Program of Events

Midwest Chapter of the American College of Sports Medicine

2014 Annual Meeting

November 6-8, 2014

Radisson Hotel at Star Plaza
Merrillville, Indiana

MWACSM
promotes

Science in Exercise,
Nutrition and
Physiology

The application of
scientific knowledge
in Exercise Science

Partnerships,
friendships
and
fun!

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MWACSM Past-President and Annual Meeting Planning Chair's Welcome!

Dear Attendees, Colleagues and Friends:

Welcome and thank you for attending the 2014 Annual Meeting of the Midwest Chapter of the American College of Sports Medicine. Wow! (At the time I'm writing this message) we already have well over a RECORD number of presentations and pre-registered attendees! I can't wait to see how well things go and our final numbers.

It is amazing, yet almost impossible to believe that our Annual Meeting is now here. That which you are participating in, is a culmination of a lot of hard work – on the part of the presenters, including countless students, and, of course the MWACSM Annual Planning Committee. Our clinical focus on Friday features seven tutorials capped off by a one, two, three combo-Clinical Keynote address… spurring us to promote action!

- Dr. Robert Murray of The Ohio State University: *The Learning Connection: How Nutrition and Physical Activity Affect Cognitive Function*
- Mr. Robert Bisceglie of the Action for Healthy Kids: *What You Can Do to Ensure that All Kids Have Access to Health Promoting Schools*
- Ms. Mary Nicholson of the American Dairy Association Indiana, Inc.: *Fuel Up to Play 60!*

From the research and academic perspectives we have four tutorials – including one ACSM exercise professional update, two teaching "best and new practices" presentations, and one exploration of activity on campus, six research symposia, seven sessions of (four each) free communication presentations and over 70 poster presentations. And if that wasn't enough, we'll end with a keynote address on Saturday from the immediate past-president of ACSM:

- Dr. Janet Walberg Rankin, FACSM: *ActivEarth: Burn Fat not Fossil Fuels*

If you make it into town on Thursday evening, please stop by and meet up with old friends and make some new ones at the MWACSM Past-President's Social. Everyone is welcome! To cap off a great Friday of presentations we'll present the MWACSM Student Quiz Bowl (Jeopardy-challenge). Then let's relax with colleagues, new and old friends for a second Social by the Waterfall that will conclude with another round or two of laughs… join us for comedian Danny Browning!

Please take a minute to consider what it takes to bring together this caliber of meeting. The volume of high-quality presentations puts MWACSM at the top of ***regional*** meetings! It would be impossible to make as big a mark without so many people, and I have had the honor to work with many great ones! Please take a few minutes to thank the MWACSM Board of Directors and offer praise to as many presenters as you can. And don't forget to say thank you to our Graduate Fair participants, Exhibitors and Sponsors. I know afterward this meeting you'll agree that the 2014 MWACSM Annual Meeting was a wonderful experience!

I would like to provide a special thank you to the Program Committee for all of their time and commitment in pulling the pieces together for the 2014 Annual Meeting. A special thank you for: Dr. Amanda Salacinski, our (brand new) hardworking executive director + the coordinator of our Annual Student Quiz Bowl; President-Elect, Dr. Julianne Wallace for coordinating the Abstract Review Committee and for continuously "picking up all the pieces" as we have moved forward; President, Dr. Paul Nagelkirk for contributing throughout the process… he's like a ROCK; Drs. Stacy Fischer, Rich Rodenberg and Ramsey Shehab for coordinating the Friday clinical sessions; Dr. Derek Kingsley for organizing the judging for the student presentation awards; and finally, I would like to thank Dr. Katie Smith (newly "doctored"), our MWACSM student representative, for her continuous contributions including coordinating this year's MWACSM Student Colloquium and helping with the ACSM Regional Grant funded project – "Speed Dating/Mentoring with the MWACSM Experts!"

In closing, thank you for participating in this event. I hope you learn and take away much from these activities.

Michael

Michael Kushnick, Ph.D.

2014 Program Committee, Chair
2014 Past-President, MWACSM (formerly known as the 2013 President & Past-President, and previously known as the 2012 President-Elect & President)

2014 MWACSM Board of Directors

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Bowling Green State University

Member-at-Large
EIM On Campus Committee, Co-chair
Dr. Heather Hayes Betz
2012-2014
E-mail: hbetz@albion.edu
Albion College

Chapter and Conference Information

Did you know that the Midwest Chapter of the American College of Sports Medicine was the FIRST regional chapter granted permanent status?

In 1972, the Midwest Regional Chapter of the American College of Sports Medicine (MWACSM) was the first regional chapter to be granted permanent status. It was founded to follow, fulfill and promote, at the regional level, the objectives of the American College of Sports Medicine. The MWACSM is a chapter rich in tradition with a strong student focus. Through the years it has offered its members outstanding educational programs and opportunities for networking through the regional annual meeting.

Purpose and Objectives

- To promote and advance scientific knowledge and application of this knowledge dealing with the effect of sports and other physical activities on the health and wellness of human beings at various stages of life.
- To collaborate with other organizations, educators, scientists, physicians, fitness practitioners, and students concerned with the same or related specialties.
- To arrange for mutual meetings of educators, scientists, physicians, fitness practitioners, and students concerned with the same or related specialties.
- To initiate, promote, and collaborate on research in these fields.
- To disseminate information pertaining to various aspects of sports, other physical activities, and medicine.

ACSM Continuing Education Credit (CEC)

The American College of Sports Medicine's Professional Education Committee certifies that the Midwest Regional Chapter meets the criteria for official ACSM Approved Provider status. Provider #650390. The 2014 MWACSM Annual Meeting meets the criteria for 12.0 credit hours of ACSM Continuing Education Credit (CEC). Each hour of professional education is awarded one CEC. Attendees should claim only the credits commensurate with the extent of their participation in the activity. A certificate documenting completion of 12.0 CEC's is included in this program.

Continuing Medical Education Credit (CME)

Application for CME credit has been filed with the American Academy of Family Physicians. Determination of credit is pending.

Name Badge

Badges must be worn at all times to gain admittance into educational sessions, poster sessions, and special events to include the opening reception. In addition, your name badge serves as your meal ticket during the meeting. If you lose your badge, please see the registration desk; there is a replacement fee of $5.00.

Meeting Location

All sessions and events are held at the official conference site. Room assignments for events are detailed in this program, along with a map of the conference site.

Annual Business Meeting and Saturday Keynote Session

The annual business meeting is scheduled for Saturday, November 8, from 12:15-2:00p.m. in the Celebrity Ballroom – Center and West. It will be immediately followed by the keynote session entitled, *ActivEarth: Burn Fat not Fossil Fuels!* The annual business meeting is your opportunity to participate in the activities of the Midwest Chapter of ACSM. The agenda includes the announcement of the presentation award winners, professional award winners, newly elected officers, an update from the MWACSM Chapter Office and other, new items. Please plan to attend.

Awards

Chapter awards will be presented to include: the Student and Clinical Presentation Awards, the Founder's Award, and the MWACSM ActiveU Competition Award. For more information on all of our student and professional awards, to include eligibility requirements, criteria, application forms, and submission deadlines, please go to:
http://mwacsm.org/html/awardsMain.html

Future Meeting Location

To be determined…

Continuing Education Credits Certificate

ACSM CEC Certificate

Participant Name

Midwest Regional Chapter of the American College of Sports Medicine
Organization

2014 MWACSM Annual Meeting, Merrillville, IN
Course Title

650390	12.0
Approved Provider Number	CECs Awarded

Lead Program Administrator Signature

ACSM APPROVED PROVIDER

AMERICAN ACADEMY OF FAMILY PHYSICIANS
STRONG MEDICINE FOR AMERICA

Continuing Medical Education Credits (CME)

Application for CME credit has been filed with the American Academy of Family Physicians.

Determination of credit is pending. Check our website for updates: www.MWACSM.org

The Midwest Chapter of the ACSM thanks our 2014 Sponsors, and gratefully acknowledges receipt of funds or services from the following organizations:

AMERICAN COLLEGE of SPORTS MEDICINE
www.acsm.org

CARROLL UNIVERSITY

GATORADE SPORTS SCIENCE INSTITUTE

OHIO UNIVERSITY
College of Health Sciences and Professions

NeuMed$_x$
Expanding Non-Invasive Diagnosis
http://www.neumedx.com

NSCA National Strength and Conditioning Association

Friends of the Chapter

Individuals, universities or organizations making donations to MWACSM

Human Kinetics

Graduate Fair

On Friday from 11:00am-5:00pm MWACSM will sponsor a Graduate and Internship Fair in the Orpheum/Palace rooms running concurrent to poster sessions on the 2nd Floor. Representatives from the participating institutions will be available for part of this time to talk to those interested in their programs and distribute literature.

Ball State University	New York Chiropractic College
Benedictine University	Northern Kentucky University
Bowling Green State University	Northern Michigan University
Cincinnati Children's Hospital (internship)	Ohio University
Carroll University	Southern Illinois University
Georgia Atlantic University	University of Akron
Indiana State University	University of Indianapolis
Michigan State University	University of Wisconsin – River Falls
Miami University of Ohio	Western Michigan University

The MWACSM also thanks our 2014 Exhibitors:

PARVO MEDICS
Making Metabolic Measurement Easy

http://www.parvo.com/
ParvoMedics TrueOne® 2400 system is accurate, reliable and easy-to-use for exercise VO_2max and resting RMR measurement. Used by NASA, U.S. Olympic Training Centers, and NIH.

NSCA
NATIONAL STRENGTH AND CONDITIONING ASSOCIATION

The National Strength and Conditioning Association (NSCA) is the worldwide authority on strength and conditioning, supporting and disseminating research-based knowledge and practical application to improve performance and fitness. Founded in 1978, the NSCA offers respected accredited credentials of distinction including the Certified Strength and Conditioning Specialist ® (CSCS®). http://www.NSCA.com

NEW YORK CHIROPRACTIC COLLEGE
School of Acupuncture & Oriental Medicine
School of Applied Clinical Nutrition

http://www.nycc.edu/
Offers various graduate programs: Doctor of Chiropractic, Masters of Science in Acupuncture and Oriental Medicine, Masters of Science in Applied Clinical Nutrition, Masters of Science in Human Anatomy and Physiology Instruction.

COSMED
http://www.cosmed.com
COSMED provides Gold Standard solutions for cardiopulmonary, metabolic, and nutritional assessment applications. Featured products include the K4b2 (portable metabolic measurement), the Fitmate PRO (desktop CPET), and the BOD POD® (body composition assessment).

Exercising Nutritionally LLC
www.enllc.us • en.llc@me.com

Exercising Nutrionally, LLC
In 1984, Craig Broeder, Ph.D. FACSM, FNAASO founded Exercising Nutritionally, LLC, a private consultancy focused on working with competitive athletes and community groups assisting in the development of programs to enhance sports performance and healthy lifestyles. Today, Exercising Nutritionally, LLC core research focuses on health interventions for the treatment and prevention of obesity, cardiovascular disease, or sports performance enhancement. http://enllc.us/

Midwest ACSM
American College of Sports Medicine

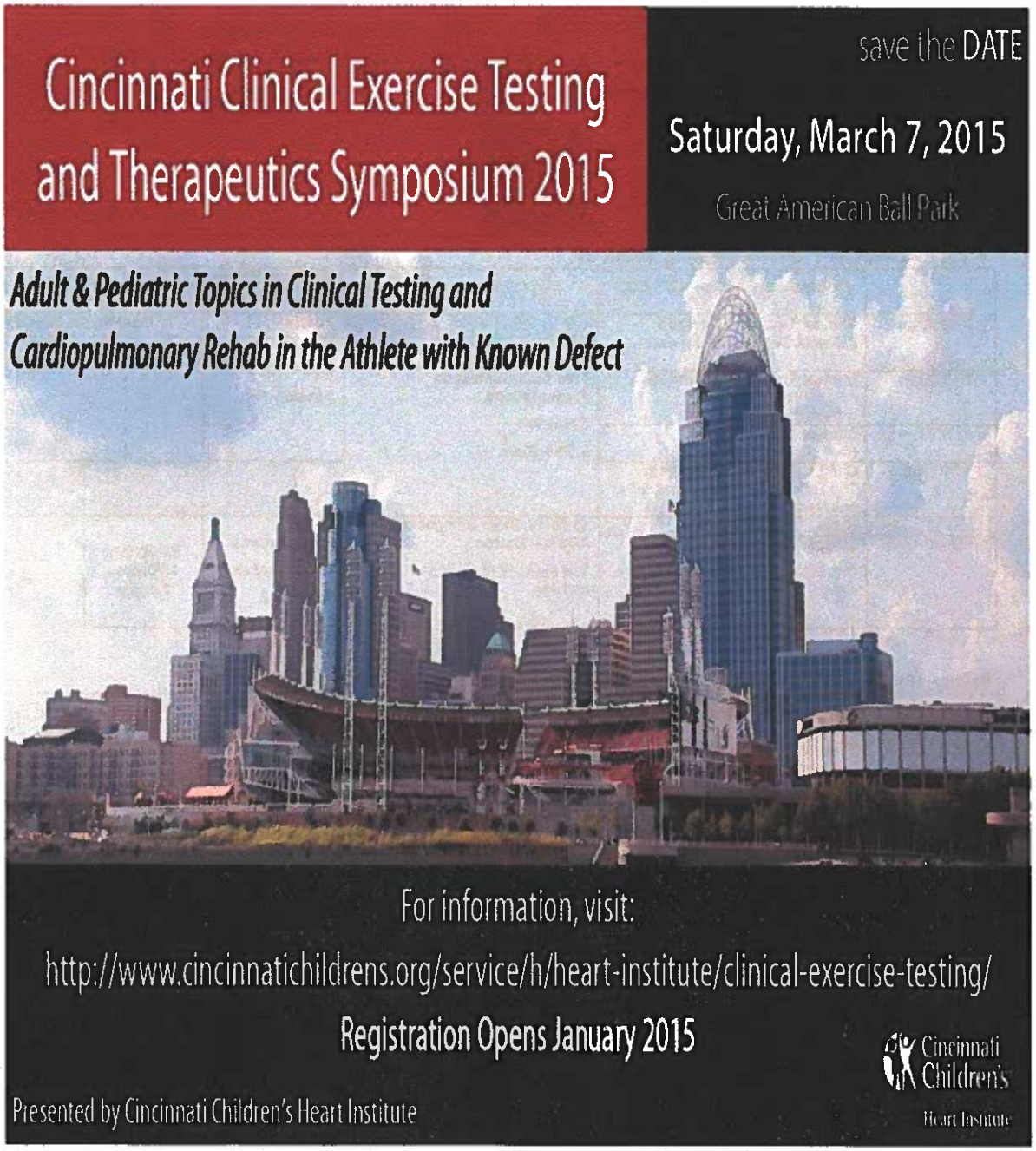
Please come visit our EXHIBITORS

East Lobby – 2nd Floor

Friday from 10:00am-7:00pm

and

Saturday from 8:00am-12:00pm



For more information visit the Cincinnati Children's Hospital Internship Graduate Fair table on Friday afternoon.

2014 MWACSM Annual Meeting Schedule

Thursday, November 7, 2014 – Afternoon/Evening

	Location	
2:00-5:00pm	McCartney Room	MWACSM Board of Directors Meeting
8:00-10:00pm	Waterfall – Hotel Atrium	**MWACSM Past-President's Reception – everyone's invited** 

Friday, November 7, 2014 – Morning Sessions

	Ambassador/Uptown – 2nd Floor	Chicago/Roxy – 2nd Floor	Orpheum/Palace 2nd Floor	East and South Lobby 2nd Floor
8:00-8:30am	**Clinical Tutorial – Duerson** Evidence based shoulder exam		**Poster Presentations 8:00-9:45am** *Session 1*	**Continental Breakfast 7:30-10:00am**
8:30-9:00am	**Clinical Tutorial - McClintock** *Treatment of infectious mononucleosis in athletes*	**Free Communication Presentations** *Session 1* **9:00-9:50am**		
9:00-9:30am	**Clinical Tutorial - Bahr** *Heat illness and athletics*			
9:30-10:00am	**Clinical Tutorial - Rodenberg** *The Friday night cramps and salty sweaters*			
10:00-10:15am	**Break**	**10:00-10:50am Symposium – ACSM – Cotton** *The exercise professional - updates*	**Poster Presentations 10:00-11:45am** *Session 2*	**Exhibitors 10:00am - 7:00pm**
10:15-10:45am	**Clinical Tutorial - Panjwani** *Organization of mass participation events*			

Friday, November 7, 2014 – Late Morning through Afternoon Sessions

	Ambassador/Uptown – 2nd Floor	Chicago/Roxy – 2nd Floor	Orpheum/Palace 2nd Floor	East and South Lobby 2nd Floor	
10:45-11:15am	**Clinical Tutorial – Shebab** *Performance enhancing drugs*	**Symposium - Zuo** *Respiratory Muscle Training* **11:00-11:50pm**	**Poster Presentations 10:00-11:45am** *Session 2*	**Exhibitors 10:00am - 7:00pm**	**Orpheum/Palace 2nd Floor**
11:15-11:45am	**Clinical Tutorial – Stuart** *CrossFit: Trend or Not?*				
11:45-12:00pm	**Break**				**MWACSM Graduate Fair 11:00-5:00pm** lunch break 12-2pm
12:00-2:00pm	**Luncheon and Clinical Keynote:** **Dr. Robert Murray** *The Learning Connection: How Nutrition and Physical Activity Affect Cognitive Function* **Mr. Rob Biscegile – Action for Healthy Kids®** *What You Can Do to Ensure that All Kids Have Access to Health Promoting Schools* **Ms. Mary Nicholson – American Dairy Association Indiana, Inc.** *Fuel Up and Play 60!* **Celebrity Ballroom Center and West – 1st Floor**				
	Ambassador/Uptown – 2nd Floor	**Chicago/Roxy – 2nd Floor**	**Orpheum/Palace 2nd Floor**	**East and South Lobby 2nd Floor**	**Orpheum/Palace 2nd Floor**
2:10-3:00pm	**Tutorial - Reeves** *Transforming Student Learning*	**Free Communication Presentations** *Session 2*	**Poster Presentations 2:00-3:45pm** *Session 3*	**Exhibitors 10:00-1:00pm**	**MWACSM Graduate Fair 11:00-5:00pm** lunch break 12-2pm
3:10-4:00pm	**Tutorial - Oppliger & Rankin** ActivEarth On Campus	**Free Communication Presentations** *Session 3*			
4:10-5:00pm	**MWACSM Student Focus - Knect & Coughlin** *Academic & Professional prep - Career in Exercise Science*	**Free Communication Presentations** *Session 4*			
5:10-6:40pm	**MWACSM Student Quiz Bowl "Jeopardy"** **Celebrity Ballroom Center and West – 1st Floor**				

Friday, November 7, 2014 – Evening

	Ambassador/Uptown – 2nd Floor	Chicago/Roxy – 2nd Floor	Orpheum/Palace 2nd Floor	East and South Lobby 2nd Floor	Orpheum/Palace 2nd Floor
6:40-8:30pm	Dinner on your own				
8:30-11:00pm	Enjoy the company of your MWACSM colleagues	MWACSM Social by the Waterfall (Hotel Atrium) 8:30-10:00pm 	Entertainment Celebrity Ballroom Center and West – 1st Floor 10:00-11:00pm Professional Comedian: Danny Browning 	Laughter is good for you!	

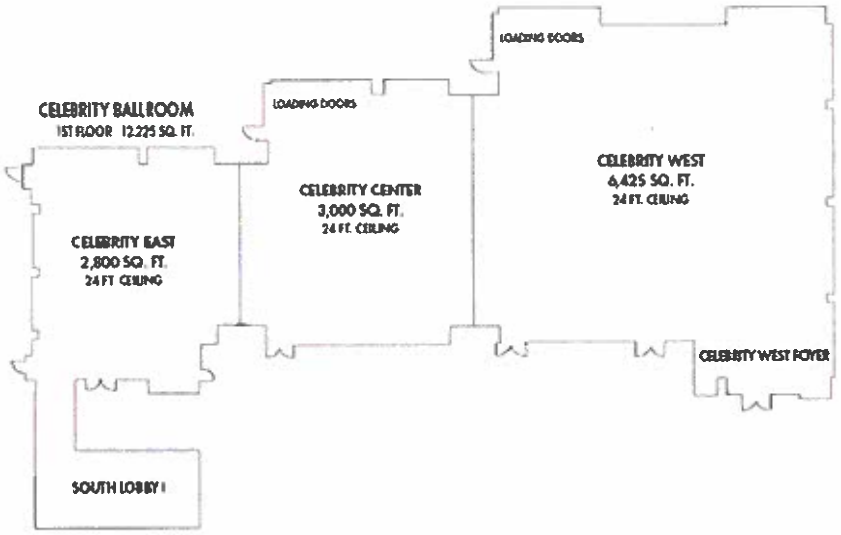
Saturday, November 8, 2014

	Ambassador/Uptown – 2nd Floor	Chicago/Roxy – 2nd Floor	Orpheum/Palace 2nd Floor	East and South Lobby 2nd Floor	
7:30am				Continental Breakfast 7:30-10:00am	
8:00-8:50am	Free Communication Presentations *Session 5*	Symposium - Bosak *Training Sports Officials*	Poster Presentations 8:30-10:30am *Session 4*	Exhibitors 8:00-12:00pm	Continental Breakfast 7:30-10:00am
9:00-9:50am	Free Communication Presentations *Session 6*	Symposium - Knect *Metabolic indices of integrated exercise testing*			
10:00-10:50am	Free Communication Presentations *Session 7*	Symposium – Betz, Knous, Coughlin & Ode *Games, play and innovation in teaching exercise science*			
11:00-11:50am	Symposium - McDaniel *Single leg cycling*	Symposium – Carriker *Nitrate, Nitrite and Nitric Oxide*			
12:00-12:15pm	Checkout				
12:15-2:00pm	Announce student presentation awards	Luncheon & Business Meeting Keynote: *ActivEarth* by Dr. Janet Walberg Rankin (past-president ACSM) Celebrity Ballroom Center and West – 1st Floor		Announce election results	

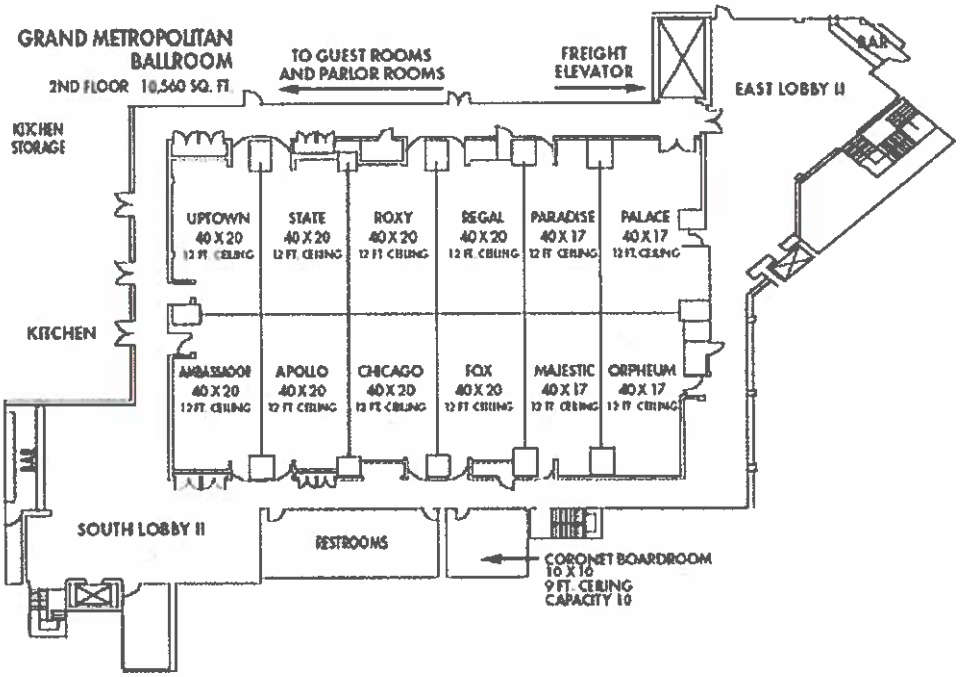
Radisson
AT STAR PLAZA
800 East 81st Ave
Merrillville, Indiana 46410
(219) 769-6311

Floor Plan

Conference Center 1st Floor



Conference Center 2nd Floor



Featured Keynote Speakers

Clinical Keynotes
Friday, November 7, 2017
12:45-2:00pm
Celebrity Ballroom Center and West – 1st Floor

Robert Murray, M.D. The Ohio State University

Dr Murray spent his career as a professor of pediatrics in the Ohio State University School of Medicine, practicing at Nationwide Children's Hospital in Columbus. In 2006, he became the Director of the Center for Healthy Weight and Nutrition, providing both medical and bariatric surgical options. Dr. Murray had spent 20 years at in the field of Pediatric Gastroenterology and Nutrition. He spent 3 years as the Pediatric Medical Director for Ross Labs, a division of Abbott Nutrition, before returning to Children's to create the weight management program. Currently, along with teaching and research in the Department of Human Nutrition at OSU, Dr Murray is involved in several projects involving pediatric nutrition and obesity prevention. He spent 10 years on the American Academy of Pediatrics' Council on School Health. Currently, Dr Murray is president-elect of the Ohio Chapter of the AAP.

12:45-1:15pm
Presentation: *The Learning Connection: How Nutrition and Physical Activity Affect Cognitive Function*

This presentation will look at the role of nutrition and physical activity in brain development and cognitive function. It will touch on the epigenetic effects of diet and play. Specifically, the talk will focus on school meals, particularly breakfast, and on activities, such as recess, on educational performance and long-term health outcomes.

Rob Bisceglie, CEO, Action for Healthy Kids

Rob Bisceglie was appointed CEO of Action for Healthy Kids in January 2008, bringing more than 15 years of diverse non-profit experience in management, operations, development, and strategic and operational planning to the organization. Prior to joining Action for Healthy Kids, Rob worked for non-profit, governmental and community organizations in both Chicago and Washington, DC. Rob has lead and overseen health and economic development initiatives both here in the U.S. and internationally, having managed programs for the U.S. Agency for International Development in more than 40 developing countries worldwide. He has a master's degree in foreign affairs with a concentration in human rights foreign policy from the University of Virginia and a bachelor's degree in business from the University of Illinois. Most important, Rob is the father of three young children who fuel his desire to work to improve the lives of all kids.

Action for Healthy Kids®

Action for Healthy Kids® is the nation's leading nonprofit and largest volunteer network fighting childhood obesity and undernourishment by helping schools become healthier places so our kids can learn to eat right, are active every day and are ready to learn. Nationwide, the school-based, grassroots efforts of our 50,000+ volunteers are supported by a collaboration of more than 70 organizations, corporations and government agencies.

1:20-1:45pm
Presentation: *What You Can Do to Ensure that All Kids Have Access to Health Promoting Schools*

This presentation will focus on the importance of ensuring that all kids develop the lifelong habits necessary to promote health and learning. In conveying this message, I will discuss and invite attendees to join our new Every Kid Healthy Campaign as we pursue the visionary goal to support all schools in providing healthy foods, quality health and physical education and comprehensive physical activity for all 55 million students by 2030.

Clinical Keynotes
Friday, November 7, 2017
12:40-2:00pm

(continued)

1:45-2:00pm
Presentation: *Fuel Up to Play 60*

Fuel Up to Play 60 is an in-school, student led health and wellness program developed by the National Dairy Council and the NFL, with oversight by the USDA. It engages students, working with adults, in making long-term, healthy changes in their school environment that improve food, nutrition and physical activity opportunities and influence healthy choices among students.

Objectives: Introduce Fuel Up to Play 60
Show the relationship between the Learning Connection and Fuel Up to Play 60
Make attendees aware of ways they can become involved

Mary Nicholson, American Dairy Association Indiana, Inc.
I am a native of southern Illinois and graduated from Illinois State University with a BS in Foods and Nutrition. I worked for several years in institutional foodservice before joining the National Dairy Council in 1989, serving as a Marketing and Resource Assistant. After moving to Indianapolis, I started working with the American Dairy Association Indiana, Inc. in 2000 as a Program Coordinator, working with our school nutrition education programs, which have evolved into Fuel Up to Play 60.

My organization is the American Dairy Association Indiana, Inc. (ADAI) and we serve as the sponsor for the Fuel Up to Play 60 program in Indiana. An affiliate of the National Dairy Council, ADAI serves as a resource for schools, consumers, and health professionals with science-based information. As the Fuel Up to Play 60/NFL Lead, my role is to oversee the activation of Fuel Up to Play 60 in our schools and to foster support for it from those outside of the school environment.

Keynote
Saturday, November 8, 2014
1:10-2:00pm
Celebrity Ballroom Center and West – 1st Floor

Janet Walberg Rankin, Ph.D., Past-President ACSM, Virginia Tech

Janet Walberg Rankin, Ph.D. has worked in the intersection of nutrition and exercise physiology during her career as a professor at Virginia Tech. She came to Virginia Tech after completing her doctoral training at the University of California at Davis in nutrition with a minor in exercise physiology. Her personal interest in cycling was elevated by her time in Davis where cycling dominates transportation. After a brief stint in rat research during graduate school, she focused her research on the effect of nutrition and exercise on human health and performance in the remainder of her career. Her early research explored the optimal strategies for and consequences of weight loss in athletes. Her interest evolved to the effects of exercise and nutrition on inflammation in athletes and in obesity. A recent project in her laboratory examined the effects of the omega-3 fat, DHA, on muscle damage and inflammation with resistance exercise. Most recently her personal interest in cycling is converging with a new research area related to the value of active transportation to improve health, the environment, and the economy. At Virginia Tech, she has had various administrative rolls that include Associate Dean of the Graduate School (current), Director of the Institute for Biomedical and Public Health Sciences, and Acting Department Head. She has served on national panels that developed summary evidence statements for the Institute of Medicine and US Pharmacopeia on dietary supplements used for performance. She was a co-author on the most recent American College of Sports Medicine (ACSM) position stand on the impact of exercise for body weight and composition in obesity. Dr. Rankin has been highly involved in ACSM, first in the Southeast regional chapter (President in 1995) and currently as immediate Past- President of ACSM.

Presentation: *ActivEarth: Burn Fat not Fossil Fuels*

ACSM encourages physical activity to improve health and reduce non-communicable diseases. However, our communities are organized for car rather than people-powered transportation, making physical activity more difficult. This presentation will review the status of active transportation in this country and highlight the connection to improved health, the environment, and the economy. Barriers as well as strategies to encourage additional use of active transportation will be discussed.

Objectives:
- Understand the patterns of use of active transportation in the US.
- Appreciate the connection between the use of active transportation, physical activity, health, the environment, and the economy.
- Recognize the role of infrastructure and personal factors as predictors of active transportation.
- Realize the need for additional efforts to encourage active transportation of the public.

Clinical Tutorials
Friday, November 7, 2014
Morning Sessions
Ambassador/Uptown Room 2nd Floor

8:00am-8:25am
Presentation: *Evidence-Based Shoulder Exam*
Drew Duerson, M.D.

Learning Objectives:
1) Identify those physical exam techniques commonly used to help diagnose specific shoulder pathology.
2) Describe how to perform these exams properly and how they have been traditionally defined.
3) Provide the sensitivity, specificity, positive predictive values for these techniques in regard to specific shoulder pathology.

Dr. Duerson is the Nationwide Children's Hospital Sports Medicine Fellow for 2014-2015. He grew up in Kentucky where he was a competitive junior golfer, high school regional champion, and state golf tournament participant both his junior and senior years. He attended Bellarmine University in Louisville, KY on a golf scholarship where he majored in Biology. He stayed in Louisville for medical school then moved to Ohio to complete his pediatric residency at Nationwide Children's Hospital. During residency he provided medical coverage at several different sporting events around Columbus and was team physician for the Linden McKinley and London high school football teams. He also assisted with sports physicals for many local high schools and the Special Olympics. He was active in three different sports medicine research projects that lead to presentations at the AMSSM, ACSM, and Ohio AAP annual meetings. He also received the 2014 Central Ohio Pediatric Society resident travel award and AMSSM resident scholarship.

8:30am-8:55am
Presentation: *Treatment of Infectious Mononucleosis in Athletes*
Amy McClintock, M.D.

Learning Objectives:
1) To provide a brief review of the common presentation of infectious mononucleosis.
2) To briefly review how to diagnosis and treat mononucleosis.
3) Brief discussion of current recommendation in regards to return to play of athletes with infectious mononucleosis.

Dr. McClintock is a Primary Care Sports Medicine Fellow at Summa Health System in Akron, Ohio. She is a former college soccer player at Rice University in Houston, Texas. She received her medical school training at Saint Louis University School of Medicine. Following medical school, Dr. McClintock completed a family medicine residency at Mercy Hospital - St. Louis. She currently holds a board certification in family medicine.

9:00am-9:25am
Presentation: *Heat Illness and Athletics*
Marcel Bahr,M.D.

Learning Objectives:
1) Understand pathophysiologic mechanisms that lead to exertional heat stroke.
2) Recognition of EHS and accurate diagnosis under consideration of predisposing factors.
3) Adequate treatment of EHS in the acute setting.

Dr. Bahr graduated from medical school in Göttingen, Germany at Georg August Universität in 2007. Research year with completion of doctoral thesis in family medicine at the University of Hannover in 2008. Worked in internal medicine 2008-2011 before continuing his education in the US. Akron general center for Family Medicine 2011-2014. Currently Sports Medicine fellow at Summa Health System in Akron. Hobbies include running and exploring nature and cultural life in Ohio and beyond.

9:30am-9:55am
Presentation: *The Friday Night Cramps and Salty Sweater*
Rich Rodenberg, M.D.

Learning Objectives:
1) Understand the definition of athletic muscle cramping.
2) Understand the 2 main theories behind muscle cramping including salty sweating versus Altered Neuromuscular Control Hypothesis.
3) Understand possible treatments and prevention options for muscle cramping.

Dr. Rodenberg, MD, joined Nationwide Children's Hospital Sports Medicine in 2007 and is a Clinical Assistant Professor of Pediatrics at The Ohio State University College of Medicine. He is board certified in internal medicine, pediatrics and primary care sports medicine. As a team physician, Dr. Rodenberg has cared for high school, Division I, II, and III collegiate and professional athletes. He is currently the program director for the Primary Care Sports Medicine Fellowship at Nationwide Children's Hospital. His experience includes teaching at the University of Kentucky in internal medicine, pediatrics, and sports medicine, while caring for the Wildcats athletic teams. He also serves as team physician at Big Walnut High School and Ohio Dominican University in the central Ohio area.

BREAK
10:00am-10:15am

10:15am-10:40am
Presentation: *Organization of Mass Participation Events*
Sam Panjwani, M.D.

Learning Objectives:
1) Discuss the key administrative issues regarding medical care at mass participation events.
2) Review the common medical conditions encountered.
3) Highlight previous disasters from the past and lessons learned.

Dr. Panjwani is a board certified physician in family medicine and currently a sports medicine fellow at The University of Chicago - NorthShore. Dr. Panjwani attended undergraduate college at the University of Texas in Austin and received his medical degree from Kasturba Medical College in India. He completed his residency in 2011 at the Rutgers Robert Wood Johnson family medicine residency in New Jersey and worked as faculty in the residency prior to starting fellowship in 2014.

10:45am-11:10am
Presentation: *Performance Enhancing Drugs*
Ramsey Shehab, M.D.

Learning Objectives:
1) Identify most common ergogenic aids on the market.
2) Review the evidence for their effect on athletic performance.
3) Review the potential side effects of ergogenic aids.

Dr. Shehab is a senior staff physician at Henry Ford Health System and Clinical Assistant Professor of Orthopaedics at Wayne State University. He is board certified in Family Medicine and Sports medicine. He also serves as team physician for the University of Michigan-Dearborn and Detroit Country Day School. He completed a Family Medicine residency at the University of Michigan followed by a Sports Medicine fellowship at Wake Forest University.

11:15am-11:40am
Presentation: *Cross Fit: Fitness Trend or Not?*
Emily Stuart

Learning Objectives:

1) Provide an overview of the CrossFit philosophy.
2) Discuss the benefits of CrossFit.
3) Review risks associated with CrossFit.

Dr. Stuart is a pediatric sports medicine physician at Nationwide Children's Hospital in Columbus, Ohio. She is originally from Oklahoma and attended the University of Missouri for college and medical school. She completed her residency at Phoenix Children's Hospital followed by a sports medicine fellowship at Nationwide Children's Hospital. Emily is a member of ACSM, AMSSM, and AAP. She is the team physician for London High School. As a former level 10 gymnast and current judge for women's gymnastics competitions, Emily has a special interest in caring for gymnasts. In her free time she is an avid crossfitter and enjoys biking and hiking.

Poster Presentations
Friday, November 7, 2014
Morning Sessions

Orpheum/Palace – 2nd Floor

8:00-9:45am
Poster Presentations
Session 1

10:00-11:45am
Poster Presentations
Session 2

Abstracts are available

Symposia and Free Communications
Friday, November 7, 2014
Morning Sessions

Chicago/Roxy – 2nd Floor

9:00-9:50am
Free Communication Presentations
Session 1
Abstracts available later in the program

MWACSM Special Symposium

10:00-10:50am

Richard Cotton, M.A., P.D., E.S., American College of Sports Medicine
Richard Cotton is ACSM's National Director of Certification and Registry Programs. He has worked in the health and fitness industry for more than 30 years. Cotton earned a B.A. in education from Wayne State University, Detroit, and an M.A. in exercise science from San Diego State University. He holds ACSM certifications as Preventive and Rehabilitative Program Director SM and ACSM Exercise Specialist®. He frequently serves as an expert source on behalf of ACSM in print, broadcast and Web-based media.

Presentation: *The Exercise Professional - Update*

The ACSM certified professionals are recognized nationally and worldwide as valuable exercise professionals. The overall purpose of this presentation is to familiarize MWACSM membership with the efforts and initiatives of the ACSM with regards to ACSM certifications.

Learning outcomes:

1) Understand adjustments made to ACSM certifications over the past few years.
2) Learn how to best prepare for ACSM certification exams.
3) Learn ACSM's efforts to market and promote ACSM certifications.
4) Be informed of ACSM's short and long term strategic plans regarding certification.

11:00-11:50am Symposium

Li Zou, Ph.D., The Ohio State University, College of Medicine, Columbus, OH

Dr. Zuo has obtained his PhD in Biophysics/Physiology from Ohio State University and previously held a faculty position at School of Medicine, University of California, San Diego. Currently Zuo has OSU-P status for supervising MS or PhD students. Zuo is a faculty member of Biophysics Graduate Program, Radiologic Sciences and Respiratory Therapy Division in the School of Health and Rehabilitation Sciences in the College of Medicine. Zuo serves as Editor-in-Chief for *Journal of Biological Research & Development*, Academic Editor for *PeerJ*, Associate Editor for *The Internet Journal of Oncology, Frontiers in Striated Muscle Physiology* and *Frontiers in Physiology*.

Presentation: *Exercise-Based Training on Respiratory Skeletal Muscle Against COPD*

Narrative: The objective of my research is to study the mechanism of respiratory muscle failure induced by oxidative stress in chronic obstructive pulmonary disease (COPD). COPD is currently the fourth leading cause of death worldwide, and it has been estimated to be the third-leading cause of death in the year 2020. The majority of COPD deaths are directly or

indirectly related to the cardiac and respiratory muscle failure. The diaphragm, regarded as the major "pump" of respiration, can be chronically damaged due to the over production of inflammatory factors such as a tumor necrosis factor-α (TNF-α) and hypoxic stress associated with increased carbon dioxide accumulation in COPD. Both TNF-α and hypoxia can also induce excessive reactive oxygen species (ROS) formation and oxidative stress, resulting in extensive muscle protein degradation, diaphragm dysfunction, and eventually "pump" failure associated with subsequent heart failure, which is lethal if an immediate external ventilator is not provided to the patient. Therefore, my laboratory is primarily aimed to develop novel non-invasive therapeutic strategies to strengthen the internal ventilator, the diaphragm in COPD patients.

Learning Objectives:

1) Understand the effect of pulmonary TNF-α overexpression on rodent respiratory muscle.
2) Understand the mechanism of oxidative stress in respiratory muscle in COPD.

Purpose: To highlight the potential role of hypoxic preconditioning (HPC) in the preservation of skeletal muscle function during COPD condition.

Tutorials and Free Communications
Friday, November 7, 2014
Afternoon Sessions

Ambassador/Uptown Room 2nd Floor

2:10-3:00pm Tutorial

Brenda Reeves, Ph.D., FACSM, Carrol University, Waukesha, WI
Dr. Reeves is an assistant clinical professor at Carroll University, and is a Past-President of MWACSM and currently serves as Executive Director. Brenda received her doctorate from the University of Toledo with emphasis areas in exercise physiology and health education. She received her Masters degree in exercise science as well as her undergraduate degree in psychology from Bowling Green State University. Her fitness and wellness career spans 25 years with experiences in military conditioning, hospital-based wellness, corporate wellness, community fitness, and campus recreation. She has also been recognized in the Who's Who of Professional Educators as well as the Manchester Who's Who Among Executive and Professional Women. Brenda is also a fellow member of the American College of Sports Medicine, and initially became involved in the Midwest chapter of the American College of Sports Medicine in 1990. She has previously served on the board of directors as a member-at-large, secretary, and president.

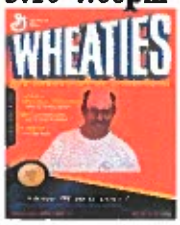
Presentation: *Transforming the Student Learning Experience in Higher Education with the IPAD*

Narrative: In June 2013, President Obama announced the ConnectED Initiative, designed to enrich K-12 education in America by providing resources and support to upgrade Internet connectivity and provide access to educational technology in the classroom, transforming the student learning experience. While several K-12 school districts have integrated instructional technology using the iPad with success, what about higher education? In the past decade most colleges and universities have incorporated learning management systems such as Blackboard, but are they effectively using instructional technology in the classroom or teaching digital literacy for the 21st century? Furthermore, what educational gaps will faculty be faced with when the 5th graders of today reach college?

Learning Objectives:

1) Identify 21st century skills
2) Discuss gaps between technology needs of the workforce and the use of technology in the classroom
3) Explore information and digital literacies in higher education and how they can be tied to assessment
4) Discuss the impact of an iPad policy within a graduate curriculum
    a. Uses as well as available tools and resources
    b. Effects on the academic experience
    c. Perceived barriers
5) Compare pros and cons, and what to consider in implementing this type of policy

3:10-4:00pm Tutorial



Robert Oppliger, Ph.D., FACSM
Bob has served on a wide range of ACSM committees and as secretary/treasurer for MWACSM. Currently he is a member of the Strategic Planning Committee, Chair of the Health Science Policy Committee and is a member of Ad-hoc ActivEarth Committee. Dr. Bob is a League of American Bicyclist Cycling Instructor and helps organize bike education programs for adults and at local schools. He helped organize the first Bike to Work Week in Iowa City 25 years ago and regularly writes guest opinions in local papers advocating for active transportation. His academic vita includes more than 50 publications and well over a hundred presentation to scientific and lay audiences. He has chaired the authoring committee for an ACSM position statement been a consultant to the NCAA, National Federation of High School Associations and several state high school sports associations. When he's not on a bike, Dr. Bob referees USSF, recreational, and high school soccer, and tends his gardens.

Janet Walberg Rankin, Ph.D., FACSM, Virginia Tech University, Blacksburg, VA
Bio available on page 14 (Keynote)

Presentation: *ActivEarth on Campus*

Narrative: The ACSM's ActivEarth initiative had its genesis at the 2013 national meeting. An official launch is planned for September 2014 with additional efforts to develop over time. The goal of ActivEarth is to promote active transportation through accessible and safe walking and biking options as a means to better health, environments, and sustainable economies. Research shows that individuals who live in walkable communities get more physical activity that can reduce the burden of chronic disease. Since the transportation sector accounts for about a third of CO_2 emissions, an increase in active transportation can reduce the negative impact on our environment as well as our dependence on import of expensive fossil fuels. Active transportation is good for business in that property values improve and commercial income rises when the surrounding community is more walkable and bikable. Statistics show that, in general, college communities use more active transportation than the general population but it is still well below desired levels. In addition, young adults tend to be more motivated to reduce their impact on the environment. For these reasons, college communities may be an important target for changing active transportation behavior.

Learning Objectives:
1) Know the goals of ActivEarth
2) Relate the goals of ActivEarth to the mission of ACSM
3) Identify ways to promote ActvEarth on a college campus
4) Identify measurable steps for an ActivEarth on a college campus

4:10-5:00pm Tutorial

MWACSM Student Focus

Panelist: Sandra K. Knecht, MS, RCEP Cincinnati Children's Hospital Medical Center
Sandy was born and raised a "Hoosier" and completed her bachelor's degree in Sports Medicine at the University of Evansville, Indiana and her master's degree from California University of Pennsylvania, Pennsylvania. She has been an Exercise Physiologist at Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio for 14 years and is involved with the testing of pediatric and adult congenital heart patients, research projects, and most recently, the Cardiopulmonary Lab's educational and internship programs.

Panelist: Adam Coughlin, Ph.D. Saginaw Valley State University
Adam graduated from Adrian College with his B.S. in Exercise Science and Michigan State University for his M.S. and Ph.D. in Exercise Physiology. After teaching at Adrian College for 9 years, he moved to Saginaw Valley State University in 2014. He has continued to present research data at state, regional, and national conferences while working with undergrads on research projects involving community wellness programs, and running footwear. He has previously been on the MWACSM BOD and is currently running for President-Elect of MWACSM.

Presentation: *Academic and Professional Preparation- Careers in Exercise Science*

Both Adam Coughlin, Ph.D., and Sandy Knecht,M.S., RCEP are successful professional exercise scientists. While the two share a lot of common experiences in their academic and professional development, their careers are quite different… or are they?

Learning Objectives:

1) Understand common successful academic and professional development activities in different exercise scientists
2) Recognize the role of exercise scientists in academia and clinical exercise settings

Symposia and Free Communications
Friday, November 7, 2014
Morning Sessions

Orpheum/Palace – 2nd Floor

2:00-3:45pm
Poster Presentations
Session 3

Abstracts are available

Free Communications
Friday, November 7, 2014
Afternoon Sessions

Chicago/Roxy – 2nd Floor

2:10-3:00pm	**3:10-4:00pm**	**4:10-5:00pm**
	Free Communication Presentations	
Session 2	*Session 3*	*Session 4*

Abstracts available

Special Events
Friday, November 7, 2014

Celebrity Ballroom Center and West – 1st Floor

5:10-6:40pm

Sponsored in part by

NSCA National Strength and Conditioning Association

MWACSM Quiz Bowl "Jeopardy"

Be a part of this fun event… showcasing our undergraduate student attendees! Come support the teams.

The Radisson Hotel
Atrium above the Waterfall

8:30-10:00pm
MWACSM Social

Featuring snacks, dessert and drinks

Conference Center
Celebrity Ballroom Center and West – 1st floor

10:00-11:00pm
Comedian: Danny Browning

Born and raised in the glorious utopia that is rustic Southern Indiana, Danny's a country boy at heart with a friendly sarcasm and sharp wit. You will laugh as Danny cleverly explains why his life is a living nightmare. Whether it's a bad vacation or a wedding reception without beer, Danny's stories are funny, relatable and always memorable.

Free Communications and Symposia
Saturday, November 8, 2014
Morning Sessions

Ambassador/Uptown Room 2nd Floor

8:00-8:50am | **9:00-9:50am** | **10:00-10:50am**

Free Communication Presentations

Session 5 | *Session 6* | *Session 7*

Abstracts available later in the program

11:00-11:50am Symposium

John McDaniel, Ph.D. Kent State University & Cleveland VA Medical Center

Dr. McDaniel is an Assistant Professor at Kent State University and a Health Science Specialist at the Cleveland VA Medical Center. Initially, his research employed a variety of animal and human based models, including cycling, to study muscle function. Specifically, he varied cycling parameters to quantify the cost of torso stabilization during cycling exercise and to determine how shortening velocity and contraction/relaxation rates influence metabolic cost of muscle contraction. More recently his research has focused on vascular health, muscle perfusion and blood flow regulation in a variety of populations including healthy older individuals and those with heart failure/transplant, COPD, stroke and spinal cord injuries. To this end he has been interested in employing single-leg cycling as an exercise paradigm that can maximize peripheral adaptations for sport performance as well as for those who are centrally compromised (i.e., Heart failure and COPD).

Steven Elmer, Ph.D. Michigan Technological University

Dr. Elmer is an Assistant Professor in the Department of Kinesiology and Integrative Physiology at Michigan Technological University. His research interests are broad in nature and he uses a cycling model, including single-leg cycling, to understanding various aspects of neuromuscular function and dysfunction. Applications for his research range from basic aspects of neuromuscular function to applied human performance in a variety of settings including injury, rehabilitation, ergonomics, and sport. As a new member of MWACSM Dr. Elmer looks forward to developing new collaborations within the Midwest region.

Presentation: Single-Leg Cycling: Advantageous for Improving Performance, Restoring Function, and Facilitating Research

Purpose to present recent data that support the use of single-leg cycling as a training modality for both athletic and patient populations and introduce a variety of applications for this model in laboratory settings.

Background To date, there is growing interest in the notion that training with one leg is better than training with two. Specifically, during high-intensity whole-body exercise, blood flow to the active muscles is generally limited by central circulation. Conversely, when exercise is confined to a smaller muscle mass (e.g., knee extension exercise), skeletal muscle perfusion is not centrally compromised resulting in increased blood flow to the active muscle which ultimately allows the muscle to perform at greater work rates. Thus, smaller muscle mass activities may be useful for improving muscle aerobic capacity in a variety of populations ranging from endurance athletes to patients who have reduced tolerance to exercise due to central and/or peripheral limitations. Single-leg cycling is a unique exercise modality that allows for a reduced active muscle mass and is clinically relevant.

Symposium Overview In this symposium we will demonstrate how single-leg cycling can be utilized to improve performance, restore function, and facilitate research. First, we will compare the physiological and biomechanical characteristics of single-leg cycling to normal double-leg cycling and provide evidence supporting the use of chronic single-leg cycling training to stimulate improvements in metabolic and cardio-respiratory function in athletic (cyclists) and patient (COPD, pre-diabetes, ACL patients) populations. Along the way we will describe equipment modifications required to make single-leg cycling a tolerable exercise modality and touch briefly on a current topic of debate relating to the implementation of single-leg cycling. We will also demonstrate how single-leg cycling can be a valuable research model for comparing smaller and larger muscle mass activities and understanding relative contributions of central and peripheral factors to phenomenon such as neuromuscular fatigue. Finally, we will identify questions that remain to be answered and potential future directions.

Learning Objectives:

1) Describe physiological differences between small and large muscle mass exercise
2) Explain general benefits to small muscle mass exercise training.
3) Recognize physiological and biomechanical differences and similarities between single-leg and double-leg cycling.
4) List positive outcomes associated with chronic single-leg cycling training.
5) Identify potential applications of single-leg cycling.

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Symposia
Saturday, November 8, 2014
Morning Sessions

Chicago/Roxy – 2nd Floor

8:00-8:50am Symposium

Andy Bosak, Ph.D., HFS, CSCS Armstrong State University

Dr. Bosak is an associate professor in Sports Medicine with an emphasis in Exercise Physiology in the Department of Health Sciences at Armstrong State University. Dr. Bosak earned a BS degree in Physical Education (Emphasis: Exercise Science) and a MS degree in Physical Education (Emphasis: Exercise Physiology) from Western Kentucky University, and completed a Doctorate of Philosophy degree in Human Performance/Kinesiology (Emphasis: Exercise Physiology) at the University of Alabama. Dr. Bosak is certified by both the National Strength and Conditioning Association and by the American College of Sports Medicine. Dr. Bosak's research interests include: 1) evaluating the recovery aspects from sport and occupational performance, 2) improving athletes' and emergency service workers' performance, 3) assessing athletes' and sports officials' physiological changes pre, post, and during the sporting seasons, 4) analyzing the prevalence of low back pain in physically demanding occupations, and 5) evaluating the physiological responses to and the metabolic costs of exergaming. Dr. Bosak has presented his research and related works at various state, regional, national, and international conferences with over 75 primary presentations and over 25 co-author presentations. Dr. Bosak is the Assistant State Director for the NSCA Georgia State Advisory Board and also serves as an assistant sports scientist for the Professional Referee Organization.

Presentation: *Training Sports Officials: An Exciting, Yet Relatively New Opportunity in Exercise Science and Sports Performance*

Narrative: The performance of athletes, including all related aspects, has been evaluated in a rather thorough manner and multiple studies have been conducted that have focused on improvements in sports performance. Variables such as nutrition, biomechanics, sports psychology, training programs, etc. all play a major role in determining athletes' performance as well as often contributing to the end results of competition. However, one area, that has great influence on the outcomes of athletic contests, but has not been extensively studied nor is often taken into consideration, is the training of sports officials. In multiple sports, sports officials (ie. referees, umpires, etc.) can negatively impact a game by making "the wrong call". These unfortunate incorrect decisions are often a result of the referee being out of position or the cumulative effects of fatigue. In both cases, the fitness status of the officials is a key contributor to incorrect calls and improvements in their conditioning levels will help reduce future incorrect calls. In many sports, the officials need to be at least as fit as the athletes that play the specific sports and in some cases, the officials may have to be even more fit than the players as in the case of sports like soccer, field lacrosse, rugby, etc. In these specific cases, it is not uncommon that the referees will "cover" more distance during the game than the athletes do. Hence, it is quite crucial that the officials are trained in a somewhat similar manner as athletes, but also with important training program differences due to the demands of the official's position and duties required to successfully officiate the games that they oversee.

Learning Objectives:

1) Understand the multiple opportunities to obtain a sports science career in training sports officials.
2) Understand how the training of sports officials is both similar and different from training athletes.
3) Comprehend how concepts from sports nutrition, physiology, psychology, biomechanics, and training principles can be applied to training sports officials.
4) Understand the various research opportunities that exist with the evaluation of various aspects of officiating sports.

Goal: One of the major goals of this presentation is to create a forum where a generation of future research ideas can be discussed. Thus, suggestions of what future research studies might focus on will be given by the presenter, while the audience will also be encouraged to participate and share ideas in a "roundtable" or "open quorum" group discussion. Since little is known regarding how sport science can improve sports officials' performance, more research is needed with an emphasis on the importance of specifically training officials to meet the unique demands of officiating different sports at the professional and amateur levels.

9:00-9:50am Symposium

Sandra K. Knecht, MS, RCEP Cincinnati Children's Hospital Medical Center
Sandy was born and raised a "Hoosier" and completed her bachelor's degree in Sports Medicine at the University of Evansville, Indiana and her master's degree from California University of Pennsylvania, Pennsylvania. She has been an Exercise Physiologist at Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio for 14 years and is involved with the testing of pediatric and adult congenital heart patients, research projects, and most recently, the Cardiopulmonary Lab's educational and internship programs.

Presentation: *Metabolic Indices during Integrative Cardiopulmonary Exercise Testing as a Prognosticator Across Age Ranges*

Physical exercise requires the interaction of physiological control mechanisms to enable the cardiovascular and ventilatory systems to couple their behaviors in order to support their common function: meeting the increased respiratory demands of the contracting muscles. A number of physiological changes facilitate the accommodation of these systems to support the hemodynamic demands of exercise. When cardiopulmonary exercise testing is supplemented with expiratory gas analysis, we can evaluate the ability of the cardiovascular and respiratory system to perform their major function of gas exchange between the cells and the environment simultaneously, and these gas exchange measurements are fundamental to understanding the mechanisms of exercise limitation. From these measurements of oxygen consumption (VO_2), carbon dioxide production (VCO_2), minute ventilation (V_E), end-tidal PO_2, and end-tidal PCO_2, more parameters can be calculated to provide more clinically relevant assessments of aerobic conditioning and cardiac function. These measurements include peak VO_2, cardiac output ($\dot{C}O$), heart rate (HR), heart rate reserve (HRR), stroke volume (SV), oxygen pulse (O_2 pulse), respiratory exchange ratio (RER), ventilatory anaerobic threshold (VAT), VE/VCO_2 slope, and assessments of pulmonary function including breathing reserve, FEV_1, maximal voluntary ventilation (MVV) and forced vital capacity (FVC).

The interpretation of these metabolic indices is dependent on the underlying pathophysiology and the age of the patient. Longitudinal follow-up of these indices can provide clinically relevant information of the progression of the underlying pathophysiologic progression and the change of the functional status of the patient. **Interpretation of these metabolic indices is dependent on appropriate normal criteria based on age and gender.** Applications on these principles must be applied in a systematic and standard manner.

Learning objectives:

1) Application of an integrative cardiopulmonary exercise test across patient age
2) Interpretation of metabolic indices acquired during a maximal exercise test
3) Application of appropriate normal value ranges for the metabolic indices across patient ages
4) Integration of metabolic indices across disease groups

10:00-10:50am Symposium

Heather Betz, Ph.D. Albion College
Heather an Assistant Professor in the Department of Kinesiology at Albion College in Albion, Michigan. Dr. Betz is currently serving her second term on the MWACSM Board of Directors, as she was a Student Representative before her current term as a Member-At-Large. Dr. Betz serves as the Chair of the Exercise is Medicine committee within the region.

Adam Coughlin, Ph.D. Saginaw Valley State University
Adam graduated from Adrian College with his B.S. in Exercise Science and Michigan State University for his M.S. and Ph.D. in Exercise Physiology. After teaching at Adrian College for 9 years, he moved to Saginaw Valley State University in 2014. He has continued to present research data at state, regional, and national conferences while working with undergrads on research projects involving community wellness programs, and running footwear. He has previously been on the MWACSM BOD and is currently running for President-Elect of MWACSM.

Jeremy Knous, Ph.D. Saginaw Valley State University
Jeremy is an associate professor at Saginaw Valley State University, who obtained his Ph.D. in Kinesiology from Michigan State University. He has taught a number of courses across an exercise science curriculum, with his main focus being exercise physiology. Current research interests include the "healthy campus" initiative for young adults, corporate wellness and athlete performance.

Josh Ode, Ph.D. Saginaw Valley State University
Josh is an Associate Professor of Kinesiology at and the Assistant Dean of the College of Health and Human Services at Saginaw Valley State University. He is a graduate of SVSU (B.A., 2001), Central Michigan University (M.A., 2003) and Michigan State University (Ph.D., 2007). His current research interests include the scholarship of teaching and learning with an emphasis on problem based learning and service learning.

Presentation: *Games, Play, and Innovations in Teaching of Exercise Science*

The current class of college students, known as the iGeneration (Rosen et al.), is often defined by the technology and media in which they use, their reliance on electronic communication, and their use of multitasking. It is often difficult to incorporate the newest technological advances into classroom teaching; engaging students does not always involve using the latest technology. In fact, innovative teaching may involve leaving the classroom to teach globally, creating a collaborative and dynamic classroom environment through structured activities, and to promote students learning through creative games and play. Many of our colleagues are utilizing innovative teaching strategies and this symposium will explore some of these methods in the context of the Kinesiology curriculum. The purpose of this symposium is to provide examples from those who are incorporating innovative teaching methods, games, and play in the classroom when teaching Kinesiology students and examples of ways to teach outside of the classroom through experiential learning. This symposium will include presenters from teaching intensive institutions. We hope that this session facilitates further dialog among educators regarding innovative teaching methods to improve student learning within the field of Kinesiology.

Learning Objectives:

1) Understand the key characteristics of the iGeneration.
2) Recognize the differences and challenges involved in teaching a technology-savvy undergraduate population.
3) Gain insight into different classroom teaching techniques to better address the needs of current college students.
4) Understand ways to teach outside of a classic classroom setting through experiential learning opportunities.
5) Leave with concrete examples of new teaching techniques to incorporate into and outside of the classroom.

10:00-10:50am Symposium

Colin Carriker, Ph.D. Indiana State University
Colin completed his doctorate at the University of New Mexico. He is currently an assistant professor at Indiana State University. His doctoral dissertation explored the effect of acute dietary nitrate consumption on submaximal oxygen consumption and oxidative stress in hypoxia. Dr. Carriker has also examined the effect of dietary nitrate and training status, comparing changes in submaximal oxygen consumption in trained and untrained runners following nitrate supplementation. His research interests include nutritional/exercise interventions and their impact on oxygen cost and performance. He has previously conducted and assisted with research in various environments including high altitude, heat and cold. His appreciation for exercise as preventative medicine stems from his previous experience working as a personal trainer, group fitness instructor and emergency medical technician.

Presentation: *The nitrate-nitrite-nitric oxide pathway: who benefits from beet juice?*

This session will explore the recent literature surrounding the effect of dietary nitrate (beet juice) on performance and submaximal oxygen cost. You'll learn about the physiological responses initiated by dietary nitrate. The ergogenic potential has surfaced, but who might benefit the most from this supplement? Recent research sheds light on the benefits of dietary nitrate for different populations (healthy, high blood pressure, peripheral artery disease etc) and different environments (sea level vs high altitude).

Background: Previous research examining dietary nitrate supplementation finds submaximal oxygen cost may be reduced at sea level (Bailey et al. 2009; Lansley et al. 2011a; Lansley et al. 2011b; Larsen et al. 2007; Larsen et al. 2010; Larsen et al. 2011). An increase in plasma nitrite, NO_2^-, occurs in response to nitrate supplementation via both nitrate salts ($NaNO_3^-$) or whole foods high in nitrate content; such foods include: celery, cress, chervil, lettuce, red beetroot, spinach, and rocket (rucola) (Hord et al. 2009). The increased plasma nitrite content is thought to play a role in NO production; increased NO production has been associated with increased mitochondrial efficiency and/or reduced ATP cost during submaximal activity.

As such, the ergogenic potential of nitrate supplementation has been established (Bailey et al. 2009; Lansley et al. 2011a; Cermak et al. 2012a; Murphy et al. 2012; Bond et al. 2012). Results from a number of studies, however, provide conflicting evidence with regard to the performance benefits linked to nitrate supplementation (Peacock et al. 2012; Bescós et al. 2012; Wilkerson et al. 2012; Cermak et al. 2012b).

Purpose: To examine the effect of dietary nitrate on performance and submaximal oxygen cost during exercise. Attendees will be introduced to evidence-based research which may serve to answer a commonly asked question: Is this supplement right for me? A surge in publications reporting the use of dietary nitrate (beet juice) has occurred in the last 5 years. This lecture serves to summarize the recent findings and interpret the literature to determine who may receive the greatest benefit from dietary nitrate supplementation.

Learning Objectives:

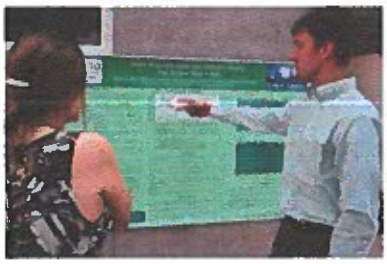
1) Understand dietary nitrate supplementation dosing strategies.
2) Understand the implications of current literature; deciphering the results to determine which populations may receive benefit (healthy, diseased, trained, untrained, etc.).
3) Determine how dietary nitrate may impact performance and submaximal oxygen cost when used prior to exercise in different physical environments (sea level vs high altitude etc).

Symposia and Free Communications
Saturday, November 8, 2014
Morning Sessions

Orpheum/Palace – 2nd Floor

8:30-10:30am
Poster Presentations
Session 4

Abstracts are available



Poster Presentation
by Session and Abstract Number

Friday, November 7, 2014
Morning Sessions

8:00-9:45am
Poster Presentations
Session 1

Abstracts are available

1 NECK COOLING IS INEFFECTIVE IN REDUCING PHYSIOLOGICAL AND PERCEPTUAL STRAIN FOLLOWING PASSIVELY-INDUCED HYPERTHERMIA
Mackenzie L. Abeare, Samantha C. Orr, Ross A. Sherman. Grand Valley State University, Allendale, Michigan.

2 COGNITIVE AND MOTOR SKILL PERFORMANCE IS NOT IMPROVED BY NECK COOLING FOLLOWING PASSIVELY-INDUCED HYPERTHERMIA
Samantha C. Orr, Mackenzie L. Abeare, Ross A. Sherman. Grand Valley State University, Allendale, Michigan.

3 THE EFFECT OF AN UNDERGRADUATE STUDENT DIRECTED FACULTY WELLNESS PROGRAM ON INTERPERSONAL COMMUNICATION SKILLS IN STUDENTS
Elaina Voss, Brianne Burkhart, Matt D. Beekley FACSM & K. Lee Everett. University of Indianapolis, Indianapolis, Indiana.

4 COMPARISON OF LEVELS OF SPORT CONFIDENCE AND NINE NCAA DIVISON II COLLEGE ATHLETIC TEAMS; Jordan Sharp, Koby Orris, Jill Cain, Mindy Hartman Mayol, Brianna Scott, Lee Everett;University of Indianapolis, Indianapolis, IN

5 FACTORS THAT INFLUENCE SELF-ESTEEM LEVELS IN COLLEGIATE ATHLETES
Maggie Paul, Jill Cain, Mindy Hartman Mayol, Brianna Scott, Lee Everett, University of Indianapolis, Indianapolis, IN

6 DIETARY PRACTICES OF DIVISION II FACULTY PARTICIPATING IN A STUDENT-RUN FITNESS PROGRAM
Charles Brauchla, Brianne Burkhart, Matthew D Beekley, FASCM, K Lee Everett;
University of Indianapolis, Department of Kinesiology, 1400 East Hanna Ave, Indianapolis, IN

7 LEADERSHIP STYLES IN COLLEGIATE ATHLETICS: PERCEPTIONS AND PREFERENCES OF ATHLETES AND COACHES
Jacquelyn M. Close, Tim J. W. Daniels, and Matthew S. Renfrow;T aylor University Human Performance Lab, Taylor University, Upland, IN

8 BARRIERS TO RESISTANCE TRAINING AMONG COLLEGE-AGED WOMEN
Nathan A. Peters, Rebecca A. Schlaff, Jeremy L. Knous ;Saginaw Valley State University, University Center, MI

9 INFLUENCE OF EXPERIENCE ON ENERGY COST OF NEW ACTIVE VIDEO GAMES IN YOUTH; John S. Jarvis, Kimberly A. Clevenger, Cheryl A. Howe; School of Applied Health Sciences and Wellness, Ohio University, Athens,

10 THE RELATIONSHIP BETWEEN BODY ESTEEM PERCEPTIONS IN COLLEGIATE MALE AND FEMALE ATHLETES AND DEMOGRAPHIC CHARACTERISTICS
Desarae Davis, Jill Cain, Mindy Hartman Mayol, Brianna Scott, Lee Everett
University of Indianapolis, Indianapolis, IN

11 INVESTIGATING SOURCES OF SPORT MOTIVATION IN DIVISION II COLLEGIATE ATHLETES; Jill Cain, Koby Orris, Mindy Hartman Mayol, Brianna Scott, Lee Everett
University of Indianapolis, Indianapolis, IN

12 THE COMPARISON OF ANATOMICAL MODELS AND THE ANATOMAGE TABLE AS EFFECTIVE TEACHING MODALITIES; Kelsey Venis, Migle Staniskyte, Dean Smith, Helaine Alessio; Miami University, Oxford Ohio

13 CHANGES IN SCREEN TIME FOLLOWING THE BEST FOOT FORWARD PROGRAM
Jennifer C. Poelstra[1], Rachel Shelton[1], Grant Schwarz[1], Marcy Kinzer[2], Rob Antcliff[2], Karin A. Pfeiffer, FACSM[3], and Rebecca W. Moore[1]; [1]Eastern Michigan University, Ypsilanti, Michigan; [2]Playmakers Fitness Foundation, Okemos, Michigan; [3]Michigan State University, East Lansing, Michigan.

14 THE EFFECT OF A HEALTH AND WELLNESS PROGRAM ON MULTI-DIMENSIONAL WELLNESS IN UNIVERSITY FACULTY; Shelbie R. Whitaker, Brianne Burkhart, Mindy Mayol, Matt D. Beekley FACSM & K. Lee Everett; University of Indianapolis, Indianapolis, Indiana.

15 NUTRITION SELF-EFFICACY IN 4th GRADE STUDENTS FOLLOWING THE BEST FOOT FORWARD PROGRAM; Rachel Shelton[1], Jennifer Poelstra[1], Grant Schwarz[1], Marcy Kinzer[2], Rob Antcliff[2], Karin A. Pfeiffer, FACSM[3], & Rebecca W. Moore[1]; [1]Eastern Michigan University, Ypsilanti, MI; [2]Playmakers Fitness Foundation, Okemos, MI; [3]Michigan State University, East Lansing, MI.

16 THE EFFECTS OF FAITH BASED VALUES AND AN EXERCISE PROGRAM ON CARDIOVASCULAR RISK FACTORS; Annisa Albury, April Crommett, Katherine O'Hara, Ginger Cameron, Jeff Huston, Greg Thorp, & Jacob Forsythe; Cedarville University, Cedarville, Ohio.

17 EFFECTS OF A 12-WEEK EXERCISE PROGRAM ON PHYSIOLOGICAL CARDIOVASCULAR DISEASE RISK FACTORS; Brad Polen, Duane B. Corbett, Kylene Peroutky, Michael Rebold, Mallory Kobak, Ellen L.Glickman FACSM, J. Derek Kingsley; Kent State University, Kent, OH

18 FUN VERSUS PRACTICAL: PHYSIOLOGICAL RESPONSES AND PREFERENCE OF EXERCISE EQUIPMENT; Shana Strunk, Courtney Perkins, Brandon Musarra, Megan O'Keefe, Katie Webb, Kenneth Sparks, Eddie T.C. Lam, Emily Kullman, Department of HHP, Cleveland State University, Cleveland, Ohio

Friday, November 7, 2014
Morning Sessions

10:00-11:45am
Poster Presentations
Session 2

Abstracts are available

1 WHICH SHOE ELICTS THE HIGHEST EXPENDITURE?
Chelsey Bruce, Kelsey Scanlon, MS; University of Mount Union, Alliance Ohio

2 SUPPLEMENTING CARBOHYDRATES WITH PROTEIN INCREASES POST-EXERCISE ENERGY EXPENDITURE IN MALE RECREATIONAL RUNNERS; Laura Moore, Erin Pelko, Linden Daiss, & Matthew Harber, FACSM; Department of Kinesiology, Taylor University, Upland, Indiana

3 COMPARISON OF ELECTRONIC AND MECHANICAL HANDGRIP DEVICES IN LOWERING BLOOD PRESSURE; Brandon Musarra, Katie Webb, Megan O'Keefe, Shana Strunk, Courtney Perkins, Kenneth Sparks, Eddie T.C. Lam, Emily Kullman; Cleveland State University, Cleveland, Ohio

4 GLYCEMIC CONTROL FOLLOWING SHORT TERM HIGH INTENSITY INTERVAL TRAINING IN SEDENTARY MEN; Jenna P. Behnfeldt, Megan E. Applegate, James L. Chapman, Kelsey N. Ball, Lucas M. Harrison,Robert L. Hunt, Jessica L. Luzar, Christa L. Cocumelli, Michael W. Clevidence, Rika Tanda, Norio Hotta, Michael R. Kushnick; Ohio University, Athens, OH

5 THORACIC GAS VOLUME IN ATHLETES AND NON-ATHLETES
Sara B. Savard, Samuel C. Tubb, Caleb T. Swedorki, Shem S. Neuenschwander.
Cedarville University

6 SUBSTRATE UTILIZATION AT REST AND FOLLOWING A MEAL AFTER ACUTE CALORIC RESTRICTION; Robert L. Hunt, Lucas M. Harrison, Christa L. Cocumelli, Megan E. Applegate, James L. Chapman, Erica M. Roessler, Ryan J. Lubbe, Michael W. Clevidence, Michael R. Kushnick; Ohio University, Athens, OH

7 TRIGLYCERIDE LEVELS FOLLOWING SHORT TERM HIGH INTENSITY INTERVAL TRAINING IN SEDENTARY MEN; Kelsey N. Ball,[1] Megan E. Applegate,[1] Jimmy L. Chapman,[1] Robert L. Hunt,[1] Jessica L. Luzar,[1] Jenna P. Behnfeldt,[1] Lucas M. Harrison,[1] Sam Robison,[1] Christa L. Cocumelli,[1] Rika Tanda, PhD, RN,[2] Michael W. Clevidence, MS,[1] Norio Hotta, PhD,[3] Michael R. Kushnick, PhD[1];[1]Exercise Biochemistry and Physiology Laboratories, School of Applied Health Sciences and Wellness, [2]School of Nursing, Ohio University, Athens, OH 45701; [3]College of Health Sciences, Chubu University, Kasugai, Japan

8 THE EFFECT OF PARTICIPATION IN A BINGOCIZE PROGRAM ON SELF-EFFICACY, MUSCULAR STRENGTH, BALANCE, AND FLEXIBILTY OF OLDER ADULTS; Chloe Anglemyer, Matt Brackenhoff, Alex Kursonis, Meredith Lapp, Kendra Smith, Dr. Aly Williams[1]& Dr. Melissa Cook; Division of Health and Human Performance, Indiana Wesleyan University

9 LET'S GET MOTIVATED: THE RELATIONSHIP BETWEEN FITNESS ASSESSMENT RESULTS AND MOTIVATION TO EXERCISE; Jon-Marc Ream, Josh Greentree, Luis Orozco, Abby Reinke, Melissa Cook, Aly Williams; Division of Health and Human Performance, Indiana Wesleyan University

10 DECREMENTS IN VO2MAX AND HEART RATE MAX IN NORMOBARIC HYPOXIA
Amy E. Hoeh, Brian J. McGowan, Brenna J. Sellman, Samantha M. Bussey, David J. Cleveland, & Scott N. Drum, FACSM; Northern Michigan University, Marquette, Michigan

11 THE EFFECT OF AN ACUTE BOUT OF EXERCISE ON MOVEMENT TIME
Lindsey A. Nock , Dean L. Smith, Jessica A. Inman, Cody Costanzo, Randal P. Claytor; Department of Kinesiology & Health, Miami University, Oxford, Ohio

12 DOES A CARDIO DANCE CLASS OR A BOOT CAMP CLASS OFFER GREATER BENEFITS FOR BODY COMPOSITION AND MUSCULAR ENDURANCE? Shelley Jackson, Curtis Fennell, Kylene Peroutky, Mallory Kobak, Michael Rebold & Ellen L Glickman FACSM. Kent State University, Kent, OH

13 DIETARY SUPPLEMENTATION AND ATHLETIC PERFORMANCE DURING COMPETITION; David R. Pfeifer, Kelsey M. Arvin, Courtney N. Herschberger, Nicholas J. Haynes, Matthew S. Renfrow; Taylor University, Upland, IN

14 THE EFFECTS OF A 7-WEEK POWER LIFTING AND PLYOMETRIC EXERCISE PROGRAM ON FEMALE COLLEGIATE ATHLETE'S VERTICAL JUMP SCORE
McConnell, M.R., Lynch, E., Saladino,S.A., Piersanti, J.V., Koerner, N.D., Taylor, M St. Ambrose University Davenport, IA

15 THE EFFECT OF A FACULTY WELLNESS INITIATIVE ON HEALTH AND FITNESS IN UNIVERSITY FACULTY; Brianne Burkhart, Dajana Jovanovic, Matt D. Beekley, FACSM & K. Lee Everett; University of Indianapolis, Indianapolis, IN; [2]Eastern Illinois University, Charleston, IL.

16 THE EFFECT OF LOAD UNCERTAINTY IN THERAPUTIC PLYOMETRIC EXERCISE ON FUNCTIONAL PERFORMANCE AND MUSCLE ACTIVATION
Kelsey L. Biller, Aaron M. Hannigan, Brian J. Richards & William P. Berg Miami University, Oxford Ohio

17 AN ACUTE BOUT OF AEROBIC EXERCISE ENHANCES COGNITIVE PERFORMANCE IN COLLEGE-AGE MALES; J. Inman, C. Costanzo, L. Nock, D.L. Smith & R.P. Claytor; Department of Kinesiology & Health, Miami University, Oxford, OH 45056.

18 AN ASSESSMENT OF TEST-RETEST RELIABILITY FOR A SKILLS BASED SOCCER FITNESS TEST; Jeremy N. Hopkins, Andrew R. Zaleski, Neil J. Fleming; Indiana State University, Terre Haute, Indiana.

19 A COMPARISON OF TEST MODALITIES FOR THE ASSESSMENT OF AEROBIC FITNESS IN SOCCER PLAYERS; Andrew R. Zaleski, Jeremy N. Hopkins, Neil J. Fleming
Indiana State University Terre Haute, Indiana

Friday, November 7, 2014
Afternoon Sessions

2:00-3:45pm
Poster Presentations
Session 3

Abstracts are available

1 PLASMA AND SALIVARY CORTISOL AND CORTISONE RESPONSE TO INTENSE EXERCISE IN FEMALES: EFFECTS OF ORAL CONTRACEPTIVES
Regina C. Schurman, Christopher A. Kordick, Sameen S. Kinza, Matthew J. Fitzgerald, Jeremy B. Nadolski, Pedro Del Corral. College of Science, Department of Biological Sciences, and Department of Mathematical and Computational Sciences, Benedictine University, Lisle, IL 60532

2 CALF VENOUS COMPLIANCE IN MALE AND FEMALE CHILDREN; Michelle Williams, Trey Beckerman, Juliane Wallace, FACSM; Southern Illinois University, Carbondale, Illinois

3 THE PREVALENCE OF ELEVATED PULSE WAVE VELOCITY AS AN INDICATOR OF SUBCLINICAL ATHEROSCLEROSIS IN A HEALTHY ADULT POPULATION; Kristine M. Tecca, Garett J. Griffith, Mary S. Tuttle, Mitchell H. Whaley, FACSM, Leonard A. Kaminsky, FACSM. Human Performance Laboratory, Clinical Exercise Physiology Program, Ball State University, Muncie, IN.

5 CORRELATION OF RISK FACTOR PROFILES WITH CHANGES IN PHYSICAL ACTIVITY AND KNOWLEDGE OF AEROBIC EXERCISE PRESCRIPTION IN GRADE SCHOOL CHILDREN; Jacob Szeszulski[1] & Bill Saltarelli[1] [1]Central Michigan University, Mount Pleasant, MI

6 SPATTING IS MORE EFFECTIVE THAN STANDARD ANKLE TAPING ON ANKLE RANGE OF MOTION BEFORE AND AFTER EXERCISE; Alyssa Lenius and Joseph O'Kroy, FACSM; University of Wisconsin - River Falls, River Falls, Wisconsin.

7 THE ACCCURACY OF THE CALORIES EXPENDITURE FOR EA SPORTS ACTIVE ON THE NINTENDO WII CONSOLE; Ashley C. David and Joseph A. O'Kroy, FACSM
University of Wisconsin-River Falls, River Falls, WI

8 RELIABILITY OF THE FUNCTIONAL MOVEMENT SCREEN SCORES FOR OLDER ADULTS; Melissa A. Fawcett, Lynn A. Darby, FACSM, C. Matthew Laurent, & Amy L. Morgan, FACSM. Bowling Green State University, Bowling Green, Ohio.

10 EVALUATION OF DIVISION I ICE HOCKEY PRACTICES VIA HEART RATE MONITORING AND DIRECT OBSERVATION: A PILOT PROJECT; Ashley N. Triplett, Amy C. Ebbing, Emily A. Niemyjski, Christopher P. Connolly, James M. Pivarnik, FACSM, & Michael Vorkapich; Michigan State University, East Lansing, MI

11 A STUDY TO COMPARE THE EFFECTS OF A STAIR RUNNING PROGRAM VERSUS A PLYOMETRIC PROGRAM ON VERTICAL JUMP; Alexander J. Scott, Reginald J. Overton, Charles Marks, and Tamara Hew-Butler FACSM; Exercise Science Program, Oakland University, Rochester, MI

12 THE METABOLIC EFFECTS OF HYPOXIC HIGH INTENSITY INTERMITTENT EXERCISE ON SEDENTARY, OVERWEIGHT AND OBESE ADULTS; Max W. Adolphs[1], Scott N. Drum[1], FACSM, Bryan J. Dixon[2], Phil B. Watts[1], FACSM, Lanae Joubert[1], Randy L. Jensen[1], FACSM; [1]Northern Michigan University, Marquette, MI; [2]Marquette General Hospital, Marquette, MI.

13 DOES FOUR WEEKS OF OUTDOOR ELLIPTICAL BIKE TRAINING CHANGE IMPORTANT PHYSIOLOGICAL MARKERS IN HIGHLY FIT TRAINED RUNNERS?
Ian E. Klein[1], Jason White[1], Sharon Rana[1], Roger Gilders[1]. [1] Ohio University, Athens, OH.

14 PARKINSON'S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE? Lauren E. Pesola, Amy L. Morgan, Lynn A. Darby, K. Todd Keylock; Bowling Green State University

15 ACTIVATION OF THE STRESS RESPONSE IN HUMAN PBMC CELLS AND THE ROLE OF AEROBIC FITNESS; Kelsey Bourbeau, Mattina Rosinksi, Jenna Sessions, Taylor Szczygiel, Nicole Weis, and Micah Zuhl; School of Health Sciences, Division of Exercise Science Central Michigan University, Mt Pleasant, MI

16 Comparison of Accelerometers Placed on the Wrist and Hip for Prediction of Physical Activity Intensity; Josh M. Bock[1], Alexander H.K. Montoye[1], M. Benjamin Nelson[1], James M. Pivarnik[1],FACSM, Subir Biswas[3], Karin A. Pfeiffer[2], FACSM; [1]Human Performance Laboratory, Ball State University; [2]Department of Kinesiology, Michigan State University; [3]Department of Electrical and Computer Engineering, Michigan State University

17 A COMPARISON OF ACCURACY FOR THE DUAL-AXIAL OMRON AND TRI-AXIAL FITBIT ACCELEROMETERS; Lindsay Toth, Carol Weideman, Timothy Michael, FACSM, Michael Miller; Western Michigan University, Kalamazoo, Michigan.

18 GPS AND ACCELEROMETRY: ASSESSMENT OF RECESS FREE-PLAY INTENSITY BY PLAYGROUND LOCATION; Kimberly Clevenger, Matthew Jackson, Brain Ragan, Gaurav Sinha, Cheryl Howe; Ohio University, Athens, OH

19 STUDENT MOTIVATIONS FOR GRADUATE STUDIES IN EXERCISE PHYSIOLOGY: A MEANS-END ANALYTIC APPROACH; Anthony Carter[1], Amanda J. Salacinski[1], Steven M. Howell[1], & David B. Klenosky[2]. [1]Northern Illinois University, DeKalb, Illinois; [2]Purdue University, West Lafayette, Indiana

21VARIABILITY OF SEDENTARY BEHAVIOR THROUGHOUT A SEVEN-DAYMEASUREMENT PERIOD; Mary S. Tuttle, Seth Donaldson, Leonard A. Kaminsky, FACSM; Human Performance Lab, Clinical Exercise Physiology Program, Ball State University, Muncie, IN

22 LOW INTENSITY CYCLING THROUGHOUT A SEMESTER-LONG LECTURE COURSE DOES NOT INTERFERE WITH STUDENT TEST PERFORMANCE; Matthew A. Kilgas, Alexandrea M. Holley, Lanae M. Joubert, Scott N. Drum, FACSM; Northern Michigan University, Marquette, Michigan

23 THE PREDICTION OF RESTING BLOOD PRESSURE USING PROXIES OF MUSCLE FIBER TYPE AND ANTHROPOMETRIC CHARACTERISTICS; Eric W. Slattery, Mark S. Walsh, Thelma Horn, & Ron Cox. Miami University, Oxford, Ohio

Saturday, November 8, 2014
Morning Sessions

8:30-10:30am
Poster Presentations
Session 4

Abstracts are available

1 INFUSION RATES AND ACID-BASE STATUS DURING PROLONGED HYPERLACTATEMIA IN A CANINE MODEL; Matthew J. Rogatzki[1,2], Brian S. Ferguson[1,3], Yi Sun[1,4], James R. McDonald[1], Matthew L. Goodwin[1,5], FACSM,

Khalil Lee[1], Geert Oldenbeuving[6], Maarten W.N. Nijsten[6], Gooitzen M. van Dam[6], and L. Bruce Gladden[1], FACSM; [1]Auburn University, Auburn, AL; [2]University of Wisconsin-Platteville, Platteville, WI; [3]University of Missouri, Columbia, MO; [4]Ministry of Education, Shanghai, China; [5]University of Utah; [6]University Medical Center Groningen, Groningen, the Netherlands

2 ASSOCIATIONS AMONG DOMAINS OF PHYSICAL ACTIVITY DURING PREGNANCY AND BIRTH OUTCOMES; Alicja B. Stannard, Lanay M. Mudd FACSM; Michigan State University, Department of Kinesiology, East Lansing, Michigan

3 RELATIONS AMONG PHYSICAL ACTIVITY, DIET AND SCREEN TIME IN LOW INCOME, URBAN CHILDREN; Todd M. Buckingham[1], Lanay M. Mudd[1], FACSM, Karin A. Pfeiffer[1], FACSM, Sandra Selby[2], Joe Warning[1], Kimbo Yee[1]. [1]Michigan State University, [2]Crim Fitness Foundation

Jessica 8:30 – 10:30

4 METHODS OF MEASURING AEROBIC FITNESS AND BODY COMPOSITION FOR A PROFESSIONAL RACE CAR DRIVER WITH A SPINAL CORD INJURY
Jessica E. Mospan & John E. Lowry; Saginaw Valley State University, University Center, Michigan

5 CHANGES IN POMS AND BODY FAT PERCENTAGE DURING A 12-WEEK UNIVERSITY BASED EXERCISE PROGRAM; Kylene Peroutky, Mike J Rebold, Mallory S Kobak, Duane Corbett, Kimberly Hauge, John Gunstad, Ellen L Glickman FASCM. Kent State University, Kent, OH

6 INFLUENCE OF FIREFIGHTER RECRUIT TRAINING PROGRAMS ON MEASURES OF HEALTH AND FITNESS; David J. Cornell[1], Stacy L. Gnacinski[1], Aaron Zamzow[2], Jason Mims[3], & Kyle T. Ebersole[1]; [1]University of Wisconsin-Milwaukee, Milwaukee, WI; [2]City of Madison Fire Department, Madison, WI; [3]City of Milwaukee Fire Department, Milwaukee, WI.

7 EFFECTS OF 22 WEEKS SUPERVISED TRAINING AND 5 WEEKS UNSUPERVISED TRAINING ON MUSCULAR ENDURANCE AND CARDIOVASCULAR PARAMETERS;
Curtis Fennell, Kylene Peroutky, Ellen Glickman FACSM Kent State University, Kent, OH

8 THE EFFECT OF PROTEIN KINASE B ON HYPOXIC PRECONDITIONING AND REOXYGENATION INJURY IN DIAPHRAGMATIC SKELETAL MUSCLE; Li Zuo, William J. Roberts, Benjamin K. Pannell, Julia N. Stimpfl; The Ohio State University College of Medicine, Columbus, OH 43210, USA

9 IMPACT OF STABILITY BALL SITTING ON PEAK VO2 AND HEART RATE DURING ARM + LEG EXERCISE; Charles R.C. Marks. Exercise Science Program, Oakland University, Rochester, MI.

10 SKELETAL MUSCLE HYPEREMIA DURING REPETITIVE PASSIVE LIMB MOVEMENT; Brandon S. Pollock[1], Keith J. Burns[1], John McDaniel1,[2]; [1]Kent State University, Kent, Ohio; [2]Cleveland Veterans Affairs Medical Center, Cleveland, Ohio

11 USE OF PASSIVE EXERCISE TO TRANSIENTLY INCREASE BLOOD FLOW IN THE LOWER AND UPPER EXTREMITIES; Keith J Burns, Brandon S. Pollock, Sara Harper, Kylene Peroutky,John McDaniel;Department of Exercise Science, Kent State University, Kent, Ohio

12 THE EFFECT OF FACEBOOK ON CARDIOVASCULAR RESPONSES: AN EXPERIMENTAL STUDY;
Gabriel J. Sanders Northern Kentucky University, Highland Heights, KY

13 INFLUENCE OF AEROBIC FITNESS ON PARASYMPATHETIC MODLUATION AT REST IN CHILDREN;
Justin Guilkey, Matthew Overstreet, Brandon Dykstra and Anthony D. Mahon
Human Performance Laboratory, Ball State University, Muncie, Indiana

Free Communications
by Session and Abstract Number

Friday, November 7, 2014
Morning Sessions

9:00-9:50pm
Free Communications
Session 1

Abstracts are available

1 THE EFFECTS OF ACUTE BLOOD FLOW RESTRICTION INTERVAL TRAINING ON AEROBIC CAPACITY AND MAXIMAL STRENGTH; Trent E Cayot, Jakob D Lauver, Barry W Scheuermann; University of Toledo, Department of Kinesiology, Toledo, OH

2 LOW INTENSITY ECCENTRIC BLOOD FLOW RESTRICTION CONTRACTIONS AND THE ATTENUATION OF MUSCLE DAMAGE; Jakob D Lauver, Trent E Cayot, Barry W Scheuermann; University of Toledo, Department of Kinesiology, Toledo, OH

3 HIGH-INTENSITY EXERCISE ON CENTRAL AND PERIPHERAL VASCULAR FUNCTION; Yu Lun Tai, Lauren McLain, Hannah Cooper, J. Derek Kingsley; Kent State University, Kent, OH

4 THE INFLUENCE OF LATERAL FOOT DISPLACEMENT ON CYCLING EFFICIENCY AND MAXIMAL CYCLING POWER; Sara A. Harper, Keith J. Burns, Brandon S. Pollock, John McDaniel; Kent State University, Kent, OH

Friday, November 7, 2014
Afternoon Sessions

2:10-3:00pm
Free Communications
Session 2

Abstracts are available

1 THE PHYSICAL AND PSYCHOLOGICAL EFFECTS OF HULA HOOPING AMONG WOMEN ACROSS THE LIFESPAN; Sarah J. Janicek, David X. Marquez, FACSM ; University of Illinois at Chicago, Chicago, Illinois

2 CARDIORESPIRATORY FITNESS IN ADOLESCENT GIRLS: ASSOCIATIONS WITH RACE AND PUBERTAL STATUS; Catherine Gammon[1], Jiying Ling[2], Karin A. Pfeiffer[1], FACSM, Lorraine B. Robbins[2;1]Department of Kinesiology, Michigan State University, East Lansing, MI, 48824
[2] College of Nursing, Michigan State University, East Lansing, MI, 48824

3 QUESTIONING THE BASIC ASSUMPTION BEHIND CURRENT EXERCISE PROMOTION EFFORTS: DO PEOPLE MAKE EXERCISE CHOICES RATIONALLY? Zachary Zenko & Panteleimon Ekkekakis, FACSM; Iowa State University, Ames, Iowa.

4 HEART RATE AT A RESPIRATORY EXCHANGE RATIO OF 1.00 ACCURATELY PREDICTS 20 KM CYCLING TIME TRIAL PERFORMANCE; Willard W. Peveler, Brandy Shew, Samantha Johnson, Gabe Sanders, and Roger Kollock; Northern Kentucky University

Friday, November 7, 2014
Afternoon Sessions

3:10-4:00pm
Free Communications
Session 3

Abstracts are available

1 EFFECTS OF 24 HOUR ENERGY STATUS ON POSTPRANDIAL GLYCEMIC RESPONSES
Lucas M. Harrison,[1] James L. Chapman,[1] Jessica L. Luzar,[1] Megan E. Applegate,[1] Robert L. Hunt,[1] Kelsey N. Ball,[1] Jenna P. Behnfeldt,[1] Christa L. Cocumelli,[1] M.S., Rika Tanda, Ph.D.,[2] Michael Clevidence, M.S.,[1] Norio Hotta, Ph.D.,[3] Michael Kushnick, Ph.D.[1]
[1]Exercise Physiology and Biochemistry Laboratories, School of Applied Health Sciences and Wellness, [2]School of Nursing, Ohio University, Athens, OH, [3]College of Health Sciences, Chubu University, Kasugai, Japan

2 THE EFFECT OF GRAPEFRUIT JUICE AND INTENSE EXERCISE ON PLASMA CORTISOL; Christopher Kargl, Mohammad Arshad, Colin Coughlin, Alexis Ocampo, Doug Foote, Regina C. Schurman, Jeremy B. Nadolski, Pedro Del Corral. College of Science, Department of Biological; Sciences, and Department of Mathematical and Computational Sciences, Benedictine University, Lisle, IL 60532

3 THE EFFECT OF 5-HYDROXYTRYPTOPHAN AND INTENSE EXERCISE ON PLASMA CORTISOL AND CORTICOSTERONE Mohammad Arshad*, Alexis Ocampo*, Christopher Kargl, Colin Coughlin, Doug Foote, Regina C. Schurman, Jeremy B. Nadolski, Pedro Del Corral. College of Science, Department of Biological Sciences, and Department of Mathematical and Computational Sciences, Benedictine University, Lisle, IL; *Both authors performed equivalent work

4 ACUTE BOUT OF RESISTANCE EXERCISE ON VASCULAR PARAMETERS IN RESISTANCE-TRAINED MEN; Gustavo S. Heidner[1], Andrea Brewer[1], Emily Buxton[1], J. Derek Kingsley[2];[1]Indiana State University, Terre Haute, IN; [2]Kent State University, Kent, OH

Friday, November 7, 2014
Afternoon Sessions

4:10-5:00pm
Free Communications
Session 4

Abstracts are available

1 EIGHT WEEKS OF RESISTANCE TRAINING ON DISEASE IMPACT AND PAIN CATASTROPHIZING AND AUTONOMIC MODULATION IN WOMEN WITH FIBROMYALGIA; Emily Buxton[1], Gustavo S. Heidner[1], Andrea Brewer[1], J. Derek Kingsley[2]
[1]Indiana State University, Terre Haute, IN; [2]Kent State University, Kent, Ohio;

2 NUTRITION KNOWLEDGE AMONG NCAA DIVISION II FOOTBALL PLAYERS
Valerie J. Adams, Rebecca A. Schlaff, & Jeremy L. Knous; Saginaw Valley State University, University Center, MI

3 THE EFFECT OF FITBIT TECHNOLOGY ON PHYSICAL ACTIVITY LEVELS IN OLDER INACTIVE ADULTS (50+ YEARS OF AGE); Kerri L. Vasold[1], Elizabeth G. Groendal[2], Jeremy L. Knous[3]; [1]Michigan State University, East Lansing, Michigan; [2]Central Michigan University, Mt. Pleasant, Michigan; [3]Saginaw Valley State University, Saginaw, Michigan[3]

4 THE RELATIONSHIP BETWEEN ACADEMIC SUCCESS AND NEIGHBORHOOD RECREATIONAL SPORTS USE; Sara A. Krebs[1], Samantha J. Deere[1], James M. Pivarnik[1,2], FACSM; [1]Department of Kinesiology, [2]Department of Epidemiology, Michigan State University, East Lansing, MI

Program of Events




Midwest Chapter of the American College of Sports Medicine

2013 Annual Meeting

November 7-9, 2013

Radisson Hotel at Star Plaza
Merrillville, Indiana

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Dear Attendees, Colleagues and Friends:

Welcome and thank you for attending the 2013 Annual Meeting of the Midwest Chapter of the American College of Sports Medicine. What you are participating in is a culmination of a lot of hard work – on the part of the presenters, including countless students, and, of course the MWACSM Annual Planning Committee.

Last year's meeting focused on Exercise Is Medicine®. Building off the successes of it, we extend that theme to an integration of basic and applied sciences towards Exercise is Medicine®, or simply Science into Practice. To that end we have a number of exciting experiences planned, including three featured MWACSM talks: 1) the student focus – MWACSM Student Colloquium: *Implementing EIM on your campus*; 2) the faculty/professional focus – *From principle to practice: How to incorporate EIM and team-based health care principles into an exercise science curriculum*; and, 3) a featured talk from ACSM – *The exercise professional.*

Our clinical focus on Friday features five case studies, six clinical tutorials or symposia, including one, sure to be exciting, hands on demonstration of spine boarding. From the research perspective we have eight symposia, five sessions of (four each) free communication presentations and over 50 poster presentations. And if that wasn't enough…

- Dr. Carrie Jaworski, FACSM, Vice President ACSM, will deliver the Clinical Keynote on Friday after lunch: *Exercise and mental health: Finding the right dose*

  -and-

- Dr. George Brooks, FACSM, will present the Keynote Address on Saturday after lunch, leading us in an exploration: *Fourty-four years of research on lactate metabolism in exercise physiology and it's still not finished!*

Don't forget to join us, your colleagues, new and old friends for the Friday evening social. We'll even throw in a laugh or two to finish off a great day! …with a first for MWACSM, a comedian: Vince Carone.

As you know, to bring such an amazing meeting together it takes an army! And I'd like to thank everyone who has taken part in helping me build this annual event into what it will be this Friday and Saturday. I know afterwards you'll agree that it was a great experience.

I therefore wish to provide a special thank you to the Program Committee for all of their time and commitment in pulling the pieces together for the 2013 Annual Meeting. A special thank you for: Dr. Brenda Reeves, our hardworking executive director for too many things to name; President-Elect, Dr. Paul Nagelkirk for coordinating the Abstract Review Committee; Dr. Stacy Fischer for coordinating the Friday clinical sessions; Drs. Craig Broeder and Ramsey Shehab for helping attract amazing exhibitors; Dr. Amanda Salacinski for coordinating the Jeopardy Student Quiz Bowl session and being our AV "go-to"; Dr. Juliane Wallace for organizing the judging for the student presentation awards; and finally, I would like to thank Katie Smith, our MWACSM student representative, for continuous contributions including coordinating this year's MWACSM Student Colloquium.

Be sure to mark your calendar for November 7-8, 2014. We are already gearing up for next year… and we're just not sure how we're going to top this year. But with your help, you can bet we'll try!

In closing, thank you for attending this meeting. I hope you learn much and take a lot away from this meeting.

Michael Kushnick, Ph.D.
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2013 Program Committee, Chair

2013 MWACSM Board of Directors

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Chapter and Conference Information

Did you know that the Midwest Chapter of the American College of Sports Medicine was the FIRST regional chapter granted permanent status?

In 1972, the Midwest Regional Chapter of the American College of Sports Medicine (MWACSM) was the first regional chapter to be granted permanent status. It was founded to follow, fulfill and promote, at the regional level, the objectives of the American College of Sports Medicine. The MWACSM is a chapter rich in tradition with a strong student focus. Through the years it has offered its members outstanding educational programs and opportunities for networking through the regional annual meeting.

Purpose and Objectives

- To promote and advance scientific knowledge and application of this knowledge dealing with the effect of sports and other physical activities on the health and wellness of human beings at various stages of life.
- To collaborate with other organizations, educators, scientists, physicians, fitness practitioners, and students concerned with the same or related specialties.
- To arrange for mutual meetings of educators, scientists, physicians, fitness practitioners, and students concerned with the same or related specialties.
- To initiate, promote, and collaborate on research in these fields.
- To disseminate information pertaining to various aspects of sports, other physical activities, and medicine.

ACSM Continuing Education Credit (CEC)

The American College of Sports Medicine's Professional Education Committee certifies that the Midwest Regional Chapter meets the criteria for official ACSM Approved Provider status. Provider #650390. The 2013 MWACSM Annual Meeting meets the criteria for 12.5 credit hours of ACSM Continuing Education Credit (CEC). Each hour of professional education is awarded one CEC. Attendees should claim only the credits commensurate with the extent of their participation in the activity. A certificate documenting completion of 12.5 CEC's is included in this program.

Continuing Medical Education Credit (CME)

Application for CME credit has been filed with the American Academy of Family Physicians. Determination of credit is pending.

Name Badge

Badges must be worn at all times to gain admittance into educational sessions, poster sessions, and special events to include the opening reception. In addition, your name badge serves as your meal ticket during the meeting. If you lose your badge, please see the registration desk; there is a replacement fee of $5.00.

Meeting Location

All sessions and events are held at the official conference site. Room assignments for events are detailed in this program, along with a map of the conference site.

Annual Business Meeting and Saturday Keynote Session

The annual business meeting is scheduled for Saturday, November 9, from 12:30-2:00p.m. in the Celebrity Ballroom – Center and West. It will be immediately followed by the keynote session entitled, *Forty-four years of research on lactate metabolism in exercise physiology and it's not finished!* The annual business meeting is your opportunity to participate in the activities of the Midwest Chapter of ACSM. The agenda includes the announcement of the presentation award winners, professional award winners, newly elected officers, an update from the MWACSM Chapter Office and other, new items. Please plan to attend.

Awards

Chapter awards will be presented to include: the Student and Clinical Presentation Awards, the Founder's Award, and the MWACSM ActiveU Competition Award. For more information on all of our student and professional awards, to include eligibility requirements, criteria, application forms, and submission deadlines, please go to: http://mwacsm.org/html/awardsMain.html

Future Meeting Location

We are excited to provide you with more information about the 2014 MWACSM Annual Meeting being held at this same venue – Radisson at Star Plaza in Merrillville, IN on November 7-8, 2014 at the luncheon and business meeting on Saturday. We promise to continue providing excellent programming and outstanding participation from the students and professionals in the Midwest region!

MWACSM is giving back to the community!

MWACSM is proud of our outstanding reputation with our professional affiliations. We are now working on initiatives to give back to the community! This year the Annual Planning Committee has decided to promote and *contribute* to the **Cystic Fibrosis Foundation**. http://www.cff.org/

Cystic fibrosis is a life-threatening inherited disease that impacts the lungs and digestive system that requires daily intensive care.

Nixon et al. (1992) were the first to demonstrate a significant correlation between VO_2peak and survival in patients with cystic fibrosis. Since then, it has been demonstrated that **chronic exercise** attenuates the loss of lung function (Selvadurai et al., 2002) and improves quality of life (Orenstein et al., 1989).

The Cystic Fibrosis Foundation is leading research towards a cure for this inherited disease that causes pre-mature death and lung/digestive complications. Since the foundation was founded, the life-expectancy of patients has doubled. The foundation helped fund the research of a new drug (Kalydeco) that treats the under-lying cause of cystic fibrosis rather than the symptoms. Forbes named it new drug of the year in 2012. Unfortunately, this drug can only be used by 4% of patients. The foundation is working towards this type of treatment for all patients. 90% of donations are used towards research and to support cystic fibrosis care-centers around the country.

In particular, one such story, of an individual close to a member of the Annual Planning Committee is presented here: http://fightcf.cff.org/goto/kathystraley

References

Nixon PA, Orenstein DM, Kelsey SF, Doershuk CF. (1992) The prognostic value of exercise testing in patients with cystic fibrosis. *N Eng J Med* 327(25): 1785-1788.

Orenstein DM, Nixon PA, Ross EA, Kaplan RM. (1989) *Chest* 95(2): 344-347.

Selvadurai HC, Blimkie CJ, Meyers N, Mellis CM, Cooper PJ, Van Asperen PP. (2002) Randomized controlled study of in-hospital exercise training programs in children with cystic fibrosis. *Pediatr Pulmonol* 33(3): 194-200.

Help MWACSM give back to the community and the Cystic Fibrosis Foundation through http://fightcf.cff.org/goto/kathystraley by participating in the following MWACSM activities at the Annual Meeting:

1. Buy a MWACSM T-shirt

   $10 for Sm, Med, Lrg, X-Lrg ($12 for XX-Lrg)

2. Buy a MWACSM Window Clings for $2

Midwest ACSM American College of Sports Medicine

3. Participate in the MWACSM Raffle for CF – buy a raffle ticket for $2 or three tickets for $5

   Prizes continue to be donated. A full list of prizes will be made available at the meeting. Two random drawings will be made: 1) at the conclusion of the social on Friday -and- 2) at the luncheon on Saturday. You must be present to win. MWACSM is not responsible for participants not responding to their numbers called or lost (receipt) tickets.

   Prizes include:

   textbooks, heart rate monitors, pedometers, T-shirts/sweatshirts, a laser-engraved autographed football of the 2013 Washington Redskins, gift cards and one free registration for an NSCA certification exam!

4. And of course, donations always accepted!

   The proceeds will go to the Cystic Fibrosis Foundation through http://fightcf.cff.org/goto/kathystraley

Take part in these great and worthwhile events through MWACSM!

Note: T-shirts purchased by MWACSM are from a vendor that only utilized materials purchased only from companies that participate in fair labor practices/the fair labor association.
http://www.sanmar.com/cgi-bin/pr.cgi?action=view&pid=2007-11-01-1193949044.job

Continuing Education Credits Certificate

ACSM CEC Certificate

Participant Name

Midwest Regional Chapter of the American College of Sports Medicine
Organization

2013 MWACSM Annual Meeting, Merrillville, IN
Course Title

650390	12.0
Approved Provider Number	CECs Awarded

Lead Program Administrator Signature

ACSM APPROVED PROVIDER

AMERICAN ACADEMY OF FAMILY PHYSICIANS
STRONG MEDICINE FOR AMERICA

Continuing Medical Education Credits (CME)

Application for CME credit has been filed with the American Academy of Family Physicians.

Determination of credit is pending.

The Midwest Chapter of the ACSM thanks our 2013 Sponsors, and gratefully acknowledges receipt of funds or services from the following organizations:

AMERICAN COLLEGE of SPORTS MEDICINE
www.acsm.org

CARROLL UNIVERSITY

MICHIGAN STATE UNIVERSITY College Of Education
DEPARTMENT OF KINESIOLOGY

GATORADE SPORTS SCIENCE INSTITUTE

NSCA National Strength and Conditioning Association

OHIO UNIVERSITY
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Vacumed
Wolters Kluwer Health - LWW
The Washington Redskins

Graduate Fair

On Friday from 11:00am-4:00pm MWACSM will sponsor a Graduate and Internship Fair in the Armstrong-Mozart Rooms (Conductor's Row) on the 1st Floor. We will have lots of information available and representatives from the institutions participating will be available for part of this time to talk to those interested in their programs.

Benedictine University
Cincinnati Children's Hospital (internship)
Carroll University
Marquette University
Michigan State University
New York Chiropractic College
Ohio University
Southern Illinois University
University of Akron
University of Wisconsin – River Falls
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PARVO MEDICS
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ParvoMedics TrueOne® 2400 system is accurate, reliable and easy-to-use for exercise VO_2max and resting RMR measurement. Used by NASA, U.S. Olympic Training Centers, and NIH.

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The National Strength and Conditioning Association (NSCA) is the worldwide authority on strength and conditioning, supporting and disseminating research-based knowledge and practical application to improve performance and fitness. Founded in 1978, the NSCA offers respected accredited credentials of distinction including the Certified Strength and Conditioning Specialist ® (CSCS®). http://www.NSCA.com

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Tenex Health TXT allows physicians to identify and specifically cut and debride diseased. pain generating soft tissue. leaving healthy tissue undisturbed while stimulating a healing response in tendons and other musculoskeletal structures of the shoulder. elbow. knee. ankle and foot.

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Wolters Kluwer

http://www.lww.com
Lippincott Williams & Wilkins (LWW) is a leading international publisher of trusted content delivered in innovative ways to practitioners, professionals and students to learn new skills, stay current on their practice, and make important decisions to improve patient care and clinical outcomes. Our partnership with the American College of Sports Medicine allows us to work with the country's leading experts on exercise and personal fitness to develop the information tools that students and professionals need for both education and certification.

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COSMED provides Gold Standard solutions for cardiopulmonary, metabolic, and nutritional assessment applications. Featured products include the K4b2 (portable metabolic measurement), the Fitmate PRO (desktop CPET), and the BOD POD® (body composition assessment).

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Please come visit our EXHIBITORS

South Lobby – 2nd Floor

Friday from 10:00am-7:00pm

and

Saturday from 8:00am-12:00pm

Tekscan

http://tekscan.com
Tekscan manufactures a broad range of tools for better pressure offloading and enhanced gait analysis. Our systems use paper-thin, high-resolution sensors to accurately measure plantar pressure distribution, timing and Center of Force (CoF) trajectory in dynamic evaluations. The unique information these systems provide helps you objectively validate treatments and improve outcomes.

2013 MWACSM Annual Meeting Schedule

Friday, November 8, 2013 – Morning Sessions

	Uptown Room – 2nd Floor	Ambassador Room – 2nd Floor	Fox-Majestic Orpheum 2nd Floor	South Lobby 2nd Floor	
7:00-7:50am	**Clinical Case Presentations**			**Continental Breakfast 7:30-10:00am**	
8:00-8:50am		**Symposium - Howe, Ragan, Benigno** *Evaluating free-living physical activity: Context, cues, and causes*	**Poster Presentations** **8:00-9:45am** ***Session 1***		
9:00-9:30am	**Clinical Tutorial - Lachniet** *Barefoot running and minimalists running shoes: A fad or the future of running?*	**Free Communication Presentations** ***Session 1***			
9:30-10:00am	**Clinical Tutorial - Stuart** *Common injuries in gymnasts*				
10:00-10:30am	**Clinical Tutorial - Donaworth** *Objective tools for concussion assessment: A heads up about what is available*	**Symposium - Slawinski, Kerrigan** *Applications of VO_2max testing in a clinical cardiology setting: Pediatics vs adults*	**Poster Presentations** **10:00-11:45am** ***Session 2***	**Exhibitors 10:00-7:00pm**	**Armstrong-Mozart 1st Floor**
10:30-11:30am	**Clinical Tutorial & Demo - Rodenberg et al.** *Current knowledge & practice for spine boarding athletes wearing athletic equipment: A hands-on demo*	**Symposium - Broeder** *Adv cardiorespiratory testing: An integrated approach for preventive health or perf testing*			**MWACSM Graduate Fair 11:00-4:00pm**
11:00-11:50am					
12:00-1:50pm	**Luncheon and Clinical Keynote: Dr. Carrie Jaworski** ***Exercise and mental health: Finding the right dose*** **Celebrity Ballroom Center and West – 1st Floor**				

Friday, November 8, 2013 – Afternoon Sessions

	Uptown Room – 2nd Floor	Ambassador Room – 2nd Floor	Fox-Majestic Orpheum 2nd Floor	South Lobby 2nd Floor	Armstrong-Mozart 1st Floor
2:00-2:50pm	**Clinical Symposium - Krause** *State of mental health care in sports medicine*	**Free Communication Presentations** *Session 2*	**Poster Presentations** **2:00-3:45pm** ***Session 3***	**Exhibitors 10:00-7:00pm**	**MWACSM Graduate Fair 11:00-4:00pm**
3:00-3:50pm	**Clinical Symposium - DeLaFuente et al.** *FitKids360: An effective, low cost childhood obesity intervention program*	**Symposium - Laurent** *Sex-specific responses to high-intensity work: Implications for fatigue and recovery*			
4:00-4:50pm	**MWACSM Student Focus – Betz and a panel** *Student Colloquium: Implementing Exercise is Medicine On Your Campus*	**MWACSM Faculty/professional Focus – Reeves and a panel** *From principle to practice: How to incorporate EIM® and team-based health care principles into an exercise science curriculum*			
5:00-6:30p.m	**MWACSM Student Quiz Bowl "Jeopardy"** **Celebrity Ballroom Center and West – 1st Floor**				
6:30-8:00pm	**Dinner on your own**				
8:00-10:00pm	**MWACSM Social** **by the Waterfall (Hotel)** 	**Comedian: Vince Carone** **Celebrity Ballroom Center and West – 1st Floor** 			

2013 MWACSM Annual Meeting Schedule

Saturday, November 9, 2013

<table>
<tr><th></th><th>Uptown Room – 2nd Floor</th><th>Ambassador Room – 2nd Floor</th><th>Fox-Majestic Orpheum 2nd Floor</th><th colspan="2">South Lobby 2nd Floor</th></tr>
<tr><td>7:40-7:55am</td><td colspan="3">MWACSM Fitness Demonstration – Hill and Hill
Kettlebell Training: Get into the swing of things! &
Calisthenics: Get a good workout in anywhere!</td><td colspan="2">Continental Breakfast 7:30-10:10am</td></tr>
<tr><td>8:00-8.50am</td><td>Free Communication Presentations
Session 3</td><td>Symposium - Fitts and Nelson
Skeletal muscle fatigue: Role of pH, P_i and Ca^{2+}</td><td rowspan="3">Poster Presentations
8:30-10:30am
Session 4</td><td rowspan="4">Exhibitors 8:00-12:00N</td><td rowspan="2">Continental Breakfast 7:30-10:00am</td></tr>
<tr><td>9:00-9:50am</td><td>Free Communication Presentations
Session 4</td><td>Symposium - Hunter and Ng
Skeletal muscle fatigue: CNS</td></tr>
<tr><td>10:00-10:50am</td><td>Free Communication Presentations
Session 5</td><td>Symposium - Alessio, Cox
Built environment: Tensions between building a healthy you in a healthy environment</td><td rowspan="2"></td></tr>
<tr><td>11:00-11:50am</td><td>Symposium – Mullins
The insidious influence of gender socialization on female's physical activity: Rethink pink</td><td>Symposium - ACSM
The exercise professional</td><td></td></tr>
<tr><td>12:00-12:30pm</td><td colspan="4">Checkout</td></tr>
<tr><td>12:30-2:00pm</td><td colspan="4">Luncheon, Business Meeting and Keynote: Dr. George Brooks
Forty-four years of research on métbolisme lactate in exercise physiology and it's not finished!
Celebrity Ballroom Center and West – 1st Floor</td></tr>
</table>

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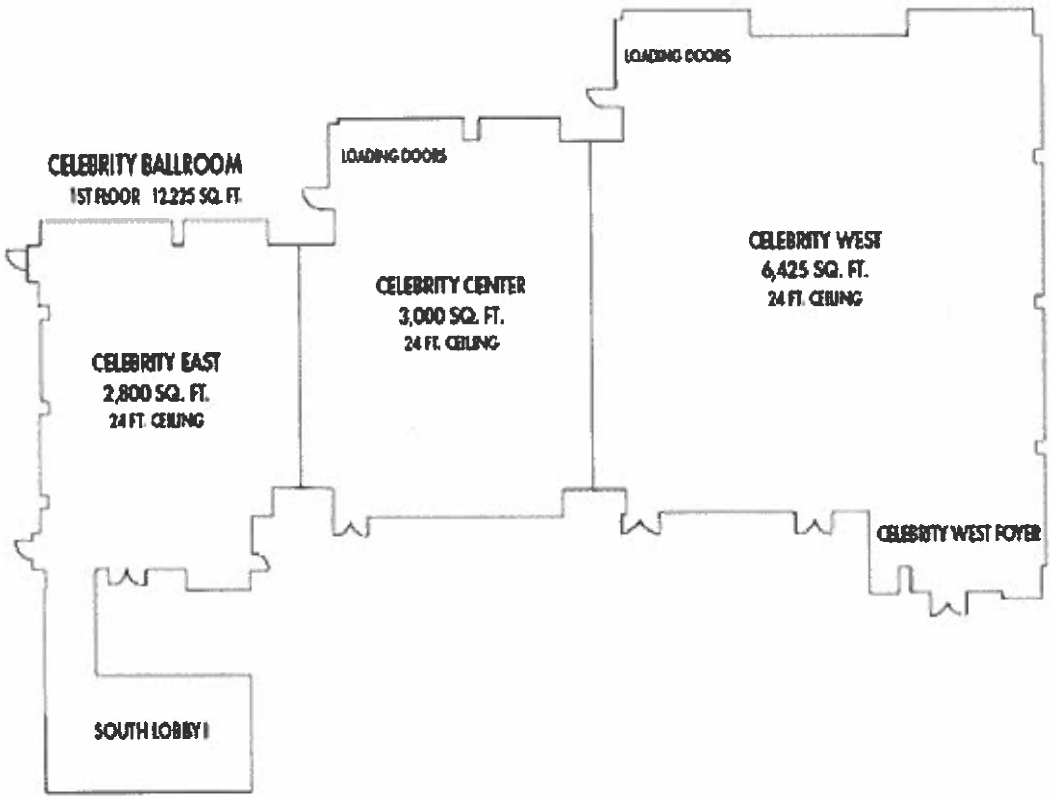
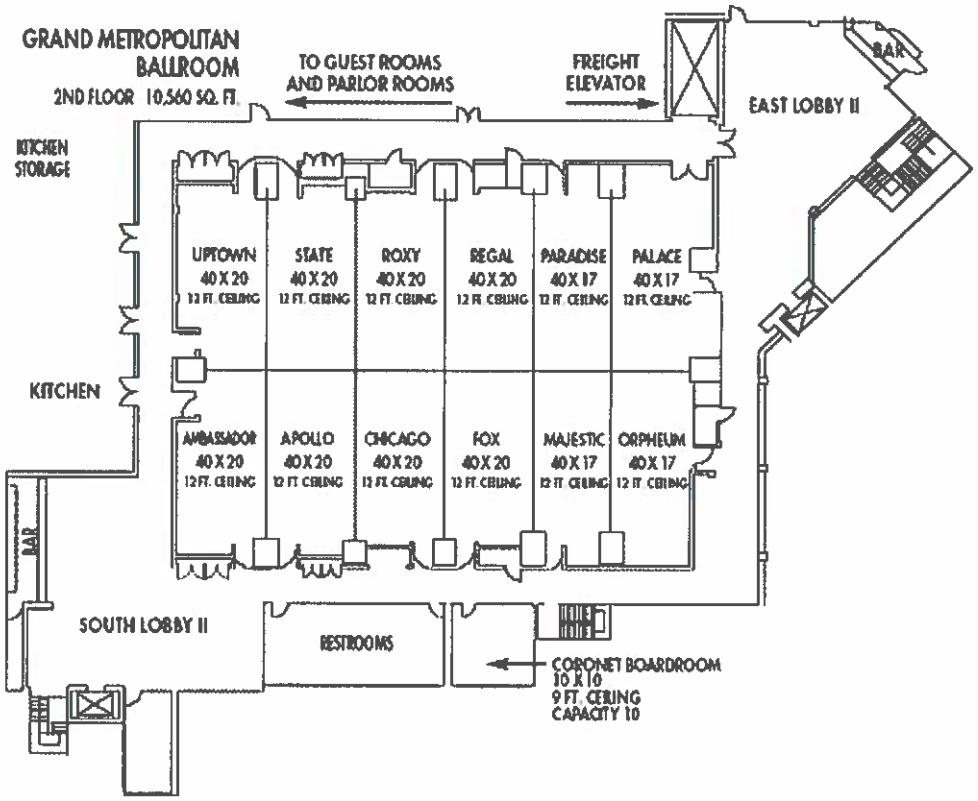
Floor Plan

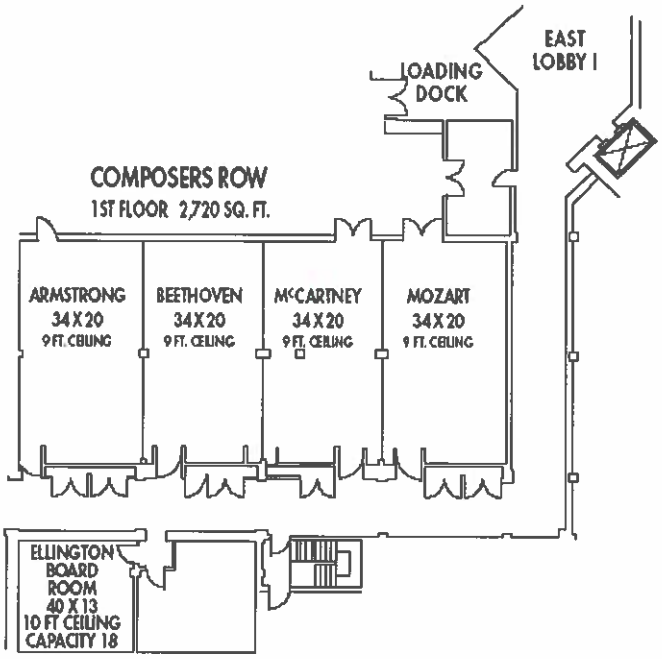
Conference Center 1st Floor



Conference Center 2nd Floor



Conference Center 1st Floor



Featured Keynote Speakers

Carrie A. Jaworski, M.D., FAAFP, FACSM

Dr. Jaworski is the Director of the Division of Primary Care Sports Medicine and Sports Medicine Fellowship Director at NorthShore University HealthSystem. She is a Vice President of the American College of Sports Medicine and a section author for Current Sports Medicine Reports. Dr. Jaworski was previously the Head Team Physician at Northwestern University and a Team Physician at the 2002 Winter Olympics in Salt Lake. She volunteers as a Team Physician for a local high school and annually as one of the medical leads for the Chicago Marathon. Her interests include concussions, the pediatric and female athlete, nutrition/supplements, endurance medicine and the promotion of "Exercise is Medicine".

Clinical Keynote
Friday, November 8, 2013
1:00-1:50pm
Celebrity Ballroom Center and West – 1st Floor

Exercise and mental health: finding the right dose

Objectives are:

- Explore the range of mental health issues as they relate to athletes.
- Discuss approaches to management of the athlete with a mental health disorder.
- Understand the benefits of exercise in the treatment of mental health issues.
- Review of challenging case examples

George Brooks, Ph.D., FACSM

As an undergraduate Brooks competed in track and field winning Collegiate Track Conference and other titles. In the open AAU Division, Brooks ran on relays with the Grand Street Boys, as small team comprised mostly of Olympians from the former British West Indies. Those experiences gave rise to an interest in exercise physiology and metabolism that has continued over four decades. As a graduate student at the University of Michigan Brooks studied mitochondrial energetics with Robert Beyer in the Laboratory of Chemical and Molecular Biology, Department of Zoology, and exercise physiology with John Faulkner, Department of Physiology. In post-doctoral studies with Robert Cassens in the Muscle Biology Laboratory, University of Wisconsin, Brooks first used isotope tracers to study metabolism in laboratory rats. In the Fall of 1971 Brooks joined the faculty at the University of California Berkeley. Today Brooks is professor of Integrative Biology at UC, Berkeley.

At Berkeley Brooks continued to study interactions between mitochondrial energetics and the regulation of metabolism in vivo. He and his associates identified the presence of a mitochondrial reticulum and studied the effects of endurance exercise on mitochondrial biogenesis and energetics and the relative roles of muscle respiratory capacity and oxygen transport in determining exercise endurance. More recently, using confocal laser scanning microscopy, cell fractionation and molecular techniques they identified the presence of a Mitochondrial Lactate Oxidation Complex in rat and human skeletal muscles, as well as rat brain and cultured myocytes derived from rats.

Also at Berkeley Brooks and associates used radioactive tracers to identify the pathways of lactate disposal in rats during and after physical exercise. That body of work gave rise to the concept of Cell-Cell and Intracellular Lactate Shuttles, thus rendering O2 Debt concepts archaic. Work on isolated sarcolemmal vesicles revealed the presence of lactate transporters (now generally referred to as monocarboxylate transporters, MCTs), and at present Brooks and associates continue work with cell culture systems to elucidate the role of lactate and other physiological signals on regulation of genes and other factors affecting the expression of MCTs and Mitochondrial Lactate Oxidation Complex proteins.

At the whole body level and using stable isotope tracers, with men and women Brooks and associates studied the effects of exercise, exercise training, diet and gender on energy substrate partitioning. Collectively, this body of work gave rise and supports the Crossover Concept of energy substrate partitioning in humans and other mammalian species.

Also, in a major collaboration with scientists and clinicians in Neurosurgery at UCLA, Brooks and associates are using stable isotope tracers to describe a Body-Brain lactate Shuttle as well as provide nutritive support to the injured brain. Those studies include technologies to measure Body Energy State following traumatic brain injury (TBI), to provide substrates to support brain metabolism while at the same time minimizing brain swelling and the build up of intracerebral pressure, and to calculate and provide for body nutrient needs following TBI.

Keynote
Saturday, November 9, 2013
1:10-2:00pm
Celebrity Ballroom Center and West – 1st Floor

Forty-four years of research on lactate metabolism in exercise physiology and is not finished!

Objectives are:

- To trace the history of exploration on lactate metabolism from Pasteur through Meyerhof, Hill, Warburg, the Coris, and Wasserman through the present day.
- To describe discovery of the Lactate Shuttle Theory
- To describe discoveries leading to the description of "Cell-cell" and "Intracellular Lactate Shuttles."
- To describe briefly other lactate Shuttles, such as the Astrocyte-Neuron Lactate Shuttle
- To describe briefly controversies in the field
- To describe clinical applications of Lactate Shuttle Theory
    - Neurotrauma
    - Cancer and the "Warburg Effect"

The presentation will be student oriented in that the course of investigation, including the obstacles and hazards, will be described. As well, the presentation will lead to a description of present day efforts to apply theory to practice.

Clinical Presentations
Friday, November 8, 2013
Morning Sessions

Cases Studies

Uptown Room – 2nd Floor

7:10-7:30am
Presentation: ***Rectus Sheath Hematoma (RSH) – An Unusual Case of Abdominal Pain***
Jose Armendariz, M.D.

7:30-7:50am
Presentation: ***Achilles Tendon Rupture in an 18 Year Old Male***
Jason Foster, M.D.

7:50-8:10am
Presentation: ***Back Pain in a Gymnast***
Scott Repa, D.O.

8:10-8:30am
Presentation: ***Back Injury – Football***
Emily Stuart, M.D.

8:30-8:50am
Presentation: ***Sea Shell Shin Pain***
Christopher Liebig, M.D.

Note:
Abstracts available later in the program

Clinical Tutorials
Friday, November 8, 2013
Morning Sessions

Uptown Room 2nd Floor

9:00-9:30am
Presentation: ***Barefoot running and minimalists running shoes: A fad or the future of running?***

Pamela Lachniet, M.D.-Ph.D., Sports Medicine Fellow
Dr. Lachniet is a Primary Care Sports Medicine Fellow at Cincinnati Children's Hospital Medical Center (CCHMC). Prior to starting her fellowship, she completed a pediatric residency at CCHMC in 2003 and subsequently was employed as Clinical Staff in Emergency Medicine at CCHMC from 2003-2013. She received her medical school training at Vanderbilt University where she completed the combined MD/PhD program, earning her Ph.D. in Biochemistry.

As the popularity of recreational running has increased, so have the new innovations in running gear and running styles. Shoe companies have invested extensive time and money over the years into product development with the trend towards increasingly supportive shoes. But more recently there has been resurgence of interest in barefoot running as well as running using minimalist shoes to promote changes in the biomechanics of the foot strike. Are the new trends helpful to runners in terms of injury prevention and performance? Are they just another fad with no benefit to runners? Can barefoot or minimalist running actually cause injuries?

Learning objectives:
- Identify the advantages of running barefoot or with minimalist shoes
- Identify the potential pitfalls and associated injuries
- Deciding if we should be recommending this to all our patients or just a small subset

9:30-10:00am
Presentation: ***Common injuries in gymnasts***

Emily Stuart, M.D.
Dr. Stuart is the Nationwide Children's Hospital Sports Medicine Fellow for 2013-2014. She grew up in Oklahoma where she was a level 10 gymnast. She attended University of Missouri for college and medical school, and she completed her pediatric residency at Phoenix Children's Hospital/Maricopa County Hospital in Phoenix, Arizona. Dr. Stuart is a member of the American College of Sports Medicine, the American Academy of Pediatrics and the American Medical Society of Sports Medicine. She is a professional member of USA Gymnastics and is a judge for both collegiate and club gymnastics competitions.

Learning objectives:
- Be able to describe common injuries in gymnastics, specifically injuries to upper extremities, lower extremities, and torso/spine
- Recognize overuse injuries in gymnasts.
- Understand risk factors for injuries in gymnasts and ways to prevent injuries in gymnasts.

10:00-10:30am

Presentation: ***Objective tools for concussion assessment: A heads up about what is available***

Michael Donaworth, M.D.
Dr. Donaworth is originally from the greater Cincinnati area. He is currently in his fellowship year as a Primary Care Sports Medicine fellow at Cincinnati Children's Hospital Medical Center in Cincinnati, Ohio. He is a graduate of the University of Cincinnati College of Medicine and completed his residency training in Family Medicine at The Ohio State University. Upon completion of his fellowship training, he would like to work in a university setting providing care to students and athletes.

Learning objectives:

- Overview of the various modalities of objective measurement of concussion
- Discuss specific changes from SCAT2 and SCAT3
- Overview the proper usage of objective material on the sideline and in the clinic

10:30-11:50am

Presentation: ***Current knowledge & practice for spine boarding athletes wearing athletic equipment: A hands-on demo***

Richard E. Rodenberg, M.D.
Dr. Rodenberg joined Nationwide Children's Hospital Sports Medicine in 2007 and is a Clinical Assistant Professor of Pediatrics at The Ohio State University College of Medicine. He is board certified in internal medicine, pediatrics, and primary care sports medicine. As a team physician, Dr. Rodenberg has cared for high school, Division I, II, and III collegiate and professional athletes. His experience includes teaching at the University of Kentucky in internal medicine, pediatrics, and sports medicine, while caring for the Wildcats athletic teams. He also served as team physician at Big Walnut High School and Ohio Dominican University team physician in the Central Ohio area. Dr. Rodenberg is also the program director for the Nationwide Children's Hospital Sports Medicine Fellowship.

Anastasia Fischer, M.D., FACSM
Dr. Fischer is a physician in the Division of Sports Medicine and the Section of Ambulatory Pediatrics at Nationwide Children's Hospital and a Clinical Assistant Professor of Pediatrics at The Ohio State University College of Medicine. She is fellowship trained and board certified in sports medicine, and is a member of the American College of Sports Medicine and the American Medical Society for Sports Medicine. Dr. Fischer attended medical school at The Ohio State University College of Medicine before completing a family practice residency at University of Pittsburgh Medical Center in Pittsburgh, Pennsylvania, and a primary care sports medicine fellowship at Maine Medical Center in Portland, Maine. She is a member of the Home and School Health Committee for the Ohio Chapter of the American Academy of Pediatrics, and a board member of the Midwest Chapter of the American College of Sports Medicine, where she serves as chair of the Membership Committee and is the Clinical Session Coordinator. She has helped develop the Healthy Weight and Nutrition childhood obesity program at Nationwide Children's Hospital and the Play Strong rehabilitation program for pediatric oncology patients in remission. Dr. Fischer has been a volunteer physician with the Greater Ohio Bicycle Adventure and the Tour de Grandview for many years and serves as the team physician for Groveport Madison High School in the central Ohio area.

Eric Leighton, ATC
Eric Leighton is a certified athletic trainer with 14 years of experience in school and sports coverage as well as orthopedics. He has been working at Nationwide Children's Hospital Sports Medicine for 6 years as a physician extender and a clinical lead in Functional Rehabilitation focused on injury rehabilitation for return to sports and activity. Eric is also a former EMT and is a lead in the EMS education program through Sports Medicine and the Trauma department.

Julie Young, M.S., ATC
Julie Young is an athletic trainer with Children's Sports Medicine and at Canal Winchester High School. She completed her undergraduate degree in athletic training at Mount Union College and received her master's degree in exercise and sports science with a concentration in athletic training from the University of North Carolina at Chapel Hill, where she worked with the women's soccer team as well as the men's and women's indoor and outdoor track and field teams.

Significance:
Spinal cord injuries in the US primarily affect young adults [1]. Participating in athletics is the second most common cause of spinal cord injury after motor vehicle accidents in those aged thirty and under [2]. Neurological injuries in football are common; over half of all college football players suffer at least one neuropraxia of the cervical nerve roots or brachial plexus and 5-10% of those with 'stinger' symptoms have a more serious condition [3]. Delancy estimated that 11,000 America football players report to an emergency department each year with a neck injury [4]. In football, there are on average 7.8 spinal cord injuries per year with incomplete recovery [5] with 6 of those ending in quadriplegia [6]. Due to the potential catastrophic consequences of not properly stabilizing the head and neck in suspected cervical injuries, spine boarding has become standard practice. Some spinal cord injuries can be caused or exacerbated by initial management and transport [7]. Additionally, spinal cord injury signs and symptoms may not present immediately, offering further evidence to treat suspected cervical injuries cautiously [8].

First responders to an athlete with a suspected cervical injury can include certified athletic trainers (ATCs), EMS providers, or team physicians. These personnel need to work together to offer the best care to the athlete. Disagreements and differences in opinions among first responders can increase the amount of time to properly manage a cervical injury, leading to delayed transport to the emergency department. In a survey of EMS providers in Ohio, EMT's did not think that ATCs were qualified to make a decision about equipment removal of a down athlete [9]. In a more recent study, 75% of high school ATCs and 50% of college ATCs reported that they had an on-field disagreement with EMS providers about the proper management of a football athlete [10].

Everyone involved in the initial response to a suspected cervical injury needs to follow the same procedures. Athletes participating in sports with helmets and shoulder pads are harder to stabilize than someone with none of this equipment. Unfortunately, it is common for EMS providers, ATCs, and team physicians to differ in opinion on the proper management of the suspected cervical injured athlete. In 2001, an inter-association task force of athletic trainers, EMS professionals, physicians and surgeons met to develop guidelines for the pre-hospital care of the spine injured athlete. This consensus statement can be found on the National Athletic Trainers Association (NATA) website. Additionally, in 2009 NATA published a position statement which offers slightly different recommendations [11].

Purpose of Symposium: Nationwide Children's Hospital Division of Sports Medicine has taken the inter-association task force guidelines and developed a training program for area EMS providers to ensure everyone is utilizing the same procedures for caring for the athlete wearing helmets and shoulder pads with a suspected cervical injury. To date, we have trained over 1,000 area EMS personnel in 11 different fire districts. This educational platform has been well received with these local EMS. **Purpose #1: It is the goal of the presenters to utilize this same educational format to allow the symposium attendees to become comfortable in proper cervical spine immobilization and athlete spine boarding practices in athletes wearing sports equipment such as helmets and shoulder pads. Purpose #2: It is the presenters' hope that attendees of the symposium will be able to take this information back to their respective groups and demonstrate and practice the techniques learned at the symposium.**

Approach to Symposium
The symposium will consist of an educational demonstration utilizing a PowerPoint presentation followed by hands on training. The hands on training will consist of splitting into groups of 8-10 individuals and practicing spine boarding techniques with individuals dressed in football helmets and shoulder pads. These sessions will emphasize the various nuances related to spine boarding an athlete with a helmet and shoulder pads in place. A few key concepts that will be emphasized include:

1. The removal of face masks, secured by clips. Special attention will be placed on the differences and nuances in removal of the variety of different manufacturers' face mask clips and common problems they may encounter while removing them.
2. The expedient and proper removal of shoulder pads and helmets in these athletes if needed.
3. Proper technique used to spine board the cervical spine injured athlete from both supine and prone positions.

After the PowerPoint demonstration we will split up into groups of 8-10 people. Each group will be provided with a spine board, a human subject wearing equipment, and the various cutting tools used to remove the different face mask clips. Individuals will take turns practicing the various transfer techniques for spine boarding as well as face mask, helmet, and shoulder pad removal. Each group will be provided a trained ATC/Physician from NCH. With this format we could handle 2 groups of 20 people. If need arises we could split into 4 groups of 10 people led by either a physician or ATC.

Educational Goals:

1. Attendees will be comfortable with recognizing various athletic equipment differences in helmets and shoulder pads and the various tools that are utilized to remove them in an emergency situation.
2. Attendees will understand proper spine boarding techniques with regards to athletes wearing helmets and shoulder pads based on the consensus recommendations of the 2001 inter-association task force recommendations of athletic trainers, EMS professionals, physicians and surgeons as well as some nuances as recommended in the 2009 NATA position statement.
3. Attendees of the symposium will be able to take this information back to their respective groups and demonstrate and practice the techniques learned at the symposium.

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Symposia and Free Communications
Friday, November 8, 2013
Morning Sessions

Ambassador Room – 2nd Floor

8:00am-8:50am

Presentation: ***Evaluating Free-Living Physical Activity: Context, Cues, and Causes***

Cheryl Howe, Ph.D.
Dr. Cheryl A. Howe has been with Ohio University since the fall of 2010 as an assistant professor in exercise physiology where she serves as the co-director for Education for the Diabetes Institute, and on the Global Health Task Force, as well as on the advisory board for Kids on Campus. She is an active member of the Obesity Society, the National and Midwest Chapter of the American College of sports Medicine. Cheryl earned her doctorate from the University of Massachusetts with a focus on pediatric physical activity measurement, her MS from Ball State and her BS from Lake Superior State University.

Brian Ragan, Ph.D.
Brian G. Ragan is currently an assistant professor in the School of Applied Health Sciences at Ohio University. His research focuses on developing and improving clinical and patient-centered measures/assessments for a variety of injuries and chronic diseases. He has been actively engaged in development of multiple patient-centered measures by adapting modern methods and technologies such as GPS, and accelerometers.

Joann P. Benigno, Ph.D., CCC-SLP
Dr. Benigno is an Associate Professor in the Division of Communication Sciences and Disorders at Ohio University. She earned her graduate degrees in Developmental Psychology and Speech-Language Pathology from the University of Florida and she completed a postdoctoral traineeship at the Institute of Child Development at the University of Minnesota. Her research program focuses on the social underpinnings and social functions of children's language and thought. She is particularly interested in how children's language and cognitive level relates to their engagement with their parents, peers, and siblings in naturalistic contexts such as play.

Purpose: Integrate the technical and applied aspects of evaluating free-living physical activity. This panel will bring together research scientists from various disciplines to compare and contrast the use of GPS-based activity monitoring, accelerometry, pedometry, and videography in measuring free-living physical activity. The panelists will begin by discussing how advances in technology allow for measuring free-living physical activity duration, intensity and location and how adding context to a free-living behavior can help explain the cues and causes of this behavior. Using this technology, the panel will then describe the relative roles of playground location, social-cognitive skills, and executive function on physical activity duration and intensity in a community and playground setting. The diverse viewpoints from this interdisciplinary project will provide implications for further research and intervention approaches. This panel is comprised of two exercise physiologists (Cheryl Howe and one undergraduate student, Kimberly Clevenger), an athletic trainer (Brian Ragan), a geographer (Guarav Sinah), and a developmental psychologist (Joann Benigno) interested in measurement issues and key variables impacting physical activity in the schoolyard. All are affiliated with their respective areas at Ohio University. Findings from our interdisciplinary project will be discussed from the perspective of each scientific collaborator. Included below are brief abstracts of each of the talks proposed for this panel:

Mapping and Measuring Physical Activity Patterns (Ragan). Global Positioning System (GPS) applications are becoming common in athletic training and health studies to help map and measure physical activity patterns of different population groups in their natural environment, instead of artificial clinical settings. Prior to the use of GPS units the clinician did not have a means, other than patient reported data, to determine functionality or chart physical activity levels for the patient. The use of GPS units, combined with accelerometry data on movement rates, and geospatial data from geographic information systems, allows not just measurement of physical activity but also geographic contextualization through mapping and spatial analysis. This can allow the clinician discover links between health and the social and physical environments of the patient

and determine appropriate steps during a rehabilitation plan. In this talk, we will first discuss the benefits of a novel geospatial physical activity metric called Movement and Activity in Physical Space (MAPS) that integrates accelerometer and GPS unit data to measure functionality and summarize mobility and activity patterns. We will then also show results from experiments on the spatial accuracy of GPS units, which can vary from a few meters to tens of meters. Spatial uncertainty is often ignored in such studies, but poses a serious methodological problem if short range movements need to be referenced against geographic features or mobility parameters such as velocity, distance, and duration need to be measured accurately. ***Learning Objective:*** Participants will become aware of the MAPS method for measuring and mapping physical activity, and will also learn about GPS measurement errors and their implications on physical activity measurement and characterization.

The Impact of Playground Location on Physical Activity Duration and Intensity. (Howe) Changes in a playground setting can increase children's free-play reinforcing the need to identify specific cues for physical activity to inform the development of effective and low-cost means of promoting playground activity. Video tagging software provides the means of coding children's behavior using direct observation, the gold standard for assessing children's free-play. This talk will first discuss the differential effect of different playground locations (grassy fields, sport-specific courts, and climbing or adventure structures) on physical activity intensity and duration during recess on an individual level using direct observation from video footage. Because direct observation on the individual level is time-intensive, the talk will also discuss the feasibility of using combined accelerometry and GPS data for objectively and accurately measuring physical activity intensity and duration relative to these playground locations across various age, sex, and obesity groups. This data will reveal that some playground locations will promote greater physical activity than others and that physical activity intensity and duration will be greater for boys, younger and healthy weight children in some locations, and no difference in the assessment will exist between direct observation and the combination of accelerometry and GPS. These data will assist schools in finding a low-cost method for promoting physical activity within the school playground during recess, whether that includes upgrading the existing playground structures or simply re-designating the play locations within the existing playground environment. ***Learning Objective:*** Participants will realize the benefits of using videography for coding children's physical activity on the individual level, as well as the feasibility of substituting accelerometry + GPS for measuring this behavior.

Predictors of School-Age Children's Social Engagement and Physical Activity During Recess (Benigno). The nature and determinants of children's PA in natural contexts such as recess, particularly in regards to the role of psychosocial factors in explaining the links between weight status and academic outcomes is still unknown. This study examines the relative contributions of social cognition, language, executive function and BMI status in predicting children's social engagement and physical activity at play. All children completed a social stories task used to index theory of mind understanding. Parents completed questionnaires on their children's executive functioning skills as well as their children's social and communication abilities. All playground interactions during recess were coded for solitary and group play and physical activity duration and intensity. Preliminary analyses revealed a moderate correlation between counts per 15 seconds and children's composite score on the theory of mind task. Further analyses will explore which factors most strongly predict physical activity and social engagement. Implications for research and intervention protocols will be discussed.

Learning objective:

- Participants will be able to identify and describe three methods that can be used to assess school-age children's social and cognitive skills.

9:00-9:50am

Free Communication Presentations
Session 1
Abstracts available later in the program

10:00-10:50am

Presentation: ***Application of VO_2 max testing in the Clinical Cardiology Setting: Pediatrics vs Adults***

Michelle Slawinski, M.A.
Michelle is an exercise physiologist at Nationwide Children's Hospital in Columbus, OH. Michelle is a graduate of The Ohio State University with her Masters (2010) and Bachelors (2007) in Exercise Science where she was a GA, worked closely with the Women's Soccer Team, and completed her thesis on "Energy Cost of Long Distance Swimmers and Ironman Triathletes". Prior to her work at Nationwide Children's, Michelle worked in the Oxidative Stress Lab at Queensland University in Brisbane, Australia.

Dennis J. Kerrigan, Ph.D.
Dr. Kerrigan is a Senior Clinical Exercise Physiologist in Preventive Cardiology, Division of Cardiovascular Medicine, Department of Internal Medicine, Henry Ford Hospital, Detroit. He earned his B.S. from Bowling Green State University (1998), his M.S. from Eastern Michigan University (2002), and his Ph.D. from The Ohio State State University (2008). Dr. Kerrigan is also a Visiting Professor, School of Health Promotion & Human Performance, Eastern Michigan University, Ypsilanti, Michigan and an Adjunct Professor, Exercise Science Program, The School of Physical Activity & Educational Services, The Ohio State University, Columbus, Ohio.

Purpose: To provide an overview of the application of VO_2 max testing in the clinical cardiology setting with focus on the unique differences between the pediatric and adult populations.

VO_2max is the single best predictor of aerobic exercise capacity. The graded exercise stress test with gas analysis enables accurate attainment of VO_2max as well provides a plethora of cardiovascular variables which offer understanding of the physiologic response to exertion. The value of the graded exercise test with VO_2 measure has led to its application in the clinical cardiology setting; however, indications for exercise testing in adults and pediatrics vary greatly.

The symposium will be presented in two parts: Pediatrics and Adults.

The pediatric exercise test indications must be known prior to testing. Indications are derived from age, type of condition, and need for intervention. The following indications for the given conditions will be explained using basic heart diagrams, EKGs, and case studies.

Functional capacity. The assessment of functional capacity or VO_2 max is routinely performed in patients with congenital heart defects. The least severe (Atrial/Ventricular Septal Defect) to the most severe (Single Ventricle/Fontan) patients are exercise tested as these patients may be interested in playing sports or given comprised heart function, amount of work performed may be telling of peripheral compensations. Protocol selection, achievement of anaerobic effort (RER >1.05), VE/VCO_2 analysis, and oxygen desaturation are critical aspects of the VO_2 test with this population. Other congenital heart defects to be addressed are Transposition of the Great Arteries and Tetralogy of Fallot.

Risk stratification: Recent guidelines for patients with a diagnosis of Cardiomyopathy recommend VO_2 max exercise testing for risk stratification. As this group is at high risk for sudden cardiac death, testing requires extreme caution in monitoring for decrease in blood pressure or tachyarrhythmia. Consequently, these patients often have placement of an Internal Cardiac Defibrillator (ICD).

Arrhythmia: Heart rate and rhythm are monitored with a 12-Lead EKG during VO_2 max testing. While VO_2 may not be the primary variable in arrhythmia studies, achieving appropriate anaerobic effort by measurement of RER, is important since heart rate response will likely be abnormal or blunted due to medications. With the diagnosis of Premature Ventricular Contractions, Wolff-Parkinson-White Syndrome, or Long QT Syndrome, the suppression, loss of pre-excitation, and interval duration, respectively, are evaluated with higher heart rates achieved through graded exercise.

Pacemaker function: When a patient receives a pacemaker for conditions such as Complete Heart Block and Sinus node dysfunction, pacemaker settings must be programmed for Upper Rate Limit and Rate Responsiveness which allow appropriate increases in heart rate. Treadmill testing is used to optimize such programming.

Other: Pulmonary Physicians regularly order exercise tests for the evaluation of exercise induced asthma or in the evaluation of oxygen desaturation with exercise. Patients seeking bariatric surgery complete many multidisciplinary assessments prior to surgery, including cardiac evaluation with VO_2 max testing. Absolute, Relative, Ideal Body Weight, and Adjusted Body Weight VO_2s can be explained to the patient pre and post surgery.

VO_2 max testing in cardiology with adults will address indications (ie. Ischemia, congestive heart failure), issues (left ventricular assist devices), and cardiac rehabilitation. Further details pending.

Learning objectives:

- understand the wide range of application of VO_2 testing in clinical cardiology
- provide understanding of congenital heart diseases in terms of incidence, severity, and diagnostic use of VO_2 max exercise testing

- teach an algorithm for analyzing EKGS and will inform the audience on the role of the exercise physiologist working in a pediatric or adult cardiology setting

11:00-11:50am

Presentation: ***Advanced Cardiorespiratory Testing – An Integrated Approach For Preventive Health or Performance Testing***

Craig E. Broeder, Ph.D., FACSM, FNAASO

Dr. Broeder's degrees include a Masters degree in Clinical Nutrition and Biology (physiology) from the University of North Texas and a Ph.D. in Exercise Physiology, Metabolism, and Health Promotion under Dr. Jack Wilmore, Ph.D.. Dr. Broeder has served on both the SEACSM and MWACSM boards. He is also a past president of the MWACSM regional chapter. Dr. Broeder was one of the co-authors for the 8th edition of the ACSM Guidelines for Exercise Testing and Prescription.

Dr. Broeder's research over the last 25-30 years have included projects in the areas obesity/metabolic syndrome, cardiovascular drugs and exercise, eating disorders, exercise and metabolism, androgenic hormone supplementation, and sport nutrition supplementation. In regards to obesity research, Dr. Broeder's primary interest is in how exercise and nutritional timing play a major role in the prevention and treatment of obesity

This tutorial's **primary purpose** will discuss advanced concepts in cardiorespiratory testing and how they apply in both health and performance testing centers. The presentation will discuss the integration of EKG testing, pulmonary function testing, whole-body metabolic testing, cardiac performance testing, performance data variables (i.e., cycling or treadmill), blood markers, and regional muscle oxygen extraction measurements. Integrative case studies will be presented showing how to properly establish a standardized testing process and how integrative testing can enhance the evaluation, treatment, and training recommendation processes. In addition, attendees will be introduced to new non-invasive but highly effective technologies such advanced cardiac impedance systems, near infra-red muscle oxygen measurement systems, and advanced performance measurement software and smart phone app technologies.

Learning objectives:

- Students will be presented a core background overview of cardiorespiratory testing.
- Students will be taught the key aspects of standardized and integrative cardiorespiratory testing principles.
- Students will be provided an over-view of new technologies and shown how these technologies can be used to advance our understanding of an individual's health or performance testing results.
- Students will be shown video samples of several integrative testing procedures so they can get a better understanding of what is required to collect data properly.
- Finally, case study samples will be presented so each attendee can see the integrative testing results and interpretation process – start to finish samples.

Clinical Presentations
Friday, November 8, 2013
Afternoon Sessions

Clinical Symposia

Uptown Room – 2nd Floor

2:00-2:50pm
Presentation: ***State of mental health care in sports medicine***

Andrew Krause, Ph.D., AT
Dr. Krause is an Assistant Professor of Anatomy in the College of Health Sciences and Professions and an affiliate of the Ohio Musculoskeletal and Neurological Institute at Ohio University. He earned his PhD in Life Sciences from Indiana State University and his Master's in Physical Education from Ohio University. His current research addresses issues surrounding the mental health care of college athletes and health care professionals' knowledge of and experience in managing student athletes with mental health disorders.

The purpose of this symposium will be to address the levels of evidence related to mental health disorders (MHD) among athletes. In doing so, gaps in the knowledge of MHDs among sports medicine professionals caring for athletes will be discussed. Though the primary focus of my work is investigating athletic trainers' (AT) roles in the management of these cases, the importance of broadening the perspectives of all sports medicine professionals will be addressed.

Learning objectives:
- -A discussion of the implications of mental health disorders among athletes
- -An understanding of the current body of knowledge concerning athletes with MHDs
- -The framework for interprofessional roles of sports medicine professionals in the recognition and identification of diagnostic criteria of MHDs
- -A dialog regarding accepted and emerging practices in comprehensive management of MHDs

Significance of the Problem
In a recently published report detailing the overall causes of death in collegiate student-athletes, suicide (9%) was identified as the second leading cause of sudden death behind only cardiac related cases (16%). Mental health disorders (MHDs) are of significant public concern, yet few studies detail the incidence and prevalence in athletes. Mental illness is a public health concern and within their lifetime, one-half of the world population will be diagnosed with a MHD. Over one-quarter of all Americans ages 18 and older have a diagnosis in a given year and MHDs are the number one disability in the 15-44 year old demographic. One in six adults are affected by depression, but only one-third are adequately treated. The mean age at onset of depression and other mental health disorders is the early twenties. Approximately, 25% of college students seek health services for counseling, 10% have suicidal ideation and 1.5% state that they have attempted suicide within the past academic year.

Mental health diagnoses and management are complex, not unlike concussion or cardiovascular abnormalities. These conditions are often clinically misinterpreted and it is common for athletes to not recognize or acknowledge the symptoms. Disordered eating, attention deficit hyperactivity disorders, and substance abuse have drawn investigative focus in athletic populations. There is an assumption that there is a lower prevalence of MHDs in athletes, which has led to a limited body of knowledge. This supposition can be traced to idealization and idolization that may mask signs, symptoms, and ideation of mental illness. However, the literature suggests that athletic populations are may be more prone to mental health illness. Athletes themselves are inclined to minimize apparent signs of weakness or may feel stigmatized by the thought of having a disorder and thus may be more susceptible to misdiagnosis, under-diagnosis or inadequate treatment of MHDs than non-athletes.
Currently, there is a limited cross-discipline consensus as to the appropriate standard of care in managing athletes across the spectrum of MHDs and there is a clear absence of evidence that addresses these issues. Several papers have indicated that team physicians feel there are not adequate enough qualified counselors and sports psychologists for athletes and their

injuries. Mann, et al. (2007) reported that ATs are only moderately effective in the appropriate management and that improved communication with in the sport medicine team must be developed to actualize this.

Data from my lab identified that nearly 90% of ATs have had experience managing an athlete with a diagnosed MHD and reported managing anxiety (79.7%), ADHD (79.7%), mood (77.9%), and eating disorders (76.5%) most frequently. Our data are similar to the currently limited papers regarding the prevalence of MHDs in college students and student athletes. Although 71.7% of ATs report confidence in their ability to recognize signs and symptoms associated with MHDs, 76.4% are not familiar with the DSM-IV TR diagnostic criteria. Athletic trainers in this study report moderate confidence in their ability to manage MHDs acutely (62.7%), but are less confident in the long-term care (43.2%). Following completion of their entry-level training, 73.2% of ATs were not confident in their ability to manage patients with MHDs. A key finding was that ATs could identify mood, anxiety, and personality disorders as mental health diagnoses. Yet, more than 65% of ATs did not identify substance abuse, ADHD, eating and image disorders, and some developmental disorders as diagnosable MHDs. Finally and strikingly, respondents report they are not knowledgeable about the medications prescribed (71.5%) and the adverse reactions of medications (82.4%) used to treat MHDs.

Mental health is a universal and emerging aspect of sports medicine that requires close attention. The lack of consensus in policies and procedures for best practices, regardless of the setting, highlights the need for further dialogue and investigation. Consequently, it is of utmost importance for those in the field of sports medicine to develop interprofessional approaches that address both the physical and mental well being of our athletes.

3:00-3:50pm

Presentation: ***FitKids360: An effective, low cost childhood obesity intervention program***

Kim DeLaFuente, M.A., ACSM-PD
Kim is the Community Exercise Educator and internship supervisor for the Healthier Communities Department of Spectrum Health Hospital. She is also an adjunct instructor in the Movement Science Department of Grand Valley State University. Kim earned her graduate degree from Michigan State University in Exercise Physiology and her Bachelor's degree from Central Michigan University in Health Promotion. Her career expands 25 years and includes experience in cardiac rehabilitation, corporate wellness, community programming and childhood obesity. Kim has co-authored two childhood obesity prevention and intervention programs including FitKids360. Kim is a certified ACSM Clinical Program Director and is Wellcoach trained.

Jill Graybill, RD
Jill graduated from Western Michigan University with a Bachelor of Science in Dietetics and from Vanderbilt University Medical Center for her internship. Throughout her career, she has specialized in: prenatal and pediatric nutrition as well as oncology and cardiovascular nutrition. Her current focus is on childhood obesity and she has a certificate of Training in Childhood and Adolescent Weight Management through the American Dietetic Association. She co-developed the "Raising Healthy Children in an Unhealthy World" 0-5 obesity prevention curriculum used to train professionals and educate parents. Jill has also co-authored the FitKids 360 curriculum, a program for overweight kids and their families.

Heather Saturley, B.S.
Heather is the FitKids360 Program Coordinator and oversees the daily operations for the program. She has a BS in Heath and Physical Education from Baptist Bible College in Pennsylvania and is pursuing a MA in Health Studies/Health Promotion from the University of Alabama. She is a NASM certified personal trainer and corrective exercise specialist and is Wellcoach certified. Her professional interests include education, coaching behavior change and engaging people in healthy lifestyles. Her engaging presentation style makes her a favorite with kids as well as adults.

Purpose: The purpose of the presentation is to highlight a Level 2-childhood obesity intervention program – FitKids360.
The presentation will discuss curriculum, program outcomes, and lessons learned with emphasis on exercise education and goal setting for families with overweight and obese children.

In 2007, the American Academy of Pediatrics released the expert committee recommendations regarding the prevention, assessment and treatment of child and adolescent overweight and obesity. In doing so, they outlined a four-stage approach that promotes brief, office-based intervention followed by a systematic intensification of efforts. Efforts are tailored to the capacity of the clinical office, the motivation of the family, the presence of risk factors and the degree of obesity. Families transition to the next stage if there has been no improvement in BMI/weight after 3-6 months and if the family is willing and ready to change.

- Stage 1 - Prevention Plus
- Stage 2 - Structured Weight Management
- Stage 3 - Comprehensive, Multidisciplinary Intervention
- Stage 4 - Tertiary Care Intervention

In an effort to fight the obesity epidemic, Spectrum Health Healthier Communities department and First Steps Kent joined with other community groups, local universities including a medical school, insurance company, local advocates, and pediatricians to provide a medically focused, research-based approach to prevent and treat childhood obesity. Fit Kids 360, a stage II obesity treatment program, was developed to further expand upon improving childhood obesity in the greater Grand Rapids area.

FitKids360 is a 6-week family based intervention for children ages 5 to 16 whose BMI exceeds the 85th percentile. The primary aim of the program is to improve health habits of youth and their families. Participants and their parents meet weekly for 2-hour classes that include education related to psychosocial issues, nutrition and exercise. Volunteers including medical students and exercise science students employ motivational interviewing techniques to facilitate weekly goal setting. In addition, patients participate in 30 minutes of group exercise each week.

In the four years since implementation, over 400 overweight and obese children and their families have attended the classes. FitKids360 is offered free of charge to families and staffed by pediatricians, social workers, exercise professionals, registered dietitians and volunteers who donate their time.

FitKids360 has been successful in improving family-based healthy lifestyles.

Positive outcomes include:

- Increases in MVPA and reduced screen time
- Improvement in the home environment including nutrition choices and parenting practices
- Improvement in BMI z-score

Learning objectives:

- Identify the 4 stages of pediatric obesity prevention and intervention outlined by American Academy of Pediatrics
- Overview the process and challenges of developing a community based Stage II childhood obesity intervention program
- Overview the goal setting process using evidence based messaging delivered in an understandable format
- Discuss exercise education topics, teaching tools and value of group exercise in the FitKids360 classes

Symposia and Free Communications
Friday, November 8, 2013
Afternoon Sessions

Ambassador Room – 2nd Floor

2:00-2:50pm
Free Communication Presentations
Session2
Abstracts available later in the program

3:00-3:50pm
Presentation: ***Sex-specific responses to high-intensity work: Implications for fatigue and recovery***

Matt Laurent, Ph.D., CSCS
Dr. Laurent is an Assistant Professor of Exercise Science at Bowling Green State University. He earned his doctorate in exercise physiology from the University of Alabama following a masters and bachelors of science in exercise science from West Texas A&M University. His research aims to identify factors influencing fatigue and subsequent recovery following sport and exercise performance as well as the role of perceptual responses in human performance. Matt is an active member of the American College of Sports Medicine and author of several peer-reviewed articles, and has presented numerous times at the international, national and regional level.

The field of sport and exercise science has seen an increased interest in the role of recovery, not only between sessions of work, but also within sessions of repeated, high-intensity training. Along with this renewed interest, there is emerging literature examining the role sex may play in mediating fatigue and recovery during high-intensity work as well as possible mechanisms underlying these proposed differences (Billaut and Bishop, 2012; Billaut and Smith, 2009; Billaut et al., 2003; Fukuda et al., 2012, Laurent et al., 2010; Mageean et al., 2011).

In general the literature suggests that men will typically possess higher total and lean body mass and produce higher absolute and relative power outputs. However, recent studies have shown that, at least during intermittent type work, women may demonstrate a higher resistance to fatigue and/or improved recovery during bouts of repeated work (Albert et al., 2006, Billaut et al., 2003; Laurent et al., 2010, Perez-Gomez et al., 2008). While not all studies overwhelmingly support a true difference between men and women with respect to high-intensity exercise (Astorino et al., 2011; Billaut et al., 2011; Fukuda, et al., 2011), evidence indicates at the very least, sex-specific considerations are appropriate during training (Mageean et al., 2012; Laurent et al., 2010, Sjokvist et al., 2011). Considering the volume of recent literature investigating this notion of sex-specific responses to high-intensity work, it seems prudent and timely to present and analyze the recent findings. Specifically, this presentation will aim to provide an overview of recent literature addressing the notion of sex-specific responses regarding fatigue and recovery, the proposed mechanisms underlying possible differences and how these differences may impact sport and exercise training.

Learning objectives:

- Be oriented to the notion of possible differences between men and women with respect to fatigue and recovery during high-intensity work.
    - Physiologically
    - Metabolically
    - Perceptually
- Be introduced to proposed mechanisms underlying possible sex-specific responses.
- Gain an appreciation for and an understanding of the implications of sex-specific responses to fatigue and recovery during high-intensity training.

MWACSM Student Focus
Friday, November 8, 2013

Ambassador Room – 2nd Floor

4:00-4:50pm

Student Colloquium: Implementing Exercise is Medicine On Your Campus

Sponsored by MICHIGAN STATE UNIVERSITY College Of Education DEPARTMENT OF KINESIOLOGY

Moderator: Heather Betz, Ph.D.
Dr. Heather Betz is an Assistant Professor in the Department of Kinesiology at Albion College in Albion, Michigan. Dr. Betz is currently serving her second term on the MWACSM Board of Directors, as she was a Student Representative before her current term as a Member-At-Large. Dr. Betz serves as the Chair of the Exercise is Medicine committee within the region.

Panelists:

Karissa Peyer, M.S.
Karissa Peyer received her Bachelor's degree in Exercise and Sport Science from the University of Wisconsin – La Crosse in 2008 and Master's degree in Exercise Physiology from Michigan State University in 2010. After completely her Master's she spent two years working as an exercise physiologist at the UW Health Pediatric Fitness Clinic in Madison, WI. She is currently pursuing a doctorate at Iowa State University, studying with Dr. Greg Welk. Her research centers around pediatric obesity and the Family Nutrition and Physical Activity screening tool which assessed family behavioral factors that may contribute to increased weight.

Bradley Peters, M.S.
Bradley Peters earned a bachelor's degree in Exercise Science from the University of Nebraska Kearney and is working on a master's degree in Kinesiology at Iowa State University. He currently leads the marketing efforts of the ExerCYse is Medicine initiative along with the Ambassador Outreach and doctor referral programs. His research has focused on community health programming along with exercise and diet interventions. Future plans include expanding the role of technology in behavioral change and physical activity motivation. In his spare time he enjoys camping and hiking in the great outdoors.

Objectives: To be able to utilize the online toolkit to create an EIM On-Campus initiative at your own institution. Discover ideas for activities other schools are doing to promote the EIM campaign on their campus.

Description: Are you interested in promoting the Exercise is Medicine message on your own campus but unsure where to begin? Then this session is just for you! Learn how to build an EIM On-Campus organization from the ground up and utilize online resources that are already developed for you to simplify this process. Hear from active EIM On-Campus organizations throughout the region about their club activities. You will have the opportunity to ask any questions you may have on how to take the campaign back to your own campus and help ACSM promote EIM!

MWACSM Faculty & Professional Focus
Friday, November 8, 2013

Ambassador Room – 2nd Floor

4:00-4:50pm

Presentation: ***From principle to practice: How to incorporate EIM® and team-based health care principles into an exercise science curriculum***

Moderator: Brenda Reeves, Ph.D., FACSM
Dr. Reeves is an assistant clinical professor at Carroll University, and is a Past-President of MWACSM and currently serves as Executive Director. Brenda received her doctorate from the University of Toledo with emphasis areas in exercise physiology and health education. She received her Masters degree in exercise science as well as her undergraduate degree in psychology from Bowling Green State University. Her fitness and wellness career spans 25 years with experiences in military conditioning, hospital-based wellness, corporate wellness, community fitness, and campus recreation. She has also been recognized in the Who's Who of Professional Educators as well as the Manchester Who's Who Among Executive and Professional Women. Brenda is also a fellow member of the American College of Sports Medicine, and initially became involved in the Midwest chapter of the American College of Sports Medicine in 1990. She has previously served on the board of directors as a member-at-large, secretary, and president-elect.

Panelists:
Tom Pahnke, MS, PT, ATC

Christina Robohm, MS, PA-C

In the workshop summary from the Roundtable on Values & Science-Driven Health Care, which was established by the Institute of Medicine (IOM), lowering healthcare costs and improving outcomes are national healthcare imperatives. Based on their report released in February 2011, approximately $2.5 trillion was spent on health care in 2009, representing 17% of the GDP. The U.S. spends more on health care than any other nation; however, it is estimated that 30% of healthcare spending ($765 billion) is waste including unnecessary services, inefficient delivery of services, missed prevention opportunities, excessive administrative costs, inflated pricing, and fraud. Many of these facts were illustrated in the investigative documentary, *Escape Fire: The Fight to Rescue American Healthcare*, released in 2012. A common message is the need to change current medical practice.

Around the same time, both the American College of Sports Medicine and the American Medical Association as well as the U.S. Department of Health and Human Services released documents that addressed the evidence-based benefits of physical activity in terms of health, prevention and treatment, including Exercise Is Medicine®, Physical Activity Guidelines for Americans, and Healthy People 2020. These documents share a common goal, to *make physical activity and exercise a standard part of a disease prevention and treatment medical paradigm*

While there are numerous evidence-based documents endorsing exercise and lifestyle medicine in the prevention and treatment of chronic diseases, the field of exercise physiology is still basically unregulated with only one state in which clinical exercise physiologists are licensed, and only 37 universities or colleges in the U.S. that have accredited undergraduate exercise physiology programs. In addition, it was not until 2012 that exercise physiology was listed as a separate occupation by the U.S. Bureau of Labor Statistics. Has this impacted the field? It has in terms of salaries as evidenced by the results of the 2010 CEPA practice survey. In addition, the lack of licensure and standardized training could impact the role of exercise physiologists in team-based healthcare and interprofessional education (IPE) models. Currently, many of these models do not include exercise physiologists.

Given this backdrop, what is the future for exercise physiologists, and are they prepared to work in the proposed medical paradigm? And, what is the role of faculty in preparing students to work with health care providers as well as building

awareness and advocacy into the curriculum to promote EIM® and entrepreneurism? The purpose of this tutorial is to explore how faculty can incorporate the principles of EIM® and team-based health care into course assignments, service learning, and research opportunities to prepare students to promote and deliver exercise and functional medicine within clinical practice.

Learning objectives:

- Increase awareness of available information and resources related to the current state of affairs in health care, and the movement towards exercise and functional medicine in clinical practice.
- Discuss how fitness professionals might fit into a team approach in health care.
- Explore potential assignments that could be embedded into exercise science courses to prepare students for a role in changing health care.
- Engage participants in a "call to action," and challenge faculty, students and professionals to take action at the community level to educate and partner with health care providers.

Special Events
Friday, November 8, 2013

Celebrity Ballroom Center and West – 1st Floor

5:00-6:30pm

Sponsored in part by

CARROLL UNIVERSITY

MWACSM Quiz Bowl "Jeopardy"

Be a part of this fun event… showcasing our undergraduate student attendees! Come support the teams.

The Radisson Hotel
Atrium above the Waterfall

8:00-9:30pm

MWACSM Social
Featuring snacks, dessert and drinks

Conference Center
Celebrity Ballroom Center and West – 1st floor

9:45-10:15pm

Comedian: Vince Carone

Comedian **Vince Carone** is known for his fast-talking, quick-witted, over-the-top rants and a dominating stage presence. Carone refuses to relent until he steps off the stage!

Special Event
Saturday, November 9, 2013

7:40-7:55am

Fitness Demonstration

Introduction to Kettlebell Training: Get into the Swing of Things!
and
Calisthenics: Get a good workout in anywhere!

Danielle Hill, ATC, CSCS
Danielle is currently a second-year graduate student at Northern Illinois University pursing her Master's Degree in Exercise Physiology. She completed her Bachelor of Arts degree in Athletic Training at Northwestern College in 2012. Danielle currently teaches undergraduate academic activity classes and group fitness classes for the FIT program, a university- and community-based wellness organization. Classes she has taught include: kettlebells, yoga, weight training, bootcamp, water aerobics, and fitness classes for seniors. She has completed three strength and conditioning internships with DI, DIII, and NAIA athletic teams.

Brady Hill, USAW
Brady Hill earned his Bachelor of Science Degree in Exercise Science with an emphasis in Strength and Conditioning and a minor in Psychology at Central College in 2012. He is currently a graduate student at Northern Illinois University pursing his Master's Degree in Sport Psychology with an emphasis Exercise Physiology. At NIU, Brady teaches undergraduate academic activity classes and serves as a staff member of the FIT program, a university- and community-based wellness organization. Brady was a strength and conditioning intern at Central College from 2010 to 2012. He is currently a certified USA Weightlifting Level 1 Sports Performance Coach.

Demonstration: Kettlebells
Kettlebells have become an increasingly popular training tool, although they have been around for hundreds of years. Kettlebell training requires and further develops mobility, strength, strength endurance, and power, challenging individuals of all fitness-levels. The use of a single device permits quick transitions between movements, which undoubtedly increases the intensity of the workout. A variety of whole-body movements can be performed, several of which will be included in the demonstration. The structure of a kettlebell workout leaves a lot of room for creativity from its user; workouts may take the form similar to traditional weigh training with predetermined sets and repetitions, circuits, tabatas and more. Although a seemingly simple device, users must be educated about the proper technique of kettlebell exercises in order to receive the full benefits and reduce risk of injury.
Objectives:
(1) Identify the purpose and benefits of kettlebell training
(2) Demonstrate proper technique of basic and intermediate kettlebell exercises
(3) Explore methods to modify volume and intensity to meet training goals

Demonstration: Calisthenics
Though the only resistance applied during calisthenic exercise is one's own body weight, do not equate calisthenic workouts with boring, monotonous, or easy. Such workouts include much more than the push-ups, jumping jacks, and sit-ups you performed in middle school P.E.. Movements can be easily adjusted to challenge novice and elite athletes, alike. Whether you are traveling, unable to make it to the gym, or looking to add some variety to your workouts, calisthenics are an accessible alternative to anyone, anywhere. Within this demonstration a variety of whole-body, functional calisthenics will be introduced along with their modifications.

Objectives:
(1) Identify the purpose and benefits of callisthenic workouts
(2) Demonstrate full-body callisthenic exercises
(3) Provide modifications to challenge individuals of all fitness-levels

Sponsored by

NeuMed$_X$

Research Symposia
Saturday, November 9, 2013
Morning Sessions

Ambassador Room 2nd Floor

8:00-8:50am

Presentation: ***Skeletal Muscle Fatigue: Role of pH, Inorganic Phosphate, and Ca^{2+} Release***

Robert Fitts, Ph.D. , FACSM

Dr. Fitts is a Professor of Biological Sciences at Marquette University. In 1998 he received the American College of Sports Medicine's Citation Award for Research Excellence. His laboratory's primary goals are to understand how skeletal muscle function is altered by programs of regular exercise-training, and elucidate the cellular causes of fatigue.

Cassie Nelson, M.S.

Cassie Nelson is a graduate student in the Department of Biological Sciences at Marquette University in Milwaukee, Wisconsin. Cassie received a B.S. from Marquette in Physiological Sciences and an M.S. from Indiana University in Cellular Physiology and plans to graduate this spring from Marquette with her Ph.D. The primary focus of Cassie's Ph.D. work is to understand the cellular mechanisms of skeletal muscle fatigue at the level of the cross-bridge cycle. Cassie is particularly interested in *how* elevated P_i and H^+ (low cell pH) contribute to single fiber force, velocity, and power depression.

Muscle fatigue defined as a loss of force and power is problematic particularly in the elderly and those suffering from muscle, respiratory or heart disease. Despite considerable progress, the causes of muscle fatigue are not yet resolved, but clearly involve both factors within the central nervous system (Central Fatigue), and factors within the muscle (Peripheral Fatigue). The relative importance of these two general types of fatigue is dependent of the type of exercise, and the age and fitness of the individual. **The goal of this symposium is to present the current theories regarding the cellular mechanism of fatigue with particular emphasis on how low pH and high inorganic phosphate reduce force, velocity, and power. We will also present data on low frequency fatigue (LFF).** Participants will leave the symposium with a basic understanding of the cellular factors involved in muscle fatigue, which will facilitate their ability to develop exercise countermeasures. It is anticipated that the symposium will be presented as two 20 minute talks plus discussion with the general layout as follows:

1. Cross-bridge mechanisms of muscle fatigue - presenter Ms. Nelson (20 minutes plus 5 minutes question period)
2. Etiology of low frequency fatigue presenter - Dr. Fitts (20 minutes plus 5 minutes question period)

The following paragraphs summarize the key points to be presented.

Cross-bridge mechanisms of muscle fatigue (Ms. Nelson). Studies employing biochemical, single fiber (living, chemically skinned, and mechanically peeled), and in vitro motility assays have provided considerable insights into how the thin actin and the thick myosin filaments interact to generate force, velocity, and power. In this presentation, a model of the cross-bridge cycle will be presented and key steps thought to participate in fatigue discussed. **A heavy emphasis will be placed on the role of low pH and high inorganic phosphate (Pi) in eliciting fatigue by altering key steps in the cycle.** The presentation will also consider how fatigue induced declines in the amplitude of the calcium transient exacerbates the detrimental effects of both high H+ and Pi.

Etiology of low frequency fatigue (LFF) (Dr. Fitts). Following certain contractile paradigms (elicited both in vivo in humans and in vitro in animals) muscle force requires several hours to days to recover and the delayed recovery is especially apparent at low activation frequencies. The etiology of this LFF is still not understood. Since the amplitude of the Ca^{2+} transient is depressed and recovery slow, the mechanism is thought to involve a structural alteration of either the SR Ca^{2+}

release channel and/or associated proteins. This structural change reduces the amplitude of the Ca^{2+} transient for all stimulation frequencies, but due to the shape of the pCa-force relationship a major depression of force is only observed at low frequencies. **In this presentation, the SR calcium release channel and the SR SERCA pump will both be discussed and their role in LFF highlighted.**

9:00-9:50am

Presentation: ***Skeletal Muscle Fatigue: CNS Factors and the Impact of Aging and Disease.***

Dr. Sandra Hunter, Ph.D. FACSM

Dr Sandra Hunter, PhD is an Associate Professor in the Exercise Science Program, Department of Physical Therapy at Marquette University. Dr. Hunter achieved a PhD in Exercise and Sport Science from The University of Sydney where her research focused on neuromuscular function with aging and strength training. Dr Hunter was a post postdoctoral research associate under the mentorship of Dr Roger Enoka at the University of Colorado Boulder (1999-2003). She is now director of the NIH funded Neuromuscular Physiology of Movement laboratory at Marquette. Her research focuses on mechanisms contributing to sex-based and age differences in neuromuscular function and fatigue, and the effects of stress and exercise training in aged and clinical populations.

Alexander Ng, Ph.D., FACSM

Dr. Alex Ng received his BS in Biological Sciences from the University of California- Davis and PhD Exercise Physiology (aka Physical Education) from the Biodynamics Laboratory at the University of Wisconsin-Madison. Post-Doctoral work included stints at University of Arizona and the University of Colorado (1990-93) where he studied cardiovascular regulation in older adults. An interest in muscle fatigue led him to additional post-doctoral work examining mechanisms of fatigue in persons with Multiple Sclerosis and other chronic diseases at the University of California- San Francisco. Since 2000, Dr Ng has been teaching at Marquette University where he is currently an associate professor in the Exercise Science Program in the College of Health Sciences. He is also an adjunct associate professor at the Medical College of Wisconsin (MCW) through the Clinical Translational Science Institute and is a member of the MCW Cancer Center. Dr. Ng's primary line of research is investigating mechanisms of fatigue in persons with multiples sclerosis (MS) or cancer survivors (i.e., cancer-related-fatigue). This symptomatic fatigue may or may not be independent of impaired muscle function and could be mediated by psycho-neuro-immunological factors. His secondary research interest is broadly based on determining beneficial effects of exercise, also in persons with MS or cancer survivors. When not brooding in his ivory tower or learning to speak Australian from Dr. Hunter, Dr. Ng has been known to enjoy cycling, cross-country skiing, and the occasional run, with his wife and two teenage sons.

Muscle fatigue defined as a loss of force and power is problematic particularly in the elderly and those suffering from muscle, respiratory or heart disease. Despite considerable progress, the causes of muscle fatigue are not yet resolved, but clearly involve both factors within the central nervous system (Central Fatigue), and factors within the muscle (Peripheral Fatigue). The relative importance of these two general types of fatigue is dependent of the type of exercise, and the age and fitness of the individual. **The goal of this symposium is to present the current theories regarding the CNS mechanism of fatigue in young and older adults, and in selected clinical populations. Participants will leave the symposium with a basic understanding of how changes in the CNS can contributes to fatigue, and appreciate how the mechanisms eliciting fatigue vary with age and disease.** It is anticipated that the symposium will be presented as two 20 minute talks plus discussion with the general layout as follows:

1. Mechanisms of central fatigue presenter Dr. Hunter (20 minutes, plus 5 minute question period)
2. Heightened fatigability in clinical populations presenter Dr. Ng (20 minutes, plus 5 minute question period)

The following paragraphs summarize the key points to be presented.

Mechanisms of central fatigue (Dr. Hunter). Muscle fatigue is an exercise-induced decline in force or power of the muscle during a maximal or submaximal task. Processes within the muscle (peripheral factors) and within the central nervous system (central factors) can contribute to this decline in force and power, although contribution from peripheral and central origins will vary with the task requirements and age of the population. Central fatigue and those sites within the nervous system that contribute to loss of adequate voluntary activation and muscle fatigue include descending pathways, spinal interneurons and peripheral afferent feedback. Age-related changes in the neuromuscular system however can increase the

susceptibility of men and women to fatigue within the central nervous system. **This presentation will highlight the latest studies and techniques, e.g. transcranial magnetic stimulation, that demonstrate the large contribution that central fatigue can have in limiting force production in young and older adults during and in recovery from fatiguing exercise.**

Heightened fatigability in clinical populations (Dr. Ng). Fatigue is a clinically significant symptom in many chronic diseases that can result in disability and decreased quality of life. Despite the importance of this symptom, surprisingly little is known about the actual mechanisms of fatigue in many clinical populations including persons with neurologic or immunologic disease. **This presentation will focus on central, peripheral and intramuscular mechanisms of muscle fatigue in persons with multiple sclerosis and cancer survivors, both of which are immunological in origin.** It will also highlight the distinction, between muscle fatigue and the clinical symptom of fatigue and how one may not necessarily lead to the other.

10:00-10:50am

Presentation: ***The Built Environment: Tensions between building a healthy you in a healthy environment***

Helaine Alessio, Ph.D., FACSM

Dr. Alessio is a Professor and Chair in the Department of Kinesiology and Health. She is a Fellow of the American College of Sports Medicine and Scripps Gerontology Center, former President of the Midwest American College of Sports Medicine. Dr. Alessio's scholarly interests include Exercise Physiology, risks and benefits associated with exercise, and age-related changes influenced by the interaction of environment and genetics, on physiological phenotypes linked to health and disease. Her research has been supported by the National Institute on Aging, National Institute of Health, and National Cancer Institute. Dr. Alessio's teaching includes undergraduate and graduate classes in Exercise Physiology and Gerontology. She has participated in several Faculty Learning Communities to enhance teaching effectiveness, and has won several teaching awards at Miami University, where she has taught for 25 years.

Ron Cox, Ph.D.

Ron Cox is currently an associate professor in the Department of Kinesiology & Health. His primary teaching responsibilities are in the exercise physiology curriculum. His training was in in cardiovascular physiology with work that primarily focused on the physiological adaptations produced by endurance activity, particularly as they influenced the physiological responses to psychological stress. Currently research interests focus on the utility and feasibility of altering the work environment to include low intensity but extended duration activity via active work stations.

Purpose: The purpose of this symposium is to provide evidence from recent studies that life long personal health and a thriving environment cannot be separately acquired; both are necessary for optimal and sustainable wellness. By consuming excessive energy as we eat, exercise, and live, we support a one-sided approach to health at the expense of the environment, leaving us exposed to air, water, food, and land that may become toxic, from over-consumption, pollution, and climate change. The presenters will engage the audience in an interactive session and provide current information about new initiates to make school and workplaces less sedentary with the use of active workstations and integrating regular physical activity throughout the day. These initiatives need to be balanced with the stress they place on limited environmental resources in part from the use of electrically powered exercise equipment that rely on coal. This symposium will provide theory and practical examples for understanding how human health and wellness can and should be attained, with regard for both the person and the environment.

Learning objectives:

- Recognize advantages and disadvantages of a variety of initiatives designed to decrease sedentary behavior in schools and in the workplace.
- Calculate the energy cost of working at an active workstation for a variety of hours vs. sitting vs. standing, and convert work rate to kcal to pounds shed.
- Characterize some task that can be accurately completed and others that may be compromised while using an active workstation for work and education.
- Articulate barriers as well as facilitators that respect and protect the human health and the environment in a free market economy.
- Calculate energy cost and identify unintended and/or hidden consequences when using a variety of popular products and exercise equipment that require energy and convert kWatts to kcal to pounds of coal.

- Learn about new initiatives in ACSM, including ActiveEarth, and the start up of "green gyms" around the country that consider environmental health in all of the exercise equipment and health and fitness products.
- Learn about research that compares different traffic and walking paths/patterns that facilitate or provide barriers to healthy behaviors including walking, biking, and public transportation.

Conclusion

The Built Environment is a new concept in public health that can benefit tremendously by the analytical and scientific strengths of many professionals involved in ACSM. No longer are Exercise Scientists limited to laboratories to conduct research. They can use their tools in understanding mechanisms, controlling variables, and bridging theory and practice in a variety of settings outside the laboratory. Ron Cox has published several papers that have investigated benefits and obstacles of implementing active workstations in a variety of work and school settings. Helaine Alessio has been involved with an interdisciplinary team of investigators, learning about the environmental cost of energy-dependent exercise equipment, and writing about this novel topic. There is a real need for students and professionals in ACSM to be involved in improving the understanding and implementation of healthful physical activity programs that benefit both human health and the health of the environment.

MWACSM Special Symposium

11:00-11:50am

Presentation: ***Is There a Future for Exercise Professionals?***

Richard Cotton, M.A., P.D., E.S.

Richard Cotton is ACSM's National Director of Certification and Registry Programs. He has worked in the health and fitness industry for more than 30 years. Cotton earned a B.A. in education from Wayne State University, Detroit, and an M.A. in exercise science from San Diego State University. He holds ACSM certifications as Preventive and Rehabilitative Program Director SM and ACSM Exercise Specialist®. He frequently serves as an expert source on behalf of ACSM in print, broadcast and Web-based media.

Exercise Science and/or Kinesiology are popular majors at many colleges and universities, but many of the jobs available to degreed exercise professionals tend to be entry level with low compensation. Clinical exercise physiologists have been fighting to retain their established roles in clinical programs, but are challenged from multiple directions. Major issues include lack of licensure, inability to bill insurance directly for services, and often, replacement with nurses or physical therapists. This presentation will review the barriers that exercise professionals are facing today and will present strategies for change. The overall purpose is to engage faculty and exercise professionals in strategic action that will advance the profession.

Attendees will:

1) become aware of the issues clinical and health fitness exercise professionals face in today's work environment
2) become aware of strategies to improve the work environment for exercise professionals including information on a common naming convention for the field, licensure, employment patterns, accreditation, and the impact of the affordable care act.
3) learn about the steps that the ACSM CCRB is taking to advance the profession
4) will have an opportunity to discuss the issue raised in the session

Research Symposia
Saturday, November 9, 2013
Morning Sessions

Sponsored in part by

NSCA National Strength and Conditioning Association

Uptown Room 2nd Floor

8:00-8:50am
Free Communication Presentations
Session 3
Abstracts available later in the program

9:00-9:50am
Free Communication Presentations
Session 4
Abstracts available later in the program

10:00-10:50am
Free Communication Presentations
Session 5
Abstracts available later in the program

11:00-11:50am
Presentation: ***The insidious influence of gender socialization on females' physical activity: rethink pink***

Nicole Mullins, Ph.D., HFS, CSCS
Dr. Mullins is an Associate Professor of Exercise Science, in the Department of Human Performance and Exercise Science (HPES), at Youngstown State University. She is an ACSM Health Fitness Specialist (HFS), and an NSCA Certified Strength and Conditioning Specialist (CSCS). She earned her B.S. in exercise science from the University of New Hampshire, where she competed in gymnastics, and her M.A. and Ph.D. in exercise physiology from Kent State University. Her primary research interests involve sports-specific training, bone health, body composition and performance, gender socialization effects on physical activity, and the psychology of sport, exercise, and health-related behaviors.

Continually accumulating information indicates the severity of the public health need for increased physical activity, and thus for careful attention to all factors that can curtail it. However, study and documentation of such factors are not enough to promote widespread change in firmly established, sedentary behaviors; if they were, the countless, existing informants of inactivity's ills would have already done so. Accurate information needs both to reach those who need it, and be communicated in ways that demonstrate relevance and importance. PURPOSE: To enhance awareness, specifically among physical activity professionals, of some of the many socializing influences that render girls less physically active than boys, from very early ages. The underlying intent is to promote changes that could enhance the fitness and health of girls and women. SPECIFIC OBJECTIVES: To enhance awareness of 1) the potential effects of gender socialization and benevolent sexism on the physical competence and confidence of girls and women; 2) the inequities that persist in terms of exposure, instruction, and support of females' physical activity and sports participation; 3) the common practices that perpetuate gender inequities; 4) the importance of promoting change in socialization practices that undermine the physical activity, health, and overall well-being of the female population.

Clinical Presentations – Friday, November 8, 2013: Morning Sessions
Cases Studies
Abstracts

7:10-7:30am

RECTUS SHEATH HEMTOMA (RSH) – AN UNUSUAL CAUSE OF ABDOMINAL PAIN

Jose Armendariz MD, Summa Health System, Sports Medicine Fellowship, Akron, OH

HISTORY: 54yo WM admitted for inpatient management of pneumonia c/o acute onset abdominal pain one day prior to discharge. He noticed acute sharp progressive abdominal pain that began in his RLQ and extended to include RUQ. Pain is 10/10, constant, no radiation, and nothing makes his pain better, hip flexion makes it worse. No F/C/NS, N/V/D. On bedside exam the patient was hemodynamically stable. Of note the patient had been given treatments for cough during his admission for pneumonia but otherwise progressing as expected. Remainder of his ROS were otherwise negative.

PHYSICAL EXAMINATION:

GENERAL: Vital signs stable. AOx3 well nourished male in acute distress and cannot find a comfortable position on the hospital bed, "writhing in pain".

CHEST: LCTAB, n/Wheezing, HRRR, NL S1-S2, n/Murmurs.

ABDOMEN: Obese, No bruising, +Guarding, +FIRM RUQ/RLQ with severe PTP in all quadrants, -Rebound or bruising. Rectal exam deferred.

EXTREMETIES: Pulses 2+, + severe pain with hip flexion RIGHT

NEUROLOGICAL: Non focal

DIFFERENTIAL DIAGNOSIS: The differential diagnosis includes RSH, Trauma, Hernia, Mesenteric Ischemia, SBO, LBO, Pancreatitis, UTI, Urinary Obstruction, Shock Hyovolemic, If Female: Ectopic, UTI, Ovarian Cysts, Ovarian Torsion, If Pediatric: Appendicitis, Gastroenteritis, Intussusception.

TESTS AND RESULTS: STAT AAS-RUQ and RLQ nonspecific consolidation of fluid/mass. NL bowel gas pattern, no free air. CBC,CMP, INR-WNL. Due to patient hemodynamic instability the patient was transferred to the ICU for close monitoring and further management and CT of the abdomen when stable. CT ABD showed a large RSH with 28cm crainal caudal 21cm AP exerting a mass effect and displacing his liver and bowels left from normal anatomic alignment. No free air, repeat CT showed enlarged but stable RSH.

FINAL WORKING DIAGNOSIS: Spontaneous RSH Type 3 with hemodynamic instability.

TREATMENT AND OUTCOMES: The patient spent 2 weeks in the ICU and required 8U PRBCs and 3U FFP until the RSH stopped. He also required the use of a commercial intra-Abdominal Pressure (IAP) Monitoring System while in the ICU. No aggressive surgical intervention was necessary and the patient was discharge to SNF with PT prior to going home. On follow up appointment he was doing well and we estimated 3-5 months for resolution of his hematoma.

7:30-7:50am

ACHILLES TENDON RUPTURE IN AN 18 YEAR OLD MALE

Jason Foster, The Ohio State University, Family Medicine, Columbus, OH
Jim MacDonald, Nationwide Children's Hospital Sports Medicine, Columbus, OH

History: An 18 year old junior college basketball player presented with acute onset posterior left ankle pain after someone stepped on his heel while running down court in an open gym basketball game. He noted immediate pain and inability to stand on his toes. The injury occurred on 7/23/13, he was seen by his PCP and referred to sports medicine where he was seen on 8/2/13.

Physical Exam: Patient complained of minimal pain. Able to ambulate but unable to toe rise on left lower extremity. Left ankle had full passive ROM. Soft tissue swelling present in peritendinous distribution of medial, left Achilles. A palpable defect was present approximately 6 cm proximal to the calcaneus. Thompson test of left leg was positive (absent plantar flexion with calf compression).

Differential diagnosis: complete vs. partial rupture of Achilles tendon, rupture of posterior tibialis tendon, tear of medial head of gastrocnemius ('tennis leg').

Test and results: 3 view left ankle series was normal. Ultrasound showed complete Achilles rupture approximately 7 cm proximal to the calcaneal insertion with approximately 1 cm of retraction. Subsequent MRI confirmed Achilles rupture approximately 5 cm from calcaneal insertion with extensive edema.

Final working diagnosis: left Achilles tendon rupture

Treatment: the patient was placed in a long walking boot with plantar flexion on initial evaluation in our clinic and given crutches with instructions to ambulate partial- vs. non weight-bearing on the affected leg. He was referred urgently to orthopedics. Orthopedics noted some active plantar flexion and a negative Thompson test. Their initial plan was conservative treatment and an MRI to evaluate findings noted on ultrasound. After results of the MRI verified complete

rupture, the patient and orthopedics team decided to undergo surgical repair on 8/12/13. Initial indications are successful surgery, patient now is in recovery. He will continue to be in the walking boot, non weight-bearing for 6 weeks after the procedure. He will begin ROM exercises 2 weeks post-op.
Outcome: the patient is 2 weeks post-op and recovering as expected.

7:50-8:10am
BACK PAIN IN A GYMNAST

Scott Repa, DO, University of Chicago/NorthShore University HealthSystem Primary Care Sports Medicine Fellow, Chicago, IL. Sponsor: Carrie Jaworski, MD, FACSM

HISTORY: A 14-year old level 8 gymnast c/o an insidious onset of midline low back pain over the course of 1.5 years. It increased more significantly during the month prior to her presentation to clinic, and is worst when performing vault exercises. A physical therapist working with her gymnastics team recommended further medical consultation. She denied any particular injury. She reported pain with prolonged sitting, standing or walking. It is relieved by lying down. She has woken up several times during the night with pain, and feels stiff in the morning before loosening up throughout the day. She denied any numbness, tingling, or weakness at any time. She denied bowel or bladder incontinence and perianal paresthesias. She further denied fever, chills, unexplained weight loss, recent infection, or other contributory past medical history.
PHYSICAL EXAMINATION: Well-nourished, well-developed 5'1", 139 lb adolescent female in no acute distress. All vital signs stable. Gait is nonantalgic. No signs of swelling, warmth, erythema, ecchymosis. Active lumbar flexion demonstrated full ROM but pain past 45 degrees. Active extension produced pain immediately. She had bony tenderness and palpable crepitus midline at L4 and L5, and decreased flexibility in her bilateral hamstrings. Her bilateral hip and knee exams were unremarkable, with full ROM. Her lower extremities were neurovascularly intact with 2+ distal pulses, and normal bilateral deep tendon reflexes, strength, and sensation.
DIFFERENTIAL DIAGNOSIS: Acute vs. chronic spondylolysis, spondylolisthesis, ankylosing spondylitis, disc herniation, diskitis, compression fracture, muscular or ligamentous strain, tendinitis, calcified mass.
TESTS AND RESULTS: AP, lateral, and bilateral oblique x-rays of the lumbar spine were obtained, revealing bilateral L4-L5 spondylolyses, a spondylolisthesis of L4 on L5 of 2.1mm, and well-maintained disc spaces and vertebral heights. There were no signs of compression fracture and the SI joints were normal in appearance. MRI is pending to evaluate acute vs chronic spondylolysis, and to evaluate surrounding tissues and structures.
Requested MRI sequencing:

1. Edema Sensitive – STIR Images (T2 Fat Sat)
2. Cortex (Marrow) Sensitive – T1 (or T2) Non Fat Sat
3. Multiplanar – Axial, Sagittal, Coronal Oblique
4. Thin Slice – at least 3mm

FINAL DIAGNOSES: Current working diagnosis is bilateral spondylolysis of L5 with grade 1 spondylolisthesis.
TREATMENT and FINAL OUTCOME: The patient will be treated initially with 3 weeks of rest, pending her MRI, after which she will be re-evaluated to determine response to rest. If pain subsides, under the guidance of her physical therapist, she will progress to do limited pain-free rehab activities. The MRI will be used to help determine if a longer course of complete inactivity is necessary to facilitate healing if her fractures are demonstrated to be acute. When appropriate, we will increase the intensity of her pain-free activities with more strenuous physical therapy and eventually gymnastics. If her symptoms are labile, further imaging and or bracing will be considered.

8:10-8:30am
BACK INJURY – FOOTBALL

Emily Stuart, FACSM, Nationwide Children's Hospital Sports Medicine, Columbus, OH

HISTORY: A 16 year-old male football player presented for 2 weeks of right low back pain that started after practice. He can recall no injury. One day prior to presentation he went to the emergency room due to increased pain. Xrays and a CT in the ER showed possible sclerosis. He had been taking ibuprofen and cyclobenzaprine without improvement of his symptoms and was given prescriptions for naproxen and methocarbamol in the ER. He has right posterior leg pain in his thigh, but he denies fevers or problems going to the bathroom. He has had intermittent back pain in the past but never this severe. He is unable to participate in football. His past history is significant for Langerhan's cell histiocytosis that has been in remission for many years.

PHYSICAL EXAMINATION: The patient walks moves with difficulty. Examination of the spine showed decreased flexion and very minimal extension. He had full range of motion in right and left sidebend and in rotation with pain. He had 3/5 strength in hip flexion bilaterally. His straight leg test on the right was negative as he only had pain in his back, however, he had a positive crossed-straight leg test. He was otherwise neurovascularly intact.

DIFFERENTIAL DIAGNOSIS: The differential diagnosis includes herniated disc, spondylolysis, spondylolisthesis, and muscle strain.
TESTS AND RESULTS: Initial xrays from the emergency department showed right L5 sclerosis. A CT that was also obtained in the emergency department showed an area of increased density at the right L5 pars articularis which coincided with the sclerosis on xray. After being seen in clinic, the patient was sent for an MRI which showed a central posterior disc herniation and annular tear at the L4/L5 level. The right L5 nerve root was near the disc herniation. There was a posterior right sided/foraminal disc herniation at the L5/S1 level with mass effect on the S1 nerve root. In addition there was a moderate sized Schmorl's node at L3, an L5 hemangioma, and disc degeneration at L3/L4, L4/L5, and L5/S1.
FINAL WORKING DIAGNOSIS: The final diagnosis was herniated discs and disc degeneration.
TREATMENT: The patient was given a lumbar corset for comfort and told to rest from physical activity. In addition, he was given a 5 day prednisone burst. He was instructed to continue naproxen twice a day and take muscle relaxants as needed.
OUTCOME: The patient was seen in clinic 1 week later. His pain was slightly improved but due to continued weakness, limited range of motion, and a positive cross straight leg test, he was given another 5 day steroid burst followed by a wean. He was allowed to start physical therapy for gentle stretching. He was told to follow up in 3 weeks. If he has still not improved, he will be referred to neurosurgery for possible surgery for the herniated discs.

8:30-8:50am

SEA SHELL SHIN PAIN

Christopher Liebig, Akron Children's Hospital Sports Medicine, Akron, OH

HISTORY: Patient is a 16 year-old high school cheerleader who presents over her summer vacation for left lower leg pain. She reports that she first noticed the pain after being forcefully knocked down by a wave and impacting a rock or seashell on the ocean floor. There was, of course, immediate pain at the location of impact. No laceration or wound according to patient. After a week of rest, sporadic icing, and OTC analgesics, the pain continued and led to the decision to have physician evaluation.
PHYSICAL EXAMINATION: Gait was non-antalgic. Moderate soft-tissue swelling of the anterior-medial portions of the distal tibia. Full range-of-motion of ankle joint both passively and actively. No appreciable strength deficits with dorsiflexion, plantarflexion, inversion, or eversion. No ankle instability, negative anterior drawer sign. EHL extension with no strength deficits. Neurovascularly intact. DTRs within normal limits. Toe-walking completed without difficulty. Single-leg hopping with mild pain felt through the distal left lower extremity.
DIFFERENTIAL DIAGNOSIS: The differential diagnosis includes bony/soft-tissue contusion, fracture, cellulitis, osteomyelitis, unicameral bone cyst, aneurysmal bone cyst, non-ossifying fibroma, or bony tumor
TESTS AND RESULTS: Two views of the left tib-fib revealed a large cystic lesion in the distal left tibial metadiaphyseal region. There was significant cortical thinning, but no fracture identified. No periosteal reaction.
Referred to orthopedics given size of lesion where decision made to perform left distal tibia curettage and bone grafting with iliac crest bone marrow. Thick brown-colored exudative-type material was curetted out of lesion and sent for pathology.
FINAL WORKING DIAGNOSIS: Non-ossifying fibroma
TREATMENT AND OUTCOMES: The patient was advised to maintain touchdown weightbearing only or, in other words, limit weightbearing to ~10% of patient's weight on operative extremity for at least one month following her surgery. She will then begin formal physical therapy to return to baseline strength and flexibility with eventual progression back to sport-specific activity with complete resolution of pain and radiographic stability.

Research: Free Communication Presentations – Friday, November 8, 2013
Session 1

Abstracts

FC 1 9:00-9:15AM

GENDER DIFFERENCES IN THE EFFECT OF THE PRESENCE OF AN UNFAMILIAR PEER ON OUTDOOR EXERCISE INTENSITY AND ENJOYMENT IN RECREATIONAL RUNNERS

Andrew J. Carnes, Jacob E. Barkley, Ellen Glickman, FACSM
Kent State University, Kent, OH.

Fitness professionals and popular media sources frequently recommend "exercising with a partner" to increase the motivation to exercise or boost athletic performance. Although existing non-experimental research agrees that "social support" is a positive correlate to physical activity, the available experimental research examining the causal impact of social factors on exercise behavior is limited. If training with others can encourage greater intensity and/or enjoyment of exercise, athletes who train together may achieve a greater training stimulus, which could lead to enhanced performance. **PURPOSE:** The purpose of this study was to determine if, relative to an alone condition, running with an unfamiliar training partner affects average running speed, enjoyment, or perceived exertion during a self-paced outdoor run in male and female runners. **METHODS:** Sixteen trained recreational adult runners (n = 8 male, 8 female) completed running trials on separate days under two different social conditions: running alone and with a single unfamiliar peer matched for gender and fitness. The order of social conditions was randomized. Running trials consisted of a self-paced 6.4-km run on a measured outdoor trail. The primary dependent variables were elapsed time of the run, average speed, enjoyment of the run (assessed via visual analog scale), and ratings of perceived exertion. **RESULTS**: Mixed model regression analysis revealed a significant condition by gender interaction (p =0.04) for elapsed time and average speed. Women ran significantly slower (p =0.05) in the peer condition (11.28 ± 0.35 $km \cdot hr^{-1}$) than alone (11.85 ± 0.784 $km \cdot hr^{-1}$). Conversely, men increased average running speed in the peer condition (14.28 ± 0.51 $km \cdot hr^{-1}$) relative to the alone condition (13.93 ± 0.89 $km \cdot hr^{-1}$). Men and women reported greater enjoyment in the peer condition than the alone condition, but this increase was not significant ($p \geq 0.149$). There were no main or interaction effects for RPE. **CONCLUSION**: The presence of an unfamiliar peer, relative to an alone condition, had a differential effect on voluntary running speed in men and women. Women ran significantly slower, while men ran faster, in the presence of an unfamiliar peer of the same sex.
Funding for this study was provided by the Kent State University Graduate Student Senate Research Grant.

FC 1 9:15-9:30AM

PRE-TO-POST SEASON CHANGES IN REPEATED SPRINT PERFORMANCE IN NCAA DIVISION I ICE HOCKEY ATHLETES

Danilo V. Tolusso, C. Matthew Laurent, Adam M. Fullenkamp, Daniel A. Fischer, Amy L. Morgan, FACSM.
Bowling Green State University, Bowling Green, OH

Ice hockey is a sport characterized by repeated bouts of high intensity work integrating sudden stops and starts. Within a game as well as across a competitive season, successful players tend to demonstrate the ability to produce optimal power output (PO) without undue fatigue. Sport specific testing to assess these characteristics is appropriate in the assessment of competitive ice hockey athletes. **PURPOSE:** To evaluate pre-to-post season changes in PO, decrement of PO, and recovery of PO as well as perception of effort of NCAA Division I Hockey players during a test of repeated sprints on a non-motorized treadmill. **METHODS:** Members of an NCAA Division I Men's Ice Hockey team performed two identical tests of repeated sprints as part of their pre- (n=24) and post-season (n=20) assessment. The protocol consisted of five sets of 45-sec sprints with periods of starts and stops separated by 90-sec of passive recovery. During each sprint, PO (Watts) was measured. Immediately before and after each set, HR was recorded in order to determine heart rate recovery (HRR) between sets of sprints. Following each set of sprints participants provided their RPE. After collection of raw data, decrement scores (DEC) and recovery scores (REC) were calculated. **RESULTS**: A one-way ANOVA revealed significantly lower PO during post-season assessment vs. pre-season (619 ± 110 vs. 688 ± 90 Watts). In addition, RPE values were found to be significantly higher in post-season (8.1 ± 2.0) vs. pre-season (7.6 ± 1.6) assessment. No significant differences were found between DEC, REC, or HRR from pre-to-post season. **CONCLUSION:** While PO during post-season assessment was significantly lower than pre-season, players exhibited similar fatigue and recovery patterns between sets. Interestingly, despite higher pre-season PO (versus post-season), the players reported greater RPE during the post-season testing. The higher RPE values observed in the post-season testing with attenuated levels of PO suggests that players may exhibit accumulated fatigue throughout a competitive season. Further research is needed to understand the pattern of decay in power through the course of a season.

FC 1 9:30-9:45AM

HEART RATE RECOVERY AND VARIABILITY IN BOYS AND GIRLS FOLLOWING MAXIMAL AND SUBMAXIMAL EXERICSE

Justin P. Guilkey, Matthew Overstreet and Anthony D. Mahon
Human Performance Laboratory, Ball State University, Muncie, IN

Heart rate recovery (HRR) may be faster in boys compared to girls, but seems to be dependent on exercise intensity and whether the intensity is absolute or relative. However, the underlying parasympathetic activity responsible for HRR between boys and girls is unclear but can be assessed using heart rate variability (HRV). **PURPOSE:** This study examined HRR and HRV following submaximal and maximal exercise in boys (n=13; 10.1±0.8 yrs) and girls (n=12; 10.1±0.7 yrs). **METHODS:** Subjects completed ten minutes of supine rest followed by a graded exercise test to maximal effort. On a separate day, subjects performed submaximal exercise at the VO_2 at ventilatory threshold. Immediately following both exercise bouts, subjects assumed a supine position for 10 minutes for HRR and HRV assessment. HRR was the change in HR during the first minute of recovery. HRV variables were log transformed and analyzed under controlled breathing in the time and frequency domains (e.g. standard deviation of NN intervals (lnSDNN), high frequency (lnHF) and total power (lnTP)) over the final five minutes of rest and recovery. Data were analyzed using independent t-tests and a group x time MANOVA and applicable post-hoc testing. **RESULTS:** There were no differences in HRR following maximal and submaximal exercise 58±8 beats·min^{-1} and 59±8 beats·min^{-1}, respectively in boys and 54±6 beats·min^{-1} and 52±19 beats·min^{-1}, respectively in girls ($p>0.05$). HRV variables responded similarly from rest to recovery from maximal exercise between groups ($p>0.05$). There also were no differences during recovery for any HRV variables, including lnHF in boys (4.32±2.00 ms^2) and girls (3.59±1.04 ms^2) ($p>0.05$). The submaximal trial produced significant group x time interaction effects for lnSDNN and lnTP. However, pairwise comparisons showed no significant differences between boys and girls at rest (lnSDNN: boys; 4.61±0.28 ms vs. girls; 4.28±0.52 ms and lnTP: boys; 9.14±0.42 ms^2 vs. girls; 8.30±1.05 ms^2) or during recovery (lnSDNN: boys; 3.78±0.46 ms vs. girls; 3.87±0.64 ms and lnTP: boys; 7.33±1.09 ms^2 vs. girls; 7.44±1.24 ms^2). **CONCLUSIONS:** HRR following maximal and submaximal exercise were similar between boys and girls. This could be due to the similarities in parasympathetic regulation of HR during recovery.

FC 1 9:45-10:00AM

EFFECT OF BODY FAT AND ACUTE EXERCISE ON METABOLIC FLEXIBILITY IN OVERWEIGHT BOYS

Matthew L. Overstreet[1], Justin P. Guilkey[1], Matthew P. Harber[1], Brian W. Timmons[2], Bret Goodpaster[3], Anthony D. Mahon[1]
[1]Ball State University, Muncie, IN; [2]McMaster University, Hamilton, Ontario; [3]University of Pittsburgh, Pittsburgh, PA

Metabolic flexibility is the ability to increase metabolism of fat or carbohydrate when that particular fuel source is readily available and is a hallmark of metabolic health. Metabolic inflexibility is associated with obesity and precipitates a host of metabolic disorders including dyslipidemia, insulin resistance, Type II diabetes, and metabolic syndrome. The rise in childhood obesity has been accompanied by an increased prevalence of these metabolic dysfunctions and is a major health concern. **PURPOSE:** This study investigated the influence of body fatness and acute aerobic exercise on metabolic flexibility in overweight boys. **METHODS:** Five overweight (OW) boys (10.5 ± 0.5 yrs, 96.8 ± 0.9 BMI%ile) completed a two-hour oral glucose tolerance test after either a 30-minute submaximal exercise bout or rest. Blood glucose concentration ([BG]) and carbohydrate oxidation rate (COX) were measured prior to glucose ingestion and at 30-minute intervals. Nine lean (L) boys (10.0 ± 0.3 yrs, 39.3 ± 9.2 BMI%ile) performed the resting trial. Comparisons were made at rest between groups and between rest and exercise within OW using ANOVA. **RESULTS:** In the resting condition [BG] increased ($p < 0.05$) over time from 86 ± 2 to 167 ± 10 mg/dl in L and from 86 ± 2 to 161 ± 12 mg/dl in OW ($p > 0.05$ for group and interaction). COX increased ($p < 0.05$) over time from 1.9 ± 0.5 to 4.7 ± 0.6 mg/kg/min in L and from 1.4 ± 0.4 to 4.1 ± 0.3 mg/kg/min in OW ($p > 0.05$ for group and interaction). Following exercise, [BG] in OW increased ($p < 0.05$) over time from 91 ± 4 to 157 ± 2 mg/dl ($p > 0.05$ for trial and interaction). COX in OW increased ($p < 0.05$) over time from 0.5 ± 0.3 to 2.4 ± 0.4 mg/kg/min in the exercise trial but was lower ($p < 0.05$) versus rest ($p > 0.05$ for interaction). **CONCLUSIONS:** At rest body fatness did not affect [BG] or COX response to the glucose challenge. Exercise also did not affect [BG] responses, but decreased COX. Understanding factors affecting metabolic health in overweight children has important health implications.

Research: Free Communication Presentations – Friday, November 8, 2013
Session 2

Abstracts

FC 2 2:00-2:15PM

RACIAL DIFFERENCES IN FOREARM BLOOD FLOW FOLLOWING MAXIMAL EXERCISE BEFORE AND AFTER AEROBIC TRAINING

Rebecca M. Kappus[1], Sushant M. Ranadive[2], Huimin Yan[3], Abbi D. Lane[4], Marc D. Cook[1], Kenneth R. Wilund[3], Jeffrey A. Woods[3], FACSM & Bo Fernhall[1], FACSM

[1]University of Illinois at Chicago, Chicago, IL; [2]Mayo Clinic, Rochester, MN; [3]University of Illinois at Urbana-Champaign, Urbana, IL; [4]University of Iowa, Iowa City, IA

African Americans (AA) have altered vascular function, beginning at an early age. It is unknown if this impacts the blood flow response to exercise, or if there are changes with exercise training. We investigated baseline blood flow before and following maximal exercise, and before and following training, in AA and Caucasians (CA). **PURPOSE:** To determine if there are ethnic specific responses in forearm blood flow before and after a peak exercise bout and following exercise training. **METHODS:** Baseline and post acute peak exercise measurements were obtained in 75 sedentary subjects (38 AA and 37 CA, mean age=24 years). Resting forearm blood flow (FBF) in addition to peak FBF and area under the curve (AUC) following reactive hyperemia measurements were assessed using strain gauge plethysmography before and following a VO_{2peak} test. The 8 week training program consisted of 30-60 min of endurance exercise at 60-90% of HR_{max} 3 times per week. Pre- and post-intervention values were compared between AA and CA using a repeated measures (2x2) ANOVA. **RESULTS:** AA had reduced FBF, peak FBF and AUC compared to CA, and this did not change following 8 weeks of endurance training (see tables below for mean values). In addition, AA had no increases in FBF, peak FBF or AUC following peak exercise, in comparison to CA who had significant increases in AUC (both before and after training), peak FBF (before training), and FBF (following training) following peak exercise. **CONCLUSIONS:** AA have reduced FBF at rest and following exercise compared to CA. This racial difference is not improved by exercise training. This response could potentially be due to decreased nitric oxide bioavailability, which could be a factor in the endothelial dysfunction seen in AA.
Supported in part by National Institutes of Health HL093249-01A1 (Fernhall)

FC 2 2:15-2:30PM

RELATIONS AMONG PRE-PREGNANCY AND EARLY PREGNANCY PHYSICAL ACTIVITY AND SERUM LIPID LEVELS IN MID TO LATE PREGNANCY

Alicja B. Stannard[1], Lanay M. Kazmirzack[1], Caitlin Kelly[2].

[1]Michigan State University, Department of Kinesiology, East Lansing, Michigan; [2] Michigan State University- MSU-Sparrow Ob/Gyn Residency clinic, Lansing, Michigan

While serum lipid levels increase during pregnancy, excessively high lipids in mid pregnancy are associated with adverse pregnancy outcomes. One study reported physical activity (PA) during early pregnancy was associated with lower lipids. It is unknown whether PA pre-pregnancy (PP) or in the first trimester (T1) effects lipids later in pregnancy. **PURPOSE**: To examine relations between PP and T1 PA and lipids among women in their second (T2) and third trimester (T3). **METHODS**: Seventy-eight gravidas recruited form a Midwest OBGYN clinic participated in the study. Women recalled frequency, duration and intensity of aerobic PA to calculate min/week of moderate and vigorous PA in PP and T1. Participation in 150+ min/wk of PA was categorized as meeting PA recommendations. Women reported participation in resistance training activities in PP and T1 (categorized as any/none). Non-fasting finger stick blood draws measured total cholesterol (TC), triglycerides (TG), high- (HDL) and low-density lipoprotein (LDL) in mg/dl. Median splits were used to categorize women in each trimester with High/Low values of each lipid. Data were analyzed separately for women in the T2 and T3. Spearman correlations evaluated associations between serum lipids (mg/dl) and min/wk of PA in PP and T1. Chi-square analysis evaluated relations between resistance training and meeting PA recommendations in PP and T1 with High/Low lipids in T2 and T3. **RESULTS**: Participants' mean age was 25.1 years (±5.5) and most (87%) were on Medicaid. Reported PP and T1 PA levels were low for women currently in T2 (n=49, 122.4±179 min/wk PP, 55.8±121 min/wk T1) and in T3 (n=29, 142±159 min/wk PP, 68±128 min/wk T1). Spearman correlations found no significant relationships between min/wk of PP or T1 PA with serum lipids for women in either trimester. Chi-square analyses found no significant relations between categorical PA variables and lipid levels. **CONCLUSION**: Our study did not confirm a relation between PP or T1 PA and lipids measured later in pregnancy. It is possible that pregnancy related changes in lipids overwhelm any effect of PA in later gestation. More longitudinal studies are needed to examine the effects of PA on lipid levels during pregnancy. (COE Seed Grant)

FC 2 2:30-2:45PM

HYPOXIC PRECONDITIONING REDUCES RESPIRATORY SKELETAL MUSCLE ROS FORMATION DURING PROLONGED HYPOXIA

Li Zuo[1,2], Michael T. Chien[3], William J. Roberts[1,2], Lan Jiang[1]
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Prolonged exposure to hypoxia may cause muscular oxidative stress resulting in severe muscular injuries. Hypoxic preconditioning (HPC), which employs cycles of brief exposure to low oxygen followed by normal oxygen, may attenuate these hypoxic injuries. **PURPOSE:** We hypothesized that HPC treatment can reduce intracellular reactive oxygen species (ROS) levels in mouse diaphragm during hypoxia. **METHODS:** In our current study, dihydrofluorescein (a fluorescent probe) was used to monitor intramuscular ROS production, in isolated diaphragm muscle from adult C57BL/6J male mice in real time confocal microscopy in a simulated hypoxic condition. Muscle strips were treated with either HPC (5 cycles; n = 5), antioxidant treatment (ebselen; n = 4), or no treatment (control; n = 5) before subjected to a 30 min hypoxic condition (PO_2 = 5 Torr). Data were analyzed using a multi-way ANOVA, and expressed as means ± SE. The differences between the treatments were determined by post-ANOVA contrast analysis using JMP software. $P < 0.05$ was regarded to be significant. **RESULTS:** In the control group, intracellular ROS formation did not appear during the first 15 min of the hypoxic period. However, after 20 min of hypoxia, ROS levels increased significantly and this increase continued until the end of the 30 min hypoxic condition. Conversely, we found that muscles treated with either HPC or the antioxidant, ebselen, showed a complete absence of the increase of fluorescence throughout the entire hypoxic period. **CONCLUSION:** Our data suggest that HPC effectively suppresses intracellular ROS levels in the diaphragm muscle during hypoxia. Thus, we infer that HPC is a potential drug-free treatment to reduce oxidative stress in respiratory muscle against hypoxia. Supported by OU General Fund G110, and Research Excellence Fund of Biomedical Research, OSU-HRS Fund 013000.

FC 2 2:45-3:00PM

SALIVARY CORTISONE, A POTENTIAL BIOMARKER OF PLASMA CORTISOL: EFFECTS OF INTENSE EXERCISE.

Pedro Del Corral, Regina C. Schurman, Sameen S. Kinza, Matthew J. Fitzgerald, Tasneem F. Naqvi, Liz R. Danley, Jennifer L. Rusch, Kathleen A. Baschen, Emily R. Buxton, Kevin R. Imhof, Jeremy B. Nadolski.
College of Science, Department of Biological Sciences, and Department of Mathematical and Computational Sciences, Benedictine University, Lisle, IL

Background: Intense exercise increases plasma (Pl) and salivary (Sa) cortisol (F). Recently, there has been increased interest in cortisone (E), as a reservoir for F. However, little is known about the effect of exercise on E. **PURPOSE:** The purpose of this study was to examine the effect of a graded exercise test to maximal effort (EX) on Pl & Sa F and E in 12 endurance trained men. **METHODS:** Each subject completed a treadmill EX in the evening. Paired capillary blood (0.5 ml) and Sa samples (1-2 ml) were obtained at rest before exercise (EX1), at 5 (EX2) and at 20 (EX3) minutes post-exercise. A repeated measures ANOVA was used to determine differences in Pl and Sa F and E concentrations (determined by ELISA) over time with a post-hoc Bonferroni analysis. Spearman correlations were used to examine correlations between F and E. **RESULTS:** Significant time effect existed for Pl-F, all the time points (EX1, EX2, and EX3) were pair-wise different ($p<0.01$). Similar pair-wise differences were seen in Sa-F (EX1 to EX3 ($p=0.02$) and EX2 to EX3 ($p<0.001$)). Pl-E increased from EX1 [2.99 ± 0.75 $ug \cdot dl^{-1}$] to EX2 [6.88 ± 2.20 $ug \cdot dl^{-1}$], and EX1 to EX3 [7.65 ± 1.65 $ug \cdot dl^{-1}$] (both $p<0.01$). Sa-E increased from EX1 [0.46 ± 0.09 $ug \cdot dl^{-1}$] to EX3 [1.30 ± 0.13 $ug \cdot dl^{-1}$], and EX2 [0.80 ± 0.16 $ug \cdot dl^{-1}$] to EX3 (both $p<0.01$). There were moderate associations between Pl-F and Pl-E ($r=0.58$, $p < 0.001$), Pl-E and Sa-E ($r=0.68$, $p< 0.001$). Strong associations were found between Pl-F and Sa-F ($r=0.81$, $p< 0.0001$), and Pl-F and Sa-E ($r=0.81$, $p<0.0001$). **CONCLUSIONS:** These results in endurance trained men indicate: a) intense exercise increases Pl-E; b) increases in Pl-E are reflected in Sa-E; c) Sa-E and Sa-F are equally strongly correlated to Pl-F, suggesting that Sa-E may be used as a novel, non-invasive means to quantify adrenocortical stress during intense exercise. Future studies should examine whether these findings are reproducible in females, and at moderate exercise intensities.

Research: Free Communication Presentations – Saturday, November 9, 2013
Session 3

Abstracts

FC 3 8:00-8:15am

COLLEGE STUDENT ACADEMIC SUCCESS: THE EFFECTS OF MEETING ACSM PHYSICAL ACTIVITY RECOMMENDATIONS

Samantha J. Danbert, James M. Pivarnik, FACSM, Lanay M. Kazmirzack
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Participation in regular physical activity (PA) is a critical component in health promotion and disease prevention. PA declines from childhood to adulthood, but it has not been well studied in young adults. Since academic success is important to college students, positive effects of PA participation on course grades may motivate college students to exercise. However, little research has investigated this relationship. **PURPOSE:** To determine the effect of meeting PA recommendations on the grade point average (GPA) of college students. **METHODS:** Data were obtained from the Fall 2010 National College Health Assessment Survey (NCHA) (n=30,093). A subsample was included in analyses based on exclusion criteria (e.g., missing data, reporting a D average). The analytic sample (n=14,560) was 63% white, 67% female, 35% first year undergraduates. Subjects reported days/week spent in at least 30 minutes of moderate PA and days/week spent in at least 20 minutes of vigorous PA. Subjects who reported ≥5 days of moderate activity and/or ≥3 days of vigorous activity were considered to meet PA recommendations (ACSM). Self-reported GPA denoted as A, B, or C, defined academic success. Eleven variables were identified as possible covariates (gender, race, current residence, cigarette use, smokeless tobacco use, alcohol use, marijuana use, diagnosed depression, stress level, year in school, hours/week working for pay). Percentages were calculated for all variables of interest. Adjusted odds ratios (aOR) and 95% confidence intervals (CI) were calculated for all variables of interest using multinomial logistic regression. **RESULTS:** One-third of our sample met PA recommendations. More students reported a 'B' (51.1%) for GPA than an 'A' (36.8%) or 'C' (12.1%). Meeting PA recommendations was associated with significantly higher odds of reporting an 'A' vs. 'C' (aOR=1.28, 95% CI: 1.13,1.45) and 'B' vs. 'C' (aOR=1.20, 95% CI: 1.07, 1.36), after controlling for all 11 covariates considered. **CONCLUSION:** Students who met ACSM PA recommendations reported a higher GPA than those who did not meet recommendations. Future research should include more precise measures of PA (i.e., minutes per week of moderate and vigorous PA) and assess academic success using university registrar reported student GPA, which is less subject to reporting bias.

FC 3 8:15-8:30am

VALIDITY OF OBJECTIVE AND SUBJECTIVE PHYSICAL ACTIVITY MEASUREMENT DURING PREGNANCY

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Pregnancy researchers use various physical activity (PA) measurement techniques. However, few studies have evaluated the validity of these techniques in free-living environments, and there is little agreement regarding which may be the best to use. Consensus on this issue would be valuable to future researchers wishing to compare results across studies. **PURPOSE:** To determine the validity of the SenseWear Armband (SA; kcal/kg/hr), Omron pedometer (PED; steps/day/hr) and Pregnancy Physical Activity Questionnaire (PPAQ; MET·min/week) during pregnancy and postpartum, using two placements of the Actigraph accelerometer (hip (ActH; counts/hr) and ankle (ActA; counts/hr)) as criterion measures. **METHODS**: The ActH, ActA, SA, and PED were worn by participants (n=20) in a free-living environment for two consecutive weeks (average of the two weeks used in analysis) at ~20 and 32 weeks gestation, and 12 weeks postpartum. Participants also completed the PPAQ at each time point. The relationship between PA measured at the ActH and ActA locations was evaluated at all time points via Pearson correlations. Pearson correlations were also used to determine validity (r) of the SA, PED, and PPAQ using both ActH and ActA as criterion measures. **RESULTS**: Moderate correlation was found between the two Actigraph locations at 20 weeks pregnancy ($r=0.53$; $p<0.05$) and 12 weeks PP ($r=0.45$, $p<0.05$) but not 32 weeks pregnancy ($r=0.05$). Table 1 shows validity coefficients (r) for each measurement technique and the Actigraphs. PED was significantly related to both ActH and ActA, except at 32 weeks gestation, where there was no relationship with ActH. In contrast, neither SA nor PPAQ were related to the Actigraphs at any time point. **CONCLUSIONS**: Assuming that the Actigraph is an appropriate criterion measure, the Omron pedometer was the only device tested that showed adequate validity when measuring free living PA during pregnancy and postpartum periods. However, Actigraph location should be considered when measuring PA late in pregnancy.

FC 3 8:30-8:45am

PERCEIVED EXERTION AND ENERGY COST OF PREGNANCY PHYSICAL ACTIVITY

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Decline in maternal physical activity declines across gestation may be related to altered perception of physical activity intensity as pregnancy progresses, which may be modified by physical activity participation history. **PURPOSE:** We determined whether a woman's rating of perceived exertion (RPE) during treadmill exercise changes at a given energy expenditure, and evaluated the influence of prepregnancy physical activity behavior on this relationship. **METHODS:** Fifty-one subjects were classified as either exercisers (N = 26) or sedentary (N = 25) based on exercise history. Participants visited our laboratory three times: at 20 weeks and 32 weeks gestation and at 12 weeks postpartum. At each visit, following a light warm-up, women performed five minutes of treadmill exercise that they deemed to be moderate and vigorous. Heart rate (HR), oxygen consumption (VO_2), and RPE (6-20 Borg scale), were measured at each intensity. **RESULTS:** At moderate intensity, postpartum VO_2 was higher compared to 20 or 32 week VO_2 (17.0 ± 2.7 mL/kg/min vs. 15.7 ± 2.3 and 14.8 ± 2.4, respectively), but there was no difference for HR (119.3 ± 12.4 bpm vs. 122.8 ± 8.1 and 123.0 ± 8.3) or RPE (11.3 ± 1.6 for postpartum vs. 11.2 ± 11.6 and 11.4 ± 1.5). For vigorous intensity, postpartum HR (150.7 ± 10.6 bpm) and VO_2 (24.0 ± 5.3 mL/kg/min) were higher than at 32 weeks (142.4 ± 7.8 bpm and 19.3 ± 3.4 mL/kg/min), but RPE was not different at any time points. RPE/VO_2 was higher at 32 weeks pregnancy compared to other time points, particularly during vigorous exercise. Results were similar when subjects were stratified by prepregnancy physical activity levels. **CONCLUSION:** RPE does not differ by pregnancy or postpartum time point for either moderate or vigorous intensity, likely because subjects self-selected their own running/walking speed. However, relative to energy cost, physical activity was perceived to be more difficult at 32 weeks compared to the other time points, particularly in sedentary women. Our results suggest pregnant women may compensate for physiological changes during gestation by decreasing their walking/running speeds at both moderate and vigorous intensities. Funding for this study was provided by NIH (Grant R03 HD 35080).

FC 3 8:45-9:00am

ASSESSING THE EFFECT OF ACCELEROMETER PLACEMENT AND MODELING METHOD ON ENERGY EXPENDITURE MEASUREMENT

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The hip is the most common placement for accelerometer-based activity monitors, but placement on other parts of the body may be preferable for comfort and improved measurement accuracy. Additionally, use of machine learning modeling based on accelerometer data shows promise for predicting energy expenditure (EE) in controlled environments, but it is unclear if machine learning improves EE measurement in free-living settings. **PURPOSE:** The purposes of this study were to 1) compare the accuracy of accelerometers placed on the wrist, ankle, and thigh (components of a wearable sensor network) for measuring EE and 2) compare machine learning to traditional linear regression for measuring EE. **METHODS:** Participants (n=29) aged 19-28 years completed a 60-minute simulated free-living protocol, performing 14 activities: lying down, sitting reclined, sitting straight, standing, biceps curls, sweeping, squats, walking slow, walking fast, cycling slow, cycling fast, jogging, stair climbing, and jumping jacks. Each activity was performed for 1-10 minutes, with the duration and order of activities chosen by the participants. Participants wore the three accelerometers (wrist, ankle, and thigh) and a portable metabolic analyzer. Accelerometer data were processed using artificial neural networks (ANNs) and linear regression models (LMs). ANNs and LMs were created using a leave-one-out validation (PRESS statistic for LMs). Input variables included features extracted from accelerometer data (mean, standard deviation) and participant characteristics (weight, height), with EE as the output variable. Root mean square error (RMSE) and Pearson correlations (r) were calculated for predicted EE from the accelerometers compared to measured EE from the metabolic analyzer. **RESULTS:** Correlations were r=0.74-0.80 and r=0.63-0.74 for the ANNs and LMs, respectively. RMSE values were 1.61-1.85 METs and 1.80-2.06 METs for the ANNs and LMs, respectively. The thigh accelerometer had the highest correlations and lowest RMSE, and the wrist accelerometer had the lowest correlations and highest RMSE. **CONCLUSION:** ANNs outperformed LMs for measuring EE for all three accelerometers. Although the thigh accelerometer provided that highest validity, all three accelerometers showed good validity ($r \geq 0.60$) for measuring EE. These findings lend support to use of machine learning along with wrist- and thigh-mounted accelerometers for measuring free-living EE.
Supported by NIH grant R21 HL093395.

Research: Free Communication Presentations – Saturday, November 9, 2013
Session 4

Abstracts

FC 4 9:00-9:15am

SHORT-INTERVAL HIGH-INTENSITY TRAINING (HIT) IN CHRONIC STROKE: FEASABILITY, EXERCISE RESPONSES AND COMPARISON TO MODERATE INTENSITY CONTINUOUS EXERCIE (MICE)

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High-Intensity Interval Training (HIT) involves short bursts of intense exercise alternated with recovery periods. Compared to Moderate-Intensity Continuous Exercise (MICE), HIT has shown superiority for improving aerobic capacity in healthy adults and persons with heart disease. Studies have also shown improvements in gait and aerobic capacity for HIT among persons with stroke. Short-interval HIT, using 15-30 second bursts and 15-30 second rest periods, showed superiority to other HIT protocols in cardiac rehabilitation. However, no previous post-stroke HIT study has reported recovery periods shorter than 2 minutes. **PURPOSE:** Assess the feasibility of short-interval HIT for persons with chronic (>6 months post) stroke and evaluate exercise responses relative to MICE. **METHODS:** Six subjects are included in this preliminary analysis. Subjects had a median (range) age of 58 (49-66) years and a comfortable walking speed of 0.74 (0.23-0.96) m/s. Each subject underwent a GXT to determine peak heart rate (HR). On a separate day, subjects performed a treadmill HIT protocol involving a 5 minute warm up (40-50% HRreserve), 20 minutes of HIT (30 second bursts and 30 second rest periods), then a 5 minute cool down. Measured exercise responses included average HR, total steps taken during the 20 minutes of HIT, and average treadmill speed during bursts. The speed that achieved a steady state HR of approximately 45%HRreserve during the warm up was used to estimate average MICE speed. Step cadence at this speed was extrapolated over 20 minutes to estimate the MICE step count. Wilcoxon Signed Rank Tests were used to compare HIT responses to MICE estimates. **RESULTS:** Six of 8 subjects tested were able to complete the short-interval HIT. HIT elicited greater median (range) exercise responses than MICE for treadmill speed (HIT 1.04 [0.82-1.28] m/s, MICE 0.51 [0.31-0.98] m/s, p=0.28), steps (HIT 1227 [1026-2004], MICE 760 [520-1000], p=0.28), and HR (HIT 127 [77-144] bpm, MICE 99 [76-111] bpm). **CONCLUSION:** For persons with chronic stroke, short-interval HIT appears to be a promising alternative to MICE that elicited higher treadmill speeds, step counts and HR in this preliminary sample. Further study is needed to confirm tolerance, safety and efficacy in a larger group.

This research has been supported in part with a Magistro Family Foundation Research Grant from the Foundation for Physical Therapy and an award from the University of Cincinnati Provost's Pilot Research Program.

FC 4 9:15-9:30am

CHANGES IN COLLEGIATE ICE HOCKEY PLAYER ANTHROPOMETRICS AND AEROBIC FITNESS OVER THREE DECADES

Amy C. Ebbing, Matthew R. Green, Christopher P. Connolly, David P. Carrier, James M. Pivarnik, FACSM; Michigan State University, East Lansing, MI

Over the past few decades, fitness training has become integral to collegiate ice hockey, with the goal of improving on-ice performance. However, the change in anthropometric and fitness profiles of collegiate ice hockey players has not been addressed. In addition, it is not known whether these characteristics differ in athletes who later play in the National Hockey League (NHL) compared to those who do not. **PURPOSE:** The purposes of this study were to describe anthropometric (height, weight, BMI, %fat) and aerobic fitness (VO_{2max}) characteristics of collegiate ice hockey players over 32 years, and to evaluate whether these characteristics differ from those athletes who later played professionally in the NHL. **METHODS:** Physiologic and anthropometric profiles were obtained through preseason fitness testing of all players from a NCAA Division I men's ice hockey team from 1980 through 2012. Athletes (N=56) who later played at least one year in the NHL were also compared to athletes who did not. Descriptive statistics (means, standard deviations) were calculated for overall teams, as well as NHL players as a group. Changes over time in variables of interest for each year's team were evaluated via regression analysis using linear and polynomial models. Comparisons between average team characteristics and future NHL athletes were assessed via analysis of variance. **RESULTS:** Regression analysis revealed that a cubic model best predicted changes in mean height (R^2=0.60) and weight (R^2=0.76) over time, while quadratic and cubic models were virtually identical in predicting change in BMI over time (R^2=0.66). There were no significant changes found for either %fat or VO_{2max} over the 32 years of data collection, however, team averages were slightly, yet significantly (P<0.01) greater for %fat (12.5±1.3 % vs 10.7±3.6 %) and significantly less for VO_{2max} (57.9±1.9 $ml \cdot kg^{-1} \cdot min^{-1}$ vs 60.4±4.9 $ml \cdot kg^{-1} \cdot min^{-1}$). There were no differences

in heights (181.7±2.1 cm vs 182.5±4.9 cm), weights (83.9±3.2 kg vs 84.2±6.5 kg), or BMI (25.4±0.6 vs 25.3±1.8), between team and future NHL athletes, respectively. **CONCLUSION:** While average player heights and weights fluctuated, increased emphasis on off ice fitness training did not appear to affect athletes' relative body fatness or aerobic fitness levels.

FC 4 9:30-9:45am

EFFICACY OF SELF-MYOFASCIAL RELEASE INTERVENTION ON RECOVERY BETWEEN ACUTE, MAXIMAL BOUTS OF EXERCISE: A PILOT STUDY

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Myofascial release (MFR) interventions, such as massage or foam roller (FR) use, have been shown to be effective or better vs. standard, active recovery when observing blood lactate (BLa) removal or maintenance of power output (PO). This is important to athletes (e.g., track and field, triathlon) who may compete or train multiple times per day. **PURPOSE:** To determine the efficacy of MFR interventions [FR and the newer Roll Recovery 8 (R8) devises] on the maintenance of a subsequent high-intensity exercise bout. **METHODS:** Participants (n = 9) were randomized to one of three, 20-min recovery groups – FR, R8, and low-intensity spinning on a cycle ergometer (SPIN) – in between two, 7-min cycling time trials (TT_1 and TT_2) to volitional fatigue. Note, to mimic a realistic recovery, FR and R8 groups cycled for 4-min immediate post TT_1 (IPE_1) prior to undergoing 12-min of modality use (standardized by viewing a video) followed by 4-min of gentle cycling just prior to TT_2. To clarify, SPIN served as an active control with no modality use. Participant characteristics (mean ± SD) were: age = 27.1 ± 6.8 yrs, ht = 142.3 ± 60.0 cm, wt = 56.9 ± 22.4 kg, BMI = 20.2 ± 8.1 kg · $m^{2\ -1}$ and VO_{2max} = 43.7 ± 18.0 ml · kg^{-1} · min^{-1}. PO (total KJ's), heart rate (HR, bpm), and rating of perceived exertion (RPE, Borg Scale) were assessed during TT_1 and TT_2. BLa was measured from IPE_1 to the end of recovery. A one-way ANOVA with $p < 0.05$ for significance was utilized. **RESULTS:** No significant percent change differences (from T_1 to T_2) between groups were observed on PO, HR, and RPE. However, R8 and SPIN were significantly different vs. FR (from IPE_1 to the end of recovery) on BLa (-0.62 ± 12.84, -9.32 ± 6.02, and 13.82 ± 13.71 %, respectively). **CONCLUSION:** R8 showed probable efficaciousness in conjunction with specific, dynamic exercise to remove BLa during recovery and could help enhance athlete performance during interval training or multiple one-day competitions. However, this pilot project was limited by a low participant pool and additional research is warranted.

FC 4 9:45-10:00am

QUANTITY AND QUALITY OF FOOD CONSUMED AT NCAA DIVISION I FOOTBALL GAMES AND SPECTATOR SATISFACTION WITH CONCESSION SERVICES

Ashley N. Triplett, Christopher P. Connolly, Sarah S. Parks, Mathew J. Reeves, & James M. Pivarnik FACSM; Michigan State University, East Lansing, MI

Few investigations have directly examined food consumption behaviors and preferences of sporting event spectators. College football games attract thousands of spectators where many concession items are served. **PURPOSE:** The purpose of this study was to investigate the quantity and quality of food consumed by NCAA Division I football game spectators, as well as spectator satisfaction levels with this food. **METHODS:** Data on concession sales from 2012 Michigan State University (MSU) home football games were obtained from the MSU Culinary Services Office. Overall and individual food consumption was estimated from concession food sales records and game attendance. Weather conditions were considered in the analyses. Additionally, surveys were administered to MSU students and season ticket holders to help determine spectator satisfaction with stadium concession options. **RESULTS:** A total of 527,671 spectators attended the 6 home games of the 2012 season. There were 582,421 total concession sales and items were divided into four categories: entrees, beverages, sweets, and snacks. Top selling items were bottled water, 32-ounce pop, hot dogs, hot coffee/cocoa, and large pretzels. Results indicated that each spectator consumed an average of 1.1 items per game, translating to 249 kilocalories/game (30.4% from fat). Food consumption increased when the games occurred during normal mealtimes, and decreased with inclement weather. Survey results indicated spectators desired more food and beverage options, consistently expressed the need for healthier options and requested more community/state-specific foods. Although alcoholic beverages are not sold at MSU football games, spectators requested beer to be available for purchase. Furthermore, spectators indicated dissatisfaction with what they considered to be high prices of concession food and beverage options. **CONCLUSION:** Considering spectators are typically at the football game for approximately four hours, average energy intake was likely less than that expended. Therefore, while some food options were high in kilocalories and fat, consumption did not appear to be excessive. Spectators were dissatisfied with the variety, price, and quality of food available for purchase. Future studies should seek to estimate food and beverage consumptions patterns that occur outside the stadium and immediately prior to the game.

Research: Free Communication Presentations – Saturday, November 9, 2013
Session 5

Abstracts

FC 5 10:00-10:15am

RACIAL DIFFERENCES IN PRESSURE WAVE SEPARATION RESPONSES FOLLOWING AN 8 WEEK ENDURANCE TRAINING PROGRAM

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African Americans (AA) have an increased prevalence of hypertension and greater levels of cardiovascular disease morbidity and mortality when compared with Caucasians (CA). Untrained AA also do not experience exercise induced hypotension, but it is unknown if exercise training can alter this response. **PURPOSE:** To compare the training induced differences in the BP response following a peak bout of aerobic exercise (VO_2peak), after 8 weeks of endurance training between AA and CA. **METHODS:** Young generally healthy sedentary (~25yr) AA (n=21, BMI=29.1 kg/m^2) and CA (n=24, BMI=24.7 kg/m^2) subjects participated in 40-60 min, 3 times per week for 8 weeks, of aerobic exercise training at 65% of their aerobic capacity. Individuals had brachial (bSBP, bPP), and aortic (aSBP, aPP) measurements obtained in the supine position at rest, 15 min following a peak bout of aerobic exercise. Applanation tonometry was used to obtain aSBP pressure waveforms. Wave separation analyses were used to produce forward and reflected wave pressures height (FPH, RPH). Repeated measure Analysis of variance (ANOVA) was performed to investigate ethnic differences in post training status. **RESULTS:** Resting blood pressure was not changed with training for either group (AA: bSBP 118 vs. 116, aSBP 103 vs. 101 and CA: bSBP 119 vs. 119, aSBP 100 vs. 101). (See table) Exercise training reduced the change from rest to 15 min after acute maximal exercise for bPP, aPP and FPH (*$p<0.05$), in both groups. However, there was an interaction for RPH (**$p<0.05$) and the reduced change was significant from baseline only in the AA (‡$p<0.05$) **CONCLUSION:** Exercise training appears to attenuate the changes in blood pressure following acute maximal exercise. This suggests that exercise training reduces post exercise hypotension.

FC 5 10:15-10:30am

SEX DIFFERENCES IN HEMODYNAMIC RESPONSES FOLLOWING 8 WEEKS OFAEROBIC EXERCISE TRAINING

Sang Ouk Wee[1], Alexander Rosenberg[1], Sushant Ranadive[2], Abbi Lane[1], Rebecca M. Kappus[1], Bo Fernhall[1]
FACSM, [1]University of Illinois, Chicago, Illinois, [2]University of Illinois, Urbana-Champaign, Illinois

Aerobic exercise can be effective as a non-pharmaceutical intervention for hypertension. However, it is unknown whether potential sex differences of aerobic exercise training exist in pulse wave characteristics, including forward or reflected pressure waves. **PURPOSE:** The purpose of this study was to investigate whether sex difference exists in the response to aerobic training in blood pressure and pulse wave including wave separation analysis in young healthy individuals. **METHODS:** 81 adults (37 males, 44 females under 35 yrs) participated in the study. Participants performed 40 – 60 minutes, 3 times/week, 8 weeks of aerobic exercise training at 65% of their aerobic capacity. Central pulse wave analysis was measured using tonometry and separated into forward and reflected wave at pre-training, post-4 week control period, and post 8 week aerobic training. Repeated measure Analysis of Variance (ANOVA) was performed to investigate sex differences in post training status. **RESULTS:** (See table) Females, but not males exhibited a significant decrease in resting brachial SBP ($p<.05$) as well as aortic systolic blood pressure after 8 weeks of aerobic exercise training ($p<.05$). In addition, aortic pulse pressure at post training time point was decreased following the 4 week control period ($p<.05$). No other changes were noted. **CONCLUSIONS:** The results suggest that the benefits of aerobic exercise training on hemodynamics may be more substantial for females than males. Both central and peripheral blood pressure were reduced, but without changes in forward or reflected pressure.

FC 5 10:30-10:45am

EFFECTS OF CAFFEINE ON CARDIAC AUTONOMIC FUNCTION DURING EXERCISE RECOVERY

Kanokwan Bunsawat, Alexander Rosenberg, Sang-Ouk Wee, Rebecca Kappus, Kari Hultgren, Bo Fernhall, FACSM, Tracy Baynard, FACSM.
University of Illinois, Chicago, Illinois

Impaired cardiac autonomic recovery following exercise is associated with an increased risk of sudden death. Caffeine effects on autonomic function are equivocal, with some data showing caffeine-induced increases in parasympathetic modulation at rest. Whether caffeine alters cardiac autonomic recovery remains unclear. **PURPOSE:** To compare the effects of caffeine on cardiac autonomic function during exercise recovery using heart rate variability (HRV) analyses in healthy individuals. **METHODS:** In a double-blinded, randomized, crossover study, 18 individuals (26 ± 1 yrs; 23.9 ± 0.8 kg/m^2) took either caffeine pills (400 mg, CAF) or placebo and performed an incremental treadmill test. A modified CM5 lead was used with data collected at 1000 Hz. HRV was assessed at baseline, 5, 15, and 30-min post-exercise in both the frequency (low frequency (LF), high frequency (HF), LF/HF ratio, and total power (TP)) and time domains (Root mean square of successive differences (RMSSD)). Frequency data were log-transformed (Ln) to create normally distributed data. **RESULTS:** No baseline differences were observed for any variable. Peak heart rate was greater in the CAF trial (192 ± 2 vs. 190 ± 2 bpm, $p<0.05$). During recovery, heart rate decreased more so in the placebo trial (#$p<0.05$). As for HRV, time effects were observed for LnTP, LnLF, LnHF, and RMSSD in both trials, with no effect of caffeine (*$p<0.05$). However, there was an interaction for LnLF/LnHF (†$p<0.05$). LnLF/LnHF increased from baseline at all time points in both trials (*$p<0.05$), with a lower increase during 5- and 15-min post-exercise in the CAF trial (#$p<0.05$). The changes in LnLF/LnHF from baseline were greater in placebo during 5- (1.2 ± 0.4 vs. 0.3 ± 0.2 ms^2) and 15- (0.7 ± 0.2 vs. 0.5 ± 0.1 ms^2), but not 30-min (0.3 ± 0.1 vs. 0.4 ± 0.1 ms^2) post-exercise (#$p<0.05$). **CONCLUSIONS:** Caffeine elevated heart rate, but did not increase sympathetic dominance during exercise recovery. The higher heart rate during recovery may result from other mechanisms than direct neural effects on the heart.

FC 5 10:45-11:00am

THE ACUTE EFFECTS OF NON-STIMULANT OVER-THE-COUNTER DIETARY HERBAL SUPPLEMENTS ON RESTING METABOLICE RATE

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The use of over-the-counter supplements to aid in weight loss has dramatically increased for all populations. Although a greater effort has emerged to identify the impacts of many weight loss aids, empirical evidence is limited on the effectiveness of trending herbal supplements. **PURPOSE:** Determine the acute effect of non-stimulant herbal supplements on resting metabolic rate (RMR). **METHODS:** 16 apparently healthy, college-aged individuals (10 men, 6 women; mean age 24 ± 4.4 yr; mean weight 79.3 ± 17.8 kg) volunteered for this study. Participants ingested a placebo or herbal supplement approximately 2 hours before each trial. There were a total of two herbal supplements used in trials 2 and 3 for all subjects (trial 1 was always placebo). Primary ingredients for supplement 1 and 2 were "raspberry ketones" and a "metabolic activator blend" respectively; both claiming to increase caloric expenditure. Lean mass and weight (InBody520^{TM}, Biospace, Cerritos, CA) were assessed before each trial. Participants rested on a table for 15 minutes, before a 30-minute gas analysis via a metabolic cart (Parvo Medics True One 2400, Sandy, UT) and canopy. RMR, fat utilization (%), carbohydrate utilization (%), volume of oxygen consumption (VO_2) and volume of carbon dioxide consumption (VCO_2) were recorded. **RESULTS:** One-way analyses of variance (ANOVA) were conducted to assess mean differences between the different metabolic variables of a placebo and two different supplement groups. Between the placebo and supplement 1 groups, there existed no significant mean differences in actual RMR ($p = .731$), estimated RMR ($p = .994$), percent of carbohydrates used ($p = .111$), percent of fat used ($p = .112$), and substrate utilization ($p = .121$). Similarly, between the placebo and supplement 2 groups, there existed no significant mean differences in actual RMR ($p = .495$), estimated RMR ($p = .965$), percent of carbohydrates used ($p = .835$), percent of fat used ($p = .822$), and substrate utilization ($p = .841$). **CONCLUSION**: Our results suggest that neither supplement marketed for weight loss increased metabolic rate, nor fat utilization as claimed. Further research is needed to develop a better understanding of chronic supplementation and their effectiveness.

Research: Poster Presentations – Friday, November 8, 2013
Session 1

Abstracts

P1-#1 8:00-9:45am

SATIETY DURING A STANDARD MEAL CHALLENGE AFTER CALORIC RESTRICTION AND A PREVIOUS BOUT OF EXERCISE

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Reducing caloric intake is an important aspect of weight loss and disease risk reduction. However, restricting calories may result in lower satiety, a feeling of fullness, and ultimately make diet adherence more difficult. **PURPOSE:** To assess differences in satiety to a standard mixed meal the morning after caloric control including treadmill exercise. **METHODS:** Ten apparently healthy men (22.8±2.7years of age) participated in three experimental trials in random order. Each trial consisted of a caloric control session–a 24hour period in which the participants consumed a controlled diet that induced a moderate or mild caloric restriction or caloric balance (25 and 35 or 45kcals/kg FFM, respectively) and a single treadmill run at approximately 60% of their pre-determined VO_2max to expend 10kcals/kg/FFM (684.6±43.3kcals). Approximately 15 hours after their treadmill run and 12 hours fasted, participants returned to the lab and rated their satiety on a standardized scale (Cardello et al., 2004; +50 -to- +1 "full" and -1 -to- -50 "hungry") before (baseline) and for three hours following a standardized mixed macronutrient test meal. Data are reported as mean±stdev; repeated measures ANOVAs were used with LSD *posthoc* tests where appropriate (alpha <0.05). **RESULTS:** Caloric balance resulted in significantly greater satiation at baseline (-7.0±15.7 vs -20.0±8.2, -21.9±6.2 for 45 vs 25, 35, respectively) and 3hrs after the meal (5.4±10.0 vs -0.5±10.83, -4.3±11.7). Moreover, among the other differences, in all trials baseline satiety was lower (participants more hungry) than 30 minutes after the meal (20.5±11.1 (45), 19.9±13.4 (25), 11.7±10.1 (35). Beyond 30 minutes after the meal, satiety continued to decline in all trials, however, only in the 25 trial did satiety continue to significantly decline from 2 to 3hrs after the meal–indicating participants continued to become hungrier. **CONCLUSIONS:** In this group of healthy men, 24 hours of mild and moderate caloric restriction, which included a bout of treadmill exercise, resulted in less satiety (greater hunger) the following morning, and the moderate caloric restriction further resulted in different satiety responses following a morning meal. These data should be considered when developing plans for restricting calories in individuals attempting to alter body composition/lose weight.

This research was supported in part by grants from Ohio University's Provost's Undergraduate Research Funds, the College of Health Sciences and Professions Student Research Grant and MWACSM's Outstanding Student Research Project Award.

P1-#2 8:00-9:45am

HEMODYNAMIC AND VASCULAR RESPONSES TO HANDGRIP EXERCISE IN PARKINSON'S DISEASE

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Parkinson's disease is a degenerative disorder of the central nervous system characterized by symptoms of motor dysfunction including tremors, impaired gait and rigidity as well as autonomic dysfunction which impairs the regulation of the cardiovascular system. Along with the impaired central cardiovascular regulation, oxidative stress associated with this disease may also result in peripheral vascular dysfunction and subsequent reduced skeletal muscle blood flow during exercise. Whether peripheral vascular dysfunction is present in Parkinson's disease has yet to be established. **PURPOSE:** To determine if patients with Parkinson's disease have compromised hemodynamics and/or reduced vasodilation during exercise compared to healthy controls. **METHODS**: Seven Parkinson's participants and four healthy control participants underwent a progressive isometric handgrip protocol. Specifically, participants were asked to squeeze an isometric handgrip dynamometer once per second for 3 minutes across 4 different intensity levels (30, 60, 90 and 120 N). During the last minute of each stage blood pressure, brachial artery (BA) diameter and BA blood velocity were measured via Doppler-ultrasound. BA diameter and BA flood flow were also to determine BA dilation and shear rate. **RESULTS:** Independent samples t-test indicated there was no difference in the slope of the blood flow-exercise intensity ($p=.349$) between Parkinson's disease and controls. In addition the slopes describing the relationship between the relative changes in vessel diameter ($p=.404$) were also not different between groups. **CONCLUSION:** These data indicate that patients with Parkinson's disease did not exhibit a decreased hyperemic response nor reduced vessel dilation during a progressive handgrip exercise protocol compared to healthy controls. Thus, it appears that peripheral vascular and hemodynamic responses to isolated limb exercise are not compromised in the Parkinson's population.

P1-#3 8:00-9:45am

NEUROMUSCULAR FATIGUE IN INDIVIDUALS WITH AND WITHOUT TYPE 2 DIABETES

Jonathon Senefeld[1], Alison R. Harmer[2], Hugo Pereira[1], Tejin Yoon[1], Bonnie Schlinder-DeLap[1], Rita Deering[1], Anna Buzzard[1], April Harkins[1], Mike Danduran[1] & Sandra K. Hunter[1], FACSM
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The global epidemic of diabetes is growing, and currently 25.8 million Americans have type 2 diabetes (T2D) and 8 million Americans have pre-diabetes. Although fatigue is commonly reported by those with T2D, very few studies have investigated the mechanisms of muscular fatigue among individuals with T2D, and no studies have investigated fatigue in pre-diabetes. **PURPOSE:** To determine mechanisms of muscular fatigue among individuals with T2D or pre-diabetes compared with healthy controls. **METHODS:** Participants were separated into three groups based upon physician diagnosis and glycated hemoglobin (HbA1c) values: healthy controls (n=7, 2 females; HbA1c 5.4±0.2%), pre-diabetes (n=5, 2 females; HbA1c

5.9±0.3%); and T2D (n=8, 5 females; HbA1c 7.2±1%). To induce fatigue, participants performed a 6-minute single-limb dynamic protocol with the knee extensors while seated at 90° of hip and knee flexion. During the 6 minutes, 120 maximal velocity dynamic contractions (MVDCs) were performed with a load equivalent to 20% maximal voluntary isometric (MVIC) torque through a 90° range of motion. MVICs were performed before, during and immediately after the fatigue protocol. Single-pulse electrical stimulation (200 μs) over the quadriceps evoked single twitches at rest to assess contractile properties of the muscles. Repeated-measures ANOVA over time with group as a between-subject factor compared dependent variables. **RESULTS:** The reduction in MVDC velocity was greater for individuals with T2D (47±14%) and pre-diabetes (48±18%) compared with healthy controls (26±21%, $P<0.05$). Greater declines in MVIC torque were evident among the T2D group compared to controls (49±15% vs. 23±13%, respectively, $P<0.05$). The reduction in resting twitch amplitude was greater among those with T2D (60±9%) and pre-diabetes (49±22%) compared with healthy controls (18±24%). The reduction in resting twitch amplitude was associated with the decline in MVDC power ($r=0.74$; $P<0.001$) and also baseline HbA1c values ($r=0.59$; $P=0.008$). **CONCLUSION:** Individuals with T2D or pre-diabetes exhibited greater reductions in MVDC power compared with healthy controls. The greater fatigue was at least partly attributable to muscular mechanisms and was associated with status of metabolic control. Interventions that condition skeletal muscle and improve metabolic control, e.g. exercise, may reduce fatigability of the lower limb muscle among individuals with T2D or pre-diabetes. Supported by a grant to SKH: NIA 1R15AG039697

P1-#4 8:00-9:45am

POSTPRANDIAL GLYCEMIC AND INSULINEMIC RESPONSES FOLLOWING A 24-HOUR ENERGY DEFICIT

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Blood glucose concentrations rise after eating carbohydrate (postprandial glycemia; PPG) and is coupled with a resultant rise in blood insulin (postprandial insulinemia; PPI). Energy deficit accomplished through diet and exercise may alter substrate utilization, insulin sensitivity, and thus glycemic control. The extent of energy deficit may elicit a graded response. **PURPOSE**: to assess the acute PPG and PPI responses to energy balance, mild energy deficit, and moderate energy deficit trials (45, 35, and 25 kcal/kg FFM, respectively) induced by diet and treadmill exercise. **METHODS**: Five apparently healthy men (23.8±3.5 years; VO_2max 58.3±7.0 mL/kg·min^{-1}; 15.9±3.7% BF) were recruited to complete each trial, which consisted of a caloric control day and a metabolic testing session. On the caloric control day, energy expenditure was assessed via accelerometry, composition controlled mixed meals were provided, and a single treadmill run at 65% VO_2max (10 kcal/kg FFM) was completed. On the subsequent morning, PPI and PPG responses to a mixed meal challenge (20 kcal/kg FFM) were assessed. All data was reported as mean±stdev. Repeated measures ANOVAs were used to analyze variables among trials and across time with significance accepted at $p \leq 0.05$. Area under the curves were calculated for PPG and PPI and analyzed with an ANOVA. Where applicable, LSD post hoc analyses were used. **RESULTS**: No statistical interaction occurred for glucose and insulin, therefore the data was collapsed across trials. Glucose was significantly lower at baseline (87.3±1.4; 94.2±15.7; 91.8±3.8 mg/dL, 25, 35, and 45 kcal/kg FFM, respectively) as compared to ½ hour only (124.9±33.4; 125.8±42.6; 117.4±22.4 mg/dL). Insulin was significantly lower at baseline (8.9±8.6; 5.1±2.3; 4.1±1.7 pmol/L) as compared to ½, 1, 2 and 3 hours. Three hour (28.3±9.5; 21.2±15.6; 26.3±12.9 pmol/L) was also significantly lower than 1 and 2 hours. Furthermore, no significant differences existed among trials within glucose or insulin AUCs. **CONCLUSION**: In this sample of apparently healthy men, two levels of energy deficit induced by caloric restriction and exercise did not attenuate PPG or PPI beyond that of energy balance. Further data collection may be needed to determine if these responses are similar among other populations. This research was supported in part by the Ohio University Provost's Undergraduate Award, the College of Health Science and Professions Student Research Grant, and the Midwest American College of Sports Medicine's Student Research Grant.

P1-#5 8:00-9:45am

EFFECTS OF A SHORT HIT PROTOCOL ON INDICES OF AEROBIC TRAINING

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High Intensity Training (HIT) has generated interest in the potential of "anaerobic" type training to produce adaptations characteristic of aerobic training. A variety of protocols have been used. All purport to save time and induce training effects, yet many require upwards of 60 min per session and 3 hours/wk to accommodate the number of high intensity and recovery intervals. **PURPOSE:** To assess the adaptations in VO_2 peak, heart rate (HR), recovery VO_2, and blood lactic acid in response to short training bouts (21 min/session) performed 3 days per week. **METHODS:** Ten males, 22 yr. of age participated. VO_2peak was measured with a Corival electronic bike ergometer. The response of heart rate (HR), VO_2 and blood lactic acid (LA) were assessed during the first HIT session and after 1 and 3 weeks of training. Training consisted of 3

one min intervals of approximately 125% of VO_2 peak separated by 4 min recovery intervals of 40% of VO_2 peak. Total training time was 21 min (includes a one min warm up and cool down at 50 W). Data obtained pre and post training were analyzed with Student's t-tests for paired observations. **RESULTS:** VO_2 peak increased 8% after 3 weeks (9 sessions; 45.2 vs 48.7 ml/kg/min $p<.05$, paired t-tests). Reductions in the HR (relative bradycardia) and blood LA responses were observed during the training session beginning at week 1 ($p<.05$). VO_2 during the recovery intervals averaged 0.45 L/min more than predicted for the 100 W recovery workload. **CONCLUSIONS:** Significant changes in aerobic capacity and submaximal responses can be generated with short weekly time investments and the highly elevated recovery VO_2 may contribute to the aerobic adaptations observed.

P1-#6 8:00-9:45am

THE EFFECT OF BLOW FLOW RESTRICTION DURING SUB-MAXIMAL EXERCISE ON MOTOR UNIT RECRUITMENT AND MICROVASCULAR OXYGENATION

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Blood flow restriction (BFR) exercise at low exercise intensities (20-30% MVC) has been shown to resemble high intensity exercise (>65% MVC) due to the similar gains in muscle strength and hypertrophy following BFR training. BFR training has been shown to significantly increase maximal oxygen uptake (VO_{2MAX}) following endurance training but there still remains little information on the effects of BFR exercise on the microcirculation. **PURPOSE:** The purpose of the present study was to examine the neuromuscular recruitment, metabolic, and microcirculatory responses of healthy adults performing moderate intense cycling exercise in combination with BFR. **METHODS:** Healthy male subjects (n=9, age = 23.2 ± 3.2 years, weight = 91.5 ± 18.1 kg) performed cycling exercise at a resistance equivalent to 10% above the ventilatory threshold (VT) for 20 min during three separate sessions. BFR conditions (control, CON; low, LO; moderate, MO) were randomized between and within each participant and were applied during the 20 min cycling bout. Electromyography (EMG) and near-infrared spectroscopy (NIRS) techniques were utilized to observe the neuromuscular recruitment and microcirculation of the thigh. Pulmonary gas exchange data was collected and analyzed via a commercially available metabolic cart. Repeated measures two-way ANOVA were used to find significance ($p<0.05$). **RESULTS:** MO-BFR caused a significant decrease in neuromuscular recruitment during exercise (MO = 164.83%BL, LO = 240.31%BL, CON = 225.69%BL) and recovery (MO = 100.01%BL, LO = 125.25%BL, CON = 141.20%BL) compared to LO-BFR and CON-BFR ($p<0.05$). During MO-BFR, VCO_2 and V_E increased significantly at the end of exercise (VCO_2 = 8.23%, V_E = 10.62%) and during the beginning of recovery (VCO_2 = 13.33%, V_E = 14.99%) compared to LO-BFR and CON-BFR ($p<0.05$). Total hemoglobin content (THC) significantly increased 50.33%BL during the exercise bout with MO-BFR compared to CON-BFR ($p<0.05$). The deoxygenated status of the microcirculation (deoxy [Hb + Mb]) increased 44.50%BL during the beginning of exercise with MO-BFR compared to CON-BFR ($p<0.05$). During recovery deoxy [Hb + Mb] remained elevated 282.05%BL following MO-BFR compared to LO-BFR and CON-BFR ($p<0.05$). **CONCLUSION:** Acute MO-BFR exercise decreases the neuromuscular recruitment during exercise and recovery. MO-BFR seems to have an effect on the blood volume within the microcirculation during exercise, possibly causing "cell swelling" to occur. BFR conditions may also dictate the magnitude of reperfusion during the recovery phase following exercise.

P1-#7 8:00-9:45am

VALIDATION OF THE INBODY 520™ DEVICE AS A METHOD TO ESTIMATE RESTING METABOLIC RATE

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Currently, the use of the metabolic cart is the criterion method for determining resting metabolic rate (RMR). However, this method is not always practical within a research or clinical setting due to the complex and time-intensive nature of the analysis. As a result, a number of alternative devices have been developed to estimate RMR based on factors such as: sex, age, and lean body mass which afford a much shorter analysis time, but often at the expense of accuracy. **PURPOSE:** To assess the validity of the InBody 520™ device to estimate RMR in apparently healthy adults relative to a metabolic cart. **METHODS:** 48 apparently healthy adults (30 men, 18 women; mean age 24 ± 4.4 yr; mean weight 79.3 ± 17.8 kg) volunteered to participate in the study. Participants refrained from exercising for 24 hours and consuming food for 12 hours prior to testing. During testing, the estimated RMR was calculated from the InBody 520™ (Biospace, Cerritos, CA). Participants laid supine at complete physical rest, undisturbed for 15 minutes. Participants were then placed under a canopy attached to a metabolic cart (Parvo Medics True One 2400, Sandy, UT), which was used to perform a 30-minute gas analysis. The first 5 minutes of the gas analysis were omitted and the remaining 25 minutes were used to compute RMR. **RESULTS:** A Pearson product-moment correlation was used to determine the relationship between estimated and actual RMR ($r = .844$, $p < .001$). Independent sample t-tests were conducted to compare means between the estimated and actual RMR values ($p =$

.562). **CONCLUSION:** The InBody520™ provides valid measurements of RMR in apparently healthy adults. This method may be a practical alternative to determine RMR in research or clinical settings due to the validity and simplistic nature of the analysis.

P1-#8 8:00-9:45am

THE RELATIONSHIP BETWEEN THE PHYSICAL ACTIVITY QUESTIONNAIRE (PAQ) AND METABOLIC SYNDROME IN CHILDREN

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For children over 9 years, metabolic syndrome (METS) can be diagnosed with abdominal obesity and two or more other cardiovascular disease risk factors (CVDRFs), including high triglycerides, fasting blood glucose, and blood pressure, and/or low high-density lipoprotein cholesterol (HDL-C). Low physical activity may be related to METS in children, which is related to poorer health outcomes later in life. **PURPOSE:** To determine if physical activity in children is related to METS and individual CVDRFs. **METHODS:** CVDRFs were assessed in 336 5th graders (53% female; mean age = 10±.57 years), while participating in the Cardiovascular Health Intervention Program at Central Michigan University. Abdominal obesity (measured by waist circumference in cm), HDL-C (mg/dL), triglycerides (mg/dL), fasting blood glucose (mg/dL), and resting blood pressure (mmHg) were measured. Physical activity was measured using the Physical Activity Questionnaire in Children (PAQ-C). This survey consists of 12 questions that assesses physical activity over the last seven days and produces a score of one (very low) to five (very high). Using CVDRF measures, children were categorized as having METS or not with independent *t*-tests evaluating whether mean PAQ-C score was different between groups. Pearson correlations were used to evaluate relations among PAQ-C scores and each CVDRF. **RESULTS:** Of the 336 participants, 277 (82%) had complete data for these analyses. Of these, 60.6% had at least one CVDRF and 24 (8.7%) had METS. Average values for waist circumference (72.70±12.66 cm), HDL-C (51.44±14.16 mg/dL), triglycerides (73.86±47.28 mg/dL), fasting blood glucose (90.46±10.39 mg/dL), resting blood pressure (104/66±11/8 mmHg), and PAQ-C (2.98±.68) were within normal limits. Pearson correlations showed inverse associations between PAQ-C scores and waist circumference (r=-0.12, p=0.04), systolic blood pressure (r=-0.13, p=0.03), and diastolic blood pressure (r=-0.14, p=0.02). Mean PAQ-C values were not different between children with (2.84) and without METS (3.00). **CONCLUSION:** Weak but significant relations were found between levels of physical activity and the individual CVDRFs of obesity and blood pressure. However, no relationship was found between physical activity and METS itself. Future work utilizing more precise measures of physical activity is needed to better understand the relationship of physical activity and risk of METS in children.

P1-#9 8:00-9:45am

RECOVERY FROM COLD WATER IMMERSION IMPAIRS COGNITIVE FUNCTION IN HEALTHY MEN

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PURPOSE: The physiological effects of immersion hypothermia and afterdrop are well-characterized but the psychological effects are less clear. The purpose of this study was to quantify changes in cognitive function during and after lower body water immersion. **METHODS:** Nine young healthy men participated and were randomly assigned to both neutral (35 ± 1 °C) and cold (13 ± 1 °C) water immersion on separate mornings. Subjects rested in neutral air for 30 min followed by 60 min water immersion to the iliac crest and 15 min of recovery in neutral air. Rectal temperature and mean skin temperature were continuously monitored. Metabolic rate, the Stroop Color Word Test (SCWT), and the Profile of Mood State (POMS) were quantified at predetermined time intervals. **RESULTS:** During immersion in cold water, rectal temperature was reduced but SCWT and POMS scores were unchanged relative to baseline. During recovery from cold immersion, rectal temperature was further reduced by ~0.5 °C, shivering was noted, and metabolic rate increased two-fold. Coincident with this acute afterdrop, SCWT Color-Word performance (-4 ± 8 versus 7 ± 6 correct responses) and Interferences score (-2 ± 7 versus 4 ± 8) was impaired relative to recovery from neutral immersion (i.e. when core temperature and metabolic rate did not change). **CONCLUSIONS:** Recovery from lower body cold water immersion elicits the afterdrop phenomenon and impairs selective attention as measured by the SCWT. Finding countermeasures to this predicament would likely improve medical care of people who are accidentally or occupationally exposed to the cold.

P1-#10 8:00-9:45am

INDUCED ANTERIOR CRUCIATE LIGAMENT CREEP INFLUENCES GROUND REACTION FORCES AND MUSCLE ACTIVATION IN WALKING

Navya Soma & Michael W. Olson
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Prolonged loading of the anterior cruciate ligament (ACL) modifies agonist muscle activity during static knee flexion-extension efforts. The resulting neuromuscular responses of the thigh musculature during dynamic activities after ACL loading are yet to be determined. **PURPOSE:** To observe electromyography (EMG) activity of thigh muscles and ground reaction forces (GRF) during gait initiation before and after static loading of the ACL. **METHODS:** Three healthy males (23.0 ± 1 yrs, 1.83 ± 0.05 m, 79.2 ± 2.3 kg) participated. Participants were seated while the left knee was flexed to 90° and secured to prevent movement. Maximal voluntary isometric contractions were performed in knee flexion and extension. A padded cuff was then fitted around the proximal lower leg, and a cable was fixed around the pad. The cable ran through a pulley system and loaded the leg for 10 min with a 200 N load. Gait was initiated with the left leg 8 times immediately before and after static loading. EMG of rectus femoris (RF), vastus lateralis (VL), vatus medialis (VM), biceps femoris (BF), and semimembranosis (SM) were collected. GRFs were normalized to body weight and analyzed during the first step. Paired T-tests were used to identify changes between pre- and post-loading steps during the first 50% of the stance phase. Alpha was set at < 0.05. **RESULTS:** Peak Fy was modified for all participants ($p < 0.05$). Peak Fz decreased during post-loading for one participant (0.989 ± 0.01 vs. 0.971 ± 0.02, $p < 0.03$). No other peak forces differed within participants. Average GRFs differed depending upon the participant (Table 1). Peak EMG was increased in RF, but reduced in VL, VM, and SM in one participant. No other peak EMG measures were significant. Average EMG activity changed, but not uniformly between participants (Table 1). **CONCLUSION:** Inconclusive results regarding the neuromuscular response and GRF changes postulated to occur after prolonged static loading of the ACL are presented. Modifications in the EMG data are detected from all muscles, which present potential evidence of neuromuscular modifications of the thigh muscles to potentially compensate for increased compliance of the ACL.
Table 1. Means (± sd) of average normalized EMG and ground reaction forces.

P1-#11 8:00-9:45am

RECOVERY OF FORCE OUTPUT AND ELECTROMYOGRAPHY FROM TRUNK MUSCLES AFTER CYCLIC PASSIVE LOADING

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Continuous loading of the low back tissues results in modified neuromuscular and kinetic output during trunk extension efforts. It is believed that the viscoelastic behavior of these low back tissues is modified, but the ramifications of these loading schemes needs further study for longer durations. **PURPOSE**: To observe force output and muscle activation pattern changes during trunk extension efforts before and up to 60 minutes after passive cyclic loading of the lumbar spine during trunk flexion-extension exercise. **METHODS**: Three healthy female volunteers (20.3 ± 2.1 yrs, 1.63 ± 0.04 m, 50.2 ± 9.3 kg) participated for collection of these pilot data. An isokinetic dynamometer was used in performing a 10 min set of cyclic trunk flexion-extension at a preset velocity of 10°/s through each subject's range of trunk flexion from seated upright position. Participants performed maximum voluntary isometric contraction (MVIC) trunk extension efforts before, immediately after, and at 15 minute intervals for 60 min after cessation of the passive loading scheme. Maximum and average torque output, as well as surface electromyography (EMG) from thoracic (TP) and lumbar paraspinal (LP) muscles (bilaterally), were recorded. Paired T-tests were used to identify changes at each time period of testing compared to baseline values. Alpha was set at < 0.05. **RESULTS**: Maximum and average torques did not change over time (all $p > 0.5$) (Table 1). Rate of force development did not change over time ($p > 0.6$) (Table 1). The left TP was observed to increase average EMG at min 60 of recovery (0.566 ± 0.06 to 1.02 ± 0.14, $p < 0.02$), whereas peak EMG of right TP increased at min 60 of recovery (1.0 ± 0 to 1.05 ± 0.03, $p < 0.05$). No other significant changes were observed in the paraspinal muscles. **CONCLUSIONS**: These pilot data provide inconclusive results as to the force output and EMG modifications when the passive viscoelastic tissues are cyclically loaded in flexion-extension. There are indications of modifications in the EMG detected from TP, providing further potential evidence of neuromuscular modification to potentially compensate for increased compliance of the viscoelastic tissues.

P1-#12 8:00-9:45am

PRE/POST COMPARISON OF COLLEGE ATHLETES TAKING A MULTI-DIMENSIONAL WELLNESS COURSE

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A multi-dimensional wellness (MDW) curriculum is a holistic method of engaging and providing students with an opportunity to gauge their level of overall wellness, aside simply discussing the physical aspect of wellness. Student-athletes often have a pre-disposition toward the physical dimension but awareness and understanding of other wellness dimensions could prove to be meaningful to their overall well-being. **PURPOSE:** To evaluate collegiate student-athletes perceived behavior change over time in nine dimensions of wellness within a MDW course. **METHODS:** Pre/post data were collected, over a 15-week semester, via the MDW Inventory completed by student-athletes enrolled in an undergraduate wellness course (N=53). The inventory, designed to measure one's perceived behavior with respect to personal wellness orientation, consisted of five questions per dimension to formulate nine single wellness constructs: physical exercise (PE), physical nutrition (PN), mental (M), social (S), spiritual (SP), intellectual (I), environmental (E), occupational (O) and financial (F) wellness. Each question was measured on a 1-4 scale (1 = Does not describe me at all to 4 = Absolutely describes me) with summed construct scores ranging between five and 20. Paired samples t-tests were used to analyze the data. An alpha level of < 0.05 was set for statistical significance. **RESULTS:** Student-athletes exhibited statistically significant increases in perceived behavior change over one semester in physical exercise, physical nutrition, environmental and financial wellness.

P1-#13 8:00-9:45am

THE RELATIONSHIP BETWEEN SELF-ESTEEM AND HOLISTIC WELLNESS IN COLLEGE ATHLETES

Chelsi Kitchen, Brianna Scott, Lisa Hicks, Kai Shin Chu, Patricia Miller, Melissa Oran, Lee Everett,
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Collegiate athletes face additional challenges and scheduling demands while striving to continue to perform successfully in and out of the classroom. When compared to their fellow students, studies have shown that most athletes have higher levels of self-esteem than non-athletes. However, one can speculate what the interaction between understanding one's own personal wellness orientation and self-esteem levels would be for the student-athlete population. **PURPOSE:** The purpose of this study is to investigate the relationship between self-esteem and holistic wellness in collegiate athletes. **METHODS:** NCAA Division II student-athletes (N = 63) enrolled in a required wellness course completed both the Multi-Dimensional Wellness Inventory and Rosenberg Self-Esteem Scale. The Multi-Dimensional Wellness Inventory was used to measure one's perceived behavior with respect to personal wellness orientation via nine dimensions of wellness (physical exercise, physical nutrition, mental, social, spiritual, intellectual, environmental, occupational and financial). The Rosenberg Self-Esteem Scale was used to measure levels of global self-esteem. Both surveys were paper-based and self-reported. A bivariate, Pearson correlational analysis was conducted among self-esteem scores and all nine wellness constructs. **RESULTS:** Mental, social, intellectual, environmental and occupational wellness for college athletes were significantly correlated with self-esteem at the $p<.01$ level while no correlation was demonstrated between self-esteem and physical exercise, physical nutrition, spiritual and financial wellness. Results showed a range of significant correlations between these wellness dimensions and self-esteem: intellectual ($r=.366$), social ($r=.395$), occupational ($r=.412$), environmental ($r=.418$) and mental ($r=.489$). **CONCLUSIONS:** While correlations cannot determine an exact reason for cause, there was a relationship reported between these athletes' self-esteem levels and mental, social, intellectual, environmental and occupational wellness levels. Further, these relationships were positive; thus, an increase in self-esteem indicates an increase in mental, social, intellectual, environmental and occupational wellness, and vice versa. Since athletes are regularly coached and motivated to maintain physical intensity and motivational drive, physical exercise and physical nutrition wellness dimensions could conceivably be considered independent from self-esteem. Although all wellness dimensions are important in an emerging adult's development, spiritual and financial showed no correlation with self-esteem and perhaps may not be of primary behavioral focus in their daily habits.

P1-#14 8:00-9:45am

COMPARISON OF COLLEGE ATHLETES AND NON-ATHLETES ENROLLED IN A MULTI-DIMENSIONAL WELLNESS COURSE

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A wellness curriculum should provide a platform for students to discover, learn and demonstrate a positive application of personal wellness behaviors. However, more often than not, student-athletes question what added benefits a wellness course would provide them since they perceive themselves as currently healthy. **PURPOSE:** To compare athletes versus non-

athletes enrolled in a multi-dimensional wellness (MDW) course by evaluating their personal growth and behavior change in nine wellness dimensions. **METHODS:** Students (N = 337 non-athletes; N = 65 athletes) enrolled in a 15-week undergraduate MDW course voluntarily completed the Multi-Dimensional Wellness Inventory which seeks to measure one's perceived behavior with respect to personal wellness orientation within nine dimensions. The 45-question inventory, paper-based and self-reported in nature, consisted of nine single wellness constructs: physical- exercise, physical- nutrition, mental, social, spiritual, intellectual, environmental, occupational and financial wellness. An independent samples t-test was used to analyze the data. An alpha level of 0.05 was set for statistical significance. **RESULTS:** As expected, athletes were significantly higher with physical wellness exercise ($p < .001$) compared to non-athletes. No significant differences were demonstrated between the two groups within physical nutrition, mental, social, spiritual, intellectual, environmental, occupational and financial wellness dimensions ($p > .05$). **CONCLUSIONS:** It was expected that athletes would demonstrate a higher level of physical wellness exercise compared to non-athletes given the daily demands of their given intercollegiate sport activities. However, it became evident that the potential to discover, learn and 2 apply the other wellness dimensions is just as crucial for the personal development of all students alike regardless of their athlete status. Future studies on overall perceived wellness behaviors and stereotypes within the college population are in progress and further needed in the literature.

P1-#15 8:00-9:45am

VASCULAR FUNCTION IN PARKINSON'S DISEASE PATIENTS

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BACKGROUND: It is believed that oxidative stress (an imbalance between free radicals and antioxidant defense) contributes to the cascade leading to dopamine cell degeneration in Parkinson's disease. Additionally, oxidative stress results in decreased nitric oxide bioavailability, inflammation and ultimately vascular dysfunction. Thus it is possible that the exercise intolerance associated with Parkinson's disease partially results from oxidative stress induced vascular dysfunction and subsequent poor blood flow to the exercising muscles. **PURPOSE:** The purpose of this research was to use the standard flow mediated dilation (FMD) protocol to determine if endothelial dysfunction is present in individuals diagnosed with Parkinson's disease. **METHODS:** Ten individuals diagnosed with Parkinson's disease (66.8 ± 6.06 years) and sixteen healthy controls (68.8 ± 7.63 years) were recruited for this investigation. A Doppler ultrasound system was used to measure participant's brachial artery diameter and blood velocity at baseline and for the first 2 minutes immediately following 5 minutes of forearm blood flow occlusion. %FMD was calculated as: %FMD = (peak diameter - baseline diameter) / baseline diameter. %FMD relative to shear was also determined. Independent samples t-tests were used to determine differences in %FMD and %FMD / Shear between groups. **RESULTS:** Independent samples t-test revealed no significant difference ($p = 0.55$) in %FMD between the Parkinson's group (7.66 ± 3.29%) and control group (8.61 ± 4.27%). When %FMD was expressed relative to shear, there was still no significant difference ($p = 0.81$) observed between the control group (.0002 ± .00012) and Parkinson's group (.0002 ± .00008). **CONCLUSIONS:** Parkinson's disease subjects did not appear to exhibit a reduced %FMD compared to healthy controls, there was also no difference when expressed relative the stimulus for dilation, shear. Thus, these data indicate that endothelial dysfunction may not be present in PD patients beyond what is expected with normal aging.

Research: Poster Presentations – Friday, November 8, 2013
Session 2

Abstracts

P2-#1 10:00-11:45am

THE EFFECTS OF VELOCITY ON ENERGY EXPENDITURE IN BAREFOOT AND SHOD CONDITIONS

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The last 5 years has seen a growth in the popularity of barefoot or minimalist running. However, the acute physiological effect of barefoot running on habitually shod runners has yet to be fully elucidated. **PURPOSE:** To investigate the cardiorespiratory and metabolic cost of barefoot running across a range of velocities in a group of habitually shod runners. **METHODS:** Healthy, male recreational runners (n=10; age 24 ± 3 yr, height 1.79 ± 0.07 m, body mass 75.1 ± 9.5 kg, BMI 23.3 ± 2.3 $kg.m^{-2}$) with no experience of barefoot running volunteered for this study. Subjects ran in a randomized trial order at 3 fixed velocities (V_1=3.13, V_2=3.80 and V_3=4.47 $m.s^{-1}$, respectively) on a motorized treadmill in two conditions (barefoot or shod). Each trial lasted a minimum of 3 minutes to attain steady state metabolic data, with 5 minutes recovery between each trial. Heart rate (HR) and gas exchange data were collected throughout all trials. Energy expenditure (EE) and cost of locomotion (COL) were subsequently calculated post exercise. Statistical analysis was performed using 2 factor repeated

measure ANOVA with $P<0.05$ inferring significance. **RESULTS:** As expected, velocity had a significant effect on both EE ($P<0.001$) and HR ($P<0.001$), irrespective of condition. COL during barefoot running was lower than shod at all velocities (V_1; 0.191 ± 0.015 vs. 0.195 ± 0.022 $mL.kg^{-1}.m^{-1}$, V_2; 0.188 ± 0.016 vs. 0.191 ± 0.018 $mL.kg^{-1}.m^{-1}$, V_3; 0.187 ± 0.014 vs. 0.191 0.011 $mL.kg^{-1}.m^{-1}$) however no statistically significant differences between groups were observed. When data were averaged across all velocities, the metabolic cost of barefoot running was 2% lower than shod running. **CONCLUSION:** While barefoot running appears more economical than shod running, the high degree of inter-subject variability resulted in no statistically significant differences. This variability is likely due to biomechanical differences in the running gait between subjects. A 2% reduction in COL is consistent with reported lower running economy associated with reduced mass at the foot (Franz et al. 2012). However, the current findings are in disagreement with recent data comparing shod and minimalist running (Perl, et al., 2012).

P2-#2 10:00-11:45am

PERCEPTIONS OF BODY WEIGHT AND NUTRITIONAL PRACTICES AMONG MALE AND FEMALE NCAA DIVISION II ATHLETES

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Although collegiate athletes have a high-energy requirement due to their increased energy expenditure, previous research suggests that disordered eating and body weight disturbances may be more prevalent in athletes than in the general population. However, little is known about how these issues differ between genders. **PURPOSE:** To examine perceptions about body weight and nutritional practices among male and female NCAA Division II athletes. **METHODS:** The sample consisted of 37 male and 59 female Division II athletes at Saginaw Valley State University. All data were obtained via an online questionnaire and were self-reported by individual athletes. Pearson Chi-Square analyses were used to identify significant differences between genders related to body weight perceptions and nutritional practices. Ideal weight difference (IWD) was calculated by subtracting current weight (lbs.) from ideal weight (lbs.) and an independent samples t-test was used to investigate gender differences. An alpha level of 0.05 was used to determine statistical significance. **RESULTS:** Mean±SD female IWD was -6.1 ±8.5 lbs. and mean male IWD was 2.1 ±13.0 lbs. ($p=0.03$). Males reported significantly more nutritional supplement usage ($p<0.001$). Both male and female athletes perceived disordered eating to be a problem only among athletes of their own gender ($p<0.001$-0.01) Females were more likely to report controlled intake of fat and calories while training ($p=0.03$), and the desire to lose weight to please others ($p=0.03$). Significantly more females were dissatisfied with their weight, and believed their performance would improve with weight loss ($p<0.001$). Gender differences regarding concern about percent body fat, avoidance of meat to stay thin, and limiting carbohydrates were non-significant ($p=0.08$-0.70). **CONCLUSION:** Our results indicate that significant gender differences may exist with regard to perceptions about body weight and nutritional practices among collegiate athletes. These findings emphasize the importance of addressing the perceptions of male and female Division II collegiate athletes through the deliverance of gender-specific educational information about proper nutritional practices. Likewise, it is vital to educate and offer supplemental tools for coaches and professionals working alongside athletes. To properly tailor interventions to specific sports, research with larger sample sizes is needed.

P2-#3 10:00-11:45am

THE ACUTE EFFECTS OF NO STRETCHING VERSUS STATIC AND DYNAMIC STRETCHING ON WINGATE PERFORMANCE

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Research has demonstrated that pre-exercise static stretching hinders performance and may compromise a muscles ability to produce maximal force. A common test to measure an individual's maximal power is a Wingate Anaerobic cycle test. Previous studies have examined the effects of stretching on maximal strength and vertical jump force production. **PURPOSE:** To examine the acute effects of static stretching, dynamic stretching, and no warm up on mean power (MP), peak power (PP), and rate of fatigue (RF) during a Wingate anaerobic power test. **METHODS**: Ten individuals ages 18 and older volunteered as participants in the study. Each participant performed three trials which were completed in random order at approximately the same time of the day, within 14 days. The three trials included a no warm up, a dynamic warm-up, or static stretching followed by being fitted on an electronically braked cycle ergometer for 5 minutes of cycling at 50 watts. The dynamic warm-up consisted of three sets of butt kicks, power kicks, leg swings, and high knee jogs. Static stretching warm-up consisted of 3 sets of hamstring stretch, quadriceps stretch, and calf stretch, each stretch was held to mild discomfort for 30 seconds. All warm-up trials lasted 10 minutes. The participants warmed up on the cycle for five minutes. The Wingate protocol consisted of a five-minute cycle warm-up at a self-selected cadence and intensity. To begin the test, the participants were instructed to increase their pedal cadence up to their maximum RPM at which point a resistance was

applied to the flywheel of the ergometer for 30 seconds. After the test was completed, the resistance was immediately reduced to 50 watts and the participants cooled down by slowly pedaling for 5 minutes. Mean power (MP), peak power (PP), and rate of fatigue (RF) during the test were tabulated. **RESULTS:** Paired T-tests showed no significant differences (p.0.05) in MP, PP, and RF between the three stretching protocols. **CONCLUSION:** In the current study, stretching did not have any effect on power measures during the test. Future research may focus on duration of stretching routine or types of stretches used to warm up.

P2-#4 10:00-11:45am

EXAMINING PRIMARY SOURCES OF NUTRITIONAL INFORMATION AMONG MALE AND FEMALE DIVISION II ATHLETES

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Athletes obtain information about nutrition from a number of sources, with some being more accurate than others. However, little is known about how sources of nutritional information vary by gender and among varying levels of competitive collegiate experience. **PURPOSE:** To examine the influence of years of collegiate experience and gender on primary sources of nutritional information among male and female NCAA Division II athletes. **METHODS:** The sample consisted of 56 male and 92 female NCAA Division II athletes at Saginaw Valley State University. All data were obtained via an online questionnaire and were self-reported by individual athletes. Participants reported their gender, years of collegiate experience, and were asked to numerically rank the following sources according to where they most frequently received nutrition advice: coach, magazines, athletic trainer, strength & conditioning coach, college course, internet, teammates, and parents. Independent Samples Mann-Whitney analyses were used to identify differences in rank order of athletes' primary nutritional sources with respect to gender and years of collegiate experiences. An alpha level of 0.05 was used to determine significance. **RESULTS:** The three highest ranked primary sources (in order) for male athletes were internet, parents, and athletic trainer, while females most commonly reported receiving advice from Parents, Internet, and Athletic Trainers. Females (Mdn = 3.0) were significantly more likely to utilize magazines as a primary source of nutritional information than their male counterparts (Mdn = 5.0) , U= 1201.5, p = 0.028. Additionally, older athletes (two or more years of collegiate completion) (Mdn= 2.0) were significantly more likely to utilize their Strength & Conditioning Coach as a primary source of nutritional information compared to their younger counterparts (Mdn = 5.0), U= 103.5, $p < 0.001$. **CONCLUSION:** Our results indicate that the sources student-athletes utilize for nutritional advice may not be the most appropriate for receiving accurate information. Furthermore, there may be a need for professionals to provide educational materials to athletes in a formal setting about proper nutritional practice to enhance performance. Also, these results merit better education of sound scientific nutrition principles for coaches, athletic trainers, and strength and conditioning coaches.

P2-#5 10:00-11:45am

RELATIONSHIPS AMONG SELF-REPORTED PHYSICAL ACTIVITY, MAXIMAL OXYGEN CONSUMPTION, AND LEAN BODY MASS IN OLDER ADULTS.

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Higher levels of physical activity (PA) and physical fitness are associated with decreased risk of chronic disease and loss of independence in older adults. The Community Healthy Activities Model Program for Seniors (CHAMPS) physical activity questionnaire is commonly used to assess PA in older adults. There are no data regarding the relationship between CHAMPS-measured PA and cardiorespiratory fitness in this population. **PURPOSE**: To investigate the relationship between self-reported physical activity in kcal·week^{-1} and subject's cardiorespiratory fitness level measured as VO_2max (ml·kg^{-1}·min^{-1}). **METHODS:** A total of 20 older adults, males (n=5) and females (n=15) between the ages of 61-79 (mean ± SE = 66±1yrs.) volunteered to participate in this study. Using a modified version of the Community Healthy Activities Model Program for Seniors (CHAMPS) questionnaire, participants self-reported weekly frequency and duration of various physical activities. Total energy expenditure from physical activity (mean ± SE = 4077±823 kcal·wk^{-1}) and energy expenditure from moderate-to-vigorous physical activity (mean ± SE = 2626±686 kcal·wk^{-1}) were determined based on answers to the questionnaire. Cardiorespiratory fitness was reported as VO_2max (ml·kg^{-1}·min^{-1}) using the YMCA Cycle Ergometer protocol. Lean mass was measured using air plethysmography. **RESULTS**: The mean values for VO_2max, body mass index and lean body mass were 30±1 ml·kg^{-1}·min^{-1}, 26±1 kg·m^{-2}, and 45±2kg respectively. There were significant positive correlations between self-reported total energy expenditure from physical activity and VO_2max (r = 0.525, P=0.0209) and between energy expenditure from moderate-to-vigorous physical activity and VO_2max (r = 0.552, P=0.0142). There was also a significant positive correlation between lean mass and VO_2max (r = 0.647, P = 0.00277). **CONCLUSION**: The data from the present study show that self-reported physical activity from the CHAMPS PA questionnaire is positively correlated with

cardiorespiratory fitness in older adults. The data also show that lean body mass is positively correlated with cardiorespiratory fitness in older adults. Further research is needed to determine the assessment quality and validity of the CHAMPS questionnaire and whether correlations exist for other physical function tests.
Funding: Miami University's Undergraduate Summer Scholars Award

P2-#6 10:00-11:45am

RESISTANCE EXERCISE DOES NOT ALTER CARDIOVASCULAR FUNCTION IN WOMEN WITH FIBROMYALGIA: A PILOT STUDY.

Andrea Brewer[1], Emily Buxton[1], Maria Martinson[1], Gustavo S. Heidner[1], Sara Hochgesang[1], Ifeanyi Osude[1], Timothy Demchak[1], Donna Purviance[2] & J. Derek Kingsley[3].
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Many of the symptoms of fibromyalgia (FM) may be explained by increases in sympathetic activity at rest due to autonomic dysfunction. An increase in sympathetic activity may increase systolic blood pressure (SBP) through increases in arterial stiffness and wave reflection. Resistance exercise training (RET) has been purported as an effective means to treat the symptoms of FM, may ameliorate autonomic dysfunction and improve wave reflection. **PURPOSE:** To investigate the effects of 8-weeks of RET on autonomic modulation and wave reflection in women with FM. **METHODS:** Fourteen women with FM were randomly assigned to a RET group (RET: n=7) or a non-exercising control group (CON: n=9). The intervention consisted of 8-weeks of whole-body RET utilizing 3 sets of 8-12 repetitions on 5 different resistance exercises. Maximal strength (1RM), brachial BP, aortic BP, wave reflection (radial tonometry), and heart rate variability were assessed at baseline and after RET. **RESULTS**: All participants met the diagnostic criteria for FM as defined by the American College of Rheumatology. The groups were similar ($p>0.05$) for age (RET: 48±17yrs; CON: 55±10yrs), height (RET: 1.64±0.04m; CON: 1.66±0.06m), weight (RET: 87.2±16kg; CON: 84.5±19kg) and BMI (RET: 31.7±6.1kg/m2; CON:33.2±7.2kg/m2). Women with FM in the RET group had significant increases in both the chest press and leg extension after RET ($p<0.05$). There were no significant interactions for brachial BP or aortic BP ($p>0.05$). There was a significant group by time interaction ($p<0.05$) for the augmentation index normalized to 75 bpm (AIx@75), such that there was an 8% increase (CON: 25.7±6.5 to 28.0±5.1) for the control group, and a 13.6% decrease (RET: 27.6±8.3 to 23.9±6.3) for the RET group at rest after RET compared to baseline. There were no other significant interactions ($p>0.05$) for measures of wave reflection. There were no significant interactions for measures of autonomic modulation. **CONCLUSIONS:** These data suggest that despite reductions in AIx, there may be no change in brachial BP, aortic BP, wave reflection and autonomic modulation after RET in women with FM. Future studies need to further assess the use of RET as a means to treat autonomic and vascular dysfunction in women with FM.
This project was supported by funding from the University Research Committee, Indiana State University.

P2-#7 10:00-11:45am

THE EFFECTS OF ACUTE WATER CONSUMPTION ON BODY COMPOSITION MEASURED BY AIR DISPLACEMENT PLETHYSMOGRAPHY

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There is relatively little research which assesses the accuracy of air displacement plethysmograpy (ADP) if manufacturer protocols are not followed. **PURPOSE:** To determine the effect of acute water consumption on ADP measures. **METHODS:** Eighteen healthy males (18-30 yrs) volunteered for the study. Baseline measurements included height, weight, and ADP trials following manufacturer protocol (PRE). A total of three 500 mL (1500 mL total) bottles were consumed, with ADP tests completed after each bottle (W1, W2, W3). Time between trials was less than 10 min. Percent body fat (% BF), fat mass (FM), and fat-free mass (FFM) were recorded from each trial. **RESULTS:** Paired T-tests revealed significant differences ($p<0.05$) in % BF (PRE vs W2, PRE vs W3, W1 vs W2, and W1 vs W3), FM (PRE vs W1, PRE vs W2, PRE vs W3, W1 vs W2, and W1 vs W3) and FFM (W1 vs W2). Mean ($\pm$ SD) for the variables: %BF = PRE=16.5$\pm$6.3%, W1=16.9$\pm$6.2%, W2=17.7$\pm$5.9%, W3=17.9$\pm$5.8%; FM; PRE=14.1$\pm$6.7 kg, W1=14.5$\pm$6.7 kg, W2=15.3$\pm$6.5 kg, W3=15.5$\pm$6.4 kg); FFM PRE=68.8$\pm$5.6 kg%, W1=68.9$\pm$5.8 kg, W2=68.6$\pm$5.8 kg, W3=68.9$\pm$5.9 kg. **CONCLUSION:** The acute consumption of water translated into an increase in FM and % BF, while not affecting FFM. Significant differences appear with as little as 1000 mL of water consumption. This can be used to skew results, especially in sports where BF% is used to determine participation eligibility (ie., wrestling). Researchers must ensure strict adherence to the recommended pre-trial protocol to minimize inaccurate results.

P2-#8 10:00-11:45am

RELIABILITY OF ACCELEROMETER DEVICE TO MEASURE VERTICAL JUMP HEIGHT

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An accelerometer developed by Lafayette Instruments (Vertimetric) has been purported to measure vertical jump height. Is the device reliable? **PURPOSE:** The purpose of this study was to determine the reliability statistics of the vertical height reached using the Vertimetric device compared to a Vertec, a Force Platform (AMTI), and Just Jump Mat. Unfortunately, there is no agreement on a "gold standard" for vertical jump height. **METHODS:** University of Indianapolis athletes off season were recruited for this study (n=12, 2 female, mean age 20.9 SD 1 years, mean ht 178.3 SD 9.4 cm, mean wt 81.9 SD 9.6 kg). Subjects completed 5 successful jumps on 2 separate days; all data were pooled (10 jumps per subject). Jumps were measured using simultaneous Vertimetric, Vertec, Just Jump Mat, and AMTI Force Platform. Significance was set at < 0.05 level. Intraclass correlation coefficient (ICC), standard error of mean (SEM), and coefficient of variation (CV) were calculated as indicators of reliability. **RESULTS:** Statistical analysis (ANOVA) revealed that means of Just Jump (52.4 SD 8.8) and Vertec (51.9 SD 11.4) were not significantly different; Vertimetric mean (46.4 SD 7.7) was significantly lower than Just Jump or Vertec, but significantly higher than Force Platform (39.7 SD 8.5). Intervisit relative and absolute reliability between visit 1 and 2 (ICC, SEM (cm), CV% - Vertimetric 0.91, 3.1, 7.2, Force Platform 0.90, 2.4, 4.9, Vertec 0.85,3.1, 5.9, Just Jump Mat 0.89, 3.4, 6.8), and intravisit relative and absolute reliability across 5 jumps for visit 1 (ICC, SEM (cm), CV% - Vertimetric 0.93, 2.2, 6.3 Force Platform 0.95, 2.7, 5.1, Vertec 0.88, 3.9, 6.2, Just Jump Mat 0.92, 2.0, 5.9) indicate generally good reliability. Pearson correlation coefficients between Vertimetric and Force Platform ($R = 0.83$) and Vertimetric and Vertec ($R = 0.82$) were statistically significant ($p < 0.05$) and indicated good agreement. **CONCLUSIONS:** The Vertimetric device appears to be a reliable measure of vertical jump height. ******This study was funded in part with monies from Lafayette Instruments.*

P2-#9 10:00-11:45am

THE EFFECTS OF DIFFERENT FOCAL OBJECT DISTANCES ON LOWER BODY POWER AND VERTICAL JUMP PERFORMANCE

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Previous studies have reported improvements in long jump performance and vertical jump performance using internal and external focus of attention. **PURPOSE:** The purpose of this study was to examine the acute effects of an external focus of attention when the focal object was both within (EXI) and out (EXO) of reach on lower body power. **METHODS:** Twelve (males = 6, female = 6), college aged students [(mean ± SD) age, 20.5 ± 1.4 years; height, 167.7 ± 10.2 cm; weight, 75.4 ± 15.0 kg] volunteered for this study. All subjects exercised less than 90 minutes per week (last 3 months). Each subject performed three counterbalanced conditions [control (CON), external focus within reach (EXI), or external focus outside of reach (EXO)] following a 5 min light jog. Subjects performed five countermovement jumps in which they were instructed to focus hitting their fingertips on the rungs of a Vertec jumping device. The EXI condition allowed the participants to actually touch the rungs on the Vertec, while the EXO condition was set at twelve feet which was out of reach for all participants. There was no adjustment for relative height differences. Vertical jump and power output were measured using a VertiMetric accelerometer device which was placed on the ankle of each subject's dominant leg. One way repeated measures ANOVA was used to analyze the dependent variables. An alpha level of $P \leq 0.05$ was set for statistical significance. **RESULTS:** There was no significant difference between conditions for vertical jump (cm) [(mean ± SD) 42.8 ± 11.2 (CON), 43.1 ± 11.3 (EXO), 43.0 ± 11.8 (EXI); $p = .892$] or power output (watts) [(mean ± SD) 3960.1 ± 1160.2 (CON), 3980.1 ± 1213.7 (EXO), 3970.1 ± 1171.7 (EXI); $p = .905$]. **CONCLUSION:** While there were no significant differences found in the present study, both vertical jump and lower body power showed very small improvements when the focal object was out of reach. Future studies should examine whether exercise habits or prior jumping experience factor into focusing strategies' effects on performance.

P2-#10 10:00-11:45am

THE EFFECTS OF EXTERNAL FOCUS OF ATTENTION ON LOWER BODY POWER IN NCAA DIVISION II ATHLETES

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Previous studies have reported changes in athletes' jumping performance due to different focusing strategies performed prior to jumping or athletic activities. **PURPOSE:** The purpose of this study was to examine the acute effects of different external focus of attention distances on lower body power and vertical jump (VJ) performance in NCAA Division II athletes. **METHODS:** Twelve (males = 7, female = 5), NCAA Division II athletes [(mean ± SD) age, 21.0 ± 1.1 years; height, 179.8

± 11.6 cm; weight, 85.8 ± 23.7 kg] volunteered for this study. Each subject performed five countermovement jumps following three randomly ordered conditions [control (CON), external focus within reach (EXI), or external focus outside of reach (EXO)]. Participants were instructed to focus on the rungs of a Vertec device for both the EXI and EXO conditions. The EXI condition allowed for the rungs that subjects focused on to be within their reach during a VJ while the EXO condition was set at twelve feet(out of reach for all subjects). Vertical jump and power output were measured using a VertiMetric accelerometer device which was placed on the ankle of each subject's dominant leg. One way, within subjects repeated measures ANOVA was used to analyze the dependent variables. An alpha level of $P \leq 0.05$ was set for statistical significance. **RESULTS:** There was no significant difference between conditions for vertical jump (cm) [49.8 ± 9.4 (CON), 51.5 ± 9.7 (EXO), 51.3 ± 9.8 (EXI); p = .142] or power output (watts) [4688.0 ± 1318.7 (CON), 4774.3 ± 1324.2 (EXO), 4768.1 ± 1327.8 (EXI); p = .121]. **CONCLUSION:** No significant differences were found in the present study; however both dependent variables showed small increases in performance when a focal object was placed outside an athlete's reach. Future studies should expand upon the literature in order to find the best focusing strategy to enhance performance during power and jumping activities for athletes.

P2-#11 10:00-11:45am

THE EFFECTS OF ACUTE FOOD CONSUMPTION ON BODY COMPOSITION MEASURED BY AIR DISPLACEMENT PLETHYSMOGRAPHY

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According to the manufactures protocol, one must adhere to a fasting state of two hours prior to testing. To date, little research has examined the effect of food intake on body composition measurements by use of Air Displacement Plethysmography (ADP). **PURPOSE:** To examine whether the results body density (BD), fat free mass (FFM), fat mass (FM), or percent body fat (%BF) would be affected when participants were fed multiple intervaled meals. **METHODS:** Thirty nine participants underwent ADP trials. All participants were instructed to adhere to the following prior to testing: 1) Fast 2 hours 2) Avoid strenuous exercise for 24 hours 3) Wear tight fitting clothing (i.e. lycra or spandex material) and no jewelry. All measurements were performed in accordance to manufacturer's guidelines. Following the first baseline trial, participants consumed 1 cup of breakfast cereal with 350 mL of 1% milk within 10 minutes of the first trial. A second ADP trial was performed on the 15th minute. The same procedure was performed for a total of two breakfast meal consumptions and 3 ADP trials. A repeated measures ANOVA was used to determine if significant differences existed in BD, FFM, FM, and % BF following consumption of two meals. Post Hoc Bonferroni analysis was performed on all significant differences. Significance was set at $p < 0.05$ for all comparisons. **RESULTS:** The current study showed no significant differences before or after two food consumptions on BD, FFM, FM and % BF using ADP. **CONCLUSION:** This study found that ingesting a small amount of breakfast cereal with milk just before testing did not appear to have substantial adverse effects on body composition measures. This study used food products that were considered low density foods; whether higher dense foods affect the ADP results is unknown, therefore future research is warranted.

P2-#12 10:00-11:45am

HEART RATE VARIABILTY AND COMPLEXITY AFTER ACUTE BOUTS OF RESISTANCE EXERCISE IN TRAINED VERSUS UNTRAINED INDIVIDUALS.

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An acute bout of whole-body resistance exercise may decrease vagal modulation. However, no studies have examined the effect of different acute bouts of resistance exercise on autonomic modulation in resistance-trained individuals. **PURPOSE:** To investigate the effects of different acute resistance exercise modalities in untrained (UT: n=14) versus resistance-trained (RT: n=15) participants on autonomic modulation. **METHODS:** Twenty-nine participants volunteered for the study. Electrocardiogram readings were collected at rest and 25 minutes after a randomly selected control period (CON), whole- (WB), lower- (LB), or upper-body (UB) resistance exercise bout. Each acute resistance exercise bout consisted of 3 sets of 10 repetitions with 90 seconds of rest between sets. Autonomic modulation was assessed via time domain measures of heart rate variability (HRV) using the standard deviation of normal to normal beats (SDNN) and the squared root of the standard deviation of the RR interval (RMSSD), which reflect overall variability and vagal modulation, respectively. Heart rate complexity (HRC) was measured via sample entropy (SampEn) and was used as a measure of vagal modulation. A repeated measures ANOVA was used to examine groups (RT versus UT) across the different conditions (CON, WB, UB, LB) by time (rest versus recovery). **RESULTS:** Participants were similar for age (22 ± 2yrs), height (1.72 ±0.10m) and weight (73.0 ± 16.7kg). Resistance-trained participants had significantly greater 10 repetition maximums for all exercises ($p<0.05$). There was a significant ($p<0.05$) condition x time interaction for both SDNN and RMSDD such that they were decreased after each of the acute resistance bouts, but not the control. There was a significant group x time interaction ($p<0.05$) for SampEn such

that it was not affected in the UT group, but was significantly decreased after whole- (-17.5%) and upper-body exercise (-13.5%) in the RT group. The changes in SampEn after lower-body resistance exercise were not significant (-15.7%; p=0.06) **CONCLUSIONS:** These data suggest that whole- and upper-body resistance exercise may result in significant reductions in vagal modulation in a resistance-trained individual compared to an untrained one, as noted by decreases in HRC. This occurs despite similar reductions in vagal modulation between the groups as measured by RMSDD.

P2-#13 10:00-11:45am

COMPARISON OF DIFFERENT MEASUREMENT DEVICES TO CALCUATE POWER OUTPUT IN DIVISION II ATHLETES

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Lower body power is an important indicator in certain types of athletic performance. Vertical jump is one technique used to measure and calculate lower body power. **PURPOSE:** The purpose of this study was to compare the power output attained by three different measurement devices while performing a hands-on-hips countermovement jump. **METHODS:** Twelve NCAA Division II athletes were recruited for this study [(mean ± SD) age, 20.9 ± 1.1 years; height, 178.3 ± 9.4 cm; weight, 81.9 ± 9.6 kg]. Subjects completed 5 successful countermovement jumps (VJ) on 2 separate days. Power output was measured on both days using three separate devices simultaneously (AMTI force platform, VertiMetric accelerometer, and Just Jump Mat). Subjects placed their hands on their hips for each countermovement jump. Both the force platform and VertiMetric devices reported peak power output from each countermovement jump. Power output for the Just Jump Mat was calculated using a regression (Sayers) equation that included the subject's mass (kg) and countermovement jump height (cm). Once both days were completed all of the data was pooled (10 jumps per subject). Repeated measures ANOVA and Pearson product-moment correlations were calculated, and an alpha level of $p < 0.05$ was set for statistical significance. **RESULTS:** Mean power was statistically different for all three devices (Force plate mean = 4057 SD 1098; Vertimetric mean = 4386 SD 1075; Just Jump Mat mean = 4574 SD 1063) but was likely due to measured differences in jump height. However, statistically significant ($p < 0.05$) Pearson correlations showed excellent power output agreement between the Vertimetric and the force platform ($R^2 = 0.93$), between the Vertimetric and the Just Jump Mat ($R^2 = 0.97$) and between the Force Plate and the Just Jump Mat ($R^2 = 0.95$). **CONCLUSIONS:** Using the Vertimetric device to measure lower body power, or calculating power with a regression equation and the vertical jump results of the Just Jump Mat, may elicit similar values to a purported "gold standard" for measurement of lower body power, the force platform. **This study was funded in part with monies from Lafayette Instruments.*

P2-#14 10:00-11:45am

EXAMINING THE RELATIONSHIP BETWEEN ON-ICE PERFORMANCE AND PHYSIOLOGICAL CONDITIONING LEVELS OF UNIVERSITY CLUB HOCKEY PLAYERS

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Ice hockey is a sport that is fast-paced and both highly anaerobic and aerobic. The extant literature examining the relationship between a player's on-the-ice performance and their levels of physical conditioning, however, is quite limited. **PURPOSE:** To determine the relationship between a university club ice hockey player's blood lactate, aerobic fitness, anaerobic power, and body mass index (BMI) to their total minutes played (Tmin) and total points scored (TP) during a season. **METHODS:** Seven male university club hockey athletes (mean height 181.4 ± 5.1 cm; mean weight 81.9 ±14.5 kg) participated. Subjects completed a lactate threshold (LT), maximal oxygen uptake (VO_{2max}) test on a cycle ergometer, and three consecutive 30-second Wingate Anaerobic Tests (WAnT) for peak power (W), where 5% of the athlete's body weight (kgs) was used as resistance. Average peak blood lactate levels were analyzed using the YSI 2300 (Yellow Springs, OH) with two probes, each in duplicate sample. **RESULTS:** A Pearson product-moment correlation was used to determine the relationship between levels of physical conditioning and on-the-ice performance. LT ($p = .55$), percent of VO_{2max} Watts ($p = .70$), VO_{2max} in L/min ($p = .43$), VO_{2max} in mL/kg/min ($p = .77$), peak average power ($p = .53$), peak power ($p = .49$), time to peak ($p = .58$), average power ($p = .12$), average W/kg ($p = .51$), and BMI ($p = .28$) were not significantly related to TP. OBLA ($p = .73$), percent of VO_{2max} Watts ($p = .74$), VO_{2max} in L/min ($p = .78$), VO_{2max} in mL/kg/min ($p = .48$), peak average power ($p = .98$), peak power ($p = .17$), time to peak ($p = .54$), average power ($p = .34$), average W/kg ($p = .62$), and BMI ($p = .73$) were not significantly related to Tmin. **CONCLUSION:** The present findings demonstrate that no significant relationships exist between level of conditioning and on-the-ice performance. Recruiting additional subjects and players with a wider level of conditioning is warranted to enhance this analysis. From an applied perspective, coaching staffs could leverage this information to establish individualized fitness regimens for each player to maximize their on-the-ice efficiency.

Research: Poster Presentations – Friday, November 8, 2013
Session 3

Abstracts

P3-#1 2:00-3:45pm

THE USE OF MECHANOMYOGRAPHY RECORDINGS TO PREDICT RELATIVE AND ABSOLUTE MUSLCE FORCE PRODUCTION

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Mechanomyography (MMG) is the recording of the muscle sounds or oscillations produced by the gross lateral expansions of a skeletal muscle belly of interest during any type of muscle activity. MMG may allow for the recording of motor unit recruitment strategies as well as relative and absolute force production in the muscle of interest. EMG recordings do not have a direct correlation with force production, however, MMG may show a more direct relationship between peak amplitude and muscle force production. **PURPOSE:** To determine if MMG can accurately predict relative and absolute muscle force during isometric contractions. **METHODS:** Three male and one female subject underwent three isometric contractions at 20, 50, and 80% MVC on a Humac isokinetic dynamometer with MMG recordings taken at each percentage of MVC. MMG recordings were taken using a Biopac VMG TSD 250 transducer placed on the thickest part of the vastus lateralis muscle belly. Using a Pearson correlation statistic, the percent increase in force generation was compared to the percent increase in MMG peak amplitude in VMG units. **RESULTS:** There was a Pearson r= 0.886 between the overall percent increase in MMG amplitude and percent increase in muscle force production. At 20% MVC the r= 1.000 with a p=0.001. However, at 80% MVC the correlation was reduced to r=0.69. **CONCLUSIONS:** A strong correlation existed between MMG peak amplitude and isometric muscle force produced. This suggests that MMG recordings may be useful in predicting relative submaximal muscle forces produced during isometric muscle contractions. Even the reduced correlation found at 80% MVC could serve as a useful measure, but further work is needed to elucidate the changes found in the model.
Funded by the Office of Research and Sponsored Programs, Central Michigan University.

P3-#2 2:00-3:45pm

THE INFLUENCE OF RESISTANCE TRAINING ON PERFORMANCE IN AN INTERNATIONAL DISTANCE TRIATHLON: A PRELIMINARY REPORT

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The use of resistance training to increase economy in cycling and running has been shown to be effective. However, little is known about the effect of resistance training on overall international distance (1.5 km swim, 40 km bike, 10 km run) triathlon performance. **PURPOSE:** To determine whether the resistance training behaviors in the 2 months preceding an international distance triathlon impact performance. **METHODS:** 102 individuals (men, n = 56; women, n = 46; ages, 19 - 70yrs; triathlon experience, 5.85 ± 0.70yrs; *mean ± se*) who signed up for one of two international distance triathlon races in the Midwest participated in an online survey of triathlete training behaviors. Participants routinely performing upper body (UB) or lower body (LB) resistance training were identified. Race times were retrieved for all participants. An ANCOVA (covariate; total weekly training hours) was utilized to determine if differences in overall race time existed between triathletes participating in both UB and LB resistance training and triathletes who did not participate in any resistance training. **RESULTS:** Initial findings showed that there was no statistically significant difference ($p < 0.05$) in overall performance time between the triathletes who engaged in both UB and LB resistance training and the triathletes that did not engage in any resistance training with the estimated marginal means ± se reported as 194.21 ± 4.93 min and 190.48 ± 6.64 min, respectively. **CONCLUSIONS:** According to this preliminary finding resistance training does not impact overall international distance triathlon performance. More comprehensive analyses involving specific upper and/or lower body resistance training behaviors, other training habits, and swim, bike, and run split times are forthcoming.

P3-#3 2:00-3:45pm

RELATIONSHIPS BETWEEN FUNCTIONAL MOVEMENT SCREEN SCORES AND AGILITY AMONG NAIA MALES ATHLETES

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Functional movement is the body's ability to maintain mobility and stability during fundamental movement patterns which is important for optimal sport performance. Specifically, sport-related skills such as agility are thought to require sound functional movement in order to execute with precision. A method for quantifying or scoring functional movement has

recently been proposed called the Functional Movement Screen (FMS). It is hypothesized that the higher the score of the seven different FMS movement patterns, the greater the performance in sport-related skills. **PURPOSE:** To examine relationships between FMS scores and agility test times among male NAIA volleyball (n=14) and baseball players (n=40). It was hypothesized that the higher one's FMS score, the faster the agility time. **METHODS:** The volleyball and baseball athletes took part in one testing session scheduled at the beginning of preseason. Each team's testing session was conducted on different days. During testing, athletes completed FMS screening before proceeding to the agility station. Two trials of the agility T-Test were performed with adequate rest in between each test; the best time of the two trials was used. **RESULTS:** Linear regression analyses showed that height and rotary stability (1 of the 7 FMS tests) respectively explained 12.5% and 17.4% of the variance in agility ($p<0.01$). However, total FMS scores were not found to have a significant relationship with agility. **CONCLUSION:** This study suggests that rotary stability may be related to agility among NAIA male volleyball and baseball athletes. Therefore, there may be an association between functional movement in the pelvis, core, and shoulder (tested by rotary stability) and agility – a skill that is necessary for many athletes. Additionally, if further investigation continues to support relationships between FMS and agility performance, specific training may be implemented to improve functional movement and ultimately agility performance among athletes.

P3-#4 2:00-3:45pm

THE EFFECT OF LOAD UNCERTAINTY IN PLYOMETRIC EXERCISE ON MOVEMENT TIME AND MUSCLE TORQUE

Aaron M. Hannigan, Brian J. Richards & William P. Berg
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Load uncertainty increases average anticipatory and compensatory muscle activity in the catching of weighted balls (Eckerle, Berg & Ward, 2012). The implication is that in plyometric exercise involving the catching of weighted balls, load uncertainty might provide for enhanced training stimulus overload compared to traditional exercise performed with load knowledge. Richards & Berg (2012) demonstrated that it is feasible to incorporate load uncertainty into plyometric exercise by using visually identical balls. **PURPOSE**: The purpose of this study was to test the effect of load uncertainty in plyometric exercise on movement time and muscle torque. **METHODS**: The experiment involved three groups of male participants (mean age = 21), Group A) traditional plyometric training (n=12), Group B) load uncertainty plyometric training (n=13), and Group C) control group (n=14). Participants were pre and post tested on elbow flexion movement time, as well as elbow flexion peak torque (concentric and eccentric). Training involved 3 sessions/wk for 6 weeks using 4 single-arm plyometric exercises with balls weighing 1-9 lbs. Sets involved 16 repetitions of 4 ball weights (30, 53, 78 & 100% of max.) presented randomly. Participants in Group A were informed of ball weight in advance of each repetition, both verbally and visually (balls color-coded by weight). Participants in Group B received no information about ball weight, and all balls were visually identical. Both the intensity and volume of exercise increased over the training period. Data were analyzed using one-way ANOVAs with Bonferroni-adjusted post-hoc comparisons where appropriate. **RESULTS**: Groups did not differ in the extent to which movement time changed between pretest and posttest $F(2,36)=1.82$, $p= .17$. Groups differed in the extent to which concentric elbow flexion torque changed between pretest and posttest $F(2,36)=10.1$, $p< .001$. The improvement by the Group A far exceeded that by Groups B and C. Groups differed in the extent to which eccentric elbow flexion torque changed between pretest and posttest. $F(2,36)=8.88$, $p< .001$. Again, the improvement by the Group A far exceeded that by Groups B and C. **CONCLUSION**: Incorporating load uncertainty into plyometric medicine ball training did not improve the effectiveness of the exercise, as tested. In fact, load uncertainty training was far less effective that traditional plyometric exercise.

P3-#5 2:00-3:45pm

ARE THERE DIFFERENCES IN CHILDREN'S PHYSICAL ACTIVITY AND AEROBIC FITNESS ACCORDING TO ACADEMIC ACHIEVEMENT?

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Academic achievement in children and adolescents has been shown to be positively associated with physical activity and physical fitness. However, few studies have examined if there are differences in physical activity and physical fitness related to academic achievement in children from low income, ethnically diverse areas. **PURPOSE:** The purpose of this study was to examine differences in physical activity and aerobic fitness related to academic achievement scores of urban children. **METHODS:** Study design was cross-sectional and participants included 153 students from/near Flint, Michigan. Physical activity was assessed using a survey question, while aerobic fitness was estimated using the Progressive Aerobic Cardiovascular Endurance Run (PACER). Academic achievement was assessed using math and reading scores from the elementary schools. All measures were converted to a 4.0 grade point. Groups were created based upon high and low academic success, using 3.0 as the cut-point for high achievement. Differences in physical activity and physical fitness were assessed using a one-way analysis of variance. **RESULTS:** Children classified as high academic achievement in reading

and math were 58% and 61% of the sample, respectively. No differences were seen in PACER laps (p=0.208) or physical activity (p=0.535) between the groups for reading score with the high group completing 16.6 (± 10.2) laps and the low group completing 14.6 (± 9.0) laps. For physical activity, the high group achieved 60 minutes for 5.0 (± 2.0) days and the low group achieved 60 minutes for 4.8 (± 2.2) days. There was a significant difference between the math groups for PACER laps (p=0.023) and physical activity (p=0.005), with the high group completing 17.2 (± 10.2) laps and low group completing 13.6 (± 8.3) laps. For physical activity, the high group achieved 60 minutes for 5.3 (± 2.0) days, whereas the low group achieved 60 minutes for 4.3 (± 2.2) days. **CONCLUSION:** Results suggest that there is a difference in physical activity and physical fitness scores related to academic achievement scores in math, which is consistent with previous research. This information could have implications for interventions aimed at improving low academic achievement, by targeting physical activity and/or physical fitness of children. This study was funded by the Michigan State University College of Education and Human Medicine and the Crim Fitness Foundation

P3-#6 2:00-3:45pm

THE INFLUENCE OF SUSPENSION TRAINING ON NEUROMUSCULAR RECRUITMENT PATTERNS

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Body weight suspension exercise (BWS) has recently gained popularity in the fitness industry despite little scientific evidence available to support the effectiveness of these exercise programs. Neuromuscular recruitment patterns, of both primary and accessory muscles, provide insight to the activation and timing of skeletal muscles during complex movement patterns. **PURPOSE:** The purpose of this study was to examine potential differences in neuromuscular recruitment patterns between BWS and a traditional biceps curl (TRAD). **METHODS:** Healthy male subjects (n=4), who had at least 12 months of resistance training experience participated in the study. Subjects performed either BWS or TRAD elbow flexion exercise trials on two separate days. Each subject completed one set of elbow flexion curls to voluntary fatigue at a resistance equivalent to 70% one-repetition maximum (1RM). Electromyography (EMG) was used to assess neuromuscular recruitment patterns of the biceps brachii, lateral triceps, anterior deltoid, posterior deltoid, rectus abdominis, and erector spinae. Maximal voluntary isometric force (MVIF) of the elbow flexors was recorded and used as measure of fatigue during exercise and the recovery phase. A two-way ANOVA with repeated measures and paired t-tests were utilized to determine significance ($p<0.05$). **RESULTS:** TRAD had greater neuromuscular recruitment of the biceps brachii ($p=0.03$) and anterior deltoid ($p=0.04$) compared to BWS during the concentric phase. During the eccentric phase, the neuromuscular recruitment of the biceps brachii was greater for TRAD compared to the BWS ($p=.03$).Compared to TRAD the BWS demonstrated a significant reduction in the force ($p<.05$) throughout the concentric range of motion (ROM) followed by a subsequent increase ($p<0.05$) in force throughout the eccentric ROM. Time to fatigue was longer ($p<0.05$) during BWS than TRAD but there was no difference in MVIF during recovery between TRAD and BWS. **CONCLUSION:** The results of this study demonstrate that TRAD bicep curl elicits a higher neuromuscular recruitment of the primary muscle compared BWS elbow flexion exercise performed at the same relative intensity. Although both modes of exercise began with the resistance set to 70% 1RM, the significantly lower force throughout the concentric ROM in BWS could be a possible explanation for the lower neuromuscular recruitment observed.

P3-#7 2:00-3:45pm

IMPACT OF STABILITY BALL SITTING DURING AN ARM WINGATE TEST.

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A past study (Marks, Dupuie, Patros, 2012) demonstrated that sitting on a stability ball (when compared to sitting on a chair) during arm graded exercise testing can elevate peak VO_2 and peak heart rate (HR) without affecting peak power output. **PURPOSE**: This study attempted to determine if stability ball sitting affects HR, Power Output (PO) and kinematic parameters during an arm anaerobic power test. **METHODS**: Twenty-two apparently healthy young male and female adults participated in a randomized cross over design study. Participants completed a 30 second Wingate arm ergometer test once on a Stability Ball (SB) and once on a Chair (C) with a one hour rest between tests. Resistance (kp) was set at 0.05 of Body Mass for both tests so any differences in PO would be due to changes in revolution rate (RPM). HR was monitored continuously with an ECG and analyzed during the first 10 seconds of immediate recovery, RPM was continuously monitored by a photo cell and light source on the arm crank and analyzed every 5 seconds, the right sagittal view was video recorded and an analyzed at about mid test for four crank positions (90° apart) for elbow, shoulder, hip, and knee angles. Paired *t* tests and Repeated Measures ANOVA were used with **RESUDTS**: Arm ergometer resistance averaged 3.5 ± 0.6 kp with peak RPM averaging 14.0 ± 2.4 for SB and 13.8 ± 2.4 for C. There was no significant ($p = 0.76$) HR difference between SB (168 ± 12 min^{-1}) and C (167 ± 13 min^{-1}). In addition, there were non-

significant RPM sitting mode effects ($p = 0.077$) and sitting mode-time interaction ($p = 0.87$) but a significant time effect ($p < 0.001$). Finally, all joint angles had non-significant ($p \geq 0.063$) sitting mode effects, interaction, and time effects. **CONCLUSION**: Sitting on a stability ball apparently does not affect the performance of an arm Wingate test when compared to sitting on a chair.

P3-#8 2:00-3:45pm

CARDIOVASCULAR, METABOLIC, AND PERCEPTUAL RESPONSES TO COMBINED RESISTANCE & AEROBIC EXERCISE IN FEMALES

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PURPOSE: To examine the cardiovascular, metabolic, and perceptual responses to a unique combination (circuit) of short intervals of resistance and aerobic exercise in females. **METHODS:** 12 college age females (22.1±1.1 yrs) were tested for body composition (BodPod; 23.9+5.8%), BMI (23.8±2.9), aerobic capacity (44.6±6.9 ml/kg/min), and muscular strength (1RM) between 3 & 6 days prior to participation in the first circuit routine. The resistance-aerobic interval (RAI) circuit required subjects to alternate a set of 10-12 reps of each resistance exercise (RE) (30 sec. per set) with 3 min. of aerobic exercise (AE). Intensity of both RE & AE was preset at 65% maximum; 8 RE (leg press, chest press, leg extension, shoulder press, leg curl, lat pulldown, bicep curl, and triceps pushdown) were alternated with 7 bouts of AE. Traditional (Trad) RE followed by AE required subjects to complete all 8 RE (30 sec per RE set with approximately 60 sec rest between sets) before completing 21 minutes of continuous AE (bLa was taken at 3 min intervals during AE). The circuit routine was countered and separated 5-8 days. HR, VO_2 & Ve were collected continuously with a Cosmed K4b^2. RPE (1–10 scale) and blood lactate (bLa) was collected immediately following each set of RE & AE; approximately 30-60 sec between RE & AE intervals was taken to gather these data for both RAI & Trad routines. Paired t-tests with the Bonferroni adjustment was used to analyze the data. **RESULTS:** Total energy expenditure (EE) (RAI-7.5+1.2 vs 7.2+1.4 kcal/min, overall-%VO_2max (42.8+1.5 vs 41.7+1.6 %), overall-%HRmax (74.8+1.5 vs 73.5+1.7), and Total Time (TT) was similar (2375+92 vs. 2365+121 sec) between RAI & Trad, respectively. Ve (48.5+8.0 vs 56.8+9.4 l/min; $p<0.01$), overall-bLa (3.0+1.3 vs 4.4+1.5 mmol/L; $p<0.001$), RE-La (3.3+1.2 vs 5.3+1.1 mmol/L; $p<0.001$), AE-La (2.7+1.4 vs 3.4+1.3mmol/L; $p<0.05$) and overall-RPE (5.8+1.1 vs 7.0+1.2; $p<0.01$), RE-RPE (6.2+1.1 vs 7.1+1.1; $p<0.01$), and AE-RPE (4.7+1.2 vs 5.4+1.4; $p<0.05$) were significantly lower during RAI vs. Trad, respectively. **CONCLUSION**: RAI exercise results in similar overall-EE, overall-%VO2max & overall-%HRmax, but significantly lower overall-ventilatory, overall-bLa, RE-bLa & AE-bLa responses and significantly lower perceptions of effort (RPE); Overall, RE-RPE & AE-RPE during RAI as compared to Trad. These data suggest that alternating a set of RE with 3-min. bouts of AE results in similar EE and lower RPE as compared to the more typical approach to combining RE and AE. Ventilatory and bLa responses at least partially explain this perceptual response to an acute bout of combined short intervals of resistance and aerobic exercise.
(Partially funded by the Miami University Committee for Faculty Research)

P3-#9 2:00-3:45pm

EXAMINATION OF OPTIMAL TIMING FOR BLOOD LACTATE ANALYSIS FOLLOWING HIGH INTENSITY ANAEROBIC TRAINING IN COLLEGIATE HOCKEY PLAYERS

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For ice hockey performance monitoring, little is known regarding the optimal timing required for post-exercise lactate values to accurately assess the physiological stress experienced by these competitive athletes. **PURPOSE:** To identify the best time point for detecting peak blood lactate following anaerobic exercise. **METHODS:** Seven male university club hockey athletes (mean height 181.4 ± 5.1 cm; mean weight 81.9 ±14.5 kg) volunteered. Subjects completed a lactate threshold (LT), a maximal oxygen uptake (VO_{2max}) test on a cycle ergometer, and three consecutive 30-second Wingate Anaerobic Tests (WAnT), where 5% of the athlete's body weight in kgs was used as resistance. Each WAnT was followed by an active cool down consisting of walking at a rate of 2 mph/0% incline on a treadmill for 2 mins, then 3 mins seated rest. Blood samples were collected via finger prick prior to testing and at 5, 8, and 10 mins after the final WAnT was completed. Average blood lactate levels were analyzed using the YSI 2300 (Yellow Springs, OH) with two probes, each in duplicate sample. **RESULTS:** Average VO_{2max} was 39.9 ± 6.12 mL/kg/min and average power was 112.75 ± 18.90 W. A one-way analysis of variance (ANOVA) with Tukey post hoc was conducted to assess mean group differences of peak lactate values (mmol/dL) between three different time points at 5 (M = 14.17 ± 2.87 mmol/dL), 8 (M = 13.03 ± 2.92 mmol/dL), and 10 (M = 11.66 ± 4.00 mmol/dL) mins, and yielded no significant between group differences ($F(2, 18) = 1.009$, $p = .384$). Time points between 5 and 8 mins, 8 and 10 mins, and 5 and 10 mins, average peak lactate values decreased by 1.14 ± .05, 1.37 ± 1.09, and 2.51 ± 1.13 mmol/dL, respectively. **CONCLUSION:** Following anaerobic exercise, 5 mins post-exercise yields the highest blood lactate values in male hockey players. This study can enhance the knowledge on the acculation of blood lactate between

hockey shifts on ice and data collection on post-exercise lactate in anaerobic exercise. Funding was awarded via a grant from Northern Illinois University's Undergraduate Special Opportunities In Artistry & Research (USOAR) Program.

P3-#10 2:00-3:45pm

A COMPARISON OF DIRECT AND INDIRECT MOTIVATIONAL COACHING ON HOLISTIC HEALTH DEVELOPMENT

Steve Snyder, Jenna Norris, Nick Haynes, Kayla Bedinghaus, Chelsea Sjahfiedin, Matt Renfrow, Bruce Pratt, Abby Moore, Lauren Clark, Kelsey Fitzjarrald

Understanding how to effectively motivate individuals is important in improving holistic health and overall quality of life. In order to effectively motivate, it is necessary to understand what mode of communication people respond best to, as well as what impact gender plays in motivation. **PURPOSE:** To examine the effects of a biweekly motivational coaching style of either personal contact or email contact and gender on the holistic health of participants in the Walking Fit program. **METHODS:** This study analyzed 33 volunteers (25-63 yrs) affiliated with a Midwestern university. Each volunteer was involved in the Walking Fit program that used pedometers to measure total daily step counts for a ten week period. The participants were randomly separated into two experimental groups, personal contact (18) and email contact (15). Researchers contacted the participants biweekly to provide intrinsic motivational tools to apply while exercising. The change in holistic health was measured through the Taylor University Holistic Health Inventory before and after the ten week period. The inventory measured nine scales: optimism (OPT), self-esteem (SEst), mood (MD), intrinsic motivation (IM), anxiety (ANX), generosity (GEN), processes of change (POC), and stage in the Trans-theoretical model of exercise (TTME) and Trans-theoretical model of health (TTMH). A Two-Way ANOVA was used to analyze the effects of gender and coaching style on each scale in the inventory. **RESULTS:** The personal contact coaching group statistically and practically increased for processes of change ($p<.05$, $\eta^2=.367$) and intrinsic motivation ($p<.05$, $\eta^2=.292$). The effects of both coaching styles were insignificant on all other scales. The effect of gender on all the scales was also statistically and practically insignificant. The main and interaction effects of gender and coaching were insignificant on every scale except for processes of change and intrinsic motivation on coaching style. **CONCLUSION:** Participants coached through personal contact experienced a greater increase in processes of change and in intrinsic motivation than the participants coached through email contact. Gender showed no effect on any of the scales.

P3-#11 2:00-3:45pm

FITNESS AS A DETERMINANT OF HEARING ABILITY IN ADULTS OF DIFFERENT AGES AND PERSONAL-LISTENING DEVICE BEHAVIORS

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Noise exposure and age have a major influence on hearing loss as one ages. However, research has indicated that specific listening behaviors that include using personal listening devices (PLDs) and health-related fitness can also impact hearing. **PURPOSE:** To compare hearing sensitivity in adults aged 18-74 with different fitness levels and different personal listening behaviors. Results may reveal possibilities for easily implementable interventions to sustain optimum hearing over time. **METHODS:** 110 adults volunteered for this study. Two groups of adults categorized as young (18-23 yrs) and old (40-74 yrs) were assessed for fitness variables (e.g. resting blood pressure and heart rate, body fat, body mass index, waist and hip circumference, VO_2max, blood lipids, muscle strength, and daily physical activity). All subjects also underwent standard clinical audiometry testing 250 to 8000 Hz in octave intervals. All were sorted into PLD users and non-users with information gathered about the time spent listening as well as the volume used when listening. ANOVA, Univariate analyses and tests of between-subjects effects analyzed the data. **RESULTS:** In young adults, listening to a PLD for more than 7.5 hours per week is significantly related to poor hearing ($p < 0.05$). Listening volumes were virtually all within healthy ranges. Older adults' average listening volumes were also not at dangerous levels and no association was found between listening duration and hearing thresholds. In young adults, the main fitness variables that influenced hearing were determined to be body mass index and waist: hip circumference ($p < 0.05$). In adults, aged 40 -74, the fitness variable most likely to contribute to hearing was waist: hip circumference ($p = .006$). **CONCLUSION**: Virtually all subjects listened to PLDs within healthy volumes, even in a background of noise. Any age-associated hearing loss is likely due to other noise exposure and fitness that for young people focuses on BMI and waist and hip circumference. In older people, the fitness variables associated with hearing include waist: hip ratio. (Supported by Miami University Summer Scholars Fund)

P3-#12 2:00-3:45pm

THE EFFECTS OF MOTIVATIONAL COACHING FOR WALKING ON HOLISTIC HEALTH DEVELOPMENT

Nick Haynes, Kayla Bedinghaus, Lauren Clark, Kelsey Fitzjarrald, Abby Moore, Jenna Norris, Bruce Pratt, Matthew Renfrow, Steve Snyder.
Taylor University, Upland, Indiana.

Understanding what strategies effectively motivate individuals to increase physical activity is important in achieving holistic health and increasing overall quality of life. **PURPOSE:** To investigate the effects of intrinsic motivational techniques used in the Walking Fit Program on holistic health, measured by the Taylor University Holistic Health Inventory as well as weekly step count. **METHODS:** 33 participants (11 males, 22 females, *M* age = 49.1) volunteered to participate in the program. The participants were randomly placed into two experimental groups, personal contact or e-mail contact (Personal = 18, E-mail = 15). To begin the study, basic physical measurements were conducted, and the participants took the Taylor University Holistic Health Inventory. The inventory consisted of 124 questions broken down into 9 subscales – Optimism (OPT), Self-Esteem (SEst), Mood (MD), Intrinsic Motivation Inventory (IMI), Anxiety (ANX), Generosity (GEN), Processes of Change (POC), Trans-theoretical Model of Exercise (TTME), and Trans-theoretical Model of Health (TTMH). The same measurements and inventory were taken at the end of the 10-week study. During the course of the study, researchers met in person or e-mailed their participants bi-weekly and coached them using motivational techniques found in the Taylor University Motivational Coaching Guide. Repeated Measures ANOVAs and η^2 were conducted to assess the changes of the pre- and post-inventory on the 9 subscales. The average step counts of the participants were also graphed and qualitatively analyzed. **RESULTS:** The difference between the pre- and post-inventory was both statistically and practically significant for POC ($p<.05$, $\eta^2=.186$), ANX ($p<.01$, $\eta^2=.228$), TTME ($p<.01$, $\eta^2=.270$), and TTMH ($p<.01$, $\eta^2=.205$). Statistical, but not practical, significance was found for IMI ($p<.05$, $\eta^2=.159$). No significant differences were found between the pre- and post-inventory for OPT, SEst, MD, or GEN. **CONCLUSION:** Participants experienced a significant increase in POC, TTME, TTMH, and IMI and a significant decrease in ANX. Exercise and intrinsic motivation coaching had significant positive effects on changing reasons to exercise, reducing anxiety, and moving participants further in the process of change.

P3-#13 2:00-3:45pm

THE EFFECTS OF A WELLNESS COACHING PROGRAM ON HOLISTIC WELLNESS IN COLLEGE STUDENTS

Jake Hartley, Lisa Hicks, Mindy Mayol, Chelsi Kitchen and Lee Everett
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Previous studies have examined different modes in which to educate and improve college student's perceptions of wellness and their overall personal wellness. **PURPOSE:** The purpose of this study was to examine the effects of personal coaching on wellness dimensions in college students. **METHODS:** Forty two college students [(mean ± SD) age, 19.8 ± 1.1 years; height, 165.9 ± 9.4 cm; weight, 67.5 ± 16.3 kg] participated in the present study. Each subject was selected to participate in a multidimensional wellness program. The Holistic Lifestyle Questionnaire (TestWell 50 Question College Assessment) was used to measure nine dimensions of wellness with an overall composite score. The dimensions included: activity, nutrition, environmental, self-care, safety, sexuality, emotional, intellectual, occupational, and spiritual. The survey was administered in consecutive fall semesters of college (one year). Between pre and post measurements, students met with personal wellness coaches four times. These visits were 30-45 minutes in which students and coaches collectively determined the dimensions needing addressed. Students were asked to set three wellness goals between each visit, with subsequent visits addressing goal outcomes and re-evaluating the students' overall wellness. Paired samples t-tests were used to analyze the dependent variables. An alpha level of $P < 0.05$ was set for statistical significance. **RESULTS:** There were significant increases in nutritional (66.9 to 75.0; $p < .001$), self-care (69.8 to 78.0; $p = .002$), and intellectual (71.2 to 78.7; $p = .002$) wellness categories. There were no significant changes in activity (73.6 to 74.7; $p = .592$), safety (87.2 to 88.6; $p = .540$), environmental (80.1 to 80.4; $p = .904$), occupational (76.3 to 79.0; $p = .247$), sexuality (89.4 to 92.1; $p = .393$), emotional (82.9 to 82.4; $p = .845$) and spiritual (85.6 to 83.3; $p = .337$) wellness categories. Furthermore, overall wellness did not significantly change (786.7 to 810.4; $p = .144$). **CONCLUSION:** While the present study found improvements in nutritional and intellectual wellness, other dimensions of wellness did not improve following a year of personal wellness coaching. While personal wellness coaches may be beneficial for some wellness dimensions, future studies should examine specific aspects of wellness coaching.

P3-#14 2:00-3:45pm

HEALTH BEHAVIORS OF LOW-INCOME PREGNANT WOMEN

John Chase, Stefan Jones, Cameron Meyer, Carolina Torres, Alicja Stannard, Lanay M. Kazmirzack
Michigan State University, East Lansing, Michigan.

Pregnancy is a crucial time when behaviors may influence both maternal health and fetal development. **PURPOSE:** To evaluate health behaviors (i.e. smoking, drinking, dietary behaviors and physical activity participation) among low-income pregnant women and determine whether behaviors are interrelated. **METHODS:** Participants were recruited from an OBGYN clinic in their 2nd and 3rd trimesters of pregnancy. Included in the analysis were pregnant women on Medicaid (n=70). Women completed a questionnaire on health behaviors, which included smoking (any/none), alcohol consumption (any/none), and consumption of dairy (milk and cheese), fruits and vegetables. Participants were categorized as meeting/not meeting recommendations for dairy (≥3/<3 cups/day), fruits (≥2/<2 cups/day) and vegetables (≥2/<2 cups/day). Using the validated Pregnancy Physical Activity Questionnaire, exercise, household and job-related physical activity were measured (MET-hrs/wk). Household activity was categorized as High/Low using a median split, job-related physical activity was categorized as any/none, and exercise was rated as meeting/not meeting the recommendations (7.5 MET-hrs/week). Descriptive statistics were used to determine subjects' characteristics and health behaviors. Chi-square, and Fisher exact tests were used to evaluate relations among health behaviors. **RESULTS:** Of the 70 participants, 21% reported smoking, but only 1 participant reported alcohol consumption. Most were meeting recommendations for dairy (83%), and fruit (64%), and about half were meeting vegetable recommendations (54%). One-third of women were meeting exercise recommendations, while 57% reported job-related physical activity. Meeting vegetable recommendations was significantly related to meeting fruit, dairy and exercise recommendations and having High household activity (chi-square p-values<0.05). Job-related activity and smoking were not related to other health behaviors. **CONCLUSION:** Most low-income pregnant women were meeting dietary recommendations; however, recommended exercise participation was low and a significant minority was smoking while pregnant. Recommended vegetable consumption appears to be related to several other health behaviors. More work with more precise measures of health behaviors is needed to determine how these behaviors may impact pregnancy health among low-income women. (Funded by MSU College of Education Seed Grant)

P3-#15 2:00-3:45pm

AUTONOMIC DYSFUNCTION IN YOUTH PERSISTANT POSTCONCUSSION SYMPTOMS: A HEAD-UPRIGHT TILT TABLE STUDY

Geoffrey L. Heyer,[1] Anastasia Fischer,[2] Julie Wilson,[3] James MacDonald,[2] Sarah Cribbs,[4] Reno Ravindran,[2] Thomas L. Pommering,[2] Steven Cuff[2]

Dizziness is a common symptom following concussion. However, little is known about lightheadedness (orthostatic intolerance) in youth with persistent postconcussion symptoms. **PURPOSE:** To explore signs of autonomic dysfunction using head-upright tilt table testing in a cohort of youth with persistent postconcussion symptoms that include lightheadedness and to correlate repeat tilt table results with symptom improvements for those found to have postural tachycardia syndrome (POTS) on initial testing. **METHODS:** Thirty four patients (13-18 years of age) with postconcussion symptoms of 21 days to 6 months duration were recruited for prospective study. The Postconcussion Symptom Interview (PCS-I) and patient ratings of lightheadedness and vertigo (scales of 0-5) were used to measure symptom burden. All participants underwent an abbreviated tilt table protocol comprising up to 10 minutes of head-upright tilt at 70 degrees. Patients meeting POTS diagnostic criteria were asked to repeat testing when postconcussion symptoms improved or 3-6 months after the initial test if symptoms persisted. **RESULTS:** Twenty four of 34 (70.6%) patients had abnormal tilt table results with patients categorized as normal (n=10), isolated syncope (n=10), or POTS (n=14). POTS patients had higher patient PCS-I scores than patients with normal tilt table results (11.9 ± 2.1 vs. 8.7 ± 2.4, p<0.001) and higher ratings of lightheadedness than both patients with normal results (3.9 ± 0.9 vs. 2.5 ± 1.3, p=0.015) and syncope patients (3.9 ± 0.9 vs. 2.9 ± 1.2, p=0.04). Twelve POTS patients underwent repeat tilt table testing, and 9 of 12 (75%) no longer met POTS diagnostic criteria. All patients with resolution of POTS reported corresponding improvements in postconcussion symptoms, including lightheadedness and vertigo. **CONCLUSIONS:** Our exploratory study demonstrates a high rate of tilt table abnormalities among youth with persistent postconcussion symptoms that include lightheadedness. Several patients with POTS diagnosed initially had normalization of the tilt table result on repeat testing which corresponded with improvements in symptom burden. Our results suggest that autonomic dysfunction can contribute to symptom burden in some patients with persistent postconcussion symptoms.

Research: Poster Presentations – Saturday, November 9, 2013
Session 4

Abstracts

P4-#1 8:30-10:15am
LONGITUDINAL CHANGE IN RPE DURING SEDENTARY, LIGHT-, MODERATE- AND VIGOROUS-INTENSITY ACTIVITIES IN YOUTH

Catherine Gammon[1], Karin A. Pfeiffer[1], FACSM & Stewart G. Trost[2].
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Rating of perceived exertion (RPE) scales are used to report perceptions of physical effort and are frequently used in pediatric exercise studies. Findings indicate that the validity of RPE scales improves as children get older. Establishing how RPE during a given activity changes with age can provide valuable insights into the influences of growth, development and maturation on a child's physical and psychological experience of exercise. To date, no studies have examined longitudinal changes in RPE reports during physical activity. **PURPOSE:** To examine longitudinal changes in children's RPE during sedentary, light-, moderate- and vigorous-intensity physical activities. **METHODS:** Approximately once per year, for four consecutive years, 206 participants between the ages of 6 - 16 completed 11, five-minute activity trials. Activities included homework and playing computer games (sedentary activities); folding laundry, throwing and catching a ball, overground walking at a comfortable pace and sweeping (light-intensity physical activities); dance aerobics, overground walking at a fast pace and treadmill walking at a fast pace (moderate-intensity physical activities); and basketball and overground running (vigorous-intensity physical activities). Immediately after each 5-minute activity trial, participants reported their perceived effort by selecting a number from the OMNI RPE scale. Repeated measures ANOVA was used to examine change in mean RPE across the four time points. **RESULTS:** Mean age of participants at baseline was 11.0 years (sd=2.7). Mean RPE demonstrated significant decreases across the four measurement points, for all activities. Decreases in mean RPE from time 1 to time 4 ranged from -0.28 (computer game) to -1.27 (basketball). The decrease in mean RPE from time 1 to time 4 for vigorous-, moderate-, light-intensity and sedentary activities was -1.3, -1.3, -1.0 and -0.4 RPE points, respectively. **CONCLUSION:** Previous, cross-sectional research reports non-significant differences when comparing RPE reports from older and younger children during exercise (Utter et al., 2002; Benjamin et al., 2012). This is the first study to directly examine longitudinal change in RPE among a cohort of youth. Decreases in perceived effort may reflect age-related improvements in economy, greater activity experience and/or social influences on effort expression; further research is required to examine explanatory factors. Funded by the National Institutes of Health (NICHD R01 55400)

P4-#2 8:30-10:15am
PERCEIVED QUALITY OF LIFE, PHYSICAL ACTIVITY AND BODY MASS INDEX IN SAGINAW COUNTY RESIDENTS

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Saginaw Valley State University, University Center, MI

Saginaw County has been ranked as one of the unhealthiest counties in Michigan (University of Wisconsin Population Health Institute County Health Rankings, 2013). Data from the Michigan Behavioral Risk Factor Survey found that 27.4% of Saginaw County residents reported not participating in any leisure-time physical activity (PA) and 40.2% had a body mass index (BMI) ≥30. However, little is known about how quality of life measures impact an individual's amount of PA or their BMI. **PURPOSE:** To determine whether various perceived quality of life measures and demographic variables were related to PA and BMI among residents of Saginaw County. **METHODS:** Subjects were 212 residents of Saginaw County who completed a survey distributed at local public libraries. The primary outcome variables used were self-reported PA (minutes per week) and BMI (self-reported height and weight). The exposure variables were gender (male, female), living (urban, non-urban), race (Caucasian, other), and income (0-24,999, 25,000-49,999, ≥50,000). Indicators of perceived quality of life were reported as either poor, average, or above average, and included: 1) general health, 2) availability of recreational activities, 3) neighborhood safety, and 4) availability of healthy foods. Pearson correlations were used to examine associations between PA/BMI and all other variables. An alpha level of 0.05 was used to determine statistical significance. **RESULTS:** Above average availability of recreational services ($r=0.17$, $p<0.03$), and male gender ($r=0.36$, $p<0.001$) were the only variables that were significantly related to PA. All other demographic and quality of life variables were not significantly associated with PA ($p=0.20$-0.73). BMI was not significantly associated with any quality of life measurement ($p=0.08$-0.95). However, urban residents were more likely to have a higher BMI ($r=0.16$, $p=0.04$). **CONCLUSION:** We found that availability of recreational services and male gender were significantly related to PA level among Saginaw County residents. However, aside from area of residence, perceived quality of life and demographic variables were not associated with BMI. Our findings suggest that interventions focusing on increasing availability of recreational services in communities may impact residents' physical activity levels. Furthermore, efforts specifically targeted toward urban areas and females may be beneficial. This project was supported by the Allen Foundation Student/Faculty Research Grant

P4-#3 8:30-10:15am

CHARACTERIZING CHILDREN'S FREE-PLAY PHYSICAL ACTIVITY: STEPS VS. COUNTS

Kimberly A. Clevenger and Cheryl A. Howe.
Ohio University, Athens, Ohio.

Pedometers are the most practical activity monitors for measuring and promoting physical activity (PA), particularly in children, because of their low cost, ease of use, and immediate output. Historically, pedometers have not been able to quantify PA intensity, such as minutes spent in moderate-to-vigorous PA. The technology in the latest generation of activity monitors allows for steps to be measured in epochs as short as 1-sec (steps/sec). This technological advancement may improve the capacity of pedometers to accurately characterize children's free-play PA. **PURPOSE:** The purpose of this study was to establish pedometer-based cut-points for classifying the intensity of children's free-play PA during recess in a free-living, playground setting. **METHODS:** Third and fourth grade children (N = 18; 8 male; 8 – 10 y) were recruited from an elementary school in rural Appalachia. After measuring height, weight, and skinfold thicknesses, PA data was measured during three normal recess periods (20.1 ± 1.4 min) using an activity monitor with the capacity to measure both steps and counts simultaneously. Data was recorded using a 1-sec epoch, then averaged for each child for each recess period as counts/min and steps/min. Regression analysis was used to assess the relationship between counts/min and steps/min data. Based on this regression analysis, pedometer-based cut-points were generated for light, moderate, and vigorous PA intensity. **RESULTS:** There was a modest relationship between counts/min and steps/min ($R^2 = 0.57$), generating the following pedometer-based cut-points: light PA = 16 - 22; moderate PA = 23 - 48; and vigorous PA > 48 steps/min. **CONCLUSIONS:** This was one of the first studies to generate pedometer-based cut-points to classify children's free-play PA for a range of intensities. Although this study demonstrates that pedometers hold promise as a practical and accurate PA measurement tool in children, further research is needed to refine and improve these proposed cut-points using a criterion measure, such a direct observation. Funded by Ohio University's Provost's Undergraduate Research Fund.

P4-#4 8:30-10:15am

MASSAGE THERAPY INDUCED PROTECTION AGAINST SYSTEMIC ENDOTHELIAL FUNCTIONAL IMPAIRMENT FOLLOWING EXERTIONAL MUSCLE DAMAGE IS ASSOCIATED WITH A REDUCTION IN SYSTEMIC INFLAMMATION

Austin T. Robinson[1], Nina C. Franklin[1], Mohamed M. Ali[1], Edita Norkeviciute[1], Tracy Baynard[2] and Shane A. Phillips[1,3]
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Our lab has previously found that massage therapy (MT) attenuates impaired brachial artery flow-mediated dilation (FMD) resulting from lower extremity exertion-induced muscle damage (EMD) in sedentary, young adults. **PURPOSE:** The purpose of this study was to determine if a reduction in systemic inflammation mediated by MT is associated with protection against systemic reduction in FMD following lower extremity EMD. We hypothesized that reduced systemic inflammation contributes to the attenuation of impaired brachial artery FMD following EMD. **METHODS:** Thirty-six sedentary young adults were randomly assigned to one of three groups: 1) eccentric leg press; EMD only, 2), 30 minutes of lower extremity massage; MT only, or 3) EMD and MT. Subjects were evaluated at baseline and after 90 min, 24 hrs, 48 hrs and 72 hrs following their respective intervention. Brachial artery FMD was determined by ultrasound at each time point. In addition we collected plasma for Immunoassay quantification of Tumor Necrosis Factor-α (TNF-α). **RESULTS:** We found a significant group by time interaction for TNF-α using repeated measures ANOVA with Scheffe's post hoc analysis ($p < 0.05$). There was a trend for increased levels of circulating TNF-α following exercise in the EMD only group although not significant. TNF-α levels decreased in the MT only group reaching statistical significance at 24 and 48 hours ($p < 0.05$ for both) before returning to near baseline levels at 72 hours. This data supports our previous findings of increased post exercise FMD relative to baseline in the EMD and MT group and the MT only group ($p < 0.05$ for both), remaining elevated until 72 hrs. FMD was reduced at 24 and 48 hrs ($p<0.05$ for both) returning to baseline after 72 hrs in the EMD only group. **CONCLUSION:** Our results suggest that the attenuation of impaired upper extremity arterial function resulting from lower extremity exercise in sedentary young adults may be associated with a reduction in TNF-α.
This work was supported by a Massage Therapy Foundation research grant as well as National Heart, Lung, and Blood Institute grants K23HL85614, RO1HL095701, and HL095701-01A2S, and the University of Illinois at Chicago, Center for Clinical and Translational Science (CCTS), award UL1RR029879 from the National Center for Research Resources.

P4-#5 8:30-10:15am

EVALUATION OF TREKDESKS FOR ACTIVE WORK

Gregory Welk, Joanne Lasrado, Jeanne Stewart, Hector Angus, Randall Foster, Hannah Greenfield, Elizabeth Gerdis.
Iowa State University, Ames, Iowa.

PURPOSE: To determine the feasibility of use of the TrekDesk mobile workstation by Iowa State University office workers who perform sedentary tasks. **METHODS:** The study covered 22 departments and offices. 171 participants (130 females and 41 males) were recruited to the study and 99 participants responded to the survey regarding their TrekDesk experience. TrekDesk mobile workstations are placed in departments, centers, and administrative offices across campus for 30 days. The department chairs provide approval for the placement of a TrekDesk in common rooms or office suites. The TrekDesks were placed in supervised areas only accessible to employees within that specific time. Participants provided informed consent and completed an online survey after 30 days regarding their experience with the TrekDesk. **RESULTS:** Results indicate that a majority of survey respondents (73.4%) report they have had a favorable experience using the TrekDesk, 81% are likely to recommend the TrekDesk, and 79% agree the University should consider TrekDesks for their employees. A majority of the respondents (82.8%) used the TrekDesk at least one day and 17.2% claimed they never used the TrekDesk. 58.8% of the respondents reported their use of the TrekDesk either "stayed the same" or "increased". However, 27.5% of the respondents reported a decrease in use. Participants were asked to rate the ease of performing typical office tasks while using the TrekDesk and a majority of respondents reported that carrying out day-to-day office tasks while using the TrekDesk was not difficult. Respondent ratings suggested greater positive feelings rather than negative side effects after using the TrekDesk, with respondents reporting feelings of "moderately" energetic and "not at all" to "slightly" for tiredness, nausea and light-headedness. 37% of respondents reported benefits they attributed to their use of the TrekDesk, with a majority of these respondents claiming improved physical and mental well-being. **CONCLUSIONS:** A majority of faculty and staff found the TrekDesk enjoyable and an applicable way to incorporate physical activity into an otherwise sedentary occupation.

P4-#6 8:30-10:15am

INDIVIDUALS WITH PARKNISON'S DISEASE SHOW IMPROVED TIMED UP AND GO AND 6-MIN WALK TEST SCORES AFTER DYNAMIC CYCLING

Robert S. Phillips, Kayla A. Wilson, Angela L. Ridgel
Kent State University

Parkinson's disease (PD) is a neurodegenerative disorder that affects motor planning and leads to decreased quality of life. Many individual's with PD experience decreased abilities to ambulate and perform everyday activities. Previous studies, in older adults, have shown that with exercise intervention subjects can improve their scores on the Timed Up and Go (TUG) and 6-Minute walk test (6MWT) demonstrating improved function, but no intervention studies have tested people with PD. **PURPOSE:** The objective of this study is to determine the effects of cycling exercise on performance on the 6MWT and the TUG. **METHODS:** Fourty-seven individuals with mild to moderate PD were randomly assigned into either a static (n=23) or dynamic (n=24) cycling group. Each subject was first evaluated using 6MWT and the TUG and then completed three days of cycling with one day of rest between. A post-exercise evaluation was completed one day after the last cycling session. A two-way repeated measures ANOVA was performed for each variable using IBM SPSS statistics 21. Change scores were than calculated for ease in comparing data. **RESULTS:** Preliminary results show that 6 min walk speed/distance for the static group improved by 3.8% while the dynamic group showed a 4.4% improvement. TUG self-selected speed worsened by 15.6% in the static group and improved by 16.5% in the dynamic group. **CONCLUSION:** Three days of dynamic cycling, when compared to static cycling, results in improved scores in the TUG and 6MWT, both measures of functional mobility. This project was funded by R21 grant HD068846 from the National Institute of Health (NIH) to ALR.

P4-#7 8:30-10:15am

THE ASSOCIATION BETWEEN PHYSICAL ACTIVITY, HISTORY OF SEXUAL ABUSE AND MENTAL HEALTH: RESULTS FROM BRFSS 2011

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PURPOSE: According to the BRFSS, 12.2% of adults experience some form of sexual abuse before the age of 18 years old. Moreover, research has shown an association between experiencing child sexual abuse and poor physical and mental health in adulthood, which can result in dysfunctional health-related coping behaviors. Clinicians recommend physical activity as a coping behavior; however, some research studies have indicated that vigorous physical exercise may activate the fight-flight response; thus decreasing the therapeutic benefit of physical activity on mental health. Thus, the purpose of this study was to investigate the association between physical activity and mental health among adults who reported history of sexual abuse. **METHODS:** We analyzed secondary 2011 BRFSS Data from 47,025 adults (18-99 yrs.) who reported history of sexual abuse, Defined as: 1) no history of sexual abuse, 2) forced to touch or were forcibly touched, or 3) forced to have sex, all by

someone that was at least five years older. Poor mental health was measured by number of days in the last 30 days that mental health was reported as poor and levels of physical activity as: inactive, insufficiently active, active, and highly active. A multiple linear regression was used to model the effect of poor mental health days on level of physical activity for those who reported history of sexual abuse. **RESULTS:** A Pearson correlation coefficient was used to assess the relationship between poor days of mental health. The results indicated a positive correlation between the two variables, r (356042) = 0.01, <0.001, one tailed Interestingly, individuals who reported a history of forced penetration and were at least active significantly predicted decreased days of poor mental health (β = -.08, t (7) = -2.86, p < .01). **CONCLUSIONS:** Although this study suggests those who were both active and highly active reported the similar mental health benefits; therefore concerns regarding the activation of the fight-flight response do not appear to be supported. However, further studies need to be conducted to confirm these findings.

P4-#8 8:30-10:15am

EFFECTS OF BIOMECHANICAL MUSCLE STIMULATION ON MUSCLE RECRUITMENT AND BALANCE IN HEALTHY INDIVIDUALS

Kelsey Bryant, Makynna Henneman, Robert S. Phillips and Angela L. Ridgel.
Kent State University, Kent, OH

During balance tasks, such as single leg stance (SLS), proprioceptive input is essential for maintaining appropriate motor output and upright posture. Locally applied vibration stimuli have been shown to activate muscle spindles and an increase in muscle activity. **PURPOSE:** The objective of this study was to determine the effects of biomechanical muscle stimulation (local vibration) on motor unit recruitment, as measured with electromyography (EMG) during SLS in healthy adults. **METHODS:** We tested four healthy female adults (ages 18-28). Bipolar electrodes were placed on the soleus muscle on the self-selected dominant leg after the socks and shoes had been removed. Baseline EMG measurements were collected during maximum voluntary contraction during a single leg stance with eyes open and eyes closed. Subjects held a SLS with 90 degrees hip flexion for 15 seconds and baseline measurements were taken on a solid surface with eyes open and eyes closed, and on an unstable surface (foam) with eyes open and eyes closed. Individuals then completed biomechanical muscle stimulation of the soleus muscle at 10Hz and 35Hz with a day of rest in between. The order of each condition was counterbalanced. EMG measurements were repeated after each condition. Repeated measures ANOVA was used to compare across time and conditions. **RESULTS:** Peak EMG amplitude of the soleus increased by 55% (p= 0.065) after the 35 Hz condition during SLS with eyes closed on a foam surface. Peak amplitude with eyes closed on a solid surface also showed a 59% (p=0.092) increase. Peak firing frequency of the soleus showed a 41% (p=0.085) improvement during SLS with eyes closed on a foam surface and eyes open on foam surface improved by 28% (p=0.075) after 35 Hz of vibration stimuli. **CONCLUSION:** Although this small sample is not yet significant, peak EMG amplitude and frequency for single leg stance is altered after high-frequency vibration while eyes were closed. This suggests that muscle recruitment is increased after 35Hz biomechanical stimulation. Additional study subjects will be added to increase the power of this result. This finding could be important for performance as well as clinical populations with balance problems.

P4-#9 8:30-10:15am

PHYSIOLOGICAL AND BEHAVIORAL PROFILES OF DIVISION I COACHES IN MIDSEASON

James L. Chapman[1], Christa L. Cocumelli[1], Megan. E Applegate[1], Stephen M. Patterson[2],
Michael R. Kushnick[1], Jason B. White[1]
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It is widely accepted that the nature of job duties impacts the health of the employee. Limited research has reported on the physiological and behavioral health of full-time coaches in collegiate programs. **PURPOSE:** To investigate physiological and behavioral variables pertaining to health of Division I (D-I) football and basketball coaches while in midseason. **METHODS:** Ten male coaches (41.6±7.6, 30-50 years of age) were recruited to participate in this investigation and underwent testing to evaluate: body composition (air plethesmography), waist-to-hip ratio (WHR), daily average kcal expended in physical activity (accelerometry) over 5 days, blood lipid and glucose profiles, years in current job and career, and self-reported behavioral indices (Taylor-anxiety; PSQi-percieved stress; Cook-Medley-hostility). The profiles of these variables are reported as mean±stdev and minimum-maximum values. In additional, selected significant Pearson's correlation coefficients (p<0.05) were used to determine relationships among variables. **RESULTS:** Body fat averaged 25.5±5.0 with a range of 17.1-34.2%, while WHR was 0.9±0.1, 0.85-1.01 and daily average energy expenditure was 545.1±164.6, 340.7-842.7kcals. The average and range for blood lipid profiles indicated total cholesterol of 212.8±29.6, 188.1-282.0mg/dL, HDL-C of 50.2±7.0, 40.2-61.2mg/dL, triglycerides of 110.6±42.0, 70.9-185.8mg/dL, and LDL-C of 140.5±30.2, 112.7-204.7mg/dL. Fasting plasma glucose was found to be 94.5±8.2, 76.4-104.5mg/dL. Overall, the years at their current job averaged 6.5±7.4, but ranged from 0.8-17, while their years at this career averaged 17.3±8.0, but ranged from 5-26. Behavioral variable outcomes were reported as Taylor (anxiety) with an average of 7.3±3.6, and range of 1.0-11.0; PSQi (perceived stress): 0.4±0.1, 0.1-0.5; Cook-Medley (hostility): 19.3±5.3, 13.0-28.0. Some of the significant

correlations were with blood glucose, years in their current job both to the Taylor (anxiety) score (r=0.79, p=.04 and r=-0.84, p=0.02) and %body fat and triglyceride concentrations (r=0.64, p=0.048). **CONCLUSION:** This data set illustrates health variables in a sample of full-time collegiate D-I male coaches in midseason. The averages and ranges for many of these variables are not within the optimal recommended values and may be related to the participant's job duties. These results suggest that a better understanding of collegiate coaches' health variables is warranted as the job duties may promote negative health outcomes. Funded by Ohio University Health Sciences and Professions Mentored Research Award

P4-#10 8:30-10:15am

THE ACUTE EFFECTS OF ENERGY DEFICIT ON POSTPRANDIAL LIPEMIA

Christa Cocumelli, James Chapman, Megan Applegate, Erica Roessler, Ryan Lubbe,
Michael Clevidence, Michael Kushnick
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Postprandial lipemia (PPL) is the rise in blood triglycerides (TG) after a meal. While PPL is anticipated, an exaggerated response has been linked to an increased risk for cardiovascular disease. Recent literature indicates that an energy deficit (exercise and/or kcal restriction) can reduce PPL. It appears that this response may be graded. **PURPOSE:** To determine the effects of 24hr energy balance versus two levels of energy deficit on metabolic parameters at rest and in response to a meal. **METHODS:** Ten apparently healthy men (22.8±2.7yrs) participated in three experimental trials in random order, each trial consisting of two sessions. The first session was a caloric control/exercise session, consisting of 24hr control of caloric intake- moderate and mild caloric restriction (25 and 35 kcal/kg FFM) and an energy balance trial (45 kcal/kg FFM)- including a treadmill run to expend 10 kcal/kgFFM (684.6±43.3kcals) at approximately 60% of the participant's pre-determined VO_2max. The next morning the participants returned to the lab for a baseline blood sample, consumption of a mixed meal challenge on an approximate 12hr fast, and subsequent blood draws over three hours. Data is reported as mean±stdev; repeated measures ANOVAs were utilized with significance accepted as $p<0.05$. **RESULTS:** No differences in PPL per trial over time were found and so the data were collapsed. Significant differences in PPL were found in all trials over time, where baseline was less than all subsequent times, and 30min was less than 1, 2 and 3hrs after the meal (59.0±8.2, 69.9±8.5, 89.4±12.4, 133.7±17.8, and 148.5±18.6mg/dl, respectively). While not statistically significant, the PPL response for energy balance at 2 and 3hrs was 158.4±76.2 and 175.0±82.6mg/dl, respectively; mild restriction at 2 and 3hrs was less than energy balance by approximately 39.5 and 42.5mg/dl, respectively; moderate restriction at 2 and 3hrs was less than energy balance by approximately 34.4 and 36.8mg/dl, respectively. **CONCLUISION:** Expected PPL response can be observed after acute energy deficits or energy balance are established for a 24hr period. While these data did not demonstrate significant differences in PPL with mild or moderate caloric restriction compared to energy balance, differences existed that may have clinical implications. Research Professions Student Research Grant.was funded in part by the MWACSM Student Research Grant, the Joseph Allen Butts Award, and the College of Health Sciences and

P4-#11 8:30-10:15am

THE EFFECT OF FITBIT TECHNOLOGY ON PHYSICAL ACTIVITY LEVELS IN INACTIVE ADULTS

Kerri L. Vasold, Elizabeth G. Groendal, Jeremy L. Knous
Saginaw Valley State University, Saginaw, Michigan

The Fitbit tracker is new wearable technology designed to motivate individuals to become physically active by increasing awareness of physical activity (PA) levels. The Fitbit tracks activity, sleep, nutrition, can sync with other applications, upload wirelessly, and is tiny and discreet. Published data are limited concerning the effectiveness of Fitbit technology on increasing PA levels in sedentary populations. **PURPOSE**: To study the changes in individuals' level of PA as a result of wearing the Fitbit for 8 weeks. **METHODS**: Sixty university employees were stratified into two groups, intervention (n=29) and control (n=31), based on meeting ACSM recommendations of 150 minutes of PA per week. Intervention group participants were given a Fitbit to wear for 8 weeks and provided technical support, while control group participants were encouraged to maintain current PA habits. Fitness assessments occurred prior to and following the intervention and included demographic, anthropometric, biometric, body composition, flexibility, muscular strength/endurance, and cardiorespiratory fitness. Self-reported PA, exercise self-efficacy, and technology usage were assessed via surveys. Independent sample T-tests were used to analyze differences between the intervention and control groups. Paired sample T-tests were used to analyze differences pre- and post-Fitbit intervention. Differences in self-efficacy and technology usage were assessed via Chi-square analysis. **RESULTS**: Mean age, weight, and BMI for the entire sample was 45±12 years, 181±44 pounds, and 29.2±6.8 kg/m2, respectively. There were no significant differences between intervention and control groups at pre-test except for self-reported PA (intervention: 74 minutes, control: 358 minutes). Survey data revealed no significant differences between intervention and control in exercise self-efficacy and technology usage. Post-intervention self-reported PA revealed that although a significant difference remained between intervention and control groups the difference was decreased (intervention: 216 minutes, control: 396 minutes). There was a significant ($p<0.05$) change in self-reported PA in the intervention group from pre- to post-intervention. The intervention group was meeting ACSM recommendations post-

intervention. **CONCLUSIONS**: Based on these results, wearing the Fitbit for 8 weeks increased PA in inactive individuals to the point of meeting/exceeding ACSM PA recommendations. Further research needs to be done to determine the levels of improvement for those using this technology.
Supported by the Saginaw Valley State University Student Research and Creativity Institute.

P4-#12 8:30-10:15am

FACTORS INFLUENCING PERCEPTIONS OF PHYSICAL INACTIVITY AND CHRONIC DISEASE AMONG RESIDENTS IN SAGINAW COUNTY

Jadrianna Sobczak, Rebecca A. Schlaff, David M. Callejo-Perez, & Joshua J. Ode
Saginaw Valley State University, University Center, MI

Saginaw County is ranked 76th out of 82 counties in Michigan for overall health. Although the county is ethnically diverse and encompasses both urban and rural areas, little is known about whether these factors influence residents' perceived severity and importance of key health issues within their community. **PURPOSE:** To evaluate how demographic and lifestyle factors influence the perception of key health issues among residents in Saginaw County. **METHODS:** A survey was used to determine factors that predict community members' perceptions of key health issues (n=212). Participants self-reported several demographic and lifestyle variables including: location of residence (urban or non-urban), gender, height, weight, physical activity, race, and income. Participants rated key health issues [diabetes, cancer, heart disease, stroke, obesity (BMI>30) and physical inactivity (<150 minutes/week)] on a scale from least important to most important according to perceived severity and need for attention in their community. The percentages of participants that selected "most important" for each key health issue were compared within each demographic or lifestyle variable. Prevalence estimates were calculated for demographic/lifestyle variables and key health issues. Chi-Square analyses were used to determine relationships between these factors . An alpha level of 0.05 was used to determine statistical significance. **RESULTS:** Location of residence was significantly related to perceived importance/severity of diabetes (86.6% urban vs. 76.8% nonurban; p= 0.047), cancer (81.2% urban vs. 92.9% non-urban; p=0.04), and physical inactivity (65.3% urban vs. 80.3% non-urban; p=0.04). Race was significantly related to perceived importance/severity of diabetes, cancer, heart disease, stroke, and obesity (p=0.002-0.048). Gender was significantly related to perceived importance/severity of obesity (95.0% female vs. 77.6% male; p= 0.002). Income was significantly related to perceived importance/severity of diabetes (p=0.006). Meeting physical activity guidelines and obesity were not associated with perceived severity of any key health issues (p=0.12-0.99). **CONCLUSION:** Our findings indicate that location of residence, race, gender and income impact Saginaw County residents' perception of disease importance and severity. These results suggest that intervention and prevention efforts of key health issues in diverse areas may benefit from knowledge of demographic and lifestyle variables, as these factors may influence residents' readiness to change.

P4-#13 8:30-10:15am

POSTPARTUM WEIGHT RETENTION: IS IT ASSOCIATED WITH LEISURE-TIME PHYSICAL ACTIVITY AND GESTATIONAL WEIGHT GAIN?

Rebecca A. Schlaff[1], Claudia Holzman[2], Kimberly Maier[2], Karin A. Pfeiffer[2], FACSM, & James M. Pivarnik[2], FACSM
[1]Saginaw Valley State University, University Center, MI; [2]Michigan State University, East Lansing, MI

PURPOSE: The purpose of this study was to prospectively examine the separate and combined effects of gestational weight gain (GWG), and pregnancy and postpartum leisure-time physical activity (LTPA), on postpartum weight retention (PPWR) at six months postpartum. **METHODS:** Our sample consisted of a subset of women from the Archive for Research on Child Health (ARCH) study who were contacted in the postpartum period (n=68). Pre-pregnancy weight was obtained via questionnaire at enrollment and abstracted from each woman's birth certificate after delivery. GWG was calculated by subtracting pre-pregnancy weight (self-reported at study enrollment or abstracted from birth certificates) from weight at delivery (abstracted from birth certificates) and classified as "excess" or "not excess" using the upper limit of the 2009 IOM recommended ranges. Pregnancy LTPA was self-reported via enrollment questionnaire, and six month postpartum LTPA was self-reported via phone interview. Each LTPA variable was dichotomized as "meeting recs" (≥150 minutes of moderate and/or vigorous activity per week) or "not meeting recs". Each pre-pregnancy weight estimate was subtracted from self-reported postpartum weight to calculate two different values of six month PPWR. Linear regression was used to examine independent and combined associations between GWG and LTPA (pregnancy and postpartum) on the outcome of PPWR. **RESULTS:** The prevalence of excess GWG ranged from 53-57%, and average six month PPWR ranged from 2-4 kg, depending on estimate of pre-pregnancy weight utilized in calculations. Both estimates of excess GWG were independently associated with increased PPWR (R^2=0.12-0.21). Of the total sample, 45% and 52% met LTPA recommendations during pregnancy and at six months postpartum, respectively. Meeting pregnancy and postpartum LTPA recommendations did not significantly predict PPWR (R^2=0.001-0.02). In the combined model and after adjusting for pre-pregnancy BMI and breastfeeding, excess GWG remained the only significant predictor of PPWR. **CONCLUSION:** Our findings highlight the importance of appropriate GWG in reducing PPWR. To better inform interventions and clinical practice, research with

improved methodologies (particularly with regard to LTPA assessment) is needed to more precisely explore the interrelationships among GWG, pregnancy LTPA, postpartum LTPA, and PPWR.

P4-#14 8:30-10:15am

USING SOCIAL ECOLOGICAL THEORY TO DETERMINE WORKSITE WELLNESS PROGRAMMING BARRIERS WITHIN A PRIVATE MIDWESTERN HIGHER EDUCATION SETTING

Sara L. Terrell
Ohio Northern University, Ada, Ohio

Worksite wellness and disease state management (DSM) programs improve employee health, reduce health-related expenditures, and improve job satisfaction. Higher education settings offer a unique opportunity to foster interdisciplinary collaboration between allied health disciplines to facilitate wellness and DSM programs for employees. However, optimizing positive outcomes is dependent upon maximizing employee participation. **PURPOSE**: The purpose of this research was to assess employees' perceived barriers to participation within an employee wellness program implemented by an interdisciplinary health care team (*ONU HEALTHWISE*) comprised of Exercise Physiology faculty and Pharmacy faculty within a private Midwestern university. **METHODS:** Data was collected and analyzed from 249 employees' survey responses related to the Social Ecological (SE) model and the Partnership for Prevention's *Lead by Example* (LBE) initiative. Statistical procedures included T-test, ANOVA, post hoc analysis, and Pearson's R to assess differences in responses based on gender, self-reported medical condition, and employee classification. **RESULTS**: Results indicate employees value wellness programming differently based on gender ($p \leq .021$). Differences between faculty, staff and administration existed related to institutional barriers of technology ($p \leq .049$), fitness facility ($p \leq .004$), flex time ($p \leq .041$), and paid time off to participate ($p \leq .007$). *Lead by Example* results indicate a significant difference based on employee classification in the following subscales: business alignment with health promotion goals ($p \leq .001$), integration of health promotion objectives annually into the university's strategic plan ($p \leq .009$), awareness of the link between employee health and business outcomes ($p \leq .000$), and leadership support for participation ($p \leq .001$). **CONCLUSIONS**: An employee's health behavior such as choosing to participate in worksite wellness programs is determined by several strata of influence. Results indicate *HEALTHWISE* is valued by employees, but interpersonal and institutional barriers may exist. LBE results indicate a need for collaboration between university administration and the *HEALTHWISE* team to better integrate *HEALTHWISE* within the university's infrastructure. Employee participation in *HEALTHWISE* is linked to financial rewards. Therefore, the Social Ecology model provides the *HEALTHWISE* team and university leaders a necessary framework for future decisions vital to improving employee participation and the university's overall health climate.

P4-#15 8:30-10:15am

CHANGES IN INTENSITY OF PHYSICAL ACTIVITY DURING A UNIVERSITY INCENTIVE-BASED WEIGHT LOSS CHALLENGE

Jessica E. Mospan[1], James M. Pivarnik[2], FACSM, & Jeremy L. Knous[1].
[1]Saginaw Valley State University, University Center, Michigan; [2]Michigan State University, East Lansing, Michigan.

With health care costs for conditions associated with excess weight exceeding $200 billion/year and new laws for health care required by employers, strategic options to decrease these costs are necessary. Worksite health and wellness programs across the nation have been eager to offer employees programs which promote healthy lifestyles to decrease the prevalence of overweight, obesity, and other chronic disease risk factors. **PURPOSE:** To determine if moderate (MPA), vigorous (VPA), and/or total physical activity (TPA) increased and was related to weight loss during a university incentivized Weight Loss Challenge (WLC). **METHODS:** Following the WLC, 6 males and 16 females completed a survey which evaluated MPA and VPA participation prior to and during the challenge. MET/MIN were used to quantify amount of PA (MPA=4 METS, VPA=6 METS). TPA was calculated by adding MPA and VPA. The following variables were created: MET/MIN for MPA, VPA, and TPA prior to and during the WLC, and the change in MET/MIN between like intensities prior to and during the WLC. Additionally, change in pre-post WLC weight was calculated. A t-test was conducted to determine if the change in weight post WLC was significantly different from pre WLC values. Also, a t-test compared the like intensity variables prior to and during the WLC. Finally, correlations were run between each intensity variable versus change in weight to determine any relationships between intensity and weight change. **RESULTS:** Weight significantly decreased over the WLC (-6.8±7.8 lbs.). VPA MET/MIN increased significantly ($\rho<0.05$), while MPA MET/MIN decreased and TPA MET/MIN increased, but neither were statistically significant ($\rho=0.8499$, $\rho=0.1101$ respectively). When variables were correlated with change in weight, none displayed a significant relationship ($r=0.010788$-$r=0.38735$). **CONCLUSION:** Overall, since TPA did not significantly increase, MPA decreased, and VPA increased significantly, it is possible that participants substituted time spent in MPA with VPA to attempt to increase their daily energy expenditure. Additionally, although questions about diet were not asked, dietary alterations may have affected overall weight loss significantly. Further research is necessary to determine the interaction between diet and PA during programs such as weight loss challenges.

P4-#16 8:30-10:15am

ACCURACY AND PRECISION OF BIA AND URINE SPECIFIC GRAVITY FOR TRACKING EXERCISE-INDUCED DEHYDRATION

Nhu Ly, Dimitrios Simeakis, Karrie L. Hamstra-Wright, Craig A. Horswill
Department of Kinesiology & Nutrition, University of Illinois at Chicago, Chicago, IL

Bioelectrical impedance analysis (BIA) and urine specific gravity (USG) are two methods widely accepted to assess hydration status. These methods require that the individual be in a chronic, steady state of hydration. **PURPOSE:** The purpose of this study was to assess the accuracy and precision of these methods when an acute change in hydration has occurred. **METHODS:** Endurance-trained male runners (n=11; mean ±SD: Wt: 64.7 ±6.0 kg; Ht: 176.7 ±4.8 cm; VO_2max: 72.6 ±5.3 mL/kg/min; % fat: 9.0 ±1.6%) were studied. Each participated in three 90-min outdoor training sessions of moderate intensity running. No fluids were consumed during the exercise to elicit ~2% body mass loss (dehydration). Before and after exercise, body mass, USG, and BIA were measured. The equations of Chumlea et al (Int J Obesity 2002) were used to calculate total body water (TBW) from BIA. Paired t-tests were used to establish differences with change in hydration. Correlation coefficients were calculated to determine if a relationship existed among changes in body mass, TBW, and USG. For the correlations, the data were handled as though each trial was an individual observation, providing a maximum of 33 data points. **RESULTS:** The results (mean ±SD) for the change in body mass, TBW, and USG were -1.47 ±0.33 kg, -0.61 ±1.40 L, 0.0030 ±0.0059, respectively. All values were significantly different from zero ($p < 0.05$), indicating significant, detectable shifts in hydration. For the relationships, none of the correlation coefficients were significant (change in TBW vs change in body mass, $r = 0.06$; change in USG vs change in body mass, $r = 0.17$). **CONCLUSION:** Using the change in body mass as the criterion variable for the change in hydration, both BIA and USG are relatively accurate for detecting change in hydration. However, neither method appears to be reliable for predicting a precise change in hydration status. This could be a result of a technical issue of the methodology, biological variability, or a statistical nuance due to range restriction since the change in body mass was consistently 2%.

2011 MWACSM ANNUAL MEETING

University Place
Conference Center & Hotel
IUPUI, Indianapolis, IN
October 28-29, 2011

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Past Founder's Award Winners

Year	Recipient
2010	Jim Pivarnik
2009	Helaine Alessio
2008	Elaine Betts
2007	Lynn Darby
2006	Barry Franklin
2005	Tony Mahon
2004	Jeff Betts
2003	Lynn Millar
2002	Jeff Edwards
2001	Darlene Sedlock
2000	Ann Snyder
1999	Wayne Sinning
1998	Richard Parr
1997	Leonard Kaminsky
1996	Merle Foss Henry Montoye Fazlola Nickhah
1995	Richard Bowers
1994	Tim Kirby

Jim Pivarnik, Ph.D., FACSM, Recipient of the 2010 Founder's Award

WELCOME LETTER

October 18, 2011

Dear MWACSM 2011 Conference Participants,

Welcome to the 2011 Midwest Chapter of American College of Sports Medicine's annual meeting. On behalf of the Board of Directors, I would like to extend a warm welcome and our excitement that you have chosen to join us. I am excited about this meeting because it closes out our 4th decade as a regional chapter of the American College of Sports Medicine. As we conclude this milestone for the Chapter, we are undertaking an important business item this year as we vote on whether to adopt an updated Constitution and Bylaws for the chapter.

In addition to this important item of chapter business, I think that we have a put together a very exciting scientific meeting for the Chapter. We are starting with a clinical session on Friday morning that is followed by 11 symposia/tutorials, 12 orals presentations, and 31 poster presentations. In addition to these exciting presentations, we have the honor having Drs. Steve Roth (FACSM) and Mindy Millard-Stafford (FACSM) present our keynote address. Dr. Roth is from the University of Maryland and is a one of the leading experts on genetics and physical performance. He will be presenting a talk entitled "Genetics and sport: the Jekyll and Hyde of an emerging field." Dr. Millard-Stafford is from the Georgia Institute of Technology as well as a Past-President on the American College of Sports Medicine. Dr. Millard Stafford will be giving a keynote talk entitled "The Physiology of Endurance Performance: What Do We Really Know?"

In addition to the scientific sessions, I encourage attendees to engage plenty of social interaction, as well. On Friday night, come watch our jeopardy competition to see who will win the honor to represent our chapter at the National ACSM meeting in San Francisco in 2012. Also, be sure to look out for MWACSM board members and attendees in down town Indianapolis on Friday night. Additionally, if you have chance, try to check of ACSM national headquarters and their brick garden along the canal.

I would also like to thank Dr. Stacy Fischer for organizing the morning clinical session and obtaining the CMEs for that session. I would like to thank Drs. Mike Godard (MWACSM President-Elect) and Brenda Reeves (MWASCM President) for the advice and guidance on helping plan this meeting. I would like to thank the Board-of-Directors for their input into the meeting, as well. Lastly, I would like to thank Dr. Lynn Darby, who has been the Executive Director for the Chapter during my time as President-Elect, President, and Past-President. Her sage guidance has been invaluable to me during this time. Unfortunately, Dr. Darby is stepping down as Executive Director; so, if you are interested in serving the Chapter in this position, please see the RFP on our web site.

I would like to invite you to attend the 2012 at Maumee Bay outside of Toledo. The 2012 meeting will mark the 40th anniversary of our chapter. Dr. Reeves is planning and exciting meeting that will highlight many of the achievements of the chapter. Lastly, I want to thank you for attending this meeting, and I hope you have a fun time while learning new information at this meeting.

Sincerely,

Jeff T Lem

Jeff Lemmer, Ph.D., MWACSM Past-President

Thank you to these SPONSORS and EXHIBITORS for their support of the 2011 MWACSM Annual Meeting! Their contributions are greatly appreciated!

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...for all of their contributions to MWACSM and to the Annual Meeting

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Indianapolis

MWACSM Graduate Assistants

Janel Sweitzer
Bowling Green State University

Yu Zhang
Bowling Green State University

Conference Information

OBJECTIVES

The 2011 meeting of the MWACSM is designed to:

- Enhance the scientific and clinical understanding of the physiological, biochemical, and psychological basis for the changes that occur during and following exercise in both normal and pathological states;
- Provide a forum for members and students to present research related to exercise science and sports medicine; and
- Promote interaction among scientists, clinicians, and students in related fields to provide new approaches to, and perspectives on, problems in exercise science and sports medicine.

TARGET AUDIENCE

MWACSM members, ACSM members, clinicians, professionals, and students interested in the field of sports medicine and exercise science.

ACSM Continuing Education Credits (CEC's)

The American College of Sports Medicine's Professional Education Committee certifies that this annual meeting meets the criteria for 11 credit hours of ACSM Continuing Education Credit. Credit is awarded for these CECs by attending the "Midwest Regional Chapter ACSM Annual Meeting." The MWACSM is an "Approved Provider" of CEC for ACSM. A card documenting completion of 11 CEC's is included this program.

NAME BADGES

Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Please hold on to your badge!

MEETING LOCATIONS

All sessions and events unless otherwise noted will be held at the official conference site. Room assignments for events are detailed in this program, along with a map of the conference site.

ANNUAL BUSINESS MEETING ON SATURDAY KEYNOTE SESSION

The annual business meeting is scheduled for Saturday at the luncheon. The annual business meeting is your opportunity to participate in the activities of the Midwest Chapter of ACSM. Please plan to attend Saturday.

AWARDS

The annual 'Founder's Award' and the Professional Award will be announced at the Business Meeting on Saturday. The Founder's Award is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

FUTURE MEETING SITE

Maumee Bay State Park, Oregon, OH (near Toledo, OH), October 31 to November 3, 2012
NOTE: This will be 40th anniversary of the founding of the Midwest Regional Chapter of ACSM.

Continuing Education Credits Certificate

ACSM CEC Certificate

Participant Name

Midwest Regional Chapter of the American College of Sports Medicine
Organization

2011 MWACSM Annual Meeting. Indianapolis. IN
Course Title

650390 — Approved Provider Number

11 — CECs Awarded

Lead Program Administrator Signature

ACSM APPROVED PROVIDER

AAFP
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Continuing Medical Education Credit (CME)

"This Live activity, Annual Meeting of the Midwest Regional Chapter of the American College of Sports Medicine, with a beginning date of October 28, 2011 has been reviewed and is acceptable for up to ***3.75 Prescribed credits*** by **the American Academy of Family Physicians**. Physicians should claim only the credit commensurate with the extent of their participation in the activity." (AAFP - COCPD, 2011)

2011 MWACSM Annual Meeting Schedule

Friday, October 28, 2011 Morning

Time	Event	Moderator	Location
8:00 am - 5:00 pm	**Registration**		Lobby
11:30 - 4:30 pm	**Refreshments** (cookies, snacks, fruits, juices, coffee, soda, etc.)		Outside Rooms 118 and 132
12:00 – 5:00 pm	**Exhibitors/Graduate Program Tables**	Dr. Tony Kaleth	Lobby/Slate Hall
8:00 – 9:00 am	**Case Presentations** Anastasia Fischer, M.D.; Panelists: Richard Rodenberg, M.D., Deepak Patel, M.D., James MacDonald, M.D., Eric Bowman, D.O.	Dr. Stacy Fischer	Room 118
9:00 – 9:30 am	**The Trouble with Kids: Pediatric Sports Injuries Not to be Missed** James MacDonald, M.D.	Dr. Stacy Fischer	Room 118
9:30 – 10:00 am	**The Female Athlete Triad** Anastasia Fischer, M.D.	Dr. James MacDonald	Room 118
10:00 – 10:30 am	**Update on Concussion – What's new on the legal side of concussion?** Eric Bowman, D.O.	Dr. Stacy Fischer	Room 118
10:30 - 11:00 am	**Patellofemoral Syndrome** Deepak Patel, M.D.	Dr. Stacy Fischer	Room 118
11:00 - 12:00 pm	**Debate: ECGs in the pre-participation physical** Anastasia Fischer, M.D., Richard Rodenberg, M.D.	Dr. Stacy Fischer	Room 118
12:00 – 12:30 pm	**Break** (Refreshments outside Rooms 118 and 132)		
12:30 – 1:30 pm	**Turning Failure Into Success: Exercise Training The Patient With A Left Ventricular Assist Device** Dennis Kerrigan, Ph.D.	Dr. Paul Nagelkirk	Room 118
12:30 -1:30 pm	**Resistance Training For Triathletes: Research And Practical Application** Willard W. Peveler, Ph.D. and Andy Bosak, Ph. D.	Dr. Jeffrey Lemmer	Room 132

2011 MWACSM Annual Meeting Schedule

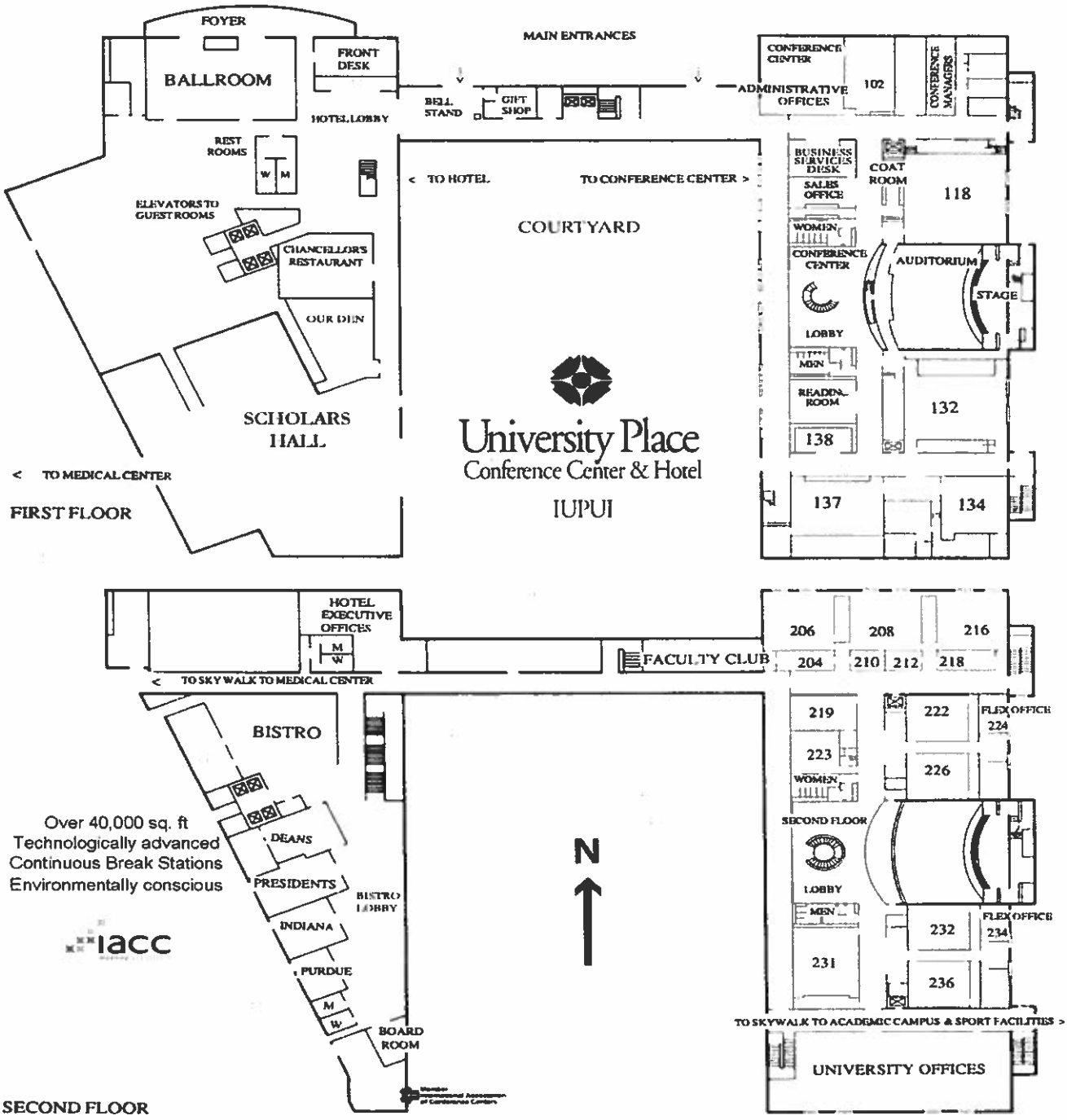
Friday, October 28, 2011 Afternoon

Time	Event	Moderator	Location
11:30 - 4:30 pm	Refreshments (cookies, snacks, fruits, juices, soda)		
1:30 – 4:30 pm	**Poster Session** **1:30-2:30 pm** (Authors of Even Numbered Posters Present) **2:45 pm – 3:45 pm** (Authors of Odd Numbered Posters Present)	Posters displayed 1:30 – 4:30 pm	Slate Hall
1:30 – 2:30 pm	**Oral Session I**	Dr. Jim Pivarnik	Room 118
2:30 – 2:45 pm	**Break** (Refreshments by Rooms 118 and 132)		
2:45 – 3:45 pm	**Why Should I Advocate? What Students And Post Graduates Should Know About Advocacy** Robert A. Oppliger, Ph.D., FACSM, Dan Henkel, ACSM Senior Director of Communications and Advocacy	Dr. Helaine Alessio	Room 118
3:45 – 4:45 pm	**Student Session: "Choosing the Right Graduate Program: From mascots to funding, understanding what to look for when deciding where to apply"** Heather Hayes, M.A., Mallory Marshall, M.S., and Adam Smith, Michigan State University, Dasmyn Langston, Grand Valley State University, and Kallie Hitchings, Bowling Green State University	Heather Hayes	Room 132
3:45 – 4:45 pm	**Creating A Better Exercise Science Graduate Through Service-Learning: How Can I Connect The Exercise Science Coursework And Experiential "Real" Work?** Jaimy M. Dyer, Ph.D., Amy Jo Sutterluety, Ph.D., FACSM	Dr. Heather Gulgin	Room 118
4:30 – 5:00 pm	Jeopardy Setup	Dr. Amanda Salacinski	Ballroom
5:00 – 6:00 pm	**Jeopardy**	Dr. Jeff Lemmer	Ballroom
6:00 – 7:00 pm	**Genetics and sport: the Jekyll and Hyde of an emerging field** Steve Roth, Ph.D., FACSM, University of Maryland (Keynote Speaker)	Dr. Jeff Lemmer	Ballroom
7:00 pm	Organized MW events finished for the evening		

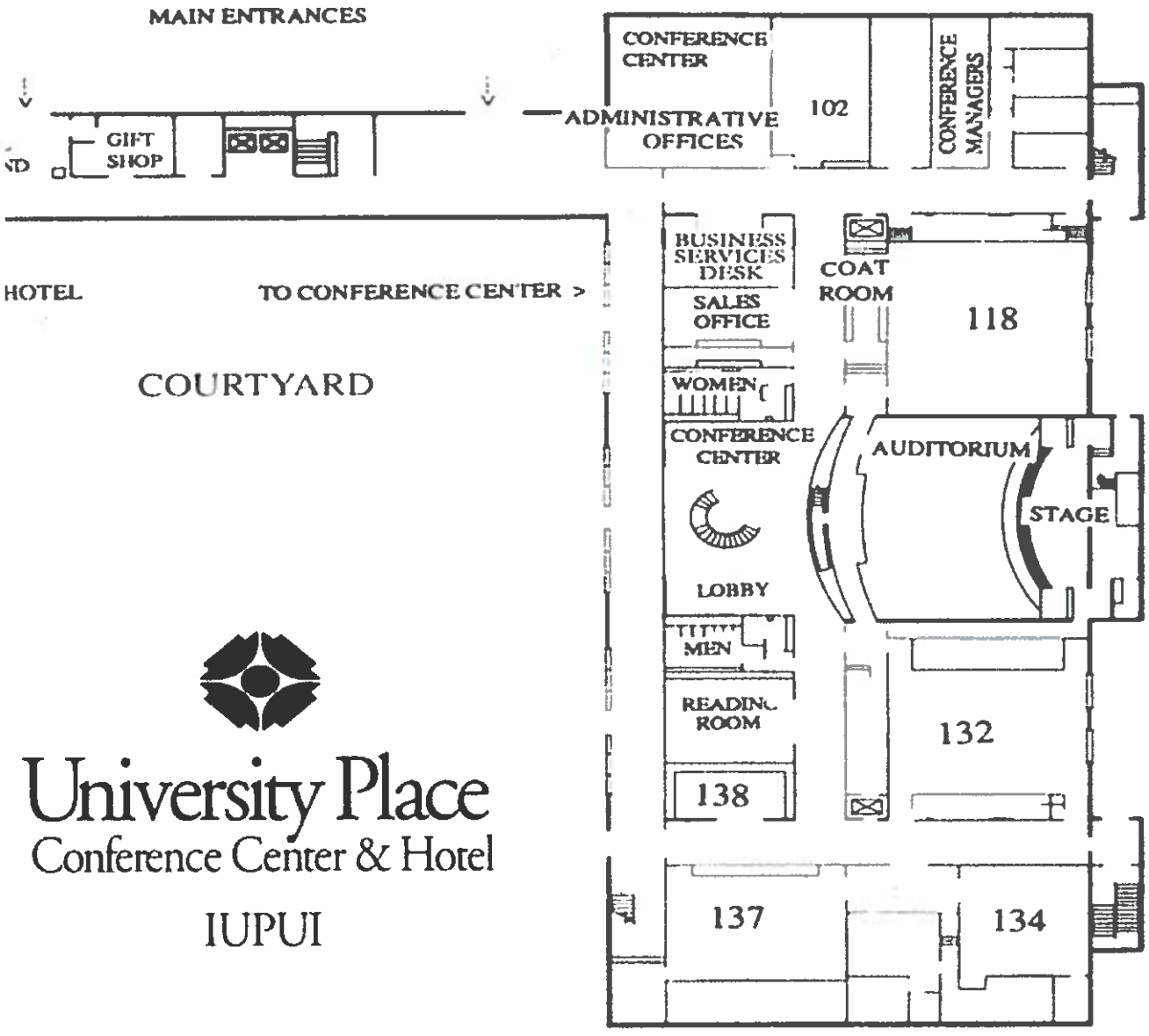
Saturday, October 29, 2011 Schedule of Events

Time	Event	Moderator	Location
7:30 am – 10:00 am	Registration		Lobby
7:30 am - 11:30 am	**Refreshments:** Coffee, bagels, yogurt, fruit, pastries, sodas, juices, etc.)		Outside Auditorium
8:00 am – 11:00 am	Exhibitors	Dr. Lynn Darby	Lobby/ Slate Hall
8:00 am - 9:00 am	**Physiological Adaptations to Long-term Altitude Exposure: Implications for Exercise Performance** John E. Davis, Ed.D.	Dr. Jeremy Knous	Room 132
8:00 am – 9:00 am	**Off-Road Endurance Sports: Trail Running And Mountain Biking** Andy Bosak, Ph. D., and Willard Peveler, Ph.D.	Dr. Craig Broeder	Room 118
9:00 am- 10:00 am	**The Importance Of Quality Sports Performance Monitoring For Improving Athletic Training Outcome Goals** Craig E. Broeder, Ph.D., FACSM	Dr. Karin Pfeiffer	Room 132
9:00 am – 10:00 am	**Campus and Community Physical Activity Partnerships To Promote Health** Nicole R. Keith, Ph.D., FACSM, Mary De Groot, Ph.D., Kisha Virgil, M.P.H.	Dr. Julianne Wallace	Room 118
10:00 am -11:00 am	**Oral Session II**	Dr. Adam Coughlin	Room 132
10:00 am -11:00 am	**Oral Session III**	Dr. Jeff Edwards	Room 118
11:00 am - 11:30 am	**Business Meeting** Recognize Schools for EIM on Campus		Auditorium
11:30 am –12:30 pm	**The Physiology of Endurance Performance: What Do We Really Know?** Mindy Millard-Stafford, Ph.D., FACSM, and 52nd President of ACSM, Georgia Institute of Technology (Keynote Speaker)	Dr. Jeff Lemmer	Auditorium

Conference Center Map



First Floor Map - Enlarged



Featured Keynote Speakers

Mindy Millard-Stafford, Ph.D., FACSM

Dr. Melinda (Mindy) Millard-Stafford is Professor and Associate Chair in the School of Applied Physiology at Georgia Institute of Technology in Atlanta, GA, where she directs the Exercise Physiology Laboratory. Over a 25-year career at Georgia Tech, she rose through the academic ranks as an Assistant Professor to her current appointment as Full Professor and Graduate Coordinator of the doctoral program that began in 2005. Mindy received her B.S. in Physical Education from The Pennsylvania State University where she was a 4-year letter winner in women's swimming and team captain. She went on to earn her Masters' degree in physical education from the University of Florida under the tutelage of Dr. Christian Zauner and the late Dr. Robert Cade (Inventor of Gatorade). After working as Head Swim Coach and Instructor at Mount Holyoke College, she moved south again to earn her Doctorate in Exercise Physiology at the University of Georgia in 1986 under Dr. Kirk Cureton.

Dr. Millard-Stafford is an experienced investigator in applied exercise physiology, with her work centered around the interface of nutritional and environmental influences on exercise performance. She serves on the Editorial Board for three international journals: *International Journal of Sports Nutrition and Exercise Metabolism, International Journal of Sports Physiology and Performance*, and Journal of *Strength & Conditioning Research*. Her achievements prompted induction into the National Academy of Kinesiology in 2003. Dr. Millard-Stafford is the Past-President of the Southeastern Chapter of the American College of Sports Medicine, and elected to the Board of Trustees, Vice-President and, then in 2008, President of the American College of Sports Medicine as the 5th Woman President in its 54 year history.

Featured Keynote Speakers (cont.)

Stephen M. Roth, Ph.D., FACSM

Stephen M. Roth, Ph.D., has extensive training in both exercise science and human genetics, and maintains a research program dedicated to understanding the genetic aspects of exercise in the contexts of aging and health. He graduated from the University of Montana with a B.S. in health and human performance in 1996 and then completed his M.A. and PhD degrees in Kinesiology from the University of Maryland in 2000, focusing on strength training and aging skeletal muscle. He then moved to the University of Pittsburgh where he completed postdoctoral training in human genetics and began to develop his specialization in the genetic aspects of exercise and health. In 2003 he was recruited back to the University of Maryland as an Assistant Professor in the Department of Kinesiology and Director of the Functional Genomics Laboratory, a 1000 sq. ft. wet lab dedicated to exercise genetics research. He has been funded by the NIH (R21, K01, R01) to perform a variety of genetic investigations. He was promoted to Associate Professor with tenure in 2009. Dr. Roth is an author or co-author for over 70 peer-reviewed articles, book chapters, etc., including a sole-author textbook with Human Kinetics entitled, "Genetics Primer for Exercise Science and Health" and a co-editor for a recently published book with Humana Press entitled, "Exercise Genomics." Steve has been married since 1998 to Nancy Roth and has three children: Nels (11 yr), Ellyn (8 yr.), and Anna (5 yr.).

Clinical Session Presenters

Anastasia Fischer, M.D.

Anastasia Fischer, MD, is a member of Sports Medicine and the Section of Ambulatory Pediatrics at Nationwide Children's Hospital and a Clinical Assistant Professor of Pediatrics at The Ohio State University College of Medicine. She is fellowship trained and board certified in sports medicine, and is a member of the American College of Sports Medicine and the American Medical Society for Sports Medicine. Dr. Fischer obtained a master's degree in Exercise Physiology from the University of Georgia. She then attended medical school at The Ohio State University College of Medicine before completing a family practice residency at University of Pittsburgh Medical Center and a sports medicine fellowship at Maine Medical Center in Portland, Maine. She is currently a member at large on the Board of Directors for MWACSM.

Richard E. Rodenberg, M.D.

Richard E. Rodenberg, MD, joined Nationwide Children's Hospital Sports Medicine in 2007 and is a Clinical Assistant Professor of Pediatrics at The Ohio State University College of Medicine. He is board certified in internal medicine, pediatrics and primary care sports medicine. As a team physician, Dr. Rodenberg has cared for high school, Division I, II, and III collegiate and professional athletes. Prior to joining Nationwide Children's, he was program director for Grant Medical Center's Primary Care Sports Medicine Fellowship. His experience includes teaching at the University of Kentucky in internal medicine, pediatrics, and sports medicine, while caring for the Wildcats athletic teams. He also served as team physician at Big Walnut High School in the central Ohio area.

Deepak S. Patel, M.D., FAAFP

Dr. Patel is Director of Sports Medicine at Rush Copley Family Medicine Residency Program in Aurora, IL and Assistant Professor, Rush Medical College in Chicago, IL. He also practices Family Medicine and Sports Medicine at Yorkville Primary Care in Yorkville, IL. He serves as team physician for Plano and Oswego High Schools.

Clinical Session Presenters (cont.)

James MacDonald, M.D.

Jim MacDonald is a graduate of Harvard College and Medical School. He trained in Family Medicine in Maine. He did his sports medicine fellowship at Children's Hospital, Boston. Prior to coming to Columbus to join Nationwide Children's Hospital Division of Sports Medicine, he practiced sports medicine at the University of California.

Eric Bowman, D.O.

Dr. Bowman, the Nationwide Children's Hospital Sports Medicine Fellow for 2011-2012, is a lifelong resident of Ohio. He attended Capital University in Columbus, Ohio where he was a dual major in Biology and Religion, with a minor in Chemistry. He is a 2008 graduate of Ohio University College of Osteopathic Medicine and completed his pediatric residency at Nationwide Children's Hospital in Columbus, Ohio in 2011. During his time in medical school and residency, he played active roles in medical student and resident education policy and promoted the understanding and education of Osteopathic Manipulative Treatment. He has been involved as a player and official in multiple sports throughout his life including football, basketball, rugby, baseball, and golf. Dr. Bowman is a member of the American Academy of Pediatrics, American College of Osteopathic Pediatricians, American College of Sports Medicine, and American Medical Society of Sports Medicine. Professionally, he is interested in education and exploring the vital role that manipulative treatment can play in injury recovery. He enjoys camping, hiking, rugby, football, movies and exploring historical sites in his free time.

Dennis Kerrigan, Ph.D.

Dr. Kerrigan is a Senior Staff Member and Clinical Exercise Physiologist in Preventive Cardiology, Division of Cardiovascular Medicine, Department of Internal Medicine, Henry Ford Hospital, Detroit, Michigan, 2008 - Present. He currently oversees clinical exercise programs for patients with various chronic diseases. He is also the PI in a current study investigating the effects of a cardiac rehabilitation program on function and quality of life in patients with continuous-flow left ventricular assist devices. In addition to his research interest in patients with LVADs, he is also involved in exercise research involving cancer patients who are undergoing chemotherapy. Dr. Kerrigan earned his B.S. from Bowling Green State University (1998), his M.S. from Eastern Michigan University (2002), and his Ph.D. from The Ohio State University (2008). Dr. Kerrigan is also a Visiting Professor, School of Health Promotion & Human Performance, Eastern Michigan University, Ypsilanti, Michigan and an Adjunct Professor, Exercise Science Program, The School of Physical Activity & Educational Services, The Ohio State University, Columbus, Ohio.

Symposia and Tutorial Presenters

Willard Peveler, Ph.D.

Willard (Will) Peveler is an Assistant Professor of Exercise Science and a laboratory director with an extensive background in the sport of cycling and triathlon. The vast majority of Dr. Peveler's published works and presentations cover physiological and biomechanical factors that affect performance in the sports of cycling and triathlon. He has recently published The Complete Book of Road Cycling and Racing (McGraw-Hill, 2009). Dr. Peveler also has extensive Triathlon, Duathlon, Mountain Biking, and Running experience as both a competitor, in races such as Half-IronMan: Gulf Coast, Powerman Duathlon: Alabama, and XTERRA Mountain Bike Races, and as a cycling and triathlon coach.

Andy M. Bosak, Ph.D.

Andy Bosak is currently an Exercise Science Assistant Professor and Laboratory Director. Prior to completing his Ph.D., Dr. Bosak was a collegiate and national level distance runner, as well as a coach for various levels, in the sports of Cross Country and Track and Field. Dr. Bosak earned his Doctorate in Human Performance from the University of Alabama and is certified by both the National Strength and Conditioning Association (as a Certified Strength and Conditioning Specialist) and by the American College of Sports Medicine (as a Health Fitness Specialist). Dr. Bosak's research interests include: 1) Evaluating the recovery aspects from sport and occupational performance, 2) Assessing athletes' physiological changes pre, post, and during the sporting seasons, and 3) Analyzing the prevalence of low back pain in laborious (i.e., physically demanding) occupations.

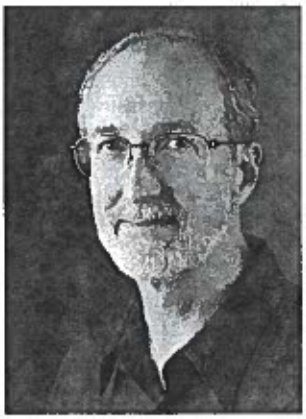
John E. Davis, Ed.D.

Dr. Davis received his doctorate from SUNY Buffalo and worked as a Post-Doctoral Fellow at Johns Hopkins University before taking his current position as a faculty member at Alma College in Alma, Michigan. He has been at Alma for 27 years where his current title is Charles A. Dana Professor of Integrative Physiology and Health Science. Dr. Davis has received grants from many different organizations including NASA and the National Science Foundation. His current research is supported by an NSF-STEP grant. After investigating the physiological adaptations to long-term spaceflight for a number of years, his current research interests focus on the physiological adaptations to high altitude exposure. Recently, Dr. Davis has lead several research expeditions to South America that have looked at the physiological adaptations to altitude in high altitude Andean natives. His research also examines long-term adaptation to altitude in sea- level residents.

Symposia and Tutorial Presenters (cont.)

Robert A. Oppliger, Ph.D., FACSM

Robert (Bob) A. Oppliger, Ph.D., FACSM has been a member of ACSM since 1976 and a fellow since 1987. His professional interests have focused on health and performance issues among wrestlers, body composition, and more recently policy initiatives promoting physical activity and exercise. He has authored or co-authored more than 50 articles and reviews, 75 abstracts including 40 at ACSM national or regional meetings and served continuously on ACSM committees since 1991. Away from the office Dr. Bob is an avid bicyclist, Master Gardener, and soccer referee.



Dan Henkel, APR

As senior director of communications and advocacy, Dan oversees internal and external communications and media relations and coordinates ACSM's advocacy and public policy program. Recent priorities include helping to pass state laws governing concussion in youth sports, as well as calling for renewal of federal physical activity guidelines. Dan's work puts him in daily contact with media who turn to ACSM for expert sources and research. He has a role in many of the College's coalitions, partnerships and initiatives. Dan earned a degree in communication and theatre from Indiana University and is Accredited in Public Relations by the Public Relations Society of America. He has received numerous awards form professional societies and has been named both a Distinguished Hoosier and a Sagamore of the Wabash.

Jaimy M. Dyer, Ph.D.

Currently teaches: Strength and Conditioning, Research Design and Statistics, Fitness and Health Promotion Management, Health Behavior Management, and Personal Wellness. Dr. Dyer serves as faculty advisor to the Lifespan student group in the Division and is involved in Faculty Student Collaboration research with HPE majors on a consistent basis. She is currently serving as faculty advisor for the B-W Student Government, editor for the Journal of Research and Creative Studies and is an active member of the American College of Sports Medicine at both the regional and national levels.

Symposia and Tutorial Presenters (cont.)

Amy Jo Sutterluety, Ph.D., FACSM

Currently teaches: Physiology of Exercise, Exercise Prescription for Special Populations, Health and Physical Fitness Assessment Techniques. She is the Academic Coordinator of Exercise Science/Pre-Physical Therapy for the Division, providing leadership in curricular and program development. She is advisor to the Pre-Physical Therapy/Exercise Science Student Organization and co-coordinator of Lifespan. She has been instrumental in securing funding and implementing an employee health promotion program on campus. She is past president of the Midwest American College of Sports Medicine, a participant in the Ohio Public Health Leadership Institute, and a Fellow of the American College of Sports Medicine. She is currently a speaker for the American Heart Association, a member of the Health Educators Association of Greater Cleveland and a member of the Certification and Credentialing Review Board of the American College of Sports Medicine. She recently became a Peer Reviewer for the MERLOT Teaching and Learning Organization, a leading edge, user-centered, searchable collection of peer reviewed and selected higher education, online learning materials. She received the Strosacker Award for Excellence in Teaching at Baldwin-Wallace College in 2000 and has been recognized by the Northeast Ohio Council on Higher Education for her excellence in teaching.

Craig Broeder, Ph.D., FACSM

Craig Broeder, Ph.D. FACSM, FNAASO is currently Founder and CEO of Exercising Nutritionally, LLC which is a clinical research and education company in Naperville, IL and the Chicago area. Dr. Broeder has been a member of ACSM for 25 plus years and a past board member of both SEACSM and MWACSM. He also served MWACSM as President in 2008 and is currently chairing MWACSM's sponsorship committee. He currently serves ACSM as a program accreditation site visitor and was an author for the *ACSM's Guidelines for Exercise Testing and Prescription* (Eight Edition).

In 2009, Dr. Broeder founded The Craig and Kay Broeder Preventive Female Exercise & Nutrition Fund managed by ACSM for he and his wife. In the summer of 2009 (May 15th to August 25th), Dr. Broeder honored his wife's 20th year of surviving ovarian cancer by cycling the perimeter US states (9,109 miles) in less than 100 days to raise money the ACSM Foundation. Currently, funds are being raised to film a documentary and book to help provide support for women diagnosed with ovarian cancer titled, "The Intimate Secretes of Surviving Ovarian Cancer - A Survivor's Perspective."

Symposia and Tutorial Presenters (cont.)

Mary de Groot, Ph.D.

Mary de Groot, Ph.D. is an Associate Professor in Endocrinology at the Indiana University School of Medicine. She is a Clinical Health Psychologist who completed her doctoral degree from the University of Rhode Island in collaboration with the Cancer Prevention Research Center. Dr. de Groot's research focuses on the development of community-based interventions for adults with type 2 diabetes and depression who live in under-resourced and underserved rural and urban communities. Dr. de Groot has created a successful community-based treatment program for depression for rural adults with type 2 diabetes entitled, Program ACTIVE. This program combines state-of-the-art talk therapy with community-based exercise. Dr. de Groot recently received funding from the National Institutes of Health to conduct a comparative effectiveness trial of Program ACTIVE in rural communities in Ohio and West Virginia. Dr. de Groot is the Co-Principal Investigator with Dr. Keith on Learning About the Needs and Desires of a School and Community-based Activity Program Evaluation (LANDSCAPE), a program evaluation of the Physically Active Residences Communities and Schools (PARCS) program.

NiCole R. Keith, Ph.D., FACSM

NiCole R. Keith, Ph.D., FACSM is an Associate Professor in the Indiana University-Purdue University Indianapolis, Department of Physical Education. Dr. Keith is a Fellow of the American College of Sports Medicine (ACSM), an elected member of its Board of Trustees, chairs ACSM's Committee on Diversity Action and is a member of the ACSM's Health and Fitness Summit Program Committee and the American Fitness Index and Exercise is Medicine Advisory Boards. She earned her B.S., M.S., and Ph.D. degrees from Howard University, University of Rhode Island, and University of Connecticut respectively. In 2009 Dr. Keith received a Career Award from the National Institutes of Health (National Heart, Lung, and Blood Institute). This 4-year award allows Dr. Keith to examine ways to improve physical fitness and health within an aging population. Dr. Keith also is co-founder of the Indiana University-Physically Active Residential Communities and Schools (PARCS) program. This 9-year old program is housed in three Indianapolis Public Schools (IPS) and provides physical activity opportunities for nearly 2,000 adults and children living in IPS communities. In 2011 she received an award from the Anthem Blue Cross and Blue Shield Foundation to measure the influence of PARCS on the health outcomes of its adult participants. She is the Co-Principal Investigator with Dr. Mary de Groot on Learning About the Needs and Desires of a School and Community-based Activity Program Evaluation (LANDSCAPE) which is the first program evaluation being conducted in PARCS nearly nine year history. Dr. Keith has dedicated her career to conducting research that reduces and eventually eliminates the existing racial and socio-economic health disparities gap.

Symposia and Tutorial Presenters (cont.)

Kisha Virgil, MPH, CHES, ACSM CPT

Kisha Virgil, MPH, CHES, ACSM CPT is a PhD student in the School of Health of Rehabilitation Sciences at Indiana University-Purdue University Indianapolis where she also earned her Master's of Public Health degree. She earned her B.S. degree from the University of Illinois. Kisha is a Certified Health Education Specialist, ACSM Certified Personal Trainer and serves on the Minority Health Coalition of Marion County. In 2010, Kisha was awarded Level II of the ACSM Leadership & Diversity Training program. Kisha has worked for The Principal Wellness Company for over five years as a Health Coach and Product Portfolio Consultant for worksite wellness program products. Kisha also works as project coordinator of the LANDSCAPE research study where she oversees graduate and undergraduate research assistants and helps coordinate research efforts. Kisha also does administrative work for the PARCS program. Kisha's research interests are reducing cardiovascular disease risk and reducing racial and socio-economic health disparities.

Clinical Case Studies

Friday, October 28, 2011, 8:00-9:00 a.m., Room 118

#1

RECURRING KNEE PAIN AND EFFUSIONS IN AN ADOLESCENT BALLERINA

James MacDonald, Nationwide Children's Hospital, the Ohio State University

HISTORY: A 13-year-old ballerina presented with left knee pain that had been bothering her for several months despite active treatment. She reported no history of specific trauma. Prior to presentation, her knee pain had been originally diagnosed as patellar instability. The patient would report activity-related popping and swelling of the knee. She was subsequently treated with physical therapy and a patellar stabilizer brace. She was able to continue dancing, but despite full compliance with prescribed treatment she would complain of recurring pain, 'popping,' and knee 'swelling'. She also noted morning stiffness in the joint. Her symptoms responded somewhat to ice and ibuprofen. Past Medical History was unremarkable. Family history was significant for a maternal aunt with severe psoriatic arthritis, severe enough to require total joint replacements as a young woman. **PHYSICAL EXAMINATION:** Well-developed, well-nourished young woman in no apparent distress. Ambulatory with a non-antalgic gait. Mild quadriceps atrophy was noted on the left leg. On exam there was no effusion, full, pain-free range of motion. There was a fullness and excess soft tissue appreciated over medial joint line, as well as pain to palpation here. A "J" sign was absent. Provocative tests such as Lachman's, Drawer tests, Apley's and McMurray's were all negative. Plain films obtained on day of visit, consisting of AP/lateral/notch/Merchant views showed a skeletally mature knee, with an incidental non-ossifying fibroma in the distal femur. Otherwise films were unremarkable. **DIFFERENTIAL DIAGNOSIS:** Patellar instability, patellofemoral syndrome, medial plica, Hoffa's fat pad syndrome, discoid meniscus, meniscal tear, meniscal cyst, juvenile rheumatoid arthritis (or other rheumatologic condition), synovitis NOS. **ADDITIONAL DATA/STUDIES:** Labs were notable for pertinent negatives (ESR, CRP, rheumatoid factor, CBCD and Complete Metabolic Panel all within normal limits) and a pertinent positive (ANA titer of 1:80). Given normalcy of plain films and concern regarding possible internal derangement of the knee an MRI was ordered. It revealed proliferation of the synovium posterior to Hoffa's fat pad, consistent with focal pigmented villonodular synovitis (PVNS). **FINAL DIAGNOSIS:** Focal pigmented villonodular synovitis (PVNS). **TREATMENT:** The patient was referred to surgical colleague for consultation and underwent left knee arthroscopy with synovial biopsy and partial synovectomy. Pathology confirmed the clinical diagnosis of PVNS. She was then referred to rheumatology for on-going management. She is on celecoxib twice a day and continuing home physical therapy. She has had recurrent effusions which have required aspiration. She has not been able to return to dancing.

#2

SCAPULAR DYSFUNCTION – SWIMMING

Eric Bowman, Nationwide Children's Hospital

HISTORY: A 10 year-old female involved in swimming, soccer, and basketball presented with a right scapula that was getting progressively more winged over the past year. It became a problem when she was doing her essential fitness test in gym class and was only able to do 15 push-ups when her shoulder felt like it wasn't working. She's had no injury or trauma. She has never had any numbness, tingling, gross weakness, or neck pain. She has a negative past medical history and is not on any medications. **PHYSICAL EXAMINATION:** She is an awake, alert, pleasant healthy appearing 10 year-old in no acute distress. Her neck and back have full range of motion without spinal or paraspinal tenderness. She has a negative Spurling, no scoliosis, kyphosis, or lordosis. She has no atrophy around the shoulder girdle, but obviously wings on the right scapula at rest. She protracts less well on the right when asked to go against resistance. There is no mass, redness, warmth, or rash noted around the shoulder girdle. When comparing the right shoulder to the left, she has full range of motion, relatively normal rotator cuff exam without pain, no atrophy, and her neurovascular exam is intact, including biceps and triceps reflexes at 2+/4, and sensory exam symmetric. She had AP, axillary, and scapular Y-view x-rays of the right shoulder that showed a bony excrescence off the scapular fossa measuring approximately 23-mm in greatest craniocaudal dimensions and approximately 10-mm in anterior to posterior dimensions. **DIFFERENTIAL DIAGNOSIS:** Some possible causes for her winged scapula include long thoracic nerve palsy leading to serratus anterior weakness, spinal accessory nerve palsy leading to trapezius weakness, dorsal scapular nerve palsy leading to rhomboid weakness, mass on chest wall or on undersurface of scapula, or aseptic necrosis of the humeral head. **ADDITIONAL DATA/STUDIES:** She also had a CT 3D reconstruction showing a broad-based osseous protrusion from the medial inferior right scapula, which had a base measuring 1.4 cm and slight flaring at the tip. There was no evidence of a sizable adjacent soft-tissue mass or bony destruction. The adjacent ribs appear to be intact without definite evidence for localized osseous erosive changes. The lesion projected anteriorly adjacent to one of the posterolateral ribs and also adjacent to the intercostal space. **FINAL WORKING DIAGNOSIS:** She was ultimately diagnosed with an osteochondroma of the undersurface of her right scapula causing a gradually progressive winging at rest of that scapula. **TREATMENT:** She was taken to the OR for surgical removal of the osteochondroma. The procedure was a 2-3 cm incision over the medial border of the scapula, down to subperiosteal level and around the undersurface of the osteochondroma where a Hohmann retractor and osteotome was used to dissect without difficulty. Bone wax was placed on the stalk of the osteochondroma. **OUTCOME:** She had a successful outcome and was sent home the same day of the procedure. She has returned to full participation in all of her activities and she has required no additional follow up.

Abstracts – Oral Presentations

Friday, October 28, 2011, 1:30-2:30 p.m. in Room 118, Abstracts #1-#4
Moderator for the Session: Jim Pivarnik, Ph.D., FACSM

#1 Oral Presentation, Friday, October 28, 1:30 p.m., Room 118

PARTICIPATION IN A WORKSITE WELLNESS PROGRAM AS COMPARED TO LIESURE-TIME PHYSICAL ACTIVITY LEVELS AND AEROBIC CAPACITY

Samantha J. Danbert[1], Jeremy L. Knous[1], Rebecca A. Schlaff[2], James M. Pivarnik[2], FACSM, [1]Saginaw Valley State University, Saginaw, Michigan [2]Michigan State University East Lansing, Michigan

In developing worksite wellness programs it is important to identify characteristics of active participants. Furthermore, studies have found worksite wellness programs to improve biometrics and employee behaviors, however their effect on aerobic capacity (VO2max) and leisure-time physical activity (LTPA) levels is not well established. **PURPOSE**: Our purposes were to 1) provide information about active University worksite wellness participants and 2) determine the relationships between time spent in a worksite wellness program, LTPA levels, and fitness measures. **METHODS**: Participants included faculty/staff enrolled in a worksite wellness program ranging from 1 to 72 months (n=68). Fitness assessments (anthropometry, body composition, aerobic capacity, muscular strength, muscular endurance, and flexibility) were administered three times per year. Participants' most recent results were used for analyses. VO2max was estimated via a submaximal treadmill test and self-reported LTPA was assessed via the Global Physical Activity Questionnaire (MET.min/wk). MET values were assigned to self-reported physical activities using the Compendium of Physical Activities. Descriptive statistics were calculated using means and standard deviations. The sample was split into three groups based on time spent in the program (1-20, 21-36, >36 months). Relationships between time spent in a wellness program and 1) LTPA levels and 2) fitness measures were assessed via a one-way ANOVA. **RESULTS**: Mean(+SD) age was 43.6+10.3 years and 66% of participants were female. Participants reported engaging in strength and flexibility training an average of 2.2+1.9 and 2.2+2.0 times per week, respectively. Mean(+SD) BMI was 25.9+5.1 kg/m2, % fat was 28.5+8.1, VO2max was 34.7+8.2 ml/kg/min, and MET.min/wk was 2103+1769. VO2max of participants enrolled for 1-20 months was significantly higher than those enrolled for 21-36 months (36.0 vs. 30.8 ml/kg/min; p=.04). No significant differences were found in BMI, %fat, muscular strength, muscular endurance, flexibility, or MET.min/wk (p=.85). **CONCLUSION**: Descriptive statistics of active worksite wellness participants may help to create effective programming to improve participation and fitness measures. Our results suggest that length of time spent in a worksite wellness program is not related to LTPA levels, but may have a relationship with aerobic capacity. Longitudinal data collected at consistent time points might help explain the observed differences in aerobic capacity.

#2 Oral Presentation, Friday, October 28, 1:45 p.m., Room 118

MEASUREMENT OF ENERGY EXPENDITURE DURING PREGNANCY AND POSTPARTUM

Alaina K. Vince, Rebecca A. Schlaff, Karin A. Pfeiffer, FACSM, Kimberly Maier, & James M. Pivarnik, FACSM Michigan State University, East Lansing, Michigan

Recall questionnaires use MET values from the Compendium of Physical Activities (Compendium: Ainsworth, et al. 2011) to assess energy expenditure (EE) for pregnant women, but the validity of this practice has not been well established. **PURPOSE**: The purposes of this study were 1) to compare actual EE in pregnant women to MET values listed in the Compendium, and 2) to evaluate EE longitudinally across pregnancy and postpartum periods. **METHODS**: Fifteen pregnant women were tested at 20 and 32 weeks gestation, seven of whom were also evaluated at 12 weeks postpartum. Participants were 18-35 years old, nonsmokers, and considered low-risk by their health care providers. Each participant was tested in our laboratory, and equipped with a portable gas analyzer to measure EE via indirect calorimetry. Resting EE was determined during ten minutes of left lateral/supine rest. Women performed a series of five-minute activities ranging from light to vigorous. MET values were calculated for each activity by dividing steady state relative VO2 by actual resting EE measured at each time point. MET values for each activity at 20 and 32 weeks gestation were compared to MET values listed in the Compendium using a one-sample t-test. For the seven women with postpartum data, EE across the three time points were evaluated using repeated measures ANOVA. **RESULTS**: Compared to the Compendium, observed MET values for laundry, dusting, sweeping, and aerobics were lower (range= -0.2 to -2.8 METS, effect sizes (ES)= 0.6 to 4.1; $p<0.05$) at both pregnancy time points, while child care and walking were higher (range=0.4 to 1.1 METS: ES=0.6 to 1.9; $p<0.05$). Longitudinal analysis revealed that resting EE was significantly higher (0.2 METS; ES=0.55) and dusting was significantly lower (-0.5 METS; ES=0.75) at 32 weeks gestation compared to 12 weeks postpartum ($p<0.05$). Average MET values for all other activities were lower at 32 weeks gestation than at 12 weeks postpartum, however these differences were not statistically significant. **CONCLUSION**: Compendium MET values may not be accurate during pregnancy, and the direction of measurement errors do not appear consistent. Future research with larger samples is needed to corroborate these results.

#3 Oral Presentation, Friday, October 28, 2:00 p.m., Room 118

MAXIMIZING FAT UTILIZATION POSTEXERCISE WITH A NOVEL LOW GLYCEMIC INDEX CARBOHYDRATE MEAL

Ryan J. Lubbe, Nicholas T. Kruse, Marcus W. Barr, Michael R. Kushnick; Exercise Biochemistry and Physiology Laboratories, School of Applied Health Sciences and Wellness, Ohio University, Athens, OH 45701

A bout of exercise can increase lipolysis and fat oxidation. Conversely, ingesting carbohydrate (CHO) increases insulin concentration and blunts lipolysis. As compared to food with higher glycemic indices (GI), low GI food may be valuable in reducing glycemic and insulinemic responses and, therefore, may be valuable as a postexercise meal in order to maintain elevated fat oxidation during recovery. **PURPOSE**: To evaluate metabolic cost (VO2) and substrate utilization (RER) after consumption of a low GI CHO, high GI CHO, and control (500mL H2O) during the recovery from a previous bout of exercise. **METHODS**: A repeated-measures ANOVA model was used with LSD post hoc analyses where applicable. Means ± standard deviations are presented. Ten healthy, non-smoking, college-aged men (21 ± 2yrs) with average body composition (14.00 ± 1.82 % fat) and above average aerobic fitness (53.20 ± 2.87 mL/kg/min) were recruited. Participants completed three trials each in random order. Each trial began with a treadmill walk at 60% of their predetermined VO_2max until 300 kcal were expended, followed by consumption of 300 kcal of a low GI CHO, high GI CHO, or a control. Then measurements of ventilatory gases were made during a two-hour recovery period. **RESULTS**: There were no significant differences in VO2 among trials. However, RER was significantly different among trials and across time – presented in the table below. **CONCLUSION**: In this sample, consuming a low GI CHO after a bout of exercise helped to maintain fat oxidation during the first hour of a two-hour recovery.

	Low GI CHO	High GI CHO	Control
Time*	RER	RER	RER
1 (10-15)	0.79±0.08	0.78±0.10	0.81±0.06
2 (25-30)	0.79±0.05	0.82±0.09	0.79±0.03
3 (40-45)	0.82±0.05	0.85±0.06	0.81±0.05H
4 (55-60)	0.83±0.08	0.88±0.05C	0.83±0.05H,I
5 (70-75) A	0.82±0.06	0.93±0.10C	0.81±0.05
6 (85-90) A	0.84±0.03G	0.91±0.05C	0.82±0.03H
7 (100-105) A,B	0.87±0.07F	0.92±0.11C	0.80±0.03
8 (115-120) A	0.87±0.03E	0.95±0.11C,D	0.81±0.08

*Last 5 minutes of a 10 minute measurement period; A High>Low, Control; B Low>Control; across High: C4-8>1, D 8>6,7; across Low: E 8>1-6, F 7>1,2, G 6>2;
across Control: H 3,4,6>2; I 4>5

Funded in part by the Provost's Undergraduate Research Fund at Ohio University; all methods were approved by the Institutional Review Board at Ohio University.

#4 Oral Presentation, Friday, October 28, 2:15 p.m., Room 118

MATERNAL ENVIRONMENT AND CHILD PHYSICAL ACTIVITY: PREDICTORS OF BMI Z-SCORE IN CHILDREN

Mallory R. Marshall[1], Joey C. Eisenmann[2], Michelle A. Ihmels[3], 1Michigan State University, East Lansing, MI [2]Helen DeVos Children's Hospital, Grand Rapids, MI [3]Iowa State University, Ames, IA

PURPOSE: Maternal weight status prior to and during pregnancy influences offspring health, including obesity. Recommendations for weight gain during pregnancy have been established by the Institute of Medicine and are based on the mother's pre-pregnancy body mass index (BMI), with the recommendation that women with higher BMI gain less weight than those with lower BMI. Physical activity reduces risk of child overweight, and may moderate the relationship between maternal BMI, gestational weight gain (GWG) and child BMI z-score. The purpose of this study was to examine the relationship between maternal pre-pregnancy BMI, GWG, and child physical activity on children's BMI. **METHODS**: Mothers of 745 children (52% boys, M age = 6.6 ± 0.4 yr) reported maternal BMI, GWG, maternal smoking, age, race, child's birth weight and child's physical activity level. Child BMI was calculated from measured height and weight and BMI z-score was determined from CDC growth chart reference values. Differences in child BMI z-score among maternal BMI (normal weight, overweight, obese) and GWG (recommended gain, excess gain) groups were examined using analysis of variance. **RESULTS**: Approximately 35% of children were overweight or obese. 44% of mothers were overweight or obese prior to pregnancy and 52% had excess GWG. There was a significant ($p < 0.01$) linear relationship between the mother's pre-pregnancy BMI and children's BMI z-scores even after controlling for maternal age, GWG, child's race, socioeconomic status, fruit/vegetable consumption, and child physical activity. GWG was not related to child's BMI z-score, and there was no joint association of pre-pregnancy BMI and GWG on child BMI z-score. Similarly, child physical activity was not related to BMI z-score ($p = 0.83$). Although not statistically significant, we observed a trend for high GWG to have a greater detriment to child BMI z-score in normal and overweight women compared to obese women. **CONCLUSION**: The results confirm previous findings that maternal obesity is related to child obesity; however, we did not find a relationship between GWG and child BMI z-score. Additional research is needed to examine further the joint association of maternal weight status and GWG on child body size and other health outcomes.

Abstracts – Oral Presentations

Saturday, October 29, 2011, 10:00 – 11:00 a.m., Room 132, Abstracts #5 - #8

Moderator for the Session: Adam Coughlin, Ph.D.

#5 Oral Presentation, Saturday, October 29, 10:00 a.m., Room 132

EVALUATING DIVISION I COLLEGIATE ICE HOCKEY PLAYERS USING PRESEASON FITNESS CHARACTERISTICS AND GAME PERFORMANCE

Christopher P. Connolly, James M. Pivarnik, FACSM, Kimberly Maier, Adam Nightingale, and Michael Vorkapich; Michigan State University, East Lansing, Michigan

Preseason fitness testing has been shown to predict game performance in Division I collegiate ice hockey players. Although the plus/minus (+/-) system has been examined previously as a measure of game performance, individualized scoring chance assessments have not been investigated. **PURPOSE**: To determine whether preseason fitness predicts game performance among collegiate hockey players. **METHODS**: Testing was performed on members of a Division I collegiate men's ice hockey team over two consecutive seasons (season 1, n=19; season 2, n=20). Overall team performance resulted in 7 wins, 17 losses, and 4 overtime losses for the first season and 14 wins, 8 losses, and 6 overtime losses for the second season. Participants included forwards and defensemen who played at least half (14) the conference games each season. Preseason fitness variables consisted of % body fat, chin-ups, bench press, leg press, off-ice sprinting, and treadmill aerobic capacity. Game performance was assessed for each athlete in the form of +/- score and primary scoring chances, which were determined by a member of the hockey coaching staff. Median split was used to categorize players into high and low performance groups by both +/- score and scoring chances. Differences in preseason values between the performance groups were analyzed using one-way analysis of variance. **RESULTS**: The median +/- scores for season 1 and season 2 were -9.5 (range -22 to +2) and -1 (range -5 to +11). Median scoring chances for season 1 and season 2 were 10 (range 2 to 28) and 15.5 (range 0 to 41). In season one, chin-up score was significantly higher (p=0.01, ES=0.26) in the high performance group as determined by scoring chances. In season two, the percentage of maximum blood lactate at the fourth stage of the incremental treadmill test was significantly lower in the low performance group as determined by scoring chances (p=0.021, ES=0.23). No other significant differences were found in preseason fitness measures between performance groups. **CONCLUSIONS**: Further testing is needed to determine how overall team performance affects the relationship between preseason exercise and fitness testing and game performance among Division I collegiate hockey players.

#6 Oral Presentation, Saturday, October 29, 10:15 a.m., Room 132

PERCEPTUAL EFFECTS OF INTERMITTENT OR CONTINUOUS BLOOD FLOW RESTRICTION TRAINING

Peter J. Fitschen[1], Hae Ryong Chung[1], Jin Hee Jeong[1], Brandon M. Kistler[1], Robert W. Motl[1], Kenneth R. Wilund[1] [1]University of Illinois, Urbana, IL

Blood flow restriction (BFR) training at low-intensities has been shown to be a safe and effective way to increase muscle size and strength. However, a common side effect of BFR training is acute muscle pain, which may limit the utility of this training approach. Typically, BFR training studies occlude blood flow with a pressure cuff continuously during the entire exercise bout, including rest periods. However, few studies have used intermittent BFR training where the cuff is inflated only during sets and released during rest periods. **PURPOSE**: The purpose of this study was to investigate the effects of continuous and intermittent BFR training on muscle fatigue and perceptions of pain. **METHODS**: Healthy subjects (n=11) randomly proceeded through a series of 3 treatments of 4 sets of unilateral leg extensions to failure, with each treatment separated by 2 weeks: 1) continuous BFR, 2) intermittent BFR, and 3) control. Measurements of pain and ratings of perceived exertion (RPE) were taken immediately after and between sets. Measurements of maximal voluntary contraction (MVC) were taken immediately and 24 hr after exercise. Ratings of delayed onset muscle soreness (DOMS) were obtained at 24, 48, and 72hr post-exercise. **RESULTS**: Continuous BFR training resulted in significantly greater pain than intermittent BFR training or control after sets 3 and 4. Continuous and intermittent BFR training resulted in significantly less repetitions to failure than control. No significant differences were observed in RPE, loss of MVC, or DOMS at any time point. **CONCLUSION**: These results suggest that intermittent BFR training may be as effective as continuous BFR training, but less painful. However, long-term training studies are needed to conclusively demonstrate the relative efficacy of intermittent BFR training.

#7 Oral Presentation, Saturday, October 29, 10:30 a.m., Room 132

ASSESSMENT OF PHYSIOLOGICAL VARIABLES FOR USE IN THE QUANTIFICATION OF TRAINING LOAD

Robert W. Wilson, II[1], Thomas S. Goeppinger[2], Bruce A Wade[2], and Ann C. Snyder[1], FASCM [1] College of Health Sciences, University of Wisconsin – Milwaukee, Milwaukee, WI; [2] Department of Mathematical Sciences, University of Wisconsin – Milwaukee, Milwaukee, WI

The attainment of peak performance has led coaches to plan practice sessions, with the goal of either increasing or maintaining performance capabilities. Periodization advocates that this is accomplished by adjusting the training load (TL) through changing the volume and/ or the intensity of the physical work performed. The periodized plan is a prescription of load; as such it does not provide a measure of each individual's internal physiological load. Several methods have been proposed to calculate the individual TL in a field setting using heart rate. Recent technological advances now allow for additional objective variables, which could enhance the assessment of TL, to be obtained. **PURPOSE**: To determine if these additional variables enhance the assessment of TL. We hypothesize that a multiple variable equation will produce a better fit regression equation. We further hypothesize that using the Karvonen percent of maximal heart rate (%HRmaxK) with respiration rate (RR) and/ or "activity" (ACT) will produce a better fit equation than using %HRmax alone. **METHODS**: Twenty-two female NCAA DI soccer players completed submaximal and maximal effort tests while wearing a physiological monitor which collected heart rate (HR), RR, ACT, percent of maximal heart rate (%HRmax) body posture (BP), skin temperature (ST), peak acceleration (PA), effort (EFF) and exertion (EXR) data. %HRmaxK was also calculated using the Karvonen method. Blood was sampled at the end of each submaximal stage and the end of the maximal test for the determination of blood lactate concentration ([HLa]). Multivariate and uni-variate regression analyses were conducted. **RESULTS**: Of the 538 regression analyses that were run, the best equation was cubic and included only the %HRmaxK variable (r=0.88, R^2=77.9%, $p<0.001$). **CONCLUSION**: The best fit equation utilized only %HRmaxK not RR or ACT contrary to our hypotheses. This is due to the high variability of the RR data and the low variability of the ACT data. Therefore, this analysis indicates that HR expressed as %HRmaxK is the best variable for assessing TL. The cubic regression line is very similar to an expected lactate curve with a low slope at low intensities and a fast rise toward the end. FUNDING: Partial funding supplied by Zephyr Technologies, Inc.

#8 Oral Presentation, Saturday, October 29, 10:45 a.m., Room 132

COMPARING PHYSICAL ACTIVITY DETECTED BY DIRECT OBSERVATION AND ACCELEROMETRY UNDER FIELD-BASED CONDITIONS

Alexander H. Montoye[1], Karin A. Pfeiffer[1], FACSM, Darijan Suton[1], and Stewart G. Trost[2], FACSM. [1]Michigan State University; [2]Oregon State University

Several different accelerometer cut-points exist for classifying physical activity (PA) intensity in children and adolescents. Currently, few studies have compared the validity of various cut-points used in a group setting when compared to a criterion measure under field-based conditions. **PURPOSE**: The purpose of this study was to compare group PA obtained using accelerometer data (using several published cut-points) to direct observation in a field-based setting. **METHODS**: Participants (n=208) aged 6-16 years completed two visits which simulated an after-school program. One visit (low) consisted of sedentary-to-light activities (e.g., catch, etc.), while the other visit (high) consisted of moderate-to-vigorous activities (e.g., soccer, etc.). During each trial, participants wore an accelerometer, and a randomly selected sample of participants was observed for ten minutes each using direct observation (DO) (CARS). Accelerometer data were integrated to 30-second epochs for analysis. PA intensity was estimated for each participant using four independently developed cut-points: Freedson/Trost (Fr), Evenson (Ev), Puyau (Pu), and Treuth (Tr). Accelerometer data for all participants in a visit was averaged, and average time in each intensity (for each set of cut-points) was compared to DO using Friedman's ANOVA. **RESULTS**: Time spent sedentary (SED) was significantly under-predicted and light- and moderate-intensity activity (LPA and MPA) were significantly over-predicted for all cut-points and for both visits when compared to DO ($p<0.05$). Vigorous-intensity activity (VPA) detected by DO was not significantly different from that detected by the Tr and Fr cut-points ($p>0.05$). DO Moderate-to-vigorous-intensity activity (MVPA) was not statistically different for that obtained by the Pu cut-points for high visits ($p>0.05$) but was dramatically over-predicted by all other cut-points (e.g. 15.3 min with the Fr cut-points vs. 1.3 min with DO in the low visit). Choice of cut-points resulted in large differences in MVPA, especially in high visits (e.g. 28.11 minutes for Pu cut-point vs. 37.35 minutes for Fr cut-points). **CONCLUSION**: No set of cut-points performed well for all levels of intensity. This finding indicates that cut-points validated for use in individuals may not be appropriate for use when estimating the PA of a group.

Funded by NICHD (RO1 HD055400-02)

Abstracts – Oral Presentations

Saturday, October 29, 2011, 10:00 – 11:00 a.m., Room 118, Abstracts #9 - #12

Moderator for the Session: Jeff Edwards, Ph.D., FACSM

#9 Oral Presentation, Saturday, October 29, 10:00 a.m., Room 118

TREADMILL EXERCISE AMELIORATES DELAYED HEALING IN OBESE VERSUS LEAN MICE

Brandt D. Pence[1], Luisa A. DiPietro[2], Jeffrey A. Woods[1], FACSM. [1]University of Illinois at Urbana-Champaign, Urbana, IL; [2]University of Illinois at Chicago, Chicago, IL.

Obesity has been previously shown to delay healing in both animal and human models. Exercise is known to speed healing in aged mice and older adults, however, no studies have examined if exercise has similar effects on healing in obesity. **PURPOSE**: The purposes of this study were (1) to examine if short-term treadmill exercise speeds healing in obese, high-fat diet (HFD)-fed mice, (2) to determine if healing rate in exercised mice is increased to that of sedentary lean mice, and (3) to examine potential mechanisms by which exercise speeds healing rate in obese mice. **METHODS**: C57Bl/6J mice were fed a HFD (45% kcal from fat) for 16 weeks. Mice then exercised or remained sedentary for 3 days, followed by cutaneous punch biopsy wounding on day 4. In the healing study, mice exercised for 5 days following wounding, and healing was tracked by photoplanimetry for 10 days and visual examination of the wound site thereafter. For mechanistic examination, wounds were harvested 1 day after wounding and analyzed for gene expression of inflammatory mediators and growth factors. **RESULTS**: Exercise sped healing in obese mice ($p<0.05$) and reverted the healing response to one similar to that in lean mice. Interestingly, there was a main effect of exercise at day 1 post-wounding such that exercise sped wound healing in mice irrespective of diet (chow or HFD-fed, $p<0.05$). Despite this, no differences were seen in gene expression of inflammatory mediators or growth factors at day 1 post-wounding ($p>0.05$) although exercise tended to non-significantly increase gene expression of almost all factors tested. **CONCLUSION**: Exercise appears to speed wound healing in obese mice and to speed general healing early after wounding regardless of dietary status. Further study is necessary to determine the mechanisms by which exercise is acting as treadmill running appears to have little effect on the gene expression of early mediators of the healing process.

This study was partially supported by an ACSM Foundation graduate student grant to BDP.

#10 Oral Presentation, Saturday, October 29, 10:15 a.m., Room 118

VOLUME OF PHYSICAL ACTIVITY AND HEMOSTATIC VARIABLES IN PREGNANT WOMEN

Christine M. Nicewonger, Kelly Mattran, Christopher J. Womack, FACSM, Robert E. Lee & Judith A. Flohr, James Madison University, Harrisonburg, VA

PURPOSE: The purpose of this study was to evaluate potential relationships between hemostatic variables and physical activity (PA) during pregnancy. **METHODS**: Fasted blood draws (6-10AM) were obtained from 23 pregnant women (19-34yrs) and analyzed for tissue plasminogen activator (tPA) antigen, tPA activity, plasminogen activator inhibitor-1 (PAI-1) antigen, and vonWillebrand factor (vWF) antigen. PA was assessed by the Modified Activity Questionnaire (MAQ) and converted to METmin/wk (MET). Average daily step count (STEP) was obtained from 2 week pedometer logs. Participants were grouped by MET as "meeting" (n=15) or "not meeting" (n=8) PA recommendations established by the American College of Obstetricians and Gynecologists and STEP as "sedentary" (<5,000 steps/day; n=12) or "at least low active" (5,000+ steps/day; n=4). ANCOVA was used to determine if there were differences in hemostatic variables among PA groups when controlling for gestational age (GA). GA, MET, and STEP served as possible predictors for hemostatic variables using a forward stepwise multiple regression. Multiple linear regression provided y-intercept and slope, allowing extrapolation of pre-pregnancy dependent variables and mean expected changes over GA. **RESULTS**: There were no significant differences in hemostatic variables based on the PA groupings according to ANCOVA analysis. ANCOVA and multiple regression results suggest that PAI-1, tPA antigen, and tPA activity are influenced by GA ($p<0.05$); PAI-1 and tPA antigen were higher and tPA activity lower with increased GA. GA and MET were significant predictors of tPA antigen ($p<0.01$). STEP was not a statistically significant predictor of any hemostatic variable. Linear regression using STEP classifications resulted in a significant difference in y-intercept for tPA antigen ($p<0.05$), suggesting that tPA antigen may be lower pre-pregnancy in women accumulating at least 5,000 steps/day vs. those who are sedentary. No significant slope differences were observed in hemostatic variables in relation to PA. **CONCLUSION**: The MET prediction of tPA antigen is novel, suggesting PA may help attenuate the extent of hypercoagulation in normal pregnancy. Future research is warranted as regular PA, independent of pregnancy, is known to enhance fibrinolytic profile and reduce blood coagulation potential in women of child-bearing age and pregnant women are predisposed to hypercoagulation-related health issues.

Funded by the Morrison Bruce Center for the Promotion of Physical Activity for Girls and Women

#11 Oral Presentation, Saturday, October 29, 10:30 a.m., Room 118

THE EFFECT OF ACTIVE AND PASSIVE RECOVERY ON BLOOD LACTATE AND PERFORMANCE IN ELITE MALE HOCKEY PLAYERS

Nick J. Siekirk, Tamara Hew-Butler, FACSM, Brian R. Goslin, Charles R.C. Marks Oakland University, Rochester, MI

It is customary for ice hockey players to engage in "passive rest" between playing shifts and in between periods. The habit of passive recovery between periods, however, is being questioned with emerging evidence that a more "active" recovery may expedite lactate removal and lead to improvements of performance in the subsequent periods of play. **PURPOSE**: The purpose of this study was to investigate the effects of active and passive recovery on blood lactate concentration and subsequent performance in elite male ice hockey players. **METHODS**: Seven elite hockey players (playing experience 17.71 ± 2.87 years) participated in a randomized crossover trial assessing both passive (complete muscle inactivity) and active (cycle ergometer exercise between 50-60% peak power) recovery modes between two performance trials (PT). Each PT consisted of 7 playing shifts with 90 seconds of rest between shifts separated by a 20 minute intermission. PTs comprised a standardized task that included stickhandling, skating (forward and backward), stopping, accuracy of passing, and shooting ability on a protected net. Performance time was measured during these two performance trials and then adjusted for errors in demonstration of the ice hockey skills in the PTs. Blood lactate was collected at 5 minutes post first performance trial (PT1), immediately post active or passive rest (20 minutes) and at 5 minutes following the second performance trial (PT2). Testing was conducted in full ice hockey equipment. **RESULTS**: Blood lactate was significantly lower following active versus passive recovery (1.94 ±2.43 mmol/L active vs. -1.23 ±1.97 mmol/L passive; $p<0.01$) after PT2. However, no significant difference in performance was observed in total time (389.33 ±13.89 seconds PT2 active vs. 383.33 ±23.4 seconds PT2 passive; $p>0.05$), number of missed passing nets (.142 ± .90 active vs. 0 ± .58 passive; $p>0.05$), missed shooting nets (.43 ± 1.9 active vs. 0 ± 1.91 passive; $p>0.05$), total goals (-.43 ± 2.37 active vs. -.29 ± 1.38 passive; $p>0.05$) and hitting shooting barrier (-.14 ± 3.08 active vs. 0 ± 1.53 passive; $p>0.05$). **CONCLUSION**: While not influencing performance, active recovery reduced blood lactate accumulation in subsequent periods of simulated hockey play compared to passive recovery.

Provost's Graduate Student Research Award 2011, Oakland University, Rochester, MI

#12 Oral Presentation, Saturday, October 29, 10:45 a.m., Room 118

DOES PRE-COOLING ENHANCE AEROBIC ENDURANCE IN INDIVIDULAS WITH MULTIPLE SCLEROSIS?

John Palazzolo, Charles R.C. Marks, Sue Saliga, Tamera Hew Oakland University, Rochester, Michigan

Exercise is an important part of rehabilitation programs for individuals with multiple sclerosis (MS); however, they can experience increased susceptibility to heat intolerance that can limit their exercise benefits. Previous research has shown that pre-cooling the body before aerobic exercise may help to attenuate the heat sensitivity related fatigue. However, these studies have been limited to submaximal intensity. **PURPOSE**: The purpose of this pilot study was to determine if cooling the body can significantly reduce the symptoms of heat sensitive related fatigue in individuals with (MS) exercising to maximal volitional fatigue. **METHODS**: Three individuals with a confirmed diagnosis of MS were recruited from the Southeastern Michigan area following their informed consent and medical clearance from their physician. Each participant performed two graded exercise tests (GXT's) on a bicycle ergometer one week apart at the same time and week day. One of the GXT's (order randomized) was preceded by immersion up to the supra iliac crest in water at 19 – 21 °C for 30 minutes. Heart rate (HR), blood pressure (BP), and self-rated perceived exertion (RPE) were measured by the third minute of each exercise stage. Peak power output (PO) and time (T) to volitional fatigue were recorded. A Visual Analogue Scale for Fatigue (VAS-F) was completed the night and morning before each test and the night and morning after each test. For this pilot study only descriptive statistics are reported. **RESULTS**: The mean and standard deviation of the dependent variables are reported in the following table:

	Non-Cooled		Pre-Cooled	
	Mean	SD	Mean	SD
HR (BPM)	143.3	44.1	145.3	40.3
SBP (BPM)	152.7	9.5	153.3	15.3
DBP (BPM)	79.3	2.3	79.3	3.1
PO (watts)	108.3	14.4	112.5	12.5
T (min)	28.8	3.6	29.7	2.5
RPE	8	2.6	7.3	1.2
VAS-F N1	4.8	1.9	5.4	2.3
VAS-F M1	1.6	0.9	2.7	1.8
VAS-F N2	5.3	1.8	5.2	2.8
VAS-F M2	2.2	1.0	1.4	0.8

•N1 = night before testing, M1 = morning before testing, N2 = night after testing, M2 = morning after testing

CONCLUSION: It appears that pre-cooling might increase maximal exercise capacity without elevating heart rate and blood pressure and possibly lowering next day symptoms of fatigue.

(This study was supported by the Oakland University Provost's Graduate Student Research Award)

Abstracts – Poster Presentations

Friday, October 28, 2011, 1:30-4:30 p.m. in the Slate Hallway (NOTE: Authors of even numbered posters present 1:30-2:30 p.m.; Authors of odd numbered posters are present 2:45-3:45 p.m.)

#13

COMPARISON OF A 12-WEEK CIRCUIT VS TRADITIONAL RESISTANCE-AEROBIC TRAINING PROGRAM

Ansinelli, H., D. Ridley, P. Masciangelo, J. Jones, R. Claytor. Department of Kinesiology and Health, Miami University, Oxford OH

PURPOSE: To compare changes in muscular strength, aerobic fitness, body composition and indicators of metabolic fitness in response to two types of combined aerobic-resistance training regimens. **METHODS**: Twelve college-age males participated in 12 weeks (3 sessions/week) of training; 6 subjects were randomly selected into either a resistance-aerobic circuit (Circ) group or a traditional resistance-aerobic training group (Trad) and 4 subjects served as non-exercise controls (NEC). All study participants underwent pretests and posttests for VO2 max, body composition, 1 RM for muscular strength, and a fasting metabolic profile. Circ & Trad completed 36 training sessions. Training included 1 set; 10-12 reps of 8 resistance exercises (RE) at 65% 1-RM & 21 min of aerobic exercise (AE) at 65% VO2reserve. Resistance was progressively increased. At weeks 4 & 8 AE was increased to 28 & 35 min. Circ completed cycles of 1 RE & 3-5 min AE; Trad completed all RE with 90 sec rest between sets & then 21-35 min AE. **RESULTS**: Circ exhibited a greater increase in relative VO2max (grp*time interaction ($p<0.05$)); Circ (pre-51.1+6.2 – post-55.6+7.6 ml/kg/min) as compared to Trad (pre-53.6+5.4 – post-54.4+5.4 ml/kg/min) & NEC (pre-52.9+5.6 – post 50.1+4.4 ml/kg/min). Absolute VO2max was increased ($p<0.01$) similarly in Circ & Trad. Weight (no significant main effect or grp*time interaction) at least partially explained the greater increase in relative VO2max for Circ (pre-93.9+19.2 – post-92.7+18.2 Kg) while weight in Trad & NEC increased. %fat & Lean Mass were not significantly altered. 1-RM muscular strength was increased ($p<0.0001$) similarly for each RE for Circ & Trad, but not NEC. LDL was significantly decreased ($p<0.02$) Circ (pre-109.2+17.9 – post-104.5+16.5 mg/dl), Trad (pre-99.2+21.3 – post-75.5+19.5), NEC (pre-110.3+3.1 – post-107.8+9.0). T-Chol, HDL & Glucose were not significantly altered. Volume of RE & AE and Time to complete each session were not different between groups. However, average RPE was lower in Circ ($p<0.05$). **CONCLUSIONS**: Both resistance-aerobic training regimes resulted in similar, significant increases in VO2max & muscular strength in young, fit males. However, Circ exhibited similar improvements in aerobic and muscular fitness with the perception of less effort throughout training as compared to Trad.

#14

Perceived Physical Fitness and Desired Physical Competence among Safety Net Community Health Center Patients and Fitness Center Clients

Mitchell Arthur[1], Stephanie A. Greer[1], Lakenvia Ledford[2] and NiCole R. Keith, FACSM[1]; [1]School of Physical Education and Tourism Management, IUPUI; [2]Indiana University, Department of Biology

Measures of physical fitness are important indicators of positive health that could be used to improve overall patient management and are important for functional regulation, performance of daily living activities, independence, and overall health. Perceived physical fitness and desire for physical competence may be related and could influence performance determination, motivation, and capabilities. **Purpose:** We examined the relationship between the desire for physical competence and perceived physical fitness among subjects who are black and white race and >40 years of age. **Methods:** To assess this relationship, one-half of the subjects were recruited from a medically affiliated fitness center (FC) and one-half from a safety net community health center (CHC). The Older Adults Desire for Physical Competence survey (Rejeski et al. 2006) and Perceived Physical Fitness Scale Questions (Abadie et al. 1988) were used during the assessment. Subjects were read the Rejeski survey and were able to respond to whether they had "no desire whatsoever," a "low desire," moderate desire," "strong desire," or "very strong desire," to perform certain physical activities. Next subjects were read the Abadie survey and asked whether they "strongly disagreed," "disagreed," were "undecided," "agreed," or "strongly agreed," with statements that related their physical fitness. **Analysis:** IBM SPSS Statistics 19 was used to perform the analysis. We used Pearson and Spearman correlations to determine the association between variables. **Results:** There were 101 males, 100 females, 59 black and 142 whites who participated in this research. Subjects were 54.7yr (range = 40-81yr). Average education level was 15yr (Range 0-21yr). Results demonstrated that desire for physical competence was correlated to positive self-perception of physical fitness ($r = 0.443$, $p<0.001$). Rejeski Mean was 36 with the Standard Deviation of 10. Adadie Mean was 45 with a Standard Deviation of 16.62 **Conclusion:** This research identifies a relationship between perceived physical fitness and the desire for physical competence. Whether desire influences physical fitness perception, perception influences desire, or they are equally influential is unknown. Future research should further examine this relationship as it could inform physical fitness intervention strategies.

Acknowledgement: The project described was supported by Award Number K01HL096423 from the National Heart, Lung, and Blood Institute. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Heart, Lung, And Blood Institute or the National Institutes of Health.

#15

EFFECT OF TREADMILL RUNNING ON CARDIAC AND SKELETAL MUSCLE METABOLISM AND RIGHT VENTRICLE INFLAMMATION IN RATS WITH PULMONARY ARTERIAL HYPERTENSION

Tsungai J Chingombe[1,2], Tim Lahm[1], Jag Reddy[1], Amanda Fisher[1], Irina Petrache[1], Mary Beth Brown[2] [1]Pulmonary and Critical Care, Department of Medicine, Indiana University School of Medicine, and [2]Department of Physical Therapy, Indiana University School of Health and Rehabilitation Sciences, Indianapolis, Indiana

It has been suggested that a shift from oxidative to non-oxidative (glycolytic) metabolism promotes a right ventricle (RV) and skeletal muscle dysfunction in patients with pulmonary arterial hypertension (PAH) that contributes to their reduced exercise tolerance. Exercise training may ameliorate this glycolytic switch in PAH as it does for other cardiopulmonary diseases. However, whether exercise-induced cardiac stress also promotes detrimental RV inflammation in PAH has not yet been thoroughly examined. **PURPOSE**: The purpose of this study was to test the hypothesis that exercise training will promote a shift back towards the more efficient oxidative metabolism in cardiac and skeletal muscle of PAH rats. Further, we hypothesized that 45 minutes of exercise at a prescribed moderate intensity will not promote greater RV inflammation in PAH rats. **METHODS**: Tissues were obtained from monocrotaline-induced PAH and healthy control rats immediately following a 45 min treadmill (TM) run (75% VO_2max) that concluded a 4 wk TM familiarization/running program (15-45 min, 4x/wk). A group of unexercised PAH and healthy rats served as sedentary controls. Immunofluorescent staining (IF) for inflammatory marker CD45 in fixed RV sections was used to evaluate the acute inflammatory response to exercise. In fixed soleus and RV sections, IF for the glucose transporter Glut1, and for capillary marker CD31, were used as indicators of glycolytic (non-oxidative) metabolism and tissue capillarization, respectively. **RESULTS/CONCLUSION**: Data thus far indicates no greater acute exercise-induced RV inflammation in PAH rats compared to healthy rats. We observed higher expression of Glut1 and lower capillarization in the RV and soleus of PAH rats, indicative of a shift toward greater dependency on non-oxidative metabolism. RV and soleus capillarization, but not Glut1 expression, was greater in exercised vs. sedentary PAH rats. However, since Glut1 levels for exercised rats were measured in tissue harvested immediately following a run bout, evaluation of a chronic training effect on Glut1 expression is potentially confounded by the acute exercise effect and therefore remains to be investigated in a follow-up study.

Partially funded by the IUPUI Bridges to Baccalaureate Program, and T-32 HL091816

#16

THE EFFECT OF STRETCHING AND MOTOR IMAGERY ON ANAEROBIC PERFORMANCE IN TRAINED CYCLISTS

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Stretching has been suggested to decrease force and power production while motor imagery (MI) may improve it. MI is the visualization of simple or complex motor activities in the absence of physical movement. However, the effects of static stretching (SS) compared to MI on anaerobic performance in trained cyclists are currently unknown. **PURPOSE**: To examine the effects of SS compared to MI and quiet rest (QR) on anaerobic performance in trained cyclists. **METHODS**: Thirteen trained cyclists (9 males: 4 females; aged 21±2 yrs) were assessed for height (1.76±6.6), weight (73.4±13), % body fat (10.8±6.2) and maximal oxygen consumption (VO2max of 42.0±5.6 ml/kg/min). Participants performed 3 randomized sessions consisting of cycling for 30 minutes at 65% of VO2max before undergoing 15 minutes of SS, MI or QR followed by an anaerobic performance test. SS consisted of 3 sets of 30-second stretches for the knee flexors/extensors, hip flexors/extensors and the piriformis. Imagery was based on the PETTLEP (physical, environmental, task, learning, emotion, and perspective) approach and was conducted by a trained technician. Both relative and absolute powers, as well as peak rpm, were quantified using the Wingate anaerobic threshold test. Significance was set a priori at $p \leq 0.05$. **RESULTS**: No significant interactions existed among SS, MI and QR for relative peak power, absolute peak power or peak RPM. **CONCLUSION**: In disagreement with current literature, the present study suggests that neither SS nor MI affect anaerobic performance in trained cyclists. This may be explained by the influence of several variables such as the length of the exercise bout, the duration of the stretching and the participants' experience with imagery and/or quality of imagery.

	Static Stretch	Motor Imagery	Quiet Rest
Relative Peak Power, watts/kg	11.8±1.8	11.8±1.6	11.7±1.4
Absolute Peak Power, watts	881.8±253.6	882.5±245.8	872.6±219.3
Peak revolutions per minute	160.8±22.3	162.8±23.6	157.8±19.8

#17

COMBINED TRAINING ELICITS GREATER STRENGTH AND EQUIVALENT HYPERTROPHIC ADAPTATIONS AS EQUAL-VOLUME RESISTANCE TRAINING

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Resistance training (RT) and a combination of RT and plyometric training (CT) have been used to improve muscular strength and power. There is evidence that changes in muscle architecture, such as muscle cross-sectional area (CSA) and pennation angle (PA), are major contributors to increased muscular strength and power in untrained participants. However, there is conflicting evidence as to whether RT or CT elicits the greatest change in muscle architecture and, thus, the greatest improvement in muscle performance. Additionally, no CT protocol has been equalized for volume when compared to RT, and changes in architecture after either training protocol have not been studied in resistance-trained participants. **PURPOSE**: To examine muscle architecture and whole muscle performance changes after 5.5 wks (11 sessions) of RT (n=6, 21±1 y, 83±15 kg) and equal-volume CT (n=6; 22±3 y, 81±14 kg) in resistance-trained men. **METHODS**: Muscle architecture of the right vastus lateralis (VL) was assessed via B-mode ultrasound imaging, and muscle performance was assessed via leg press 1-repetition maximum (1RM), leg extension power and vertical jump height tests. The RT protocol consisted of four sets of leg press, machine squat, leg extension, and single-leg leg press exercises yielding 24 min training time. The CT protocol consisted of two sets of RT exercises (12 min) plus four sets of plyometric circuits (12 min) which consisted of squat jumps, split squat jumps, and bounding yielding 24 min training time. **RESULTS**: Both the RT and CT groups increased in CSA (11.3±5.8% and 11.4±6.0% respectively, $p<0.05$). The CT group had a greater increase in leg press 1RM than the RT group (27.1±19.1% vs. 11.8±7.7% respectively, $p<0.05$). There was no change in PA, leg extension power, or vertical jump height ($p<0.05$). **CONCLUSION**: Equal-volume CT appears to be more effective in increasing lower-body strength than RT and equally as effective at inducing VL hypertrophy. Neither training protocol improved VL PA or muscle power, suggesting the training protocols were not effective or more training sessions may be necessary to elicit an adaptation. These results suggest CT should be used by individuals in which greater leg strength and size is advantageous for their performance.

#18

HEALTHY LIFESTYLE BEHAVIORS IN PHYSICAL THERAPY AND PHYSICIAN ASSISTANT GRADUATE STUDENTS

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Several studies have shown that many college students exhibit unhealthy lifestyle choices, – inactivity, uncontrolled stress, declining nutrition, binge drinking, cigarette smoking, unsafe sexual practices, etc. **PURPOSE**. Compare physical therapy and physician assistant students' healthy lifestyle choices at the start, 6 months and 12 months into the program. **METHODS**. Sixty-four students enrolled in physical therapy or physician assistant program at an accredited Mid-Western university completed a series of surveys used to measure healthy lifestyle behaviors before, 6 and 12 months after their program enrollment. The healthy behaviors investigated included physical activity, nutrition, alcohol consumption, stress, hostility, vehicular safety, and knowledge and prevention of sexually transmitted infections. Mixed Model Repeated Measures Analysis of Variance was used to analyze the data. **RESULTS**. After 6 and 12 months of program enrollment, physician assistant students showed a significant decrease in healthy lifestyle behaviors (51.31 ± 1.23, mean ± SD, vs. 46.27 ± 1.61 after 6 months and 46.56 ± 1.41 after 12 months, $p<0.01$ and a significant increase in stress (86.44 ± 3.67 vs. 98.68 ± 4.60 after 6 months and 94.87 ± 3.68 after 12 months, $p<0.01$). Physical therapy students had a decrease in stress between the 6 month and 12 month period (79.40 ± 4.30 vs. 73.03 ± 3.26, $p<0.05$). Physician assistant students scored significantly higher in their knowledge of sexually transmitted infections after 12 months than physical therapy students (11.45 ± 0.28 vs. 10.63 ± 0.24, $p<0.05$). Physician assistant students had a significant increase in hostility after 12 months compared after 6 months in the program (3.42 ± 0.38 after 6 months vs. 4.27 ± 0.47 after 12 months, $p<0.05$).**CONCLUSIONS.** Our results indicate that the healthy lifestyle choices students in the physical therapy and physician assistant programs self-reported does not represent what their professions ask from their patients. To help students succeed in a healthy lifestyle, health promotion efforts should be directed toward the students of these programs.

#19

EXERGY COST OF PLAYING OLYMPUS – THE NEW EXERGAME TO PROMOTE PHYSICAL ACTIVITY AMONG YOUNG ADULTS

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Physical activity (PA) levels of adolescents and young adults decline with age. The transition from adolescence to young adulthood is a critical period that may contribute to adult habits and health-related behavior, so it is important to target this population for PA promotion. Active video games (AVG), or "exergames," that use actual human body movement to interact with the game interface have been increasingly utilized to promote PA. One such exergame, Olympus, was recently designed by the Michigan State University Games for Entertainment and Learning Laboratory. The game hardware consists of a dancepad and commercial motion controller as the input devices. Olympus, unlike many other exergames, uses a theory based approach (self-determination theory) to engage the player and determine which specific game features promote PA. **PURPOSE**: The primary purpose was to determine energy expenditure (EE) while playing Olympus and compare the energy cost to other popular exergames. A secondary purpose was to compare EE by gender and game playing experience level. **METHODS**: Participants were 152 sedentary college students (20.1 ± 1.8 yrs, 71% male). Energy expenditure (VO2) and heart rate were measured while playing Olympus using a portable metabolic analyzer and a heart rate monitor. The protocol consisted of a brief tutorial of the game followed by 15 minutes of game-play. Height and weight were assessed according to standardized procedures and BMI was calculated. Descriptive statistics and independent t-tests were used for analysis. **RESULTS**: Average EE and heart rate while playing Olympus were 11.3 ± 2.5 ml/kg/min (3.2 ± 0.7 kcal/kg/hr) and 108.6 ± 13.1 beats/min respectively. Average minutes of moderate to vigorous PA during game tutorial and game-play were 6.2 ± 3.0 and 8.2 ± 3.7 minutes respectively. There was a significant difference in game-play EE between males and females (3.3 ± 0.7 vs. 3.0 ± 0.7 kcal/kg/hr, respectively, $p < 0.01$) whereas no significant differences were found between experienced and inexperienced players. **CONCLUSION**: Playing Olympus elicited light to moderate PA. These findings are similar to energy costs of other AVGs that have been investigated. Further studies are needed to explore the effectiveness of Olympus in PA promotion.

Funded by Robert Wood Johnson Foundation

#20

ACTIVE WORKSTATIONS: THE EFFECT OF LOW INTENSITY EXERCISE ON BLOOD PRESSURE

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Numerous efforts are being made to increase levels of physical activity in sedentary working conditions by implementing active workstations into various office buildings and other working environments. Alternatives to regular desk job environments include the use of active workstations. These are height adjustable desks built over a treadmill capable of speeds between 0.3-2.0 mph. **PURPOSE**: To assess the effect of low intensity exercise on blood pressure through the use of worksite modification. **METHODS**: Blood pressure and heart rate were obtained from 18 individuals (10 female and 8 male) who completed three experimental treatments using the active workstation walking at speeds of 1.0, 2.0, and 3.7 mph. A baseline blood pressure and heart rate were taken prior to the exercise using an OMRON digital blood pressure monitor (HEM 907XL), and after the exercise bout, blood pressure and heart rate were taken every 15 minutes for an hour during a passive recovery phase. **RESULTS**: Systolic blood pressure decreased from the pre-test resting measurement to the 60 minute measurement of the passive recovery period from 120 ± 20.9 to 110.75 ± 12.32 mmHg at 1.0 mph, from 122.57 ± 20.07 to 115.35 ± 16.10 mmHg at 2.0 mph, and from 115.5 ± 15.21 to 113.18 ± 13.82 mmHg at 3.7 mph ($p<0.05$). Diastolic blood pressure remained fairly constant throughout all readings at all three walking speeds. **CONCLUSION**: A significant post-exercise decrease in systolic blood pressure was found at the low work intensities elicited by the 1.0 and 2.0 mph speeds. These speeds result in a VO2 between 7.5 and 8.9 ml/kg/min. Thus, utilization of an active workstations at speeds that are not usually associated with post exercise hypotension may be beneficial. Post activity hypotension may be a little recognized health benefit of active workstation use.

#21

COMPARISON OF PHYSIOLOGICAL AND PERCEPTUAL RESPONSES TO A COMBINED RESISTANCE-AEROBIC AND A STANDARD RESISTANCE EXERISE ROUTINE

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Purpose: Compare physiological and perceptual responses to a combined resistance-aerobic training (CRAT) routine and a standard resistance training (SRT) routine. **Methods:** Twelve males underwent assessments for body composition and aerobic fitness (age = 21.3 + 1.1 yrs; BMI = 27.3 + 3.7; % fat = 19.3 + 10.0; VO2max = 50.5 + 8.5 ml/kg/min), and muscular strength (1-RM) for leg press, chest press, leg extension, shoulder press, leg curl, pull down, triceps extension, and biceps curl resistance exercises (RE). CRAT comprised one set of each RE; 10 repetitions at 65% 1-RM; 15-30sec following each RE, aerobic exercise (AE) was performed at 65% VO2reserve for 3 minutes. SRT consisted of RE only; 3 sets of 10 repetitions of leg press, chest press, and pull down RE; 2 sets of 10 repetitions on the other RE. SRT rested for 90 seconds between RE. CRAT and SRT routines were counter-balanced with 48 hours between routines. Heart Rate (HR), O2 uptake (VO2), respiratory exchange ratio (R), rating of perceived exertion (RPE), total time (TT) to complete routines and exercise time (ET) was monitored with a Cosmed K4b2. **Results:** CRAT and SRT resulted in a similar VO2 during RE (15.8 + 1.6 vs 13.4 + 2.6 ml/kg/min), HR was significantly greater during CRAT (154 + 14 vs 136 + 9 b/min ($p<0.005$)). CRAT total (TCE) and rate (RCE) of caloric expenditure was significantly greater than SRT (413.6 + 52.8 kcals vs 224.8 + 24.7 kcals ($p<0.0001$); (11.7 + .98 kcals/min vs 6.3 + .97 kcals/min ($p<.001$). RPE was significantly lower ($p<0.015$) during CRAT (6.3 + 0.8 vs 7.3 + 0.9). TT was similar for both routines (35.5 + 1.6 vs 36.0 + .8 min); however ET was significantly greater during CRAT (25.3 + 1.2 vs 9.8 +.8 min). **Conclusion:** CRAT results in a greater caloric expenditure while RPE is lower as compared to SRT even though TT did not differ; ET was greater during CRAT - likely responsible for the increased Kcal expenditure – however, without increasing perceptions of effort. These data provide exercise professionals with a viable training routine to enhance energy expenditure.

#22

EFFECTS OF MUSIC TEMPO ON HEART RATE, RATING OF PERCEIVED EXERTION, AND DISTANCE

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This study investigated how music, although used recreationally, can also be used as a performance enhancer. The effects of different music tempos on performance as indicated by heart rate (HR), distance, and rating of perceived exertion (RPE) during aerobic activity were investigated in this study. Potential beneficiaries are those who listen to music while working out. Proposed research questions included 1) how does music tempo effect heart rate 2) how does music effect distance 3) how does music effect rating of perceived exertion? **PURPOSE:** The purpose of this study was to examine how slow, medium, and fast music tempos effected performance, which was measured using heart rate, distance and rating of perceived exertion. **METHODS:** Participants completed the Cooper 12 Minute test while listening to songs of varying tempos on an iPod, according to a website which calculated beats per minute. Participants were allowed to walk, jog, or run for 12 minutes. Each participant was tested once a week for four weeks. Distance, HR, and RPE were recorded after each week. **RESULTS:** The only significant difference was seen in distance between the slow tempo and fast tempo test periods. Although this was the only significant difference found, increases each week in all three areas were seen as music increased in beats per minute. **CONCLUSION:** The results of this study implied that a fast tempo of music may be linked to a positive effect on performance. Based upon the data collected week 4 (fast tempo) showed the highest increase in all three areas of performance. Even though test subjects were limited and environmental factors served as external distractions, overall general increases in performance were observed. If a regular regimen of music and exercise is implemented, according to the results of this study it is possible that one would experience greater performance gains than a program without music.

#23

THE RELATIONSHIP BETWEEN VERTICAL JUMP, LOWER BODY POWER AND FLEXIBILITY IN RECREATIONALLY ACTIVE MALES

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Previous studies have reported relationships between vertical jump height and power. It is possible that lower body flexibility may play a role in power production and vertical jump height. **PURPOSE**: The purpose of this study was to examine the relationship between lower body power, flexibility, and vertical jump. **METHODS**: Twenty-five healthy, recreationally active males [(mean ± SD) age, 21.2 ± 1.5 years; height, 178.8 ± 5.4 cm; weight, 80.6 ± 10.6 kg] volunteered for this study. The 25 participants reported engaging in a total of 6.8 ± 3.0 h·wk-1 of exercise. Following a 5 min light jog each subject performed two flexibility tests which included a straight leg raise test (SLR) for hamstring flexibility and Thomas test for hip flexor flexibility. Subjects also performed a vertical jump test (VJ) for VJ height and lower body peak power (PP). Five separate Pearson Correlations were used in analyzing the relationship between hamstring flexibility, hip flexor flexibility, VJ height, and PP. An alpha level was set at $P \leq 0.05$ to determine statistical significance. **RESULTS**: There was a significant correlation between peak power and both VJ height [$r = 0.565$ ($p = 0.003$)] and hamstring flexibility [$r = 0.450$ ($p = 0.024$)]. There was also a significant correlation between hamstring flexibility and VJ height [$r = 0.595$ ($p = 0.002$)], however, there was no significant relationship between VJ and hip flexor flexibility [$r = 0.213$ ($p = 0.306$) and hip flexor flexibility and hamstring flexibility [$r = 0.139$ ($p = 0.508$)]. **CONCLUSION**: The results of the present study suggest that lower body power is strongly correlated with VJ height and hamstring flexibility, while VJ height and hamstring flexibility are also strongly correlated. However, neither VJ height nor PP is correlated with hip flexor flexibility and hip flexor flexibility is not correlated with hamstring flexibility.

#24

CONTRIBUTION OF AN ACTIVE VIDEO GAME INTERVENTION TO DAILY PHYSICAL ACTIVITY

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A 2007 investigation found that only 40% of college students met physical activity recommendations (ACHA-NCHA). Additionally, 65% of college students are regular or occasional game players (Jones, 2003). Motion-sensitive controllers have made video game play more active, and active video games could be used as an intervention tool to increase physical activity among the gaming population. Our research team created an active video game and employed it in an intervention to increase physical activity among insufficiently active college students. **PURPOSE**: The purposes of this study were to 1) determine the percent contribution of playing the active video game to the average daily sedentary activity and light (LPA), moderate, vigorous, and moderate-to-vigorous (MVPA) physical activity, and 2) compare physical activity levels on days when the subjects played the game to days during which they did not. **METHODS**: Seventy-four college students who did not meet physical activity recommendations wore accelerometers to obtain average daily physical activity. Game play time was recorded by a computerized game log using the player's first and last actions. Sedentary, LPA, and MVPA were determined using Freedson's cut-points. Descriptive statistics and repeated measures ANOVA (controlling for wear time) were used for analyses. **RESULTS**: Participants engaged in 558.7 ± 9.0 minutes/day of sedentary activity, 197.8 ± 10.0 minutes/day of LPA, and 44.9 ± 3.0 minutes/day of MVPA. Game play contributed an average of 10.2 ± 5.2 % to the average daily LPA and 3.3 ± 0.8 % to the average daily MVPA. There was no significant difference between game day and non-game day sedentary (580.1 ± 93.9 vs. 543.6 ± 86.6 minutes/day, respectively), LPA (208.6 ± 105.2 vs. 188.6 ± 81.5 minutes/day) and MVPA (57.8 ± 37.0 vs. 47.0 ± 33.4 minutes/day). **CONCLUSION**: This population engaged in high amounts of sedentary activity on both game days and non-game days. Participants had more LPA as well as more MVPA on game days compared to non-game days, but this difference was not statistically significant. Results indicate that the game play increased activity level during the time frame the subjects were actually playing, but did not encourage physical activity outside the game.

Funded by the Robert Wood Johnson Foundation

#25

ASSOCIATION OF THE FAMILY NUTRITION AND PHYSICAL ACTIVITY SCREENING TOOL WITH OVERWEIGHT IN CHILDREN

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The development of screening tools to evaluate home environments and behaviors that increase a child's risk of becoming overweight has recently been recommended. One such instrument, the Family Nutrition and Physical Activity (FNPA) Screening Tool, has been shown to predict a child's risk of becoming overweight. However, additional studies are needed to establish the association of the FNPA with overweight in varied settings with diverse populations. **PURPOSE**: To examine the association of the FNPA screening tool with overweight in 5-13 year old children from a low socioeconomic, urban community. **METHODS**: Children (n=418; 51% girls; 50% Caucasian, 42% African American) from four elementary schools located in Flint, Michigan were assessed for height and weight, which were used to calculate BMI (kg/m2). The FNPA screening tool was sent home, completed by parents, and returned to school. Mann-Whitney U tests were used to assess differences in FNPA score by weight status and ethnicity. Logistic regression was used to evaluate the association of the FNPA (tertiles) with weight status. **RESULTS**: Mean BMI (19.4. + 5.2 kg/m2) approximated the 69th percentile, with 15.3% overweight and 22.7% obese. Caucasian children had a significantly higher total FNPA score (indicating low-risk family environment and behaviors; 62.5 + 6.8) compared to non-Caucasian children (58.4 + 7.0; $p<0.001$). Overweight and obese children had a significantly lower total FNPA score compared to normal weight children (59.1 + 7.4 vs. 61.3 + 6.9; $p=0.03$). Children with a total FNPA score in the lowest tertile (high-risk) had an unconditional odds ratio of 2.1 (95% CI =1.26 – 3.38) compared to children with a total FNPA score in the highest tertile (low-risk) for being overweight or obese, but this effect was no longer significant when ethnicity (Caucasian or non-Caucasian) was included as a covariate. **CONCLUSION**: Children from a high-risk family environment (determined using the FNPA) have an increased risk of being overweight or obese compared to children from a low-risk family environment. This risk is increased further for non-Caucasian children. The FNPA screening tool can be used to identify children that may be at risk for overweight/obesity in a diverse population.

This study was funded by the Crim Fitness Foundation

#26

VALIDATION OF TWO PREVIOUSLY DETERMINED RUNNING VO_2 PREDICTION EQUATIONS FOR CHILDREN AND ADOLESCENTS

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Two equations have been used to determine aerobic demand (VO_2) of running in children and adolescents, but these equations have not been validated with an independent sample. **PURPOSE**: The purpose of this study was to validate two previously published prediction equations for aerobic demand of running in children and adolescents (Walker et al., 1999; Ridley et al. 2008). **METHODS**: Participants (N=104; 44 males and 60 females) ages 6-16 years were involved in this study. Each participant ran over-ground on a marked course in a gymnasium at a self-selected pace. VO_2 was measured using a portable metabolic analyzer during the trials. Predicted VO_2 was determined using both prediction equations. Repeated measures ANOVA, Pearson correlations, and Bland-Altman plots were used to compare the predicted VO_2 values to the measured VO_2. The participants in the study were also divided into two groups based on age for analyses, since the Walker equation was created specifically for adolescents. Participants aged 6-11 years were considered children and participants aged 12-16 years were considered adolescents. Data were analyzed separately for three groups; total sample, children, and adolescents. **RESULTS**: There was a significant main effect for total sample F (1.2, 119.0)=225.1, children F (1.1, 71.0)=266.3, and adolescents F (1.2, 47.2)=41.4 (all $p<0.001$). The prediction equations significantly under-predicted VO_2 compared to measured: Total sample 38.1 vs. 31.0 vs. 26.6 (Measured vs. Walker vs. Ridley) ml/kg/min; children 38.7 vs. 29.7 vs. 24.4 ml/kg/min; and adolescents 37.1 vs. 33.1 vs. 30.2 (all $p<0.001$). The correlations for total sample were r =0.38, $p<0.001$ (Measured vs. Walker), and r =0.93, p<0.35 (Measured vs. Ridley). For children, correlations were r=0.26, p<0.074 and r =0.06, $p<0.63$. For adolescents, correlations were r =0.72, $p<0.001$ and r = 0.55, $p<0.001$. For the total sample, Bland-Altman plots showed a bias of 7.1 between measured VO_2 and the Walker equation (95% level of agreement -4.8 to 19.1) and 11.5 for the Ridley equation (-2.4 to 25.4). **CONCLUSION**: Both prediction equations under-predicted VO_2, and both appear to be more accurate for adolescents than for children.

#27

CORRELATION OF FUNCTIONAL MOVEMENT SCREEN AND GOLF SWING FAULTS

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PURPOSE: To examine the correlation of the physical movement screen with twelve common golf swing faults. **METHODS:** Thirty-six subjects (mean age 25.4 ± 9.9 yrs, ht. 175.9 ± 16.2 cm, wt. 76.2 ± 14.6 kg., hdcp 14.2 ± 10.4) participated in the study. Prior to the procedures, subjects signed a written consent as approved by the Internal Review Board for Human Subjects Research at Grand Valley State University. The subjects performed twelve different physical tests, as established by the Titleist Performance Institute (TPI). The investigator demonstrated the test as well as gave cues on how to perform. At the completion of the physical tests, subjects hit golf balls with a five-iron while being video recorded from a front on view as well as down the line view. The video recordings were used to identify golf swing faults in ProV1 software. SPSS 18.0 (SPPS, Inc) was used for statistical analysis. Two-tailed Fisher's Exact Test identified significant relationships (0.05). **RESULTS:** The three most common swing faults found were early hip extension (61.1%), loss of posture (55.6%) and flat shoulder plane (30.6%). The three most common physical limitations found were Single Leg Balance (86.1% R, 75% L), Lower Quarter Rotation (80.6% LE, 77.8% RI), and Pelvic Tilt Quality (75.0%). Thirteen significant relationships between physical limitations and swing faults were found **CONCLUSION:** Early hip extension was the most common golf swing fault found. Four of physical tests had correlation with golf swing faults. Early hip extension effect's ones ability to properly rotate their hips in the golf swing. The result of the early extension swing fault is a block or hook as the hands and arms struggle to deliver the club to the ball because of the decreased distance they have to properly swing away from the body. The results demonstrate that physical ability is strongly tied to golf swing mechanics in making consistent contact with the golf ball for optimal distance and accuracy.

#28

THE EFFECT OF ISCHEMIC PRECONDITIONING ON REPEATED SUPRAMAXIMAL SPRINTS

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The use of a tourniquet to reduce blood flow and generate mild ischemia has been demonstrated to provide cellular protection against subsequent ischemia/reperfusion injury (ischemic preconditioning; IPC). Recently, IPC treatment protocols have been used acutely to increase VO2max which may impact power output. **PURPOSE**: To determine if a single IPC treatment at the level of the proximal thigh would improve physical performance of a lower body fatiguing task and enhance recovery from that task. **METHODS**: Apparently healthy, college-aged volunteers (n = 24, age 23 ± 3yrs; 22 men, age 24 ± 3yrs; and 2 women, age 22 ± 3yrs) completed two testing sessions in random order. After a 30 minute IPC treatment of 5 minutes 220mmHg restriction alternated with 5 minutes without restriction (total restriction time of 15 minutes) or a control (no IPC treatment; equivalent in duration) a 30-second maximal cycling task (Wingate test) was performed to quantify muscle fatigue (changes in power output). This was followed by a short rest period (30 seconds) and two subsequent 10-second Wingate tests (separated by 200 seconds) to examine the recovery of power output following the fatiguing task. **RESULTS**: Data is reported as mean ± standard deviations. Paired t-tests were used, but identified no differences in power output for the initial 30-second Wingate test between trials (mean power, CON = 762.03 ± 118.92 vs. IPC = 766.82 ± 121.09 watts). Furthermore, a repeated measures analysis of variance was used and a significant main effect of time was determined. However, no differences between trials for mean power of the first 10-seconds of the initial Wingate and the two subsequent Wingate tests (CON1 = 996.80 ± 197.35 watts vs. IPC1 = 992.21 ± 195.74 watts; CON2 = 751.98 ± 132.98 watts vs. IPC2 = 754.00 ± 127.57 watts; CON3 = 901.87 ± 176.84 watts vs. IPC3 = 926.93 ± 164.68 watts). **CONCLUSION**: In this group of participants, these data suggest that the IPC treatment is not beneficial for increasing anaerobic muscle performance during a fatiguing task or improving recovery from that task.

#29

COMPARISON OF PHYSICAL FITNESS STATUS BETWEEN SAFETY NET COMMUNITY HEALTH CENTER PATIENTS AND MEDICALLY AFFILIATED FITNESS CENTER MEMBERS

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Health outcome disparities may occur when socially disadvantaged populations experience differences in opportunities to achieve optimal health and fitness. Safety net community health centers (CHC) are community-based providers that offer health services to vulnerable populations. However, health disparities go beyond access to health care services and include limited opportunities and access for improving physical fitness (PF). **PURPOSE**: To compare PF measures in sedentary adults who recently joined a medically affiliated fitness center (FC) with individuals who joined a safety net CHC. **METHODS**: Male and female subjects (>40 yr of age) who expressed interest in learning more about their PF were invited to participate. Each subject completed the Rikili and Jones Senior Fitness Test (SFT), which included functional assessments of: 1) upper-body endurance (UBE, mean number of arm curls); 2) lower-body endurance (LBE, mean number of chair stands); 3) aerobic endurance (AE, distance walked, yd); 4) lower body flexibility (LBF, mean distance reached); 5) upper body flexibility (UBF, distance between finger tips, cm); and 6) percent body fat (%BF). **RESULTS**: 201 subjects (50.2% male, 71% white, 29% black, mean age 54.7±6.1 yr) completed the study. Multiple comparisons (mean±SD) showed that FC female participants performed significantly better on each PF measure compared to female CHC: UBE (CHC=13.6±4.2, FC=20.1±5.6, $p<0.001$); LBE (CHC=9.8±3.2, FC=17.1±3.1, $p<0.001$); AE (CHC=409.7±177.5, FC= 692.6, $p<0.001$); LBF (CHC=3.2±5.6, FC=2.3±4.6, $p<0.001$); UBF (CHC=-6.6±6.3, FC=0.7±0.7, $p<0.001$); and %BF (CHC=43.6±11.6, FC=32.1±10.0, $p<0.001$). Except for LBF (CHC=-1.5±5.6, FC=-0.4±5.6, $p=0.7$), FC men performed significantly better on all PF measures compared to CHC: UBE (CHC=17.6±6.6, FC=21.5±4.7, $p<0.01$); LBE (CHC=11.6±4.5, FC=17.3±4.6, $p<0.001$); AE (CHC=482.7±191.7, FC=698.9±89.2, $p<0.001$); UBF (CHC=-8.9±6.9, FC=-2.8±5.6, $p<0.001$); and %BF (CHC= 29.3±10.0, FC=24.0±8.0, $p=0.05$). **CONCLUSION**: Within this cohort, FC adults were more physically fit than CHC adults. These results support the need for access to fitness centers and professionals in disadvantaged populations in order to more completely address health disparities.

ACKNOWLEDGEMENT: The project described was supported by Award Number K01HL096423 from the National Heart, Lung, and Blood Institute. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Heart, Lung, And Blood Institute or the National Institutes of Health.

#30

EFFECT OF PHYSICAL EDUCATION ON DAILY PHYSICAL ACTIVITY LEVELS IN 4TH AND 5TH GRADERS

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PURPOSE: To determine whether children exhibit an increase in daily physical activity (PA) when they participate in physical education (PE) class as opposed to days they do not attend PE. **METHODS**: Forty-three participants (26 Females) in 4th and 5th grade (27 4th graders) wore an accelerometer for seven consecutive days from the time they awoke until bedtime each day. Additionally, they completed the Fitnessgram physical fitness test battery during PE. PA levels were compared on school days with a standardized PE class (2 days) versus school days without PE (3 days) for each subject. Specific time blocks throughout each day were analyzed for PA; in-school (9am-4pm) and after school (4pm-10pm). **RESULTS:** There was a significant ($p<0.001$) increase in PA during the school day on days with PE (Total Cts:174867 + 52010; 416+124 cts/min) vs. days without PE (Total Cts:88544 + 42619; 211+213 cts/min). Additionally, there was a significant ($p<0.05$) increase in PA during after school on days with PE (Total Cts:140972 + 89676; 392+249 cts/min) versus days without PE (Total Cts:112013 + 83931; 301+203). PA during PE was significantly correlated with aerobic fitness (AF) & Gender but not with age or BMI%. Only AF was a significant predictor of PA during PE. Furthermore, less than 50% of the PE class time was spent in moderate-to-vigorous PA. Further analysis showed that during both PE class time slots (9:45-10:30-4th or 11:20-12:05-5th) time spent in moderate-to-vigorous PA was not significantly different. **CONCLUSION**: Even though students spent less than half (35% - 16 min) of PE in moderate-to-vigorous PA, PE served to increase PA levels during the school day and greater PA was exhibited after school on days with PE. PE is associated with increased PA throughout an entire day thus promoting energy expenditure and the associated health benefits.

#31

The Effects of Protein and Carbohydrate Supplementation on Resistance Training Induced Gains in Fat Free Mass and Strength

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PURPOSE: The purpose of this study was to compare the gains in strength and fat-free mass achieved by novice weight lifters who participated in a 9-week resistance training program, and who consumed either a protein and carbohydrate supplement drink or a non-caloric placebo drink immediately after each resistance training bout. **METHODS**: Twenty-one participants (Supplement: 12, Placebo: 9) completed the 9-week resistance-training program. Body fat percentage (BF%) and fat-free mass (FFM) were assessed via air displacement plethysmography at baseline and again at the end of the 9-week training period. Pre- and post-training strength was also assessed via 1-repetition maximum tests on three different lifts. **RESULTS**: Food diaries collected and analyzed at 3 time points during the study indicated that the protein intake (without post-exercise supplementation) of the subjects in both groups exceeded the RDA for protein of 0.8 g/kg. Both groups exhibited significant increases in FFM and strength over the 9-week training period (FFM increased from 66.0 kg to 67.9 kg and from 62.8 kg to 64.4 kg, and total 1-rep max increased from 359.1 kg to 455.3 kg and from 356.3 kg to 458.1 kg in the Supplement and Placebo groups, respectively). However, no significant between-group differences in FFM or strength gains were observed. **CONCLUSIONS**: The results of this study suggest that if protein intake is already adequate to meet daily protein requirements, post-exercise protein supplementation may not be associated with additional training-induced improvements in FFM and strength in novice lifters participating in a relatively short-term program of resistance training.

(The whey protein and dextrose used in this study were provided by Bioplex Nutrition and NOW Foods respectively.)

#32

POST EXERCISE BLOOD PRESSURE RESPONSE TO EXERCISE WITH BLOOD FLOW RESTRICTION

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The restriction of muscle blood flow with short term low-intensity exercise has been shown to enhance muscle size and strength. Post exercise hypotension is consistently elicited following 30-60min bouts of moderate intensity (50-60% peak aerobic capacity) exercise. Following an acute bout of exercise, systemic resistance does not completely recover, resulting in post exercise hypotension. **Purpose**: To determine if exercise with blood flow restriction in healthy individuals is as effective as traditional exercise in eliciting post exercise hypotension. **Methods**: Ten healthy (age =23±2y; VO2max=38.4±10ml*kg-1*min-1; body fat =18±5%) college-aged individuals volunteered to participate in this within subject's design. Participants were randomly assigned to one of two exercise trials: one with blood flow restriction and one without. The normal exercise (NE) trial consisted of level walking at 60% of heart rate max for a total of 60 minutes. Exercise with blood flow restriction (EBR) consisted of level walking at 53.6 m/min (2.0mph) for 20 minutes (two bouts of 10 min). In order to create blood flow restriction, large blood pressure cuffs were placed around the most proximal portion of both legs. Prior to exercise, the pressure in each cuff was set at 100mmHg and increased by 20mmHg while holding for 30s at each pressure and releasing for 10 seconds between increments until the final pressure of 160mmHg was reached. In both exercise trials, heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) were assessed every 5 minutes. Post exercise HR, SBP, and DBP were assessed every 5 minutes for a total of 60 minutes. **Results**: SBP was significantly lower post NE at minutes 30(111±4 vs. 115±5 mmHg), 35(109±3 vs. 114±5 mmHg), 40(110±2 vs. 115.4±5 mmHg), and 50(111±4 vs.113±4 mmHg) compared to EBR. DBP was significantly lower in the first 5 minutes post exercise (76±7 vs.83±4 mmHg) in the NE vs. the EBR trial. Post exercise HR was significantly higher in the EBR group at 50 minutes (70 ±10 vs.66±10 bpm). **Conclusion**: Exercise with blood flow restriction utilizing a lower duration and intensity of exercise does not appear to yield the same post exercise hypotension as traditional moderate intensity exercise.

#33

PREVALENCE OF CARDIAC ABNORMALITIES IN COLLEGE ATHLETES WHEN EXPOSED TO PHYSIOLOGICAL AND THERMAL STRESSORS

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Cardiovascular pre-participation screening of collegiate student athletes is underutilized according to the American Heart Association. Physiological stress in the form of submaximal exercise and heat exposure can both alter cardiovascular function, possibly elucidating an abnormality via electrocardiogram (ECG). **PURPOSE**: To investigate prevalence of cardiac abnormalities in college athletes when exposed to physiological and thermal stress. **METHODS**: Eleven participants (males n=5; females n=6; 20.5 ± 1.4 yrs; 167.8 ± 4.8 cm; 60.0 ± 4.5 kg; 56.1 ± 12.2 ml/kg/min) currently participating at the NCAA Division I level volunteered for this study. Participants completed two submaximal treadmill tests (70% of VO2 max) in varying environmental conditions: thermoneutral (TN: 24.8 ± 1.6°C) and hyperthermic (HT: 38°C) for 30 minutes. ECGs were recorded at five minute intervals. PR interval duration, ST segment elevation/depression, and R and S wave voltage amplitude were measured; ECGs were further analyzed for abnormalities. A repeated measures ANOVA was used to test the effects of condition by time. **RESULTS**: No significant condition by time interactions were found for any variable ($p>0.05$). Significance across time manifested as a decreased PR interval (TN vs HT; -19.9 vs. -18.2%, $p<0.05$), R wave voltage (TN vs. HT: -17.9 vs. -12.2%, $p<0.05$), and increased S wave voltage (TN vs. HT: 37.4 vs. 52.2%, $p<0.05$). No main effects ($p>0.05$) were found for ECG abnormalities. However, high occurrences (56%) of incomplete left bundle branch block (ILBBB) were found. **CONCLUSION**: Submaximal exercise in the hyperthermic condition did not significantly alter cardiovascular function in the parameters measured. In addition, the total number of ECG readings with abnormalities was higher in the hyperthermic condition compared to thermoneutral, most notable in incidences of ILBBB.

Supported by funding from the College of Graduate and Professional Studies at Indiana State University

#34

EXERCISE TRAINING MAY BENEFICALLY EFFECT WHITE ADIPOSE TISSUE INFLAMMATORY AND HYPOXIC GENE EXPRESSION

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Obesity contributes to the development of inflammation and lifestyle related diseases, such as Type II Diabetes Mellitus. Exercise training can have anti-inflammatory effects but it is unclear if it is a potent enough stimulus to positively affect white adipose tissue (WAT) and glucose regulation in the presence of an obesigenic diet. **PURPOSE**: To determine the effect of 12 weeks of a very high fat (VHF) diet and/or exercise training (EX) on glucose regulation and inflammatory and hypoxic gene expression within white adipose tissue. **METHODS**: Male C57Bl6/J mice (n=39) were randomized into four groups: low-fat (LF)/sedentary (SED), LF/EX, VHF/SED, and VHF/EX. The VHF and LF diets were 60% and 10% fat, respectively. The mice were placed on the diet and exercise intervention concomitantly. Exercise training consisted of treadmill running 5 d/wk at 13 m/min, 5% incline, 40 min/d for 12 weeks. A subset of mice had intraperitoneal glucose tolerance tests (IPGTT). Quantitative real-time PCR was used to determine gene expression of inflammatory and hypoxia markers within white adipose tissue. **RESULTS**: Animals given the VHF diet gained more weight than mice on the LF diet ($p<0.05$) but weight gain was partially attenuated by exercise training ($p<0.05$). The VHF diet also increased epididymal fat pad weight relative to total body mass ($p<0.05$). Animals on the VHF diet had impaired glucose tolerance as indicated by increased area under the glucose curve ($p<0.05$), with exercise training having no effect ($p>0.05$). The VHF diet increased gene expression markers of inflammation, tumor necrosis factor alpha, interleukin-1 receptor antagonist (IL-1ra), and interleukin 10 (IL-10) ($p<0.05$), within the WAT. Exercise was able to reduce the expression of IL-10 and IL-1ra in animals on a VHF diet ($p<0.05$). The VHF diet increased hypoxia inducible factor 1(HIF-1) and decreased vascular endothelial growth factor gene expression ($p<0.05$). Exercise training attenuated HIF-1 gene expression in the VHF diet fed animals. **CONCLUSION**: Although exercise training had little impact on relative fat pad mass and glucose regulation, there is some evidence to suggest that it can beneficially affect weight gain and inflammatory and hypoxic gene expression of in WAT.

#35

CHARACTERISTICS AND PREVELANCE OF INJURIES AMONG D1A MALE COLLEGIATE CHEERLEADERS

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Injuries in cheerleading have been identified as a significant problem among females in recent years, however, very little information has been collected about male cheer injuries. Previous research on female cheerleaders report stunting as a primary cause of injury and strains and sprains the most common type of injury. The ankle is the most commonly injured body part. **PURPOSE**: The purpose of this study was to identify the common injuries and event circumstances occurring among male cheerleaders at NCAA D1A schools. **METHODS**: The sample consisted of 58 male collegiate cheerleaders from the United States ranging from freshman to graduate student level with a mean age of 21.59. The average years of cheerleading experience was 5.14. Subjects were recruited via email or Facebook. Participants voluntarily completed an online questionnaire regarding their cheerleading injury history. The questionnaire had a test retest reliability of $r = 0.778 – 0.996$, $p<0.05$. Frequency information was calculated for all categorical variables. Mean and standard deviation was calculated for numerical values. **RESULTS**: Twenty eight (49%) of the participants reported an injury occurring within the last year, with 14 subjects reporting more than one injury during the specified time frame. Most of the injuries (81%) occurred during practice. Injuries to the upper extremity accounted for 36.5% of the injuries reported, lower extremity injuries accounted for 30.7% of the injuries and core injuries were 28.8%. Ankle, back, and shoulder injuries were most common. Forty eight percent of the injuries sustained were strains or sprains. Over half of the injuries were sustained while stunting. Additionally, basing/spotting was the most common cause of injury. **CONCLUSION**: Overall, the results support previous research on cheerleading injuries. Male cheerleaders appear at risk for similar types of injuries as female cheerleaders. By identifying common injuries and circumstances of the injury event coaches, strength coaches, and athletic trainers can all adapt training programs and practices to help prevent injuries from occurring. Additional research should be conducted on a larger sample, including an international population, and injury rates calculated.

#36

Physically Active Residential Communities and Schools (PARCS): A program evaluation of an urban community-based exercise partnership

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Obesity and chronic diseases disproportionately affect low-income and ethnic minority urban residents in Indiana and nationwide. PARCS is a 9-year-old community-based exercise partnership between IUPUI and Indianapolis Public Schools (IPS) that strives to increase regular physical activity in urban residents at a membership price of $20/year. PARCS is located in 3 IPS Schools and offers quality fitness facilities. Costs remain low by employing university exercise science and fitness studies majors as facility staff for academic credit. **PURPOSE**: This study describes community participants of the PARCS program. Data from this study describe the sociodemographic, health, cognitive and physical attributes of adult community members. **METHODS**: Our study sample consists of 149 adult PARCS members of Black or White race. Four questionnaires were completed by study participants including demographics and health history. Height, weight, resting heart rate (RHR) and resting blood pressure (BP) were also measured. **RESULTS**: Data show that 68% of the study participants were Black, 48% had a household income of < $40,000 per year, 48% found it financially difficult to make ends meet, while 43% reported making ends meet to be "not hard, not easy," 41% of the respondents owned a home and 56% worked outside of the home. Forty percent reported having hypertension, 31% high cholesterol, 19% diabetes, 18% physically inactive, and 15% smoked. Measured mean resting SBP and DBP were 125 + 13 mmHg and 77 + 8 mmHg, respectively. Mean RHR was 76 + 12 BPM and the average BMI was 34.6. Resting SBP and BMI in study participants were higher than national recommendations of <120 mmHg and <25, respectively, while, resting DBP and RHR of study participants fell within recommended ranges of <80 mmHg and 60-100 BPM, respectively. **CONCLUSION**: Results show that PARCS participants have limited discretionary income and several risk factors and/or comorbidities that could be managed by participating in regular exercise. Community-based partnerships such as PARCS reduce financial barriers and could improve the exercise opportunities for populations with limited resources. Study data collection will continue in order to inform strategies to improve the existing PARCS program and potentially replicate similar partnerships locally and nationally.

This grant was funded by the Anthem Blue Cross and Blue Shield Foundation and IUPUI Vice Chancellor for Research Office, Developing Diverse Researchers with InVestigative Expertise (DRIVE) program.

#37

ASSOCIATIONS BETWEEN QUALITY OF LIFE AND PHYSICAL ACTIVITY AND SCREEN TIME IN URBAN CHILDREN

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Health-related quality of life (HRQoL) includes measures of physical health, emotional functioning, and social functioning. Previous studies have shown that overweight/obese children have lower quality of life scores when compared to normal-weight children. However, limited research is available regarding the potential associations between HRQoL and physical activity (PA) and screen time (ST) in low socioeconomic children. **PURPOSE**: To examine the associations between HRQoL and physical activity and screen time in children from a racially diverse, low socioeconomic status area. **METHODS**: Participants were 197 children (50% males, 64% African American) from four elementary schools (~80% eligible to receive free/reduced lunch) in/near Flint, Michigan. PA was assessed using pedometers (New Lifestyles, SW-200) and a survey question. ST was assessed using children's self-report for viewing television, playing video games, and online computer use. Quality of life was assessed using the Pediatric Quality of Life (PedsQL) inventory. Mann Whitney U tests were used to assess differences in HRQoL between sexes and weight status for PA and ST. Spearman correlations were used to assess the relationships between quality of life and both physical activity (separately for pedometer and survey question) and screen time. **RESULTS**: The sample included 45% overweight/obese, 27% and 5% met guidelines for PA and ST, respectively. No differences between sexes or weight status were found for PA, ST, or HRQoL. No significant associations were found between HRQoL (76.0 ± 15.9) and PA (4.0 ± 2.0 days/week, r= -0.07; 8848 ± 399 steps/day, r= -0.02), or between HRQoL and screen time (19.1 ± 13.9 hours/week, r= -0.01). **CONCLUSION**: There were no associations between quality of life scores with PA or ST. Results also did not show differences between overweight/obese and normal weight children in HRQoL, which was contrary to existing literature (Williams et al., 2005; Riazi et al., 2010). More investigation is needed to examine if there are associations between quality of life and physical activity and screen time, particularly in different types of samples. It is likely that variables aside from PA and ST are more relevant to minority/low-SES populations with regard to HRQoL.

This study was funded by the Crim Fitness Foundation

#38

THE EFFECTS OF ISCHEMIC PRECONDITIONING ON AEROBIC AND ANAEROBIC PERFORMANCE ON COMPETITION SIMULATED CYLING EXERCISE

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Acute limb ischemia induced by pressure cuffs before activity (ischemic preconditioning; IPC) has been reported to improve exercise performance at maximal efforts. **PURPOSE**: To determine the effects of IPC during a submaximal performance test in competitive amateur level cyclists. **METHODS**: Twelve healthy, male cyclists participated in two simulated performance tests in which they cycled at successive intensities of 30%, 50%, 70% for 5 minutes each, culminating in 90% of their pre-determined maximal power output until exhaustion. Prior to each test, subjects randomly completed a no IPC or IPC treatment. The IPC treatment consisted of alternating 220 mmHg of cuff pressure applied to the proximal portion of both thighs for three five minutes bouts separated by 5 minutes of rest. Selected aerobic (VO2), anaerobic ([lactate]), and performance (time to exhaustion) variables were measured for each trial. **RESULTS**: Data are reported as means ± standard deviations; comparisons of data were made with repeated measures analyses of variance or paired t-tests and significance accepted as $p<0.05$. There were no significant differences in VO2 or [lactate] between the treatments or across intensities (Table 1). Time to exhaustion was also not significantly different (no IPC = 1121 + 64.6 vs IPC = 1121.6 + 69.1 seconds). **CONCLUSION**: In this group of competitive amateur level cyclists, an acute treatment of IPC did not improve performance (reduce VO2 or [lactate]) at each submaximal intensity or increase time to exhaustion.

Table 1 Selected Variables

Intensity	VO2 (ml/kg/min)		[Lactate] (mmol/l)	
	No IPC	IPC	No IPC	IPC
30% Peak	25.9 + 1.9	26.2 + 2.5	1.90 + .44	1.82 + .40
50% Peak	35.9 + 2.7	36.2 + 2.9	2.55 + .68	2.76 + .79
70% Peak	46.7 + 4.3	46.7 + 3.6	5.43 + 1.2	5.39 + 1.6
90% Peak	53.6 + 4.2	53.5 + 3.5	12.45 + 1.4	12.7 + 1.6

Funded in part by the Provost's Undergraduate Research Fund at Ohio University; all methods were approved by the Institutional Review Board at Ohio University.

#39

THE INFLUENCE OF RECOVERY TIME FOLLOWING A DYNAMIC WARM UP ON LOWER BODY POWER AND VERTICAL JUMP IN RECREATIONALLY ACTIVE MALES

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Previous studies have reported improvements in power and strength following dynamic warm-ups. However, it is possible that the recovery period may influence performance changes. **PURPOSE**: The purpose of this study was to examine the influence of recovery time following a dynamic warm up on lower body power. **METHODS**: Twenty-eight healthy, recreationally active males [(mean ± SD) age, 21.3 ± 1.4 years; height, 178.0 ± 6.3 cm; weight, 80.9 ± 10.7 kg] volunteered for this study. The 28 participants reported engaging in a total of 6.9 ± 2.9 h·wk-1 of exercise. Each subject performed 2 randomly ordered conditions [control (CON) and dynamic warm up (WU)] following a 5 min light jog. During the control trial, each subject sat and rested for 5 minutes following the light jog. The dynamic warm-up included an exercise routine that gradually progressed in intensity. Each participant performed a pretest, and three post tests (0 min, 10 min, and 20 min). Vertical jump (VJ) and lower body power (AP) were calculated during each test period. A two-way repeated measures ANOVA [condition (control vs. WU) x time (pre vs. 0 min post vs. 10 min post vs. 20 min post)] was used to analyze all dependent variables. Bonferonni adjusted pairwise comparisons were used as post hoc analysis. An alpha level of $P \leq 0.05$ was set for statistical significance. **RESULTS**: VJ significantly increased from pre to 0 min post test ($p < .001$), while significantly decreasing from 0 min post test to both 10 min ($p < .001$) and 20 min ($p = .001$) post test for the WU condition. VJ was significantly greater for the WU condition at 0 min post test compared to the CON condition ($p = .002$). AP significantly increased from pre to 0 min post test ($p < .001$) for the WU condition, however it significantly decreased from 0 min post test to both 10 min ($p < .001$) and 20 min ($p < .001$) post test. **CONCLUSION**: A dynamic warm up may improve performance; however, a longer recovery time following the warm up is less effective in maintaining the performance improvements.

#40

EFFECTS OF VISFATIN GENE POLYMORPHISM RS4730153 ON EXERCISE-INDUCED WEIGHT LOSS OF OBESE CHILDREN AND ADOLESCENTS OF HAN CHINESE

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Purpose: to investigate the effects of Visfatin gene polymorphism RS4730153 on exercise-induced weight loss. **Methods**: 88 obese children and adolescents of Han Chinese were subjected to 4 weeks of aerobic exercise to lose weight. By using ligase detection-polymerase chain reaction (LDR-PCR) sequence typing techniques, we determined the RS4730153 polymorphism of Visfatin gene of individual subject, and measured physical shape, functions, quality and metabolic indicators of glucose and lipid metabolism before and after exercise intervention. **Results**: The A/G genotype frequency was 15.9% among subjects. Compared indicators of all genotypes before with after aerobic exercise, there were significant changes. The pre-exercise triglyceride (TG) levels were significantly different between two genotypes (GG: 1.40 ± 0.74mmol / L; AG: 1.86 ± 1.11mmol / L; P =. 050). In addition, exercise-induced changes of HOMA-β level between two genotypes were significantly different (P =. 050). Furthermore, gender also influenced changes of various metabolic indicators by exercise. **Conclusion**: Visfatin single nucleotide variants RS4730153 exist in obese Han Chinese children and adolescents. Weight loss via exercise may be improved by reducing TG levels or increase insulin sensitivity of obese children with homozygous Vasfatin RS4730153.
Keywords: Visfatin;Exercise; Obese children and adolescents; Polymorphism

#41

STABILITY BALL SITTING DOES NOT AFFECT VO_2 OR HEART RATE DURING SEMI-RECUMBENT LEG EXERCISE

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Prior studies in our laboratory demonstrated that sitting on a stability ball during aerobic arm exercise will significantly elevate VO_2 without affecting heart rate when compared to chair sitting. It appears that there are no comparable studies that look at stability ball sitting during semi-recumbent leg exercise. **PURPOSE**: The purpose of this study was to determine if sitting on a stability ball during semi-recumbent leg exercise will elevate VO_2 and heart rate (HR). **METHODS**: Sixteen apparently healthy young male and female adults who were at least moderately active were recruited following IRB approved informed consent. Participants completed two graded exercise tests (GXT) to volitional fatigue over two consecutive days: once sitting on a stability ball and once on a chair (order randomized). Participants exercised sitting behind a bicycle ergometer holding on to the seat with their hands and pedaling with foot straps securing the feet. Exercise started at 30-60 W and increased 30 W every three minutes. VO_2 and HR were continuously monitored. VO_2 and HR at 50% of peak power output, penultimate stage, and peak were examined. **RESULTS**: 2 (sitting mode) x 3 (stage) repeated measures ANOVAs revealed a significant ($p < 0.001$) stage main effect for both VO_2 and HR. However, there were non-significant sitting mode ($p = 0.475$, $p = 0.402$) main effects and interactions ($p = 0.440$, $p = 0.591$) for VO_2 and HR, respectively. Table 1 reports the means + SD.

Table 1. VO_2 and HR responses to GXT and different sitting modes

	VO_2 l/min		HR min-1	
	Ball	Chair	Ball	Chair
50%	1.59 + 0.31	1.56 + 0.39	140 + 14	142 + 11
Penult	2.47 + 0.60	2.49 + 0.70	174 + 11	175 + 10
Peak	2.89 + 0.71	2.80 + 0.68	185 + 9	185 + 9

CONCLUSION: It is concluded that sitting on the stability ball during semi-recumbent leg exercise does not affect VO_2 and heart rate. (Supported in part by an Oakland University Faculty Research Grant)

#42

DURATION OF POST-EXERCISE EFFECTS ON BRAIN COGNITION

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Research has already proven aerobic activity improves cognitive function (Ratey, 2008), though there is no mention of the duration of increased brain activity. **PURPOSE:** It is necessary that this information be studied to assist educators and their desire for optimal academic performance from their students, and the students themselves who can see increased scores from the knowledge gained from this study. **METHODS:** In order to study the increase in cognitive function after exercise, we recruited 20 college students, both male and female ranging from 18 to 23 years of age. The participants were initially tested for baseline cognition scores using the Guilford's Alternative Uses Test. They were then asked to run on a treadmill at maximum heart rate range for 20 minutes. Following the treadmill run, they were administered the cognition test at 10, 30, and 60 minutes following exercise. We hypothesized that greatest increases would occur at the 10 minute interval and would subsequently decrease at each interval. **RESULTS:** After the cognition tests were scored it was confirmed that the greatest cognition scores were achieved at 10 minutes after exercise. We saw an overall 13% increase from baseline testing to the 10 minute interval but decreases were seen after 10 minutes. **CONCLUSION:** Because such significant increases were seen, we can conclude that exercise will increase brain activity and that this increase will occur immediately after exercise. For further research it will be necessary to use smaller intervals between testing and more objective cognition testing. In conclusion, this study confirmed our theory that exercise can be used as an academic tool to increase brain activity.

#43

EFFECTIVENESS OF AN AT-HOME BASED PHYSICAL ACTIVITY INTERVENTIONS FOR FAMILIES WHO HAVE CHILDREN WITH INTELLECTUAL DISABILITIES

Alyssa Gutierrez[1], Kathleen A. Stanton-Nichols, Ph.D. School of Physical Education and Tourism Management, Indiana University Purdue University Indianapolis

This pilot study was conducted to determine whether an at-home based activity intervention for families who have a child with an intellectual disability was an effective means to increase motor skill ability and activity adherence. **Purpose:** Specifically, investigators were interested in 1) determining whether weekly home-based visits improves motor skills (intervention group) more than families who only received weekly phone calls (attention group) and 2) determining factors that affected family's adherence to the program. Physical activity literature involving children with intellectual disabilities suggests that behavior management, directed activity programming, and family intervention enhance adherence as well as sustainability of a new program. The authors anticipated that the intervention group would 1) have greater adherence to an exercise program and 2) improved scores on the gross motor quotient (GMQ), which is a numeric representation of the participant's overall score on the assessment. For the purposes of this abstract, only the assessment scores are reported. **Methods:** The study was conducted with 16 families, eight in the intervention group and eight in attention group. All participants had some degree of intellectual disability in addition to other disability conditions. The families were educated on the importance of regular physical activity and how to modify each activity for their child. Measures of efficacy include activity adherence (self-report) and pre/post motor skill performance on an assessment looking at motor skills. The mean age of the participants was 9.1 years old at the beginning of the study. **Results:** An independent t-test was conducted comparing scores from the pre- to the post- assessments between the attention and intervention groups. There was no significant differences in the scores for the attention group (M=11.25 SD=9.177) and the intervention group M=20.25, SD=21.737; t (14) =-1.079, p=.3 (two-tailed). However, the magnitude of the differences in the means (mean difference=-9.0, 95% CI: 26.892 to 8.892) suggested that there was a moderate interventional effect although not statistically significant. **Conclusion:** The results of this study showed that there were no statistical significances between groups; however it did show that the intervention had a moderate effect. Although significance was not found, the investigators were encouraged by the moderate effect of the intervention and would suggest that a larger sample size or more sensitive assessment instrument could potentially show a difference between groups. Future studies should concentrate on increasing sample size, selection of a different motor skill assessment or use of more than one motor skill assessment.

1. This project was funded by Louis Stokes Alliance for Minority Participation, Diversity Scholar Research Program.
*Equipment for this project was purchased with a grant from the Undergraduate Research Opportunities Program.

Business Meeting - Agenda Item
Vote on Proposed New MWACSM Constitution and Bylaws
11:00-11:30 a.m., Saturday, October 29, 2011 - Auditorium

At this meeting the membership will be voting on whether or not to adopt a new constitution and by-laws for the Midwest Chapter of the American College of Sports Medicine. Listed below are the major points for the adoption of a new Constitution and Bylaws.

Conversion of MWACSM Constitution to Constitution and Bylaws

1. Original constitution was made in 1972 during founding of chapter.
2. Procedural drift has occurred related to functioning of MWACSM Board.
3. Current proposal updated the MWACSM constitution and created bylaws for the chapter to reflect practices of the Board of Directors.

Benefit of changing to a constitution and bylaws for MWACSM

1. Having bylaws allows the MWACSM Board to modify operation and procedures of the chapter more easily.

Major changes proposed:

1. Updates the goals and objectives of the Chapter
2. Adds a Graduate Student Representative as an Officer of MWACSM with a 2-year term.
3. Adds language for removal of an Officer of MWACSM
4. Updates the start and termination dates for officers to reflect calendar year terms that have been used.
5. Changes Secretary/Treasurer position to Secretary only
6. Changes the term of office for Secretary, Executive Director, and Regional Chapter Representative to 3 years to match terms of office for other officers.
7. Updates the standing committees of MWACSM

The vote will occur during the Business Meeting on Saturday, October 29, 2011.

Constitution and Bylaws of the Midwest Chapter of the American College of Sports Medicine (MWACSM)

Revised 06/21/2011
Approved by MWACSM Membership on XX/XX/XXXX

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Constitution of the Midwest Chapter of the American College of Sports Medicine

Article I: Name And Geographical Area

Section 1: Name

The name of the organization is the "Midwest Chapter of the American College of Sports Medicine" (MWACSM). MWACSM is a permanent regional chapter of the American College of Sports Medicine (ACSM).

Section 2: Geography

The geographic area shall include the states of: Illinois, Indiana, Iowa, Michigan, Ohio and Wisconsin.

Section 3: Restructuring

Any restructuring of the geographical area will follow ACSM guidelines.

Article II: Purpose and Objectives

1. To promote and advance scientific knowledge and application of this knowledge dealing with the effect of sports and other physical activities on the health and wellness of human beings at various stages of life.
2. To collaborate with other organizations, educators, scientists, physicians, fitness practitioners, and students concerned with the same or related specialties.
3. To arrange for mutual meetings of educators, scientists, physicians, fitness practitioners, and students concerned with the same or related specialties.
4. To initiate, promote, and collaborate on research in these fields.
5. To disseminate information pertaining to various aspects of sports, other physical activities, and medicine.

Article III: Organization

Section 1: Status

MWACSM is a non-profit organization that was granted permanent regional status in 1972 by ACSM. MWACSM was the first chapter to be granted permanent regional status.

Section 2: MWACSM Office

The main office for MWACSM will be located at the professional location of the Executive Director.

Section 3: Officers

The Officers of MWACSM will consist of a Presidents' Council (President-Elect, President, and Past-President), six Members-at-Large, a Secretary, and a Graduate Student Representative. The Officers in conjunction with an ACSM Regional Chapters' Committee Representative, and an Executive Director shall form the MWACSM Board of Directors.

The Board of Directors, with the exception of the Graduate Student Representative, must be Professional Members of MWACSM and ACSM during their terms. The Graduate Student Representative must be a student member of MWACSM and ACSM at the beginning of each year of his or her term.

Section 4: Board of Directors' Duties

The Board of Directors shall determine and implement the policies of the Chapter, and will conduct the business of the membership as described by the MWACSM Constitution and Bylaws.

Section 5: Board of Directors' Voting Rights

The President, Past-President, President-Elect, Secretary, the six Members-at-Large, and the Graduate Student Representative shall be the voting members of the Board of Directors on all official matters related to the policies and procedures of the Chapter.

The Executive Director and Regional Chapter Representative will have voting rights related to the location and content of the MWACSM annual meeting, but will not have voting rights for other official business of the Chapter.

Section 6: Elections

Elections for the Officers of MWACSM will be held annually. For the positions of President-Elect, Secretary and Graduate Student Representative, the candidate with the most votes is elected to that position. For the positions of Member-at-Large, the candidates with the first and second most votes will be elected to those open positions.

Section 7: Appointments

The President with the approval of the Officers of MWACSM will appoint the Chapter Representative to ACSM Regional Chapters' Committee.

For the Regional Chapter Representative, an appointment is confirmed by a majority vote of all Officers of MWACSM

The Officers of MWACSM will vote to approve the Executive Director for the MWACSM chapter.

For the Executive Director, an appointment is confirmed by a majority vote of all Officers of MWACSM.

The Officers of MWACSM have the authority to remove either the Regional Chapter Representative or Executive Director with a simple majority vote at any time.

Section 8: Board of Directors Terms

The term of office for President will be for three years. Each person elected President will serve one year each as President-Elect, President, and Past-President. The terms of office for the Members-at-Large, Secretary, Executive Director, Graduate Student Representative, and Regional Chapter Representative will be for three years.

Section 9: Board of Directors Vacancies

The President-Elect shall fill any vacancy in the office of the President. Vacancies in the other offices of the Board of Directors will be filled by appointment of the President with approval of the Officers of MWACSM. The appointee shall complete the term of the Officer he or she is replacing.

Section 10: Officer Removal

A member of the Board of Directors can be removed in accordance with the policy and procedures in the MWACSM Bylaws.

Section 11: Fiscal Year

The fiscal year shall be from January 1 through December 31.

Article IV: Membership

Any persons meeting the qualifications of membership as described in the MWACSM Bylaws is eligible to be a member of MWACSM. Categories of membership are described in the MWACSM bylaws.

Article V: Committees

Section 1: Standing Committees

The standing committees of MWACSM are: Annual Meeting, Awards, Communications, Exercise Is Medicine, Leadership and Mentorship, Membership And Member Services, Nominating, and Sponsorship.

Section 2: Ad hoc Committees

The President may appoint ad hoc committees at his or her pleasure. The ad hoc committee will disband at the end of the President's term unless re-appointed by the President-Elect.

Section 3: Committee Terms

Membership on a committee will be for one year. An individual may be appointed to successive terms on a committee.

Section 4: Appointment

All committee Chairs and members will be appointed by the President, and approved by the Officers of MWACSM at the beginning of each fiscal year.

The President in consultation with the President-Elect, Past-President, and Executive Director will fill vacancies on a committee.

Section 5: Reporting

The Chair of each committee will submit a written report to the President-Elect prior to the first Board of Directors meeting at the beginning of each fiscal year. This report should identify priorities for the year as determined by the chapter's strategic plan along with a timeline as well as any updates to the committee's policies and procedures. The Chair of each committee will then submit an update to the Board of Directors for each Board of Directors' meeting.

Section 6: Removal

A member of a committee can be removed at the discretion of the President in consultation with the Past-President, President-Elect, and Executive Director.

Article VI: Meetings

Section 1: Annual Business Meeting

MWACSM will hold an annual business meeting to conduct the business of the Chapter, and have membership vote on appropriate items. The date and location for annual business meeting will be determined by the Presidents' Council and approved by a vote of the Board of Directors.

Section 2: Scientific Meeting

In conjunction with the business meeting, MWACSM shall conduct a scientific meeting that shall be devoted to topics related to exercise science and sports medicine.

Section 3: Meeting Planning

The annual business and scientific meeting will be planned by the Past-President in consultation with the President, President-Elect, and Executive Director.

Section 4: Date and Location

The date and site for the annual meeting shall be determined by the Past-President in consultation with the President, President-Elect, and Executive Director.

Section 5: Board of Directors Meetings

In addition to the annual business meeting, the Board of Directors will conduct a minimum of two additional board meetings throughout the calendar year. This will include a meeting at the National ACSM meeting.

Article VII: Amendments

Amendments to the Constitution of MWACSM may be initiated by a proposal signed by at least five members of the organization in good standing.

- This proposal must be delivered to the Executive Director in writing at least 60 days prior to a Board of Directors meeting.
- The proposed amendment must be approved by majority vote of the Board of Directors at least 30 days prior to the MWACSM annual meeting
- A two-thirds affirmative vote by the membership at the MWACSM annual business meeting shall be required to adopt any amendment.

Article VIII: Funds

Section 1: Income

The funds of the MWACSM shall be derived from the annual dues collected from each member as well as from registration fees, endowments, gifts, grants, and bequests to the organization.

Section 2: Expenditures

The Executive Director with the approval of President may expend funds up to a maximum amount that has been approved by the Board of Directors. Expenditures in excess of the approved maximum must be approved by majority vote of the Board of Directors.

Article IX: Dissolution of the Chapter

In the event of the dissolution of the Midwest Chapter of the American College of Sports Medicine (MWACSM), the assets and debts of the organization shall be transferred to ACSM.

Bylaws for the Midwest Chapter of the American College of Sports Medicine

Article I: Membership

Section 1: Categories of Membership

Subsection 1.1: Professional Member

A Professional member possesses an earned bachelor's degree, master's degree, or a doctoral degree from an accredited institution in a field related to health, physical education, kinesiology, exercise science, medicine, nutrition or biology. Professional members are also persons working in a field related to sports medicine or exercise science, who have not earned a bachelor's degree, or have not earned a degree in a related field.

Subsection 1.2: Graduate Student Member

A Graduate Student member possesses a bachelor's degree and is pursuing graduate studies at an accredited institution. A Graduate Student member must be studying at least half time as defined by their attending institution during at least one semester of a regular academic year.

Subsection 1.3: Undergraduate Student Member

An Undergraduate Student member must be attending an accredited undergraduate institution and studying at least half time as defined by their attending institution during at least one semester of a regular academic year. To be eligible for this category, the student must be in good standing at the attending institution.

Section 2: Voting Privileges

All members of MWACSM are eligible to vote in elections for Officers for the Board of Directors and for Constitutional changes.

Section 3: Dues

The national office of the ACSM determines the annual dues rate for regional chapters. MWACSM members may pay their regional dues through the ACSM office, they may submit their payment to the MWACSM's Executive Director's office, or they may pay it at the MWACSM annual meeting. Dues must be paid annually on the member's yearly anniversary of joining. If dues are not paid annually, a person will be removed for the MWACSM membership.

Article II: Board of Directors

Section 1: Members of the Board of Directors

The Constitution for MWACSM names the officer positions held by the Board of Directors members.

Section 2: Duties of the Board of Directors

Subsection 2.1: President

The President shall preside over and run Board of Directors' meetings and the annual business meeting. The President shall set the agenda for Board of Directors' meetings and the annual business meeting in consultation with the President's council and the Executive Director. The President shall be responsible for making appointments for vacant Board of Directors and committee positions. The President shall be responsible for implementing the strategic plan, policies, and procedures of the MWACSM chapter. The President shall be responsible for ensuring that MWACSM operates in accordance with the procedures and policies established for the regional chapters by ACSM. The President assumes the duties of Past-President in the year after their service as President.

Subsection 2.2: President-Elect

The President-Elect shall be responsible for determining committee memberships in consultation with the President, Past-President, and Executive Director at the beginning of each fiscal year. The President-Elect will coordinate the work of the committees and facilitate committee reporting to the Board of Directors. The President-Elect will chair the Abstract Review subcommittee of the Annual Meeting Committee. The President-Elect assumes the duties of President in the year after their service as President-Elect.

Subsection 2.3: Past-President

The Past-President shall be responsible for planning and coordinating the annual meeting in consultation with the President, President-Elect, and Executive Director. A retiring Past-President shall be immediately eligible to serve as Secretary, a Member-at-Large, or Executive Director. A retiring Past-President shall not be eligible to serve as President-Elect until one year has elapsed.

Subsection 2.4: Secretary

The Secretary shall be responsible for keeping the minutes for all official business meetings of the chapter (e.g. Board of Directors and annual business meetings). There shall be no limit to the number of consecutive terms a person may serve as Secretary. A retiring Secretary shall be immediately eligible to serve as President-Elect, Member-At-Large, Secretary, or Executive Director.

Subsection 2.5: Members-at-Large

The Members-at-Large shall be responsible for developing the policies and procedures for MWACSM. Members-at-Large shall serve as chairs of the MWACSM standing committees, and be responsible for nominating committee members to the President-Elect for appointment by the President. A retiring Member-at-Large shall be immediately eligible to serve either as President-Elect, Executive Director, or Secretary. A retiring Member-at-Large shall not be eligible to serve again as Member-at-Large until one year has elapsed.

Subsection 2.6: Graduate Student Representative

The Graduate Student Representative shall be responsible for helping to develop the policies and procedures for MWACSM. The Graduate Student Representative will chair the student involvement committee, which will be a subcommittee of the Exercise is Medicine standing committee. The Graduate Student Representative shall also fulfill the duties related to being a member of the ACSM Student Affairs Committee, and shall attend the Student Affairs Committee meeting at the ACSM annual meeting.

Subsection 2.7: Executive Director

The Executive Director shall maintain an administrative office through which the routine business of the MWACSM Chapter shall be conducted. The Executive Director shall supervise the finances of chapter by maintaining appropriate financial records of the income and expenditures of the Chapter. The Executive Director shall be responsible for preparing financial reports for the Board of Directors and the annual business meeting. The Executive Director in conjunction with ACSM will maintain the Chapter's roster of membership. The Executive Director shall submit the necessary annual reports and documents to ACSM. There will be no limit on the number of consecutive terms any individual can serve as Executive Director. A retiring Executive Director shall be immediately eligible to serve as President-Elect, Secretary, or Member-at-Large.

Subsection 2.8: Regional Chapter Representative

The Regional Chapter Representative will function as the liaison between MWACSM and ACSM and make the Board of Directors aware of changes in chapter policies. An individual may only serve for two consecutive terms terms. Regional Chapter Representative. Eligibility for Regional Chapter Representative includes serving as Past-President of the MWACSM.

Section 3: Election of the Board of Directors

Subsection 3.1: Offices on the Ballot

All Officers, except the President, Past-President, Regional Representative, and Executive Director shall be elected by ballot sent to each MWACSM member in good standing.

Subsection 3.2: Eligibility for Board of Directors

Each nominee must be a current MWACSM and ACSM member in good standing. A nominee for President-Elect must have served or be serving as a Member-at-Large or Secretary in order to be eligible for nomination. All nominees shall have to declare a willingness to accept the office for which they are nominated.

Subsection 3.3: Nominating Process

Nominations for the ballot for President-Elect, Members-at-Large, Secretary, and the Graduate Student Representative will be to the Chair of the Nominating Committee one month prior to the annual meeting. A proposed ballot will be presented to the Board of Directors three weeks prior to the annual meeting for final approval by the Officers of MWACSM.

Subsection 3.4: Voting Procedures

Voting on the ballot for President-Elect, Members-at-Large, Secretary, and Graduate Student Representative will be open to MWACSM members two weeks prior to the beginning of the annual meeting. Voting will close during the MWACSM annual meeting prior to the business meeting.

Subsection 3.5: Announcement of Election Results

New members of the Board of Directors will be announced at the business meeting during the MWACSM annual meeting. New members of the Board of Directors will also be announced via email and newsletter following the meeting.

Section 4: Initiation, Rotation, and Expiration of Terms of Officers

Subsection 4.1: Initiation of Term

New Officers will assume their positions on the Board of Directors on the January 1 immediately following their election to the office.

Subsection 4.2: Rotation of Officers

The Members-at-Large terms shall rotate so that no more than two positions will be available for election in a given year.

Subsection 4.3: Expiration of Term

The term of an individual Officer will expire on December 31 at the end of their term.

Section 5: Removal of an Officer of MWACSM

Subsection 5.1: Cause for Removal of a Member of the Board of Directors

Causes for initiating removal proceedings against an Officer of MWACSM include: 1) A conflict of interest that will inhibit the Officer's ability to act in the best interest of MWACSM, 2) financial misconduct related to MWACSM chapter finances, and 3) professional misconduct that may inhibit the Officer's ability to represent MWACSM.

Subsection 5.2: Approval to Initiate Removal Proceedings.

To initiate removal of the Officer in question, a majority vote of the Board of Directors must be obtained.

Subsection 5.3: Notification of Removal Proceedings

The President shall notify the Officer in question that removal proceedings will be initiated and that possible removal of that Officer from the Board of Directors may occur.

Subsection 5.4: Initiation of Removal Proceedings

The President shall notify the Officer in question that they must submit two names of MWACSM members to the Board of Directors within thirty days to act as members of the Removal Review Board. If the Officer in question fails to notify the Board of Directors who their two committee members will be, the Board of Directors will select the two MWACSM members on the Officer's behalf.

Subsection 5.5. Composition of Removal Review Committee

A Removal Review Committee consisting of four members of MWACSM and the Past-President will be formed to review the reasons for removal. The composition of the four MWACSM members will be two MWACSM members appointed by the President and the two MWACSM members selected by the Officer in question, or by the Board of Directors if the Officer in question does not identify two members.

The Officer in question may not be a member of the Removal Review Committee.

If the Officer in question is the President, then the Past-President shall appoint the two members of the Removal Review Committee

If the Officer in question is the Past-President, the President-Elect will serve on the Removal Review Committee.

Subsection 5.6: Proceedings for Removal

The Removal Review Committee shall hear the charges and evidence, and provide its findings and recommendations to the Board of Directors within seven days of the Removal Review Committee meeting.

Subsection 5.7: Removal of Officer

The removal of the Officer requires a majority of vote of the Board of Directors.

The Officer in question may not vote on their removal.

Section 6: Appointment of the Executive Director

In the last year of an Executive Director's term, the Board of Directors will put out a request for proposals (RFP) for an Executive Director. The RFP shall include a budget outlining the costs associated with running the MWACSM chapter office. The President and Past-President will review the proposals and make a recommendation to the Officers of MWACSM for appointment of the Executive Director. The appointment of the Executive Director must be approved by majority vote of the Officers of MWACSM.

Section 7: Appointment of the Regional Chapter Representative

The President shall appoint the Regional Chapter Representative with approval of the Officers of MWACSM.

Section 8: Standing Committees Membership

Subsection 8.1: Annual Meeting Planning Committee

The Annual Meeting Planning Committee members shall be comprised of the Presidents Council and Executive Director. The Chair of the committee will be the Past-President. Subcommittees of the annual meeting planning committee will include the Quiz Bowl Committee and the Graduate Fair Committee. Committee memberships may be increased based on recommendations of the Past-President and appointment of the President. The number of committee members may vary from year to year depending

on the particular infrastructure adopted by the Committee Chair and the resources that are already available (or unavailable) to him/her at the time. Committee members are appointed by the President, and approved by the Officers of MWACSM.

Subsection 8.2: Awards Committee

The President with the consent of the Officers of MWACSM shall appoint the chair of the Awards Committee. The Chair of this committee will be a current or former member of the Board of Directors of MWACSM. There will be a minimum of three committee members in addition to the Chair. Committee members are appointed by the President, and approved by the Officers of MWACSM.

Subsection 8.3: Communications Committee

The President with the consent of Officers of MWACSM shall appoint the Chair of the Communications Committee. The Chair of this committee will be a current or former member of the Board of Directors of MWACSM. In addition, the Chair also serves as the editor of the chapter newsletter, MWNews. There will be a minimum of three committee members in addition to the Chair. Committee members are appointed by the President, and approved by the Officers of MWACSM

Subsection 8.4: Exercise is Medicine

The President with consent of Officers of MWACSM shall appoint the Chair of the Exercise is Medicine Committee. The Chair of this committee will be a current or former member of the Board of Directors of MWACSM. The committee will have one representative from each state in the region for a total of six committee members in addition to the chair. Committee members are appointed by the President, and approved by the Officers of MWACSM.

The Exercise is Medicine Committee will have a subcommittee that is a student lead committee, which will be chaired by the graduate student representative. The subcommittee will have one representative from each state in the region for a total of six subcommittee members in addition to the chair. The Chair of the Exercise is Medicine committee will oversee this subcommittee. There will be a minimum of one student committee member from each state on this subcommittee.

Subsection 8.5: Leadership and Mentorship

The President with consent of Officers of MWACSM shall appoint the Chair of the Leadership and Mentorship Committee. The Chair of this committee will be a current or former member of the Board of Directors of MWACSM. There will be a minimum of three committee members in addition to the Chair. Committee members are appointed by the President, and approved by the Officers of MWACSM.

Subsection 8.6: Membership and Member Services Committee

The President with the consent of Officers of MWACSM shall appoint the Chair of the Membership and Member Services Committee. The Chair of this committee will be a current or former member of the Board of Directors of MWACSM. There will be a minimum of three committee members in addition to the chair. Committee members are appointed by the President, and approved by the Officers of MWACSM.

Subsection 8.7: Nominating Committee

The President with the consent of Officers of MWACSM shall appoint the Chair of the Nominating Committee. The Chair is appointed to serve a one-year term concurrent with the President. The chair may serve for no more than two consecutive years. The Chair of this committee will be a current or former member of the Board of Directors of MWACSM. The nominating committee will include at least three active members of MWACSM who are serving or have served as a member of the Board of-Directors. No member of the committee can serve on the committee if they accept a nomination for a position as an officer on the Board of Directors. Committee members are appointed by the President, and approved by the Officers of MWACSM.

Subsection 8.8: Sponsorship Committee

The President with the consent of Officers of MWACSM shall appoint the Chair of the Sponsorship Committee. The Chair of this committee will be a current or former member of the Board of Directors of MWACSM. There will be a minimum of three committee members in addition to the chair. Committee members are appointed by the President, and approved by the Officers of MWACSM.

Section 9: Standing Committee Functions

Subsection 9.1: Procedures

The standing committees' duties are outlined in the MWACSM procedures manual.

Subsection 9.2: Amendment of Procedures Manual

Standing committee duties and procedures can be amended with a simple majority vote of the Officers of MWACSM.

Article III: MWACSM Meetings

Section 1: MWACSM Annual Meeting

MWACSM will hold an annual meeting for its membership that includes social, scientific, and business activities.

Section 2: Board of Directors Meetings

The MWACSM Board of Directors will hold an annual business meeting in conjunction with the MWACSM annual meeting. A minimum of two additional Board of Directors meetings will be scheduled as needed by the President and in consultation with the Past-President, President-Elect, and Executive Director.

Article IV: Parliametry Authority

The rules contained in the current edition of ***Robert's Rules of Order Newly Revised*** shall govern MWACSM in all cases to which they are applicable and in which they are not inconsistent with these bylaws and any special rules of order that MWACSM may adopt.

Article V: Amendments

Section 1: Amending Bylaws

The bylaws of MWACSM can be amended at a Board of Directors meeting, or by mail, email, or web-based vote of the Officers of MWACSM.

Section 2: Passage of Amendments

To amend the bylaws of MWACSM, there must be a favorable three-fourths vote by the Officers of MWACSM.

Section 3: Voting on Amendments

Mail, email, or web-based votes must be completed and/or returned to the President within thirty days of being mailed, emailed, or posted online to/for the Board of Directors.

Past Student Award Winners

Year	Award	Recipient(s)
1989	Student Presentation	DN Proctor
1990	Student Presentation	Carol Wiedeman
1991	Student Presentation	Amy Jo Casenhiser
1992	Student Presentation	Kathryn Coningham
1993	Student Presentation Student Recognition	Kevin Short Cynthia McKnight Glenna DeJoug
1994	Student Poster Presentation Outstanding Student Award Student Presentation	D. M. Choi Cathy Karroll Mary Sled C. Kasper
1995	Student Poster Presentation Student Presentation Outstanding Student Award Student Research Award	Ray Stasling Michael Caddia Charlie Lambert Kera Kelsey
1996	Student Presentation	Alan Parcell Cindy Bouillon
1997	Outstanding Undergraduate Student Outstanding Graduate Student Student Research Award Student Presentation	Heather Brehm Kevin Short Christopher Cheatham Sean Mulroy Christopher Cheatham
1998	Outstanding Graduate Student Student Presentation	Lisa Lesneuisky Vicki Pittenger Brandon Klump
1999	Outstanding Graduate Student Outstanding Undergraduate Student Student Presentation Student Research Award	Sean Flanagan Karin Pfeiffer Christine Meuller Leigh Mroteh Ty Hopkins Eric Hall
2000	Outstanding Graduate Student Outstanding Undergraduate Student Student Research Award Student Presentation	Cindy Anderson Kindal Shores David Wright Cindy Anderson Cheri Teranishi
2001	Outstanding Graduate Student Outstanding Undergraduate Student Student Presentation Student Research Award	Dawn Coe Tamara Keehn S. K. Tsivitse D. C. Wright Michelle Masterson
2002	Outstanding Graduate Student Outstanding Undergraduate Student Student Research Award Student Presentation-Poster: Undergrad Student Presentation- Poster: Masters Student Presentation- Poster: Doctoral Student Presentation- Oral	Candace Perkins Evelyn Warner Paul R. Nagelkirk Christina Hayter Jessica Sobolewski Paul R. Nagelkirk Adam Coughlin

Past Student Award Winners

2003	Outstanding Graduate Student	Paul Nagelkirk
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student	Maxi Meissner
	Student Presentation	DM Malek
		Paul Nagelkirk
		Michelle Masterson
		Patrick Johnson
		Renee Rogers
		Andrew Cole
	MWACSM Professional Award	Cody Sipe
2004	Outstanding Graduate Student	Dan Ritchie
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student	Alicia Gordon
	Student Presentation- Poster: Undergrad	Dan Kelly
	Student Presentation- Poster: Masters	Natalie Schweitzer
	Student Presentation- Poster: Doctoral	Christopher Herman
	Student Presentation- Oral: Undergrad	Andrea Ott
	Student Presentation- Oral: Masters	Christine Layman
2006	Student Presentation- Oral: Masters	Megan Holmes
	Student Presentation- Oral: Doctoral	Phil Anton
	Student Presentation- Poster: Undergrad	Elizabeth Priest
	Student Presentation- Poster: Masters	Lindsay Sammut
	Student Presentation- Poster: Doctoral	Richard Carpenter
	Student Research Award	Juame Padilla
	Outstanding Graduate Student	Richard Carpenter
	Outstanding Undergraduate Student	Rebekah Kuczynski
	MWACSM Professional Award	Clinton Brawner
2007	Student Presentation- Oral: Undergrad	Lindsay Kelly
	Student Presentation- Oral: Masters	Erin Kuffel
	Student Presentation- Oral: Doctoral	Tyrone Washington
	Student Presentation- Poster: Undergrad	Lisa Guth
	Student Presentation- Poster: Masters	George Schweitzer
	Student Presentation- Poster: Doctoral	Chris Herman
	MWACSM Professional Award	Kevin Temerowski
2008	Student Presentation- Oral: Masters	Leryn Boyle
	Student Presentation- Oral: Doctoral	Lanay Mudd
	Student Presentation- Poster: Undergrad	Rodney Pius
	Student Presentation- Poster: Masters	Michael Knuston
2009	Student Presentation—Oral: Doctoral	Pei-Tzu Wu
	Student Presentation—Oral: Masters	Michael Knutson
	Student Presentation—Poster: Undergraduate	Hannah Calvert
	Student Presentation—Poster: Doctoral	Darijan Suton
	Student Presentation—Poster: Masters	Ronny Benedict
	Student Presentation—Oral: Undergraduate	Hayden Ansinelli
	Outstanding Graduate Student	Charlene Henry
	Student Research Award	Michael Knutson
	Outstanding Undergraduate Award	Laura Vielbig
2010	Student Presentation- Oral: Doctoral	Melissa Linden
	Student Presentation- Oral: Masters	Brian Rider
	Student Presentation- Oral: Undergraduate	Matt Wittbrodt
	Student Presentation- Poster: Doctoral	Carole Sloan
	Student Presentation- Poster: Masters	Cody Sively
	Student Presentation- Poster: Undergraduate	Andrea Mueller
	Outstanding Graduate Student	Hilary Young

Past MWACSM Presidents

Year	Name	University/Organization
2010	Jeff Lemmer	Grand Valley State University
2009	Karin Pfeiffer	Michigan State University
2008	Craig Broeder	Benedictine University
2007	Amy Morgan	Bowling Green State University
2006	Carmen J. Babcock	Ohio State University
2005	Elaine Betts	Central Michigan University
2004	Chris Womack	Michigan State University
2003	Amy Jo Sutterluety	Baldwin-Wallace College
2002	Lynn Darby	Bowling Green State University
2001	Helaine Alessio	Miami University
2000	Jeff Betts	Central Michican University
1999	Tony Mahon	Ball State University
1998	Lynn Millar	Andrews University
1997	Fred Andres	Grand Valley State University
1996	Jeff Edwards	Indiana State University
1995	Darlene Sedlock	Purdue University
1994	Thomas Ball	Northern Illinois University
1993	Leonard Kaminsky	Ball State University
1992	Michael Flynn	Purdue University
1991	John Davis	Alma College
1990	Duane Eddy	Ball State University
1989	Richard Bowers	Bowling Green State University
1988	Barry Franklin	William Beaumont Hospital
1987	Timothy Kirby	Ohio State University
1986	Ann C. Snyder	Ball State University
1985	Robert Gandee	University of Akron
1984	Richard Parr	Central Michican University
1983	Peter Farrell	University of Wisconsin-Milwaukee
1982	Richard A. Boileau	University of Illinois
1981	Wayne Sinning	Kent State University
1980	Merle Foss	University of Michigan
1979	Bill Heusner	Michigan State University
1978	Jackie Puhl	Iowa State University
1977	Richard Bowers	Bowling Green State University
1976	Carl Gisolfi	University of Iowa
1975	LeRoy "Bud" Getchell	Ball State University
1974	David R. Lamb	University of Toledo
1973	F. Nickhah	
1972	F. Nickhah	

2010 MWACSM ANNUAL MEETING

University Place
Conference Center & Hotel
IUPUI, Indianapolis, IN
October 29-30, 2010

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MWACSM Special Interest Groups

There will be a meeting scheduled for each group during the Graduate/Employment Fair time on Saturday. Please look for signs indicating where your group will meet.

Aging
Biomechanics
Bone/Osteoporosis
Clinical Exercise Physiology
Epidemiology/Public Health
Exercise Science Education
Health, Fitness, and Wellness Coaching
Medicine/Sports Medicine
Metabolic
Neuromuscular
Nutrition
Pediatric
Physical Therapy
Psychobiology and Behavior
Strength and Conditioning
Worksite Wellness

Past Founder's Awar[redacted]d Winners

Year	Recipient
1994	Tim Kirby
1995	Richard Bowers
1996	Merle Foss Henry Montoye Fazlola Nickhah
1997	Leonard Kaminsky
1998	Richard Parr
1999	Wayne Sinning
2000	Ann Snyder
2001	Darlene Sedlock
2002	Jeff Edwards
2003	Lynn Millar
2004	Jeff Betts
2005	Tony Mahon
2006	Barry Franklin
2007	Lynn Darby
2008	Elaine Betts
2009	Helaine Alessio

Helaine Alessio, Ph
FACSM, Recipient o
2009 Founder's Av

WELCOME LETTER

October 1, 2010

Dear MWACSM 2010 Conference Participants,

On behalf of the Board of Directors, welcome to the 2010 Midwest American College of Sports Medicine Annual Meeting. I am delighted that you are attending our scientific conference. The program includes two keynote speakers, seven tutorial or symposium sessions, and 41 free communications in slide or poster format. Our opening keynote address features Dr. Barbara Ainsworth, FACSM, President-Elect of the American College of Sports Medicine. She will inform attendees about the American Fitness Index, one of the latest initiatives of ACSM. Our closing keynote speaker is Dr. Randy Wilber, FACSM, from the United States Olympic Committee. His talk will highlight preparations and information related to our country's athletes when competing in the Olympic Games. Both of our keynote speakers are nationally and internationally regarded, and we are thrilled that they agreed to address our group. Naturally, we continue to offer a special presentation geared towards students' future careers and the usual MWACSMeopardy competition and graduate/career fair. As you will see, all of our planned sessions and free communications represent a fantastic scientific agenda.

I am excited to be holding this meeting in Indianapolis, home of national ACSM headquarters and one great town. Our intent is to begin a two-year meeting cycle, starting this year. This means the Board's current plan is to hold MWACSM 2011 in Indianapolis once again. I invite you to enjoy one of the several great restaurants in town for dinner on Friday night, either on-site or after a quick walk downtown, prior to returning for the business meeting and opening keynote address.

I owe many people thanks for their assistance throughout the planning and execution of this event. Our generous conference supporters deserve many thanks for their support, as does Craig Broeder for his amazing work with initiating the sponsorship committee (thanks to the rest of the committee as well). We appreciate the work of the IUPUI conference center staff, in particular Jane Eisele and Garland Loper. Many thanks go to the Board of Directors, especially members of the annual meeting planning committee: Jeff Lemmer, Brenda Reeves, and Lynn Darby. Additionally, the student who supports the MWACSM Executive Office, Hilary Young, deserves our gratitude. Our exciting Jeopardy competition could not occur without the diligence of Shel Levine and Amanda Salacinski. Thanks also go to our session moderators and the behind-the-scenes efforts from abstract reviewers, the Leadership/Mentorship *ad hoc* Committee and Awards Committee.

Of course I need to thank all of you for attending, participating, and supporting MWACSM. We truly need our members to make conferences, and our entire Chapter, successful. Enjoy the meeting!

Sincerely,

Karin A. Pfeiffer, Ph.D., FACSM, Past-President, MWACSM

We would like to thank these EXHIBITORS for the 2010 MWACSM Annual Meeting! Their contributions are greatly appreciated!

ParVO Medics, Inc.

PARVO MEDICS
Making Metabolic Measurement Easy

BIOPAC Systems

BIOPAC Systems, Inc.

Cuattro, LLC

Cuattro's flat panel digital radiography systems improve efficiency and workflow, for increased productivity and lower costs. Cuattro digital flat panel same-day retrofits, complete rooms and mobile digital X-ray systems, and cloud–based archiving and PACS, deliver better performance at prices that are often half of other DR solutions.

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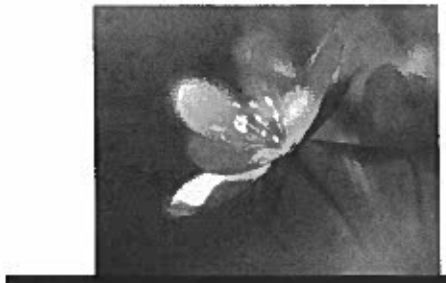
We would like to thank these SPONSORS for the 2010 MWACSM Annual Meeting! Their contributions are greatly appreciated!



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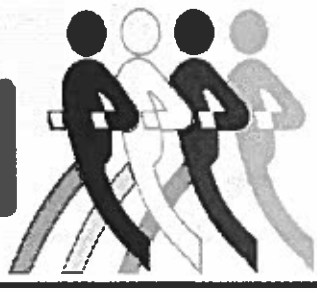

A Special Thank You to the MWACSM Board of Directors

...for all of their contributions to MWACSM and to the Annual Meeting

Officers

Jeff Lemmer, Ph.D.
President
Grand Valley State University

Brenda Reeves, Ph.D., FACSM
President-Elect
Carroll University

Karin Pfeiffer, Ph.D., FACSM
Past-President
Michigan State University

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Northern Illinois University

Lynn Darby, Ph.D., FACSM
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Bowling Green State University

Amy Morgan, Ph.D., FACSM
Regional Chapter Representative
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Tony Kaleth, Ph.D.
IUPUI

Michael Kushnick, Ph.D., FACSM
Ohio University

Paul Nagelkirk, Ph.D.
Ball State University

Josh Ode, Ph.D.
Saginaw Valley State University

Tyrone Washington, Ph.D.
Evansville University

Student Representative

Heather Hayes, M.S.
Michigan State University

MWACSM Graduate Assistants

Hilary Young
Bowling Green State University

Conference Information

OBJECTIVES

The 2010 meeting of the MWACSM is designed to:

- Enhance the scientific and clinical understanding of the physiological, biochemical, and psychological basis for the changes that occur during and following exercise in both normal and pathological states;
- Provide a forum for members and students to present research related to exercise science and sports medicine; and
- Promote interaction among scientists, clinicians, and students in related fields to provide new approaches to, and perspectives on, problems in exercise science and sports medicine.

TARGET AUDIENCE

MWACSM members, ACSM members, clinicians, professionals, and students interested in the field of sports medicine and exercise science.

ACSM Continuing Education Credits (CEC's)

The American College of Sports Medicine's Professional Education Committee certifies that this annual meeting meets the criteria for 12 credit hours of ACSM Continuing Education Credit. Credit is awarded for these CECs by attending the "Midwest Regional Chapter ACSM Annual Meeting." The MWACSM is an "Approved Provider" of CEC for ACSM. A card documenting completion of 12 CEC's is included this program.

NAME BADGES

Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Please hold on to your badge!

MEETING LOCATIONS

All sessions and events unless otherwise noted will be held at the official conference site. Room assignments for educational events are detailed in this program, along with a map of the conference site.

ANNUAL BUSINESS MEETING AT THE SATURDAY LUNCHEON

The annual business meeting is scheduled for Saturday at the luncheon. The annual business meeting is your opportunity to participate in the activities of the Midwest Chapter of ACSM. Please plan to attend Saturday.

AWARDS

The annual 'Founder's Award' and the Professional Award will be announced at the banquet on Saturday. The Founder's Award is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

FUTURE MEETING SITE

Indianapolis, Indiana

Continuing Education Credits Certificate

ACSM Certificate of Continuing Education Credits

Participant Name: _____

Organization: MWACSM

Course Title: 2010 Annual Meeting of the Midwest Chapter of the American College of Sports Medicine

Approved Provider Number: 650390

CECs Awarded: 12

Lead Program Administrator Signature

Schedule of Events

Friday, October 29, 2010

Time	Event	Moderator	Location
10:00 am - 8:00 pm	Registration		Lobby
12:30 -1:30 pm	**Tutorial/Symposium:** *From the Textbook to the Trenches...How well do Group Fitness Programs meet the ACSM's Health/Fitness Facility Standards and Guidelines to Manage Risk and Liability?* Brenda Reeves, Ph.D., FACSM & Paul Milton, Ph.D.	Helaine Alessio, Ph.D., FACSM	Room 132
12:30 - 1:30 pm	**Tutorial/Symposium:** *Stress Fractures* Deepak S. Patel, MD, FAAFP	Paul Nagelkirk, Ph.D.	Room 118
1:35 - 2:35 pm	**Student Session:** *Turbocharge Your Career: "Beef Up" Your Clientele with ACSM Certification.* Richard T. Cotton, M.A., National Director of Certification; Madeline Bayles, Ph.D., FACSM	Heather Hayes, MWACSM Student Representative	Room 132
1:35 - 2:35 pm	**Tutorial/Symposium:** *Does a Role Exist for Non-Satellite Stem Cells in Skeletal Muscle Growth following Exercise?* Marni Boppart, Sc.D.	Craig Broeder, Ph.D., FACSM	Room 118
2:35 – 2:45 pm	Break		
2:45 – 4:45 pm	**Poster Session** (see Abstracts, pages 29-44)	Darlene Sedlock, Ph.D., FACSM	Slate Hall
2:45 - 4:15 pm	**Oral Session** (see Abstracts, pages 22-24)	Tony Mahon, Ph.D., FACSM	Room 118
3:30 - 4:30 pm	**Symposium/Tutorial:** *Exercise is Medicine On Campus: the Role of the Kinesiology Department* Josh Ode, Ph.D., Samantha Danbert, Jim Pivarnik, Ph.D., FACSM	Amy Morgan, Ph.D., FACSM	Room 132
5:00 - 6:30 pm	Jeopardy Event		Auditorium

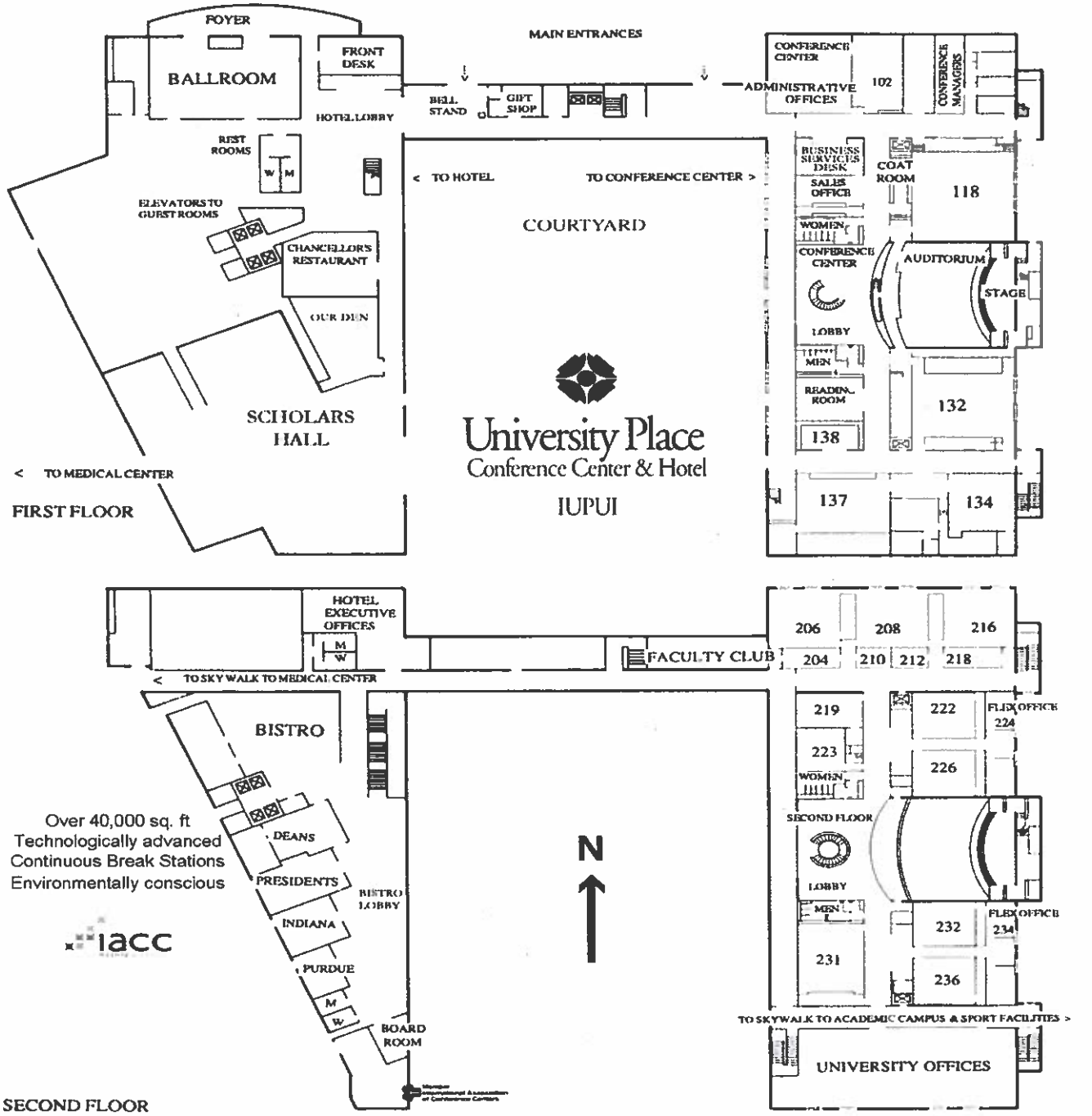
6:30 - 8:00 pm	Dinner (on your own)		Indianapolis
8:00 - 9:30 pm	**Keynote Address:** *The American Fitness Index: Fit Communities Attract Fit People* Barbara Ainsworth, Ph.D., FACSM, President-Elect, ACSM	Karin Pfeiffer, Ph.D., FACSM	Auditorium
9:30 - 11:00 pm	**Welcome Social** Halloween Costume Contest; Prizes		Ballroom

Schedule of Events

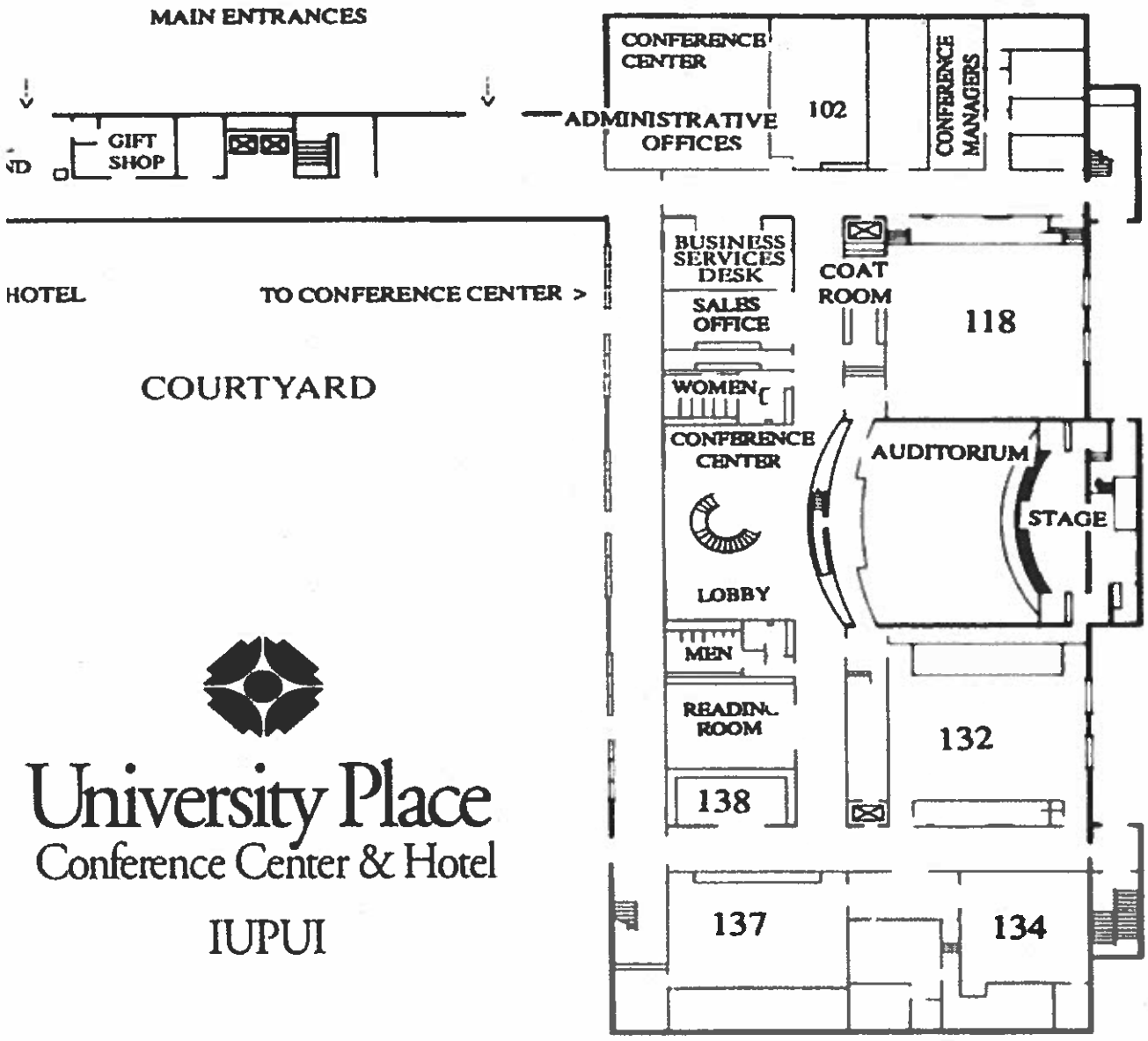
Saturday, October 30, 2010

Time	Event	Moderator	Location
8:00 am – 10:00 am	Registration		Lobby
8:30 -9:30 am	**Tutorial/Symposium:** *Practical Applications of Perceptual Responses in Human Performance* Matt Laurent, Ph.D.	Brenda Reeves, FACSM, Ph.D.	Room 132
8:30 - 9:30 am	**Tutorial/Symposium:** *Integrating the Science of Sports Medicine with Music and the Arts and Vice Versa* Randall Dick, M.S, FACSM	Ann Snyder, Ph.D., FACSM	Room 118
9:30 -10:45 am	**Tutorial/Symposium:** *Bicycling for Ovarian Cancer—The Challenges of Ultra-Endurance Cycling* Craig Broeder, Ph.D., FACSM	Jeff Lemmer, Ph.D.	Room 132
9:30 - 11:00 am	**Oral Session** (see Abstracts, pages 25-28)	Jim Pivarnik, FACSM, Ph.D.	Room 118
10:45 - 11:00 am	Break		
10:45 am -12:00 pm	**Graduate/ Professional Fair**		Slate Hall
12:00 - 2:00 pm	**Luncheon; Awards; Business Meeting**	Jeff Lemmer, Ph.D., Karin Pfeiffer, Ph.D., FACSM	Ballroom

Conference Center Map



First Floor Map - Enlarged



Featured Keynote Speakers

Barbara E. Ainsworth, Ph.D., MPH, FACSM
ACSM President-Elect

Dr. Ainsworth is a professor in the Healthy Lifestyles Research Center and in the Program in Exercise and Wellness within the College of Nursing and Health Innovation at Arizona State University. Her research relates to physical activity and public health with focuses on the assessment of physical activity in populations, the evaluation of physical activity questionnaires, and physical activity and the environment.

Dr. Ainsworth is best known as the lead author for the Compendium of Physical Activities, an exhaustive list of the energy cost of human physical activities and recently co-directed a workshop on new directions for physical activity survey assessment sponsored by the National Cancer Institute and the American College of Sports Medicine. She serves on the Editorial Board for several journals and has lectured in many countries. She holds honorary academic appointments at the Karolinska Institute in Stockholm, Sweden and the Akerhaus University College in Oslo, Norway.

Dr. Ainsworth is a fellow in the American College of Sports Medicine, Research Consortium of AAHPERD, American Academy of Kinesiology and Physical Education, and the North American Society of HPERD Professionals. She was recently elected president for the American College of Sports Medicine and was a 2006 ACSM Citation Award recipient. Her teaching assignment at ASU includes graduate courses on research methods, physical activity and public health, and physical activity epidemiology.

Randy Wilber, Ph.D., FACSM

Randall L. Wilber, PhD, is a Senior Sport Physiologist at the U.S. Olympic Training Center in Colorado Springs, Colorado (elevation 1860 m / 6200 ft), where he oversees the operation of the Athlete Performance Laboratory. He has worked with U.S. Olympic Team athletes from a variety of sports and advised them on the scientific and practical aspects of training. Those athletes include Lance Armstrong (7-time winner of the Tour de France), Alison Dunlap (2001 World Champion in Cross-Country Mountain Biking), Mari Holden (2000 World Champion in Road Cycling, 2000 Olympic silver medalist in Road Cycling), Kristin Armstrong (2008 Olympic gold medalist in Road Cycling), Barb Lindquist (World-ranked #1 Female Triathlete in 2002 and 2003), Hunter Kemper (World-ranked #1 Male Triathlete in

Featured Keynote Speakers (cont.)

2005), Michael Phelps (2008 Olympic 8-time gold medalist in Swimming), Apolo Ohno (2002 and 2006 Olympic gold medalist in Short Track Speedskating), Derek Parra (2002 Olympic gold medalist in Long Track Speedskating), Christine Witty (2002 Olympic gold medalist in Long Track Speedskating), Johnny Spillane (2003 World Champion in Nordic Combined Skiing, 2010 Olympic silver medalist in Nordic Combined Skiing), Todd Lodwick (2009 World Champion in Nordic Combined Skiing, 2010 Olympic silver medalist in Nordic Combined Skiing) and Bill Demong (2009 World Champion in Nordic Combined Skiing, 2010 Olympic gold medalist in Nordic Combined Skiing). In addition, Dr. Wilber has provided support for Team USA athletes at five Olympic Games (Salt Lake City 2002, Athens 2004, Torino 2006, Beijing 2008, Vancouver 2010) and two Pan American Games (Santo Domingo 2003, Rio de Janeiro 2007).

Dr. Wilber's research interests include evaluating the effects of altitude training on athletic performance, exercise-induced asthma (EIA) in elite athletes, and the use of ergogenic aids for the enhancement of athletic performance. He has authored scientific papers on these topics that have been published in *Medicine and Science in Sports and Exercise, European Journal of Applied Physiology, Sports Medicine, International Journal of Sport Nutrition and Exercise Metabolism*, and *Journal of Strength and Conditioning Research.*

Dr. Wilber has co-edited *Exercise-Induced Asthma: Pathophysiology and Treatment*, published by Human Kinetics in 2002 and has authored *Altitude Training and Athletic Performance: Theory and Practice*, published by Human Kinetics in 2004. In addition, he has been an invited speaker at scientific meetings in Austria, Brazil, Canada, China, Finland, Greece, Japan, Kenya, Korea, Malaysia, The Netherlands, New Zealand, Poland, Qatar, Spain and Switzerland, and serves as a consultant to the U.S. Navy SEALs on issues related to physical performance at altitude. Dr. Wilber was recognized as a Fellow of the American College of Sports Medicine (ACSM) in 1998. He has served on the ACSM Olympic and Paralympic Sports Medicine Issues Committee since 2005 and was named as Chair of that Committee in 2009. In 2005, he received the Centennial Laureate Alumni Award from Florida State University, and in 2007 he received the President's Distinguished Alumni Award from the University of Wisconsin-Eau Claire.

Dr. Wilber earned a B.A degree in history from Grove City College and holds a M.A. in history from the University of Wisconsin-Eau Claire. He earned his M.S. and Ph.D. in exercise physiology from Florida State University where he conducted research on training and detraining in endurance athletes. Originally from the Pittsburgh, PA area, Dr. Wilber spent most of his adult life in Florida prior to moving to Colorado in 1993. He has been involved in sports his entire life as an athlete (Cross-country & Track), coach, and exercise physiologist. Dr. Wilber's hobbies and recreational interests include running, biking, hiking, reading and photography. He has completed the Leadville Trail 100 Mountain Bike Race and the Pikes Peak Ascent Run.

Symposia and Tutorial Presenters

Josh Ode, Ph.D.

Dr. Ode is an assistant professor and department chair of kinesiology at Saginaw Valley State University. He is a graduate of SVSU (B.A., 2001), Central Michigan University (M.A., 2003) and Michigan State University (Ph.D., 2007). Dr. Ode is currently a MWACSM Member-at-Large and is co-chair of the MWACSM Communications Committee. His current research interests include the evaluation and promotion of physical activity and health in college students. At SVSU, Dr. Ode has focused on the integration of the kinesiology department within a University wellness program.

Samantha Danbert (presenting with Dr. Josh Ode)

Samantha Danbert is a senior majoring in kinesiology at Saginaw Valley State University. Samantha has been a member of ACSM for the past year and currently works to promote Exercise is Medicine On Campus through her internship with SVSU's wellness program. As a kinesiology student, Samantha has been involved in many research projects and specializes in coordinating events to promote a healthy lifestyle for all SVSU students, faculty, and staff. Samantha is the standing president for SVSU's Student Exercise Science Association and plans to attend medical school upon graduation.

Jim Pivarnik, Ph.D., FACSM
ACSM President (2009-10) (presenting with Dr. Josh Ode)

James Pivarnik, a graduate of Indiana University (Ph.D., 1982), is a nationally recognized expert on issues related to exercise during pregnancy and the postpartum period. He also holds dual positions at Michigan State University, as a professor in Kinesiology and Epidemiology and as Research Integrity Officer. He is the Immediate Past-President of the American College of Sports Medicine, and has been a member of ACSM for 32 years. He is currently the Chair of the Exercise is Medicine On Campus Committee.

Symposia and Tutorial Presenters (cont.)

Matt Laurent, Ph.D.

Matt Laurent is currently an Assistant Professor in the Department of Kinesiology at St. Ambrose University in Davenport, Iowa. Matt earned his doctorate from the University of Alabama in May of 2009 with an emphasis in exercise physiology following a masters and bachelor of science in exercise science from West Texas A&M University. Prior to attending the University of Alabama, Matt served as an instructor in the Department of Sports and Exercise Science at West Texas A&M University and also served as the Coordinator of the Human Performance Research Laboratory. His professional expertise lies in the field of perceptual responses during and following human performance as well as mediating factors influencing fatigue and subsequent recovery following sport and exercise performance. Matt is an active member of the American College of Sports Medicine and has co-authored several peer- reviewed articles and has presented numerous times at the international, national and regional level.

Deepak S. Patel, M.D., FAAFP

Dr. Patel is Director of Sports Medicine at Rush Copley Family Medicine Residency Program in Aurora, IL and Assistant Professor, Rush Medical College in Chicago IL. He also practices Family Medicine and Sports Medicine at Yorkville Primary Care in Yorkville IL. He serves as team physician for Plano and Oswego High Schools.

Marni D. Boppart, Sc.D.

Marni Boppart graduated from the University of New Hampshire, Durham, NH in 1992 with a B.S. in Molecular, Cellular and Developmental Biology. She obtained her M.S. in Cell Biology from Creighton University, Omaha, NE, while serving as an officer and Aerospace Physiologist in the U.S. Air Force from 1992 to 1996. In 2000, she received her doctorate degree in Applied Anatomy and Physiology from Boston University, under the guidance of Professors Roger Fielding and Laurie Goodyear. Her postdoctoral work was completed at the Joslin Diabetes Center, Harvard Medical School and in the Department of Cell and Developmental Biology at the University of Illinois, Urbana-Champaign (UIUC), where she studied the molecular mechanisms by which the a7b1 integrin protects against neuromuscular disease and exercise-induced injury. In 2007, Dr. Boppart began her current position as Assistant Professor in the Department of Kinesiology and Community Health at the University of Illinois, Urbana-Champaign. She is full-time faculty at the Beckman Institute for Advanced Science and

Symposia and Tutorial Presenters (cont.)

Technology and an affiliate of the Institute for Genomic Biology at UIUC. Dr. Boppart heads the Molecular Muscle Physiology Laboratory, which investigates the molecular and cellular mechanisms responsible for skeletal muscle regeneration and growth in response to exercise. Dr. Boppart examines the extent to which exercise increases stem cell accumulation in skeletal muscle and the capacity for these cells to increase skeletal muscle mass and function with aging. Her current research is funded by the Ellison Medical Foundation for Aging Research and the National Science Foundation.

Brenda Reeves, Ph.D., FACSM

Brenda Reeves is currently a clinical assistant professor in the exercise science program at Carroll University. She has also served as undergraduate and graduate faculty at West Texas A&M University and Longwood University. Previously, she was the director of the office of Wellness and Recreation Services at Grand Valley State University. Under her direction, the university received five healthy workplace awards sponsored by the Michigan Governor's Council on Physical Fitness, Health and Sports.

In 1995, Brenda received her doctorate from the University of Toledo with emphasis areas in exercise physiology, biomechanics and health education. Her research areas include health promotion, student development, and group exercise formats. She received her Masters degree in exercise science as well as her undergraduate degree in psychology from Bowling Green State University. Brenda is currently president-elect of the Midwest chapter and a fellow member of the American College of Sports Medicine, and has presented over 45 research projects and/or symposia at state, regional and national conferences. Her fitness career spans 25 years with experiences in military conditioning, hospital-based wellness, corporate wellness, community fitness, and recreational sports. She has also been recognized in the Who's Who of Professional Educators as well as the Manchester Who's Who Among Executive and Professional Women.

Paul R. Milton, Ph.D.

(Presenting with Dr. Brenda Reeves)

Paul R. Milton is currently an Associate Professor and Program Team Leader for the Graduate and Undergraduate Programs in Sport Management in the Department of Sport Sciences at Ashland University. Entering his fifth year on the faculty, Dr. Milton teaches the business and finance of sport, sport facility management and design, sport management, ethical and social issues in sport, leadership in sport, and sport marketing and promotions. Dr. Milton is a native Californian and earned a bachelor's degree in history from the University of California-Davis. He holds a Master's in Intramural Administration from Michigan State University, and the Doctor of Philosophy degree from Kent State University.

Symposia and Tutorial Presenters (cont.)

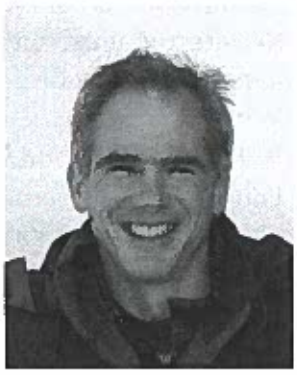
Dr. Milton's research interests are varied, but focus mainly on the impact of recreational sports programs on student learning, recruitment and retention. His latest manuscript, accepted for publication in the *International Journal of Sport Management*, is titled "Differences in Academic Success between Male and Female Student-Athletes: An Exploratory Study" and was co-authored with Ms. Rhonda Gottschalk, M.Ed., Ashland University. Dr. Milton is completing a second three-year term as Editor of the *Recreational Sports Journal*, the scholarly, peer-reviewed journal of the National Intramural-Recreational Sports Association. He also serves as the Vice-Chair of the National Research Institute for Recreational Sports Research, housed at The Ohio State University, a post he has held since the inception of the Institute in 2004. Dr. Milton has conducted a number of programs reviews, both at institutions at which he has served, and for departments of recreational sports at other colleges and universities.

Craig Broeder, Ph.D., FACSM

Craig Broeder, Ph.D. FACSM, FNAASO is currently Founder and CEO of Exercising Nutritionally, LLC which is a clinical research and education company in Naperville, IL and the Chicago area. Dr. Broeder has been a member of ACSM for 25 plus years and a past board member of both SEACSM and MWACSM. He also served MWACSM as President in 2008 and is currently chairing MWACSM's sponsorship committee. He currently serves ACSM as a program accreditation site visitor and was an author for the *ACSM's Guidelines for Exercise Testing and Prescription* (Eight Edition).

In 2009, Dr. Broeder founded The Craig and Kay Broeder Preventive Female Exercise & Nutrition Fund managed by ACSM for he and his wife. In the summer of 2009 (May 15th to August 25th), Dr. Broeder honored his wife's 20th year of surviving ovarian cancer by cycling the perimeter US states (9,109 miles) in less than 100 days to raise money the ACSM Foundation. Currently, funds are being raised to film a documentary and book to help provide support for women diagnosed with ovarian cancer titled, "The Intimate Secretes of Surviving Ovarian Cancer - A Survivor's Perspective."

Symposia and Tutorial Presenters (cont.)



Randy Dick, M.S., FACSM

Randy Dick is a Fellow and Board of Trustee with the American College of Sports Medicine and worked for twenty years with the NCAA managing its sports medicine and injury prevention programs including the development and application of two generations of the NCAA Injury Surveillance System. He also is a member of the US Lacrosse Sports Science Committee and has over 40 peer-reviewed publications and multiple book chapters on a variety of sports medicine issues. He was an invited speaker at the 2008 Third International Conference on Concussion in Sport and has organized Health and Safety Sports Consultants, LLC as a consulting business. In 2008, he began a new career option with Eli Lilly and Company in Indianapolis where he evaluates health outcomes using aggregate electronic health records.

Student Session Presenters

Richard T. Cotton, M.A.

National Director of Certification and Registry Programs
American College of Sports Medicine

Richard Cotton has worked in the health and fitness industry for nearly 30 years. Throughout his career he has been a service provider and promoter of the exercise movement. The majority of Cotton's career has been in the development and management of fitness professional certification programs. In his current position as National Director of Certification Programs with the American College of Sports Medicine® (ACSM), Cotton utilizes the vast expertise of the ACSM membership to provide a state-of-the-art certification program that is in direct support of the mission of the College. In mid-career Cotton served as the Chief Exercise Physiologist with the American Council on Exercise (ACE). Over the course of eight years, he was the organization's spokesperson, appearing on "Good Morning America," "Dateline NBC," and CNN. He was also the editor of five highly regarded health and fitness professional training manuals.

Cotton has been an expert source for a variety of print publications, including *The New York Times*, *The Los Angeles Times*, and *The Washington Post* on topics such as how to begin and maintain a safe and effective exercise program; what to look for in a personal trainer; and how to choose exercise equipment. He also led the research on the effectiveness of fitness products and trends that resulted in ACE being dubbed "The Workout Watchdog" in 1997 by *The Wall Street Journal*.

Student Session Presenters (cont.)

As Chief Exercise Physiologist at both the Sharp Healthcare System and the world renowned Scripps Clinic & Research Foundation from 1980 to 1991, Cotton worked with both obese and underweight patients, and people with heart disease, diabetes, cancer and hypertension. Cotton has a B.A. in Education from Wayne State University, Detroit, and an M.A. in Exercise Science from San Diego State University. He holds two ACSM certifications, the Preventive and Rehabilitative Program Director SM and ACSM Exercise Specialist®.

Madeline Bayles, Ph.D., FACSM

Madeline Paternostro-Bayles, Ph.D., FACSM, is a Professor of Health and Physical Education at Indiana University of Pennsylvania (IUP), where she serves as the coordinator, of the CAAHEP accredited, undergraduate Exercise Science program. Prior to 2009, Dr. Bayles was also the coordinator for the MS Sport Science Masters program. IUP is the largest of the 14 schools in the Pennsylvania State System of Higher Education, with a total enrollment of over 15,000 students. Before joining IUP, Dr. Bayles worked for over ten years as a clinical exercise program director, for both Allegheny General Hospital and the University of Pittsburgh Medical Center. Dr. Bayles received her graduate degrees from Adelphi University and the University of Pittsburgh. She is a fellow of the ACSM and the AACVPR. She has served on ACSM's Committee on Certification and Registry Board (CCRB) in several capacities, including ACSM Certified Clinical Exercise Specialist, and ACSM Certified Health Fitness Specialist. Her current term as CCRB chair, ends in 2011. Dr. Bayles is certified as a Clinical Exercise Specialist and Program Director.

Abstracts – Oral Presentations

Friday, October 29, 2010, 2:45-4:00 p.m. in Room 118, Abstracts #1 - #5
Moderator for the Session: Tony Mahon, Ph.D., FACSM

#1 Oral Presentation, Friday, October 29, 2:45 p.m., Room 118

VALIDITY OF FIELD EXPEDIENT MEASUREMENT DEVICES TO ASSESS CORE BODY TEMPERATURE DURING REST AND EXERCISE IN THE COLD

James R. Bagley[1], Daniel A. Judelson[1], Barry A. Spiering[1], William C. Beam[1], FACSM, J. Albert Bartolini[1], Keven R. Carney[1], Brian Washburn[1], Colleen X. Muñoz[1], Susan W. Yeargin[2], Douglas J. Casa[3], FACSM [1]California State University, Fullerton, California; [2]Indiana State University, Terre Haute, Indiana; [3]University of Connecticut, Storrs, Connecticut

Exposure to cold environmental conditions affects human performance and normal physiological function, possibly leading to injury or illness. The National Athletic Trainers' Association recommends rectal temperature (T_{REC}) to evaluate core body temperature (T_{CORE}) during exercise in the cold; however, other field expedient devices claim to measure T_{CORE}. **PURPOSE:** The purpose of this study was to determine if field expedient devices provide valid measures of T_{CORE} during rest and exercise in the cold. **METHODS:** Participants included 13 males and 12 females (age = 24 ± 3 y, height = 170.7 ± 10.6 cm, mass = 73.4 ± 16.7 kg, body fat = 18 ± 7 %) who reported being healthy and at least recreationally active. During 150 min of cold exposure, subjects sequentially rested for 30 min, cycled for 90 min (heart rate = 120-140 bpm), and rested for an additional 30 min. Investigators compared aural (T_{AUR}), expensive axillary (T_{AXLe}), inexpensive axillary (T_{AXLi}), forehead (T_{FOR}), gastrointestinal (T_{GI}), expensive oral (T_{ORLe}), inexpensive oral (T_{ORLi}), and temporal (T_{TEM}) temperatures to T_{REC} every 15 min. Researchers followed manufacturers' guidelines for each device. Mean biases (± 0.27 ºC) between each device and T_{REC} served as the primary criterion for validity. **RESULTS:** T_{AUR}, T_{AXLe}, T_{AXLi}, T_{FOR}, T_{ORLe}, T_{ORLi}, and T_{TEM} provided significantly lower measures compared to T_{REC} and fell below our validity criterion. T_{GI} significantly exceeded T_{REC} at three of eleven time points, but no significant difference existed between mean T_{REC} and T_{GI} across time. Only T_{GI} achieved our validity criterion and compared favorably to T_{REC}. **CONCLUSIONS:** Although T_{REC} remains the gold standard, T_{GI} offers a valid alternative T_{CORE} measure during rest and exercise in the cold; certified athletic trainers, mountain rescuers, and military medical personnel should avoid other field expedient devices in similar conditions.

#2 Oral Presentation, Friday, October 29, 3:00 p.m., Room 118

PEAK PRESSURES OF WALKING, JOGGING, AND RUNNING ON NON-MOTORIZED AND MOTORIZED TREADMILLS

Brian P. Edlbeck, Christopher J. Myatt, Kelly G. Reynolds, & Ann C. Snyder, FACSM, Human Performance Laboratory, Department of Human Movement Sciences, University of Wisconsin – Milwaukee, Milwaukee, WI, 53201

Motorized and non-motorized treadmills are now available for athletic preparation and/or fitness activities. The main difference between the exercises performed on the treadmills is that on the non-motorized treadmill the exerciser propels the treadmill belt in order for the exercise to be performed. **PURPOSE:** The purpose of this study was to examine rear foot and fore foot pressures to determine if the pressures upon the foot changed with the use of different types of treadmills. **METHODS:** Eleven healthy college aged individuals (6 males and 5 females) walked at 3 mph, jogged at 5 mph, and ran at 7 mph on three different treadmills; two motorized, a belt driven (BT) (Trackmaster, Newton, KS) and a slatted (ST) (Woodway, Waukesha, WI), and a non-motorized treadmill (CT) (Woodway, Waukesha, WI). Foot pressures were measured using Tekscan shoe inserts (Tekscan, South Boston, MA) and were recorded for 10 seconds after performing the speed for approximately one minute at the prescribed speed. The three speeds were performed sequentially on each treadmill, but the order of treadmill usage was randomized. Statistical analysis was performed using repeated measures ANOVA with a post hoc Tukey test to determine where significant differences occurred ($P<0.05$). **RESULTS:** Fore foot pressures were not different between the three treadmills for the three speeds assessed. Rear foot pressures were significantly less on the CT than for the two motorized treadmills at all three speeds.

	3 mph BT	3 mph ST	3 mph CT	5 mph BT	5 mph ST	5 mph CT	7 mph BT	7 mph ST	7 mph CT
Rear foot (kPa)	176.2 ±31.5	175.7 ±26.0	133.9 ±44.0	139.4 ±49.3	159.7 ±42.0	72.9 ±40.3	176.8 ±60.7	200.5 ±52.6	83.3 ±36.5
Fore foot (kPa)	276.6 ±66.1	270.5 ±69.0	247.0 ±51.7	331.6 ±90.3	318.2 ±74.9	311.4 ±93.1	366.2 ±101.7	353.5 ±88.2	347.1 ±115.1

CONCLUSIONS: Walking and running on the CT results in lower pressures in the rear foot than occurs on motorized treadmills. Whether this is due to the construction of this particular CT or to the general activity required of non-motorized treadmills remains to be investigated.

#3 Oral Presentation, Friday, October 29, 3:15 p.m., Room 118

EFFECT OF COMPRESSION STOCKINGS ON PHYSIOLOGICAL RESPONSES AND RUNNING PERFORMANCE IN DIVISION III COLLEGIATE CROSS COUNTRY RUNNERS DURING A MAXIMAL TREADMILL TEST

Brian C. Rider[1], Adam Coughlin[2], Kevin Darr[2], Brian Goslin[1]
[1]Oakland University, Rochester, Michigan; [2]Adrian College, Adrian, Michigan

Compression Stockings (CS) have been used in rehabilitation settings by a variety of patients suffering from venous insufficiency. There is a growing trend for runners to use CS as a potential aid to performance and to decrease recovery time. However, recent research has been equivocal about the effects of CS on runners' performances. **PURPOSE:** To determine the effects of wearing CS during a maximal treadmill test on physiological responses and running performance. **METHOD:** Ten male and female, (ages 19-23 years) NCAA Division III cross country runners volunteered for this study. Participants were randomly divided into two groups. The first group underwent a maximal treadmill test that involved 3 minute stages of increasing speed and incline, separated by a minute and half walking recovery stage without wearing CS, and the second group wore the CS. Seven days later, the participants repeated the maximal test but switched CS condition. Fingertip blood samples for lactate levels were taken pre-test, at 3 minute intervals throughout the test, immediately following the test, and after 5 minutes of active recovery, post-test. Heart rate (HR), blood lactate (BLa), blood lactate threshold (LT), blood pressure (BP), maximal oxygen consumption (VO2max), respiratory exchange ratio (RER), respiratory rate (RR) rating of perceived exertion (RPE), and time on treadmill (TTM) were also measured. **RESULTS:** Prior to and during the maximal treadmills test, HR, LT, BP, V02max, RER, RR, and RPE showed no difference ($p>0.05$) between the CS conditions. BLa was lower while wearing CS when measured during recovery at the 1-minute (CS =13.3±2.9 mmol/L, nonCS = 14.8±2.8, p= 0.03) and the 5-minute (CS = 11.0±2.7 mmol/L, nonCS = 12.8±2.8, p= 0.02) periods. TTM was longer without CS (CS = 23.570±2.39 min, nonCS = 23.93±2.49 min, p=.04). **CONCLUSIONS:** CS did not affect BLa during a maximal treadmill test. However, wearing the CS did have a significant effect on BLa levels following 1- and 5-minute active recoveries, as well as on TTM. This may lend credence to certain manufacturers' claims of reduced recovery time following exercise.

(Study supported by Provost's Graduate Student Research Award)

#4 Oral Presentation, Friday, October 29, 3:30 p.m., Room 118

HYDRATION STRATEGIES AND CHANGE IN BODY MASS DURING PRE-SEASON TWO-A-DAYS IN FEMALE COLLEGE SOCCER PLAYERS

Matthew T. Wittbrodt[1], Dana K. Lebar[2], & Ross A. Sherman[2] [1]Western Michigan University, Kalamazoo, Michigan; [2]Grand Valley State University, Allendale, Michigan

Introduction: Fluid loss and dehydration can negatively impact physical performance, skill execution, and at severe levels cause physical harm. Sports camps held during summer months are associated with significant body mass and fluid loss through sweating, which therefore places increased emphasis on maintaining adequate hydration. **Purpose:** To monitor hydration strategies and changes in body mass as a result of pre-season two-a-days in college soccer players. **Methods:** 16 female DII soccer players (19 ± 1 yrs; 1.68 ± 0.03 m; 64.8 ± 7.5 kg) were monitored during a morning and subsequent afternoon training session. The previous night participants ingested a telemetry sensor for recording of core body temperature (Tint). Prior to each session, body mass (BM) and dry uniform weight were determined, Tint was measured, and the environmental conditions were taken. Participants were free to drink water and a commercially available 6% carbohydrate sports drink *ab libitum*. During each break between drills, Tint, heart rate (HR), and environmental conditions were recorded. At the end of each session, Tint, HR, BM, wet uniform weight and volume of both water and sports drink consumed were determined. Statistical analyses were performed on select within and between-session variables using paired t-tests. **Results:** There were no differences in both Tint and HR between sessions. More total fluid was consumed in the morning compared to the afternoon (1.11 ± 0.39 L vs. 0.81 ± 0.35 L; $p<0.05$), but there were no differences in type of fluid consumed, either between or within sessions. Net BM loss was greater in the morning compared to the afternoon (1.7 ± 0.4 kg vs. 1.4 ± 0.2 kg, $p<0.05$), which equated to 2.7 ± 0.6% and 2.2 ± 0.4% net BM loss, respectively. Overall, there was a net BM loss of 2.8 ± 0.5 kg (4.4 ± 0.7%) across the whole day. **Conclusion:** The hydration strategies used failed to offset marked session-specific and daily body mass losses encountered during soccer pre-season two-a-days performed in a moderate heat stress environment. Further research is needed to elucidate the impact on acute hydration status and of consecutive two-a-days on chronic hydration status in college soccer players.

This study was part-funded by a Grand Valley State University Faculty Research Grant-in-Aid and part-funded by a Midwest ACSM Student Research Award

#5 Oral Presentation, Friday, October 29, 3:45 p.m., Room 118

VALIDATION OF A PREVIOUSLY DETERMINED VO_2 PREDICTION EQUATION IN CHILDREN AND ADOLESCENTS

Rebecca W. Moore[1], Karin A. Pfeiffer, FACSM[1], Paul D. Loprinzi[2], Stewart G. Trost, FACSM[2]. [1]*Michigan State University, East Lansing, MI.* [2]*Oregon State University, Corvallis, OR.*

Limited information is available regarding the relationship between walking speed and aerobic demand (VO_2) in youth. A prediction equation was created for treadmill walking in children 6-10 yrs old, but has not been validated in an independent sample. **PURPOSE:** To validate a previously published prediction equation for aerobic demand for walking among children and adolescents (Morgan et al., 2002). **METHODS:** Participants (N=206; 105 males and 101 females) ages 6-16 yrs were involved in this study. Each walked over-ground at self-selected slow (SW) and brisk walk (BW) paces using a course of known distance. Participants also walked on a treadmill at a brisk walk pace (over-ground BW pace was used for treadmill speed (TM)). VO_2 was measured using a portable metabolic analyzer. Predicted VO_2 was determined by using the previously established prediction equation. Paired t-tests, Pearson correlations and Bland-Altman plots were used to compare predicted VO_2 to measured VO_2 for SW, BW and TM. Since ages of some participants in the current investigation exceeded the ages of those for whom the equation was originally created, participants were divided into two groups, children (C) 6-11 yrs old and adolescents (A) 12-16 yrs old, and examined separately. **RESULTS:** The equation significantly under-predicted VO_2 for the entire sample compared to measured VO_2: SW 11.5 vs. 17.5 ml/kg/min; BW 16.6 vs. 21.9 ml/kg/min; and TM 16.1 vs. 23.7 ml/kg/min (all $p<0.001$). When analyzed separately similar results were found for C and A for SW, BW, and TM. Correlations between measured and predicted VO_2 for the entire sample ranged from r=0.63 to r=0.75. Correlations between measured and predicted for C and A ranged from r=0.46 to r=0.68 and r=0.44 to r=0.81, respectively. Bland-Altman plots showed all SW values were within 95% level of agreement (-1.78 to 13.71) and most for BW (-2.06 to 12.65) and TM (-0.96 to 15.48) were within 95%; however, bias existed in all plots. **CONCLUSION:** The prediction equation for children 6-10 yrs old significantly under-predicted VO_2 for children and adolescents, indicating that the equation may not be an accurate method for determining VO_2 during walking.

Funded by NICHD (RO1 HD055400-02)

Abstracts – Oral Presentations

Saturday, October 30, 2010, 9:30 – 11:00 a.m., Room 118, Abstracts #7 - #12

Moderator for the Session: Jim Pivarnik, Ph.D., FACSM

#7 Oral Presentation, Saturday, October 30, 9:30 a.m., Room 118

INSULIN RESISTANCE PRECEDES LIVER ADAPTATIONS AFTER ONE WEEK OF EXPOSURE TO A VERY HIGH-FAT DIET

Melissa A. Linden[1], Yair Pincu[1], Stephen A. Martin[1,3], Jeffrey A. Woods[1, 2, 3], FACSM, Tracy Baynard[1,2] [1]Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Urbana IL; [2]Division of Nutritional Sciences, University of Illinois at Urbana-Champaign, Urbana IL; [3]Integrative Immunology and Behavior Program, University of Illinois at Urbana-Champaign, Urbana IL

Obesity is associated with poor glucose control, hepatic steatosis, and inflammation. These poor clinical outcomes are often the result of prolonged periods of obesity. It is unclear how simultaneous short-term exposure to a very high fat (VHF) diet and exercise may impact these outcomes. **PURPOSE:** To determine the effect of one week of VHF diet and/or exercise training (EX) on glucose regulation, liver adiposity, and gene expression of inflammation within the liver of young mice. **METHODS:** C57BL/6 male mice (6 wks old) were randomized into 4 groups (n=8/group): low-fat (LF)/sedentary (SED), LF/EX, VHF/SED, and VHF/EX. The VHF and LF diets were 60% and 10% fat, respectively. The mice were placed on the diet and exercise intervention concomitantly. Treadmill exercise was performed 5 consecutive days at 12 m/min and 5% grade for 40 min/d. Fasting plasma glucose and insulin (INS) were assessed. Homeostatic model analysis (HOMA) was used to quantify insulin resistance. Triglyceride content of the liver (liver-TG) was assessed using a microtiter procedure. Tumor necrosis factor (TNF)-α and interleukin (IL)-6 gene expression within the liver were assessed using quantitative real-time PCR. The LF/SED group was the referent group. **RESULTS:** Body weights of the VHF groups were greater than the LF groups ($p<0.001$) after the one week diet intervention. Mice in the VHF groups had greater fasting INS and HOMA ($p<0.05$), while glucose concentrations were similar between dietary groups ($p=0.075$). No differences were observed between VHF diet and LF diet for liver-TG ($p=0.375$) or gene expression of TNF-α ($p=0.072$) within the liver. Exercise training reduced hepatic gene expression of IL-6 ($p<0.05$). No interactions between diet and exercise were observed for any variable ($p>0.05$). **CONCLUSION:** Mice exposed to a VHF diet for one week exhibited insulin resistance without increased liver adiposity or upregulation of inflammatory markers, suggesting that short term exposure to very high fat diets quickly alters glucose regulation prior to alterations in liver inflammatory markers. Yet, this low volume of exercise stimulus appeared to begin countering some of the "proinflammatory" effects of the VHF diet, which needs further study. Supported by University of Illinois Research Board seed grant.

#8 Oral Presentation, Saturday, October 30, 9:45 a.m., Room 118

THE EARLY EFFECTS OF DIET AND EXERCISE ON MARKERS OF MACROPHAGE INFILTRATION AND ADIPOSE TISSUE INFLAMMATION IN MICE

Yair Pincu[1], Melissa A. Linden[1], Stephen A. Martin[1,3], Jeffrey A. Woods[1, 2, 3], FACSM, Tracy Baynard[1,2] [1]Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Urbana IL; [2]Division of Nutritional Sciences, University of Illinois at Urbana-Champaign, Urbana IL; [3]Integrative Immunology and Behavior Program, University of Illinois at Urbana-Champaign, Urbana IL

We have previously demonstrated exercise training reduces the inflammatory profile within visceral adipose, yet this was observed in a state of existing obesity (e.g. 18 wk of HF diet). It is important to understand the effect exercise has on adipose biology during the development of obesity, in particular during initial exposure to HF feeding. **PURPOSE:** To examine the effects of 2 wks of HF diet and/or exercise on markers of macrophage infiltration and inflammation within visceral adipose tissue in mice. **METHODS:** At 6 wks of age, C57BL/6 male mice were divided into 4 groups (n=8/grp): High fat/sedentary (HF/SED), HF/exercise (HF/EX), low fat /sedentary (LF/SED), and LF/Exercise (LF/EX). The HF and LF diets consisted of 60 and 10% fat, respectively. Treadmill exercise was performed 5 d/wk at 12 m/min and 5% grade for 40 min/d for a total of 8 sessions. Mice were placed on the diet and exercise interventions concomitantly. Epididymal fat pads were excised and weighed at sacrifice. Quantitative real-time PCR was performed to assess markers of macrophage content and inflammation in adipose. LF/EX group served as reference for relative mRNA calculations. **RESULTS:** A diet effect was found for body weight (HF/SED: 23.49±0.63; HF/EX: 22.19±0.57; LF/SED: 20.19±0.57; LF/EX: 20.04±0.54 g, $p<0.05$) and epididymal weight (HF/SED: 0.75±0.67; HF/EX: 0.59±0.65; LF/SED: 0.38±0.55; LF/EX: 0.40±0.51 g, $p<0.05$). Gene expression for macrophage markers, F4/80 and CD11c were not different between groups ($p=0.40$ and $p=0.30$, respectively). Adipose inflammatory markers, monocyte chemoattractant protein-1 and tumor necrosis factor-α, were upregulated in the HF groups (3 fold difference from LF, and 2 fold difference from LF, $p<0.05$, respectively). No exercise main effects or interactions effects were observed for any of these markers. **CONCLUSIONS:** While markers of macrophage infiltration were not evident, 2 wks of HF feeding induced upregulation of several proinflammatory markers. Exercise training does not appear to mitigate adipose inflammation early in the development of obesity.

Supported by University of Illinois Research Board seed grant.

#9 Oral Presentation, Saturday, October 30, 10:00 a.m., Room 118

AN INTERDISCIPLINARY APPROACH TO UNIVERSITY WIDE WELLNESS PROGRAMMING: A PRELIMINARY STUDY

Sara Terrell[1], David R. Bright[2], Rhonda Thompson[3], Scott Swanson[1], Kelly R. Kroustos[2], Natalie A. DiPietro[2] [1]Department of Human Performance and Sport Sciences, College of Arts and Sciences, Ohio Northern University, Ada, Ohio 45810[2]Department of Pharmacy Practice, Raabe College of Pharmacy, Ohio Northern University, Ada, Ohio 45810 [3]Department of Nursing, College of Arts and Sciences, Ohio Northern University, Ada, Ohio 45810

Disease state management (DSM) programs improve employee health, reduce health-related expenditures, and improve job satisfaction. Collaboration among Exercise Physiology, Pharmacy and Nursing disciplines presents a disease state management opportunity that may reduce employee health risk factors, improve clinical outcomes, and provide a unique opportunity for student experiential learning. **PURPOSE**: The purpose of this study was to examine a three-month collaborative DSM program (ONU HealthWise) at Ohio Northern University. **METHODS**: Twenty participants enrolled in the program, with 17 completing both pharmacist visits and 8 completing supervised bi-weekly exercise sessions. Participants met with a nurse, pharmacist, and exercise physiologist over a three-month period to improve outcomes related to diabetes, hypertension, hyperlipidemia and fitness parameters. Eight subjects completed student-supervised bi-weekly exercise sessions for 10 weeks. Exercise sessions included 30 minutes of treadmill walking followed by total body strengthening and flexibility exercises. Baseline clinical endpoints were compared with post-intervention data to assess knowledge, quality of life, and patient satisfaction. **RESULTS:** Upon completion of the program, all participants with diabetes were below the 7% HbA1c goal, 4 participants achieved blood pressure control, and one participant achieved normal cholesterol readings. Of the 7 participants who listed weight loss as a goal upon enrollment, 5 lost weight, with an average weight loss of 6.7 pounds. Additionally, 4 participants completing student-supervised exercise sessions reduced total girth by an average of 3.5 inches. Two of the 4 participants who had body composition assessed reduced body fat by an average of 3.2 %. Participant satisfaction measures indicated ONU HealthWise did not jeopardize participant's medical record privacy, was valuable and convenient, and was a good learning opportunity for students. **CONCLUSIONS:** Program participants showed improved clinical outcomes after just three months and reported participation to be valuable. Collaboration among allied health disciplines presents a unique opportunity within higher education settings for employee health improvement and student experiential education. Further expansion beyond the preliminary stage will require continued faculty collaboration with university administration to determine future strategies for successful growth within the current infrastructure as well longitudinal data regarding the DSM program affect on university health care costs.

#10 Oral Presentation, Saturday, October 30, 10:15 a.m., Room 118

HIGHLY PHYSICALLY ACTIVE AMERICANS: ADDITIONAL HEALTH BENEFITS?

Soyang Kwon University of Chicago, Chicago, IL

The 2010 State Indicator Report on Physical Activity reported that 43.5 % American adults participate in more than 300 minutes a week of moderate-intensity aerobic physical activity (PA) or an equivalent combination of moderate- and vigorous-intensity aerobic PA (301+ min moderate-intensity PA equivalent (MIE)). There is lack of evidence that as high as 301+ min MIE provides additional benefits on various health outcomes over 150-300 min MIE. **Purposes:** The purpose of this study was to examine whether highly active (301+ min MIE) American adults have more favorable health outcomes (diabetes, hypertension, high cholesterol, asthma, and arthritis), compared to medium-active (150-300 min MIE) American adults. **Methods:** Secondary data analysis was conducted using the 2007 and 2009 cross-sectional Behavioral Risk Factor Surveillance System (BRFSS) datasets. Participants were selected using the random-digit dialing sampling method. Data were collected by telephone interview. Based on self-report non-occupational PA data, the PA levels of 556,306 participants 18 to 64 years of age were classified as high (301+ min MIE), medium (150-300 min MIE), low (1-149 min MIE), and inactive (0 min MIE). Demographics, health behaviors, and main outcomes were also self-reported. Multivariate logistic regression models were fit to predict health outcomes, adjusted for age, race/ethnicity, income, education, smoking, fruit and vegetable consumption, and body mass index. **Results:** Highly active American adults were less likely to have diabetes, hypertension, and high cholesterol ($P<0.01$), compared to medium-active American adults. But for Asthma and Arthritis, they had higher likelihoods ($P<0.01$). **Conclusions:** 301+ min MIE may provide additional benefits for diabetes, hypertension, and high cholesterol prevention or control over 150-300 min MIE. For asthma and arthritis control, 150-300 min MIE may be optimal.

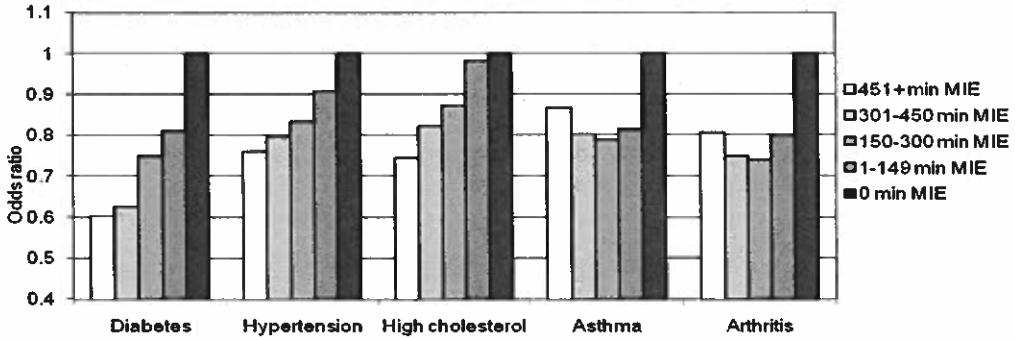


Figure. Odds ratios of health outcomes according to physical activity level in 2007 and 2009 BRFSS participants 18 to 64 years of age.

MIE, moderate-intensity physical activity equivalent. Odds ratios adjusted for age, race/ethnicity, education, income, current smoking, and fruit and vegetable consumption, and body mass index. The 99% confidence intervals of odds ratios are not presented because all of the widths of the 99% confidence intervals were ≤ 0.003.

#11 Oral Presentation, Saturday, October 30, 10:30 a.m., Room 118

SKELETAL MUSCLE MESENCHYMAL STEM CELLS FACILITATE EXERCISE-INDUCED MYOGENESIS

Heather D. Huntsman[1], Tara Lueders[1], Kai Zou[1], Carmen Valero[1], & Marni D. Boppart[1] [1]Department of Kinesiology and Community Health, Beckman Institute for Advanced Science and Technology, University of Illinois, Urbana-Champaign

Multipotent mesenchymal-like stem cells (MSCs) appear in skeletal muscle following cardiotoxin-mediated injury and contribute to muscle regeneration and healing. We have recently demonstrated that transgenic expression of the a7 integrin increases the presence of MSCs and new fibers in skeletal muscle following a single bout of eccentric exercise. **PURPOSE:** The purpose of this study was to determine the extent to which Sca-1^{+}CD45^{-} stem cells directly or indirectly contribute to new muscle fiber growth following exercise. **METHOD:** Sca-1^{+}CD45^{-} MSCs were isolated from a7Tg gastrocnemius-soleus complexes by fluorescence activated cell sorting (FACS), labeled with lipophilic dye1 (Dil), and injected (4 x 10^{4}) into the right gastrocnemius muscle of 10 wk old, female wild type mice (n=7). The contralateral (left) leg of each mouse was injected with saline. One hr prior to injection of cells or saline, four of the seven mice completed a single bout of downhill running exercise (20°, 17 m/min, 30 min) to reestablish the post-exercise microenvironment. Seven days post-injection the mice were euthanized and gastrocnemius-soleus complexes were collected. *De novo* muscle synthesis and satellite cell activation were quantified using immunofluorescence detection of embryonic myosin heavy chain (eMHC) and paired box protein 7 (Pax7), respectively. **RESULTS:** No new fiber growth was detected in saline injected legs, regardless of exercise condition. In contrast, eMHC^{+}Dil^{-} fibers were present following injection of MSCs, with a marked increase in eMHC^{+}Dil^{-} fibers observed in muscles exercised compared to muscles that were not exercised prior to injection. Consistent with this observation, Pax7^{+} cells were elevated to the greatest extent in skeletal muscle of mice injected with MSCs following exercise ($P<0.05$). **CONCLUSIONS:** This study demonstrates that Sca-1^{+}CD45^{-} mesenchymal stem cells significantly increase exercise-induced muscle growth and suggest that the interaction between MSCs and satellite cells, not satellite cells alone, regulate the adaptive response to eccentric contractions.

Supported by grants from the Illinois Regenerative Medicine Institute, UIUC Arnold O. Beckman Award, and the Ellison Medical Foundation.

#12 Oral Presentation, Saturday, October 30, 10:45 a.m., Room 118

THE α7β1 INTEGRIN PROMOTES SKELETAL MUSCLE HYPERTROPHY FOLLOWING ECCENTRIC EXERCISE

Kai Zou[1], Benjamin Meador[1], Brian Johnson[1], Heather Huntsman[1], Carmen Valero[1], Marni D. Boppart[1] [1]Department of Kinesiology and Community Health, Beckman Institute for Advanced Science and Technology, University of Illinois, Urbana-Champaign

Myogenesis and/or increased growth of new and pre-existing fibers are ultimately responsible for muscle hypertrophy observed following eccentric exercise training. We have recently demonstrated that muscle-specific transgenic expression of the α7 integrin enhances *de novo* fiber synthesis in skeletal muscle following a single bout of eccentric exercise. **PURPOSE:** The purpose of this study was to determine the extent to which transgenic expression of the α7 integrin increases muscle fiber size and force generation following multiple bouts of eccentric exercise. **METHODS:** 5 wk old, female wild type (WT) (n=10) and α7BX2 integrin transgenic (α7Tg) (n=10) mice were randomly assigned to one of two groups: 1) sedentary (SED) or 2) exercise training (EX). Exercise training consisted of downhill running 3 times/wk for 4 wk (-20°, 17 m/min, 30 min). Twenty-four hr following the final training session, maximal isometric hindlimb plantarflexor force was measured via *in situ* stimulation of the sciatic nerve. Gastrocnemius-soleus complexes were collected for further analysis of fiber cross sectional areas (CSA). Analysis of signaling events reflective of protein synthesis (AKT and $p70^{S6K}$) were completed on the contralateral limb. **RESULTS**: Whereas $p70^{S6K}$ phosphorylation was elevated 1.5-fold ($P<0.05$), no significant increases in average CSA (WT SED: 617.02±56.34 vs. WT EX: 847.77±76.18 mm^{2}; NS), or hindlimb force were observed in the WT EX group compared to WT SED. In contrast, both AKT and p70S6K phosphorylation were significantly elevated (AKT: 70%, $p70^{S6K}$: 1.3-fold; $P<0.05$) and concomitant increases in average CSA (α7Tg SED: 1280.80±62.25 mm^{2} vs. α7Tg EX: 1790.25±126.88; $P<0.05$) and hindlimb force (25.3%; $P=0.054$) were observed in the α7Tg EX group compared to α7Tg SED. The percentage of fibers ranging 2000 to 3000 mm^{2} increased 19.3% in α7Tg EX compared to α7Tg SED ($P<0.05$). **CONCLUSION:** The results from this study and our previous work demonstrate that the presence of the α7 integrin markedly enhances individual muscle fiber growth and suggests the α7β1 integrin is an important regulator of exercise-induced hypertrophy.

Supported by grants from the Illinois Regenerative Medicine Institute, UIUC Arnold O. Beckman Award, and the Ellison Medical Foundation.

Abstracts – Poster Presentations

Poster Session, October 29, 2010, 2:45-4:45 pm in the Slate Hallway
Authors will be present during the entire session.
Moderator for the session: Darlene Sedlock, Ph.D., FACSM

#13

THE 30-MINUTE TIME TRIAL AS A PREDICTOR OF VENTILATORY THRESHOLD RUNNING VELOCITY AND HEART RATE: A PRELIMINARY REPORT

Teresa K. Brtis[1], Christopher W. Westerkamp[2], & Raymond M. Kraus[1] [1]Elmhurst College, Elmhurst, Illinois; [2]Ferris State University, Big Rapids, Michigan

Lactate threshold (LT) and ventilatory threshold (VT) heart rate and running velocity can be useful in the prescription of exercise intensity for endurance athletes. However, few coaches and athletes have access to the resources necessary to conduct these tests. Limited evidence is available which suggests that the results from running a 30-minute time trial can be used to estimate both heart rate and running velocity at LT. **PURPOSE:** To determine if running a 30-minute time trial accurately estimates the heart rate and running velocity at VT. **METHODS:** Twelve healthy, competitive runners (men, n = 5; women, n = 7) with a minimum of 5 years of long distance running experience were recruited to perform a treadmill VT protocol and a 30-minute time trial. The treadmill VT protocol proceeded until volitional fatigue (1% grade, 3 minute stages, 0.22 $m \cdot s^{-1}$ increases per stage), with VT defined as the point immediately preceding the first non-linear increase in ventilation plotted against VO_2. On a separate visit, participants completed a maximal effort 30-minute time trial on a 400 meter outdoor track with mean running velocity determined by the total distance traveled in the time allotted and heart rate data continuously collected with a heart rate monitor (RS800CX, Polar Electro Inc., Lake Success, NY). **RESULTS:** A significant, positive Pearson Product Moment correlation was found between the running velocity at VT and the mean running velocity of the 30-minute time trial ($r = 0.97$; $p < 0.05$) as well as the heart rate at VT and the mean heart rate of the last 20-minutes of the time trial ($r = 0.79$; $p < 0.05$). The standard errors of the estimate for the prediction of running velocity at VT and heart rate at VT from the 30-minute time trial were 0.12 $m \cdot s^{-1}$ and 5.7 $beats \cdot min^{-1}$, respectively. **CONCLUSION:** While this sample is small, these data show that a 30-minute time trial is a valid predictor of VT heart rate and running velocity.

Supported by a Faculty-Student Summer Collaboration Grant from the Center for Scholarship and Teaching and the Faculty Development Committee of Elmhurst College

#14

EFFECT OF MODERATE HYPOHYDRATION ON ANAEROBIC EXERCISE PERFORMANCE

Courtney M. Diller, Capital University, Columbus, Ohio

Although it is well known that dehydration impacts negatively on aerobic exercise performance, the impact of dehydration on anaerobic exercise performance is less well defined. **PURPOSE:** This study tested the hypothesis that there would be no effect of hypohydration on anaerobic exercise in young, athletic subjects. **METHODS:** Twelve healthy, athletic, subjects (8 males; 4 females) completed two iterations of a 30-second Wingate Anaerobic Power Test: EUHY Wingate, in a well-hydrated condition and HYPOHY Wingate, under conditions of moderate hypohydration (males: -4.06 ± 0.67 % body weight; females: -3.05 ± 0.53 % body weight). Dehydration Protocol: The evening before the HYPOHY Wingate tests, subjects reported to the laboratory in a euhydrated condition for an initial weigh-in. After donning two cotton sweat suits, subjects exercised at low-moderate intensities until they lost 3.0 ± 0.1% of their initial body weight. Subjects were allowed to eat modestly but drank only the 100 ml. of water provided by the investigators until the next morning. The iterations were randomly assigned and, for the males, were separated by 3-10 days. Females were tested during the early follicular phase of the menstrual cycle on successive cycles. **RESULTS:** Paired *t-tests* demonstrated no significant differences between treatment conditions in the male subjects. However, there was statistically significant ($p = 0.007$) decrement in power production during the HYPOHY condition for the female subjects. **CONCLUSION:** The results indicate that moderate hypohydration does not impair anaerobic exercise performance in males. The significant decrement in anaerobic power performance in the females is likely due to the longer exercise time required to achieve a 3% loss of body weight during the active Dehydration Protocol.

(Supported, in part, by a grant from the Ohio Athletic Training Association

#15

THE EFFECTS OF A TRAINING SEASON ON PULMONARY AND CARDIOVASCULAR FUNCTION IN COMPETITIVE YOUTH SWIMMERS

Kevin M. Dunn[1], Kathryn M. Godard[2], Deborah Jessen[2], and Michael P. Godard, FASCM[1]. [1]Western Illinois University, Macomb, Illinois, [2]McDonough District Hospital, Macomb, Illinois

Swim training can produce improvement in cardiac function, aerobic capacity, pulmonary function, and body composition. This study examined the effects of a full season of competitive youth swim training on body composition, aerobic capacity, cardiac function, and pulmonary function. This study is the first to examine the effects of a full season of competitive youth swim training on left ventricular wall size and function using echocardiography. **PURPOSE:** This study's purpose was to identify alterations in body composition, pulmonary function (FEV_1/FVC%), maximal oxygen consumption (VO_{2max}), and left ventricular wall dimensions and function that take place over the course of a competitive swim season. **METHOD:** This study included 25 competitive youth swimmers (6-18 yrs.). All measures were taken immediately before and after the season. Body composition was measured using air plethysmography. Pulmonary function was measured at rest using spirometry. Aerobic capacity was measured by collecting expired gases following a 50-200 yd maximal swim. Cardiovascular dimensions (LVIDd, LVIDs, IVSd, PWd) and functions (SV, CI, shortening fraction, E/E') were measured by echocardiography. **RESULTS:** Significant increases in height (p=.002) and lean body mass (p=.005) occurred. There was no change in FEV_1/FVC% (p=.827). An increase in VO_{2max} also occurred (p=.007). Multivariate test for all LV wall dimension interactions was significant Wilks Lambda = .012, p<.001, partial eta squared .988. A significant increase in shortening fraction was the only change in cardiac function at rest (p<.001). **CONCLUSION:** Alterations in body composition is attributed to maturation and training. The lack of change in pulmonary function is consistent with previous studies and maybe attributed to the height increase. The increase in aerobic capacity is consistent with previous studies that have found aerobic training programs typically result in increases in VO_{2max}. The increases in LV dimensions are consistent with previous findings that endurance training results in LV hypertrophy. The change in shortening fraction was unexpected with the findings a first of its kind. Future studies should focus on alterations in shortening fraction as a result of competitive endurance training in youth swimmers and incorporate a stress echocardiograph to assess the chronic exercise effects to LV function.

#16

THE ACUTE EFFECTS OF VARIOUS STRETCHING MODALITIES ON PERFORMANCE ACROSS A TIME SPECTRUM IN NCAA DIVISION I VOLLEYBALL PLAYERS

[1]Nicholas T. Kruse, [1]Sharon R. Rana, [1]Marc W. Barr [1]Ohio University, Athens, Ohio

The general consensus among coaches and athletes is that static stretching (SS) decreases performance and that dynamic stretching (DS) increases performance. However, the extent to which SS causes reductions in performance has been a highly debatable topic, because its mechanisms of dosage and time are not clearly understood. Furthermore, no investigation has been conducted using an actual DS regimen by a highly fit population in NCAA athletes. **PURPOSE:** Therefore, the purpose of this investigation was to quantify the effects that a practical bout of SS and DS has on performance across a time spectrum of 25 minutes in NCAA division I varsity volleyball players. **METHOD:** Eleven female Ohio University varsity volleyball players volunteered for this investigation. Three days of randomized experimental testing (SS, control, DS) were completed. The SS protocol consisted of a stretching seven primary muscle groups used in vertical jumping for 30 seconds each. The DS protocol consisted of the volleyball team's actual DS regimen of 10 active movements. Pre and post-stretch range of motion as well as post-stretch performance measures of maximal countermovement jump (CMJ) height, power output, and force were determined at 1, 5, 15, and 25 minutes post-stretch. **RESULTS:** Peak CMJ height, peak power output, and relative peak power output had a significant trial-by-time interaction meaning that DS was found to produce significantly higher scores than the SS and control session at 1 and 5 minutes post-stretch. There was also a timing interaction for SS and DS in that SS scores were significantly lower and DS scores were significantly higher at 1 and 5 minutes post-stretch, but not 15 and 25 minutes post-stretch. Although non-significant SS scores were actually higher than DS scores at 25 minutes post-stretch. **CONCLUSION:** Athletes engaging in competitive sports should continue to utilize their typical DS routine although they may want to consider proper placement of their DS routine prior to competition, since there appears to be a critical time point where it becomes ineffective to performance. Further research may want to focus on using a longer time spectrum beyond 25 minutes to determine if/when post-stretching measures of performance plateau.

#17

SITTING ON A STABILIY BALL ELEVATES MAXIMAL OXYGEN CONSUMTION AND HEART RATE DURING ARM ERGOMETRY

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A past study in this laboratory found that during submaximal arm ergometry sitting on a stability ball (B) when compared to sitting on a chair (C) elevates VO_2 by 10 to 16% with no significant effect on heart rate (HR). **PURPOSE:** In this study we investigated further to determine whether the results are the same at maximum effort (max). **METHOD:** MAX-I open-circuit spirometry and Polar heart rate monitor were used during continuous graded exercise tests to volitional fatigue. The first stage started at 15 W or 30 W and increased 10 W to 15 W every three minutes using a Monark arm ergometer. Twenty-seven apparently healthy male and female young adults exercised twice, once on B and the other on C (order randomized), with at least 60 minutes of rest between. Paired t tests ($p < .05$) were conducted to compare B with C for maxVO_2 and maxHR. **RESULTS:** Each and every participant was able to achieve the same maximum power output for both tests. maxVO_2 was significantly ($p < .001$) higher for B (mean $\pm$ SEM, 2087 $\pm$ 91 ml/min) compared to C (1893 $\pm$ 86 ml/min) and maxHR was significantly ($p < .001$) higher for B (178 $\pm$ 2 b/min) compared to C (174 $\pm$ 2 b/min). **CONCLUSION:** The stability ball significantly elevates maximal oxygen consumption by 10% but only elevates maximal heart rate by 2%.

#18

DIFFERENCES IN CARDIOVASCULAR & METABOLIC RESPONSES DURING CONTINUOUS VERSUS CIRCUIT RESISTANCE & AEROBIC EXERCISE

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The measurement of cardiovascular and metabolic responses to resistance exercise in combination with aerobic exercise has not been studied extensively. **PURPOSE:** To compare cardiovascular and metabolic responses to a combination of resistance (RE) and aerobic exercises (AE) completed in either a circuit (CE) or a continuous (CONT) routine. **METHODS:** Twelve males were randomly assigned to either CE or CONT groups. Prior to CE or CONT, subjects underwent BMI, body composition (air plythesmography), and aerobic capacity (VO_2 max) testing. One-repetition maximal lifts (1-RM) were completed for the following resistance exercises: Leg Press, Chest Press, Leg Extension, Shoulder Press, Leg Curl, Pull Down, Triceps Extension, and Biceps Curl. CE completed 1 set of 8-12 repetitions of each RE (65% 1-RM) followed by 3 minutes of AE at 65% VO_2max. CONT performed 1 set (8-12 repetitions at 65% 1-RM) of each RE followed by 21 consecutive minutes of AE. During a CE or CONT routine, HR, VO2, R, total Kcal expenditure (TKcal), Kcal expenditure rate (RKcal), RPE, Workout time (WT), exercise time (ET) was measured with a Cosmed K4b^2. **RESULTS:** CE and CONT groups did not differ in Age, Wt, Ht, VO_2max, HRmax, % fat. During RE, HR (CE-154.4 $\pm$ 10.6 vs CONT-154.4 $\pm$ 10.6 b/min), VO_2 (CE-17.0 $\pm$ 2.1 vs 18.2 $\pm$ 1.7; CONT-31.8 $\pm$ 4.1 vs 29.0 $\pm$ 2.7 ml/kg/min), RKcal (CE-7.9 $\pm$1.3 vs CONT-7.8 $\pm$ 1.4 Kcal/min), RPE, WT and ET did significantly differ. During AE, HR (CE-157.4 $\pm$ 9.3 vs CONT-154.2 $\pm$ 5.9 b/min), VO_2 (CE-31.8 $\pm$ 6.1 vs CONT-29.0 $\pm$ 2.7 ml/kg/min), RKcal (CE-14.4 $\pm$2.3 vs CONT-11.9 $\pm$ 2.0 Kcal/min) and RPE did significantly differ. However, CE maintained a significantly greater %VO_2max during AE (63.8 $\pm$ 4.8 vs 54.5 $\pm$ 7.5 %VO_2max ($p<0.05$) and a greater TKcal (CE-334.0 $\pm$ 12.3 vs CONT-281.1 $\pm$ 10.9 Kcal; $p<0.05$). **CONCLUSIONS:** Metabolic, cardiovascular and self perceptions of effort responses to RE and short intervals of AE are similar when compared to RE and AE done in a separate but continuous manner. However, CE resulted in a greater Kcal expenditure within a similar timeframe and self-perceived level of effort.

#19

ACUTE HIGH NACL CONSUMPTION DOES NOT ALTER CALF VENOUS COMPLIANCE ASSESSMENT USING VENOUS OCCLUSION PLETHYSMOGRAPHY

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Calf venous compliance improves with aerobic training and declines with age. Individuals with hypertension often have decreased arterial and venous compliance. Acute high consumption of NaCl may increase net transcapillary fluid filtration in the limbs, but it is unknown if this acutely high sodium intake will alter non-invasive assessment of calf venous compliance. In humans, assessment of limb venous compliance is generally performed using venous occlusion plethysmography; however, there is no standard recommendation for pre-assessment food consumption and it remains unknown if acute high NaCl intake will affect limb venous compliance measures in humans. **PURPOSE:** To determine if acute high NaCl consumption will alter measures of calf venous compliance using venous occlusion plethysmography. **METHODS:** Twenty healthy college age individuals participated in this study [10 male (22.7± 3.2 yrs, 33.66±6.87 ml*kg^{-1}*min^{-1})], [10 female (22.4±2.2 yrs, 31.98±12.46 ml*kg^{-1}*min^{-1})] and underwent assessment of calf venous compliance following random assignment of either 12 hours of fasting or consumption of 3027 ± 307.2 mg of NaCl in the 12 hours prior to testing. Utilizing venous occlusion plethysmography, limb venous compliance was determined in both trials using the first derivative of the pressure-volume relationship during cuff pressure reduction. Compliance was compared as the slope of the compliance-pressure relationship. Anthropometric data were analyzed using a one way ANOVA and the limb volumes and the two conditions were analyzed using a paired t-test. **RESULTS:** Males were larger than females as evidenced by body mass (89.7 ± 11.1 kg vs. 65.2 ± 9.9 kg), height (182.4 ± 6.1 vs. 167.3 ± 6.6 cm), and body mass index (26.9 ± 2.2 vs. 23.2 ± 3.2 kg/m^2; p<.05). There were no significant differences in calf venous compliance (β_0 = .3094 ± .73929 β_1 = .0955 ± .04418 β_2 = -.0007 ±.00043 vs. β_0 = .5253 ± 1.15009 β_1 = .0974 ± .02888 β_2 = -.0008 ± .00032), capacitance (1.9550 ± 1.02980 vs. 2.1137 ± .79932 ml) or capillary filtration (1.2148 ± 1.40680 vs. .8531 ± .41505 ml) volumes between the fasted and acute NaCl intake conditions. **CONCLUSION:** These data suggest that calf venous compliance assessment using venous occlusion plethysmography is not affected by acute high NaCl consumption.

#20

SIGNIFICANT REDUCTIONS IN TRUNCAL ADIPOSITY DOES NOT ALTER THE VENTILATORY RESPONSE TO CARBON DIOXIDE IN OBESE ADULTS

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Obesity is associated with cardiopulmonary and metabolic dysfunction. Specifically, obese adults commonly report heavy breathing during exertion and cite this as a barrier to exercise adherence. Several mechanisms may alter pulmonary capacity in obese adults; however, truncal adiposity (TA) is theorized to be a primary contributor during exercise by increasing chest wall resistance during inspiration. **PURPOSE**: To investigate changes in total body fat percentage (BF%) and TA following 6-months (6M) of a diet focused weight loss program and the relationship with the V_E/VCO_2 slope during progressive treadmill walking. **METHOD:** Eight obese adults (mean ± SD, Body Mass Index, BMI, 35.7±40 kg/m^2, AGE 47.9±12.1 years) volunteered to participate in a 6-month weight loss program that consisted of the American Heart Association recommendations for healthy diet and lifestyles. The diet intervention consisted of 1250-1500 calories per day of pre-packaged meals, shakes, and fresh fruits and vegetables along with weekly educational classes focused on healthy behavioral change. Subjects completed either a sub-maximal (≤6 METS) or maximal treadmill test (n=5, n=3 respectively) according to ACSM recommendations at baseline (BASE), 3-months (3M) and 6M. Cardiopulmonary data were recorded throughout the exercise sessions. Total and regional body composition was determined with iDXA. **RESULTS:** Significant reductions (p≤0.05) from BASE to 3M and 6M in BF% (45.5 ±4.2, 39.6 ±6.4, 35.7±7.5 BF%) and TA (25.3 ±7.1, 17.8 ±3.7, 14.4 ±3.2 kg), and BMI (35.7 ±4.0, 31.0 ±2.8, 29.1 ±2.8 kg/m^2) occurred. There were no significant changes in truncal lean tissue (kg), VO_{2peak} (L/min^{-1}), respiratory frequency (f =breaths/min^{-1}), tidal volume (V_T =L/min^{-1}), peak gas exchange ratio (R=VCO_2/VO_2) or V_E/VCO_2 slope from BASE to 3M or 6M. **CONCLUSION:** We observed significant reductions in BF% and TA following 6M of participation in a diet and behavior focused weight loss program. Despite the significant reductions in TA we observed no subsequent changes in exercise respiratory f, V_T, or V_E/VCO_2 slope. Our findings indicate that reductions in TA and the subsequent decrease in chest wall resistance following 6M of a balanced diet designed for effective weight loss had no effect on ventilatory responses during progressive treadmill walking.

#21

ECONOMY BETWEEN HEEL VS. FOREFOOT STRIKERS AND RPE ESTIMATES IN ENDURANCE TRAINED RUNNERS.

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PURPOSE: To evaluate running economy (RE) between heel strikers (HS) and forefoot strikers (FFS), and to assess the ability of runners to estimate rating of perceived exertion (RPE) at submaximal intensities. **METHOD:** Twenty endurance trained runners (12 men, 8 women) volunteered for the study: Men: 28.75± 21.7 mi/wk, 12.1± 6.5 yrs exp; Women: 36.25± 17.0 mi/wk, 9.4± 4.0 yrs exp. Twelve subjects performed VO_2 max tests: Men (57.92± 6.95 $ml \cdot kg^{-1} \cdot min^{-1}$), Women (48.98± 6.85 $ml \cdot kg^{-1} \cdot min^{-1}$). Five subjects were forefoot strikers (4 men, 1 woman). Subjects ran on a treadmill at three submaximal speeds (2.68 $m \cdot s^{-1}$, 3.13 $m \cdot s^{-1}$, 3.57 $m \cdot s^{-1}$) for seven minutes each at 1% grade, with five minutes of rest between bouts. Metabolic data were collected continuously. RPE was recorded at min 4.5 and 6.5. Foot strike was video recorded during min 4-7. RE was determined by avg VO_2 (ml/kg/min) for min 3-6. **RESULTS:** No differences were found in RE between HS vs. FFS. No correlations were found between RE and VO_2max, % VO_2 max for a given workload, BMI, shoe wt, miles run per week, or yrs running experience. RPE was related to RE at 3.57 $m \cdot s^{-1}$. RPE was also related to RE for FFS, but not for HS. $\%VO_2R$ significantly increased ($p<0.05$) between 2.68 and 3.13 $m \cdot s^{-1}$ but not between 3.13 and 3.57 $m \cdot s^{-1}$ and RPE was related to $\%VO_2R$ at 2.68 $m \cdot s^{-1}$ but not at 3.13 and 3.57 $m \cdot s^{-1}$. Subjects accurately estimated RPE 33.33% of the time at submaximal intensities. **CONCLUSION:** Forefoot striking was not shown to be more economical than heel striking in endurance trained runners. However, FFS were better than HS at estimating RPE. Runners with better RE had lower RPEs at the highest intensity (3.57 $m \cdot s^{-1}$), with no differences at the lower intensities. Conversely, runners working at lower $\%VO_2R$ better estimated RPE at the lowest intensity, but not at the higher intensities. The increase in $\%VO_2R$ only reflected the magnitude of increase in work at the lowest intensity. This difference in oxygen consumption between the three running stages did not reflect the constant increase of speed between each stage (0.45 $m \cdot s^{-1}$).

#22

RESISTANCE TRAINING, ATTITUDES TOWARD PHYSICAL ACTIVITY, AND PHYSICAL ACTIVITY IN CHILDREN

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The incidence of obesity in children is higher now than in past decades. Improving children's attitudes toward physical activity (PA) may increase PA levels in children. Resistance training (RT) has become popular mode of exercise for children in recent years and has been documented to be enjoyable for some children. Little is known, however, regarding the impact of an RT intervention on children's attitudes toward PA and on PA levels. **PURPOSE:** The purpose of this study was to examine the effects of a 10-week, school-based resistance RT intervention on body mass index (BMI), attitudes toward PA, and PA levels outside of the RT intervention. **METHOD:** Fourth- and fifth-grade students in the Southeast region of the U.S. (N = 118) were placed into control and intervention groups by intact classes. The RT intervention consisted of two 30-minute sessions a week for 10 weeks following a 1-week accommodation period. Each session allowed for the rotation of children through 21 exercise stations featuring 45 seconds of activity and 30 seconds of rest. Calisthenics and stretching stations were interspersed with RT stations to enable full class participation. Height, weight, attitude toward PA, and PA level data were collected before and after the RT intervention. Attitude toward PA was measured using the Children's Attitudes toward Physical Activity Inventory (CATPAI) and PA was measured using the Physical Activity Questionnaire for Older Children (PAQC). **RESULTS:** There was no significant interaction of time and group for BMI, CATPAI, and PAQC scores ($p > .05$). However, PA levels significantly increased over time for the entire sample ($p < .001$). **CONCLUSION:** While a 10-week RT intervention was ineffective in altering BMI, attitudes towards PA, or PA levels in elementary school-aged children, RT did not lead to decreases in PA outside of the intervention. Future research should examine the impact of longer-duration RT interventions on BMI and PA in pre-adolescents. Also, variations in RT mode are important in future research to prevent boredom.

Supported by the MTSU Center for Physical Activity and Health in Youth.

#23

COMPARISON OF CARDIOVASCULAR AND METABOLIC RESPONSES TO A COMBINED RESISTANCE-AEROBIC AND A STANDARD RESISTANCE EXERCISE ROUTINE

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Purpose: To compare cardiovascular and metabolic responses during a combined resistance and aerobic training (CRAT) routine and a standard resistance training (SRT) routine. **Methods:** Six males (age = 21.5 ± 1.4 yrs) were tested for BMI and body composition (BMI = 25.4 ± 2.2; % fat = 14.5 ± 8.5), aerobic capacity (VO_2max = 53.4 ± 4.9 ml/kg/min), and muscular strength (1-RM) for leg press, chest press, leg extension, shoulder press, leg curl, pull down, triceps extension, and biceps curl resistance exercises (RE). CRAT comprised one set of each RE; 10 repetitions at 65% 1-RM. 15-30 sec following each RE, aerobic exercise (AE) was performed at 65% VO_2reserve for 3 minutes. SRT consisted of RE only; 3 sets of 10 repetitions of leg press, chest press, and pull down RE; 2 sets of 10 repetitions on the other RE. During SRT subjects rested for 90 seconds between RE. CRAT and SRT routines were counter-balanced with 24-48 hours between routines. Heart Rate (HR), O_2 uptake (VO_2), respiratory exchange ratio (R), rating of perceived exertion (RPE), total time (TT) to perform the routines and actual exercise time (ET) was monitored with a Cosmed K4b^2. **Results:** CRAT and SRT resulted in a similar VO_2 during RE (16.5 ± 1.9 vs 14.4 ± 3.9 ml/kg/min), but HR was significantly greater during CRAT (151.9 ± 17.1 vs 130.6 ± 4.9 b/min ($p<0.005$)). CRAT total (TCE) and rate (RCE) of caloric expenditure was significantly greater than SRT (335.3 ± 42.4 kcals vs 296.3 ± 33.6 kcals ($p<0.05$); (9.5 ± .92 kcals/min vs 8.2 ± .95 kcals/min ($p<.05$). TT was similar for both routines (35.2 ± 1.5 vs 36.1 ± .5 min); however ET was significantly greater during CRAT (25.3 ± 1.2 vs 9.8 ±.8 min). **Conclusion:** CRAT results in a greater caloric expenditure as compared to SRT even though T and RPE were similar; ET was greater during CRAT and was likely responsible for the increased Kcal expenditure without increase in perceptions of effort. These data provide clinicians and exercise professionals with a viable training routine to combat the current climate of inactivity and weight gain.

Partial funding from the Miami University Undergraduate Summer Scholars Program, 2010

#24

MATURATION MATCHED GENDER COMPARISON OF OUES IN EARLY PUBERTAL CHILDREN

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The oxygen uptake efficiency slope (OUES) is a relatively new spirometric measurement in the assessment of the cardiorespiratory response to graded exercise. The OUES is calculated as the slope of the line of the absolute oxygen consumption volume over the log transformed volume of ventilation: $VO_2 = a\ log V_E + b$ where a is the OUES. **Purpose**: To evaluate OUES between maturation matched young boys and girls of similar body mass. **Methods**: Nine boys (B) and ten girls (G) served as subjects. Subjects were of similar maturation (pubertal stages 1 or 2) as assessed by physician. After an initial familiarization session, subjects performed a maximum graded exercise test on a cycle ergometer starting at 20 W for 2 minutes, and increasing by 10 $W \cdot min^{-1}$ until a maximal voluntary effort was achieved. Maximal exercise responses and the absolute and mass-relative OUES were compared using an independent t-test with significance set at $p < .05$. **Results**: Body mass was similar ($p > .05$) between boys and girls (B = 39.4 ± 11.4, G = 35.9 ± 9.5 kg). VO_2max was 1.55 ± 0.25 $L \cdot min^{-1}$ in B and 1.32 ± 0.23 $L \cdot min^{-1}$ in G ($p = 0.06$); when expressed relative to mass VO_2max was not significantly different between groups, 40.5 ± 6.8 and 37.8 ± 4.9 $mL \cdot min^{-1} \cdot kg^{-1}$ in B and G, respectively. The OUES in B (1.78 ± 0.26 $VO_2 L \cdot min^{-1}/\log_{10} V_E L \cdot min^{-1}$) was significantly higher than in G (1.47 ± 0.25 $VO_2 L \cdot min^{-1}/\log_{10} V_E L \cdot min^{-1}$), but when OUES was expressed relative to body mass, no significant difference was observed between groups (B = 46.6 ± 6.7, G = 42.4 ± 8.2 VO_2 $mL \cdot min^{-1} \cdot kg^{-1}/\log_{10} V_E$ $mL \cdot min^{-1} \cdot kg^{-1}$). **Conclusion**: Early pubescent boys and girls of similar body mass possess similar values for absolute VO_2max, relative VO_2max, and OUES relative to body mass, but early pubescent boys possess greater absolute OUES values than girls. Assessment of the OUES appears to provide a means to evaluate exercise metabolism and cardiorespiratory function in children.

(Grant support provided by the Gatorade Sports Science Institute)

#25

EFFECTS OF REPEATED ANAEROBIC BOUTS ON PLASMA LEVELS OF TH1/TH2 CYTOKINES AND CASPASE-3

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To date, exercise-induced immune responses have generally been evaluated with subjects performing prolonged aerobic exercise (typically > 1HR) at an intensity between 65-80 percent of maximal oxygen consumption. **Purpose:** The primary purpose of this study was to determine if repeated bouts of anaerobic exercise would induce a change in cytokine levels and Caspase-3 which would suggest signaling of immune cells and initiation of immune cell apoptosis. **Methods:** Nine males between the ages of 18-25 volunteered to participate in this study. Subjects performed a total of nine Wingate anaerobic cycle tests which were performed in three sets containing 3 repetitions. Rest intervals were set at 120 seconds between repetitions and 405 seconds between sets for a total exercise duration of 30 minutes. Blood samples were taken at rest (R), immediately after exercise (PE), and again 1 hour after exercise (1HR). Samples were separated to obtain plasma, frozen and stored at -80°C, and finally analyzed using flow cytometry for cytokine secretion and Caspase-3. **Results:** Th1 derived cytokines (IL-2, IL-12, INF-γ, and TNF-β) exhibited a trend of increasing from R to PE and decreasing from PE to 1HR, with the exception of TNF-β which continued to increase up to the 1HR measurement; however, none of these changes reached statistical significance ($P \geq 0.05$). Caspase-3 levels exhibited the same trend (means ± SD; R= 14.49±6.7ng/mL, PE=20.3±11.3ng/mL, and 1HR= 15.7±10ng/mL) but again without significance. **Conclusions:** The present study found that repeated bouts of anaerobic exercise did not significantly alter the concentrations of cytokines or Caspase-3, which suggests that repeated anaerobic bouts do not cause an acute change in immune function with regards to cell signaling or cell death.

#26

ACUTE AND CHRONIC EFFECTS OF EXERCISE ON SALIVARY IGA AND URTI IN POST MENOPAUSAL WOMEN

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Exercise can affect salivary immunoglobulin A (SIgA) responses and may alter a person's susceptibility to upper respiratory tract infections (URTI). However, little is presently known about these effects in post menopausal women which may have reduced SIgA levels because of estrogen deficiency. **PURPOSE:** This study examined the effects of acute maximal exercise and chronic moderate exercise training on measures of SIgA and the incidence/duration of URTI in post menopausal women. **METHODS:** Thirty-two post menopausal women were randomized to a 16-week home-based, walking program (5 days/week, 30-min/session, intensity 75% of HR_{max}) or experimental control group. Before and after the intervention, each subject underwent a maximal exercise treadmill test to determine VO_{2max} and timed, whole unstimulated saliva samples were collected both at rest before and immediately after completion of each VO_{2max} test to determine absolute SIgA concentrations, saliva flow rates (SFR), and SIgA secretion rates (S-SIgA) (Fahlman et al., 2001). In addition, throughout the study duration, each subject completed standard weekly URTI symptomatology research logs. **RESULTS:** The 16-week walking program resulted in a significant improvement (+10.4%) of VO_{2max} (ml/kg/min) ($p<0.01$). Repeated measures ANOVA revealed a marked increase (+37.4%) in resting S-SIgA ($p<0.05$) and a quantitatively similar, but statistically non-significant ($p>0.05$), rise (+36.2%) in SFR in the exercise group following training. Independent of study group, both before and after the intervention, resting S-SIgA (-32.3%) and SFR (-29.3%) were noticeably reduced ($p<0.01$) following acute maximal exercise. Neither VO_{2max} testing nor the moderate intensity training intervention had an effect on absolute SIgA concentrations ($p>0.05$). Moreover, the number of URTI incidences were the same (control: 4; exercise: 4) and the duration per incidence (control: 5.3±1.5 days; exercise: 6.2±2.2 days) over the 16-week intervention period were similar between study groups ($p>0.05$). **CONCLUSION**: These findings in post menopausal women support that S-SIgA and SFR are reduced immediately following maximal exercise. Moreover, a 16-week moderately intense walking program can increase S-SIgA without affecting URTI susceptibility in this population.

Supported by NIH/NINR R01 NR 008024

#27

AN ACUTE BOUT OF EXERCISE ALTERS BLOOD TRIGLYERIDES DIFFERENTLY IN MEN WITH ABOVE VERSUS BELOW AVERAGE INITIAL CONCENTRATIONS

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Blood triglycerides (TG) are strongly related to the development of atherosclerosis and cardiovascular disease. Research demonstrates a single bout of exercise can acutely reduce TG in both absolute (mg/dl) and relative (%) terms. No research has directly evaluated whether pre-exercise TG concentration influence these absolute and relative changes. **PURPOSE:** To evaluate the influence of initial TG concentration on potential changes in their concentrations following a single bout of exercise. **METHOD:** A repeated-measures model was used and a predetermined significance of $p \leq 0.05$ accepted. Nine men (24 ± 1 yrs) with below average initial TG (40.6 ± 4.2 mg/dl; BLW) and eight men (24 ± 1 yrs) with above average TG (140.9 ±7.0 mg/dL; ABV) participated in this investigation. Participants reported to the lab in the morning following an overnight fast and ≥60 hours having refrained from activities above their "normal daily routine." Subjects then performed a single bout of treadmill walking at 60% VO_2max to expend 600kcal and had their blood sampled at 1, 24 and 48 hours post-exercise (PE). **RESULTS:** There were no difference in age, weight, height, aerobic fitness (VO_2max), or body composition (BOD POD; % fat) between ABV and BLW men. Initial concentrations and absolute changes in TG were greater in ABV versus BLW at 1hr PE (-22.4 ± 23.6 vs. 3.0 ± 8.8mg/dL), 24hr PE (-27.7 ± 18.5 vs. -4.6 ± 7.7mg/dL), and 48hr PE (-7.5 ± 19.02 vs. -1.2 ± 13.4mg/dL). However, there were no difference in relative (%) changes in TG concentrations following exercise. **CONCLUSIONS:** In this investigation, a single bout of treadmill walking to expend 600kcal at a moderate intensity resulted in greater absolute (mg/dL) changes in blood triglyceride concentrations in men whose pre-exercise TG were higher (ABV) as compared to those who started with lower TG concentrations (BLW).

Funded in part by the Office of Research and Sponsored Programs at Ohio University; All methods were approved by the Institutional Review Board at Ohio University.

#28

COMPARISON OF MEASURED VS ESTIMATED RESTING METABOLIC RATES USING INDIRECT CALORIMETRY AND BODPOD ESTIMATION IN COLLEGE-AGED MEN AND WOMEN

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Resting metabolic rate (RMR) is clinically important to determine caloric needs for energy balance. There are several estimation models used for the determination of RMR, including the use of height, weight, age, fat mass, fat free mass, body surface area, and other anthropometric measurements. These methods are relatively inexpensive and easy to use. As compared to estimation of RMR (eRMR), indirect calorimetry is relatively more expensive and time-consuming. However, there are very few studies comparing eRMR to measured RMR (mRMR) in college-aged populations. **PURPOSE:** Therefore, the purpose of this study is to compare mRMR collected via indirect calorimetry to eRMR based on body fat analysis. **METHODS:** Twenty (10 women, 10 men) participants were recruited to perform RMR testing (age: 18-23 years, 20.7 ± 1.5 years). Testing was conducted between 6am and 1pm, within an hour of waking. Each participant rested for 15 minutes upon reporting to the lab, followed immediately by 30 minutes of canopy collection of expired gases. At the completion of gas collection, participants went directly to the Bodpod for fat analysis. A two-tailed, dependent t-test and standard error of the estimate was used to compare the predicted and measured RMR values. **RESULTS:** mRMR was significantly higher than eRMR (mRMR = 1683 ± 317 kcal/day, eRMR = 1550 ± 375 kcal/day, $p > 0.001$, SE = 108 kcal/day). Interestingly, when the participants were separated by sex, the men showed no statistical difference between mRMR and eRMR. The mRMR of the women were significantly higher than their eRMR (mRMR= 1461 ± 150 kcal/day, eRMR = 1269 ± 149 kcal/day, $p > 0.001$, SE = 92 kcal/day). **CONCLUSION:** The equation used to predict RMR in college aged men and women via Bodpod significantly underestimates (8%) RMR compared to mRMR. Analyzing the data by sex reveals that Bodpod more accurately predicts RMR in men (4% underestimation), but is not a good predictor of RMR for women (13% underestimation).

#29

THE RELATIONSHIP BETWEEN ACCELEROMETRY AND METABOLISM AT VERY LOW INTENSITY EXERCISE ON THE ACTIVE WALKSTATION.

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Attempts to increase the physical activity (PA) levels of the population have included alterations of the workplace to decrease sitting time and promote low levels of activity during the work day. Providing an alternative to a sitting desk with the Walkstation is currently under investigation in a number of research efforts. Determining the caloric expenditure and the PA actually achieved with an intervention which evokes very low levels of PA can be challenging. **PURPOSE:** To assess the actual metabolic cost and accelerometry counts at the levels of activity used in the workplace with the Walkstation. **METHODS:** Oxygen consumption (VO_2) and heart rate (bpm) were obtained continuously in16 healthy male and female college students with a Parvomedics metabolic system and expressed as ml/kg/min while at rest, and while walking at .5, 1.0, 1.5 and 2.0 mph on a Walkstation. Actical accelerometers were used to determine counts per minute (cpm) under the same conditions for 10 min at each walking speed. **RESULTS:** The bodyweight of the group was 70.65 ± 15.2 kg (Mean ± S.D.). The resting VO_2 was 3.63 ± .74 ml/kg/min. Table 1 shows the values for VO_2 and Actical counts at each speed.

Speed (mph)	.5	1.0	1.5	2.0
VO_2 ml/kg/min	6.6 ± .69	7.5 ± .67	8.9 ± .78	9.7 ± .79
Actical (cpm)	12±19	155±131	510±210	1130±335
Heart rate (bpm)	80 ± 14	85 ± 14	89 ± 12	94 ± 13

The correlation between VO_2 and cpm was $r = .73$, $p<.05$. However, the metabolic rate had approximately doubled at a walking speed of .5 mph. which is at least a third greater than expected from cost of walking equations. **CONCLUSION:** Acticals did not accurately capture the physical activity level of walking at .5 mph. A common "cut-off" point of 100 cpm for the Actical would lead to the conclusion that the individual was totally sedentary. Nevertheless, considerable caloric expenditure would be accumulated at a .5 mph speed compared to a sitting position. Researchers using accelerometer technology to monitor activity levels should be cautious in describing individuals as sedentary if active walk stations are in use.

#30

CARDIOVASCULAR DISEASE RISK IN VOLUNTEER FIREFIGHTERS

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Cardiovascular related events are the leading cause of on-the-job deaths in firefighters. Currently, many municipal firefighter divisions rely on volunteer firefighters to maintain the safety of the community. With the increased dependence of volunteer firefighters and the potential for job-related cardiovascular events, it is important to evaluate the overall health of these individuals. One possible way to measure overall heath is by evaluating cardiovascular disease (CVD) risk. However, few studies have examined the prevalence of CVD risk factors in volunteer firefighters. **PURPOSE:** To assess CVD risk factors in volunteer firefighters. **METHODS:** Participants were 77 (96% male; 100% Caucasian; age: 39.9±12.0) Midwestern, suburban volunteer firefighters, who completed a survey and health assessment during February 2010. The health assessment included measured height (cm), weight (kg), calculated body mass index (kg/m^2), waist circumference (cm), and body composition via a three site skinfold measure. Meeting physical activity recommendations, family history of CVD, smoking, blood pressure, cholesterol, and blood sugar were assessed via survey. All CVD risk factors were dichotomized based on the American College of Sports Medicine risk stratification criteria. For analysis, total number of CVD risk factors were summed and categorized as 0, 1, or ≥ 2. **RESULTS:** Our results indicated that 18% were smokers, 35% had a family history of CVD, 22% had high blood pressure, 26% had high cholesterol, 7% had high blood sugar, 70% were physically inactive, and 77% were classified as obese. This resulted in 4% of the sample having 0 risk factors, 7% having 1 risk factor, and 86% having ≥2 risk factors. **CONCLUSION:** Results show a larger than expected percentage of volunteer firefighters with ≥2 CVD risk factors. Shockingly, three of every four firefighters were classified as obese. As a result, increased health standards should be imposed to help prevent cardiovascular events in volunteer firefighters.

#31

THE RELATIONSHIP BEWTWEEN PRO-SOCIAL BEHAVIOR AND PHYSICAL ACTIVITY IN ELEMENTARY SCHOOL CHILDREN

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Children of low socioeconomic status (SES) areas are exposed to high crime and violence rates at a young age. While one might expect high prevalence of poor behavior and a low prevalence of pro-social behavior in low SES communities, few studies have examined the relationship between pro-social or poor behavior and physical activity (PA). It is possible that the CrimFit Youth Program, which teaches elementary school-aged children about being healthy and physically active, could positively affect multiple aspects of behavior. **Purpose:** Our purpose was threefold: 1) to determine the relationship between behavior and physical activity in low SES elementary school-aged children; 2) to determine if children who met or did not meet PA recommendations were more likely to be classified as poorly behaved; 3) to determine whether participation in the CrimFit Youth Program modified the low SES children's behavior and PA. **Methods:** Anthropometric measures were obtained, and child and parent surveys were administered to 156 4th and 5th grade children at four elementary schools in Flint, MI. Three schools participated in the CrimFit Youth Program. Surveys included the parent-completed Strength and Difficulties Questionnaire (SDQ) and self-reported PA. Data were analyzed using correlation, odds ratios, and ANOVA. **Results:** Study participants reported 4.8±2.2 days per week of attaining at least 60 minutes of moderate-to-vigorous physical activity (MVPA). Mean scores of the 5 subscales of the SDQ were: Hyperactivity, 3.2±2.5; Emotional symptoms, 1.6±1.8; Conduct problems, 1.5±1.8; Peer problems, 1.9±1.9; Total difficulties, 8.6±6.4; and Pro-social behaviors, 8.4±1.9. Correlations between PA and each subscale were not significant and ranged from r=-0.07 – 0.03. Behavior did not differ between students who met and did not meet PA recommendations. However, children participating in the CrimFit Youth Program performed significantly more MVPA (5.2 days/week) than those who did not (4.4 days/week) (p=0.03). **Conclusions:** Few participants were classified as exhibiting poor behavior, which made it difficult to examine relationships. Future studies should include larger samples and focus on children who have been classified as poorly behaved. In addition, more objective measures of PA should be utilized in future studies.

Funded by Michigan State University Colleges of Education and Human Medicine

#32

SUBSTRATE UTILIZATION DURING RECOVERY FROM EXERCISE AFTER INGESTION OF A CARBOHYDRATE MEAL

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A single bout of exercise can increase the rate of lipolysis and fat oxidation. However, ingesting carbohydrate (CHO) results in increased insulin concentrations that in turn blunt lipolysis. Food with a lower glycemic index (GI) may be valuable in that its consumption may result in attenuated glycemic and insulinemic responses compared to food with higher GI values. Low GI food may therefore be valuable in the post-exercise recovery period to maintain elevated fat oxidation. **PURPOSE:** To evaluate plasma glycemic and insulinemic responses and substrate utilization during a two hour recovery period from a 300kcal treadmill walk and the consumption of a low or high GI CHO. **METHOD:** Healthy, non-smoking college-aged men (21 ± 2 yrs), with average body composition (13.80 ± 1.68 % fat), and above average aerobic fitness (53.24 ± 2.82 ml/kg/min) were recruited. A repeated-measures model was used and a predetermined significance of p≤0.05 accepted. Participants performed a treadmill walk at 60% of their determined VO_2max until 300kcal were expended, then consumed 300kcal of low or high GI CHO. Plasma glucose and insulin concentrations were measured at baseline and at one and two hours after CHO ingestion. Respiratory exchange ratio (RER) was measured during exercise recovery. **RESULTS:** There were no significant differences between trials or across time for plasma glucose or absolute VO_2 during recovery. Insulin concentrations were not different between trials, but increased in both trials one hour after ingestion of the CHO. During the recovery period RER was significantly lower in the low vs high trial (0.85±0.03 vs 0.93±0.04). **CONCLUSIONS:** Ingestion of 300kcal of low and high GI CHO following 300kcals of energy expenditure on a treadmill did not alter plasma glucose, but did increase insulin concentrations during a two hour recovery period. However, fat oxidation in the recovery from exercise was greater (lower RER) when a low GI CHO was consumed as compared to a high GI CHO.

Funded in part by the Office of Research and Sponsored Programs at Ohio University; All methods were approved by the Institutional Review Board at Ohio University.

#33

DOES A SINGLE BOUT OF STRUCTURED EXERCISE AFFECT FREE-LIVING PHYSICAL ACTIVITY IN COLLEGE STUDENTS?

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Controversy exists whether participation in structured exercise (SE) results in an increase in physical activity (PA) for that particular day. **PURPOSE:** To determine whether vigorous and/or moderate bouts of SE result in an increase in daily PA and PA during specific time periods during a day for normally active college students (CS). **METHODS:** 26 college students (12 males/14 females) completed a maximal treadmill test (VO_2max) and measures of height and weight; BMI was calculated. To objectively assess PA, subjects were asked to wear an Actical accelerometer from the time they awoke until bedtime for the entire 3 week study period. 7-9 days after the VO_2max test subjects returned to the laboratory to participate in either a randomly selected vigorous (75%VO_2max) or moderate (45% VO_2max) treadmill SE session that lasted until each individual expended 350 Kcals (females) or 400 Kcals (males). One-week later each subject completed the alternative SE session. VO_2, HR, V_E, RER and RPE were measured during each SE session. **RESULTS:** A 3 (Days) X 2 (Intensity) repeated measures ANOVA revealed PA (cpm) was significantly higher on the day of (DO) either moderate (MSE) or vigorous (VSE) SE as compared to the day before (DB) and the day after (DA) SE bouts ($p<0.001$). The interaction between Days and Intensity was significant; the VSE session resulted in an increase in PA for DOVSE ($p<0.01$) above DOMSE. Further analysis of specific time-blocks indicated PA during time after VSE (TAVSE) was significantly lower ($p<0.05$) than TAMSE and the same time periods on DBVSE, DBMSE, DAVSE, and DAMSE. VO_2max was not significantly correlated with PA (cpm) on DOSE, DBSE, or DASE. There were no significant gender, VO_2max and PA relationships in this group of CS. **CONCLUSIONS:** Both VSE and MSE result in increased levels of PA in a normally fit CS on DOSE. Moreover, PA during DOVSE was significantly greater than DOMSE. Even though PA during the AVSE time-block was significantly reduced DOVSE remained the day of highest PA. Gender and fitness was not associated with PA in this group of CS.

#34

ASSOCIATION OF WEIGHT TRAINING WITH BODY IMAGE AND STRATEGIES TO MANAGE PHYSICAL APPEARANCE AMONG COLLEGE STUDENTS

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Weight training (WT) is an important physical activity in that it contributes to increased bone and muscular strength, muscular endurance and mass, and improved body image. Effectively promoting WT as a regular part of college students' lifestyle requires a strong understanding of how WT is perceived by students in various subgroups. **PURPOSE:** The purpose of this study was to determine if students who engage in a regular WT program differ from those who do not regarding motivation for WT, attitudes towards WT, body image, and strategies used to manage physical appearance. **METHOD:** College students (n=601) enrolled in a wellness course open to all majors completed a survey prior to any class discussions on exercise, nutrition, or body image. Subjects who answered yes to "Do you currently weight train regularly (2 or more days per week)" were categorized as regular weight trainers. Data were also analyzed across genders. **RESULTS:** Women were more likely than men to WT to lose weight ($p<0.001$) while men were more likely than women ($p<0.001$) to WT for reasons of enjoyment. Also, men who do not WT were more likely than those who do to desire to improve their athletic performance ($p<0.001$), while women who do not WT were more likely than women who do to WT as a way to feel better about their appearance and increase their self-confidence ($p<0.001$). Students who WT regularly were more likely than those who do not to report feeling "strong and healthy" ($p<0.001$) and "proud of their body" ($p=0.002$). However, they were also more likely ($p<0.001$) to engage in three or more negative weight control practices (i.e. weight loss pills, protein supplements, anabolic steroids). **CONCLUSION:** A major motivation for college students to engage in WT is to improve their physical appearance and feelings of wellbeing. And while the students who do regularly WT report feeling better about themselves, many are also practicing unhealthy strategies to manage their physical appearance. These data suggest that promotional message encouraging students to WT might focus on the intrinsic motivations (feelings, enjoyment) for WT already sought by many students.

#35

A COMPARISON OF NORMAL VERSES LOW DIETARY CARBOHYDRATE INTAKE ON SUBSTRATE OXIDATION DURING AND AFTER MODERATE INTENSITY EXERCISE IN WOMEN.

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PURPOSE: To investigate the effects of carbohydrate restriction on substrate oxidation in women during and after exercise. METHODS: Ten healthy, active young (18-23 y) females participated in air displacement plethysmography to determine percent body fat (%FAT), fat-free mass (FFM), and fat mass (FM). A graded exercise test was used to determine maximal aerobic power (VO_2max). Subjects completed 2 treatment sessions of treadmill exercise at 55% of VO_2max until 350 kcal of energy were expended. For two days prior to testing subjects consumed either a low CHO (low-CHO; ave 20.3% CHO, 38.8% PRO, 40.2% FAT) or a moderate CHO (mod-CHO; ave 55.4% CHO, 15.8% PRO, 29.1% FAT) diet in a randomized cross-over design. Each diet was designed according to individual caloric needs. During exercise and for 2 h post-exercise, expired gases were analyzed to determine non-protein FAT and CHO oxidation rates, which were normalized to mg/kg FFM/min. A treatment x time ANOVA and Pearson correlation analysis were used to analyze the data with $p<0.05$. RESULTS: Subjects were 24.9±6.2% FAT with a VO_2max of 68.8±13.8 ml/kg FFM/min. FAT oxidation was higher and CHO oxidation was lower following the low-CHO diet compared to the mod-CHO diet during exercise, 1h Post-ex, and 2 h Post-ex.

	Testing Period		
CHO oxidation (mg/kg FFM/min)	**Exercise**	**1 h Post-ex**	**2 h Post-ex**
Mod-CHO	31.1±6.2	4.1±1.9	3.1±1.1
Low-CHO	25.1±5.6*	2.5±1.2*	2.5±0.9*
FAT oxidation (mg/kg FFM/min)			
Mod-CHO	6.2±2.2	1.6±0.5	1.7±0.4
Low-CHO	8.7±2.2*	2.2±0.5*	1.9±0.5*
CHO oxidation (%)			
Mod- CHO	63.6±12.0	46.1±19.4	39.1±11.1
Low-CHO	50.1±10.1*	28.2±13.2*	31.4±12.8*
FAT oxidation (%)			
Mod- CHO	36.4±12.0	53.9±19.4	60.9±11.1
Low-CHO	49.9±10.1*	71.8±13.2*	68.6±12.8*

*significant difference between diets ($p<0.05$).

Significant positive correlations were observed between VO_2max and CHO oxidation during exercise and post-exercise as well as significant negative correlations between VO_2max and fat oxidation post-exercise in the low-CHO condition. Waist circumference and fat oxidation exhibited significant negative correlations during exercise in the low-CHO condition and 1 h Post-exercise in the Mod-CHO condition.

CONCLUSION: Glycogen energy store as influenced by diet may impact substrate oxidation by increasing lipid oxidation during exercise and at rest after consumption of an acute low-carbohydrate diet compared to a moderate-carbohydrate diet.

#36

CHANGES IN ABDOMINAL ADIPOSITY IN OVERWEIGHT AND OBESE SUBJECTS FOLLOWING AN 8-WEEK COMMUNITY WEIGHT MANAGEMENT PROGRAM

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Introduction: Centers for Disease Control and Prevention estimated that 68% of the Americans are either overweight or obese. Adiposity has been linked with increased risk of heart disease, diabetes mellitus, hypertension, high cholesterol, respiratory disease, and stroke. Specifically, visceral adiposity has been reported to increase the risk of these comorbidities. **Purpose:** To examine changes in visceral and subcutaneous abdominal fat stores, body mass, and body mass index (BMI) following an 8-week community weight management program. **Methods:** Over the last nine years (2000-2009), 232 subjects, 174 females and 58 males (mean ± SEM, age: 50.5 ± 0.7y; height: 1.6 ± 0.005m; body mass: 95.6 ± 1.4kg; BMI: 34.2 ± kg/m^2) participated in an 8-week community based weight management program consisting of a low-calorie diet (1200 kcal/day) and moderate physical activity. Subjects participated in weekly group meetings where they received education on the food exchange system and were counseled on behavior modification strategies related to diet and exercise adherence. Fat distribution was estimated using anthropometric sagittal diameter and predictive equations. Percent body fat was measured using bioelectric impedance, Tanita BF-350 (Arlington Heights, IL). Self-reported data was used to monitor adherence to diet and exercise. Two test periods (pre-post) were analyzed using paired sample *t-test* to determine changes in body mass, BMI, percent fat, visceral adipose tissue (VAT), subcutaneous adipose tissue (SAT) and total adipose tissue (TAT). **Results:** Significant decreases ($p<0.001$) in body mass, BMI, VAT, SAT, TAT, and percent body fat ($p<0.01$) were found from pre-to-post test. Relative reductions were 6% for percent body fat, 18% for VAT, 9% for SAT, and 10% for TAT at the end of the 8-week intervention. **Conclusion:** The significant decrease in body mass as well as percent body fat contributed to significant losses in VAT, SAT, and TAT. In addition, there was greater relative loss of VAT than SAT. Our results show that an 8-week community based weight management program consisting of a low-calorie diet and moderate physical activity led to significant positive changes in body composition.

#37

A NOVEL CONCEPT FOR THE INITIATION OF SUDDEN CARDIAC ARRHYTHMIA IN SUSCEPTIBLE INDIVIDUALS

David L. Weldy, University of Toledo, Toledo, OH

Sudden cardiac arrhythmia is one of the leading causes of death in apparently healthy young athletes. Most of these deaths are subsequently associated with abnormal cardiac structure, but little has been proposed concerning the trigger for arrhythmia in these abnormal hearts. **Purpose:** To re-evaluate the initiating event for sudden cardiac arrhythmia in individuals with susceptible cardiac conditions. **Methods:** Observation of a unique onset of sudden death in a 15-yr-old female who slumped and exhibited decerebrate posturing and agonal breathing immediately following an atraumatic, feet first slide into third base. In addition, a critical review of relevant literature will be performed to develop possible hypotheses. **Results:** The athletic trigger for the arrhythmia in the case as presented was a pure axial load on the skeleton and the central and spinal nervous system. A brain MRI showed a 5 mm downward displacement of the right cerebellar tonsil through the foramen magnum. Control of fundamental cardiac and respiratory functions are located in the hindbrain (medulla and pons) near the foramen magnum. Bony impingement on these regulatory structures may lead to stimulation and/or inhibition of either sympathetic or parasympathetic outflow thereby disrupting the rhythmic cardiac cycle. Consequently, disorganized myofibril depolarization resulting in ventricular tachycardia and/or fibrillation particularly in abnormal myocardial tissue or structure may be induced. Review of the literature confirmed that individuals with Arnold-Chiari malformation (hindbrain located caudad to the foramen magnum) have a significantly increased incidence of sudden cardiac arrhythmia induced by movements of the head. A search for intracerebral pressure or edema as a stimulus was unproductive but cannot be excluded as a potential trigger. **Conclusion:** Mechanical impingement of cerebral tissue and or cranial nerves in individuals with minimal or mild caudad location of the hindbrain may be sufficient to trigger cardiac arrhythmias particularly in susceptible individuals.

#38

EFFECTS OF A WEIGHT MANAGEMENT INTERVENTION ON BODY SELF PERCEPTIONS IN OVERWEIGHT AND OBESE ADULTS

Jessica N. Stapleton, Curt L. Lox, Erik P. Kirk, Jeffrey E. Herrick, Stacy L. Gavin,
Lucas M. Novotny, and Jennifer Gapin, Southern Illinois University Edwardsville,
Edwardsville, Illinois

While overweight and obesity are often associated with chronic illnesses such as coronary heart disease, type II diabetes, cancer, and other physiological pathologies, the consequences of overweight and obesity extend to various psychosocial pathologies as well. **PURPOSE:** The purpose of this study was to investigate changes in body self perceptions of overweight and obese adults following a six month intervention aimed at effective weight loss. **METHOD:** Fourteen overweight and obese middle-aged adults (10 females, 4 males) participated in a six month weight reduction program. Diet/nutrition modification, physical activity, and lifestyle education workshops comprised the primary interventions for weight loss. Clinic participants completed the body fat subscale of the Physical Self-Description Questionnaire (PSDQ) and the Body Assessment Scale at baseline, three months into the program, and six months into the program. **RESULTS:** For females, perceptions of their current body size dropped from baseline (M=7.92 on a 1-9 scale) to three months (M=7.08) to six months (M=6.44). Females' ideal body size was notably smaller than reported current size at all assessments. However, the difference between current and ideal body size decreased substantially over time from baseline (M=3.92) to three months (M=2.42) to six months (M=2.00). For males, similar trends were reported for both current and ideal body sizes. The reported difference between current and ideal body sizes for males also dropped from baseline (M=3.00) to three months (M=2.00) to six months (M=1.60), indicating that males discrepancy between current and ideal body perceptions was less than the discrepancies identified by females. Further supporting these findings, data from the body fat subscale of the PSDQ revealed a reduction from baseline (M=5.21 on a 1-6 scale) to three months (M=4.78) to six months (M=4.37) related to participants' perceptions of their body fat. **CONCLUSIONS:** Following participation in a six month weight loss program, overweight and obese participants exhibited notable improvements in body self perceptions, suggesting that weight loss interventions may be beneficial for enhanced body self-concept and self-esteem in addition to the physiological benefits provided.

#39

EVALUATING THE PREVALENCE OF CHRONOTROPIC INCOMPETENCE USING DIFFERENT CRITERIA IN HEART FAILURE WITH PRESERVED EJECTION FRACTION

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[2]Wake Forest University School of Medicine, Winston-Salem NC

Currently there is no definitive criterion for the diagnosis of chronotropic incompetence (CI) in patients with heart failure and a preserved ejection fraction (HFpEF). **Purpose:** To determine the prevalence of CI in HFpEF patients between various CI diagnosis methods commonly utilized in previous studies of patients with heart failure with reduced ejection fraction. **Methods:** Subject data from 3 previous studies were retrospectively analyzed. Exercise testing for each of the 207 subjects (>60 years of age) was performed on an electronically braked bicycle to symptom limited maximal level using 3-min increments (12, 25, 50, 75 W). Patients were evaluated for the presence of CI using 5 different methods. Three of these techniques used achievement of 80% of age predicted maximal heart rate (APMHR). While APMHR is usually estimated as 220-age there are other formulas including; Gulati's (206 -0.88(age)), and Tanaka's (208 – 0.7(age)). Maximal heart rates achieved during the test were divided by these predicted values to determine the presence of CI. The Wilkoff Chronotropic Index and percent of heart rate reserve (HRR = peak HR- rest HR) methods were also employed with an 80% criterion level. **Results:** Data from these analyses indicate that the prevalence of CI between the Wilkoff, Gulati, 220-age, Tanaka and % HRR diagnosis methods differed significantly as shown in the table.

CI Prevalence

	Wilkoff	Gulati	220 - Age	Tanaka	% HRR
CI	52	56	60	85	107
Total	207	207	207	207	207
Percent	25.1%	27.1%	28.9%	41.1%	51.7%

Conclusion: A wide range in the prevalence (25 – 51 %) of CI exists when these 5 methods for identifying the prevalence of CI are employed. The variability in prevalence rates limits the ability to compare and interpret previous findings of CI in various populations. This variability also makes it difficult to determine which patients would benefit from therapies designed to improve chronotropic function. Therefore, future efforts are needed in determining a standardized and universally accepted criterion formula to determine the presence of CI in HFpEF patients as well as other populations.

#40

CARDIOVASCULAR AND METABOLIC RESPONSE TO RESISTANCE AND MATCHED AEROBIC EXERCISE

Ryan P. Gallagher, Brennan L. McGill, & Randal P. Claytor Department of Kinesiology and Health, Miami University Oxford, OH

Little is known about the metabolic and cardiovascular response to resistance exercise (RE) compared to aerobic exercise (AE). **PURPOSE:** To measure cardiovascular (HR) and metabolic (VO_2) responses to a single bout of RE which was then matched with bouts of AE for either HR or VO_2 and time. **METHOD:** 16 males and 8 females participated. Air plethysmography measured body composition. Maximal oxygen uptake (VO_{2max}) was measured during a standard treadmill test using open circuit spirometry. A 1-repetition maximum (1RM) test measured muscular strength for each RE. HR and VO_2 were measured during a single bout of a RE routine. The RE routine entailed 3 sets of 10 repetitions at 65% of 1RM with 90 seconds of rest between each set. RE bout included: leg press, seated bench press, leg extension, bicep curls, shoulder press, lat pull-downs, and tricep push-downs. Randomized bouts of AE were completed; one to match VO_2 of RE and one to match HR of RE. **RESULTS:** Age = 21.2 +/- 2.2 yr; BMI = 25.83 +/- 4.86 kg/m^2; % fat = 22 +/-9.1%; VO_{2max} = 50.8 +/- 9.4 ml/kg/min; HR max = 193 +/- 7.4 bpm. Bouts of RE and AE were set at 40 minutes in duration. RE Work Time = 602 +/- 91.2 s; RE Rest Time = 1825 +/- 35.5 s.

Variables	RE	HR-matched AE	VO_2-matched AE
W/R-HR (b/min)	126(6.7)/121(7.5)*	123(14.5)*	98.8(10.2)
W/R–VO_2 (ml/kg/min)	12.1(2.6)/12.4(2.5)	19.2(4.7)*	12.6(2.8)
RPE	14.4(1.5)*	11.0(2.5)	8.5(2.5)
EE (Kcal)	187.3(40.2)	289.4(70.9)*	189.5(42.1)
%VO2max	23.8(5.1)	37.8(9.2)*	24.8(5.5)

***denotes a significant difference between conditions; (p<0.05)**

HR and VO_2 did not significantly decrease during RE rest intervals compared to RE work intervals. VO_2 during RE was significantly less than HR-matched AE. HR during VO_2-matched AE was significantly lower than RE. RPE was significantly higher during and following RE as compared to either bout of matched AE. **CONCLUSION:** Both HR and VO_2 remained elevated during periods of rest between RE work. Thus, a bout of RE resulted in a significant caloric expenditure. However, perception of effort is greater during RE as compared to AE matched for either the cardiovascular or the metabolic load.

Funded by Miami University Undergraduate Summer Scholars Program, 2009

#41

EVIDENCE OF DIFFERENTIALLY EXPRESSED "SEDENTARY" GENES IN LABORATORY ANIMALS RESIDING IN STANDARD CAGES

Helaine M. Alessio, FACSM[1], Michelle L. Simonsen[1], Kayla Levine[1], Christine Edwards[1]Peter White[2], David L. Newsom[2], Ann E. Hagerman[1]. [1]Miami University, Oxford, OH. [2]Nationwide Children's Hospital, Columbus, OH.

Animals residing in a standard cage exhibit phenotypes associated with sedentary diseases such as hyperlipidemia and hypertension. Some genes associated with these diseases may be expressed differently in animals that are physically inactive. **Purpose** To investigate whether health and disease phenotypes associated with chronic physical inactivity are regulated by "sedentary" genes that are expressed differently in animals that reside in standard cages compared with animals that have access to a running wheel or activity in a large box. **Methods** 144 male Sprague Dawley rats were sorted into young (3 mo) and old (16 mo), and within each age group, equally divided into SED (standard cage), PA (access to activity in a large box), and EX (running wheel inside a cage). Blood lipids and blood pressure were assessed monthly. RNA extracted from cardiac tissue was prepared for microarray analyses and qPCR. Gene expressions were categorized by large up- (x>2) or down- (x <-2) regulation and by different gene expressions strategically placed in particular gene networks. **Results** Ten genes exceeded >2 or <-2fold change in expression by 16 mo vs. 3 mo rats among the three groups. In contrast, ~50 genes strategically placed in gene networks were expressed differently in SED vs. PA or EX. **Conclusion** A small number of genes are sensitive to sedentary conditions of a standard cage, and may contribute to sedentary diseases including hyperlipidemia and hypertension. Network placement of a number of genes (6< x <50) with subtle, but statistically significant gene expression in SED animals may also be a key regulator, affecting expression of genes (e.g.Erk,Nfkb) associated with sedentary diseases.

	SED	PA	EX
Cyp1a1	-4.1	-5.1	-8.9
Pxdn	-3.8	-5.2	-3.0
Klk10	-3.0	---	---
Inha	-2.6	---	---
Chrna1	4.0	4.1	3.6
Reg3g	---	---	-3.9
Olr085	---	5.2	---
Oas1k	---	2.6	---
LOC500263	---	2.5	---
Cpeb	---	2.5	---

Supported by NIA grant R15 AG029653-01.

#42

ANTERIOR CRUCIATE LIGAMENT TENSION DURING THREE DIFFERENT DROP-LANDING STRATEGIES: FIRM, SELF-SELECTED, AND SOFT

Adam C. Malm[1], Thomas W. Kernozek, FACSM[1], Kathryn J. Hosking[1], Laura J. Braaksma[1]
Robert Ragan[1] [1]University of Wisconsin – La Crosse, La Crosse, WI

Anterior cruciate ligament (ACL) injury is most likely to occur from a noncontact mechanism of injury, such as landing. Female athletes have been shown to have a higher incidence of noncontact ACL injuries than male athletes. **PURPOSE:** The purpose of this study was to examine estimates of ACL tension in female athletes during soft, self-selected and firm drop landings using a sagittal plane knee model. It was hypothesized that soft and self-selected landings would result in less ACL tension when compared to stiff landing techniques. **METHOD:** 29 female recreational athletes performed bilateral drop landings from a height of 40 cm. Each subject performed 5 trials of each landing technique (soft, self-selected, firm). Subjects were instructed to land in a typical way for self-selected landings, for soft landings instruction focused on increasing hip and knee flexion after initial ground contact (IC), and firm landing instruction was to limit hip and knee flexion after IC. A sagittal knee model was used to estimate ACL tension during drop landings from kinematic, kinetic, and electromyography measurements. A repeated measures analysis of variance was performed on ACL tension with an alpha level of 0.05. Post hoc comparisons were performed using the Bonferroni technique. **RESULTS:** ACL tension was increased using the firm landing technique. Maximum ACL tension for soft, self-selected, and firm landings were 0.23% body weight (BW), 0.31% BW, and 0.40% BW, respectively. Shear forces at the knee were determined from the knee model output. With a firm landing technique, patellar tendon had a reduced anterior shear force and hamstrings had a reduced posterior shear force. At IC, hip flexion and knee flexion angles and range of motion decreased with firm landing technique. With a firm landing technique, ankle plantar flexor moments increased, knee extensor moments decreased, and hip moments had no consistent pattern. Vertical ground reaction force increased with firm landings. **CONCLUSION:** Landing mechanics alter ACL tension with firm landing techniques resulting in greater ACL tension. Greater hip and knee flexion at IC and greater ROM are shown to be components of reduced ACL tension associated with landing technique.
(Funding was provided through the High Tech Program from the State of Wisconsin)

Past Student Award Winners

Year	Award	Recipient(s)
1989	Student Presentation	DN Proctor
1990	Student Presentation	Carol Wiedeman
1991	Student Presentation	Amy Jo Casenhiser
1992	Student Presentation	Kathryn Coningham
1993	Student Presentation Student Recognition	Kevin Short Cynthia McKnight Glenna DeJoug
1994	Student Poster Presentation Outstanding Student Award Student Presentation	D. M. Choi Cathy Karroll Mary Sled
1995	Student Poster Presentation Student Presentation Outstanding Student Award Student Research Award	Ray Stasling Michael Caddia Charlie Lambert Kera Kelsey
1996	Student Presentation	Alan Parcell Cindy Bouillon
1997	Outstanding Undergraduate Student Outstanding Graduate Student Student Research Award Student Presentation	Heather Brehm Kevin Short Christopher Cheatham Sean Mulroy Christopher Cheatham
1998	Outstanding Graduate Student Student Presentation	Lisa Lesneuisky Vicki Pittenger Brandon Klump
1999	Outstanding Graduate Student Outstanding Undergraduate Student Student Presentation Student Research Award	Sean Flanagan Christine Meuller Leigh Mroteh Ty Hopkins Eric Hall
2000	Outstanding Graduate Student Outstanding Undergraduate Student Student Research Award Student Presentation	Karin Allor Kindal Shores David Wright Cindy Anderson Cheri Teranishi
2001	Outstanding Graduate Student Outstanding Undergraduate Student Student Presentation Student Research Award	Dawn Coe Tamara Keehn S. K. Tsivitse D. C. Wright Michelle Masterson

Past Student Award Winners

2002	Outstanding Graduate Student	Candace Perkins
	Outstanding Undergraduate Student	Evelyn Warner
	Student Research Award	Paul R. Nagelkirk
	Student Presentation-Poster: Undergrad	Christina Hayter
	Student Presentation- Poster: Masters	Jessica Sobolewski
	Student Presentation- Poster: Doctoral	Paul R. Nagelkirk
	Student Presentation- Oral	Adam Coughlin
2003	Outstanding Graduate Student	Paul Nagelkirk
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student Presentation	Maxi Meissner
		DM Malek
		Paul Nagelkirk
		Michelle Masterson
		Patrick Johnson
		Renee Rogers
		Andrew Cole
	MWACSM Professional Award	Cody Sipe
2004	Outstanding Graduate Student	Dan Ritchie
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student	Alicia Gordon
	Student Presentation- Poster: Undergrad	Dan Kelly
	Student Presentation- Poster: Masters	Natalie Schweitzer
	Student Presentation- Poster: Doctoral	Christopher Herman
	Student Presentation- Oral: Undergrad	Andrea Ott
	Student Presentation- Oral: Masters	Christine Layman
2006	Student Presentation- Oral: Masters	Megan Holmes
	Student Presentation- Oral: Doctoral	Phil Anton
	Student Presentation- Poster: Undergrad	Elizabeth Priest
	Student Presentation- Poster: Masters	Lindsay Sammut
	Student Presentation- Poster: Doctoral	Richard Carpenter
	Student Research Award	Juame Padilla
	Outstanding Graduate Student	Richard Carpenter
	Outstanding Undergraduate Student	Rebekah Kuczynski
	MWACSM Professional Award	Clinton Brawner
2007	Student Presentation- Oral: Undergrad	Lindsay Kelly
	Student Presentation- Oral: Masters	Erin Kuffel
	Student Presentation- Oral: Doctoral	Tyrone Washington
	Student Presentation- Poster: Undergrad	Lisa Guth
	Student Presentation- Poster: Masters	George Schweitzer
	Student Presentation- Poster: Doctoral	Chris Herman
	MWACSM Professional Award	Kevin Temerowski
2008	Student Presentation- Oral: Masters	Leryn Boyle
	Student Presentation- Oral: Doctoral	Lanay Mudd
	Student Presentation- Poster: Undergrad	Rodney Pius
	Student Presentation- Poster: Masters	Michael Knuston
2009	Student Presentation—Oral: Doctoral	Pei-Tzu Wu
	Student Presentation—Oral: Masters	Michael Knutson
	Student Presentation—Poster: Undergraduate	Hannah Calvert
	Student Presentation—Poster: Doctoral	Darijan Suton
	Student Presentation—Poster: Masters	Ronny Benedict
	Student Presentation—Oral: Undergraduate	Hayden Ansinelli
	Outstanding Graduate Student	Charlene Henry
	Student Research Award	Michael Knutson
	Outstanding Undergraduate Award	Laura Vielbig

Dr. Jerome Dempsey
October 16th
Opening Keynote

Professor of Preventive Medicine - Director, John Rankin Laboratory of Pulmonary Medicine, University of Wisconsin

Dr. Steve Blair
October 17th
Luncheon Keynote

Professor - Department of Exercise Science and Epidemiology and Biostatistics at the Arnold School of Public Health, University of South Carolina

Dr. Barry Franklin
October 17th
AACVPR Keynote

Director of the Cardiac Rehabilitation and Exercise Laboratories at William Beaumont Hospital in Royal Oak, MichiganUniversity of South Carolina

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PHEASANT RUN

Welcome To The MWACSM Annual Meeting

I would like to personally welcome you to Pheasant Run Resort and Conference Center in St. Charles, IL. I am very excited you are a part of this year's conference which has several exciting developments for our regional chapter. For the first time in a while we have moved our conference site away from a university campus setting to a professional conference location. Thus, you will find more opportunities on site for entertainment shows, golf, the spa, and the beauty of St. Charles, IL in the fall. You are also just 50 miles from down town Chicago! Additionally, we're partnering for the first time with the regional affiliates of AACVRP to present an adjunct program that MWACSM members can attend in conjunction with our own meeting entitled, "Comprehensive Approaches and Trends in Lifestyle Medicine." Internationally recognized speakers like Dr. Jerome Dempsey, Dr. Steve Blair, and Dr. Barry Franklin are scheduled to present. I hope you truly enjoy our meeting and program.

I would also like to tell you how proud I am to be a part of MWACSM serving on the Board the past few years. I would like thank our Board for their excellent work this past year. I especially would like to thank Dr. Lynn Darby (Executive Secretary), Dr. Karin Pfeiffer (Current President), and Dr. Jeff Lemmer (President-Elect) for assisting me in organizing the program as I was away from the office this summer doing my ACSM and Exercise is Medicine Sponsored Event "Bicycling For Ovarian Cancer." During this event, I cycled 9,191 miles in 100 days (91.5 days of actual cycling) to celebrate my wife's 20th anniversary of surviving ovarian cancer, ovarian cancer awareness, and donations to our foundation. Without the Board's help, the high quality of the meeting you will be enjoying this weekend would not be possible. Thus, it is with great pleasure "The Kay and Craig Broeder Female Preventive Health Cancer Foundation" is proud to sponsor Saturday morning's 5K fun run (www.ov-can.org). ENJOY!

A Special Thank You To Our Sponsors

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Conference Information

OBJECTIVES
The 2009 meeting of the MWACSM is designed to:

- Enhance the scientific and clinical understanding of the physiological, biochemical, and psychological basis for the changes that occur during and following exercise in both normal and pathological states;
- Provide a forum for members and students to present research related to exercise science and sports medicine; and
- Promote interaction among scientists, clinicians, and students in related fields to provide new approaches to, and perspectives on, problems in exercise science and sports medicine.

TARGET AUDIENCE
MWACSM members, ACSM members, clinicians, professionals, and students interested in the field of sports medicine and exercise science.

ACSM Continuing Education Credits (CEC's)
The American College of Sports Medicine's Professional Education Committee certifies that this annual meeting meets the criteria for 12 credit hours of ACSM Continuing Education Credit. Credit is awarded for these CECs by attending the "Midwest Regional Chapter ACSM Annual Meeting." The MWACSM is an "Approved Provider" of CEC for ACSM. A card documenting completion of 12 CEC's is included in each registration packet.

NAME BADGES
Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Please hold on to your badge!

MEETING LOCATIONS
All sessions and events unless otherwise noted will be held in the Pheasant Run Resort. Room assignments for educational events are detailed in this program, along with a map of the Pheasant Run Resort.

ANNUAL BUSINESS MEETING AT THE LUNCHEON BANQUET
The annual luncheon banquet and business meeting is scheduled for Saturday from 12:00-2:00 pm in the New Orleans Ballroom. The annual business meeting is your opportunity to participate in the activities of the Midwest Chapter of ACSM. Please plan to attend Saturday.

AWARDS
The annual 'Founder's Award' and the Professional Award will be announced at the banquet on Saturday. The Founder's Award is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

FUTURE MEETING SITE
TBA

Schedule of Events

Friday, October 16, 2009

Time	Event	Location
12:00-8:00 pm	Registration	Atrium
12:30-1:30 pm	Tutorial: *Role of step cells in exercise-induced skeletal muscle adaptations* Marni Boppart, Ph.D.	St. Charles Ballroom Salon III
1:30-2:45 pm	Symposium: *Influence of biological sex and aging on muscle fatigue-resistance.* Brian C. Clark, Ph.D. & David W. Russ, P.T., Ph.D.	St. Charles Ballroom Salon III
1:30-2:45 pm	Tutorial: *What is exercise coaching and how can I use it to become a more effective trainer?* Brenda Reeves, Ph.D., FACSM	St. Charles Ballroom Salon IV
3:00-4:15 pm	Student Session	St. Charles Ballroom Salon II
4:15-4:30 pm	Refreshment Break	St. Charles Ballroom Salon II
3:00-6:00 pm	Poster Sessions (see abstracts, pages 21-39)	St. Charles Ballroom Salon V
4:30-5:45 pm	Oral Sessions (see abstracts, pages 40-45)	St. Charles Ballroom Salon IV
6:15-7:45 pm	Jeopardy Event	St. Charles Ballroom Salon II
8:00-9:30 pm	Opening Key Note Address: *Hypoxia and Humans: An Unhealthy Mix!* Jerome Dempsey, Ph.D., FACSM	New Orleans Ballroom
9:30-11:00 pm	Welcome Social	New Orleans Ballroom & Bourbon Street

Schedule of Events

Saturday, October 17, 2009

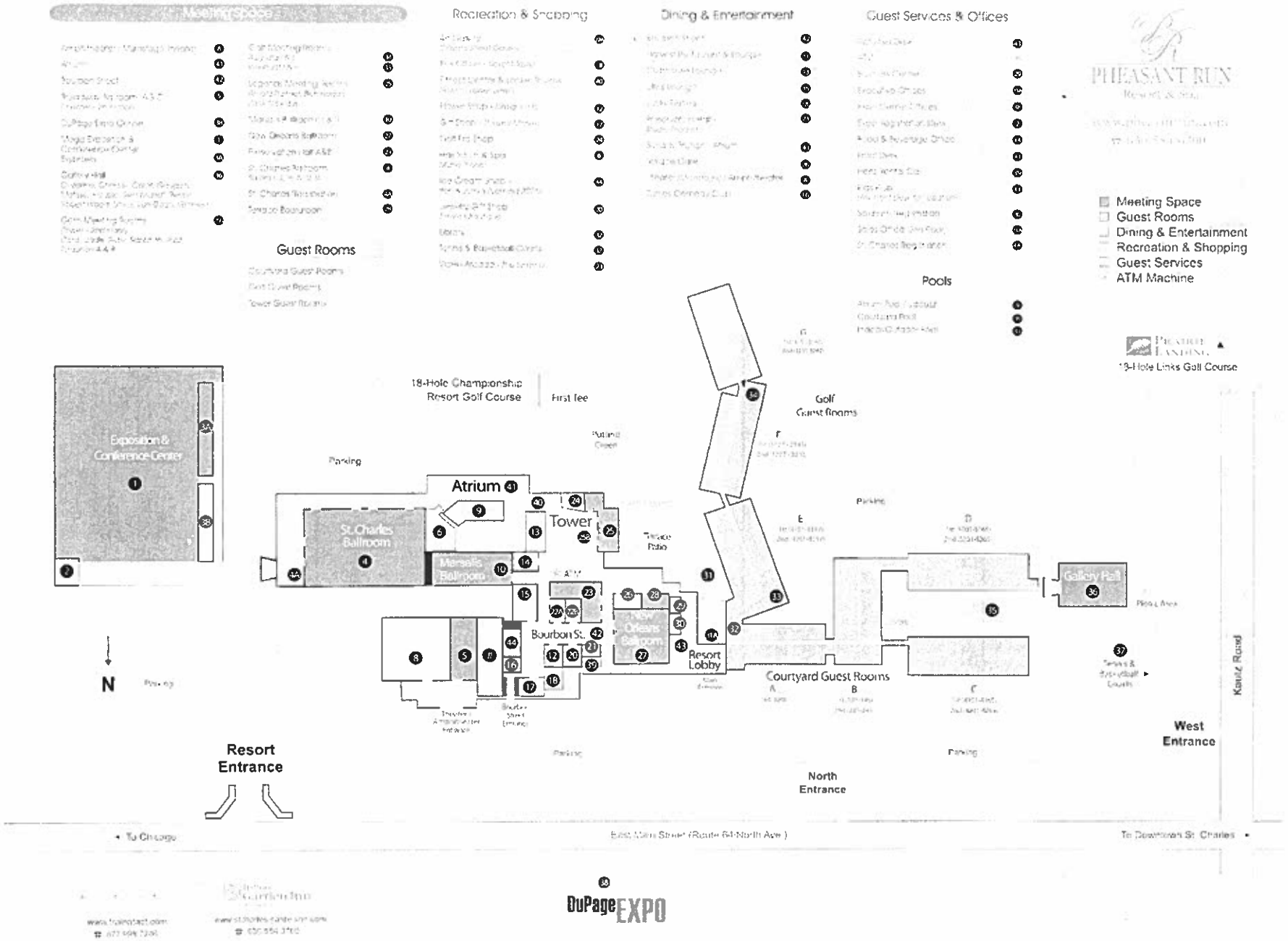
Time	Event	Location
6:15-7:15 am	5K fun run along the Golf Course	
8:00-9:15 am	Tutorial: *Annual Planning, Tracking, and Assessment of Athletes in Team Sports.* Ann C. Snyder, Ph.D., CSCS*D, FACSM, Brian P. Edlbeck, M.S., CSCS*D, NSCA-CPT, Christopher J. Myatt, B.S., & Robert W. Wilson II, M.S., CSCS*D	St. Charles Ballroom Salon III
8:00-9:15 am	Symposium: *Health Implications of Excessive Weight Gain in Football Athletes.* Jeffrey A. Potteiger, Ph.D., FACSM, Randal P. Claytor, Ph.D., & J. Brett Massie, Ed.D., A.T.C.	St. Charles Ballroom Salon IV
9:15-9:30 am	Refreshment Break	Ballroom Foyer
9:30-10:45 am	Tutorial: *Institutional Review Board (IRB) Tutorial.* Roop Jayaraman, Ph.D.	St. Charles Ballroom Salon III
9:30-10:45 am	Oral Sessions (see abstracts, pages 44-46)	St. Charles Ballroom Salon IV
10:45-11:00 am	Break	Ballroom Foyer
11:00 am-12:00 pm	Graduate Student Program and Employee Fair (A Joint MWACSM and AACVPR Event)	St. Charles Ballroom Salon V
12:00-2:00 pm	Luncheon, Awards, & Business Meeting	New Orleans Ballroom

Schedule of Events

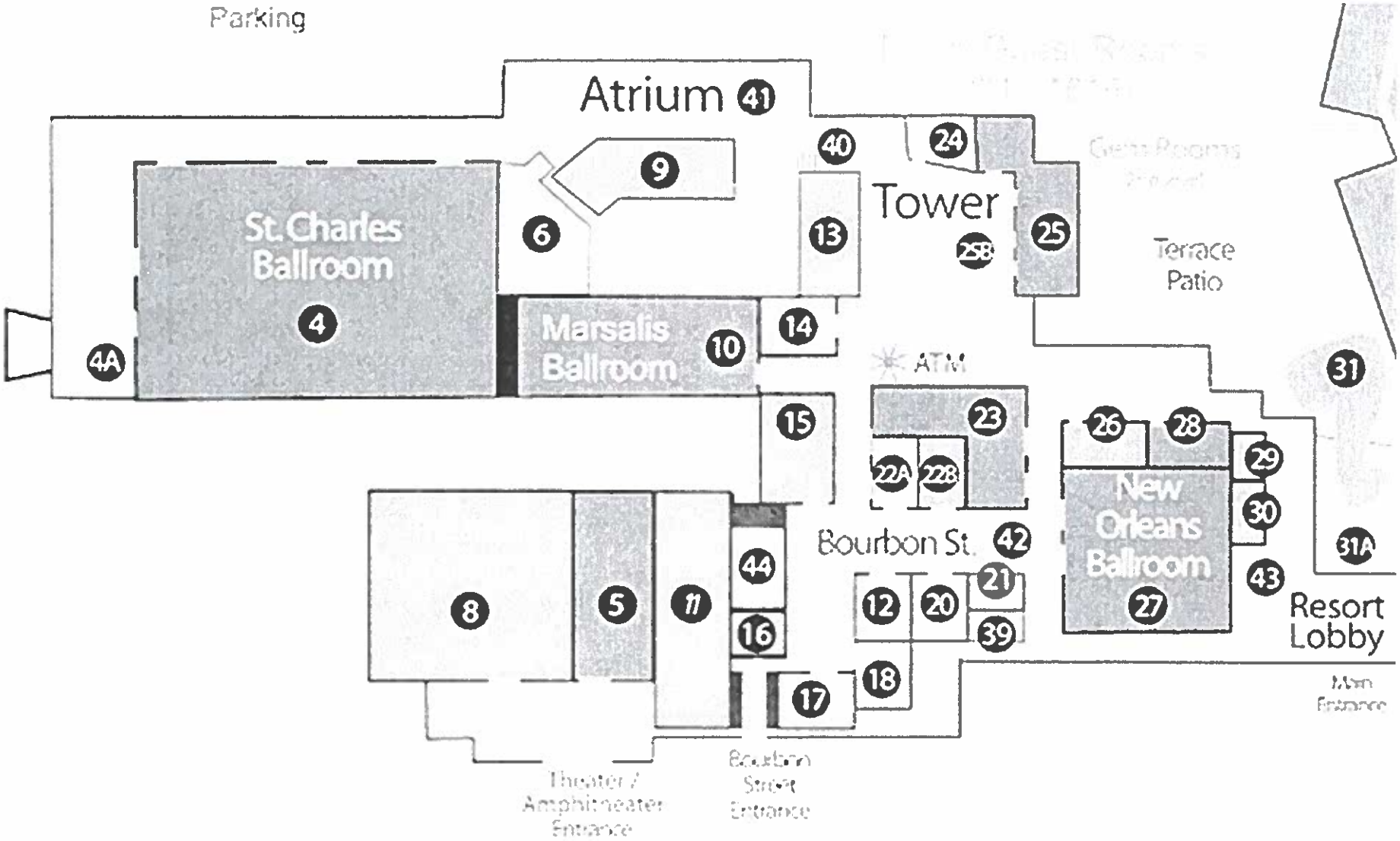
Saturday, October 17, 2009

Time	Event-AACVPR	Location
8:00-8:40 am	Continental Breakfast	St. Charles Ballroom Salon II
8:40-8:45 am	Opening Remarks: Dr. Rippe	St. Charles Ballroom Salon II
8:45-9:40 am	*Do You WOW Your Customers?* G. Curt Meyer, M.S., FACHE, FAACVPR	St. Charles Ballroom Salon II
9:40-10:30 am	*Incorporating Lifestyle Coaching into Your Program.* Sean Slovenski	St. Charles Ballroom Salon II
10:30-10:45 am	Refreshment Break	St. Charles Ballroom Salon II
10:45-11:25 am	*Cardiac Rehab on $10/day: the Administrator's Approach.* Adam deJong, M.A., FAACVPR, FACSM	St. Charles Ballroom Salon II
11:25-11:55 am	*What's New with the AACVPR?* Murray Low, Ed.D., FAACVPR, FACSM	St. Charles Ballroom Salon II
12:00-2:00 pm	MWACSM/AACVPR Luncheon & Keynote Address Steven Blair, P.E.D., FACSM	New Orleans Ballroom
2:15-3:15 pm	"Ask the Experts" Panel Discussion Barry Franklin, Ph.D., Steven Blair, P.E.D., Murray Low, Ed.D., and G.C. Meyer, M.S.	St. Charles Ballroom Salon II
3:20-4:20 pm	Keynote Address: *Recent Advances in the Prevention and Treatment of Cardiovascular Disease.* Barry A. Franklin, Ph.D., FAACVPR, FACSM	St. Charles Ballroom Salon II
4:20-4:30 pm	Closing Remarks	St. Charles Ballroom Salon II

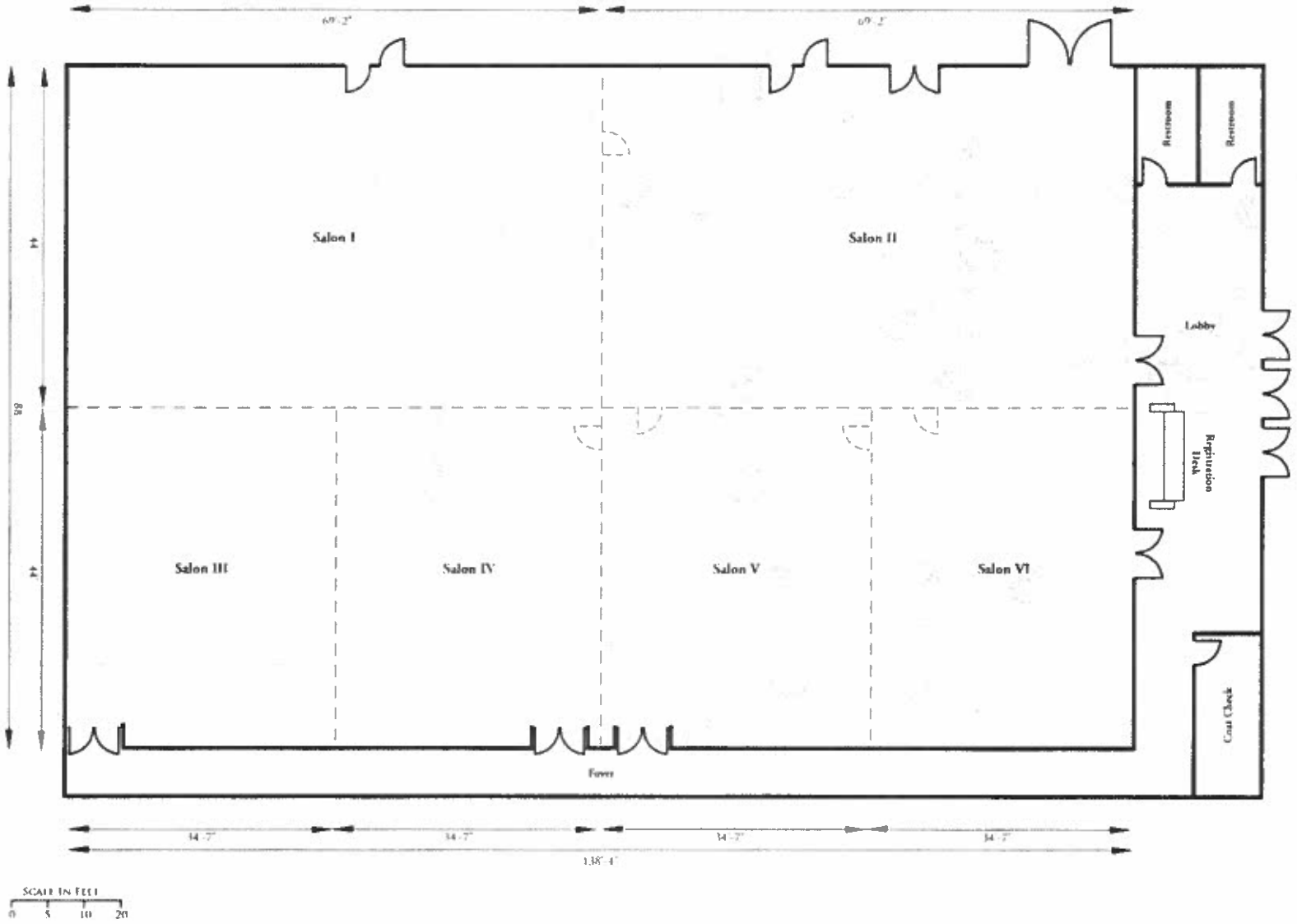
Pheasant Run Resort Map



Pheasant Run Resort Meeting Rooms



St. Charles Ballroom



Featured Keynote Speakers

Steven N. Blair, P.E.D., FACSM

Steven N. Blair is Professor in the Departments of Exercise Science and Epidemiology and Biostatistics at the Arnold School of Public Health, University of South Carolina. Dr. Blair is a Fellow in the American College of Epidemiology, Society for Behavioral Medicine, American College of Sports Medicine, American Heart Association, and American Academy of Kinesiology and Physical Education; and was elected to membership in the American Epidemiological Society.

Dr. Blair is a past-president of the American College of Sports Medicine (ACSM), National Coalition for Promoting Physical Activity, and the American Academy of Kinesiology and Physical Education. Dr. Blair is the recipient of three honorary doctoral degrees--Doctor *Honoris Causa* degree from the Free University of Brussels, Belgium; Doctor of Health Science degree from Lander University, U.S.; and Doctor of Science *Honoris Causa*, University of Bristol, UK. He has received awards from many professional associations, including a MERIT Award from the National Institutes of Health, ACSM Honor Award, Robert Levy Lecture and Population Science Research Awards from the American Heart Association, and is one of the few individuals outside the U.S. Public Health Service to be awarded the Surgeon General's Medallion. He has delivered lectures to medical, scientific, and lay groups in 48 states and 30 countries. His research focuses on the associations between lifestyle and health, with a specific emphasis on exercise, physical fitness, body composition, and chronic disease. He has published over 425 papers and chapters in the scientific literature, and was the Senior Scientific Editor for the U.S. Surgeon General's Report on Physical Activity and Health.

Featured Keynote Speakers

Jerome A. Dempsey, Ph.D., FACSM

Professor of Preventive Medicine
John Robert Sutton Professor of Preventive Medicine
Director, John Rankin Laboratory of Pulmonary Medicine

Principal Research Interests

Respiratory physiology, neuromechanical regulation of breathing during sleep and exercise, role of pulmonary system in limitation of exercise performance.

Causes and consequences of sleep apnea; the role of pulmonary vagal feedback in the regulation of breathing and regulation of the circulation; regulation of breathing in heavy exercise; under what circumstances in health does the lung or chest wall limit physical performance? (i.e., highly trained young adult, normal aging, highly trained female endurance athlete); effects of respiratory muscle work on blood flow distribution during exercise.

Primary Emphasis Group

Exercise Physiology

University Affiliations

Specialized Center of Research in Sleep-Disordered Breathing; Pulmonary Physiology and Pathophysiology NIH Training Grant Group; Departments of Preventive Medicine, Physiology, Kinesiology, Biomedical Engineering and Veterinary Science.

Featured Speakers

Brian Clark, Ph.D.

Brian Clark received his Bachelors degree in Biology from Western Carolina University in 1998, and his M.S. and Ph.D. degrees in Exercise Physiology from Syracuse University in 2001 and 2005. During his time at Syracuse University Dr. Clark was a NASA research fellow conducting environmental physiology research. He is currently an Assistant Professor of Physiology in the Department of Biomedical Sciences at Ohio University, and is the Director of the Institute for Neuromusculskeletal Research. Dr. Clark's current research focuses on determining the neuromuscular mechanisms that mediate acute adjustments and chronic adaptations in response to physical activity and under pathological conditions. The goal of this work is to develop effective and implementable interventions that increase muscle function and physical performance in patients with orthopedic and neurologic disabilities for preventative and rehabilitation medicine. In the past 10 years Dr. Clark has published more than 40 peer-reviewed articles.

David Russ, P.T., Ph.D.

David Russ received his Bachelors degree in History from Stanford University in 1989, and his Masters of Physical Therapy and Ph.D. degrees from the University of Delaware in 1993 and 2001, respectively. After completing his Ph.D., Dr. Russ performed an NIH -funded post-doctoral fellowship in the laboratory of Jane Kent-Braun in the Department of Exercise Science at the University of Massachusetts – Amherst. He is currently an Assistant Professor of Physical Therapy at Ohio University where he directs the Laboratory for Integrative Muscle Biology research. Dr. Russ' current research addresses the mechanisms of muscle force production at the system, tissue and molecular levels. In particular, he is interested in the changes in these mechanisms associated with aging, gender and fatigue, and he utilizes both animal and human models for his research. In the past 10 years Dr. Russ has published more than 20 peer-reviewed articles.

Featured Speakers

Brenda Reeves, Ph.D., FACSM

Dr. Brenda Reeves, FACSM, is currently the Lifetime Wellness Coordinator at Ashland University. Brenda received her Ph.D. from the University of Toledo with emphasis areas in exercise physiology, biomechanics and health education. She received her M.Ed. in exercise science as well as her undergraduate degree in psychology from Bowling Green State University. Brenda has over 25 years of experience in fitness and conditioning including her roles in the military, hospital-based wellness, corporate wellness, community fitness, and recreational sports. Her research areas include health promotion, group exercise formats, and student development.

Marni D. Boppart, Sc.D.

Marni Boppart obtained her bachelor degree in Molecular, Cellular and Developmental Biology from the University of New Hampshire, Durham, NH. She obtained her master degree in Cell Biology from Creighton University, Omaha, NE, while serving as an officer and Aerospace Physiologist in the U.S. Air Force. She received her doctorate degree in Applied Anatomy and Physiology from Boston University, under the guidance of Professor Roger Fielding, and completed research for her degree at the Joslin Diabetes Center, Harvard Medical School, under the guidance of Professor Laurie Goodyear. Her postdoctoral work was completed in the Department of Cell and Developmental Biology at the University of Illinois, Urbana-Champaign (UIUC), where she studied the mechanism by which the a7b1 integrin protects against skeletal muscle injury during disease and following exercise. Two years ago, she began her current position as Assistant Professor in the Department of Kinesiology and Community Health and as a full-time faculty member at the Beckman Institute for Advanced Science and Technology at the University of Illinois, Urbana-Champaign. At UIUC, Dr. Boppart heads the Molecular Muscle Physiology Laboratory, which investigates the molecular and cellular mechanisms responsible for skeletal muscle regeneration and growth in response to exercise. In particular, Dr. Boppart examines the extent to which exercise increases stem cell appearance in skeletal muscle and the capacity for stem cells to increase skeletal muscle mass and function with aging. Her current research is funded by the Ellison Medical Foundation for Aging Research and the National Science Foundation.

Featured Speakers

Ann C. Snyder, Ph.D., CSCS*D, FACSM

Dr. Snyder is a Professor in the Department of Human Movement Sciences at the University of Wisconsin – Milwaukee. She has spent much of her career working with elite athletes such as triathletes, speed skaters, cyclists and hockey players. Her research has involved the areas of sports nutrition, muscle oxygenation and fatigue, and maximizing training to avoid over- and under-training. Dr. Snyder is a certified triathlon coach (USAT level II) and strength and conditioning specialist (CSCS*D).

Left to Right: Rob Wilson, Ann Snyder, Brian Edlbeck and Chris Myatt

Brian P. Edlbeck, M.S., CSCS*D, NSCA-CPT

Brian is in his sixth year as a Clinical Assistant Professor of Exercise Science along with the strength and conditioning coach at Carroll University in Waukesha. Wisconsin. He earned his Bachelor of Science degree in dietetics in 1999 from the University of Wisconsin-Stevens Point and his Master's degree in kinesiology from UW-Milwaukee in 2004. Prior to joining the Pioneer staff, Brian interned as the assistant strength and conditioning coach at UW-Milwaukee. Prior experiences include interning with the Colorado Rockies as a minor league strength and conditioning coach and being a personal trainer for 10 years. He is a NSCA CSCS*D and certified personal trainer.

Christopher J. Myatt, B.S.

Chris is a second year Kinesiology Master's student at the University of Wisconsin – Milwaukee with a primary emphasis in Exercise Physiology. Chris earned his Bachelor of Science degree from Carroll University in Exercise Science in 2008. He has coached youth soccer camps at Carroll University and has been a volunteer strength and conditioning coach for several youth athletic teams in the Milwaukee area.

Robert W. Wilson, II, M.S., CSCS*D

Rob Wilson's interest in planning training programs stems from his 20 years of coaching soccer. Having coached from the youth level to NCAA Division I, he has recognized the need to differentiate seasonal and annual plans. Rob holds a Master's of Science degree from the University of Wisconsin - Milwaukee in Kinesiology. Rob continued working in the Human Performance Laboratory as a Research Assistant until he started working toward his Doctoral degree in UW-M's College of Health Science's Ph.D program. Rob is also a Certified Strength and Conditioning Specialist (CSCS*D) through the National Strength and Conditioning Association.

Roop Jayaraman, Ph.D.

Roop Jayaraman, Ph.D. is the Institutional Review Board Education Coordinator and an Assistant Professor in the School of Health Sciences at Central Michigan University. For the past nine years, Roop has been a member of the IRB review board at several institutions before joining the faculty at Central Michigan University in 2006. In his role as the IRB education coordinator, he is responsible for developing and conducting IRB education seminars across campus. He was involved with identifying and implementing a web based application, review and education program. He continues to sever as a full voting member of CMU's IRB board.

Roop Jayaraman obtained his Bachelors Degree from Michigan Technological University, Houghton, Michigan in 1992. He received his Masters of Science in 1997 and his Ph.D. in 2001 from Michigan State University, East Lansing, Michigan.

Andrew C. Ellis, M.S.

For the past ten years Andrew Ellis has dedicated his career to academic research. As the Assistant Director for Research Compliance at Loyola University Chicago, he oversees regulatory compliance of human and animal subject research, the Institutional Biosafety Committee (IBC), radiation safety (Chairman of the Radiation Safety Committee), and laboratory safety on campus. He has obtained "Certified IRB Professional" status in October, 2006 and is a current member of PRIM&R. Andrew received a Master of Science in Quality Assurance and Regulatory Science from Northwestern University in June, 2009. He also holds a Bachelor of Science from the University of Dayton.

Andrew has significant experience with administration of human subject protection programs. Prior to joining Loyola University Chicago in the summer of 2009, he worked in Northwestern University's Office for the Protection of Research Subjects as an Institutional Review Board (IRB) Manager. At Northwestern he was involved with the launch of a new IRB panel, implementation of a web based application and review program, development of HIPAA compliance procedures, and the writing and editing of the Human Subjects Protection Policy Manual. He also administered initial and continuing training programs for researchers and IRB members ensuring that the entire research community had the necessary resources to ensure that all research with human subject satisfied the Federal Regulations and university policy requirements.
He resides in the Chicago suburbs with his wife and daughter where he has been active with the local Habitat for Humanity Chapter helping to build affordable decent homes. He enjoys watching baseball, aviation, SCUBA, bicycling, and playing the drums.

Judith Birk, JD

Judith Birk, JD, is a Regulatory Affairs Associate in the Office of the Vice President for Research at the University of Michigan. Since 2003 she has been the Managing Director of the Health Sciences and Behavioral Sciences IRBs. In her role she is responsible for daily oversight of the operations of the IRBs and their regulatory compliance. She is also responsible for developing innovations to reduce regulatory burdens and increase IRB efficiencies. A long-standing staff member at UM, Ms. Birk has also served on multiple compliance, ethics and research regulatory committees.

Susan Loess-Perez, M.S., CIP, CCRC

Director, Office of Research Protections, DePaul University, Chicago, Illinois

Susan Loess-Perez obtained her Bachelors Degree from Bradley University, Peoria, Illinois and her Masters of Science Degree from Northern Illinois University, De Kalb Illinois. After conducting basic laboratory and animal research for several years, she became a Clinical Research Coordinator for the Dermatology Clinical Research Unit at the University of Illinois at Chicago. After 5 years of conducting clinical research, she began working for the Office for the Protection of Research Subjects (OPRS) at the University of Illinois at Chicago in 1999. During the 9 years with that office Susan worked primarily supporting the biomedical Institutional Review Board (IRB), and during the last two years was the Assistant Director for Quality Assurance and Quality Improvement. In this position Susan took a lead role in the institution's preparations for the AAHRPP accreditation process. Susan is a certified IRB Professional (CIP) and a Certified Clinical Research Coordinator (CCRC) through ACRP. She has provided educational sessions related to Good Clinical Practice (GCP), human subjects protections, and HIPAA at UIC, and helped to develop a web-based GCP course funded by NIH that is made available to everyone through the UIC Learning Management System (LMS). She is one of the instructors for the CIP exam preparation course offered by IRB Synergy. In 2008, Susan became Director of the Office of Research Protections at DePaul University in Chicago. In this position, she has administrative oversight for the IRB, the Institutional Animal Care and Use Committee (IACUC), and the Institutional Biosafety Committee (IBC). In July of 2009 based upon her submitted comments to OHRP, she was invited to be a panel speaker at the SACHRP meeting regarding Holding External IRBs Accountable.

Jeffrey Potteiger, Ph.D., FACSM

Dr. Jeffrey A. Potteiger completed his Ph.D. in exercise physiology at Auburn University and is currently a faculty member at Miami University in Oxford Ohio. Dr. Potteiger is a Fellow of the American College of Sports Medicine (ACSM), has served ACSM as a member of the Board of Trustees, and is an editorial board member of *Medicine and Science in Sports and Exercise*. Dr. Potteiger has over 90 published research articles, along with several books, and book chapters. His broad research interest is in how exercise and nutrition influence health and disease. Much of Dr. Potteiger's recent research activity has been focused on the role of exercise and dietary intake on the use of carbohydrates and fats by the body.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#1

RELATIONSHIP BETWEEN FATNESS, PHYSICAL ACTIVITY, AND C-REACTIVE PROTEIN IN 10-YEAR OLD CHILDREN

Heather M. Hayes, Joey C. Eisenmann, Karin A. Pfeiffer, FACSM, & Joseph J. Carlson Michigan State University, East Lansing, Michigan

Obesity is closely linked to cardiovascular risk factors in children, including C-reactive protein (CRP); therefore, physical activity (PA) is often considered as a preventive measure. However, there is limited knowledge on the relationship between PA and CRP and no studies have examined the combined influence of fatness and PA on CRP in children. **PURPOSE**: The purpose of this study was to determine the independent and combined influence of fatness and PA on CRP levels in children. **METHODS**: Participants were 91 (39 males, 52 females) children (mean age = 10.6±0.4 yrs). Self-reported PA was assessed as the number of days the child was active for a total of at least 60 minutes per day during the previous week. Analyses were completed comparing those children who did or did not meet the current PA guidelines (>5 days/wk). Body mass index (BMI) was used as a proxy for fatness. BMI centiles and weight status were determined by age- and sex-specific reference values. CRP was measured through fingerprick and log transformed for normality. Associations between PA, fatness (BMI centiles) and CRP were computed by partial correlations, and group differences (PA vs. weight status) were examined by ANCOVA, controlling for age and sex. **RESULTS**: The correlation between BMI centile and CRP was moderate ($r=0.46$; $p=0.001$), while a weak, non-significant correlation was observed between PA and CRP ($r=0.06$; $p=0.55$) The correlations were similar when controlling for the concomitant variable (BMI percentile ($r=0.46$; $p=0.001$) or PA ($r=0.09$; $p=0.41$)). CRP was significantly higher in obese children (1.30±1.19 mg/L) compared to normal weight (0.44±1.11 mg/L) and overweight children (0.51±1.23 mg/L) ($p=0.001$). No significant difference was seen in CRP between those children who did or did not meet the PA guideline ($p=0.48$) and PA did not modify the difference in CRP within weight categories. **CONCLUSIONS**: The results indicate that fatness (specifically obesity), but not PA, is associated with CRP levels in children. Additional research is needed to better understand the consequences of elevated CRP values in children and to investigate whether there is a dose of PA that can assist in mediating the relationship between fatness and CRP.

This work was funded by a grant from the Blue Cross Blue Shield Foundation of Michigan.

#2

A CALCANEAL FRACTURE IN A 15 YEAR-OLD WITH JUVENILE RHEUMATOID ARTHRITIS

Sean B. Barnes, M.D.[1] [1]The Ohio State University Medical Center

Although calcaneal fracture is uncommon in adolescents, it is not usually a challenging diagnosis given a history of trauma. However, diagnosis can be confounded in patients with a history of underlying joint problems. A 15 year-old male football player, with Juvenile Rheumatoid Arthritis (JRA) diagnoses age nine, presented to his rheumatologist with 2 weeks of right ankle pain and swelling following a slip down several stairs eventually landing on his heels. At the time, right foot exam showed no sign of pain, swelling or limited range of motion. Radiographs were negative for fracture; however, given his long-standing history of JRA and with report of a seemingly minor fall, he was diagnosed with an arthritis flare, and treated with triamcinolone injection. He was to take naproxen and follow-up in 6 weeks. During the next few weeks, he continued with right foot pain and swelling, particularly after lacrosse training. At rheumatology follow-up, he had pain uncontrolled by his prior injection and only mildly alleviated by naproxen. Exam showed 2+ ankle swelling and mildly limited range of motion, as well as subtalar tenderness. No new studies were performed, but it was suggested that he find an athletic trainer to discuss support options for his ankle during exercise and to increase naproxen dosing to control pain at home. He remained active and in pain. Methotrexate was started, but he continued with right foot pain and tenderness in the subtalar region. Five months following his initial presentation, MRI was performed and showed anterior calcaneal stress fracture. He was referred to sports medicine and was placed on non-weight bearing status. His treatment is going well, and CT shows initial calcaneal healing. This case illustrates the potential for missing a fracture in children with a history of joint problems and the importance of high level of suspicion for other problems in these patients. In these cases, repeat radiographs and/or advanced imaging in patients with presentations suspicious of fracture is prudent. While initial plain films were negative, repeat studies were not performed for 5 months. Significant healing could have occurred during this time with appropriate treatment.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#3

IS FEMALE ATHLETE AGE OR SIZE RELATED TO QUADRICEPS DOMINANCE DURING MOVEMENTS SIMILAR TO THOSE THAT CAUSE ACL INJURIES?

McKenzie L. Fauth[1], Christina R. Feldmann[1], Erich J. Petushek[1], Luke R. Garceau[1], Casey Vogel[1], Brittni Hsu[1], Brittney Lutsch[1] and William P. Ebben[1]

[1]Marquette University Department of Physical Therapy, Program in Exercise Science, Strength and Conditioning Research Laboratory

Enhanced hamstring and reduced quadriceps activation may stabilize the knee during jump landings and cutting, potentially preventing anterior cruciate ligament (ACL) injuries. Compared to men, women are thought to be quadriceps dominant and some sources speculate that this dominance is exacerbated with age. PURPOSE: This study evaluated the relationship between hamstring to quadriceps muscles activation ratios (H:Q) and subject age, mass, and height. METHODS: Subjects included 43 female high school and college students who were involved in school sports (mean age ± SD = 19.14 ± 1.8 years; age range = 15-23 years). Subjects performed 2 repetitions of the depth jump (J) from a height equal to their countermovement jump and 2 repetitions of a 12 meter sprint with a 45 degree angle cut (C). Electromyographic (EMG) data were collected for the rectus femoris, vastus lateralis, vastus medialis, lateral hamstring, and medial hamstring and normalized to maximum voluntary isometric contractions. Root mean square (RMS) signal processing was used on all EMG data. The timing of the foot contact during J and C landing was synchronized with the EMG data using a switch mat. The H:Q were calculated from the collective average of the hamstring muscles divided by the collective average of the quadriceps muscles for both the pre and post foot contact phases of the J and C. Data were evaluated using a Pearson's correlation coefficient in order to examine the relationship between the subjects' H:Q and subjects' age, body mass, and height. RESULTS: Results revealed that subject height was positively correlated to H:Q during the post landing phase of the C (r = .46, p = 0.03), but not for the H:Q ratios for the pre contact phase of the C or for either phase of the J ($p > 0.05$). Subject age and body mass were not correlated with H:Q ratios ($p > 0.05$). CONCLUSION: This study indicates that taller females may have higher H:Q ratios during C landings. Neither athlete age, nor body mass is related to H:Q. PRACTICAL APPLICATION: Athlete physical characteristics should be further investigated as risk factors for ACL injuries.

#4

ELETROMYOGRAPHIC ANALYSIS OF CONCURRENT ACTIVATION POTENTIATION DURING ISOMETRIC EXERCISE

Luke R. Garceau[1], Erich J. Petushek[1], McKenzie L. Fauth[1], and William P. Ebben[1]

[1]Marquette University Department of Physical Therapy, Program in Exercise Science, Strength and Conditioning Research Laboratory

Simultaneous contractions of muscles remote from the prime mover augment the force of the prime mover, though the mechanisms are unknown. **PURPOSE:** This study evaluated the effect of remote voluntary contractions (RVC) on peak torque (PT), rate of torque development (RTD), and activation of the prime movers, their antagonist, and muscles involved in the RVC's. **METHOD:** Eleven men and 12 women performed isometric knee extension tests on a dynamometer (System 4, Biodex Inc., Shirley, NY) in RVC and non-RVC (NO-RVC) conditions. The RVC condition included jaw clenching, handgripping, and the Valsalva maneuver. Electromyography (EMG) (Myomonitor 4, DelSys Inc. Boston, MA, USA) was used to quantify muscle activation in the RVC and NO-RVC conditions. A two way mixed ANOVA with repeated measures for RVC condition was used to evaluate the main effects for PT, RTD, and muscle activation, and the interaction between RVC condition and gender. **RESULTS:** The analysis revealed significant main effects for RVC condition (P = 0.01, η_p^2 = 0.27, d = 0.76) and the interaction between RVC condition and gender (P = 0.049, η_p^2 = 0.16, d =0.46) for PT. Analysis also showed significant main effects for RVC condition (P = 0.046, η_p^2 = 0.17, d =0.49) and the interaction between RVC condition and gender (P = 0.00, η_p^2 = 0.46, d =0.98) for RTD. No significant main effects were found for EMG of the prime mover or its antagonist ($P > 0.05$), though main effects were present in muscles involved in the RVCs, demonstrating higher activation in the RVC condition ($P \leq 0.05$). Significant main effects were further evaluated with paired samples t-tests. **CONCLUSIONS:** Remote voluntary contractions enhanced performance for men but not women, from 6.1 to 13.9%, for PT and RTD, respectively. This performance augmentation was accrued without a concomitant increase in EMG activation of the prime movers, though muscles involved in the RVC's were more active in the RVC condition. Athletes and exercisers may use RVC's to augment strength training performance.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#5

Does a Single Bout of Structured Exercise Affect Free-Living Physical Activity in College Students?

Haley, A., K. Heim, R. Gallagher, R. Claytor
Department of Kinesiology and Health
Miami University, Oxford OH 45056

There is controversy in the literature as to whether participation in structured exercise results in an increase in PA. At present there are no published reports as to whether participation in bouts of structured exercise results in an increase in daily PA in normally-active college-aged students.
PURPOSE: To determine whether vigorous or moderate bouts of structured exercise result in an increase in daily physical activity. **METHODS:** 13 college students completed a maximal treadmill test (VO2max) and measures of height and weight; BMI was calculated. Subjects were asked to wear an Actical accelerometer to objectively asses PA from the time they awoke each morning until bedtime each night. 7-9 days after the VO2max test subjects returned to the laboratory to participate in either a randomly selected vigorous (75%VO2max) or moderate (45% VO2max) treadmill exercise session that lasted until each individual expended 350 Kcals (females) or 400 Kcals (males). One-week later (same day of week and time of day) each subject completed the alternative structured exercise session. VO2, HR, and RPE were measured during each exercise session. Subjects continued to wear the Actical throughout the entire 3 week time period.
RESULTS: A 3 (Days) X 2 (Intensity) repeated measures ANOVA revealed that PA (activity counts per minute (cpm)) were significantly higher on the day of either moderate or vigorous structured exercise as compared to the day before and the day after the structured exercise bouts ($p<0.001$). The interaction between Days and Intensity approached significance ($p<0.07$). Fitness (VO2max) was not significantly related to PA (cpm) on Days of structured exercise or on days of non-structured exercise.
CONCLUSIONS: Vigorous and moderate bouts of structured exercise result in increased levels of PA in an active group of college students. Aerobic fitness and PA are not related in this group of college students. Regular bouts of structured exercise may help increase energy expenditure in normally active, college students.

#6

Reproducibility of Ratings of Perceived Exertion in Persons with Multiple Sclerosis

Benjamin A Ingraham, Brice T. Cleland, Molly C. Pitluck, & Alexander Ng, FACSM
Marquette University, Milwaukee, WI

Persons with multiple sclerosis (MS) can have sensory, cognitive, or cardiovascular autonomic impairment which could alter perceived exertion. **PURPOSE:** The aim of this study was to test if the Borg RPE scale is a reproducible method of exercise prescription for persons with MS. **METHODS:** Four persons with MS (2 male, 2 female; mean EDSS=2) were tested over two visits separated by a week. The following clinical measures were obtained: symptomatic fatigue (Modified Fatigue Impact Scale), depression (Center for Epidemiological Studies Depression Scale), disability (Expanded Disability Status Scale). On Day 1, subjects were instructed to the use of the RPE scale and performed a YMCA sub-maximal cycle ergometer test to predict maximal VO_2 and workload. Subjects were coached to pedal for 2 minutes at 60% and then 70% of their predicted max workload values but were blinded to the actual workload. After rest, subjects attempted to confirm that same effort, 60-70% of max, by controlling the workload on the cycle ergometer. One week later subjects were asked to replicate the effort from week 1 based on RPE by controlling the workload on the cycle ergometer. VO_2 and HR were measured continuously during testing, and workload and RPE were obtained every 30-60 s. Testing was performed at constant temperature and humidity. Data were analyzed using paired t-tests and Pearson's correlation. Data are mean (SE). Significance was $p \leq 0.05$. **RESULTS:** There were no significant differences between workload, RPE, or VO_2 from coaching to confirmation on Day 1 or from confirmation on Day 1 (Workload=102(36) watts, RPE=13(1.3), VO_2=1.7(0.6) L/min, RQ=0.84(0.04), Lactate=6.3(3.2) mmol/L) to reproduction on Day 2 (Workload=117(30), RPE=13(0.3), VO_2=1.44(0.37), RQ=0.89(0.05), Lactate=4.8(1.6)). There was a significant difference in HR (Day1=137(23) bpm, Day2= 18(24), $p=0.037$). Correlations of workload to RPE, VO2, and HR showed $r = 0.99$, 0.95, and 0.91 respectively. **CONCLUSION:** These initial results suggest that RPE can be reproduced and may be better a method of prescribing exercise than using HR alone in mild to moderately impaired persons with MS.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#7

DEFINING PEDIATRIC BODY FAT REFERNCE STANDARDS USING METABOLIC SYNDROME

Kelly R. Laurson[1], Gregory J. Welk[2], FACSM, & Joey C. Eisenmann[3] [1]Illinois State University, Normal, Illinois; [2]Iowa State University, Ames, Iowa; [3]Michigan State University, East Lansing, Michigan

Static, single-value, percent body fat (%BF) thresholds for defining "health" have been suggested for children (e.g. 25% for boys and 30% for girls). However, static cutpoints may not be appropriate for use across the age range due to normal changes in %BF during growth and maturation. **PURPOSE:** This study proposes age- and sex-specific %BF thresholds based on metabolic syndrome status and %BF using receiver operating characteristic (ROC) analysis. **METHODS:** Subjects were adolescents (n = 1966) between the ages of 12-18 years from the continuous National Health and Nutrition Examination Survey (1999-2004). %BF was estimated from skinfolds using the equations of Slaughter et al. (1988). To account for growth and maturation, %BF values were converted to percentiles using the LMS procedure. These LMS values were created previously (Laurson et al., 2009); the subjects in this study represent a sub-sample of the original group. Waist circumference, blood pressure, cholesterol, triglycerides, and glucose were used to diagnose metabolic syndrome using the pediatric definition of Jolliffe and Janssen (2007). ROC analyses were done, separately by sex, using metabolic syndrome status as the disease variable and %BF percentile as the test diagnostic. **RESULTS:** The area under the curve (AUC) was 0.855 for boys and 0.845 for girls. To create multiple levels of metabolic disease risk, various diagnostic criteria were used. A "High Risk" group was created by selecting a percentile with a specificity of 0.95 (Boys: 94th percentile, Girls: 93rd percentile). This provides a %BF threshold where 95% of all cases without metabolic syndrome fall below these values. Also, an "At Risk" group was created by selecting the percentile with at least a sensitivity of 0.95 (Boys: 69th percentile, Girls: 68th percentile). This threshold denotes that 95% of all metabolic syndrome cases are above this adiposity level. **CONCLUSIONS:** Using %BF percentiles and metabolic syndrome status, multiple %BF thresholds were created to denote levels of metabolic risk. These threshold values have also been extrapolated down to children as young as 5 years of age. AUC criteria suggest that %BF can be used effectively to classify metabolic syndrome risk. The age- and sex-specific %BF values are provided.

Funding support provided by FITNESSGRAM and The Cooper Institute

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#8

CHANGES IN SUBSTRATE OXIDATION RATES DURING A COLLEGIATE SWIMMING SEASON

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PURPOSE: Substrate oxidation rates can reveal important information regarding training status and changes in physiological function. The purpose of this study was to examine changes in carbohydrate and fat oxidation rates in female swimmers during rest and submaximal exercise and compare the results to physically active controls.
METHODS: 8 females from the university intercollegiate swim team and 7 physically active college-aged females participated in this study. Following an overnight fast substrate oxidation rates were determined at 0600 h during rest and exercise at 40% and 70% of treadmill measured maximal oxygen consumption (VO_2max). Carbohydrate and fat oxidation rates were determined using a metabolic measurement cart and normalized to fat free mass, as determined by air displacement plythesmography (Bod Pod). All subjects were tested pre-season, mid-season, and immediately following a winter training trip.
RESULTS: The swimmers had significantly higher VO_2max and fat free mass values than controls at mid-season and post-training trip ($p \leq 0.05$). The resting substrate oxidation rates as the percentage of total energy expenditure are shown below.

	Pre-season		Mid-season		Post-training trip	
Group	CHO Ox %	FAT Ox %	CHO Ox %	FAT Ox %	CHO Ox %	FAT Ox %
Swimmers	27.1±20.8*	72.9±20.8*	40.9±11.6*	59.0±11.6*	51.0±14.3*	49.0±14.3*
Controls	46.8±9.3	53.2±9.3	48.0±18.0	52.0±18.0	53.2±19.5	46.7±19.5

The swimmers had a significant increase in CHO oxidation and a significant decrease in FAT oxidation over time ($p \leq 0.05$) but there were no differences between groups. There were no significant group or time differences in substrate oxidation percentage at 40% of VO_2max. A significant group difference was observed in substrate oxidation percentage at 70% of VO_2max with the swimmers having lower CHO oxidation and higher FAT oxidation compared to the physically active control subjects ($p \leq 0.05$). There were no differences between groups for substrate oxidation at 70% of VO_2max ($p > 0.05$)
CONCLUSION: Season long training in competitive female swimmers results in changes in substrate oxidation rates at rest, but not during treadmill exercise at 40% or 70% of VO_2max.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#9

THE PHYSIOLOGICAL RESPONSE OF A GAMING SESSION WITH THE NINTENDO® WII FIT INTERACTIVE VIDEO GAME

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Persons engaged in a regimen of regular physical activity have been shown to obtain numerous health benefits. The Nintendo® Wii Fit video game is the first interactive video game explicitly marked as a fitness tool, yet currently there has been no assessment of the level of exercise intensity attained while playing. **PURPOSE:** The purpose of this study was to assess the average exercise intensity achieved throughout a 30-minute Wii Fit gaming session, and to compare these results to ACSM recommendations. **METHODS:** Young, healthy participants (mean ± sd: males, n = 6, 20.6 ± 1.9 yrs; females, n = 9, 21 ± 1.4 yrs) with BMIs of ≤ 27 completed the study. Ventilation (V_E), volume of oxygen consumed (VO_2), and volume of carbon dioxide produced (VCO_2) were monitored along with heart rate (HR) during a maximal exercise treadmill test. On a separate visit participants completed a standardized Wii Fit session where V_E, VO_2, VCO_2, and HR were continuously monitored. **RESULTS:** Throughout the Wii Fit session mean values for all variables monitored were generated using exclusively the active time participants were engaged with the game. Participants were actively engaged in Wii Fit play for a mean time of 31.2 ± 1.9 minutes. Mean play time HR was 121.58 ± 18.53 bpm, and when these data were analyzed relative to each participant's maximum HR a mean of 61% was observed. Mean play time VO_2 and METs were 15.52 ± 2.64 $ml^{-1} \cdot kg^{-1} \cdot min^{-1}$ and 4.35 ± 0.77, respectively. As calculated from each participant, the mean play time VO_2 expressed as a percentage of VO_2MAX was 35%. **CONCLUSION:** According to ACSM, moderate intensity exercise is defined as the attainment of any of the following; 40-59% of VO_2MAX, 55-69% of maximal HR, or 3-6 METs. The present study found that the mean HR and METs maintained throughout Wii Fit play were consistent with moderate intensity exercise as recommended by ACSM; however, the mean percentage of VO_2MAX did not reach the threshold specified by ACSM. This provides evidence to suggest that in a young, healthy population the Nintendo® Wii Fit video game may be an effective exercise tool.

(Supported by a Faculty-Student Summer Collaboration Stipend Grant from the Center for Scholarship and Teaching and the Faculty Development Committee of Elmhurst College.)

#10

(S)PARTNERS FOR HEART HEALTH: BASELINE CHARACTERISTICS OF PHYSICAL ACTIVITY AND SELF-EFFICACY BEHAVIORAL CORRELATES

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The prevalence of cardiovascular disease (CVD) risk factors including low physical activity (PA) is rapidly increasing among children in Michigan and in the United States. (S)Partners for Heart Health is a school-based PA and nutrition intervention designed to promote healthy behaviors and improve selected PA correlates as a means of primary CVD prevention.
PURPOSE: The purposes of this study were: 1) to compare baseline characteristics for PA to national recommendations (survey and pedometer) and 2) to examine the relationships between PA and self-efficacy (SE) and outcome/expectancy (OE).
METHODS: Participants were 134 5th grade students (55 boys, 79 girls; mean age 10.4 ± 0.7 yrs) from three Michigan primary schools. Habitual PA was assessed by a pedometer over a one-week period and a self-report PA question. Screen time (TV, video, & computer) was also self-reported. SE was assessed using a 5-point scale questionnaire designed for children. OE was assessed using one question with a 4-point Likert scale. Descriptive statistics, t-tests, Pearson and Spearman correlations were used for analyses.
RESULTS: Boys and girls averaged 12,117 ± 4,927 and 13,321 ± 10,932 steps per day, respectively. The proportion of students meeting recommendations (≥ 13,000 $steps \cdot d^{-1}$ for boys, ≥ 11,000 $steps \cdot d^{-1}$ for girls) was 44% for boys (n = 23) and 41% for girls (n = 42). The PA survey question revealed that 51% of boys and girls met the recommendations of at least 60 min ≥ 5 days/week. SE scores were 3.3 ± 0.5 for boys and 3.1 ± 0.6 for girls. Average OE scores for boys and girls were 2.2 ± 0.9 and 2.2 ± 0.7, respectively. Screen time was similar between boys (4.3 ± 2.9 hrs) and girls (4.5 ± 10.7 hrs). The proportion of girls meeting recommendations (< 4 $hrs \cdot d^{-1}$) (74%) was significantly higher compared to boys (55%; $p < 0.001$). The correlations between PA and SE and OE were r = 0.48 and 0.34 ($p < 0.01$) for boys and r = 0.64 and 0.23 ($p < 0.05$) for girls, respectively.
CONCLUSION: This sample of Michigan students' PA levels are slightly above national levels. Correlations between SE and reported PA were higher than those for OE and PA. The strong correlation of the SE for PA with PA indicates the SE measure has potential utility for predicting PA levels in this age group.

Supported by Blue Cross Blue Shield of Michigan Foundation.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#12

EFFECT OF WIND ASSISTANCE ON 10 AND 40 YARD SPRINT PERFORMANCE

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Sprinting speed is frequently trained using overspeed strategies such as towing and downhill running. Running with the wind is another overspeed training option, though its effects have yet to be quantified. **PURPOSE:** This study evaluated the effect of tailwind speed on 10 and 40 yard sprint times and stride frequency, and sought to determine if sprint times could be predicted from wind speeds. **METHOD:** Twenty-two men and women (Mean ± SD; age, 20.4 ± 1.4 years) ran 6 sprints with variable speed tailwinds, as assessed by wind vane and anemometer. Data from the sprints with the slowest wind (SW) and fastest wind (FW) conditions were kept for analysis. Ten and 40 yard sprint speed and stride frequency were assessed using an infrared timing and video analysis, respectively. Differences in sprint times and stride frequency in SW and FW conditions were assessed using paired sample *t*-tests. Additionally, difference scores were calculated for the SW and FW conditions and 10 and 40 yard sprint times. Regression analysis was used to determine if a change in wind speed was a statistically significant predictor of changes in sprint times. **RESULTS:** Slow and fast mean wind conditions of 2.63 ± 0.96 and 6.02 ± 1.89 miles per hour, respectively, were significantly different ($p < 0.001$). Mean 10 yard sprint times were 2.02 ± 0.17 seconds and 1.98 ± 0.15 seconds in the SW and FW conditions, respectively ($p < 0.001$). Mean 40 yard sprint times were 5.70 ± 0.53 seconds and 5.58 ± 0.51 seconds in the SW and FW conditions, respectively ($p < 0.001$). There was no significant difference in stride frequency between the SW and FW conditions of the 10 and 40 yard sprint ($p > 0.05$). Regression analysis indicated that change in wind speed is not a significant predictor of a change in 10 or 40 yard sprint time ($p > 0.05$). **CONCLUSIONS:** Running in the FW condition decreased 10 yard sprint times by 2.0% and 40 yard sprint times by 2.1%, without affecting stride frequency. However, changes in sprint times cannot be predicted from the wind speeds assessed.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#13

ACCELEROMETERY-DETERMINED PHYSICAL ACTIVITY AND FUNCTIONAL FITNESS IN OLDER ADULTS

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Physical fitness in older adults is directly related to functional ability. Increasing functional ability may allow older adults to live independently for a longer period of time. **PURPOSE:** To investigate the relationship between daily physical activity and the performance on fitness tests in older adults. **METHOD:** Twenty-two females (68.4 ± 9.5 years) and 11 males (61.7 ± 6.7 years) participated. Six tests from the Senior Fitness Test (Rikli & Jones, 2001) were administered: one trial each of the Chair Stand (CS), Arm Curl (AC), and 6-Minute Walk (6-Min), two trials of the 8-Foot Up-and-Go (8-Ft), and three trials each of the Chair Sit-and-Reach (SR) and Back Scratch (BSC). Following the fitness tests, participants were given a Lifecorder PLUS accelerometer and instructed to wear it for 14 days without changing their normal daily activity. Accelerometer data were collected using the PAAS Lifestyle Coach software. Pearson correlations were determined for all subjects between accelerometer data (number of daily steps, daily moderate to vigorous activity (min) (MVPA)) and the fitness tests. Differences between sexes were assessed with t-tests. **RESULTS:** Men and women were significantly different on the BSC (males: -4.05 ± 6.36 in., females: -0.4783 ± 3.26 in.) and the 6-Min (males: 666.35 ± 108.74 yd., females: 550.70 ± 138.59 yd.) tests. Daily steps were highly correlated ($p < 0.01$) with MVPA minutes ($r = .779$) and performance on the CS ($r = .519$) and 6-Min ($r = -.600$). MVPA minutes were correlated ($p < 0.05$) with the 6-Min ($r = .490$). The 8-Ft was highly negatively correlated ($p < 0.01$) with daily steps ($r = -.600$), MVPA ($r = -.439$), CS ($r = -.717$), and 6-Min ($r = -.877$), and correlated ($p < 0.05$) with SR ($r = -.364$). **CONCLUSION:** More active individuals, as measured by accelerometry, appear to perform better on fitness tests that measure various components of fitness. This suggests that individuals who are more active will be able to maintain a more independent lifestyle.

#14

EFFECT OF DIETARY PROTEIN INTAKE ON NITROGEN BALANCE DURING RESISTANCE EXERCISE TRAINING

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The protein RDA for adults is 0.8 grams/kg of healthy BW but some sources indicate that higher levels are recommended for regular exercisers especially those engaged in resistance training. **Purpose:** Twenty-three college seniors took part in a group research project to determine the effect of dietary protein intake on nitrogen balance while engaged in resistance exercise training. **Methods:** Prior to the experiment, all students began a 3-d/wk resistance-training program (or continued one that was already initiated) that consisted of 13 exercises emphasizing the arms, legs, core, back, and chest. The group was, then, randomized into 4 groups according to 4-levels of dietary protein intake, i.e., 0.4, 0.8, 1.2, and 1.6 grams/kg BW. Each student ate that diet for one week and then advanced to the next diet for the subsequent 3-weeks. They collected a 24-h urine sample on the last day of each weekly diet and from those urine samples they determined urea nitrogen and nitrogen balance. Group means were compared using a one-way ANOVA for repeated measures and a post-hoc Tukey test. **Results:** Nitrogen balance for the 0.4, 0.8, 1.2, and 1.6 grams/kg BW groups were –14.8±1.5, -11.2±1.1, -9.6±1.8, and –0.1± 1.5 grams, respectively. There was a significantly lower nitrogen balance for the 0.4, 0.8, and 1.2- grams/kg BW groups than for the 1.6-grams/kg BW group and there was a significantly lower nitrogen balance for the 0.4-grams/kg BW group than the 0.8, and 1.2 grams/kg BW groups. **Conclusions:** Nitrogen balance varied directly with dietary protein intake and a dietary protein intake of at least 1.6 grams/kg BW was required to maintain neutral nitrogen balance while engage in resistance exercise training.

Abstracts

Poster Session, October 16, 2009 from 3:00-6:00 pm in Salon V
Authors will be present from 3:00-4:00 pm (#1-15)

#15

THE EFFECT OF ACUTE RESISTANCE TRAINING ON RESTING METABOLIC RATE IN MEN

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PURPOSE: The purpose of this study was to investigate the effect of different frequencies of resistance training on an individual's resting metabolic rate (RMR). **METHOD:** Six healthy males between the ages of 18 and 35 participated in two separate trials. The first trial involved two full-body resistance training bouts, 48 hours apart with RMR measurements pre- and post-bout and a RMR measurement 24 hours following each. The second trial consisted of four split-body resistance training bouts on four consecutive mornings with RMR measurements pre- and post-bout each morning with a fifth morning for one final RMR measurement, 24 hours after the final bout of exercise. This was a repeated measures design and the order of conditions was randomized. Analysis of variance was used to interpret the data. **RESULTS:** It was discovered that mean RMR for each protocol was not significantly different (6.3941 ± 0.8272 kJ·min^{-1}, 6.3933 ± 0.7074 kJ·min^{-1}). A secondary finding was that respiratory exchange ratio (RER) decreased as RMR increased, showing a greater oxidation of fat post exercise, although there was not a statistically significant difference. **CONCLUSION:** These results led to the conclusion that RMR will be the same for two different resistance training programs as long as the work is constant between both. The practical application of these results would be that if an individual is choosing a resistance training regimen to raise RMR and lose weight, the program can be selected based on time constraints.

Abstracts

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Authors will be present from 4:00-5:00 pm (#16-31)

#16

PREDICTABILITY OF ANTHROPOMETRIC FACTORS ON TWO BALANCE TESTS IN CHILDREN

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From a biomechanical perspective, an individual's postural stability is determined by one's mass, height of center of mass (CM), and support area (Hall, 2007). However, balance or postural control often involves an adaptation to the environmental change. It is unclear to what degree anthropometric factors contribute to balance, especially for children. **PURPOSE:** The purpose of this study was to determine whether anthropometric factors predicted and correlated with balance performance on dynamic and static balance tests. **METHOD:** The participants, age 9-14 ($n=29$), had their skinfold, BMI, CM (measured in the vertical position), and foot size measured. Fatmass was estimated using the Dezenberg Equation employing a two-site skinfold measurement and accounting for body mass, race and gender (Dezenberg, 1999). Dynamic balance was assessed using a Lafayette balance platform connected to a Biopac MP100 System where average root mean squared error (RMSE) was used to gauge performance. The participants were instructed to maintain the platform parallel with the floor for eight consecutive trials lasting 30 s each with a 30 s interval. Static balance was assessed on a NeuroCom Balance Master using the Limits of Stability Test (LoS), which asked participants to deviate their CM without loss of balance. The movement velocity (MV), directional control (DC), endpoint excursion (EE), and maximum excursion (ME) were recorded for analysis. **RESULTS:** A stepwise multiple regression analysis indicated that fatmass was the only variable ($F = 21.16$, $p<.01$) to significantly predict balance acquisition in the dynamic situation although the other anthropometric variables such as BMI ($r = .62$, $p<.01$), CM ($r = .61$, $p<.05$), and foot size ($r = .50$, $p<.01$) were reliably correlated with balance performance. None of the anthropometric variables were related to the four static balance performance measurements. **CONCLUSION:** All four anthropometric factors were significantly related to each other and dynamic balance performance. Importantly, fatmass was shown to be the only predictor of postural control and negatively affected balance performance in the dynamic environment. However, neither fatmass nor the other anthropometric factors affected static balance. This indicates that anthropometric factors affect children's balance acquisition under the condition of dynamic adaptation to the environmental change.

#17

PERFORMANCE OF MOTOR AND COGNITIVE FUNCTION TASKS ARE SIMILAR DURING WALKING AND SITTING

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Research has shown that walking results in an increase in caloric expenditure compared to sitting. However, there is limited data regarding performance of motor and cognitive tasks during walking and sitting. **PURPOSE:** To determine whether a simple motor task (e.g., finger tap test (FT)), a battery of cognitive function tasks (e.g., Impact (CF)), and a standardized typing test (e.g., Mavis Beacon Typing Test for Beginners (T)) differed when performed on an active workstation during sitting and walking on a treadmill at 1.5 mph. **METHODS:** Twenty-four subjects (12 female and 12 male) participated in this counterbalanced study. Weight and Height were measured to calculate BMI. All subjects completed these tasks while wearing a Cosmed K4b2 portable metabolic measuring system. O2 Uptake (VO2), Ventilation (Ve), and Heart Rate (HR) were measured during the performance of these tasks. The following data are presented below:

	BMI	FT HR	FT VO2	CF HR	CF VO2	T HR	T VO2
Sit	25.9 (4.7)	80.6 (15.1)	5.0 (1.4)	76.5 (16.8)	4.5 (0.8)	79.4 (16.6)	4.9 (1.4)
Walk	25.7 (4.5)	90.1 (16.1)*	10.7 (3.0)*	91.0 (18.8)*	9.8 (2.2)*	92.8 (19.9)*	10.4 (2.0)*

***Indicates that $p< 0.01$**

RESULTS: A series of paired t-tests indicated that FT (finger tapping rate), CF (cognitive function test battery), and T (typing speed and accuracy) did not differ significantly when performed while sitting or walking. However, (FT, CF, and T) HR and (FT, CF, and T) VO2 measured during the series of tasks were significantly increased ($p<0.01$) during walking. VO2 was more than doubled when FT, CF, and T tasks were performed while walking at 1.5 mph.

CONCLUSION: Analysis of these data suggests that performance of a simple motor task, a battery of cognitive function tasks, and a standardized typing test were not significantly affected while walking as compared to sitting. Walking is associated with an increase in HR and VO2 which results in an increase in caloric expenditure. This data is the foundation for further study of physically active workstations which may be used as an alternative form of physical activity (e.g., energy expenditure) during the work or school day.

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#18

CHANGE IN POWER OUTPUT DURING REPEAT WINGATE TESTING IN PROFESSIONAL HOCKEY PLAYERS

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Wingate testing is frequently used to assess anaerobic performance in ice hockey players. Although a single Wingate test provides valuable information regarding anaerobic power, the completion of a second, repeated Wingate test may provide additional information on anaerobic power in a fatigued state. **PURPOSE:** To investigate the anaerobic power of professional hockey players following the completion of repeated Wingate tests and to determine which fitness variables predict performance. **METHODS:** Anthropometric measures including height, weight, and percent body fat were taken. An off-ice fitness testing battery, modified from the National Hockey League Combine, which included tests for flexibility, muscle strength, muscle endurance, and anaerobic power was completed. Each athlete performed a 30-second Wingate test on a Monark Cycle Ergometer. A second Wingate test was performed following 2 minutes of active rest. Relative peak power (PP), average power (AP), and power drop (PD) were calculated in terms of watts/kg (W/kg) for both Wingate tests. Mean differences in PP, AP, and PD between the first and second Wingate tests were assessed via a paired sample T-test ($p<.05$). Multivariate linear regression was used to assess the impact of fitness variables on Wingate performance. **RESULTS:** Thirty-one ice hockey players (Ht: 71.4 ± 2.0 cm; Wt: 88.4 ± 10.6 kg; percent fat: 12.5 ± 5.7) completed testing. Mean PP (11.9 ± 1.4 W/kg), AP (8.9 ± 0.8 W/kg), and PD (6.5 ± 1.6 W/kg) during the first Wingate test were all statistically greater ($p < 0.05$) than the second Wingate test (PP: 9.9 ± 1.0 W/kg; AP: 7.0 ± 0.7 W/kg; PD: 5.5 ± 0.9 W/kg). Linear regression analysis revealed that the best predictor of peak power during the repeat Wingate test was change in lactate (beta: -0.081, $p < 0.05$). **CONCLUSION:** Following a two minute rest period, professional hockey players experienced a substantial decrease in power output during repeated Wingate tests with lactate being the biggest predictor of performance. A repeat Wingate test may provide useful information for coaches and trainers to help assess the anaerobic ability of hockey players.

#19

THE EFFECT OF EXHAUSTIVE RUNNING ON POSTURAL DYNAMCIS

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Over the past decade, researchers have begun using a set of newly developed nonlinear dynamical analyses to investigate changes in 'temporal structure' of many continuous biological and movement behaviors. Measures such as Approximate Entropy (ApEn) have been used to examine temporal structure in the continuous behavior of many biological and movement systems. **PURPOSE:** The purpose of this experiment was to use one nonlinear dynamic analysis versus a set of traditional postural measures to evaluate postural sway during upright stance prior and following a bout of exhaustive running. **METHOD:** Following warm-up, participants ($N=19$) ran on a treadmill to exhaustion. Postural sway data was recorded via Center of Pressure (COP) obtained from a forceplate during upright stance for periods of 30s, six times during the experiment, up to ten minutes after completion of running. From COP data, researchers computed postural sway measures of COP path length, position variability, and ApEn for anterior-posterior (A-P) and medial-lateral (M-L) movement planes. Measures of sway were predicted to exhibit a quadratic trend with measures deviating from baseline, following bouts of exercise, returning to baseline levels with recovery. This indicates that fatigue causes sway to become more regular, due to a loss of flexibility in control strategies, and recovery allows the return to exploratory (less regular) postural behaviors. To examine this hypothesis we performed a set quadratic contrast for each postural measure ($\alpha = 0.05$). **RESULTS:** In both M-L and A-P planes, measures of COP variability ($p=0.025$, $p=0.022$) and path length ($p=0.048$, $p=0.002$) displayed significant quadratic trends. ApEn values were only significant in M-L plane ($p=0.002$), but near significant in the A-P plane ($p=0.078$). These results indicate that directly after the fatigue protocol, the COP path became longer, more variable, and in the M-L direction became more regular. With recovery came a return to baseline. **CONCLUSIONS:** Our findings show that fatigue affects different aspects of postural control. Path length and standard deviation indicate changes to the amount of sway, and ApEn indicates changes in the temporal structure. These results suggest changes in postural control strategies that only last a brief amount of time.

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#20

FUN VS. FUNCTIONAL: EXERCISE PREFERENCE BETWEEN THE TRIKKE AND THE BICYCLE ERGOMETER

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The Centers for Disease Control and Prevention lists one of its barriers for non-participation in physical activity as "exercise is boring" and "not enjoyable" (CDC, 2008). **PURPOSE**: To compare participants' perception of exercise preference between the Trikke and the bicycle ergometer. **METHODS**: Fifteen males and fifteen females, ages 18 to 45 years, voluntarily participated in the study. Participants came in on 3 occasions. The first session involved a 5 minute instructional video and practice on the Trikke until subjects felt comfortable. Subjects were then randomized into sessions 2 and 3 which involved either riding the Trikke or the bicycle ergometer. Participants of each group performed a 20 minute ride at 75-80% of maximal predicted heart rate. Exercise intensity was measured using a Polar heart rate monitor. The participant's rate of perceived exertion (RPE) was recorded every five minutes throughout the test using the Borg Scale. At the conclusion of the second test a questionnaire was given to determine modality preference. A univariate ANOVA was given to determine modality preference. A univarate ANOVA was used to compare results for the bicycle ergometer versus the Trikke. Version 16.0 of the SPSS for Windows was used for all analysis with .05 as the level of significance. **RESULTS**: The results of this study indicated that the energy expenditure for 20 minutes on the Trikke=160 kcal versus Bike= 180 kcal and RPE for the bicycle ergometer (13.0) was significantly higher than the Trikke (11.7), with no differences in heart rates. Higher oxygen consumption/energy expenditure and RPE on the bicycle ergometer suggests that subjects were more efficient using the Trikke versus the bicycle with a lower perception of work completed. Results of the one sample t-test indicated all items were significant ($p < .001$) from the mid-point except one item: "I will consider buying a Trikke in the future." Results of the Pearson correlation coefficients demonstrated that EPQ was significantly ($p < .05$) correlated with Kcal/min, Total Kcal, and VO2 of the Bike and Trikke. **CONCLUSION**: Participants in general found that it was more fun to ride the Trikke than a bicycle ergometer or a scooter, and they were willing to try the Trikke again if they had the chance. However, they hesitated whether they would like to buy a Trikke for their own probably due to the cost of the Trikke.

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#21

USING THE ACTIVE WORKSTATION: EFFECTS ON TYPING SPEED AND WALKING MECHANICS

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Integrating low-intensity physical activity into work environments by using the active workstation (treadmill with desk attached), could provide health benefits to many adults. Although use of the active workstation may increase health benefits, concerns have been raised about the ability to walk and perform tasks simultaneously. **PURPOSE**: To assess the effects of walking and typing practice on rectifying typing speed (WPM) decrements and improving walking mechanics. **METHOD:** Nineteen adults aged 43± 11, who could type at least 50 adjusted words per minute (AWPM) participated. All Ss completed a typing test while seated and while walking at 1 mph. Ss were randomly assigned to a massed practice session (3 consecutive 15 min blocks) or to distributed practice (daily sessions of 15 min each). Ss had reflective markers placed on the ankle, knee and hip and were filmed while walking and walking and typing. Walking mechanics were assessed through a digitized analysis of this film. A series of 2 X 2 (Practice Condition by Time) Mixed Model ANOVAs with repeated measures on the second factor were conducted to assess the effects of the two practice conditions on participants typing performance and gait parameters. Paired samples t-tests were performed to compare postural conditions. **RESULTS:** A significant difference in participants' typing performance (WPM), was found between baseline sitting (67±9.5) and walking measurements (57±8.3) $p < .00$, as well as, significant changes in knee height between walking (.50724±.033) and walking & typing (.50483±.034), $p < .03$; and stride length (.38218±.057 vs .35579±.051), $p < .00$). There was no significant improvement in typing performance in the massed practice group, but a significant improvement in the distributed practice group ($p < .00$), while both groups exhibited significant increases in stride length. The initial result of walking while typing elicited a negative effect on typing performance and changed the gait pattern of the user, yet with distributed practice these variables reverted back towards baseline measurements. **CONCLUSION:** Distributed practice was effective in the recovery of typing speed and may be associated with a return of normal walking mechanics.

(Work was supported by a Faculty Research Award to RHC)

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#22

A PRELIMINARY EXPLORATION OF THE EFFECTS OF AN INCENTIVE PEDOMETER-BASED INTERVENTION ON STUDENTS ENROLLED IN A UNIVERSITY WELLNESS COURSE

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Health problems associated with physical inactivity remain prevalent, yet higher education wellness or physical activity/education interventions have not been widely studied. **PURPOSE:** Therefore, the purpose of this study was to investigate the impact of a required university undergraduate wellness course which included an incentive pedometer-based program. Differences in blood pressure (BP), heart rate (HR), Cardiorespiratory Fitness (CF), body weight (BW), Body Mass Index (BMI) and academic performance (AP) were measured. **METHOD:** Students enrolled in a university wellness course (n=13, 50% overweight or obese) were encouraged to be physically active outside of class utilizing a pedometer-based program. Data collection measures of BW, BP, BMI and CF (Rockport 1-mile walk test to estimate VO_2) were completed as course requirements. Participants were given the goal of reaching 10,000 steps per day and self-reported total number of steps each week. Researchers recorded the number of weeks each participant met the steps goal (ten percent of the overall course grade). Semester and accumulative grade point average (AP) were gathered from university records. Significance was assessed by paired sample *t* test and Pearson's product-moment correlation ($p < .05$) using SPSS. **RESULTS:** As expected, results demonstrated negative correlations of CF with BP($r = -.717$, ($p < .009$), BW($r = -.766$, ($p < .004$), and Rockport test ($r = -.604$, ($p < .038$). Results indicated improvement in BP, BW, and BMI, and CF/VO_2, yet none were statistically significant. Correlation measures did not reveal any relationship between AP and other variables. Poor pre-BP categorical ratings did improve in 50% of cases post test. **CONCLUSIONS**: Results indicate preliminary evidence that higher education wellness and physical activity/education courses can play a role in improving health measures. While physiological measures demonstrated improvement during the course of the program, the lack of statistically significant changes to CF, BP, BMI or BW may be a result of the population (50% were overweight or obese), small sample size, short duration of program, and program's emphasis on overall personal wellness and not specifically on walking, weight loss, or blood pressure improvement. The results do suggest positive health trends in wellness courses; therefore further research in this area is warranted.

#23

THE EFFECTS OF RESISTIVE PRELOADING IN TRAINED VERSUS UNTRAINED ATHLETES

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Athletes spend countless hours training in the hopes of performing to the best of their ability during competition. But what an athlete does in the acute time frame before the event, i.e. the warm up, may have just as much effect on their success as the months of training completed before hand. Particularly for ballistic performance, evidence indicates that preloading, or performing target skills with near maximal effort, as a preparatory strategy leads to greater maximal efforts when compared to a static stretch warm-up or no warm-up at all. However, what is unclear is the extent to which long term training, and specifically ballistic performance and resistance training experience, influences the effectiveness of preloading. **PURPOSE:** The current study aims to examine whether the benefits of resistive preloading are dissimilar for trained and untrained persons. **METHODS:** Twenty four healthy male college students, age 18-28, were recruited for placement into one of two groups; trained or untrained. Five trials of maximal vertical jump were performed on two occasions, one preceded by preload and one not. The preload condition included a single five repetition set of back-squat exercise at 90% of a previously determined five rep max. The highest jump was used, and a 2x2 Mixed Model ANOVA with repeated measures on the 2nd factor was used to compare the difference between performance in each of the two conditions, with significance set at $p<0.05$. **RESULTS:** The ANOVA revealed a significant difference between the baseline vertical jump performances of the trained and non-trained groups ($F(1,22)=61.34$, $p<.01$). The analysis also revealed a significant increase in vertical jump ($F(1,22)=57.99$, $p<.01$) among all participants, however, no significant interaction occurred between the two groups ($p < 0.27$) regarding the degree to which performance was improved. In short, both the trained and untrained groups improved similarly. **CONCLUSION:** Preloading effectively enhances performance. The use of 90% 5RM elicits greater performance improvements when compared to similar studies. Training status is shown to be insignificant, suggesting that the benefits of preloading are available to athletes at all stages of their career, and do not "wash-out" with training.

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#24

Aerobic Fitness is Associated with Cognitive Function in College Students

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Aerobic fitness is positively associated with neurocognitive function, particularly indices of attention, working memory, and response speed (e.g., executive control) in healthy older adults as well as in prepubertal children.
PURPOSE: To examine the relationship between cognitive function and aerobic fitness in college students. Several indices of the executive control aspect of cognitive function were compared between hi-fit, hi-trained college athletes (TR) and normally-active, lower-fit college students (UTR).
METHODS: Fifty-five subjects (19 females) completed a maximal treadmill test to determineVO2max, maximal Heart Rate (HRmax), and maximal respiratory exchange ratio (RERmax). Subjects completed a timed, standard grooved pegboard task with the dominant (PBD) and non-dominant (PBND) hand and a series of cognitive function tasks that assess short-term working memory (Cmp Mem-acq), delayed working memory (Cmp Mem-dly), short-term visual memory (Cmp Mem-vis), and processing speed (Cmp Motor).
RESULTS: Independent t-tests revealed BMI and VO2max differed between the groups, however HRmax and RERmax did not differ; suggesting both groups reached VO2max. Cognitive function (PBD, PBDNB, Cmp Mem-vis, and Cmp Motor) was significantly correlated with VO2max. When subjects were categorized into tertiles, the TR (highest tertile for VO2max) and UTR (lowest tertile for VO2max) groups, the same indices of cognitive function were significantly correlated. ANOVA (by groups) and Linear Regression analyses confirmed that VO2max was significantly related to several indices of cognitive function (PBD, PBND, Cmp Motor), ($p < 0.05$).

GRP	N	Age	BMI	VO2max (ml/kg/min)	HRmax (b/min)	RERmax
TR	22	20.3 (2.2)	22.0 (2.2)*	65.1 (10.0)*	193.2 (2.9)	1.1 (0.05)
UTR	15	20.8 (2.5)	28.2 (7.0)	42.8 (5.1)	196.4 (6.0)	1.1 (0.07)

*Denotes significance; $p < 0.01$

w/ GROUP (TR vs UTR)	Variable	Correlation	Significance	N
	PBD	.403	< 0.05	37
	PBND	.559	<0.001	37
	Cmp Mem-acq	-.501	<0.05	37
	Cmp Mem-dly	-.496	<0.05	37
W/ Vo2max (ml/kg/min)	PBD	-.286	<0.05	54
	PBND	-.478	<0.001	54
	Cmp mem-vis	.254	0.06	55
	Cmp Motor	.306	<0.03	55

CONCLUSIONS: These data suggest that hi-fit, hi-trained college-aged males and females exhibit enhanced performance on a variety of cognitive tasks. The positive relationship between aerobic fitness and cognitive function is exhibited from childhood into young adulthood.

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#25

THE COMPARISON OF RESTING METABOLIC RATE TO DAILY PHYSICAL ACTIVITY IN ADULTS AGED 55-69 YEARS OLD

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Purpose: The primary purpose of this study was to determine if the level of physical activity is related to resting metabolic rate (RMR) in an older population. If a relationship exists, physical activity and RMR could be parameters to observe in older populations by health care professionals (physicians, exercise physiologists, etc.) to aid in weight loss, risk factors of diseases, etc. Since RMR comprises of 60-80% of an individual's total metabolism, it is important to determine ways to increase or maintain RMR as an individual ages. **Method:** Thirty healthy subjects aged 55-69 years old (average age=60 years) were recruited for this study. RMR was measured two consecutive times using the BodyGem. Anthropometric parameters that were measured included body height and weight, body composition, waist and hip measurements, and abdominal diameter. After RMR and body composition measures were obtained and recorded, subjects were given an accelerometer to wear for two weeks. The accelerometer measured daily steps taken, intensity of physical activity (moderate to vigorous activity), and calories burned through physical activity. A correlation coefficient was used to compare the variables of physical activity to RMR. A linear regression was also used to determine which variables were most predictive of RMR. **Results:** RMR was significantly correlated with every variable except percent body fat, physical activity calories, and physical activity minutes. Daily steps were significantly negatively correlated with RMR, BMI, percent body fat, hip circumference, and abdominal diameter. Physical activity calories were significantly correlated with physical activity minutes while physical activity minutes were significantly correlated with age and percent body fat. The regression analysis provided the following variables to be used in a prediction equation for RMR: age, percent body fat, physical activity minutes, and physical activity calories. **Conclusion:**
In conclusion, although RMR was not found to be significantly correlated with physical activity level and negatively correlated with the anthropometric measures, the relationships such as daily steps with BMI, percent body fat, hip circumference, and abdominal diameter were able to provide additional information that recording daily steps may aid in weight maintenance and decrease risk factors for various diseases (cardiovascular disease, diabetes, etc.).
Grant Support by the Katzner and University Bookstore Grants for Graduate Research.

#26

METABOLIC COST OF TYPING, WALKING, AND WALKING & TYPING

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Inactivity is associated with a myriad of deleterious health conditions. Efforts to increase the level of physical activity (PA) include interventions in the workplace. One of these is the use of active workstations (treadmill with desk attached). Estimates of caloric expenditure above the sitting position have relied on the well established cost of walking curves. However, walking while typing presents a slightly different biomechanical action and has the additional task of typing superimposed upon it. **PURPOSE**: A descriptive study to assess the metabolic cost of sitting and typing, walking while in a typing posture (hands supported) and walking and typing. **METHOD:** Nineteen adults aged 43± 11, years with a BMI of 31.9± 6.4 who had a baseline typing speed of 61 words per minute (WPM) with 93% accuracy (ACC) served as Ss. Heart rate and VO_2 were obtained continuously with a Parvomedics metabolic system and expressed as ml/kg/min while subjects were seated, while walking at 1 mph with hands resting on the desk, and while walking and typing. Subjects completed all conditions in that order. A one way repeated measures ANOVA was used to assess differences across the four conditions. A series of paired samples t-tests were performed to compare the typing conditions from their baseline counterpart. **RESULTS:** The VO_2 (mean± SD) in ml/min/kg for the four conditions were: sitting 3.25±.58, Sit & type 3.86± .70 ($p<.05$), walk 7.49± .97, and walk & type 7.93± .94 ($p<.05$). Heart rate in beats per minute (mean ± SD) for the four conditions was: sit 78±8.0, sit & type 83± 10.1 ($p<.05$), walk 93± 11.5, and walk & type 99±14 ($p<.05$). The cost of typing in absolute volume of oxygen is approximately 36 ml/min while sitting and 52 ml/min while walking. **CONCLUSION:** Typing alone significantly elevates metabolic rate but only typing while walking offers any significant elevation in caloric expenditure.
(Work was supported by a Faculty Research Award to RHC)

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#27

A COMPARISON OF ENERGY EXPENDITURE BETWEEN THE TRIKKE AND THE BICYCLE ERGOMETER

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Many Americans claim loss of interest or perceive that "exercise is boring" are stated as reasons for not exercising (Lifer, 2006). In order to increase the participation in physical activity, it is important to intrigue interest and enjoyment with the activity. **PURPOSE**: The comparison between energy expenditure, oxygen consumption, and perceived exertion while using the Trikke vs. the bicycle ergometer was investigated. **METHODS**: Fifteen males and fifteen females, ages 18 to 45 years, voluntarily participated in the study. Participants came in on 3 occasions. The first session involved a 5 minute instructional video and practice on the Trikke until subjects felt comfortable. Subjects were then randomized into sessions 2 and 3 which involved either riding the Trikke or the bicycle ergometer. Participants of each group performed a 20 minute ride at 75-80% of maximal predicted heart rate. Exercise intensity was measured using a Polar heart rate monitor. The energy costs were determined using the COSMED K4 oxygen/carbon dioxide portable analyzer. The participant's rate of perceived exertion (RPE) was recorded every five minutes throughout the test using the Borg Scale. A paired samples t-test was used to compare results for the bicycle ergometer vs. the Trikke. A mixed design ANOVA was used to determine gender differences. SPSS (version 16.0) was used for all analysis with .01 as the level of significance. **RESULTS**: The results of this study indicated that the energy expenditure (Trikke= 8.0 kcal/min, Bike= 9.0 kcal/min) and RPE for the bicycle ergometer (13.0) was significantly higher than the Trikke (11.7), with no differences in heart rates. Higher oxygen consumption/ energy expenditure and RPE on the bicycle ergometer suggests that subjects were more efficient using the Trikke versus the bicycle with a lower perception of work completed. **CONCLUSION**: The Trikke may be an enjoyable alternative for those individuals who have lost interest in traditional forms of exercise.

(Cleveland State University)

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#28

DOES BMI DETERMINE OBESITY LEVELS IN HIGH SCHOOL FOOTBALL PLAYERS?

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PURPOSE: Controversy exists regarding the use of the Body Mass Index (BMI) in determining overweight and obesity status in athletic populations, primarily in football players. The purpose of this study was to determine whether BMI is a valid measure of overweight or obesity levels in high school football players.

METHODS: 71 males from 7 different high schools participated in this study. Body weight (BW), height (HT), BMI, body fat percent (BF), fat mass (FM), and fat-free mass (FFM) were determined. Air displacement plethysmography was used to determine BF, FM, and FFM. BF of ≤ 20% was considered Normal; BF of 20.1%-30% was considered Overweight; BF of >30% was considered Obese. Subjects were split into three position groups: big (BIG) (offensive and defensive lineman); athletic (ATH) (quarterbacks, tight ends, running backs, and linebackers); and skilled (SKL) (wide receivers, defensive backs). Descriptive statistics and frequency distributions were calculated for the dependent variables.

RESULTS: 45 (65.2%) of the athletes tested had a BF ≤ 20% (Normal), 18 (26.1%) had a BF between 20.1%-30% (Overweight), and 6 (8.7%) had a BF greater than 30% (Obesity). Based on age-adjusted BMI, 26 (36.6%) of those tested had a BMI between the 5th and 85th percentile (Normal), 21 (29.6) had a BMI between the 85th and 95th percentile (Overweight), and 24 (33.8%) had a BMI between the 95th and 99th percentile (Obese). Based on BMI 45 (63.4%) of the subjects are overweight or obese, conversely by air plethysmography only 26 (36.6%) are overweight or obese. 39 of 69 (56.5%) athletes were misclassified as overweight or obese by BMI compared to BF. Misclassification by group was 20 (74.1%) in BIG, 13 (54.2%) in ATH, and 6 (33.3%) in SKL when using BMI compared to BF.

	Normal ≤ 20%	Overweight 20.1-30%	Obese >30%
Bod Pod	N=45 (65.2%)	N=18 (26.1%)	N=6 (8.7%)
	Normal 5–85th	Overweight 86th–95th	Obese 96th–99th
BMI age-adjusted %ile	N=26 (36.6%)	N=21 (29.6%)	N=24 (33.8%)
	Big	Athletic	Skilled
Misclassification	N=20 (74.1%)	N=13 (54.2%)	N=6 (33.3%)

CONCLUSION: The use of age-adjusted BMI percentile rank in high school football players is not effective for determining overweight/obesity levels as it leads to misclassification of overweight and obese status.

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#29

LEAN MASS AND FAT MASS EFFECTS ON BONE MINERAL DENSITY IN OLDER MEN

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It is well established that bone mineral density (BMD) is influenced by a number of factors including age, physical activity and body composition. Aging has been shown to negatively affect BMD, while higher levels of habitual physical activity consistently produce positive effects. Recent data demonstrates positive effects of both lean soft tissue (LST) and fat mass (FM) on BMD in older women, with LST appearing more influential. However, the influence of body composition on BMD in older males is less well characterized.

Purpose: The purpose of this study was to determine the relationships of LST and FM on BMD in an older male population.

Methods: Community-dwelling older men (n=29, 69.5±6.4 y) underwent dual-energy X-ray absorptiometry (DXA) of the whole body (WB), lumbar spine (LS), and proximal femur (PF) to determine body composition (FM and LST) and BMD. Partial correlations, controlling for age, were performed to examine relationships between body composition and BMD. Significance was set at $p<0.05$.

Results: BMI was positively correlated with PF BMD ($r=0.47$, $p<0.05$), as well as femoral neck BMD ($r=0.45$, $p<0.05$). When controlled for FM, BMI was related with BMD of the greater trochanter ($r=0.53$, $p< 0.01$), and remained positively associated with PF and femoral neck BMD ($r=0.49$, $p< 0.01$, $r=0.61$, $p< 0.01$ respectively). LST was positively correlated with PF BMD ($r=0.47$, $p<0.01$) and hip sub-regions, including the greater trochanter ($r=0.48$, $p<0.01$) and the femoral neck ($r=0.45$, $p<0.05$). The association between LST and PF BMD ($r=0.64$, $p<0.01$) remained when controlled for FM. LST was also related to BMD of the LS at L1 and L4 ($r=0.45$, $p<0.05$, $r=0.40$, $p<0.05$, respectively). Total FM was not related to BMD at any of the measured sites. When controlling for LST, all other relationships were eliminated.

Conclusions: It appears that LST, rather than FM, has a greater impact on BMD of the proximal femur and the lumbar spine in older males. LST appears to drives the relationship between BMI and BMD. In light of these results, older men should be encouraged to maximize lean mass to positively affect BMD.

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#30

Structured Pediatric Cardiac Rehabilitation Program Results in Increased Physical Activity and Fitness for Single Ventricle Children

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PURPOSE: To determine whether participation in a structured, 12 week exercise program would result in an increase in aerobic fitness (VO2peak) and an increase in physical activity (PA) on exercise and non-exercise days in children who have undergone the Fontan procedure.
METHODS: 14 children (age; 12±2.8 yrs; 7 females) volunteered to participate in a structured afterschool exercise program three days/week for 12 weeks. Two groups of 6-8 children began the program in January of 2008 and 2009. Children participated in group stretching (5-10 min), aerobic activities (25-35 min), resistance training (15-20 min), and interval training on treadmills, cycle ergometers and an elliptical machine (10-15 min) three days/week. Heart rate (HR) was monitored continuously and recorded periodically during each exercise session. Prior to and following the intervention, VO2peak and HRpeak were assessed during a maximal effort, modified Balke treadmill test. Physical activity was assessed with an Actical accelerometer during the first and last weeks of the exercise program.
RESULTS: Paired t-tests suggested VO2peak was significantly increased along with several measures of physical activity as a function of the exercise intervention.

Variable	Pre-test	Post-test	p-Value
BMI	19.26 (2.8)	19.07 (2.9)	ns
VO2peak	31.1 (3.5)	34.8 (4.2)	0.002
HRpeak	180.4 (14.6)	182.6 (14.1)	ns
Ave cts/min-Ex days	390.3 (71.9)	462.9 (73.6)	0.003
Ave cts/min-NonEx days	240.3 (98.6)	366.1 (112.8)	0.001
Cts/min during SE	1876 (208)	1743 (189)	ns

Multivariate ANOVA revealed that the increase in VO2peak was related to Exercise Attendance # ($p=.055$), the increase in cts/min on exercise days ($p=.056$), and the increase in cts/min during the After-School time block on Non-exercise days ($p=.06$).
CONCLUSIONS: The increase in both fitness and PA were related to structured exercise attendance and increased PA during the afterschool time block on both structured and non-structured days of the week.

Abstracts

Poster Session, October 16, 2009 3:00-6:00 pm in Salon V
Authors will be present from 4:00-5:00 pm (#16-31)

#31

THE RELATION BETWEEN MAXIMAL FAT OXIDATION AND LACTATE THRESHOLD IN PHYSICALLY ACTIVE ADULTS

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It has been suggested that the intensity at which maximal fat oxidation occurs may be closely associated with the lactate threshold. This appears plausible given that as a person's reliance on glycolysis increases, lactate production also greatly increases. **PURPOSE:** The purpose of this study is to determine if the lactate threshold is closely associated to the relative intensity at which an individual's maximal fat oxidation rate will occur. **METHODS:** 8 younger (21.5±1.5 yr) physically active men and women participated in a discontinuous graded exercise test on a motorized treadmill to volitional exhaustion. Each 3-minute stage was separated by a 1-minute rest interval. During this interval blood lactate concentration was determined electrochemically using a handheld lactate oxidase biosensor (Lactate Plus, Nova Biomedical). The speed was increased until the volunteer reached at least a level of 13 on the Borg category scale or approximately 75% of their age-predicted maximal heart rate, after which the incline was increased while speed remained unchanged. Oxygen consumption was measured continuously using open-circuit spirometry (Jaeger Oxycon Mobile, Viasys). Fat oxidation was estimated from the relation between oxygen consumption and respiratory exchange ratio based on the data from Lusk (1924). Values for oxygen consumption and fat oxidation were averaged over the last 30 seconds of each stage. Lactate threshold was determined by visual inspection. On three separate days each volunteer also participated in 30-minute steady state exercise bouts at 50 and 75 %VO_2max and their lactate threshold. Total fat oxidation was estimated for each bout. **RESULTS:** Mean VO_2max was 56.1±3.9 ml/kg/min. Lactate threshold occurred at 78.1±2.3 %VO_2max. Maximal fat oxidation occurred at a significantly lower intensity 72.98±2.1 %VO_2max ($p<0.05$). However, during steady state exercise the greatest total fat oxidation occurred during exercise at the lactate threshold (15.6±1.7 gm) compared to 75%VO2max (13.09±0.6 gm) and 50%VO2max (12.42±0.6 gm) ($p=0.06$). **CONCLUSION:** These preliminary data suggest that maximal fat oxidation was not associated with the LT during graded exercise, though this may be due to an artificially inflated RER associated with the discontinuous protocol used. However, during continuous steady state exercise maximal fat oxidation is closely associated with the lactate threshold.

Abstracts

Oral Session
Friday, October 16, 2009 4:30-5:45 pm in Salon IV

4:30-4:45 pm

POSTPRANDIAL LIPEMIA AND FITNESS STATUS

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Elevated postprandial triglycerides (postprandial lipemia; PPL) are a risk factor for the development of coronary artery disease. Chronic exercise training and the maintenance of high levels of aerobic fitness may lead to an attenuated PPL response. However, some research indicates this is due to the effects of recent exercise as acute bouts of exercise can attenuate the postprandial rise in triglycerides in active and sedentary individuals. Furthermore, to induce the PPL response, most research utilizes high-fat meal challenges which may not represent typical eating habits. **PURPOSE:** Therefore, the purpose of this study was to investigate the role of aerobic fitness status on PPL after a 60-hr period of exercise avoidance and following the ingestion of a mixed-macronutrient nutritional beverage (360 kcal; 15% Protein, 50% Carbohyrdate, 35% Fat). **METHOD:** Sixteen healthy, young (22 ± 3 yrs) men participated in this IRB approved investigation. The men were categorized according to aerobic fitness (VO_2max: 42.50 ± 4.0 ml/kg/min for the low group, n=8, and 58.0 ± 3.2 ml/kg/min for the high group, n=8). Plasma triglyceride levels were measured at baseline and hourly for four hours following ingestion of the meal. All data reported as mean ± standard deviation. The AUC data were analyzed with a one-way ANOVA with statistical significance was accepted at $p<0.05$. **RESULTS:** Following ingestion of the meal, the four -hour incremental area under the curve (AUC) for triglycerides was greater in the low aerobic fitness group than in the high aerobic fitness group (1608.37 ± 863.86 vs. 791.05 ± 234.38 mmol/l/480min; p = 0.022). **CONCLUSION:** In this sample of men, those with high aerobic fitness displayed an attenuated postprandial lipemic response as compared to those with low aerobic fitness after 60-hr of exercise avoidance.

4:45-5:00 pm

THE GLYCEMIC AND INSULINEMIC RESPONSE TO A STANDARD MEAL 4-HOURS AFTER INGESTION OF GLUCOSE AND A NOVEL EXTENDED RELEASE CARBOHYDRATE

Michael J. Knutson[1], Mark L. McGlynn[1], Brett A. Costello[1], Marques A. Wilson[1], Abigail R. Hagen[1], Michelle L. Porter[1], Joseph M. Forshey[1], Amanda N. Traylor[1], Ronald A. Vance[2]; Jay H. Shubrook[3], Michael R. Kushnick[1]; [1]Exercise Biochemistry and Physiology Laboratory; [2]College of Nursing; [3]College of Osteopathic Medicine; Ohio University, Athens, Ohio 45701

Current research demonstrates that the composition of a first meal may influence the glycemic and insulinemic responses to subsequent meals. Healthy, lean men with high aerobic fitness represent an ideal population in which to study postprandial metabolic changes due to their ability to efficiently maintain blood glucose homeostasis. A better understanding of postprandial metabolism in this population may prove to be beneficial in the comprehension and treatment of metabolic diseases. **PURPOSE:** The purpose of this study was to investigate the glycemic and insulinemic responses to a standardized meal preceded by a meal of either rapid digesting carbohydrate (dextrose monohydrate) or a novel extended release carbohydrate in healthy, lean young men with high aerobic fitness. **METHOD:** This IRB approved research employed a repeated-measures model with eight healthy, nonsmoking, low body fat (BOD POD; 15.23 % ± 2.32), high aerobic fitness (54.03 ml/kg/min ± 1.65) young (22 yr ± 1) men. Either 50g (200kcal) of a novel carbohydrate or a glucose (dextrose monohydrate) reference meal was ingested after baseline measurement followed by a standardized second meal (578kcal, 61.21% carbohydrate, 24.94% fat, 13.85% protein) ingested 4hrs later. Plasma glucose and insulin was measured at baseline and throughout the trials. All data reported as mean ± standard deviation. The AUC data were analyzed with a one-way ANOVA and statistical significance was accepted at $P<0.05$. **RESULTS:** The two-hour incremental area under the curve (AUC) following ingestion of a standardized second meal was greater in the glucose reference trial than in the slow digesting carbohydrate trial for both blood glucose (775.85 ± 174.63 vs. 389.67 ± 88.37 mmol/l/120 min; p < 0.001) and plasma insulin (3123.71 ± 996.72 vs. 1963.81 ± 499.93 mU/l/120min; p = 0.048). **CONCLUSION:** The glycemic and insulinemic responses to a standardized meal are attenuated by ingestion of a meal of extended release as compared to rapid digesting carbohydrate in healthy, lean young men with high aerobic fitness.

Funded in part by the Office of Research and Sponsored Programs at Ohio University and The Whistler Center for Carbohydrate Research at Purdue University; All methods were approved by the Institutional Review Board at Ohio University (07F016)

Abstracts

Oral Session

Friday, October 16, 2009 4:30-5:45 pm in Salon IV

5:00-5:15 pm

Resveratrol and Exercise May Improve Kidney Disease Co-morbidities in a Model of Uremia

Hae R. Chung, Emily J. Tomayko, Pei T. Wu, Andrea J. Cachia, Filand T. Cortez, Kenneth R. Wilund.
University of Illinois at Urbana-Champaign, Urbana, IL.

Introduction: Excessive inflammation and oxidative stress in chronic kidney disease (CKD) promote muscle wasting, and vascular disease. Two therapies that have shown promote in treating these conditionings are resveratrol, which is enriched in polyphenolic compounds with anti-oxidant and anti-inflammatory properties, and exercise, which has been shown to have anti-inflammatory and anti-atherogenic effects. The purpose of this study was to test the efficacy of exercise (EXE) and resveratrol (RSV) on CKD co-morbidities in uremic mice. **Methods:** Female ApoE$^{-/-}$ mice (n=24) with surgically-induced uremia were randomly assigned to the following dietary groups for 16 weeks: control diet/sedentary (CON), control diet supplemented with resveratrol at 0.04%/sedentary (RSV), control diet/exercise (EXE). The exercise protocol consisted of treadmill running 45min/day, 5 days/week at 15 m/min. One week before sacrifice, maximal aerobic capacity (VO_2max) was assessed by treadmill test to measure physical function. At sacrifice, atherosclerosis by Oil Red O staining and calcification by Arizarin Red staining in the proximal aorta were quantified using image analysis software at 3 sites, the coronary cusps, the orifices of the coronary arteries, and the ascending aorta. All statistical tests used a two-tailed significance alpha = 0.05, and independent sample t-tests were used to assess group differences in atherosclerotic lesion size. **Results**: Aortic atherosclerotic lesion area did not differ between groups at any site, but aortic calcification was significantly reduced in RSV compared to CON in the section of the proximal aorta corresponding to the orifices of the coronary arteries. In addition, VO_2max was reduced by 16% in CON ($p<0.05$) and 29.5% in EXE groups ($p<0.05$), but did not change in RSV group, suggesting that RSV attenuates uremia-associated decline in maximal aerobic capacity. **Conclusions**: These data suggest that RSV and, in part EXE, may be beneficial in the treatment of a cardiovascular disease and physical functions associated with CKD.

5:15-5:30 pm

Efficacy of Intradialytic Cycling on Physical Performance and Cardiovascular Disease Risk in Hemodialysis Patients

Pei T. Wu, Emily J. Tomayko, Hae R. Chung, Andrea J. Cachia, Filand T. Cortez, Christopher A. Fahs, Linda M. Rossow, Bo Fernhall, FACSM, Srikanth Vallurupalli, Kenneth R. Wilund.
University of Illinois at Urbana-Champaign, Urbana, IL.

Patients with chronic renal failure (CRF) undergoing hemodialysis therapy have excessively high rates of cardiovascular disease (CVD) mortality, possibly related to increases in inflammation and oxidative stress associated with uremia. It is well established that exercise training improves CVD risk in normal populations, but little is known about the effects of exercise on CVD risk in CRF patients. The purpose of this study was to evaluate the efficacy of intradialytic endurance exercise training on factors related to the excessive CVD risk in hemodialysis patients, including systemic markers of inflammation and oxidative stress, and epicardial fat thickness (EFT), a pro-inflammatory fat depot surrounding the heart. **Methods**: Seventeen hemodialysis patients were randomized to either an exercise training (EX; n=8) or control group (CON; n=9) for 4 months. The exercise training involved cycling 3 d/wk during dialysis treatment for 45 min/session at a moderate intensity. At baseline and following the intervention, we measured blood markers of inflammation (CRP and IL-6) and oxidative stress (thiobarbituric acid reactive substances; TBARS), used echocardiography to measure cardiac structure and function, and assessed physical performance by a validated shuttle walk test (SWT). Repeated measures Analysis of Variance (ANOVA) (Group x Time) was used to assess group differences. Correlation analysis was used to identify relationships between selected variables of interest. **Results**: Performance on the SWT increased by 17% in EX ($p<0.05$), but did not change in CON. There was no change in either carotid IMT or MPI. However, the EFT was reduced significantly in EX (6.1 ± 0.8 vs. 5.5 ± 0.8 mm, $p<0.05$), but did not change in CON. When data from both groups were combined, the change in physical performance was inversely correlated to the change in EFT ($r=-0.63$; $p=0.03$). TBARS was decreased by 38% in EX ($p<0.05$), but did not change in CON. Finally, serum CRP or IL-6 levels did not change in either EX or CON. **Conclusions:** These results indicate that intradialytic exercise training may reduce CVD risk in CRF patients by decreasing markers of oxidative stress and EFT, thus providing new evidence to support the adoption of intradialytic exercise as a standard component of care for CRF patients.

Abstracts

Oral Session

Friday, October 16, 2009 4:30-5:45 pm in Salon IV

5:30-5:45 pm

EFFECTS OF WEIGHT LOSS ON LIPID AND GLOCUSE LEVELS IN OVERWEIGHT AND OBESE SUBJECTS

Lindsey A. Kelly, Richard B. Parr, FACSM, Katie C. Elder, Jodi Hatinger and Roop C. Jayaraman. School of Health Sciences, Exercise Science Division, Central Michigan University, Mt. Pleasant, MI 48859

High cholesterol is a major risk factor for coronary heart disease and stroke. Recent studies are predicting heart disease is going to surpass smoking as the number one most preventable cause of death in the U.S. **Purpose:** To determine changes in lipid profile and glucose levels following an 8-week community weight loss program. **Methods:** Thirty-eight subjects, eleven males and twenty-seven females (mean ± SD, age: 55 + 12y; height: 1.7 ± .08m; body mass: 106.0 ± 23.8 kg; body mass index: 37.0 ± 7.1 kg/m^2) participated in an 8-week community weight loss study. Fasting glucose, cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL) and triglyceride levels were measured at week 1 and week 8. The program consisted of a low calorie diet (1,200 cal/day), daily moderate physical activity and behavior modification. Subjects participated in weekly group meetings where they received training on the food exchange system, exercise adherence and behavior modification strategies. Self-reported data was gathered to monitor adherence to diet and exercise. Two test periods (pre- and post-test) were analyzed using paired sample T-tests to determine changes in lipid profile and glucose levels. **Results:** Following the 8-week program, there was a significant reduction ($p<0.01$) in post-test fasting glucose (-2%), triglycerides (-10%), cholesterol (-12%), HDL (-11%) and LDL (-13%). Exercise adherence rates of 60-100% were reported from 64% of subjects. Dietary adherence rates of 60-100% were reported from 77% of subjects. Average overall weekly group meeting attendance rate was 92% over the 8-week program. **Conclusions:** The results showed that a short-term, 8 week program consisting of a 1,200 cal/day diet and moderate intensity physical activity combined with behavior modification counseling was sufficient to promote a favorable change in fasting blood glucose and lipid profile of over weight and obese individuals.

Abstracts

Oral Session

Saturday, October 17, 2009 9:30-10:45 am in Salon IV

9:30-9:45 am

EFFECTS OF WEIGHT LOSS ON ABDOMINAL FAT STORES IN OVERWEIGHT AND OBESE SUBJECTS.

Katie C. Elder, Richard B. Parr, FACSM, Jodi Hatinger, Lindsey A. Kelly, Roop C. Jayaraman
Central Michigan University, Mount Pleasant, Michigan

Obesity affects 67% of the American population, increasing the risk for hyperlipidemia, hyperglycemia, hypertension, diabetes, and stroke. Visceral adipose tissue of the abdomen has been linked to an increased risk of these co-morbidities. **Purpose:** To determine changes in body mass, BMI, visceral and subcutaneous adipose tissue of the abdomen in men and women following an 8-week community weight loss program. **Methods:** Forty subjects, twenty-nine females and eleven males (mean $\pm$ SD, age: 55 $\pm$ 12y; height: 1.7 $\pm$ .08m; body mass: 106.0 $\pm$ 23.8 kg; body mass index: 37.0 $\pm$ 7.1 kg/m^2) participated in an 8-week community weight loss study consisting of a low-calorie diet (1200 kcal/day) and moderate physical activity. Subjects maintained daily dietary and exercise log through out the 8-week program. Subjects participated in weekly group meetings where they received training on the food exchange system, exercise adherence and behavior modification strategies. Two test periods (pre- and post-test) were analyzed using paired sample T-tests to determine changes in body mass, BMI, visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT). Total adipose tissue, SAT, and VAT were estimated using anthropometric sagittal diameter and predictive equations. Skinfold measurements were marked and taken as described by Jackson and Pollock (1985) to estimate percent body fat. Measurements were taken by trained anthropometrists with Lange calipers and recorded to the nearest 0.5 mm. Self-reported data was gathered to monitor adherence to diet and exercise. **Results:** Significant differences (p<0.01) from pre-test to post-test were found for body mass, BMI, VAT and SAT. Relative reductions were 17% for VAT and 10% for SAT after 8 weeks of intervention. Dietary adherence rates of 60-100% were reported from 77% of subjects. Exercise adherence rates of 60-100% were reported from 64% of subjects. Average attendance rate was 92% over 8 weeks. **Conclusion:** A significant (p<0.01) decrease in body mass lead to significant losses (p< 0.01) in visceral and subcutaneous adipose tissue. Post-test data showed a greater relative loss of abdominal VAT than abdominal SAT. These results are important when considering other studies that have identified an association between visceral adipose tissue and obesity-related co-morbidities.

9:45-10:00 am

Influence of Knee and Ankle Strength on Unilateral Balance in Older Women

Hannah G. Calvert, Rudy J. Valentine, Ellen M. Evans, FACSM
Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Urbana, IL

Detriments in balance are predictive of falls, fractures, reductions in physical activity and loss of independence. Muscle strength tends to decline with age, corresponding with a concomitant reduction in physical function, particularly in older women. However, the distinction between knee and ankle strength in relation to dynamic balance are not well known.

PURPOSE: To determine the influence of ankle and knee strength on dynamic balance in community-dwelling older women (N=43; age 69.3±6.1).

METHODS: Unilateral balance testing was performed using the star excursion balance test (SEBT). The SEBT was performed with the participant standing on one leg and reaching maximally in three directions: anterior (ANT), posterior-medial (PM, reaching behind at a 45° angle, in relation to the stance leg) and posterior-lateral (PL). All three reach directions were summed to provide a composite measure of dynamic balance (COMP). Both legs were tested and reach distances were normalized to leg length. Isometric knee extension (KE) and flexion (KF), and ankle plantarflexion (AP) and dorsiflexion (AD) strength were assessed using an isokinetic dynamometer. Bivariate correlations were conducted to evaluate relationships between strength and balance performance, with significance set at $p<0.05$.

RESULTS: Age was inversely related to reach distance in all directions (r range=-0.37 to -0.47, all $p<0.05$), thus all subsequent analyses were run controlling for age. Neither KE nor KF isometric peak torque was related to reach distance in any direction. When normalized to body mass KF remained unrelated to reach distance ($p>0.05$), whereas KE was related to PL ($r=0.32$, $p<0.05$), PM ($r=0.42$, $p<0.01$), and COMP ($r=0.38$, $p<0.05$) reach distances. Ankle plantarflexion was positively associated with PM ($r=0.40$, $p=0.01$) and COMP ($r=0.36$, $p<0.05$) reach performance, whereas AD had no relation. However, when normalized to body mass, both AP and AD were related to SEBT performance on reaches in all directions (r range=0.39 to 0.53, $p<0.01$ and r range=0.32 to 0.48, $p<0.05$, respectively).

CONCLUSIONS: Balance ability in dynamic challenges is influenced by both ankle plantarflexion and dorsiflexion strength relative to body mass may. With respect to the upper leg, knee extension, and not knee flexion, appears to influence balance in older women. These findings support the importance of resistance training, particularly at the ankle joint, for prevention of functional declines with age.

Abstracts

Oral Session

Saturday, October 17, 2009 9:30-10:45 am in Salon IV

10:00-10:15 am

RELATIONSHIP BETWEEN BODY MASS INDEX AND PERCENT BODY FAT IN AGING FEMALES

Beth A. Ewing & Michael P. Godard, FACSM Western Illinois University, Macomb, Illinois

PURPOSE: To examine the validity of body mass index (BMI) classification in correctly identifying overweight and/or obesity (based on body fat percent) in premenopausal, perimenopausal, and postmenopausal women. **METHODS:** Body fat percent (BF%), BMI, bioelectrical impedance, waist-to-hip, waist circumference, and activity level were assessed for a total of 252 female participants (106 premenopausal, 64 perimenopausal, and 82 postmenopausal women). BF% was determined using Bod Pod and BMI was calculated from height and weight. BMI cut-points used to characterize overweight and obese were 25 kg/m^2 and 30 kg/m^2, respectively and 30% and 35%, respectively to define overweight and obesity by BF%. Using BF% as the principle measure, receiver operator characteristic (ROC) curves were used to establish optimal BMI cut-points for overweight and obesity for females. **RESULTS:** BF% significantly increased ($p < 0.05$) from premenopausal (35.10 ± 8.35%) to perimenopausal (39.20 ± 8.62%) to postmenopausal (43.49 ± 8.51%) although there was no significant change in BMI from premenopausal (25.73 ± 5.86 kg/m^2) to perimenopausal (26.32 ± 6.41 kg/m^2) to postmenopausal (27.61 ± 6.10 kg/m^2). Total weight did not change from premenopausal (71.75 ± 17.13 kg) to perimenopausal (71.76 ± 15.84 kg) to postmenopausal (74.84 ± 17.09 kg) yet fat weight gradually increased from premenopausal (26.32 ± 12.50 kg) to perimenopausal (29.20 ± 12.48 kg) to postmenopausal (33.64 ± 13.54 kg) and lean weight gradually decreased from premenopausal (45.45 ± 6.39 kg) to perimenopausal (42.55 ± 5.16 kg) to postmenopausal (41.20 ± 5.81 kg). A strong correlation between BF% and BMI ($r = .796$, $p < 0.001$) was seen. For overweight (BF% ≥ 30) using BMI ≥ 25 kg/m^2 and obese (BF% ≥ 35) using BMI ≥ 30 kg/m^2 the best sensitivity and specificity was seen when the BMI cut-points were reduced to 23 kg/m^2 for overweight and 24 kg/m^2 for obesity for all females. **CONCLUSION:** These results illustrate that although females are not gaining significant weight in their lifetime, they are increasing body fat from premenopausal to postmenopausal. Lowering the BMI cut-points to 23 kg/m^2 for overweight and 24 kg/m^2 for obese represents a more accurate BMI classification for all adult females.

10:15-10:30 am

The Relationship between Healthy Lifestyle Behaviors and Participation in a Graduate Level Physical Therapy or Physician Assistant Program

Aimee Grande, William Saltarelli, Katlyn Owens, Tiffany Broering, Iyesha Weaver and Roop C. Jayaraman.
School of Health Sciences, Exercise Science Division, Central Michigan University, Mt. Pleasant, MI 48859

Previous research has shown that college students exhibit unhealthy lifestyle behaviors as they adjust to the academic environment, few studies have investigated these tendencies in post-baccalaureate programs. **Purpose:** To examine the lifestyle behaviors of students enrolled in a graduate level health science curriculum. **Methods:** Study participants were 73 students enrolled in a post-baccalaureate physical therapy (PT) or physician assistant (PA) program at an accredited Mid-Western university. Utilizing a series of existing surveys, data was collected before and 6 months after program enrollment. The surveys employed in this study were not previously used for research purposes, but were produced by Cengage Learning Incorporated (Belmont, CA) a company that is well respected within the academic community. Topics investigated include physical activity, nutrition, alcohol consumption, stress, hostility, vehicular safety, and knowledge and prevention of sexually transmitted infections. Paired-sample Student's t-test was used to test for significance between pre and posttest. In addition, a one-way analysis of variance (ANOVA) was also utilized to compare the difference between PT and PA students on the posttest. **Results:** After 6 months of program enrollment, the total sample of post-baccalaureate students exhibited a significant decrease in healthy lifestyle behaviors (52.89 ± 6.19, mean ± SD, vs. 49.68 ± 8.05) and a significant increase in stress (3.69 ± 0.86 vs. 4.02 ± 1.03) . Follow-up analysis revealed that these results were primarily due to a negative shift in physician assistant responses, on average -4.19 on the Healthy Lifestyle score and + 0.48 on the Stress Management score. Though students enrolled in the physician assistant program had more knowledge and prevention of sexually transmitted infections, this group of students reported fewer indicators of good health and more stress than their physical therapy counterparts. **Conclusions:** The results of this study suggest that the demands of post-baccalaureate education are associated with an increased incidence of social, spiritual, physical, emotional, and intellectual health problems. For this reason, it is important that health promotion efforts are directed at the post-baccalaureate population and that physical therapy and physician assistant students examine their lifestyle behaviors and strive to make their lives more conducive to the philosophy of the healthcare setting.

Abstracts

Oral Session

Saturday, October 17, 2009 9:30-10:45 am in Salon IV

10:30-10:45 am

PREVALENCE OF METABOLIC SYNDROME RISK FACTORS IN HIGH SCHOOL FOOTBALL PLAYERS

Jeff Hart, Gary Steffes, Ryan Gallagher, Randal Claytor, Jeffrey Potteiger, FACSM Miami University, Oxford, OH 45056

PURPOSE: Metabolic syndrome is a clustering of metabolic and cardiovascular risk factors leading to an increased risk of cardiovascular disease. The purpose of this study was to determine the prevalence of metabolic syndrome risk factors in high school football players and examine if the prevalence varied according to body fat percent.
METHODS: 71 males from seven different high schools participated in this study. All testing occurred in the early morning following an overnight fast. Percent body fat percent (BF) was determined using air displacement plethysmography (Bod Pod). Waist circumference, resting systolic and diastolic blood pressure, and fasting triglyceride, HDL cholesterol, and blood glucose were determined as metabolic risk factors using American Heart Association criteria. BF of ≤ 20% was considered Normal; BF of 20.1%-30% was considered Overweight; BF of >30% was considered Obese. Descriptive statistics, frequency distributions, and Pearson correlation coefficients were calculated for the dependent variables.
RESULTS: The prevalence for metabolic syndrome risk factors for the total group and by BF category is shown below.

	Waist Circumference (>102 cm)	Systolic BP (> 130 mmHg)	Diastolic BP (> 85 mmHg)	Triglyceride (> 150 mg/dl)	HDL Cholesterol (< 40 mg/dl)	Blood glucose (> 100 mg/dl)
Total	N=8 (12.7%)	N=6 (8.5%)	N=0 (0%)	N=8 (11.4%)	N=32 (46.4%)	N=17 (26.8%)
Normal BF (n=45)	N=0 (0%)	N=1 (2.2%)	N=0 (0%)	N=5 (11.1%)	N=20 (45.5%)	N=8 (17.8%)
Overweight (n=16)	N=2 (11%)	N=4 (22%)	N=0 (0%)	N=2 (11.8%)	N=8 (47.1%)	N=6 (33.3%)
Obese (n=6)	N=6 (100%)	N=1 (16.7%)	N=0 (0%)	N=1 (16.7%)	N=4 (66.7%)	N=3 (50%)

The most prevalent risk factor was low HDL cholesterol (n=32) followed by elevated blood glucose (n=17). Significant positive correlations were observed between BF and waist circumference ($p < 0.001$), diastolic BP ($p < 0.003$), and blood glucose ($p < 0.007$), and a significant negative correlation between BF and HDL cholesterol ($p < 0.02$). Significant positive correlations were observed between waist circumference and systolic BP ($p < 0.01$) and diastolic BP ($p < 0.004$).
CONCLUSION: High school football players, despite a high level of physical activity, demonstrate a prevalence of metabolic syndrome risk factors that may place them at risk for developing cardiovascular disease later in life.

Past Student Award Winners

Year	Award	Recipient(s)
1989	Student Presentation	DN Proctor
1990	Student Presentation	Carol Wiedeman
1991	Student Presentation	Amy Jo Casenhiser
1992	Student Presentation	Kathryn Coningham
1993	Student Presentation Student Recognition	Kevin Short Cynthia McKnight Glenna DeJoug
1994	Student Poster Presentation Outstanding Student Award Student Presentation	D. M. Choi Cathy Karroll Mary Sled
1995	Student Poster Presentation Student Presentation Outstanding Student Award Student Research Award	Ray Stasling Michael Caddia Charlie Lambert Kera Kelsey
1996	Student Presentation	Alan Parcell Cindy Bouillon
1997	Outstanding Undergraduate Student Outstanding Graduate Student Student Research Award Student Presentation	Heather Brehm Kevin Short Christopher Cheatham Sean Mulroy Christopher Cheatham
1998	Outstanding Graduate Student Student Presentation	Lisa Lesneuisky Vicki Pittenger Brandon Klump
1999	Outstanding Graduate Student Outstanding Undergraduate Student Student Presentation Student Research Award	Sean Flanagan Christine Meuller Leigh Mroteh Ty Hopkins Eric Hall
2000	Outstanding Undergraduate Student Outstanding Graduate Student Student Research Award Student Presentation	Kindal Shores Cindy Anderson David Wright Cindy Anderson Cheri Teranishi
2001	Outstanding Graduate Student Outstanding Undergraduate Student Student Presentation Student Research Award	Dawn Coe Tamara Keehn S. K. Tsivitse D. C. Wright Michelle Masterson

Past Student Award Winners

2002	Outstanding Graduate Student	Candace Perkins
	Outstanding Undergraduate Student	Evelyn Warner
	Student Research Award	Paul R. Nagelkirk
	Student Presentation-Poster: Undergrad	Christina Hayter
	Student Presentation- Poster: Masters	Jessica Sobolewski
	Student Presentation- Poster: Doctoral	Paul R. Nagelkirk
	Student Presentation- Oral	Adam Coughlin
2003	Outstanding Graduate Student	Paul Nagelkirk
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student	Maxi Meissner
	Student Presentation	DM Malek
		Paul Nagelkirk
		Michelle Masterson
		Patrick Johnson
		Renee Rogers
		Andrew Cole
	MWACSM Professional Award	Cody Sipe
2004	Outstanding Graduate Student	Dan Ritchie
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student	Alicia Gordon
	Student Presentation- Poster: Undergrad	Dan Kelly
	Student Presentation- Poster: Masters	Natalie Schweitzer
	Student Presentation- Poster: Doctoral	Christopher Herman
	Student Presentation- Oral: Undergrad	Andrea Ott
	Student Presentation- Oral: Masters	Christine Layman
2006	Student Presentation- Oral: Masters	Megan Holmes
	Student Presentation- Oral: Doctoral	Phil Anton
	Student Presentation- Poster: Undergrad	Elizabeth Priest
	Student Presentation- Poster: Masters	Lindsay Sammut
	Student Presentation- Poster: Doctoral	Richard Carpenter
	Student Research Award	Juame Padilla
	Outstanding Graduate Student	Richard Carpenter
	Outstanding Undergraduate Student	Rebekah Kuczynski
	MWACSM Professional Award	Clinton Brawner
2007	Student Presentation- Oral: Undergrad	Lindsay Kelly
	Student Presentation- Oral: Masters	Erin Kuffel
	Student Presentation- Oral: Doctoral	Tyrone Washington
	Student Presentation- Poster: Undergrad	Lisa Guth
	Student Presentation- Poster: Masters	George Schweitzer
	Student Presentation- Poster: Doctoral	Chris Herman
	MWACSM Professional Award	Kevin Temerowski
2008	Student Presentation- Oral: Masters	Leryn Boyle
	Student Presentation- Oral: Doctoral	Lanay Mudd
	Student Presentation- Poster: Undergrad	Rodney Pius
	Student Presentation- Poster: Masters	Michael Knuston

Past Founder's Award Winners

Year	Recipient
1994	Tim Kirby
1995	Richard Bowers
1996	Merle Foss Henry Montoye Fazlola Nickhah
1997	Leonard Kaminsky
1998	Richard Parr
1999	Wayne Sinning
2000	Ann Snyder
2001	Darlene Sedlock
2002	Jeff Edwards
2003	Lynn Millar
2004	Jeff Betts
2005	Tony Mahon
2006	Barry Franklin
2007	Lynn Darby
2008	Elaine Betts

Dr. Elaine Betts, Recipient of the 2008 Founder's Award

2008 MIDWEST ACSM ANNUAL MEETING

OCTOBER 23-25

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Welcome to the 2008 Midwest Regional Chapter of the
American College of Sports Medicine
Annual Meeting

October 23-25, 2008
Bowling Green State University

WELCOME

October 2008

Welcome to the 2008 Annual meeting of the Midwest Chapter of the American College of Sports Medicine and to Bowling Green State University!

The program is filled with numerous high quality sessions, many designed specifically for students. In addition, please take advantage of our social opportunities such as the Opening Social and Friday night at the Black Swamp pub. Also on Friday, please come and cheer on your favorite school in the 2nd Annual MWACSM Jeopardy competition!

I hope that you find the conference to be informative and fun, and take the opportunity to refresh old friendships and forge new ones.

Again, welcome.

Sincerely,

Amy L. Morgan, Ph.D.
Past President, MWACSM
Associate Professor
Bowling Green State University

BGSU.
BOWLING GREEN STATE UNIVERSITY
School of Human Movement, Sport, and Leisure Studies

October 23, 2008

Welcome!

It is with great pleasure that I welcome you as a member of the Midwest Regional Chapter of the American College of Sports Medicine to the BGSU campus and particularly to the School of Human Movement, Sport, and Leisure Studies. The MWACSM is an impressive regional professional organization with more than 800 active members and approximately 300 anticipated participants at this conference.

I wish you much success as you share your research findings, interact with colleagues, and attend keynote addresses by leaders in the field. Our School is pleased to serve as the MWACSM Executive Director's office, and we hope that you will join the tour of the Gertrude Eppler Complex, home to our seven undergraduate programs and three graduate specializations.

Again, the School is pleased to welcome you to campus and wishes you a highly productive and enjoyable conference!

With warm regards,

Bonnie Berger

Bonnie G. Berger, Ed. D.
Director and Professor

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Conference Information

OBJECTIVES
The 2008 meeting of the MWACSM is designed to:

- Enhance the scientific and clinical understanding of the physiological, biochemical, and psychological basis for the changes that occur during and following exercise in both normal and pathological states;
- Provide a forum for members and students to present research related to exercise science and sports medicine; and
- Promote interaction among scientists, clinicians, and students in related fields to provide new approaches to, and perspectives on, problems in exercise science and sports medicine.

TARGET AUDIENCE
MWACSM members, ACSM members, clinicians, professionals, and students interested in the field of sports medicine and exercise science.

ACSM Continuing Education Credits (CEC's)
The American College of Sports Medicine's Professional Education Committee certifies that this annual meeting meets the criteria for 12 credit hours of ACSM Continuing Education Credit. Credit is awarded for these CECs by attending the "Midwest Regional Chapter ACSM Annual Meeting." The MWACSM is an "Approved Provider" of CEC for ACSM. A certificate documenting completion of 12 CEC's is included in each registration packet.

NAME BADGES
Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Please hold on to your badge!

MEETING LOCATIONS
All sessions and events unless otherwise noted will be held in the Bowen-Thompson Student Union. Room assignments for educational events are detailed in this program, along with a map of the Bowen-Thompson Student Union.

Those sessions held in other campus locations are detailed in this program. A BGSU campus map is available for meeting participants.

ANNUAL BUSINESS MEETING AT THE LUNCHEON BANQUET
The annual luncheon banquet and business meeting is scheduled for Friday from 12:30-1:30 pm in 202A BTSU, the Grand Ballroom. The annual business meeting is your opportunity to participate in the activities of the Midwest Chapter of ACSM. Please plan to attend on Friday.

AWARDS
The annual 'Founder's Award' and the Professional Award will be announced at the banquet on Friday. The Founder's Award is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

FUTURE MEETING SITE
TBA - The MWACSM Board is considering Pheasant Run Resort and Hotel in St. Charles, Illinois.

Schedule of Events

(all rooms are in the Bowen Thompson Student Union unless indicated otherwise)

Thursday, October 23, 2008

Time	Event	Location
3:00-7:00 pm	Registration	Ingram-White Castle Foundation Lounge
5:30-6:45 pm	*Which path should you take? Finding your career in exercise science.* Lanay Mudd, Tyrone Washington, Ph.D., Tillar Landick, Michelle Prinz	207, Mylander Room
7:00-8:00 pm	Keynote Lecture: *Water and sodium balance during exercise.* Craig Horswill, Ph.D, Gatorade Sports Science Institute	206, Theater
8:00-10:00 pm	Social	207, Mylander Room

Friday, October 24, 2008

Time	Event	Location
7:45 am-5:00 pm	Registration	Ingram-White Castle Foundation Lounge
8:00-9:15 am	*Interaction of environment and genetics: What a difference a few key genes make.* Helaine Alessio, Ph.D., FACSM	228, Multipurpose Room
8:00-9:15 am	*Optimizing hydration habits for youth athletes-practical strategies to enhance safety and performance.* Susan Yeargin, Ph.D. ATC	201 Sky Bank Room
8:30 am-5:00 pm	Poster Session (see pages 14-23)	207, Mylander Room
9:30-10:20 am	*"Boomeritis" addressing the increasing problem of sports injuries in Baby Boomers.* Rebecca M. Northway, M.D.	228, Multipurpose Room
9:30-10:20 am	*What to look for and how to prepare and apply for a clinical exercise physiology internship.* Dalynn Badenhop, Ph.D., FACSM	201, Sky Bank Room
10:30-11:20 am	President's Lecture: *Interventions to build physical reserve and reduce risk of functional dependency.* M. Elaine Cress, Ph.D., FACSM, University of Georgia	206, Theater
10:30-11:20 am	*Update on ACSM certifications.* Shel Levine	201, Sky Bank Room
11:30am-12:00 pm	*Making MWACSM and ACSM work for you: Find and apply for student awards and research funding.* Lanay Mudd	202B, Community Room
12:00-12:30 pm	Ask the Experts- Michael Kushnick, Ph.D., Lanay Mudd, Laura Dahmer	202B, Community Room
12:30-1:30 pm	Luncheon	202A, Lenhart Grand Ballroom

Schedule of Events

Friday October 24, 2008

Time	Event	Location
1:45-3:00 pm	Free Communications (see pages 23-25)	201, Sky Bank Room
1:45-3:00 pm	*Medical fitness facilities: Bridging the gap between medicine and fitness*. Richard K. Cavender, M.D. FACEP	228, Multipurpose Room
1:45-3:00 pm	*Digital portfolios for a digital age*. Brenda Reeves, Ph.D., FACSM, Deanna Romano, Ph.D.	207 C, Technology Building
3:10-4:00 pm	President's Lecture: *Ultraendurance exercise*. Mark Langenfeld, Ph.D., FACSM, Southeast Missouri State University	206, Theater
3:10-4:00 pm	*Body composition and its affects on the sports performance spectrum*. Dawn Weatherwax-Fall, RD, LD, ATC	201, Sky Bank Room
4:00-5:00 pm	Women's Social	208, Family Room
5:00-6:00 pm	Graduate Fair	228, Multipurpose Room
6:00-7:30 pm	Jeopardy!	228, Multipurpose Room
7:30-???	Social and Pizza	Black Swamp Pub

Saturday October 25, 2008

Time	Event	Location
8:00-10:00 am	Registration	228, Multipurpose Room
8:30-9:45 am	Free Communication (See pages 25-27)	201, Sky Bank Room
8:30-9:45 am	*Implementing work stations in the work place: Practical considerations*. Ronald H. Cox, Ph.D., Jared Guth, Christina Ohlinger, RD, LD	228, Multipurpose Room
10:00-10:50 am	*An analysis of the physiological changes of athletes during team sport seasons*. Andy M. Bosak, Ph.D.	201, Sky Bank Room
10:00am-6:30pm	ACSM Certified Personal Trainer Workshop	Eppler Center 223
11:00-11:50 am	Keynote Lecture: *Unfinished business: What are the independent effects of exercise and exercise training?* Dr. Anne B. Loucks, FACSM, Ohio University	228, Multipurpose Room
11:50am-12:00pm	Closing Comments	228, Multipurpose Room

Finding Other Sessions

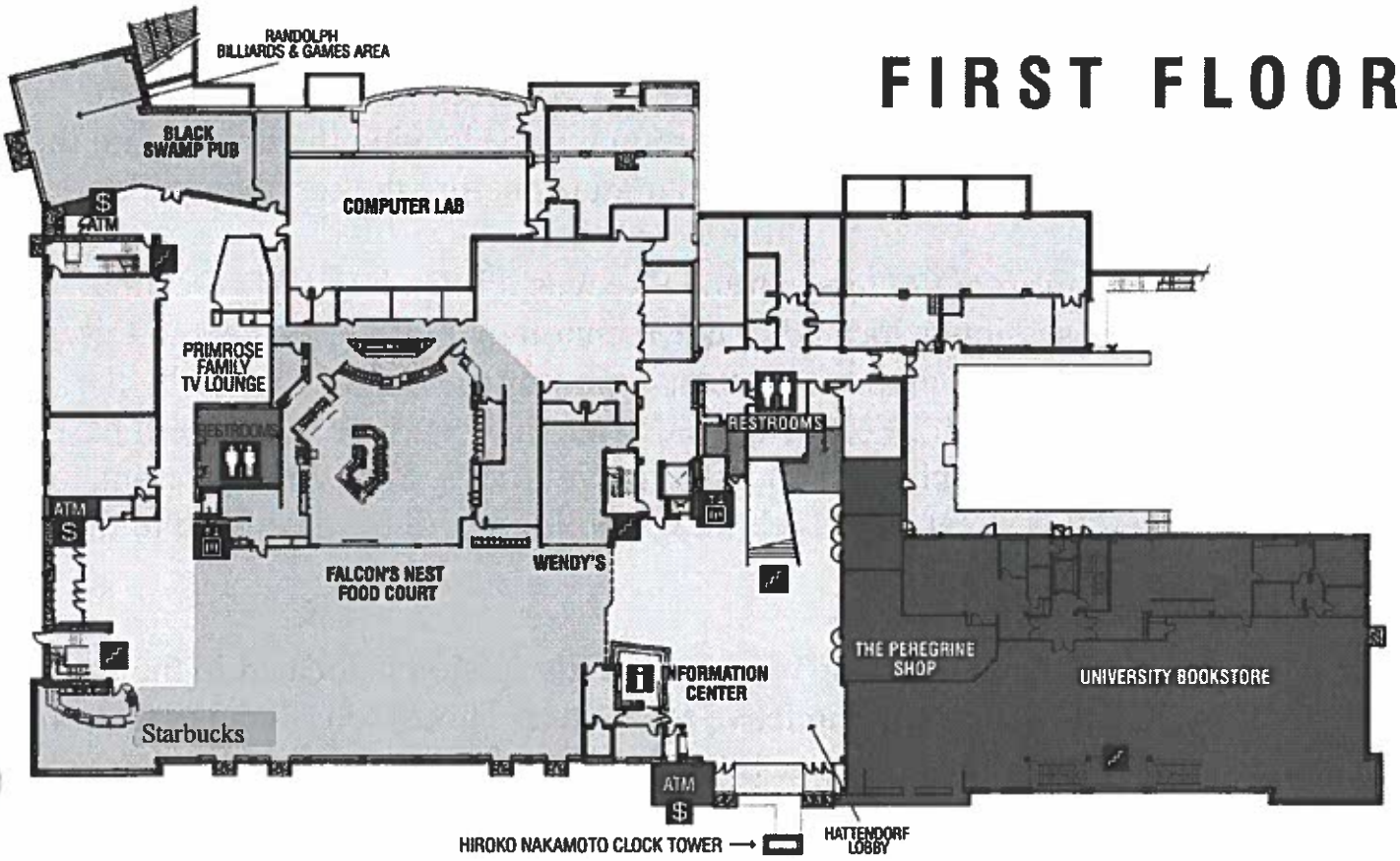
There are two sessions that are not located in the Bowen Thompson Student Union. There is a campus map located on pages 29-30. If you need any assistance staff members will be available to assist you. A group will be leaving the union from the registration desk to go to the sessions fifteen minutes before the sessions start.

1) *Digital portfolios for a digital age.* Brenda Reeves, Ph.D., FACSM., Deanna Romano, Ph.D. This session is located in the Technology building. To get to this building leave the Bowen Thompson Student Union by the main entrance by the bookstore and turn left (north). Follow the sidewalk and continue to go north past the Math Science and Life Science buildings (on your left). You will then come to Merry Street. Cross this street. The Technology building will be ahead and to the right.

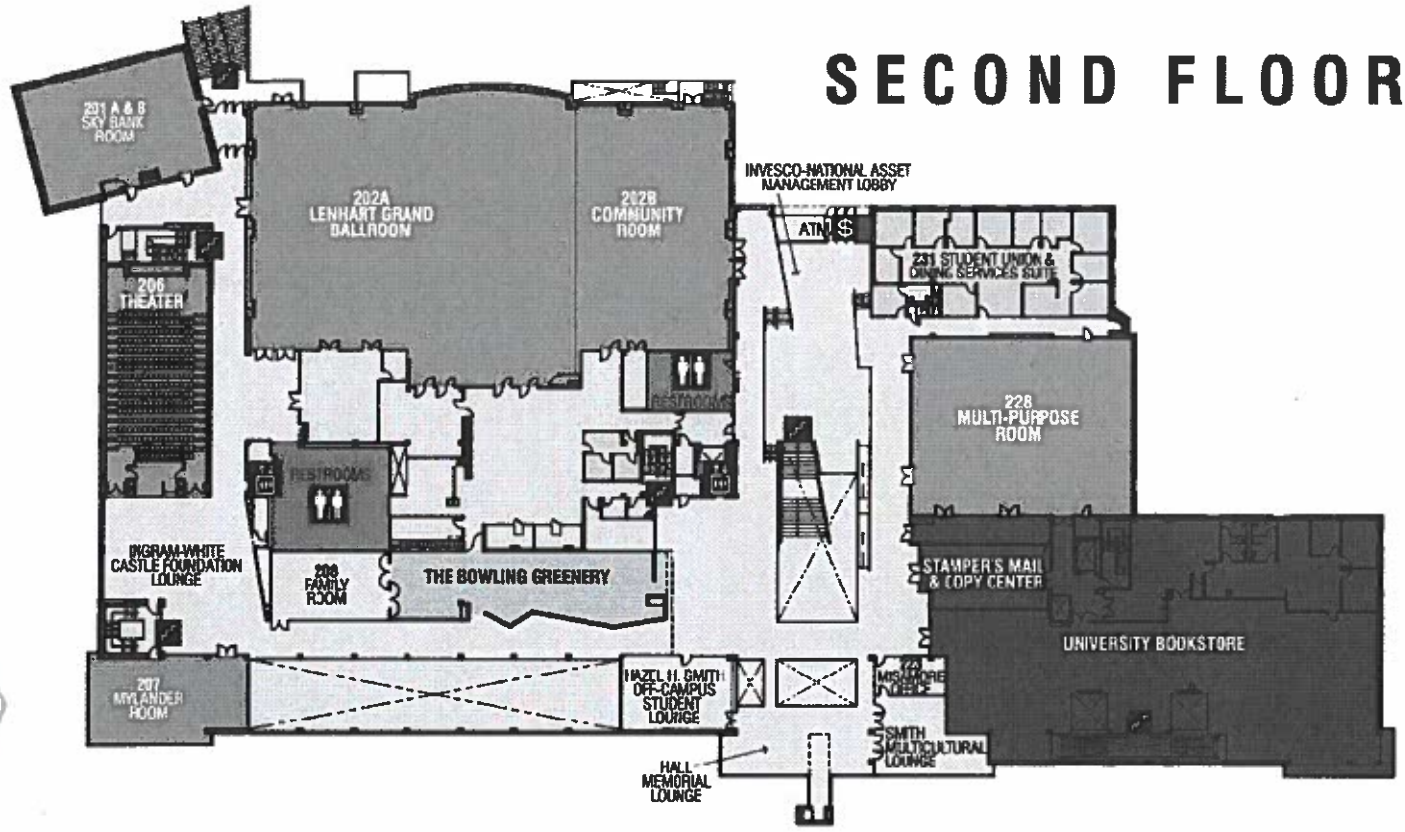
2) ACSM Certified Personal Trainer Workshop. This session is located in the Eppler Complex. To get to this building leave the Bowen Thompson Student Union by the main entrance by the bookstore. Eppler Complex is directly across the oval from the Union. Go straight out of the Union and pass Hayes Hall building on your left. Eppler Complex will be the building directly ahead of you. This session is located on the second floor in the center of the building– Room 223 Center.

Bowen Thompson Student Union

FIRST FLOOR



SECOND FLOOR



Featured Speakers

Craig Horswill, Ph.D.

Craig Horswill is a Senior Manager in Gatorade Science Innovation and Support (formerly the Gatorade Sports Science Institute) and has been with The Gatorade Company since 1994. His primary duties are to oversee efficacy research on Gatorade and new product, with a focus on hydration, nutrition and energy. He has published or co-authored over 60 papers in peer-reviewed journals on physical performance, body composition and hydration, or nutrition and fatigue. Craig received a B.S. undergraduate (natural sciences/chemistry), Master's degrees (exercise physiology) from the University of Wisconsin at Madison, and doctorate is in exercise physiology from the University of Illinois Urbana-Champaign. Prior to joining Gatorade, he served two years as a post doc in the Human Performance Lab at Ball State University, and six years as clinical assistant professor in the Divisions of Endocrinology and Nutrition, Department of Pediatrics, The Ohio State University and Columbus Children's Hospital. Craig is currently a member of the American College of Sports Medicine and the North American Society for Pediatric Exercise Medicine.

Anne Loucks, Ph.D.

Anne Loucks received her doctoral degree in physiology in 1983 from the University of California, Santa Barbara, and her post-doctoral training as a Ph.D. fellow in the Department of Reproductive Medicine at the University of California, San Diego, Medical School where she conducted extensive endocrine characterizations of female athletes. Since arriving at Ohio University in 1988, Anne has been conducting randomized, prospective, controlled experiments investigating the physiological mechanisms mediating the influences of diet and exercise on the endocrine regulation of fuel metabolism, reproductive function and bone turnover in men and women. The aim of these experiments is to acquire knowledge that will be useful for refining nutritional guidelines to better protect the health of athletes, military personnel and others who strive to improve their performance in physically demanding activities.

Anne is a Fellow of the American College of Sports Medicine (ACSM). She has received honors and awards for her research from ACSM and The Endocrine Society and Pfizer, Inc. She is a co-author of the position stands of ACSM and the International Olympic Committee (IOC) on the Female Athlete Triad. The IOC, the Federation of Football Associations (FIFA), and the International Amateur Athletic Federation (IAAF) included her in international consensus conferences on the influence of nutrition on health and performance in their sports, and she has served as an advisor to the medical and nutritional staffs of the Australian and English Institutes of Sports.

Featured Speakers

Elaine Cress, Ph.D.

Dr. Cress has worked in the field of gerontology for over 30 years. As an exercise physiologist she has received advanced degrees from the University of Colorado in Boulder and the University of Wisconsin in Madison. She is a professor at University of Georgia in the College of Education, Department of Kinesiology and College of Public Health, Department of Health Promotion and Behavior where she teaches courses in exercise and aging, public health physical activity interventions and gerontology for the gerontology graduate certificate program. She is a fellow in the American College of Sports Medicine and the Gerontological Society of America. With funding from the National Institute on Aging, she developed and validated the Continuous Scale Physical Functional Performance (CS-PFP) measure while in her post-doctoral work at the University of Washington. Her work has provided a means to test the impact of interventions on functionality in a broad range of diseases and allowed her to quantify the concept of physical reserve as it relates to functional ability and physical capacity. Being able to assess physical reserve she is now researching on person-environment for older adults to optimize quality of life in different living arrangements. Her research is internationally respected. She has active research programs in Switzerland and in Italy and the CS-PFP is used in several European countries as well as Canada and the US. She is the 2008 recipient of the Herbert H. deVries award for Distinguished research in the field of aging and gerontology from the American Association of Health, Physical Education, Recreation and Dance. Dr. Cress has published forty peer review articles and six book chapters with over 2,500 citations of her work.

Mark Langenfeld, Ph.D.

Mark Langenfeld earned his PhD in Exercise Physiology from The Ohio State University in 1980. He has taught at University of Maine, Miami University, and Southeast Missouri State University. Before graduate school Mark participated in and studied ultraendurance exercise. In May 2008 he presented a Colloquium at the national ACSM meeting about his involvement as a member of the Amazon Virtual Medical Team which supported Martin Strel, the first person to swim the entire Amazon River.

Abstracts

Poster Session, October 24, 2008 from 8:30am-5:00pm
Authors will be present from 9-10:15am (#1-12)

1) **ASSESSMENT OF CARDIOVASCULAR RESPONSE AND METABOLIC COST OF SPEAKING WHILE USING AN ACTIVE WORKSTATION.**
Jarod Guth, Ron Cox, Christopher Reed, Helaine Alessio, FACSM, Susan Brehm, Brianna Kellems and Leah Siekemeyer. Departments of Kinesiology and Health, and Speech Pathology and Audiology, Miami University, Oxford OH 45056.Click Here to Add Author(s) and Institutional Affiliations

Physical inactivity not only contributes to obesity but may be intrinsically pathogenic. Efforts to significantly increase physical activity (PA) have taken a variety of forms but are often unsuccessful. A recent innovative attempt to increase PA involves alteration of the work environment to allow walking while working at an active work station. This intervention may impact energy expenditure. However, questions remain as to its affect on users' job performance and metabolic expenditure. Two common tasks involved in the work place are phone or interpersonal conversation. PURPOSE: This study documented the heart rate, blood pressure and metabolic requirement (VO2) of speaking while sitting, standing and walking. METHOD: Thirty adults aged 37+/- 14 years participated in all conditions. Heart rate and VO2 were obtained continuously with a Parvomedics metabolic system and expressed as ml/kg/min while subjects read silently, and aloud, or engaged in spontaneous conversation in a sitting, standing or walking (1 mph) condition. Blood pressure and rating of perceived exertion (RPE) were obtained during the last minute of the respective tasks. Expert listeners, blinded to the purpose of the study and the protocol assessed randomized samples of the participants reading and spontaneous speech tasks during the 3 conditions. RESULTS: Standing elevated metabolic rate 10-15% over the sitting position (3.3 +/-.7 vs. 3.6 +/- .9 ml/kg/min). Walking 1 mph while performing the respective tasks resulted in PA of 2.0-2.3 MET. The ranges for heart rates for the tasks performed under sitting-standing-walking conditions were 78-83, 87-91, and 90-96 bpm respectively. RPE across conditions varied from .4 to 1.6. CONCLUSION: The significant elevation in metabolic rate in the absence of any deterioration in speech quality or RPE support the utility of using active work stations to significantly increase PA in the work environment and thereby enhancing health.

(Work was supported by the Miami University Undergraduate Summer Scholars Program)

2)**DEMOGRAPHICS OF AN ADULT EAST CENTRAL INDIANA POPULATION AND PHYSICAL ACTIVITY RECOMMENDATIONS**
Jason L. Jones[1], Leonard A. Kaminsky[2], FACSM, Trent A. Hargens[3] [1]Ball State University, Muncie, IN

Full abstract can be found on page 26

3) **EFFECT OF BODY COMPOSITION ON EPINEPHRINE AND NOREPINEPHRINE LEVELS DURING IMMERSION IN 18, 22 AND 26°C WATER**
Katherine Pierce[1], Greg Farnell[1], Rob Demes[1], Edward J. Ryan[1], Tiffany Collinsworth[1],Matthew V. Bliss[1], David Bellar[1], Jacob E Barkley[1], Ellen L. Glickman FACSM[1], GaryH. Kamimori FACSM[2]. [1]Kent State University, Kent, OH; [2]Walter Reed Army Institute of Research, Silver Springs, MD.

INTRODUCTION: It has been suggested that an individual's ability to maintain core temperature is largely dependent on tissue insulation (i.e., body composition). Acute cold exposure results in the release of epinephrine (EPI) and norepinephrine (NE) to increase heat production and maintain core temperature. Research has demonstrated that NE may increase while EPI remains relatively stable in response to cold exposure. The relationship between tissue insulation and EPI and NE levels during cold water immersion (CWI) remains uncertain. **PURPOSE:** To evaluate the effect of body composition on EPI and NE levels in males during immersion in 18, 22 and 26° C water. **METHODS**: Six low-fat (LF) males (22.2±2.0 y; 10.1±1.42% body fat) and 5 high-fat (HF) males (23.2±3.8 y; 28.1±3.5% body fat) underwent pre-experimental testing to determine body composition. Participants underwent 3 trials in which they were immersed to the first thoracic vertebra with limbs separated and extended for up to 120-min (or until $T_{re} \leq 35°C$) in 18, 22 or 26°C water. Blood samples were taken at 0, 60, and 120 min during CWI and analyzed for EPI and NE. **RESULTS:** Random effects model revealed a significant group x time interaction for EPI ($p = 0.006$), with the LF males demonstrating a greater change in EPI from minutes 0-120 than the HF males at all temperatures (LF: Δ33, Δ1.8, and Δ15.8 pg/mL for 18, 22 and 26°C; HF: Δ-21.8, Δ-3.6, and Δ-10.7 pg/mL for 18, 22, and 26°C). While there was not a differential ($p=0.09$) NE response of the HF and LF participants to cold water immersion (CWI), time was found to be a significant ($p \leq 0.001$) predictor of NE levels in all individuals at all temperatures; as time of CWI increased, NE levels increased (LF: Δ298.5, Δ458.1, and Δ297.5 pg/mL for 18, 22 and 26°C; HF: Δ128.6, Δ172.5, and Δ130.8 pg/mL for 18, 22 and 26°C). **CONCLUSION:** From these data, body composition appeared to affect the sympathetic stress response as exhibited by the differential increase in EPI between groups. Time was also a significant predictor of NE levels for all participants in response to immersion in 18, 22 and 26°C water.

4) **ACTIGRAPHY ASSESSMENT OF THE EFFECTS OF CIRCUIT TRAINING EXERCISE ON SLEEP IN HEALTHY, MORNING-TYPE WOMEN**
Kirsten Engelbrecht, Hermann-J. Engels, FACSM, Jean E. Davis, Hossein N. Yarandi, Wayne State University, Detroit, Michigan

Empirical research on the effects of exercise on sleep is limited and findings are often inconsistent. In addition to the exact nature of exercise and its timing relative to sleep, it is widely recognized that various

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distinct individual traits of a person (e.g., age, gender, health status, morning-type vs. evening-type) as well as other key study methodological differences can importantly affect the research outcome. As a result, much remains to be learned about the relationship between exercise and sleep. **PURPOSE:** The purpose of this study was (1) to compare wrist actigraphy-derived nocturnal sleep characteristics of healthy, morning-type women between non-exercise and structured exercise program (circuit training class) days, and (2) to examine whether a change in the regular time-of-day of their established exercise routine from the morning hours to the early evening hours affects sleep. **METHODS**: Fifteen healthy, morning-type (Horne & Ostberg, 1976) women (age: 47.3±5.5 yrs) were recruited for this study. All subjects were following an established (6 weeks or longer) morning (between 7am - 9am) exercise training routine that consisted of a 0 min, personal trainer supervised, moderate-intensity, circuit-training program conducted at a commercial fitness facility. For purpose of this study, sleep/wake patterns were determined from 24-hour wrist actigraphy (AW 64 Actiwatch, Mini Mitter, Bend, OR) recordings over five successive weekdays. During three of these five weekdays, subjects did not participate in any formal exercise training sessions. On the remaining two (always non-consecutive) days, subjects completed their regular 60 min circuit training classes on one day during their normal morning hours (between 7am - 9 am) and on the other day it was changed to the evening hours (between 5pm - 7pm). Actigraphy data were scored using the Actiware (version: 5.0) sleep analysis software (Mini Mitter, Bend, OR) for the assessment of total sleep time (TST), sleep onset latency (SOL), wake after sleep onset (WASO), and sleep efficiency (SE). **RESULTS:** Descriptive means (± standard deviation) for the global score on the Pittsburgh Sleep Quality Index and the Beck Depression Inventory for the study cohort was 4.33 (± 2.94) and .64 (± 3.65), respectively. Repeated measures ANOVA revealed no significant differences between actigraphy-derived nocturnal sleep characteristics for TST, SOL, WASO, and SE between non-exercise and normal morning exercise days (>0.05). Moreover, changing the habitual exercise training routine from the morning hours to the early evening hours failed to have a significant effect on these sleep measures (p>0.05). **CONCLUSIONS:** The present findings indicate that moderately intense circuit training exercise, either performed during a regular accustomed morning training time period or when changed to an unaccustomed early evening time period, does not seem to influence the normal sleep of healthy, morning-type women.

5) EFFECT OF SKATING TECHNIQUES ON SPEED OF QUICK START IN HOCKEY

Jabar Y. Askerov and Qin Lai, Wayne State University, Detroit, Michigan

The traditional North American quick start technique for hockey has some dissadvantages. It tends to slow a hockey player's explosiveness from a start due to a lack in range of motion in the shoulder, torso and knee. On the other hand, the Russian professional technique focuses on extending the shoulder, torso and knee. Furthermore, the Russian professional technique requires a player to make an eversion on his/her foot near 90 degrees instead of a 45 degrees seen in the traditional north American technique. PURPOSE: Therefore, the purpose of the study is to determine which skating technique is better to improve quick start speed in youth ice hockey players. METHODS: Fifteen ice hockey players between the ages of 13 to 17 (M= 14) and their parents signed an assent and an informed consent respectively, prior to experiment. They were instructed to perform an ice hockey quick start for a distance of 6.096 meters (20 feet) using two different techniques. The quick start was filmed by a Canon GL2 camera with 7.0104 meters (23 feet) distance from the skating path line. The films were digitized by Peak Motus 2D system at 64 frames per second. The interested dependent variables were time and angular displacements of shoulder, torso and knee for the quick start. RESULTS: Paired t-test on the two different techniques revealed a significant difference for skating time (M=1566 ms vs. M=1522 ms), t=7.15, p<.05, and mean angular displacement of torso (M=130 deg vs. M=135 deg), t=5.09, p<.05 between the skating techniques. Specifically, participants using the Russian professional technique decreased the time of quick start skating and increased the angular movement of torso, compared to using the North American one. CONCLUSION: The results demonstrated that Russian technique significantly improved ice hockey players' speed and explosiveness during the quick start. The improvement was due to an increase in range of motion of the torso. The current findings suggest the Russian professional technique might be a better way for quick start skating in ice hockey than the traditional North American technique.

6) EFFECT OF FLEX NIMBO TRAINING EQUIPMENT ON PERFORMANCE IN COLLEGIATE FOOTBALL PLAYERS

Nicholas A. Haught, Michael J. Rebold, & Jaimy M. Lekan. Baldwin-Wallace College, Berea, Ohio.

The Flex Nimbo is a novel total body resistance training device that employs resistance bands from the upper core to extremities to increase the effectiveness of workouts. The manufacturers of Flex Nimbo claim that it will increase range of motion, joint stability, power, speed, and strength, relating to improvements in sport performance (http://FlexNimboFSE.com). PURPOSE: This research study examined the influence of a four week training program incorporating the use of the Flex Nimbo device compared with a traditional training program on speed, agility, and power. METHODS: Twenty healthy male, Division III College football players (18-20 yrs.) participated in the study. Subjects were randomly assigned to the Flex Nimbo (FN) and the Control Groups (CN), having 10 in FN and 10 in CN. The study was a Pre- and Post-test design measuring the following performance variables: 40 meter dash for speed and acceleration, sit and reach for flexibility, vertical jump test for

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lower body power, and the Pro Agility and Brown's Agility test for agility and lateral movement. All test followed ACSM and NSCA guidelines. Training workouts were performed two times per week for four weeks, lasting 30 minutes each. Day one focused on agility and acceleration drills consisting of hurdles, ladders, standing long jumps, vertical jumping skills, and Brown's and Pro Agility combinations. Day two focused on power drills consisting of chest passes with a push-up, side shuffles, lateral explosions, and planks. RESULTS: Two-way ANOVA's (group x time) were performed with significance set a priori at $p<0.05$. There were no significant differences between FN and CN groups following training in any dependent variable (vertical jump FN 50.5 ± 8.7 cm vs. CN 50.5 ± 14.3 cm; Pro Agility FN 4.98 ± 0.26 sec vs. CN 4.97 ± 0.32 sec) , nor was there a difference within group from pre- to post-test (vertical jump FN 54.0 ± 8.0cm vs. 50.5 ± 8.7 cm, CN 53.0 ± 15.5 cm vs. 50.5 ± 14.3 cm). CONCLUSIONS: Neither training group exhibited statistically significant improvements in performance measures following the four week program. Furthermore, the Flex Nimbo device offered no advantage over training without the equipment.

7) A CASE REPORT DESCRIBING USE OF COMPREHENSIVE FUNCTIONAL EVALUATION TO ASSESS BIOMECHANICAL DYSFUNCTION ASSOCIATED WITH CHRONIC KNEE PAIN AND TREATMENT USING MODALITIES

Manoj Mithal[1] MD. PhD. Melinda D. Udell DPT. 1Three Rivers Health-Kalamazoo Center for Medical Studies/ Michigan State University, Three Rivers, Michigan.

Purpose: To describe comprehensive functional evaluation techniques to assess and treat biomechanical dysfunction associated with chronic knee pain. Presentation: The patient is a 31year old competitive marathon runner. She had an initial anterior cruciate ligament injury (ACL) in November 1995 while playing field hockey. She underwent ACL reconstruction and medial meniscus repair in September 1996. Few details were available of her post surgery rehabilitation; patient did not return to playing field hockey and instead took up long-distance running. In August 1998 during training for running a marathon she heard a few pops in the right knee; subsequent evaluation revealed a torn medial meniscus hence she underwent a medial menisectomy in November 1998. Over the next few months she occasionally felt her right knee buckle and also noticed a clicking sound during running. Assessment: On initial physical examination patient presented with positive hyperlordosis of thoracic spine with restricted end range of motion in external rotation bilateral hip. Moderate tensor fascia lata (TFL) tightness right lower extremity mild TFL tightness left lower extremity. Positive moderate to severe tightness pyriformis and gluteus medius bilaterally right more than left. Positive tender points pyriformis and gluteus medius right more than left. Positive mild tenderness right knee medial joint line with mild crepitus. Method: Pre and post assessment at pre and six weeks post .Patient was treated over a six week period three times per week with modalities of stretching, deep tissue massage, core muscle strengthening and aerobic exercise. Results: Repeat physical examination after six weeks demonstrated decreased knee pain using a visual analog scale of 0-10 from 5/10 to 2/10. Repeat physical examination at six weeks demonstrated decreased tightness in the tensor fascia lata bilaterally with increased flexibility in the glutei muscle and the pyriformis muscle. Improved end range of motion external rotation bilateral hip was also noted . Conclusion: Comprehensive functional evaluation approach focuses on understanding the overall biomechnical dysfunction associated with running injuries. The research emphasizes importance of comprehensive functional evaluation in improving outcomes of treatment and preventing recurrence of injuries. The research also discusses use of modalities to treat the underlying dysfunction.

8) STABILITY OF RUNNING ECONOMY IN MEN AND WOMEN DIVISION I COLLEGIATE BASKETBALL PLAYERS

Rebecca A. Rudey[1] , Karissa Peyer[1], Joshua J. Ode[2], Jeremy L. Knous[2], James M. Pivarnik[1], FACSM [1]Michigan State University, East Lansing, Michigan, [2]Saginaw Valley State University, University Center, Michigan

Previous running economy studies have focused on individual, rather than team sports, and have not examined the stability of this variable as athletes mature. **PURPOSE:** The purpose of our study was to compare running economy of NCAA Division I basketball players between their first and second years of college. **METHOD:** Anthropometrics (height, weight, % fat) were obtained on 38 (13 women, 25 men) NCAA Division I basketball players. Following these measures, all participants completed a discontinuous maximal treadmill protocol that featured alternating 3 min run and 90 sec rest stages. Expired respiratory gases (SensorMedics 2900) and heart rate (EKG) were measured continuously throughout, and finger stick blood samples (for blood lactate) were obtained during rest stages. Oxygen consumption (VO_2) at the third min of stages 1 (VO2-1; 6 mph, 0% grade) and 2 (VO2-2; 6 mph, 5% grade) was used as an index of running economy. Changes in VO2-1, VO2-2, VO_{2max}, % fat, and $lactate_{max}$ were calculated by subtracting year one from year two values. Differences in running economy between years were evaluated using ANOVA. Pearson correlations were run (using absolute values and change scores) between VO2-1 and VO2-2 (dependent variables) and VO_{2max}, % fat, and $lactate_{max}$ (independent variables). **RESULTS:** Running economy did not differ between freshman and sophomore years in either women (freshman VO2-1=34.7±0.8, sophomore VO2-1=33.4±0.8; freshman VO2-2=40.8±2.3, sophomore VO2-2=40.9±3.4) or men (freshman VO2-1=35.8±3.1, sophomore VO2-1=34.7±3.3; freshman VO2-2=42.4±3.1, sophomore VO2-2=42.9±2.7). Running economy was most strongly associated with VO_{2max} and

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change in VO_{2max}. This relationship was found to be stronger in women (R^2=0.31-0.64) than in men (R^2=0.16-0.50). Although, on average, running economy is stable from freshman to sophomore year, individual changes ranged from -6.3 to 4.6 $ml\,kg^{-1}.min^{-1}$ in VO2-1 and -7.3 to 9.1 $ml\,kg^{-1}min^{-1}$ in VO2-2, and were significantly related to changes in VO_{2max}. **CONCLUSIONS**: On average, running economy shows remarkable stability over the first year of a varsity basketball player's collegiate career. Despite this, wide variability in change existed on an individual basis. Additional research is needed to determine the factors that may help a player improve his or her running economy.

9) **THE EFFECT OF AN INTENSIVE DIABETES FOOT CARE EDUCATIONAL PROGRAM ON PATIENT KNOWLEDGE AND ADHERENCE TO A FOOT CARE PROGRAM**
Angela A. Lentz, Elaine Betts, P.T., Ph.D., FACSM, Jeffery Betts, Ph.D. Central Michigan University, Mt. Pleasant, MI

Diabetes mellitus (DM) is a disease that is showing a dramatic increase in the United States. One of the significant complications of the disease is lower extremity amputations due to infections, which can be exacerbated by lack of proper foot care. Education for proper foot care is the key to providing the patient the knowledge to prevent and care for the possible complications of DM. PURPOSE: This project's goal was to measure the effectiveness of knowledge obtained through face-to-face, one-to-one (1:1) diabetic foot care educational sessions versus educational reading materials alone. METHOD: 150 participants were randomly selected from the current group of patients with diabetes who utilize the Nimkee Memorial Wellness Clinic. A group of 100 was mailed an educational brochure on proper foot care. Of them, 33 responded to a questionnaire via a follow-up telephone interview 30 days following the mailing to assess patient knowledge of foot care (Group 1). Group 2 targeted 50 participants in which 24 completed the project. They received the same educational brochure and a 1:1 diabetic foot care educational session. The responses from the telephone interview (group 1) were compared to a follow-up questionnaire (group 2) to assess the difference in patient knowledge and adherence to a foot care protocol. RESULTS: The results of this study demonstrate that group 2 had a higher percentage of preferred foot care behaviors than group 1 (79% versus 73%, respectively). CONCLUSIONS: Based on these results, we recommend 1:1 face-to-face educational sessions for improved foot care knowledge in Native Americans with diabetes. Funding Provided by the Office of Research and Sponsored Programs at Central Michigan University and the Saginaw Chippewa Indian Tribe Diabetes Grant
Click Here to Add Abstract Text (Do not exceed 3500 characters)

10) **RELATIVE SAFETY AND EFFICACY OF BLOOD FLOW RESTRICTED RESISTANCE EXERCISE**
Mitchell Guiler2, Rich Hoffman, M.S. 1, Mark McGlynn2, Mike Knutson2, Petra Williams, P.T. 1, Michael R. Kushnick, Ph.D.2 and Brian C. Clark, Ph.D. 1 1Neuromuscular Physiology Lab, Institute for Neuromusculoskeletal Research, Department of Biomedical Sciences and 2Exercise Physiology and Biochemistry Laboratories, School of Recreation and Sport Sciences, Ohio University, Athens, Ohio

Blood flow restricted resistance exercise (BFRE) increases muscle mass and strength, however little is known about its safety despite theoretical concerns. In the present study, 12 healthy subjects had their nerve conduction velocity (NCV), prothrombin time (PT) pulse wave velocity (PWV, index of arterial stiffness), ankle-brachial index (ABI) and isometric and 1-repetition maximum (1-RM) strength assessed before and after 4-weeks of BFRE knee extension training (n=7; intensity=20% of strength) or high intensity resistance exercise (HIRE) training (n=5; intensity=80% of strength). Training was performed 3 days/wk (3 sets). During BFRE a cuff was inflated to 30% above systolic blood pressure. Isometric strength increased similarly in both groups (BFRE: 7.5% and HIRE: 6.3 %), although 1-RM increased more with HIRE (12.6+3.6% vs 3.0+0.1%). PT and ABI values did not change in either group (p=0.87 and 0.43), and all subjects remained within the normal lab values for both outcomes (PT range 0.9-1.2; ABI range (0.91-1.25). NCV did not change in either group with training (BFRE: 0.8+1.3%% and HIRE: -2.1+2.7%) (p=0.67) nor did PWV (BFRE: 9.07+0.05 to 8.71+0.04 m/sec and HIRE: 7.95+0.03 to 8.05+0.06 m/sec) (p=0.62). These findings indicate that BFRE induces similar gains in isometric strength as HIRE, and that neither protocol significantly alters the assessed neurovascular outcome measures. Future studies using longer training durations and special populations are warranted.

Supported in part by the Ohio University Research Committee Award

11) **DOES NEGATIVE HEEL SHOES ALTER A PERSON'S EXERCISING METABOLISM AS ADVERTISED**
Kristin Soupa, AJ Kinsella, Amy Kappel, Ambareen Khan, Nida Malik, Nicholas DeRienzo, Laur Gruss, & Craig Broeder, FACSM

Purpose: This study determined the effects Earth shoes (3.7% negative heel design) had on walking metabolic efficiency, EMG, and gait in 17 subjects (13 male; 4 female). This abstract focuses on only the metabolic efficiency data. **Methods:** Each subject completed 2 trials in Earth and New Balance shoes, respectively. Maximal and submaximal metabolic responses were measured comparing VO_2, VCO_2, RER, heart rate, substrate utilization and total steady-state energy expenditure. **Results:** $VO_{2\,max}$ test-retest results showed exceptional reliability for each shoe (Earth r-value= .97, SEE=1.1 ml, P= .0001; NB r-value= .98, SEE= 1.1ml, P= .0001). The $VO_{2\,max}$ correlation between Earth and New Balance shoes showed a r-value=.89, SEE= 1.42ml, and P= >.0001. The $VO_{2\,max}$ results showed there were no significant differences observed, indicating equal max performances for each shoe and all trials.

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Steady-state $V0_2$ results indicated no significant differences between Earth and New balance shoes' oxygen uptake at 0% grade and 3.7% grade at 3.0 mph. These results repudiate the company's claim that Earth shoes, due to 3.7% negative heel design, will increase a person's metabolic demand during walking exercise. Fat and carbohydrate (CHO) substrate utilization responses at steady state were also not significantly different between shoes when walking at 3.0 mph & either 0% or 3.7% grade. However, as expected, there were a greater total amount of kcals expended and CHO utilized when walking at 3.7 % compared to 0% grade in both shoes. Steady state heart rate results showed near significant increases while wearing Earth compared to New Balance shoes when walking at both 0% and 3.7 % grades ($p = .06$) However, this may only be due to using untrained muscles not in use when walking in normal running shoes. As expected, total kcal expenditure between shoe types showed no significant differences after 20 minutes of walking at a 0% grade (Earth = 258kcals; New Balance= 253kcals). **Conclusions:** These results indicate negative heel shoe design did not alter a person's oxygen consumption, kcal expenditure, or substrate utilization usage (fat versus CHO) compared to standard exercise shoes as advertised by the Earth shoe company.

12) PLACE KICKING KINEMATICS FOLLOWING STATIC AND DYNAMIC STRETCHING WARM-UPS IN FEMALE HIGH SCHOOL VARSITY SOCCER PLAYERS

Rodney Pius, Roger L.White, Qin Lai, & Hermann-J. Engels, FACSM Wayne State University, Detroit, Michigan

A number of recent studies indicate that the inclusion of static stretching exercises in a pre-event warm-up routine (i.e., static warm-up) may have detrimental effects on performance. In contrast, warm-up protocols that incorporate various controlled dynamic movements and progress from moderate to high exercise intensities (i.e., dynamic warm-up) are often considered to be superior, particularly for the performance of activities where success is related to maximal force development. In the game of soccer, one such important sport-specific task involves the taking of place kicks (e.g., penalty and free kicks). **PURPOSE:** Therefore, the purpose of this study was to compare the effects of a standardized static and dynamic warm-up protocol on performance of a maximal instep type soccer place kick. **METHODS:** Sixteen female high school varsity soccer players (age: 15.9±0.9 yrs; height: 165.4±6.5 cm; weight: 57.4±3.9 kg) participated in an initial familiarization meeting followed by two randomly assigned experimental sessions that involved either completion of a 10-min standardized static warm-up (S) or dynamic warm-up (D) (Faigenbaum et al., 2005) followed immediately (< 2 min) by 3 consecutive trials of a maximal effort instep place kick with the preferred leg. All testing was performed using a ball of standard size and inflation (FIFA, 2008) under controlled indoor athletic field conditions. Kicking performance motion was obtained using a video camera (Panasonic PV-GS55), and then digitized and measured from the start of the kicking leg's forward swing to the toe contact on ball at 60Hz using video-based, 2-D motion analysis software (Peak Motus, Peak Performance, Inc.). The primary dependent variables were mean and maximal linear velocities on the toe of the kicking foot, as the index for kicking performance. In addition, mean angular velocities on the ankle, knee, and hip of the kicking leg were measured to allow for a more in-depth interpretation of the kinematic characteristics of the place kick. **RESULTS:** Paired t-tests revealed no significant differences between the static and dynamic warm-up conditions on mean linear velocity (S: 10.50±1.85 m/s; D:10.63±1.75 m/s) and maximal linear velocity (S: 18.06±3.1 m/s; D: 18.23±2.77 m/s) on the toe ($p>0.05$). Similarly, no differences for the warm-up conditions were observed on any of the angular velocity variables ($p>0.05$). **CONCLUSIONS:** The present data in female high school varsity soccer players demonstrate no differences in soccer place kicking performance with the instep of the preferred leg following completion of either a static or dynamic warm-up. Recent clinical recommendations to avoid pre-event static stretches and to use a dynamic pre-event warm-up to optimize exercise performances in tasks that require a high power output need further evidence-based refinements that should include sport-specific tasks.

13) SHORT-TERM HIGH-INTESITY CYCLING INTERVAL TRAINING IMPROVES QUADRICEPS STRENGTH, CYCLING POWER, AND MUSCLE OXIDATIVE CAPACITY

Sean C. Forbes, Jill M. Slade, Jerrod E. Braman, Yolanda I. Coil, Clemens Drenowatz, Mark W. Papineau, Zdenko Radic, Marissa B. Siebel, Darijan Suton, Katie R. Visintine, Ronald A. Meyer
Michigan State University

Short-term high-intensity training has been shown to improve in vitro biochemical markers of skeletal muscle oxidative capacity. However, whether this training improves functional measures of oxidative capacity measured in vivo has not been established. Phosphorus-31 magnetic resonance spectroscopy (31P-MRS) enables monitoring phosphocreatine (PCr) changes in human muscle non-invasively, and the time constant (tau) of PCr recovery provides an in vivo measure of functional oxidative capacity. Purpose: To examine the effects of short-term high-intensity cycling interval training on quadriceps strength, cycling peak power, and muscle oxidative capacity measured in vivo. Methods: Seven healthy active subjects [21 ± 1 (SE) yrs; 69 ± 4 kg] performed six sessions of 4-6 maximal effort 30-s cycling intervals within a two week period, and seven subjects (24 ± 2 yrs; 80 ± 6 kg) served as controls. Prior to and following training, the subjects performed maximal voluntary isometric knee-extension contractions to measure quadriceps strength and a gated dynamic knee-extension exercise protocol (3 cycles of 90-s exercise and 5-min rest) in which 31P-MRS (GE 3T Excite System) was utilized to measure relative changes in high-energy phosphates and intracellular pH in the quadriceps muscles. A mono-exponential model was used to estimate the tau of PCr recovery. Re-

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sults: The high-intensity training increased ($p<0.05$) quadriceps strength and peak cycling power. The tau of PCr recovery was reduced by 14% with training (pre-training 43 ± 5 s vs. post-training 37 ± 6 s, $p<0.05$) with no change in the control group (44 ± 5 s vs. 43 ± 4 s, respectively, NS). Conclusion: These findings show that short-term high-intensity interval training is an effective means of increasing quadriceps strength, cycling power, and muscle oxidative capacity. Furthermore, these data provide support for the notion that high-intensity training is a time-efficient strategy for improving aerobic fitness.

14) **ASSESSMENT OF BREATHLESSESNESS AND SPEECH QUALITY WHEN USING AN ACTIVE WORKSTATION**

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The feasibility of using an active workstation in a work setting was investigated, with a focus on the impact its use may have on speaking tasks typical of a work setting. Implementing active workstations for a considerable portion of a work day may be associated with increased caloric expenditure and contribute to positive health, but if a person's speaking ability is significantly compromised while using the workstation, then the feasibility of its widespread use in a work setting would be severely limited. The PURPOSE of this experiment was to assess indicators of speech quality while sitting, standing, and walking on an active workstation. METHODS: 30 adults aged 37 + 14 years participated. Indicators of speech quality included number of ungrammatical pauses, alterations in numbers of syllables placed in each breath group, and alterations in speech quality parameters (breathlessness and dysfluency). RESULTS: There was no significant difference in the average number of syllables included in each breath group across the conditions ($p = .945$). The number of ungrammatical pauses that occurred when the participants were reading aloud was minimal (0 -1 ungrammatical pause per reading) and the occurrence of these ungrammatical pauses did not differ across the conditions. Expert listeners who were blinded to the purpose of the study and the protocol listened to randomized samples of the participants reading and spontaneous speech tasks during the 3 conditions. The listeners only perceived breathlessness in one sample and did not hear any dysfluencies (e.g., unusual speech patterns, stuttering). CONCLUSION: These findings indicate that walking on the Active Workstation had little or no influence on speech patterns and quality and therefore may be a feasible and healthy addition in the workplace.

(Work was supported by the Miami University Undergraduate Summer Scholars Program)

15) **FASTED AND POSTPRANDIAL OXIDIZED LDL CONCENTRATIONS AND PARAXONASE 1 ACTIVITY IN HIGH AND LOW AEROBIC FITNESS MEN**

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Oxidized low-density lipoprotein (oxLDL) is thought to directly contribute to atherogenesis and coronary heart disease (CHD). The serum enzyme paraoxonase-1 (PON-1) is bound to high-density lipoprotein (HDL) and its activity has been demonstrated to be inversely related to the atherosclerosis and CHD and is suggested to metabolize lipid peroxides and contribute to the prevention of LDL oxidation. Purpose: The purpose of this investigation was to determine the relationships between PON-1 activity and oxLDL in men with high and low aerobic fitness (VO2max) in fasted and postprandial states. Methods: Mean±Std dev are reported. Repeated measures design ANOVA was utilized with significance accepted at $p<0.05$. Sixteen healthy, non-smoking men were categorized according to VO2max (42.50 ± 4.0 ml/kg/min for the low group, n=8, and 58.0 ± 3.2 ml/kg/min for the high group, n=8). Fasting and postprandial serum PON-1 activity and oxLDL were determined for each participant over four hours. Results: There were no differences in fasting PON-1 activity (6.4±1.1 vs 6.8±1.4 U/min, low vs high aerobic fitness, respectively) or oxLDL (53.5 vs 58.0 U/l) between groups, nor were there any significant relationships between these variables and aerobic fitness. In the four hours following a standardized mixed meal (Boost Plus, Novartis) there were no relationships between PON-1 activity and aerobic fitness or differences in PON-1 activity between groups. Therefore the repeated measures model collapsed the men into one group and postprandially PON-1 activity was significantly decreased (Fasting 6.8±1.4 vs 2hr Post 5.7±1.8 U/min). Postprandial oxLDL concentrations did not change, nor were there relationships between these variables and aerobic fitness. Conclusions: In this sample of healthy, young men oxLDL and PON-1 activity were not related to VO2max. However, two hour-postprandial PON-1 activity was significantly decreased in the men regardless of aerobic fitness.

Supported in part by Ohio University's Provost Undergraduate Research Fund

16) **THE EFFECTS OF CARDIORESPIRATORY FITNESS ON SYMPTOMS OF ACUTE MOUNTAIN SICKNESS**

Mathias Hieronymus, Joshua L. Haworth, Pralhad S. Bide, Abhijeet A. Patil, Jeffrey A. Potteiger FACSM, Mark Walsh
Miami University, Oxford, Ohio

Acute Mountain Sickness (AMS) is a pathological condition that is caused by acute exposure to high altitudes. Symptoms include headache, fatigue, stomach illness, dizziness, and sleep disturbance. However, it is unclear if cardiorespiratory fitness has an effect on symptoms of AMS. **PURPOSE**: To examine the relationship between maximal oxygen uptake

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(VO_2max), Hematocrit (Hct) and body composition measured at sea level and to symptoms of AMS in a normal population. **METHOD**: Six healthy females (22 ± 1 y) and 8 males (24 ± 6 y) volunteered for this study. Hct was determined by collecting 3 ml of blood from a forearm vein using standard blood collection techniques. Body composition was measured using air displacement pleythesmography (BOD POD). VO_2max was determined using a Balke treadmill protocol. Subjects went to Nepal and ascended over a course of 14 days to Mount Everest Base Camp at 5380m. Heart rate and oxygen saturation were obtained each morning, and the presence of AMS symptoms was determined using the Lake Louise AMS Score. **RESULTS**: Relative VO_2max ranged from 34.4 - 41.9 ml/kg/min in the female group and from 41.1 - 62 ml/kg/min in the male group. Hct-values were between 32.3 - 43.3% for the females and between 41.7 - 49.5% for the males, respectively. Body fat ranged from 22.7 - 35.1% in females and from 8.3 - 28.3% in the males. Female subjects showed greater heart rate responses throughout the entire ascend. In both groups the subjects with the highest VO_2max showed the fewest symptoms of AMS. However, the subjects with the lowest VO_2max did not show the highest AMS scores. This infers that cardiac fitness at high levels may help subjects avoid symptoms of AMS but that at the middle and lower levels of cardiac fitness there seemed to be no difference in symptoms of AMS regarding cardiac fitness. **CONCLUSIONS**: Although the subjects with the highest VO_2max showed the least symptoms of AMS, cardiorespiratory fitness does not seem to be a very good predictor of susceptibility to symptoms of AMS.

17) BODY COMPOSITION AND HORMONAL ADAPTATIONS ASSOCIATED WITH FORSKOLIN CONSUMPTION IN OVERWEIGHT AND OBESE WOMEN

BETH A. EWING AND MICHAEL P. GODARD, FACSM. Western Illinois University, Macomb, Illinois

PURPOSE: This study examined the effect of forskolin on body composition, testosterone, sex hormone binding globulin, and blood pressure in overweight and obese (BMI ≥ 26 kg/m^2) women. **METHODS:** Twenty-two subjects (forskolin, n=10; placebo, n=12) were studied in a randomized, double-blind, placebo-controlled study for 12 weeks. **RESULTS:** Forskolin was not shown to elicit favorable changes in body composition as determined by the Bod Pod compared with the placebo group (p>.05) in women. There was no significant change for lean body mass in the forskolin group (-0.06 ±3.66 kg) compared with the placebo group (1.86 ± 4.10 kg). There was no significant change for fat body mass in the forskolin group (0.39 ± 2.72 kg) compared with the placebo group (1.55 ± 5.51 kg). Serum free testosterone levels showed no significant change in the forskolin group (3.38±4.29 pg/ml) compared with the placebo group (-2.05±3.88 pg/ml). There was no significant change for serum total testosterone concentration in the forskolin group (3.38±4.29 ng/ml) compared with the placebo group (-2.05±3.88 ng/ml). There was no significant change for SHBG in the forskolin group (0.01 ±0.78 nmol/L) compared with the placebo group (-1.15 ± 2.39 nmol/L). **CONCLUSIONS:** Oral ingestion of forskolin (250 mg of 10% forskolin extract twice a day) for a 12-week period was not shown to alter body composition. The results indicate that forskolin is not a therapeutic agent for the management and treatment of obesity in women. A previous study conducted in our lab (*Obesity Research*, 13(8): 1335-1343, 2005) on overweight and obese men showed that forskolin did elicit favorable changes in body composition by significantly decreasing body fat percentage (BF%) and fat mass (FM) and significantly increasing serum free testosterone compared with the placebo group (p≤0.05). We conclude that the differences in women and men are likely attributed to the dissimilarity of basal testosterone levels.

Supported by the University Research Council - Western Illinois University and Sabinsa Corporation.

18) EVALUATION OF A URINE COLOR CHART TO DETERMINE HYDRATION STATUS

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Body water balance is routinely challenged during exercise, particularly during exercise in the heat. Objective hydration assessment in athletes is essential for optimal performance and, more importantly, for prevention of heat injuries. Selection of an appropriate hydration assessment method is dependent on a number of variables, including cost, time, and required skill. Urine osmolality (U-OSMO) and urine specific gravity (USG) are valid and reliable indicators of hydration status under most conditions. However, U-OSMO and USG are laboratory tests which are costly and require time and technical skill. PURPOSE: The purpose of this study was to compare U-OSMO and USG to values determined using a Urine Color Chart (U-COL). METHODS: Urine samples were obtained from ten healthy, athletic, male subjects (age: 19.3 ± 1.25 yrs; height: 180.0 ± 7.77 cm; weight: 78.67 ± 9.17 kg; VO2max: 46.32 ± 4.47 mls/kg/min) under two conditions: EUHY, a well-hydrated condition and HYPOHY, under conditions of moderate (-3.96 % ± 0.63 body weight) hypohydration. U-OSMO was determined by freezing point depression (model 5002, Precision Instruments, Natick, MA); USG was determined by refractometry (model 5711-2021, Schuco International, London, UK). RESULTS: Results indicate high positive correlations between U-COL and known reliable indicators of hydration assessment, U-OSMO and USG: U-OSMO vs. U-COL (r = 0.847) and USG vs. U-COL (r = 0.737). CONCLUSION: The high positive correlations between U-COL and U-OSMO, as well as U-COL and USG indicate that U-COL is an accurate tool for hydration assessment in field settings. U-COL is not an appropriate tool, however, in laboratory and/or clinical settings where greater accuracy and precision is required. Because U-COL is simple, quick, and easy to administer, it is a very useful tool for increasing awareness of hydration assess-

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ment, especially in naïve populations.

19) ASSESSMENT OF PRACTITIONER INTERVENTION IN PHYSICAL ACTIVITY

Kristin T. Schley, Christine Karshin Eastern Michigan University, Shel Levine Eastern Michigan University

Lack of physical activity is a serious epidemic that affects one's health. Primary care physicians can play a key role in influencing and changing people's behaviors. **PURPOSE:** The objective of this study was to assess primary care physicians' role in physical activity counseling and what, if any, guidelines they use. **METHOD:** The Physical Activity Counseling Questionnaire, a 23-item instrument, was used to assess the physical activity intervention techniques used by health practitioners during routine medical check-ups. The first section of the survey consisted of sixteen physical activity counseling questions, followed by seven demographical questions. One hundred and forty-seven primary care physicians completed and returned the 23-item Physical Activity Counseling Questionnaire. **RESULTS:** Most of the respondents were over the age of 50 (58.5%), group practitioners (60.5%), male (59.9%), and have been practicing more than 20 years (50.3%). The majority of physicians "almost always" (47.6%) counseled their patients on physical activity. When physicians are counseling patients on physical activity, they are likely to meet the ACSM recommendation. Previous research has also shown that when a patient is given a detailed physical activity program, he/she has a greater rate of adherence (Glasgow et al., 2001; Marcus et al., 1997). Time, however (81.6%), was identified as the main barrier. A significant relationship was found between physicians who scheduled follow-ups and referrals (χ^2 (1) = 14.971, $p<.001$). **CONCLUSIONS:** The four components to physical activity were recommended when counseling. The rate of physician counseling is considerably low. Of the 147 respondents, nearly half (47.6%) "*almost always*" counsel. These values are considerably low, given that approximately 80 percent of the population depends on their physician for advice and recommendations on physical activity (Abramson et al., 2000).However, when counseling physicians meet the ACSM guidelines.

20) VARIATION BETWEEN REPEATED TIME-TO-EXHAUSTION TRIALS REDUCED WITH UTILIZATION OF AN OBJECTIVE EXCLUSION CRITERIA.

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PURPOSE: Time to exhaustion (TTE) protocols are widely used to assess endurance performance. However, the subjective endpoint of this method can contribute to increased variance between trials. Our purpose was to determine if an objective criteria for determining successful TTE completion reduced error variance between repeated trials. **METHODS:** Ten recreational exercisers (age = 24±5 yrs; VO_{2max} = 53.6±9.9 $mL \cdot kg^{-1} \cdot min^{-1}$) completed a TTE protocol consisting of a 75 minute cycle at 70% VO_{2max} followed by a treadmill run to exhaustion at 80% VO_{2max}. Subjects completed two TTE trials. In trial 1, all subjects were instructed to run until volitional exhaustion. In Trial 2, five subjects were similarly instructed to provide a maximal effort until exhaustion (ME). The other 5 subjects received instructions to cease running when they estimated they could complete only 10 additional minutes of exercise (SME). Peak isometric force (MVC) of the leg extensors was assessed pre-exercise and immediately post-exercise. An objective MVC criteria was used to exclude subjects who did not successfully complete the TTE trials. Subjects TTE data was excluded if their MVC declined <10% from pre-exercise levels, and their lowest MVC decline occurred in their shortest TTE trial. **RESULTS:** Prior to application of the exclusion criteria, there was a relatively low correlation (r=0.31) and high variation (CV=34.2%) between repeated trials, partially due to the inconsistent efforts of the SME group. The exclusion criteria eliminated three subjects from the analysis, which improved the correlation (r=0.61) and CV (24.3%) between trials. **CONCLUSIONS:** The MVC criteria correctly eliminated the two subjects with the greatest variance between TTE trials, and significantly reduced the total error variance between trials. Thus, using % MVC decline as an objective TTE completion criteria' may reduce error variance by identifying subjects who are unable to provide consistent efforts between trials. Refinement of the existing criteria may result in further improvement in consistency between trials, as not all SME trials were identified by the present criteria.

21) DETERMINING THE EFFICACY OF THE BodyBugg ARMBAND WHEN IMPLEMENTED INTO THE LIFESTYLE OF SEDENTARY INDIVIDUALS

Jessica Hendriksen, Jean Luc Leiba, Catherine Arnold, Frank Clarizio, Ryan Lown, Emily Payne, Catlin Plank, Ed Roble, Laurie Schubert, Rebekah Smith, & Craig E. Broeder, FACSM. Benedictine University, Lisle, IL

Purpose: Fourteen sedentary individuals from a University setting (4 males, 10 females, Age 37.7±11.2) were selected for a 12-week weight loss pilot study to determine the monitoring effectiveness of the "bodybugg" armband system by APEX fitness. Methods: Subjects worked out with a personal trainer at least three times a week performing both cardio-respiratory and strength training exercises, attended weekly educational sessions, wore the bodybugg monitor 24 hrs/day (except when showering or swimming), participated in team challenges, and downloaded data every 3 days. The subjects' exercise intensity and goals increased based on an individual's progress and initial testing. Body weight was measured weekly, % body fat every two weeks, and the VO2 max and 1-RM strength measurements were taken pre and post the 12-week training period. Results: The data showed a 9% weight loss and 8.6% BMI decrease with

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the greatest absolute fat losses occurring in the most active individuals (Low = -2.4%; High = -8.2%). Over the entire 12-weeks all contestants combined took 14,889,060 steps and expended 3,897,450 kcals in physical activity. The strongest correlations were observed between weight loss and the % kcal expenditure change from baseline (CFB): ($r=0.69$, $p<0.005$), % VO2 max CFB ($r=0.65$, $p<0.01$), and % steps/day CFB ($r=0.65$, $p<0.01$). Declines in a person's % body fat were most highly correlated with the % steps/day CFB ($r=0.60$, $p<0.02$) and % VO2 max CFB ($r=0.59$, $p<0.03$). A major factor that influenced a person's pre-to-post VO2 max change was the person's over-all attendance record ($r=0.56$, $p<0.04$). There were no significant relationships observed between declines in weight or % body fat with the significant improvements in total and segmental body strength (i.e., bicep curl or chest press). Exit interviews indicated that the bodybugg system was instrumental in helping a person stay within target ranges for daily steps and energy expenditure goals. Conclusions: The bodybugg armband system may help both a person interested in weight loss and the clinical weight loss mentor monitor key variables shown to help promote weight loss. Follow up research is needed to determine if the bodybugg system can facilitate continued weight loss success after a person completes a supervised weight loss program.

22) **A COMPARISON OF ENERGY EXPENDITURE IN COLLEGE STUDENTS USING A NEW GENERATION ACTIVE COMPUTER GAME VS. TRADITIONAL PHYSICAL ACTIVITY**

Kristen Perusek, Shaina Carter-Fernandez, Jennifer Wieand, Amanda Sapara, Zach Smith, Brad Blevins, Kathleen Little, Mary Motley, Sheila Patterson, Kenneth Sparks, Cleveland State University, Cleveland, Ohio

The increased popularity of video gaming systems and computers has contributed to this obesity crisis due to their sedentary nature and lack of physical interaction. New video computer games, such as the Nintendo Wii sports games, allow users to physically interact while playing the sport. **PURPOSE:** The comparison between energy expenditure, heart rate, steps, and perceived exertion during heavy bag boxing vs. the Nintendo Wii boxing game was investigated. **METHOD:** Fifteen males and 14 females, ages 18 to 40 years, randomly selected (coin toss) the heavy bag or Wii on their first test session. Each participant completed two, 30 minute sessions of 10, three minute bouts with a minimum of two days rest between sessions. The COSMED K4 portable oxygen analyzer measured oxygen consumption and energy expenditure. A Polar heart rate monitor was used to measure heart rate, a Digiwalker pedometer measured total steps taken, and rating of perceived exertion (RPE) was recorded using the Borg Scale (6-20). A paired samples t-test was used to compare results for the Wii vs the bag. An independent t-test was used to determine if there were any gender differences. SPSS (version 14.0) was used for all analyses with .05 as the level of significance. **RESULTS:** Mean age was 25.6 years, height was 171.3 cm, and weight was 71.8 kg. Significant differences were found for average heart rate (bag=156 bpm, Wii=138 bpm, $p=.001$) and perceived exertion (bag=13.8, Wii=11.4, $p=.0001$). However, energy expenditure (bag=8.0 kcal/min, Wii=7.1 kcal/min, $p=.078$) and total steps (bag=3283 steps, Wii=3190 steps, $p=.665$) did not differ significantly. The only significant gender difference was energy expenditure (kcal/min, $p<.01$) due to the larger body mass of the males. **CONCLUSION:** The results suggest that interactive video computer games, such as the Nintendo Wii, have the potential to provide similar energy expenditure as actual physical activity/sports participation. However, the significantly higher heart rate and perceived exertion during heavy bag boxing suggests that the Wii may not provide the intensity necessary to achieve optimal cardiovascular benefits. Further research is needed to compare energy expenditure for different sports on the Wii to traditional forms of exercise.

Support: Cleveland State University Undergraduate Student Research Grant

23) **THE EFFECT OF SURYA NAMASKARA YOGA PRACTICE ON RESTING HEARTRATE AND BLOOD PRESSURE, FLEXIBILITY, MUSCLE ENDURANCE AND PERCEIVED WELL-BEING IN HEALTHY ADULTS**

Kristine M. Fondran, Cleveland State University, Cleveland, Ohio

Surya Namaskara (SN) is a yoga practice (routine) that consists of a series of 12 physical postures made up of a variety of forward and backward bends. The series of movements stretch the spinal column and massage, tone, and stimulate vital organs through alternately flexing the body forwards and backwards. Purpose: The purpose of the study was to determine the effects of a twice daily SN yoga practice on resting heart rate (HR) and blood pressure (BP), flexibility, upper body muscle endurance, and perceived well-being in low to moderately active adult males and females. Methods: Participants (24 females, 6 males; mean age 34 years) were randomly assigned to a yoga or control group using the fishbowl technique of random assignment with replacement. After a 3 hour introduction to proper SN techniques, the subjects were directed to perform two SN routines daily for 10 minutes each followed by a 5 minute relaxation period, 5 times per week for a period of 6 weeks. Pre and post measurements were conducted for HR, BP, hamstring flexibility, upper body muscle endurance, and perceived well-being. Inferential statistics with repeated measures (2-way ANOVA) was used to analyze the data. Results: A significant increase was found in flexibility with an improvement of 2.9 inches ($p=.000$) and 4.4 push-ups ($p=.003$) after yoga the training program, with little or no change in the control group. Conclusion: It can be concluded that SN is effective in increasing hamstring flexibility and improving upper body muscle endurance.

24) **THE ASSOCIATION BETWEEN STUDY TIME, GRADE POINT AVER-**

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AGE, AND PHYSICAL ACTIVITY PARTICIPATION IN COLLEGE STUDENTS

Jennifer I. Flynn, Anna K. Piazza, Joshua J. Ode Saginaw Valley State University, University Center, MI

Previous studies have assessed physical activity in college students, but few have looked at the relationship between academic behaviors/performance and physical activity participation. PURPOSE: The purpose of this study was to assess the association between study time, grade point average (GPA) and meeting the recommendations for vigorous and moderate physical activity in college students. METHODS: 141 undergraduate students completed an online survey during the Fall 2007 semester. Students were classified as meeting vigorous physical activity recommendations (≥20 minutes of activity that made you sweat and breathe hard on ≥3 days per week) or moderate physical activity recommendations (≥30 minutes of activity that did not make you sweat and breathe hard on ≥5 days per week). Academic behavior was assessed as the amount of time spent studying per day (study time: ≤1 hour, 2 hours, ≥3 hours). Academic performance was assessed as cumulative GPA (GPA: no GPA, <3.0, 3.0-3.5, ≥3.5). Adjusted odds ratios and 95% CIs were calculated to assess the relationship between study time/GPA and meeting vigorous/moderate physical activity recommendations while controlling for gender, race, class standing, major, and varsity sport participation. RESULTS: When compared to students who studied ≤1 hour per day, those who studied ≥3 hours per day were 3.5 (95%CI: 1.1-11.2) times more likely to meet vigorous physical activity recommendations and 2.6 (0.9-7.5) times more likely to meet moderate physical activity recommendations. When compared to students with a GPA <3.0, those with a GPA ≥3.5 were 3.2 (0.9-11.8) times more likely to meet vigorous physical activity recommendations. GPA level was not significantly related to the likelihood of meeting moderate physical activity recommendations. CONCLUSIONS: These results suggest a potential association between academic behaviors/performance and physical activity in college students. Specifically, students who spend more time studying or have a higher GPA are more likely to participate in physical activity at recommended levels. However, due to limited research, additional information is needed to explore this relationship in more detail.

25) **THE EFFECT OF PLAYING NINTENDO WII ON LIKING, PERCEIVED EXERTION, HEART RATE AND VENTILATORY RESPONSE RELATIVE TO SEDENTARY SCREEN TIME AND TREADMILL WALKING IN HEALTHY ADULTS**

Amanda Penko and Jacob E. Barkley, Kent State University, Kent, Ohio

Currently, it is estimated that 66% of the United States adult population is overweight or obese (BMI > 25), and 31% obese (BMI >30). Therefore, there is a need to develop a better understanding of the etiology of obesity, and subsequently develop new and potentially more effective intervention strategies. Nintendo Wii is a new and popular physically interactive gaming system, which requires users to move a joystick through three-dimensional space to elicit a response of a character on a television screen. **PURPOSE**: The purpose of this study was to compare the metabolic and cardiovascular effects of playing Nintendo Wii Sport Boxing®, playing a traditional video game and leisurely walking on a treadmill. **METHODS**: Twelve healthy males (N=6) and females (N=6), 31.5 +/- 12.4 years old, participated. Heart rate (HR) and VO^2were measured using HR-monitors and indirect calorimetry during four-10 minute conditions: supine rest, walking on a treadmill at 2.5 mph, playing a traditional video game (Nintendo Punch- Out!®) and Nintendo Wii (Wii Sport, Boxing®). Five-minute rests were taken between each treatment. Liking and rating of perceived exertion was assessed using a 10-cm visual analog scale (VAS) and Borg scale for each activity. **RESULTS**: The conditions elicited the following responses: supine rest HR = 73.38 +/- 10.1 bpm, VO2=3.68 +/- .37ml/kg/min, walking on a treadmill at 2.5 mph HR= 94.14 +/- 13.42 BMP, VO2= 10.39+/- .88 ml/kg/min, playing a traditional video game (Nintendo Punch- Out!®) HR = 80.86 +/- 10.45 bmp, VO2= 4.72 +/- .80 ml/kg/min and Nintendo Wii (Wii Sport, Boxing®) HR =121.23 +/- 12.35 bpm, VO2 = 15.37 +/- 4.50 ml/kg/min. With significance determined using P≤0.05, two-way (gender x condition) ANOVAs demonstrated significant main effects of condition for HR, VO_2, RPE and liking. Average HR, VO_2, RPE and liking were significantly greater for Nintendo Wii than all other conditions. There was a significant interaction for VO_2 as males, compared to females, exhibited a greater difference in VO_2 when playing Nintendo Wii versus Nintendo Punch-Out. The VO_2 response of males and females were not different in any other condition. **CONCLUSION:** Nintendo Wii Sport, Boxing®, elicited a greater energy expenditure, HR response and, despite being perceived as more difficult, was more enjoyable than a traditional video game as well as walking on a treadmill at 2.5 mph. Nintendo Wii represents a physically active alternative to traditional video game play and may be a useful tool for future intervention strategies for increasing physical activity. Further research is needed to understand how other Wii games could be used to increase energy expenditure.

26) **A DESCRIPTION OF FEMALE ADOLESCENT TWINS' BODY COMPOSITION AND PHYSICAL ACTIVITY**

Erin E. Kuffel, Kelly L. Klump, S. Alexandra Burt, James M. Pivarnik, FACSM

Limited research is available regarding body composition and physical activity (PA) patterns among twins during adolescence. **PURPOSE**: Our purpose was to evaluate body composition and physical activity in monozygotic (MZ) and dizy-

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gotic (DZ) adolescent female twins. **METHODS**: Participants were 194 female adolescent twins (n = 86 MZ; n = 108 DZ; age=12.5±1.4 yr). Body fatness (% Fat) was assessed by bioelectrical impedance analysis and PA by a 3-Day Physical Activity Recall. Each participant reported activities completed in 30 minute increments over 3 consecutive days. MET values were assigned to each activity and then used to calculate time spent in moderate to vigorous PA, as well as, whether the study participant achieved current physical activity recommendations (≥60 min/day of moderate to vigorous PA). Intraclass correlations, chi-square, t-test, z-scores, and Mann-Whitney U tests were used to assess the relationships and differences in % Fat and PA among MZ and DZ twins as appropriate. **RESULTS**: There were no significant differences between average±SD % Fat (MZ 26.4±7.3 %; DZ 26.9±7.8 %; p=0.656), amount of time spent in moderate to vigorous PA over three days (MZ 5.1±3.9 hr; DZ 4.6±3.5 hr p=0.373), or the proportion of twins meeting PA recommendations (31.4% MZ vs 32.4% DZ; $\chi 2$ (df = 1, n = 194) = 0.023, p = 0.881) by zygosity. %Fat was more tightly correlated in MZ twin pairs (r = 0.97) compared to DZ twin pairs (r = 0.76) (z_{obs} = 5.18). However, DZ twin pairs showed a significantly stronger correlation for spending similar time in moderate to vigorous PA (r = 0.79) than did MZ twins (r = 0.41) (z_{obs} = 3.01). **CONCLUSION**: Twin zygosity did not significantly alter body composition or PA when comparing group means or the proportion of girls meeting PA recommendations. However, while anthropometric similarities were greater in MZ twins, physical activity profiles were not.

27) PHYSICAL ACTIVITY DURING PREGNANCY AND OFFSRPING CHARACTERISTICS AT 8-10 YEARS

Lanay M. Mudd[1], Erin E. Kuffel[1], and James M. Pivarnik[1],FACSM
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Few investigators have examined the relationship between pregnancy physical activity (PA) and offspring characteristics in childhood. **PURPOSE:** To evaluate the relationships between perinatal factors (birth weight, pregnancy PA) and offspring blood pressure, body mass index (BMI), and aerobic fitness at age 8-10 years while also considering childhood PA. **METHODS:** Study participants (n=16 mother/child pairs) were members of a cohort who were studied previously during pregnancy 8 -10 years ago. Resting blood pressure (Dinamap), height, weight, and percent fatness (BodPod) were measured on both the mother and her child. Women and children performed continuous treadmill tests to maximum voluntary exhaustion to determine aerobic fitness (VO_{2max}). Birth weight was abstracted from previous records. Pre-pregnancy, trimester-specific and overall pregnancy PA (kcal/kg/wk) were calculated from historical recall surveys. Mothers rated their children's PA level (0-10 scale) at age 4 yrs, 6 yrs, and currently. Relationships between perinatal factors and offspring characteristics were evaluated via Spearman correlation and linear regression analysis. **RESULTS:** Child systolic blood pressure (SBP) was marginally related to pregnancy PA (r_s = -0.474, p=0.062) and significantly related to third trimester PA (r_s = -0.622, p=0.016), child PA at 4yrs (r_s = -0.498, p=0.050), and current child PA (r_s = -0.735, p=0.001). In multivariable regression analyses, child PA at 4 yrs and current PA remained significantly related to child SBP (R^2=0.637). Child VO_{2max} was related to pre-pregnancy PA (r_s = 0.506, p=0.046) and child percent fat (r_s = -0.596, p=0.016). Neither remained significant in multivariable regression. Second trimester (r_s = -0.534, p=0.033), third trimester (r_s = -0.501, p=0.048), and average pregnancy PA (r_s = -0.502, p=0.048) were significantly related to child BMI, as were maternal VO_{2max} (r_s = -0.526, p=0.036), and maternal BMI (r_s = 0.532, p=0.034); however, none of these were significant predictors in multivariable regression. Birth weight was related to child SBP (r_s = -0.752, p=0.031) only among children of mothers who did not meet PA recommendations during pregnancy (< 7.5 kcal/kg/wk). **CONCLUSION:** These pilot data suggest that PA during pregnancy may be related to child SBP and BMI at 8-10 years of age. Pregnancy PA may also disrupt associations between birth weight and child characteristics.

28) DIAGNOSTIC ACCURACY OF BODY MASS INDEX IN THE DETECTION OF OVERFATNESS: A META-ANALYSIS

Joshua J. Ode1, Lanay M. Mudd2, Michael D. Brown2, Rebecca A. Rudey1, James M. Pivarnik2, Mathew J. Reeves2 1 Saginaw Valley State University, University Center, MI; 2Michigan State University, East Lansing, MI

Body Mass Index (BMI) is often used as a surrogate for percent fat (% fat) in the classification of obesity across many different populations. Thus, it is critical to understand the accuracy of BMI as a measure of % fat. PURPOSE: The purpose of this study was to determine the sensitivity (the percentage of overfat people identified as overweight) and specificity (the percentage of normal fat people identified as normal weight) of BMI in the diagnosis of overfatness in male and female adult populations. METHODS: A search of MEDLINE, EMBASE, and bibliographies of previous systematic reviews was conducted, with no language restriction. Two authors extracted data independently and assessed study quality on the basis of the study sample characteristics. Analysis were conducted using Meta-Test software and involved generation of summary receiver operating characteristic curves and pooled estimates for sensitivity and specificity based on a random-effects model for males and females, separately. RESULTS: The search yielded 132 publications. No unpublished studies were found. Eighteen studies met the inclusion criteria and provided data on 4073 males and 4252 females. The summary receiver operating characteristic curve analysis showed significant heterogeneity among both males and females. Sensitivity varied considerably from 6% to 92% in males and 13% to 86% in females. Specificity ranged from 60% to 100% in males and 54% to 100% in females. CONCLUSION: Studies on the diagnostic accuracy of BMI as a measure of overfatness produce highly variable

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and inconsistent results. Although BMI had reasonable specificity and was therefore useful in identifying normal fat individuals, sensitivity was often very low indicating that BMI frequently misclassified overfat men and women as normal weight.

29) **THE INFLUENCE OF HORMONE SUPPRESSION THERAPY AND RELATED FACTORS ON BONE MINERAL DENSITY IN CANCER PATIENTS.**

Leryn Boyle[1]; Katherine Hubbard[1]; Lindsey Hanna[2]; Trent Hargens[1]; Leonard A. Kaminsky[1]FACSM. Human Performance Laboratory, Clinical Exercise Physiology Program, Ball State University, Muncie, IN[1]; Oncology Rehabilitation, Ball Memorial Hospital, Muncie, IN[2].

Hormone suppression therapy (HST) is a common treatment for many patients with breast and prostate cancer to help slow the growth of metastasizing tumors. However, HST may cause bone loss in these patients. The effects of exercise and prescribed calcium supplementation (PCS) on preventing bone loss in HST patients are not well understood. **Purpose.** The purpose of this study was to determine the degree of bone mineral density (BMD) change following 6 months of a 24 months HST intervention. A secondary purpose was to determine the effects of a voluntary exercise program and PCS on BMD. **Methods.** Twelve subjects (8 females and 4 males) diagnosed with breast or prostate cancers were recruited for this study. Five subjects elected to enroll in The Cancer Exercise Program at Ball Memorial Hospital or bone stressing exercises prescribed for home. Bone stressing activities and PCS were assessed subjectively using a lifestyle questionnaire at baseline and 6 months. All subjects underwent dual-energy x-ray absorptiometry at 0 and 6 months to assess BMD at the spine, dual femur, and total body. Two-way analysis of variance and independent t- test were performed using SPSS 15.0. **Results.** A significant decrease in BMD of 3.2% was shown in the spine when all subjects were combined (Baseline mean ± SD = 1.25 ± 0.2; 6 month = 1.21 ± 0.2). No significant differences in BMD at any site were shown between groups. PCS had no effect on BMD. Those placed in the exercise group participated in significantly more bone stressing exercises than the non-exercise group at baseline (mean ± SD 2.6 ± 1.1 and 0.7 ± 1.3 activities/week respectively) and at 6 months (mean ± SD 3.4 ± 1.7 and 0.6 ± 0.8 respectively). **Conclusion.** HST decreased BMD at the spine after 6 months of treatment. While the exercise group did participate in significantly more bone stressing exercises than the control group, no difference in BMD was shown between groups. PCS appeared to have no significant effect on maintaining or preventing BMD loss. Lack of significance in these results may be due to the short intervention period (6 months).

30) **POSTURAL CONTROL ON A COMPLIANT SURFACE: A NONLINEAR APPROACH**

Joshua Haworth, Adam Strang, Mathias Hieronymus, Mark Walsh;
Miami University, Oxford, Ohio

Proprioceptive training is common in rehabilitation and training settings; intended to enhance individuals' stability. Center of pressure (COP) is a standard laboratory measure of stability, commonly analyzed for sway range, velocity, and variability. Currently, there is a strong movement in the literature to consider the use of nonlinear statistics as ancillary measures for describing COP data. Also, the use of compliant surfaces has appeared as a means to resolve how individuals move in dynamic environments. **Purpose:** The purpose of this study was to evaluate the postural sway performance of participants during quiet stance on a dynamic surface throughout a balance training program; to determine 1) movement characteristics of postural sway during interaction with a movement responsive surface, and 2) evaluate nonlinear analysis (Lyapunov Exponent, LyE) as an effective movement descriptor. **Method:** 18 healthy, physically active individuals (5 male, 13 female; age (yrs) = 20.24 ± .90; body mass (kg) = 66.05 ± 11.78), engaged in a six week balance training program (18 sessions) designed to target a variety of stance conditions. COP was measured on a compliant surface, DynaDisc-Plus, using a force plate (Bertec 60cm x 90cm) during each laboratory visit. T-tests compared pre-post training measures of range, velocity, variability, and LyE in the mediolateral (ML) and anteroposterior (AP) directions. **Results:** No change in COP range was found (ML-1.93cm, p=.481; AP-2.53cm, p=.139); however the velocities associated with these movements were decreased (ML-1.12cm/s, p=.0003; AP-.76, p=3.5E-6). Variability, as measured by the traditional standard deviation of COP position, increased in the anteroposterior direction (.456cm, p=.042), but was unchanged in the mediolateral direction (.379cm, p=.491). LyE values decreased (ML-.00033, p=.001; AP-.00467, p=.0031), indicating a more periodic (self-similar) structure within the COP path. **Conclusion:** Taken together, it appears that the participants were able to develop a more calculated approach to the maintenance of balance during interactions with a responsive dynamic surface by moving both more slowly and with a more regular movement pattern. Additionally, further support for the use of both dynamic surfaces and nonlinear analyses in the evaluation of postural sway has been provided.

31) **DYNAMIC DECOMPOSITION OF A WALKING GAIT**

Keke Yang, Tamara Reid-Bush, PhD, & Brian Feeny, PhD, Michigan State University, East Lansing, Michigan

Various methods have been adopted to collect and analyze a walking gait. The ability to detect, or monitor changes in gait that occur as a result of injury, rehabilitation, aging or other mechanisms is beneficial to the medical community. By tracking changes in gait patterns, the effects of interventions including rehabilitation, surgery or other therapies can be documented, and the progression monitored. PURPOSE: The purpose of this study was to collect experimental data on a walking activity and determine if a dynamic vibration analysis could be used to characterize the gait pattern. METHOD: Two groups of 20

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healthy people were recruited and participated in this study. Group 1 (n=10) had an age range of 20-28 years while Group 2 (n=10) was 45-67 years. Walking gaits on a treadmill at a self-selected speed were collected by the Qualysis Motion Analysis System. Thirteen targets were placed onto subjects' lower extremities, and walking gaits of three 10-second trials were recorded. A vibration-mode decomposition algorithm was applied to the walking data. RESULTS: The entire gait motion, consisting of several cycles, was successfully able to be characterized by the modal vibration analysis. From the evaluation of initial data, differences were detected within the first trial of a given subject between the right and left leg. With three trials examined, a two-independent-group T-Test was conducted ($\alpha = 0.05$) to determine if the diffrence between two legs was statistically significant. The mean value for the mean squared amplitude of each extracted mode is 0.211, SD = 0.02967, and $P = 0.359 > 0.05$. Further analysis is being conducted to quantify difference between the two groups. CONCLUSION: The proposed dynamic model has demonstrated its potential for quantifying and characterizing the movement patterns performed in gait because of the initial success in comparing right and left side within a trial of a single subject. However, the analysis with three trials showed that $p > 0.05$, meaning that the difference between the right and left leg was not significant.Since only the data from one subject was analyzed by far, further analysis of more data from the two groups are required.

32) COMPARISON OF DIFFERENT PHYSICAL WORKING CAPACITY TEST PROTOCOLS

Justin R. Bland and Karin A. Pfeiffer, FACSM. Michigan State University, East Lansing, Michigan

In recent investigations, researchers have used either a 2-min or 3-min protocol for physical working capacity (PWC) assessment as a measure of aerobic fitness in children and adolescents. **PURPOSE:** The purpose of this study was to compare different PWC tests in adolescents using 2-, 3-, and 6-minute protocols. **METHODS:** Seventeen adolescents (9 girls, 8 boys), 11-16 years (13.3 ± 2.0), participated in this study. Each participant visited the laboratory on two separate occasions within a two-week period and performed a total of three PWC tests (2-min, 3-min, 6-min stages) using a cycle ergometer. The first visit comprised of anthropometric measurements using standardized procedures and one or two of the PWC tests; the second visit involved the remaining PWC test(s). Order of PWC tests was randomized and counterbalanced, with exercise tests separated by 30 minutes of rest (when applicable). Heart rate (HR) was assessed and recorded every 30-sec and within the last 10-sec of each test stage using a Polar monitor. Each PWC test consisted of at least three stages of increasing loads, with the goal of reaching a HR $\geq$165 b·min^{-1}. A fourth stage was completed if participants did not achieve 165 b·min^{-1} within three stages. Participants began each test at 20 or 30 watts (depending on body weight), and subsequent workloads were based on HR attained during the previous stage. Individual regression lines were created in order to predict workload that would be achieved at HR=170 b·min^{-1} (PWC_{170}) for each test. Repeated measures ANOVA was used to compare PWC_{170} values. **RESULTS:** There were significant differences for PWC_{170} values among protocols ($F(2,14)=9.3$, $p<0.0001$). Post-hoc analyses showed that there were significant differences between the 2- and 6-minute protocols (111.3 vs. 92.5 watts; $p<0.05$) and 3- and 6-minute protocols (104.2 vs. 92.5 watts; $p<0.05$). **CONCLUSION:** Although results from the 2- and 3-min protocols are similar, both are significantly different from the 6-min protocol. Data collection for this study is ongoing; the next phase of analysis will involve determination of the relationship between PWC_{170} and VO_{2peak} for each protocol and how achievement of steady state exercise during testing stages affects these relationships.

This research was funded by the Spencer Foundation.

33) CALF AND FOREARM VENOUS COMPLIANCE IN OLDER ADULTS

Juliane P. Hernandez and Michelle J. Miller, Southern Illinois University, Carbondale, Illinois

Similar to changes in arterial compliance with aging, venous compliance in the lower extremities declines with age. There is evidence that venous compliance is lower in younger females than males but to date this potential sex difference has not been investigated in an older population. PURPOSE: To determine if there is a difference in the venous compliance of the extremities in older men and women. METHODS: Seventeen healthy adults over the age of 60 [10 male (65.4 +4.8 yrs, 31.5+2.1 ml*kg-1*min-1), and seven female (69.1+1.4 yrs, 22.4+3.3 ml*kg-1*min-1) volunteers underwent submaximal graded exercise tests and assessments of calf and forearm venous compliance. Utilizing venous occlusion plethysmography, calf and forearm venous compliance was determined in both groups using the first derivative of the pressure-volume relation during cuff pressure reduction. Capacitance and capillary filtration volumes were determined from the increase in limb volume following cuff pressure inflation. Sex differences were assessed with a simple ANOVA. RESULTS: The males were significantly larger than the females ($p<.05$; BMI 28.7 + 3.2 kg/m2 vs. 24.5 + 2.1 kg/m2 and calf volume 44.2 + 2.2 cm vs. 36.6 + 3.6 cm) and were also significantly more fit than the females ($p<.05$; VO2peak estimated from submaximal test; 31.5 + 2.1 ml*kg-1*min-1 vs. 22.4 + 3.3 ml*kg-1*min-1). There were no differences in calf [males; ΔLimb Volume = 1.3229+.1229 + .0840 + .0047 (Cuff Pressure) - .0007 + .00006 (Cuff Pressure)2 vs. females; ΔLimb Volume = 1.4233 +.3476 + .08658 + .0049 (Cuff Pressure) - .0008 + .00005 (Cuff Pressure)2] or forearm [males; ΔLimb Volume = 1.3811 +.1388 + .0871 + .0036 (Cuff Pressure) - .0006 + .00017 (Cuff Pressure)2 vs. females; ΔLimb Volume = 1.4327 +.3657 + .0850 + .00365 (Cuff Pressure) - .0008 + .00005 (Cuff Pressure)2] venous compliance, capacitance or capillary filtration volumes

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between the sexes in either limb. CONCLUSION: Any sex differences that might exist in younger individuals do not exist in an older healthy population. Despite having a significantly higher estimated VO2, the older males had similar venous characteristics in their extremities as the females. This suggests that males may lose venous compliance with age faster than females.

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2) DEMOGRAPHICS OF AN ADULT EAST CENTRAL INDIANA POPULATION AND PHYSICAL ACTIVITY RECOMMENDATIONS

Jason L. Jones[1], Leonard A. Kaminsky[2], FACSM, Trent A. Hargens[3]
[1]Ball State University, Muncie, IN

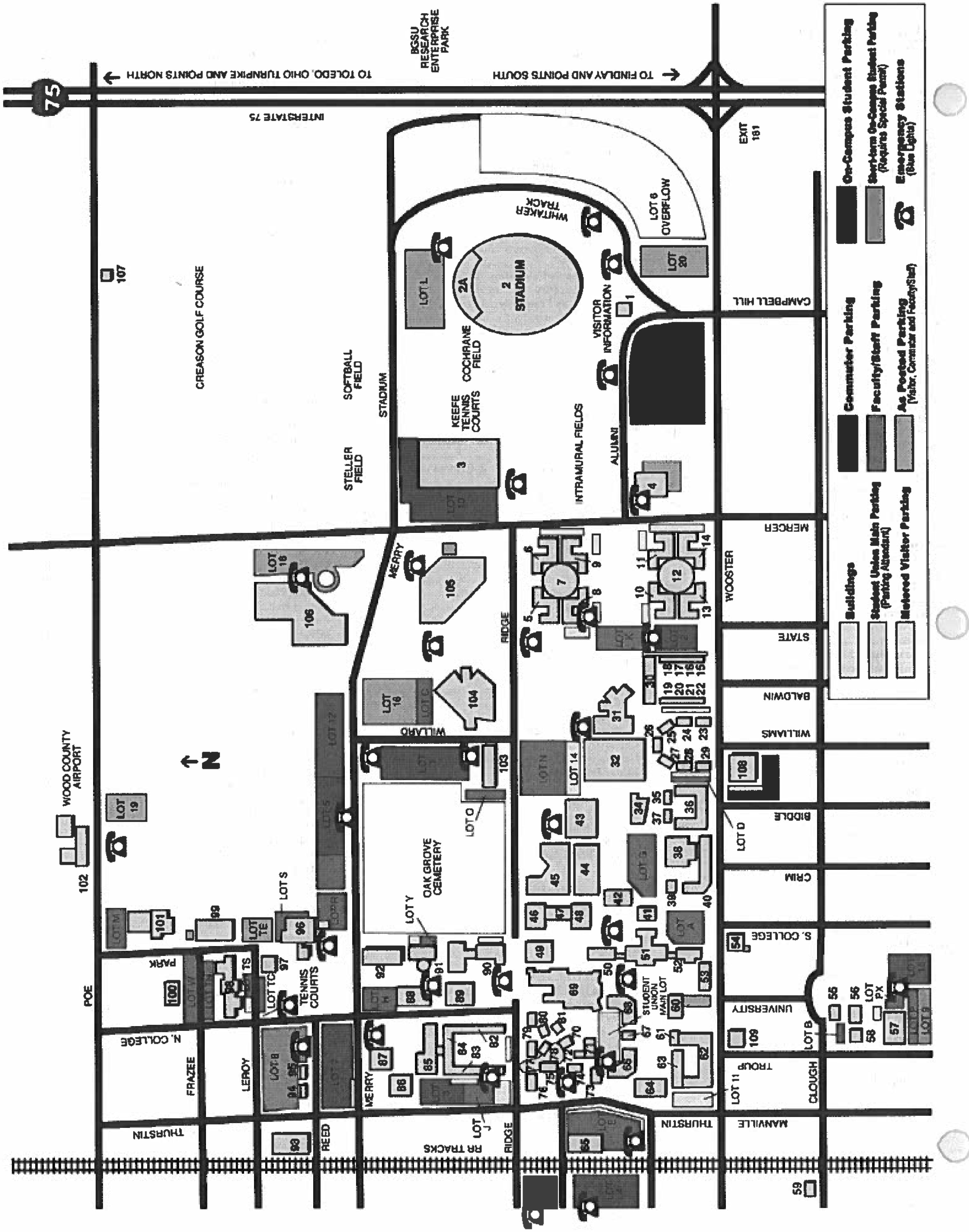
There are reported demographical influences on physical activity (PA). Most of the research includes subjective self-reported PA questionnaires, identifying males, younger adults, those earning higher salaries, and those with higher education being more active. Physical activity monitors have become more available, which allow objective quantification of PA and may address survey-based study limitations. **Purpose:** To objectively measure PA habits of an East Central Indiana (ECI) adult population and compare demographical influences on PA to state (Indiana) and national PA survey-based data. **Methods:** Subjects (n=122; 43 males, 79 females; 44.6±16.3yrs) wore a New Lifestyles® NL-1000 pedometer for one week and completed a demographics questionnaire including gender, age, income, and highest level of education. Subject inclusion criteria consisted of wearing the pedometer ≥5 days·week^{-1} (4 weekdays, 1 weekend day) and accumulating ≥2,500steps·day^{-1}. State and national data from CDC offers percentages of individuals physically active ≥30min·day^{-1} moderate intensity ≥5days·week^{-1}, which is similar to American Heart Association and American College of Sports Medicine PA recommendations (2007). The criteria for ECI subjects meeting physical activity recommendations were if they accumulated an average of ≥10,000steps·day^{-1} ≥5days·week^{-1}, which is equivalent to ≥30min·day^{-1} ≥5days·week^{-1}. **Results:** Subjects (n=122) averaged 8,865±3,302steps·day^{-1}. 20 subjects met PA step criteria (14,007±2,600steps·day^{-1}) with the remaining 102 subjects averaging 7,830±2351steps·day^{-1}. Table 1 summarizes the subjects meeting PA recommendations.

Table 1. Percentage of Subjects Meeting Physical Activity Recommendations

	Gender		*Age*			*Income*		*Education*	
	Male n=43	Female n=79	18-44 n=47	45-64 n=58	65+ n=17	<25k n=27	>25k n=95	HS n=16	College n=106
ECI	20.9	13.9	14.9	19.0	11.8	22.2	14.7	37.5	13.6
*State Data**	49.6	45.8	53.4	44.2	37.8	41.8	49.9	48.1	50.0
*National Data**	49.9	47.0	54.3	46.6	44.0	40.9	50.7	45.6	51.7

Values are in percent (%). Cell size (n) represents ECI subjects.
* CDC. *BRFSS Data*. 2005. http://apps.nccd.cdc.gov/brfss/index.asp

Conclusions: Males and middle-aged persons were more active than females and other age groups. Lower income and less educated persons were more active, which is dissimilar to state and national data. The percentage of subjects objectively determined to meet PA recommendations appears to be lower than state and national data.


TO TOLEDO, OHIO TURNPIKE AND POINTS NORTH
TO FINDLAY AND POINTS SOUTH
INTERSTATE 75
75
BGSU RESEARCH ENTERPRISE PARK
EXIT 181
CREASON GOLF COURSE
WOOD COUNTY AIRPORT
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SOFTBALL FIELD
STELLER FIELD
STADIUM
KEEFE TENNIS COURTS
COCHRANE FIELD
WHITTAKER TRACK
LOT 6 OVERFLOW
VISITOR INFORMATION
INTRAMURAL FIELDS
ALUMNI
CAMPBELL HILL
MERCER
WOOSTER
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STUDENT UNION MAIN LOT
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FRAZEE
LEROY
REED
RR TRACKS
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Short-term On-Campus Student Parking (Require Special Permit)
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Past Award Winners

Our records are incomplete. If you have any additional information please send it to the MWACSMoffice at mwacsm.org

Awards		
Year	Award	Recipient(s)
1989	Student Presentation	DN Proctor
1990	Student Presentation	Carol Wiedeman
1991	Student Presentation	Amy Jo Casenhiser
1992	Student Presentation	Kathryn Coningham
1993	Student Presentation	Kevin Short
		Cynthia McKnight
	Student Recognition	Glenna DeJoug
1994	Student Poster Presentation	D. M. Choi
	Outstanding Student Award	Cathy Karroll
	Student Presentation	Mary Sled
		C. Kasper
1995	Student Poster Presentation	Ray Stasling
	Student Presentation	Michael Caddia
	Outstanding Student Award	Charlie Lambert
	Student Research Award	Kera Kelsey
1996	Student Presentation	Alan Parcell
		Cindy Bouillon
1997	Outstanding Undergraduate Student	Heather Brehm
	Outstanding Graduate Student	Kevin Short
	Student Research Award	Christopher Cheatham
	Student Presentation	Sean Mulroy
		Christopher Cheatham
1998	Outstanding Graduate Student	Lisa Lesneuisky
	Student Presentation	Vicki Pittenger
		Brandon Klump
1999	Outstanding Graduate Student	Sean Flanagan
	Outstanding Undergraduate Student	Christine Meuller
	Student Presentation	Leigh Mroteh
		Ty Hopkins
	Student Research Award	Eric Hall
2000	Outstanding Undergraduate Student	Kindal Shores
	Outstanding Graduate Student	Cindy Anderson
	Student Research Award	David Wright
	Student Presentation	Cindy Anderson
		Cheri Teranishi
2001	Outstanding Graduate Student	Dawn Coe
	Outstanding Undergraduate Student	Tamara Keehn
	Student Presentation	S. K. Tsivitse
		D. C. Wright
	Student Research Award	Michelle Masterson
2002	Outstanding Graduate Student	Candace Perkins
	Outstanding Undergraduate Student	Evelyn Warner
	Student Research Award	Paul R. Nagelkirk
	Student Presentation-Poster: Undergrad	Christina Hayter
	Student Presentation- Poster: Masters	Jessica Sobolewski
	Student Presentation- Poster: Doctoral	Paul R. Nagelkirk
	Student Presentation- Oral	Adam Coughlin
2003	Outstanding Graduate Student	Paul Nagelkirk
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student	Maxi Meissner
	Student Presentation	DM Malek
		Paul Nagelkirk
		Michelle Masterson
		Patrick Johnson
		Renee Rogers
		Andrew Cole
	MWACSM Professional Award	Cody Sipe
2004	Outstanding Graduate Student	Dan Ritchie
	Student Research Award	Adam Coughlin
	Outstanding Undergraduate Student	Alicia Gordon
	Student Presentation- Poster: Undergrad	Dan Kelly
	Student Presentation- Poster: Masters	Natalie Schweitzer
	Student Presetnation- Poster: Doctoral	Christopher Herman
	Student Presetnation- Oral: Undergrad	Andrea Ott
	Student Presentation- Oral: Masters	Christine Layman
2006	Student Presentation- Oral: Masters	Megan Holmes
	Student Presentation- Oral: Doctoral	Phil Anton
	Student Presentation- Poster: Undergrad	Elizabeth Priest
	Student Presetnation- Poster: Masters	Lindsay Sammut
	Student Presentation- Poster: Doctoral	Richard Carpenter
	Student Research Award	Juame Padilla
	Outstanding Graduate Student	Richard Carpenter
	Outstanding Undergraduate Student	Rebekah Kuczynski
	MWACSM Professional Award	Clinton Brawner
2007	Student Presentation- Oral: Undergrad	Lindsay Kelly
	Student Presentation- Oral: Masters	Erin Kuffel
	Student Presentation- Oral: Doctoral	Tyrone Washington
	Student Presentation- Poster: Undergrad	Lisa Guth
	Student Presentation- Poster: Masters	George Schweitzer
	Student Presentation- Poster: Doctoral	Chris Herman
	MWACSM Professional Award	Kevin Temerowski

Founder's Awards
1994 Tim Kirby
1995 Richard Bowers
1996 Merle Foss
Henry Montoye
Fazlola Nickhah
1998 Richard Parr
1999 Wayne Sinning
2000 Ann Snyder
2001 Darlene Sedlock
2002 Jeff Edwards
2003 Lynn Millar
2004 Jeff Betts
2005 Tony Mahon
2006 Barry Franklin
2007 Lynn Darby

AMERICAN COLLEGE OF SPORTS MEDICINE
FOUNDED 1954

2007 Midwest ACSM annual meeting

OCTOBER 25 - 27

hosted by...

THE OHIO STATE UNIVERSITY

EXERCISE SCIENCE LABORATORY

WELCOME TO THE 2007 MIDWEST REGIONAL CHAPTER
AMERICAN COLLEGE OF SPORTS MEDICINE
ANNUAL MEETING

OCTOBER 25-27, 2007
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO

Welcome to the Annual Regional Chapter Meeting of the Midwest American College of Sports Medicine. The Program Planning Committee has worked diligently to put together a diverse program, providing an array of scientific and clinical presentations applicable to many areas of interest. We are both honored and excited to present such an outstanding line-up of featured guests. David Lamb, Ph.D., is the Gatorade Sport Science Institute keynote speaker for this year's meeting. We are fortunate to also present renowned experts, Larry Durstine, PhD, Steven Keteyian, PhD, and Jack Wilmore, PhD among our invited speakers. We also have planned many social opportunities this year including the 1st Annual MWACSM Quiz Bowl, Graduate and Internship Fair, Tommy's Pizza Social, Ask the Experts Breakfast and tours of OSU's Exercise Science facilities.

The Ohio State University Exercise Science Laboratory is proud to host the MWACSM Annual Meeting. Our newly created space in the Physical Activity and Educational Services (PAES) Building is of great pride to us and we look forward to opening our doors to old friends and new acquaintances. We hope that you will take advantage of our facility tours and take time to visit with our outstanding faculty, staff and students here at The Ohio State University.

I hope you have time to enjoy a bit of Columbus during your trip. Columbus is the largest city in Ohio, the 15th largest in the United States and the fastest growing city in the northeast quadrant. Points of interest in the Greater Columbus area include the Ohio Theater, Martin Luther King Center, Columbus Zoo, Center of Science and Industry, Wexner Center, State Capitol Building, and the downtown hot-spot - the Arena District.

Please enjoy yourself and take full advantage of the many programs, events, and social opportunities available at this year's meeting. On behalf of the Midwest Chapter, thank you for your attendance and participation at the MWACSM Annual Meeting.

Carmen Babcock, Ph.D.
2006-2007 President, MWACSM
Program Chair

WELCOME

THE OHIO STATE UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN ECOLOGY

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Meeting Information

Event Locations:

All events will be held in the Physical Activity and Educational Services building (PAES) or Recreation and Physical Activity center (RPAC). Below are directions from the buildings main entrance to the meeting room locations. Associated maps are shown on page 4.

PAES

Lobby– directly inside the main entrance

A25– basement level, follow signs to designated area

A39– basement level, follow signs to laboratory

A105– level 1, immediate left past lobby

A109– level 1, past the lobby on your left

A111– level 1, past the lobby on your left

RPAC

#1-3– proceed to turnstile check-in (you must have your meeting badge to proceed) climb stairs to level 2, turn right at top of stairs, follow signs to rooms Griner-located just prior to RPAC rooms #1-3

Continuing Education Credit:

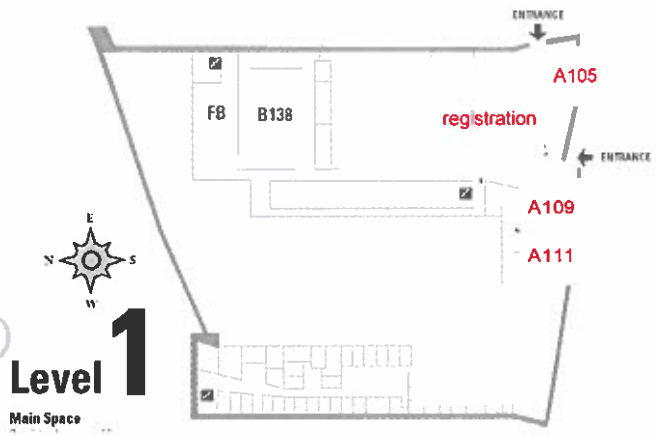
The American College of Sports Medicine's Professional Education Committee certifies that this Continuing Education offering meets the criteria for 14.5 credit hours of ACSM Continuing Education Credit. To request CEC's you are required to complete and sign the ACSM Attendance Verification Form available to you at the registration table. The fee for ACSM members desiring verification is $15.00 and the fee for non-members is $20.00. Individuals are responsible for mailing their own form and appropriate fee to ACSM for processing. ACSM will then send a credit verification letter to each individual within 4-6 weeks.

Finding Your Way Around

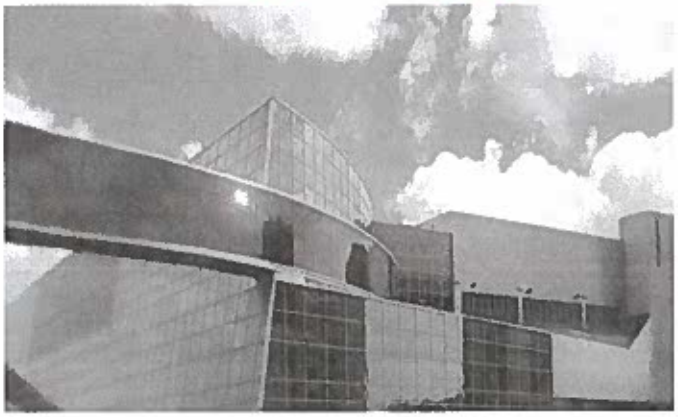
PAES

To locate PAES meeting rooms, enter the PAES building from the main entrance (east side of building). Meeting registration will be in the lobby area. All PAES meeting rooms will be directly to the left of registration.

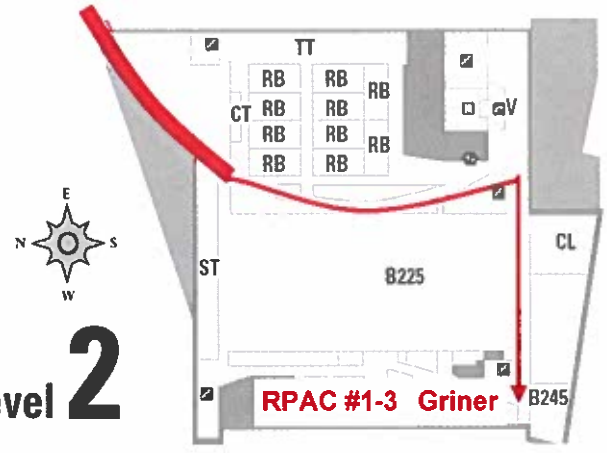
Note: PAES rooms A25, A39 and the Exercise Science facility tours are on the ground level (one floor down from Level 1)



RPAC



To locate RPAC meeting rooms: enter RPAC from the red walkway, immediately behind registration in the PAES building. Upon exiting the red walkway (you will be on RPAC Level 2), continue directly ahead, following signage to the meeting rooms. You will turn RIGHT after the stairwell and proceed until the hall dead-ends and turn RIGHT. The meeting rooms will be on your left.



Schedule of Events

Thursday, October 25, 2007

Time	Event	Location
2:00-8:00pm	Registration	PAES Lobby
3:00-4:00pm	*NFL Charities study on Metabolic Syndrome in Linemen*, J. Buell	RPAC #1
4:00-5:00pm	*Calcium and Weight Loss* , C. Broeder	RPAC #1
5:00-6:30pm	*Exercise in Insulin-Resistant Populations*, J & E. Betts	PAES A105
5:00-6:30pm	*The Effect of "Training" Recovery on Performance*, A. Bosak & P. Bishop	RPAC #1
6:00-8:00pm	Tours of Exercise Science Facilities	PAES A25
6:00-8:00pm	Poster Session (Abstract #1-6) *(Presenters must be present 2nd hour)*	PAES A25
6:30-7:30pm	*Popular Supplements*, M. Myhal	PAES A105
6:00-8:00pm	Dedication of Sherman Lab	PAES A39
7:30-8:30pm	Free Communications (Abstract #7-12)	PAES A105
8:30-9:30pm	Gatorade Sport Science Institute Keynote Address: *Improving Performance: A Recapitulation of Nutritional Manipulation* D. Lamb	RPAC #1-3

Friday, October 26, 2007

Time	Event	Location
7:30-9:00am	Breakfast	PAES Lobby
8:00-9:00am	Free Communications (Abstract #13-18)	PAES A109
8:00-10:00am	Poster Session (Abstract #19-24) *Presenters must be present 1st hour)*	PAES Lobby
9:00-10:00am	PARVO Medics Featured Speaker *Lipids, Lipoproteins, and Exercise* L. Durstine	RPAC #1-3
10:00-12:00pm	Posters Session (Abstract #25-30) *(Presenters must be present 2nd hour)*	PAES lobby
10:00-11:00am	Medgraphics Featured Speaker *Cardiac Rehabilitation and Evidence-Based Care in Patients with Heart Disease...Just Getting our Second Wind* S. Keteyian	RPAC #1-3
11:00-12:00pm	AEI Sponsored Speaker *Cardiopulmonary Exercise Testing: Cardiovascular Disease*, J. Ehrman & C. Brawner	RPAC Griner

cont'd next pg...5

Schedule of Events

continued...

Friday, October 26, 2007

Time	Event	Location
12:00-1:30pm	Luncheon/Hall Meeting	RPAC #1-3
1:30-2:30pm	*Metabolic Syndrome in Children*, J. Eisenmann	RPAC Griner
1:30-3:30pm	Poster Session (Abstract #31-36) *Presenters must be present 1st hour)*	PAES Lobby
2:30-3:30pm	MWACSM Christian Fellowship Featured Speaker *The Obesity Epidemic: Fact or Fiction?* J. Wilmore	RPAC #1-3
3:30-4:30pm	*The Effect of Simulated Altitude via Re-Breathing on Cycling Performance* C. Babcock	PAES A111
3:30-4:30pm	*ACSM Certification and Registry Programs: The Gold Standard* A. Sutterluety & S. Levine	PAES A109
4:00-7:30pm	Graduate/Internship Fair	RPAC #1-3
5:00-7:30pm	Quiz Bowl	RPAC #1-3
8:00-10:00pm	Tommy's Pizza Social Event	174 W. Lane Ave.

Saturday, October 27, 2007

Time	Event	Location
7:30-9:00am	*"Ask the Expert" over Breakfast*	PAES A109
9:00-10:00am	*Blood Lactate Responses to Maximal Exercise at Altitude: Does the "Lactate Paradox" Exist?* J. Davis	PAES A109
10:00-11:00am	*Urinary Protein Loss During Exercise and Altitude,* M. Leukemeyer	PAES A109
11:00-12:00pm	*Energy Expenditure Estimation by Accelerometry: Which Equation to use?* N. Leenders	PAES A109

Featured Speakers

Dr. David Lamb is an emeritus professor of exercise physiology at The Ohio State University in Columbus, Ohio. He is an expert speaker on the role of fluid ingestion and dietary carbohydrate in enhancing endurance performance and in the use of various other dietary supplements to improve sport performance. Lamb's research has focused on how manipulations of dietary carbohydrate and patterns of beverage ingestion can affect endurance performance. Lamb's research has been published in the *American Journal of Clinical Nutrition*, the *Journal of Applied Physiology*, the *International Journal of Sports Nutrition*, and other specialty journals. Lamb is a past-president of ACSM and is a recipient of the ACSM Citation Award. He is also a member of the American Physiological Society, and has been Chairman of GSSI since its inception in 1987.

Dr. Larry Durstine chair of the Department of Exercise Science in the Arnold School of Public Health at the University of South Carolina, is the 2006-2007 president of the American College of Sports Medicine. Durstine is director of clinical exercise programs at USC. He recently was awarded USC's highest teaching honor, the Michael J. Mungo Distinguished Professor of the Year Award. Durstine is internationally recognized for his research on lipids, adult fitness, and physical activity to manage chronic diseases and disabilities, and his research has been supported by the Centers for Disease Control and Prevention, the American Heart Association, and the American Cancer Society. The editor of 5 books and 20 book chapters, Durstine has published numerous scholarly articles in scientific journals and is a reviewer for 16 national and international journals. Durstine is a fellow of the ACSM and AACPR and a past president of the SEACSM. He earned a bachelor's degree in physical education from Malone College, a master's degree in physical education from the University of Denver, and a doctoral degree in exercise physiology from the University of Toledo.

Dr. Steve Keteyian is the Program Director of Preventive Cardiology, Henry Ford Heart & Vascular Institute in Detroit. He is also an adjunct Associate Professor, Department of Physiology, Wayne State University School of Medicine, and Clinical Professor of Exercise Science, Oakland University. Dr. Keteyian received his Ph.D. from Wayne State University, masters degree from the University of N. Colorado and his undergraduate degree from Grand Valley State. Keteyian's research focus and clinical duties currently involve patient's with heart failure. He is actively involved with human performance and the role of exercise and physical activity in the primary and secondary prevention of disease. Keteyian, is the founding and current editor of Clinical Exercise Physiology. He is a member of the Board of Trustees and fellow of ACSM; a member of the American Physiological Society and AACPR. Keteyian has published more than 40 articles and chapters in books.

Dr. Jack H. Wilmore is the 2006 ACSM Honor Award Recipient. Wilmore was selected for ACSM's most prestigious award based on his academic achievements in exercise and integrative physiology, his leadership in the emergence of Exercise Science over the last 40 years, his record as an educator, his professional service to ACSM and other organizations, his infectious optimism, and his unconditional willingness to help others. Wilmore has been an intellectual leader in key areas of human physiology including body composition, development of automated gas exchange systems, human performance, the female athlete, and exercise in health promotion and disease rehabilitation. Most recently he has played a key role in the HERITAGE Family Study, the 1st comprehensive effort to understand the "genomic" factors that regulate adaptations to exercise training in humans. He has contributed more than 300 peer-reviewed articles, 50 plus book chapters, and numerous books including the *Physiology of Sport and Exercise*, a leading general textbook co-authored with his close friend Dave Costill. More impressively, in each area of his academic pursuits Jack has been at the vanguard.

Special Events

Thursday, October 25, 2007

Facility Tours: Please join us for a tour of our brand-new Exercise Science facilities. We will offer a guided tour every half-hour from 6-8pm.

Dedication of the Sherman Lab: PAES Laboratory A39 will be dedicated to our very own W. Michael Sherman, Ph.D.

Dr. Sherman currently serves as the vice provost for academic administration in the Office of Academic Affairs. He was previously director of the School of Physical Activity & Educational Services and is Professor of Sport & Exercise Science Education at The Ohio State University. He received the Bachelor of Science in Education degree at Ohio University (Dr. Fritz Hagerman), the Master of Science degree in Human Bioenergetics at Ball State University (Dr. David Costill), and the Doctoral Degree in Kinesiology at the University of Texas-Austin (Dr. John Ivy). He was elected fellow of the American Academy of Kinesiology in 1999 and has been AAKPE Newsletter Editor since 2000. He is Co-Editor-in-Chief for the *International Journal of Sports Medicine* (1994 to present). In collaboration with Drs. David Lamb and Robert Murray, he organized two very successful symposia on sports nutrition with the Gatorade Sports Science Institute (1992 & 1994). He worked with the University's Departments of Recreational Sports and Athletics on our $139 million--625,000 sq ft recreation, aquatics, and academic facility , which we are now housed. Sherman has secured nearly $1 million in funding as principal or co-principal investigator for research associated with carbohydrate metabolism and physical activity measurement. He has published over 60 peer-reviewed publications, five book chapters, five comprehensive reviews, and has made over 100 presentations. We are very proud of his accomplishments! Be sure to stop by and give him your congratulations!

Friday, October 26, 2007

Graduate/Internship Fair: Students be sure to join us in RPAC #1-3 at 4pm for future professional and academic opportunities.

Quiz Bowl: The 1st annual Quiz Bowl will take place from 5-7pm in RPAC #1-3. Come watch the fun as some of the top schools in the Midwest battle it out for #1 in a jeopardy style game of wits.

Tommy's Pizza Social: Join us from 8-10pm at Tommy's on Lane. There will be free pizza and fun, so be sure to stop by 174 W. Lane Ave. Directions from PAES Building: take Tuttle Park Dr. (which runs past the football stadium), turn right on Lane Ave., Tommy's Pizza will be on the left.

Saturday, October 27, 2007

"Ask the Experts" Breakfast: Students!!! Don't miss out on this awesome opportunity to sit down to breakfast and have a chat with your favorite researcher. We are honored to have such renowned researchers dedicate their time, so please take advantage and enjoy this wonderful occasion.

Abstracts

POSTER SESSION, Thursday October 25, 6-8pm (#1-6)

1) THE EFFECT OF COMPRESSION SOCKS ON MUSCLE SORENESS FOLLOWING A BOUT OF CALF RESISTANCE EXERCISE

TD Heden, and JD Smith, Department of Kinesiology and Health, Southern Illinois University Edwardsville, Edwardsville, IL 62026

Delayed onset muscle soreness (DOMS) is a common phenomenon that may occur following muscular activity, particularly eccentric muscle contractions. The negative effects of DOMS include muscle pain, stiffness, tenderness, and weakness accompanied by a decreased range of motion that may lead to even greater injury. Cheung et al. (2003) reviewed the literature and found that nonsteroidal anti-inflammatory drugs and exercise have been shown to alleviate DOMS but only temporarily. Continuous compression using compression socks (Ali, Snow, & Caine, 2007) or sleeves (Kraemer et al. 2001) has also shown promise in alleviating DOMS. However, these are the only two studies to the researcher's knowledge that examine the effect continuous compression on DOMS. With so little research available regarding continuous compression as a treatment for DOMS, more research is needed. PURPOSE: To determine if the continuous compression applied from compression socks has an effect on DOMS 24 and 48 hours after an acute bout of calf muscle resistance exercise. METHODS: In this single-blinded, randomized, repeated measures study 49 participants (Age 24.0 ± 5.2 yrs, Height 173.4 ± 9.6 cm, Weight 78.2 ± 18.2 kg) performed a 1RM on a seated calf machine and after one week, performed the first exercise trial to induce muscle soreness. This trial consisted of lifting 75% of their 1RM until failure for three sets on the seated calf with a knee-high dress sock (placebo) or with the knee-high compression sock. One week later this trial was repeated but with the opposite condition. The sock was worn during the trials and for the following 24 hrs, and muscle soreness was recorded by the participants using a 7 point Likert Scale 24 and 48 hrs after the bout. RESULTS: Repeated Measures ANOVA indicated a significant effect of time but not a significant effect of condition (Table 1). CONCLUSIONS: Wearing knee-high commercially available compression socks for 24 hours following three sets of seated calf raises does not reduce DOMS in the calf. This study does not support findings of the positive effect of the sock as was found during endurance exercise (Ali, Snow & Caine, 2007). Although the trial protocol should have been sufficient to induce soreness, it may be that participants did not exercise to fatigue, thus lowering the treatment effect.

Table 1. Rating of soreness after a bout of seated calf raises

	No Sock	Sock
24 Hours†	1.24 ± 1.28	1.71 ± 1.44
48 Hours†	*0.75 ± 1.29	**1.06 ± 1.36

†Based upon a 7-point Likert scale, with 0 being "a complete absence of soreness" and 6 being "a severe pain that limits my ability to move"

* Significantly different from 24-hr No Sock ($p < .05$)

** Significantly different from 24-hr Sock ($p < .05$)

2) HEART RATE COMPARISON OF A TRADITIONAL PHYSICAL EDUCATION CLASS AND DANCE DANCE REVOLUTION

A Crommett. Cedarville University, Kettering, OH

Due to availability of video entertainment, children do not show a strong motivation to engage in physical activity. In order to combat this problem, software systems that incorporate movement into video games are being developed. One such software system that incorporates movement into video gaming is known as Dance Dance Revolution (DDR). DDR utilizes music and cues on a screen for participants to follow by foot patterns on a dance pad. PURPOSE: To compare heart rates reached during a traditional physical education class and heart rates reached in a class using DDR. METHODS: Subjects were 48 children (28 girls, 20 boys) recruited from local home school families, faculty and staff families/homes and the Salvation Army (age = 8.6 + 3.6, height = 53.6 + 15.9 in, weight = 32.5 + 27 kg). Heart rates were recorded and compared between a traditional P.E. class format and a DDR class format. During each session, each child wore a small portable heart rate telemetry unit (Polar E600) that recorded his or her heart rate every 15 seconds during each session. The traditional P.E. class consisted of a warm up, stretching, 1-minute intervals of jumping jacks, marching in place, jogging in place, basic stepping on a bench, and jumping rope. This session concluded with bean bag relays, cool down, and stretching. Homemade dance pads were used during the DDR class format so every child had a dance pad. These sessions began with a traditional warm up and traditional stretching. Then the DDR game was used with the subjects for 30 minutes including a slower warm up song and a slower cool down song. The workout phase songs ranged from 142-165 BPM and the warm up and cool down songs ranged from 130-131 BPM. RESULTS: A repeated measu ANOVA with pair-wise comparisons revealed statistical differences between heart rates during minutes 21-24 and 24-27. The alpha level was set at <0.05. CONCLUSION: This study showed that heart rates during DDR and heart rates during a traditional P.E. class were both elevated to 60% of HRmax, a percentage which would produce health benefits over time. The significant finding is that although the P.E. class raised the heart rate higher than the DDR class, the DDR class heart rates reached a plateau during class while the P.E. heart rates spiked and fell. Thus, DDR would be a good alternative to a traditional P.E. class.

3) AN ANALYSIS OF THE ASSOCIATION BETWEEN LEISURE-TIME PHYSICAL ACTIVITY AND BREAST CANCER RISK

CW Herman [1,2], KB Welch [2], & CA Erdmann [2]. 1) Exercise Science, Eastern Michigan University, Ypsilanti, MI and 2) The University of Michigan, Ann Arbor, MI

PURPOSE: The objective of this study was to review the methodology and analyze the existing data examining the relationship between leisure-time physical activity and breast cancer risk. METHODS: Methodological differences (physical activity instrumentation, subject characteristics, and time span of physical activi exposure measurement) were assessed for all studies. The potential effect of confounding variables was estimated by calculating the percent difference between the multivariate-adjusted risk estimates from the original studies and the unadjusted risk estimates used in the present meta-analyses. A series of meta-analyses using Stata 9.2 were performed, and only studies quantifying leisure-time physical activity using the Compendium of Physical Activities by assigning MET scores to activities were included in the analyses (6 analyses using 15 studies of pre and postmenopausal women, both stratified and combined). Subjects from the studies were combined and categorized as either having a low, moderate, or high amount of total weekly physical activity, and the moderate and high activity groups were compared to the low activity reference group. RESULTS: The percent difference between the adjusted and unadjusted estimates ranged from 0-21% across all physical activity categories for 14 of 15 studies, with one study (Patel et al., 2003) reporting a difference ranging from 20% to 64%. The combined risk estimate for high vs. low activity was 0.832 (95% CI = 0.747-0.926; $p = .001$) for pre- and postmenopausal women combined, 0.820 (95% CI = 0.584-1.151; $p = .251$) for premenopausal women, and 0.8 (95% CI = 0.754-0.999) for postmenopaus women. Moderate activity was only significantly different ($p = .001$) among pre- and post-

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nopausal women combined. CONCLUSIONS: Combined risk estimates of studies using the Compendium report that high, but not moderate, amounts of leisure-time physical activity appear to reduce the risk for postmenopausal breast cancer, while activity's association with premenopausal breast cancer risk remains unclear. Future studies assessing the relationship between physical activity and breast cancer should examine pre- and postmenopausal women separately, and should adhere to a standardized questionnaire for assessing types of physical activity as well as a standard time-frame for measuring physical activity.

4) EFFECT OF FITNESS ON FASTING INSULIN IN OVERWEIGHT, ADOLESCENT, AFRICAN AMERICAN FEMALES

A Gier, C Kist, K Horn, T Horn & R Claytor. Cincinnati Children's Hospital Medical Center, Cincinnati, OH and Miami University, Oxford, OH

The rate of overweight and obesity in children and adolescents has almost tripled over the past twenty years. Additionally, several recent reports suggest an increase in type 2 diabetes (T2D) and subclinical features of (T2D) in children and adolescents. Overweight/obese African American (AA) adolescent, females have been reported to be disproportionately susceptible to these lifestyle maladies. Given the health implications of obesity and T2D, the development and study of prevention and treatment strategies involving diet and exercise is warranted. PURPOSE: To determine the extent of the relationship between changes in aerobic fitness, body composition, and fasting insulin levels in overweight African American females after participation in a clinical, behaviorally-based, weight management program. METHODS: Prior to and following participation in the first phase (e.g. approximately 20-24 weeks) of the clinical weight management program (35 AA females; age = 11.7 +/- 2.4 yrs) a maximal, graded, treadmill exercise test was performed to determine maximal oxygen uptake (VO2max). Height and weight were measured to calculate BMI and body composition (% fat) was measured by DEXA. Additionally, as part of the program, a fasting blood sample was taken to determine fasting insulin, glucose, and lipid levels. During Phase 1 of the clinical weight management program participants and families attended 6 nutrition education and goal setting sessions and attended an after-school, structured exercise program at least once per week or as many as 5 (1 hour) sessions per week. RESULTS: A multiple linear regression analysis controlling for participants' age was conducted. The dependent variable was change in fasting insulin levels, and the predictor variables were changes in BMI, body composition and changes in aerobic fitness. Results revealed that aerobic fitness change (beta = -.556) was the only significant predictor of change in fasting insulin levels. That is, as study participants increased in level of aerobic fitness from pre to post study, their fasting insulin levels correspondingly declined. The adjusted R-squared value was .260. CONCLUSIONS: Regardless of changes in BMI or body composition, AA females who improved VO2max the most showed the largest decreases in fasting insulin. These data suggest that an increase in aerobic fitness plays a major role in decreasing metabolic factors related to T2D in AA females.

5) FITNESS AND FATNESS: EFFECTS OF SUPERVISED GROUP EXERCISE IN OVERWEIGHT YOUTH

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Overweight and obesity rates of U.S. children and adolescents have nearly tripled over the past 20 years. Most authorities suggest that changes in eating and physical activity behaviors have influenced the rates of childhood obesity. As such, strategies to prevent and treat pediatric overweight and obesity are necessary to combat this problem. PURPOSE: The purpose of this study is to determine whether there is a relationship between changes in aerobic fitness (VO2max), BMI, and/or body composition and attendance in an after-school, structured, group exercise program in overweight youth while participating in a clinical, behaviorally-based, weight management program. METHODS: Data from 204 subjects were used in these analyses; 138 were Caucasian (C) (49 males and 89 females); 67 were African-American (AA) (31 males and 37 females). Age at pretest was 12.2 +/- 2.8 yrs for the entire group. Prior to and following participation in the first phase (approximately 20-24 weeks) of the clinical weight management program, a maximal, graded, treadmill exercise test was performed to determine maximal oxygen uptake (VO2max). Height and weight were measured to calculate BMI and body composition (% fat) was measured by DEXA. During Phase I of the clinical weight management program participants and families attended 6 nutrition education and goal setting sessions and attended an after-school, structured exercise program at least once per week or as many as 5 (1 hour) sessions per week. Group exercise sessions included warm-up/stretching activities, aerobic games, resistance training, and short intervals of exercise on aerobic-type equipment followed by cool-down and stretching activities. The total number of exercise classes each child attended and the percentage of classes they attended were recorded and used for analysis. RESULTS: A repeated measures MANOVA showed a significant Time main effect ($p<0.0001$; eta=0.81). VO2max increased from pretest to posttest (25.9+/- 4.7 vs 29.7+/-5.5 ml/kg/min). Weight (84.5+/-25.1 vs 82.7+/-24.8 Kg); BMI (34.6+/-6.5 vs 33.1+/-6.6); and % fat (42.0+/-5.6 vs 39.7+/-6.2 %) significantly decreased. Univariate correlation analyses indicated a significant relationship between number of sessions attended and BMI change ($r = -0.28$; $p < 0.05$) for the AA group of males and females. In addition, AA females exhibited a significant correlation between sessions attended and aerobic fitness increase ($r = 0.33$; $p< 0.05$). The C and AA girls demonstrated significant correlations between % sessions attended and weight change ($r = -.23$; $p< 0.03$) and BMI change ($r = -.21$; $p< 0.04$). t-tests suggest that there was no significant difference between those who changed fitness the most (median split) and either number of sessions attended or % sessions attended. However, when two groups were formed by BMI change (median split) a

6) DOES FATIGUE AFFECT VALGUS ALIGNMENT AT THE KNEE DURING A DROP JUMP TASK?

P Bide, K Padfield, C Ansberry, A Behm & M Walsh, Miami University, Oxford, OH

It is well known that women athletes have a much higher incidence of anterior cruciate ligament injuries than their male counterparts in similar sports. A gender difference in valgus alignment at the knee is also well documented and it is possible that this may have a relationship with knee injuries in women athletes. The affect of fatigue on knee alignment has not been well documented. The purpose of this study was to examine the effect of fatigue on the knee alignment of a group of female university students during a drop jump task. Ten female students performed a drop jump task from a height of 30 cm. The fatigue task consisted of 15 counter movement jumps and 15 drop jumps, each with 10 seconds rest in between, and the a maximum speed shuttle run for 15 seconds which was 7 meters long. The fatigue protocol was repeated 3 times. The frontal plane kinematics at the knee joint during a drop jump were examined for the initial jumps as well as for jumps after each set of the fatigue protocol. To aid in digitization reflective markers were fixed to joint landmarks of the subjects' hips, knees and ankles. The data was analyzed using SIMI motion analysis software. The frontal plane parameters that were examined were the right and left knee angles, this distance between the right and left ankles and between the right

and left knees at landing and at the point of maximum knee joint abduction. Initial values for the frontal plane knee angle at landing showed a valgus alignment at landing of the dominant leg of 0.2 degrees (Standard deviation 3.2) and the non dominant leg of 1.9 degrees (SD 4.0) and the maximum valgus alignment of the dominant leg during the jump as 2.7 (SD 11.1) and for the non dominant leg 6.8 (SD 8.6). After all three fatigue protocols the values at landing were 0.7 (SD 4.0) for the dominant leg and 1.3 (SD 3.4) for the non dominant leg and the maximum valgus alignment was 1.1 (SD 16.7) for the dominant leg and 4.0 (SD 13.0) for the non dominant leg. None of these differences or differences in other measured kinematics were determined to be significant. Neuromuscular control has been implicated in valgus knee alignment, knee injuries in female athletes and fatigue has been shown to impair neuromuscular control. The results of this study find no effect of fatigue on valgus alignment during drop jumps. Interestingly, although there was no significant difference caused by fatigue, the post fatigue trials tended to show higher standard deviations which may be an indicator of decreased neuromuscular control. As in previous studies a greater valgus alignment during jumping was seen in the nondominant leg. In conclusion, the fatigue protocol chosen for this study had no effect on valgus alignment of the knee in female university students.

7) THE EFFECT OF DEHYDRATION ON ANAEROBIC EXERCISE ERFORMANCE

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Dehydration, a loss of body water, is common during exercise or work, especially under conditions of extreme heat. In the sport or occupational setting, individuals who are dehydrated are often required to perform anaerobic exercise. Although it is well known that dehydration impacts negatively on aerobic exercise performance, the impact of dehydration on anaerobic exercise performance is less well defined. This study examined the effect of moderate dehydration on anaerobic exercise performance. Eight healthy, athletic, male subjects (age: 19.6 ± 1.3 yrs; height: 180.1 ± 8.6 cm; weight: 82.6 ± 10.8 kg; VO2max: 46.5 ± 3.8 mls/kg/min) have completed two iterations of a 30-second Wingate Anaerobic Power Test: EUHY Wingate, in a well-hydrated condition, and HYPOHY Wingate, under conditions of moderate hypohydration (-3.8 ± 0.6 % body weight). The iterations were randomly assigned and separated by 3-10 days. Paired t-tests demonstrated no significant differences between treatment conditions (EUHY vs. HYPOHY) in mean power (EUHY: 663.08 ± 90.30 watts vs. HYPOHY: 641.40 ± 70.01 watts) $p = 0.52$; power/kg BW (EUHY: 8.37 ± 1.24 watts/kg BW vs. HYPOHY: 8.31 ± 0.95 watts/kg BW) $p = 0.89$; and power/kg LBW (EUHY: 9.19 ± 1.43 watts/kg LBW vs. HYPOHY: 8.87 ± 1.13 watts/kg LBW) $p = 0.49$. Skinfolds to predict percent body fat using population-specific equations were taken in both the EUHY and HYPOHY conditions. There were no differences in predicted percent body fat between conditions (EUHY: 8.70 ± 4.65 vs. HYPOHY 8.48 ± 4.88 %) $p = 0.53$. The results indicate that moderate hypohydration does not impair anaerobic exercise performance. Further, prediction of percent body fat using skinfold measurements is a reliable tool in both euhydrated and moderately hypohydrated subjects.

8) PERCEIVED COMPETENCE AND SOCIAL ACCEPTANCE AMONG AFRICAN AMERICAN CHILDREN FOLLOWING A 5-WEEK SUMMER SPORTS CAMP

A Lindsey, S Kelly, L Gordon, GM Ventimiglia & RC Jayaraman. School of Health Sciences, Exercise Science Division, Central Michigan University, Mount Pleasant, MI

African American children from low-income families are at increased risk for poor developmental and educational outcomes. In addition, several studies have reported that African American preschoolers evaluate their abilities less favorably than their Caucasian peers. Purpose: The purposes of our study were to examine the self-perceptions of low-income African American preschoolers using the Pictorial Scale of Perceived Competence and Social Acceptance (PSPCSA) and to examine how participating in a summer sports camp influenced the PSPCSA perceived competence and social acceptance subscales. Methods: African American 5-year-old boys and girls (29 boys and 22 girls) from low-income families were recruited for this study from a larger group of children participating in a subsidized 5-week long summer sports camp at a university in the Midwest. Parents completed consent forms and the children provided verbal ascent prior to testing. Perceived competence and social acceptance was measured using the 24-item PSPCSA for Young Children (Harter & Pike, 1984). Each child was interviewed individually before and after participating in the camp. Results: African American preschoolers evaluated their abilities more favorably than previously reported in the literature, cognitive competence: 3.72 ± 0.42 (mean ± SD); physical competence: 3.31 ± 0.64; peer acceptance: 3.54 ± 0.48; maternal acceptance: 3.28 ± 0.63 (Mantzicopoulos, 2004). Two one-way repeated measures ANOVAs compared the subject's competence (cognitive plus physical) and acceptance (peer plus maternal) scores before and after camp. There was no significant change in the competence subscales over time ($F(1,37) = 1.66$, $p > .05$) but there was a significant decrease in the acceptance subscales from before and after camp($F(1, 37) = 5.14$, $p < .05$). High PSPCSA scores at the start of camp may be the result of children's need to provide socially desirable answers. Conclusions: Contrary to previous reports, African American preschoolers from low-income families in our study scored significantly higher than the reported norms for African American and Caucasian preschoolers. In addition, participating in a 5-week sports camp did not significantly change the African American preschooler's perceived competence but there was a significant decrease in social acceptance, which may be due to the structure of the camp, i.e. kids having to follow rules.

9) PHYSIOLOGIC AND METABOLIC RESPONSES TO RUNNING WITH AND WITHOUT A JOGGING STROLLER: A PRELIMINARY ANALYSIS

AJ Aubrey, LK Dahmer, DP Coe, KA Pfeiffer, FACSM & E Elmi. Grand Valley State University, Allendale, MI

A common barrier that prohibits people from engaging in regular physical activity is absence of child care. Running with a jogging stroller allows parents to stay close to their child with the potential of simultaneously increasing energy expenditure as compared to running without a jogging stroller. Purpose To determine whether pushing a jogging stroller is associated with an increase in oxygen consumption, heart rate and perceived exertion compared to running without a jogging stroller. Methods Participants were 8 adults (age=30.5±2.5 years). Each subject performed a maximal exercise test to volitional exhaustion on the first visit. During two subsequent visits, the subjects participated in 4 trials (2 trials per visit). Two of the trials (1 mile each) involved running at a self-selected pace with and without the jogging stroller. The other two trials (1 mile each) involved running at a pre-determined pace (10 minutes per mile) with and without the jogging stroller. The running trials were randomly counterbalanced, and a 20 minute break was given between trials. The jogging stroller contained a standard 25-pound weight. Oxygen consumption was assessed using breath-by-breath analysis (Oxycon Mobile, Viasys Healthcare) and heart rate was assessed using telemetry (Polar). Rating of Perceived Exertion was assessed immediately following each trial

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ng the OMNI scale. Data were analyzed to examine differences across type of trial (self-paced versus predetermined) using paired T-tests. Results There were no significant differences in oxygen consumption, heart rate, or perceived exertion while running with and without the jogging stroller at the 10 minute mile pace or the self-determined pace. Conclusion Running with a jogging stroller did not significantly increase oxygen consumption, heart rate, or perceived exertion at either predetermined or self-selected paces. After more data are collected, it will be possible to examine differences across trials and potential interactions.

	10 min mile pace with the jogging stroller	10 min mile pace without the jogging stroller	Self-determined pace with the jogging stroller	Self-determined pace without the jogging stroller
VO2 ($ml \cdot kg^{-1} \cdot min^{-1}$)	30.5±2.8	28.9±1.6	37.8±3.8	37.2±2.5
HR ($beats \cdot min^{-1}$)	143.1±17.3	147.3±15.8	171.8±12.5	167.5±12.2
RPE	4.0±1.6	3.4±1.3	6.1±1.7	6.5±2.0

10) CARDIOVASCULAR REACTIVITY, PHYSICAL ACTIVITY, AND METABOLIC SYNDROME IN YOUTH

YI Coil1, ME Holmes1 & JC Eisenmann1.
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BACKGROUND: Metabolic syndrome (MetS) in U.S. adolescents has become an important public health issue in the last decade. Physical activity and diet are often associated with the MetS phenotype; however, stress and stress reactivity may also contribute to the MetS. These contributions have been shown in adults, but further etiological studies to examine MetS in youth are necessary. The purpose of this study was to provide preliminary data on the relationships between physical activity, cardiovascular reactivity to physical stress, and the MetS in 8-18 year old boys (n=37). Specifically, we examined whether the relationship between physical stress and MetS was modified by level of moderate to vigorous physical activity (MVPA). METHODS: Habitual physical activity was assessed using the MTI Actigraph accelerometer. Cardiovascular response was measured during a stress protocol consisting of a 2 minute 30% maximal effort isometric handgrip challenge (HG) and 1 minute forehead cold pressor test (CPT), Changes in mean arterial pressure (MAP) from baseline to CPT was used as an index of cardiovascular reactivity(CVR). A continuous metabolic syndrome score (MSS) was generated by summing the age-standardized residuals for waist circumference, mean arterial pressure, glycosylated hemoglobin, and high-density lipoprotein-cholesterol. RESULTS: In the total sample, the correlations between MVPA and CVR (r=-0.24), MVPA and MSS (r=-0.24), and CVR and the MSS (r= -0.19) were low. After separating the group into low, moderate, and high daily MVPA categories, the correlations between CVR and the MSS was r= 0.37 in the low MVPA group, r= 0.13 in the moderate MVPA group, and r= 0.19 in the high MVPA group. CONCLUSIONS: Results from this preliminary study show evidence that the relationship between cardiovascular reactivity and the metabolic syndrome may be modified by daily physical activity. In particular, CVR was more strongly associated with a higher MSS in youth who engage in fewer minutes of MVPA per day compared to children with moderate to high daily MVPA. *This work supported by a grant from the Center for Designing Food and Improving Nutrition, Iowa State University-USDA CRESS.*

11) INTERLEUKIN-6 DEFICIENCY ATTENUATES THE RECOVERY OF SKELETAL MUSCLE MASS FROM DISUSE-INDUCED ATROPHY

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Interleukin-6 (IL-6), an inflammatory cytokine, expression is induced during recovery from disuse-induced atrophy in skeletal muscle. However, the functional significance of increased IL-6 expression in response to reload has not been determined. Purpose: The purpose of this study was to determine the effect of IL-6 loss on reload-induced muscle morphology and gene expression related to hypertrophy. Methods: Female C57/BL6 (WT) and IL-6 knockout ($IL\text{-}6^{-/-}$) mice (10 wks of age) were assigned to a control, hindlimb suspension, or hindlimb suspension + recovery treatments. To induce disuse-induced atrophy mice underwent 10 days of hindlimb suspension. The recovery groups were allowed normal ambulation following hindlimb suspension for 1, 7, or 14 days. Results: 10 days of hindlimb suspension decreased gastrocnemius muscle mass to tibia length ratio 20% in both WT (5.7 ± 0.11 mg/mm vs. 4.6 ± 0.20 mg/mm, $p < 0.05$) and $IL\text{-}6^{-/-}$ mice (5.7 ± 0.20 mg/mm vs. 4.6 ± 0.17 mg/mm, $p < 0.05$). 7 days of reload returned wild type mice muscle mass to tibia length ratio to control values, whereas $IL\text{-}6^{-/-}$ gastrocnemius muscle to tibia was still depressed ($p < 0.05$). However, 14 days of reload returned gastrocnemius muscle mass of $IL\text{-}6^{-/-}$ mice back to control values. 1 day of reload increased IGF-1 gene expression 4-fold ($p < 0.05$) in WT gastrocnemius muscle. However, $IL\text{-}6^{-/-}$ gastrocnemius muscle had a 67% decrease ($p < 0.05$) in IGF-1 gene expression. 1 day of reload increased myoD mRNA abundance 3-fold ($p < 0.05$) in WT gastrocnemius muscle. However, 1 day of reload decreased myoD gene expression 85% ($p < 0.05$) in $IL\text{-}6^{-/-}$ gastrocnemius muscle. 1 day of reload increased myogenin gene expression 2-fold ($p < 0.05$) in WT gastrocnemius muscle whereas; this response was ablated in the $IL\text{-}6^{-/-}$ gastrocnemius. Conclusion: In conclusion, these data point to IL-6 as a critical regulator of the myogenic and anabolic growth programs that are initiated at the onset of recovery from disuse-induced atrophy.

12) PHYSIOLOGICAL EFFECTS OF CAFFEINE DURING SUBMAXIMAL EXERCISE

J.L. Wendling, LM Rittersdorf, NC Furlong, LA Regian, JL Gullan, SM Battjes, PR Thompson, CR Hawkins & PS Visich, FACSM, Central Michigan University, Mount Pleasant, MI 48858

PURPOSE: Caffeine consumption has increased tremendously in the past decade. A popular and growing source of this caffeine is in the form of energy drinks, which can contain the equivalent of 2 to 4 cups of coffee per 8 to 16 ounce serving. The purpose of this study was to determine the effect of caffeine (commonly found in an energy drink) on physiological function during submaximal exercise. METHODS: Eleven healthy males (aged 22.1 ± 1.14) who do not regularly consume caffeine (< 2 caffeine beverages/day) performed two submaximal treadmill sessions on two separate occasions. Each exercise trial was undertaken in the morning and subjects were required to be in a fasted state. One hour prior to each trial subjects were required to consume either a caffeinated (containing 6g/kg body weight caffeine) or non-caffeinated beverage. During both experimental trials subjects exercised for 8min at 40, 60 and 80% of VO2max separated by a two minute recovery between each intensity. Blood pressure (BP), heart rate (HR), blood lactate (BL), and rating of perceived exertion (RPE) response were assessed at each intensity. RESULTS: There were no significant differences ($p > 0.05$) for BP, HR, BL, or RPE at 40, 60 or 80% of VO2max between the two trials. CONCLUSION: Caffeine consumption (6g/kg) does not appear to influence BP, HR, BL, or RPE during submaximal exercise between 40 and 80% of one's VO2max. Therefore, consumption of popular energy drinks does not appear to have a harmful or beneficial influence on physiological function in young healthy males when exercising at submaximal intensities.

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ORAL PRESENTATION, Friday October 26, 8:00-9:00am (#13-18)

13) FACTORS ASSOCIATED WITH EXERCISE ASSOCIATED COLLAPSE (EAC) IN MARATHON RUNNERS

CA Asplund, MD, Christopher W. Bunt, MD, Uniformed Services University of the Health Sciences, Bethesda, MD

Purpose: Exercise Associated Collapse (EAC) is commonly encountered following a marathon. Most causes of EAC are non-severe and occur following the finish line; however, EAC can be associated with life-threatening conditions requiring hospital transfer. The purpose of this study is to better define factors associated with EAC. Methods and Study Design: Retrospective case-control study. Runners presenting to medical tents with EAC following marathon completion were identified as cases. Finishers without EAC were identified as controls. Both groups were administered a verbal questionnaire. Runners <18 years old, requiring advanced cardiac or basic life support and/or with collapse secondary to orthopedic injuries were excluded. Results: 59 cases of EAC and 316 controls were identified. Of the cases: 30 were male and 29 female; controls: 221 male and 92 female. Factors found to be associated with EAC: previous EAC ($p<0.001$), previous heat illness ($p<0.01$), emesis during marathon ($p<0.001$), chronic medical problems ($p<0.001$), and runners reporting a perceived maximum effort over the last 6 miles ($p=0.04$). The average finishing time of runners with EAC was 4:19 versus 3:46 for controls ($p<0.001$). Female gender was associated with a 2.5 times higher risk of EAC ($p=0.01$). Factors not associated with an increased risk for EAC: age, NSAID use during week prior to the marathon, attempting to set a Personal Record (PR), number of previous marathons, average weekly training mileage. Conclusions: Factors found to be associated with EAC in marathon runners: previous EAC, previous heat illness, emesis during the marathon, female gender, chronic medical problems, slower finishing time and perceived maximum effort over the final 6 miles. Significance of Findings: Marathon race and medical directors can improve distribution of resources and educate runners so that they may recognize some of the factors that may increase their risk for EAC to insure safe completion of the event.

14) EFFECT OF ENDURANCE EXERCISE TRAINING ON MARKERS OF CHOLESTEROL ABSORPTION AND SYNTHESIS

K Wilund. University of Illinois at Urbana-Champaign, Urbana, IL

Abnormal cholesterol metabolism, including low intestinal cholesterol absorption and elevated whole body cholesterol synthesis, are prevalent in individuals with diabetes, hyperlipidemia, obesity, and the metabolic syndrome. Recent studies have shown that diet-induced weight loss improves markers of cholesterol absorption in these populations. The aim of this study was to examine whether endurance exercise training with minimal weight loss also normalizes markers of cholesterol metabolism. To examine this, we used GC/mass spectroscopy to measure circulating levels of campesterol and sitosterol - plant sterols that correlate with cholesterol absorption, and lathosterol - a precursor in the cholesterol synthetic pathway that is a marker of cholesterol synthesis, from plasma samples of 65 sedentary subjects (34 women, 31 men, average age = 59) before and after 6 months of endurance exercise training. Following the exercise intervention, there was a significant increase in plasma campesterol, and this change was positively correlated with the change in VO2max ($r = 0.273$, $p = 0.028$), and inversely correlated with the change in body weight ($r = -0.291$, $p = 0.019$). Plasma sitosterol and lathosterol levels were not significantly different after the exercise intervention, but the change in sitosterol was positively correlated with the change in VO2max ($r = 0.249$, $p = 0.049$), independent of changes in body weight. This data indicates that exercise training may help normalize cholesterol absorption, and these changes may be partially independent of weight loss. These findings highlight previously unrecognized benefits of exercise training on cholesterol metabolism.

15) VALIDITY OF ESTIMATING MINUTE-BY-MINUTE ENERGY EXPENDITURE WITH ACCELEROMETRY

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PURPOSE: Researchers commonly use accelerometers to measure physical activity intensity and duration in free-living subjects, but these require regression equations to produce useful information. This study examined the accuracy of the Freedson, Hendelman, and Swartz regression equations and the Crouter 2-regression model for predicting metabolic equivalent values (METs) during transitions from rest to activity and back to rest. METHODS: Thirty volunteers (age, 28±8 yrs) performed 15 minutes of supine rest, followed by 8 minutes each of: one-on-one basketball, seated rest, overground walking, and seated rest. An ActiGraph GT1M was positioned on the right hip and a portable metabolic unit was worn during all activities. Participants were randomly assigned to start the activity bouts at 0-s, 20-s, or 40-s into the minute (according to the ActiGraph clock). RESULTS: The mean measured MET value for the basketball bout was 9.0 METs, compared to 7.7 METs for the Crouter 2-regression model, 5.4 METs for the Freedson equation, 5.0 METs for the Hendelman equation, and 6.0 METs for the Swartz equation (all, $P<0.05$). The mean measured MET value for the walking bout was 3.5 METs, compared to 3.9 METs for the Crouter 2-regression model, 3.7 METs for the Freedson equation, 4.1 METs for the Hendelman equation, and 4.6 METs for the Swartz equation (all, $P < 0.05$). The Crouter 2-regression model over-predicted measured METs during the first minute of all walking conditions and the last transitional minutes of the 20-s and 40-s walking conditions ($P < 0.001$). CONCLUSION: During basketball the Crouter 2-regression model provided a more accurate estimate of METs than other commonly used single-regression ActiGraph equations. The tendency of the Crouter 2-regression model to over-predict the energy cost of walking results from the high variability in the accelerometer counts in the first and last transitional minutes. *This study was supported by NIH Grant 01R21 CA122430-01.*

16) PHYSICAL ACTIVITY PARTICIPATION AND THE VALIDITY OF SELF-REPORTED WEIGHT AND HEIGHT IN WOMEN

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Self-reported weight and height are often used in epidemiological studies, although validity may be limited. Weight status is known to influence the validity of self-reported anthropometric variables in women; but the effects of demographic and health behavior variables have not been well defined. PURPOSE: To examine how physical activity (PA) and demographic/health variables affect the validity of self-reported height, weight, and body mass index (BMI) among women 18-65 yrs old. METHODS: Women (n=138) self-reported weight (lbs), height (in), and demographic/health variables during a telephone interview on reproductive health and diet. A trained investigated later measured weight on an electronic scale, height with a portable stadiometer, and minutes of moderate and/or vigorous PA/wk with the 7-day PA recall questionnaire durin home visit. Quartiles of total min/wk of were created and the number of women reporting any participation in vigorous PA was deter-

mined. BMI values were calculated (kg•m-2) using self-reported and measured data. Overweight was defined as BMI ≥25 kg•m-2. Measured values for height, weight, and BMI were used as the criterion. RESULTS: Mean difference between self-reported and measured height was 0.05 in (95% CI, -0.07; 0.18), whereas mean differences in weight and BMI values were -4.43 lb (-5.55; -3.30) and -0.79 kg•m-2 (-1.01;-0.57). Overweight women (n=73) and those reporting no vigorous PA (n=45) underestimated weight to a greater degree than normal weight, vigorously active women (p values <0.05). Vigorous PA participation added significantly to the prediction of measured BMI from self-reported BMI. For self-reported data the sensitivity of overweight status was 0.81 (95%CI, 0.70; 0.89) and specificity was 1.00 (0.83; 1.00). When adjusted for vigorous PA, sensitivity increased to 0.85 (0.74; 0.92), but specificity decreased to 0.95 (0.86-0.99). Total PA quartile, age, marital status, education, working status, depression, alcohol use, and smoking did not influence these results. CONCLUSION: Women report height accurately; however the validity of self-reported weight and BMI values varies by current weight status and vigorous PA participation. The sensitivity of self-reported data for detecting overweight is improved by controlling for vigorous PA participation.

17) FUNCTIONAL ANATOMY, PREDICTIVE FACTORS, PATHOMECHANICS, AND PREVENTION OF LATERAL ANKLE INJURIES: COMPREHENSIVE LITERATURE REVIEW

K Carlson, Wheaton College, Applied Health Science Department, Wheaton, IL

PURPOSE: To review the literature in relation to the functional anatomy, predictive factors, pathomechanics, rehabilitation and prevention of lateral ligament complex ankle injuries. METHODS: We searched MEDLINE, PubMed, Sport Discus and Health Source from 1980 to 2007 using the terms *ankle*, *ligament*, *injury*, *prevention*, *rehabilitation*, *epidemiology* and *pathomechanics*. RESULTS: Lateral ankle sprains are among the most common injuries incurred during physical activity participation. The talocrural, subtalar and inferior tibiofibular joints contribute to overall ankle function. The proper and abnormal function of these joints needs to be considered when examining the pathophysiology and pathomechanics of lateral ankle sprain. The most common mechanism of lateral ankle sprain is excessive supination, which involves plantarflexion, inversion and adduction of the ankle/foot complex. There were few prospective studies focusing on identifying the risk factors associated with lateral ankle injury. Although inconclusive, the literature presents the following intrinsic and extrinsic risk factors for lateral ankle sprain. Stated intrinsic risk factors include: previous sprain, sex, height, weight, limb dominance, anatomic foot type, foot size, generalized joint laxity, ankle joint laxity, anatomic alignment, muscle strength, muscle reaction time and postural sway. Stated extrinsic risk factors include: ankle prophylactics, shoe type, duration and intensity of competition. There were also very few evidence-based studies of injury prevention programs. CONCLUSIONS: Even though there is a majority of agreement among authors on various aspects of lateral ankle injury, many controversies still remain. The literature is inconclusive on risk factors associated with lateral ankle injury. In addition, the appropriate approach for injury prevention is an area of much inconsistency within the literature. A comprehensive understanding of this body of literature is imperative when developing injury prevention programs that will reduce both the incidence and severity of this injury.

18) RELIABILITY AND APPLICATION OF AN INEXPENSIVE ACCELEROMETER IN MECHANOGRAPHY

WJ Armstrong, MA Goad, RL Baaken & MA Abrahantes, Hope College, Holland, MI

The mechanomyogram (MMG) is the recording of pressure waves produced by the lateral expansion of a number of muscle fibers. It is considered to be the mechanical equivalent to electromyography, and researchers suggest that MMG is a more accurate measure of muscle fatigue. Our laboratory is interested in examining changes in the MMG with electrical stimulation; MMG measurement with acute bouts of fatigue; MMG changes with training/overtraining; and others similar lines of scholarship. To this end, an accelerometer (ACC) was designed to integrate with the MP150 (Biopac Systems, Inc., Goleta, CA) and . PURPOSE: To determine the reliability of the designed ACC during isometric contractions. METHOD: 11 college-age participants (5 males; 6 females) performed six 6-s isometric leg extensions held at 30-degrees of flexion at 60% one-repetition maximum with a three minute rest between contractions. This protocol was repeated on three consecutive days. Mean and peak-to-peak (p-p) MMG values were measured for eight 0.5 s epochs (seconds 2-5). Intraclass correlation coefficients were calculated by two-way ANOVA using SPSS. RESULTS: ICCs for were 0.866 and 0.825 for mean MMG and p-p MMG, respectively. CONLUSIONS: The ACC design is reliable for use in MMG applications. Its size and inexpensive cost of production make it a viable alternative to more costly commercially produced ACCs for a wide range of applications. *Funded by: Howard Hughes Medical Institute grant*

19) ACCESS TO LIFELONG EXERCISE IMPROVES PHENOTYPIC AND GENETIC MARKERS

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It is well accepted that the interaction of genetic and environmental factors influences health and longevity in animals across the animal kingdom. The exact genotype and phenotype associations are not well understood, but advances have been made as new genes and their functions are discovered. Our laboratory is interested in how lifelong exercise affects gene expressions and associated phenotypes known to be associated with health and longevity. In this study 6 week old male Sprague Dawley rats were housed 1) with no access to exercise outside a standard cage (SED), with twice weekly hourly access to physical activity in a large box (PA), and with regular access to running wheel exercise (EX). Throughout the life span, regular measurements of body weight, blood pressure, and blood lipids were recorded. At 16 months, the animals were sacrificed and a portion of the left ventricle was removed from each heart. RNA was isolated and analyzed by Affymetrix microarray. Gene expressions were analyzed with GeneSifter software (http://www genesifter.net/web/). The phenotype results indicated that compared with SED, life long exercise resulted in healthier cardiovascular-related profiles in EX including reduced body weight, blood pressure, serum cholesterol, and triglycerides. The three genes which had the largest changes in expression (> 1.5 fold) were transcribed locus LOC 287992, transcribed locus AB2-143, and crystallin lambda. All three have been associated with regulation of blood pressure, body weight, and blood lipids. In our experiment, lifelong exercise downregulated LOC 287992 and AB2-143 3 while crystalline lambda was up-regulated by exercise. Fold change ratios from microarray and qPCR for the CRYL1 gene were similar at -1.24 vs. -1.66.

Abstracts

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20) CARBOHYDRATE TIMING EFFECTS ON EXERCISE PERFORMANCE: FRONT, END, & CONTINUAL LOADING OF CARBOHYDRATE BEVERAGE DURING EXERCISE

G Schweitzer. University of Michigan, Ann Arbor, MI

INTRODUCTION: During exercise, carbohydrate becomes actively involved in powering a person to perform work, especially during that which is high-intensity. Presently, it is not well understood how the timing of carbohydrate ingestion during exercise influences performance. PURPOSE: The purpose of this study was to compare three separate exercise sessions, each differing in the timing of carbohydrate ingestion during exercise (front-loading, end-loading, and continual loading) on performance. METHODS: Ten well-trained cyclists completed three separate exercise sessions (2 hours of cycling at 67 ± 1% (± SEM) of their maximum oxygen uptake, followed by a 15-minute "all out" performance ride), with different carbohydrate ingestion protocols, but the same quantity of carbohydrate in all trials (~75 grams). In the front load trial (FL), participants ingested the carbohydrate beverage (CHO) during the first hour and a placebo beverage, containing minimal carbohydrate and an artificial sweetener, during the second hour. In the end load trial (EL), participants ingested CHO during the second hour and a placebo the first hour. In the continual load trial (CL), CHO was ingested throughout the trial. The participant's performance in each condition was measured by the power output during the 15-minute performance ride and their GI symptoms were assessed by a self-report questionnaire. RESULTS: There was no difference in work output among the three conditions (FL: 255 ± 16, CL: 241 ± 17, EL: 254 ± 17 watts). In addition, there were no self-reported measures of gastrointestinal distress, a common limiter of physical performance. However, FL led to a greater average speed and distance traveled than CL likely due to the nonlinearity of the speed/power measurement of the Velotron cycle ergometer (36.26 ± 0.92 vs. 35.24 ± 1.00 $km \cdot hr^{-1}$ and 9.05 ± 0.23 vs. 8.80 ± 0.25 km, respectively). Ingestion of the differing amounts of carbohydrates was tracked via venous blood glucose. In the first hour of exercise, venous blood glucose was high in the FL condition (peaking at 5.4 ± 0.2 $mmol \cdot L^{-1}$), intermediate in the CL condition (4.8 ± 0.1 $mmol \cdot L^{-1}$), and low in the EL condition (4.4 ± 0.2 $mmol \cdot L^{-1}$). In the second hour, venous blood glucose was low in the FL condition (4.1 ± 0.1 $mmol \cdot L^{-1}$), intermediate in the CL condition (4.7 ± 0.2 $mmol \cdot L^{-1}$), and high in the EL condition (peaking at 5.2 ± 0.2 $mmol \cdot L^{-1}$). FL was significantly lower than EL at the 120-minute time point (4.1 ± 0.1 vs. 4.9 ± 0.1 $mmol \cdot L^{-1}$, respectively). Following the 15 minute time trial, the FL venous blood glucose level increased from the 120-minute time point to the 135-minute (post-time trial) time point to levels the same as the CL and EL conditions (FL: 5.2 ± 0.2, CL: 4.8 ± 0.3, EL: 4.9 ± 0.2 $mmol \cdot L^{-1}$). CONCLUSION: Overall, the timing of carbohydrate beverage consumption during 2 hours of exercise at 67% VO_2 max did not alter cycling performance among the three conditions.

21) BRANCH-CHAIN AMINO ACID SUPPLEMENTATION ELIMINATES THE LOSS OF MUSCLE POWER AFTER ECCENTRIC EXERCISE IN MIDDLE-AGED WOMEN

ZM Sullivan, SM Baier, NM Johannsen, & DS King, FACSM. Iowa State University, Ames, IA

Previous research suggests that branch-chain amino acids (BCAA) supplementation may attenuate perception of muscle soreness after exercise. PURPOSE: The purpose of this study was to determine the effects of an acute BCAA supplementation before exercise on the subjective appraisal of muscle soreness, muscle power, and plasma creatine phosphokinase (CK) and lactate dehydrogenase (LDH) activities after eccentric exercise. METHODS: Forty-five middle-aged people (25 women, 20 men; 48 ± 6 y) volunteered for this randomized double-blind study. A 5-repetition isokinetic muscle function test of knee flexion and extension was performed before and 1 and 2 days after eccentric exercise. Subjects ingested either 8 g BCAA (Ile:Leu:Val= 1:2:1) or placebo (PL) and immediately performed 6 sets of 10 repetitions of eccentric knee extensions and flexions at 120% of peak concentric torque. A 4-wk washout period separated the two trials. RESULTS: The change in mean extension power during the 5-repetition test from Day 1 to Day 2 was different for BCAA (+3.1 + 2.0 watts) and PL (– 5.3 + 3.0 watts; P = 0.02, Effect size (ES) = 0.67) in women. The change in mean flexion power from Day 1 to Day 2 was also different for BCAA and PL (+0.1 ± 1.6 vs. -6.0 ± 2.1 watts, respectively; P = 0.03, ES = 0.65) in women. For men and women combined, the change in mean extension power from Day 1 to Day 2 tended to be different in BCAA (+1.6 + 2.2 watts) and PL (-4.4 + 2.3 watts; P < 0.07, ES = 0.40). Ratings of muscle soreness and increases plasma CK and LDH activities were mild and not different between BCAA and PL. CONCLUSIONS: These results provide evidence that a single dose of BCAA eliminates the loss in muscle power output observed in women after exercise that produces mild muscle damage. BCAA supplementation did not reduce plasma markers of muscle damage, possibly because the exercise protocol only modestly elevated circulating plasma creatine phosphokinase and lactate dehydrogenase activities.

Funding for this study was provided by Otsuka Pharmaceutical, Co., Ltd.

22) ENDURANCE EXERCISE TRAINING AND GALLSTONE DEVELOPMENT IN MICE

HR Chung, LA Feeney, EJ Tomayko, KR Wilund. Department of Kinesiology and Community Health, University of Illinois, Urbana, IL.

Cholesterol gallstones form when the ratio of biliary cholesterol to bile acids and phospholipids is too high, causing the cholesterol to precipitate in the bile. Physical *inactivity* has been suggested to increase the risk of cholesterol-gallstone development, but experimental evidence supporting this hypothesis is lacking and potential mechanisms responsible for the benefits of physical activity on gallstone development have not been described. In this study, we examined the effect of 12 weeks of endurance exercise training on gallstone development and the expression of genes involved in liver and bile cholesterol metabolism by real-time quantitative polymerase chain reaction (RT-qPCR) assay in a gallstone-sensitive mouse strain (C57L/J). At six weeks of age, fifty mice were fed a lithogenic diet (21% fat, 1.25% cholesterol and 0.5% cholic acid) and were randomly assigned to an exercise (EX) or sedentary (SED) group (n=25 per group). Mice in the EX group ran on a treadmill at ~15m/min for 45 minutes/day for 12 weeks, while mice in the SED group did not have access to the treadmill. At sacrifice, gallbladders were removed and the gallstones were collected, pooled, and weighed. The average weight of gallstones in the SED mice was 5.7mg, while the average stone weight in EX mice was 2.3mg. In addition, in the EX mice, there were increases in the hepatic expression of the LDL receptor and SRB1, which increase cholesterol clearance by LDL and HDL particles, respectively. Furthermore, there was an increase in the hepatic expression of Cyp27a1, a rate limiting enzyme in the conversion of cholesterol to bile acids. Taken together, this data indicates that exercise training promotes changes in hepatic gene expression that increases cholesterol uptake by the liver, but simultaneously increases the conversion of hepatic cholesterol to bile acids, effectively reducing cholesterol saturation in the bile. This suggests a mechanism by which exercise improves cholesterol clearance while simultaneously inhibiting gallstone formation.

23) SHORT-TERM LOW-FAT OR LOW-CARBOHYDRATE DIET CONSUMPTION DOES NOT AFFECT 24-HOUR PHYSICAL ACTIVITY AND PERFORMANCE

Abstracts

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POSTER SESSION, Friday October 26, 10:00-12:00pm (#25-30)

SS Vispute, JD LeCheminant, JD Smith & G Schweitzer. Southern Illinois University Edwardsville, Edwardsville, IL

Objective: This study was undertaken to examine the effects of a two-week low-carbohydrate and low-fat weight maintenance diet on 24-hour physical activity and physical performance. Methods: Twelve moderately-trained adult women (23 ± 2 y, 64 ± 8 kg, 24 ± 3 kg/m2, 36 ± 6 ml/kg/min) consumed 2 weeks of a low carbohydrate and 2 weeks of a low fat diet separated by a 1-week wash-out period using a randomized counter-balanced design. For both diets each participant received an energy intake level calculated to maintain their body weight. The low carbohydrate diet consisted of a daily carbohydrate intake level of approximately 25% of total daily energy from carbohydrate and the low fat diet consisted of approximately 30% or less of intake from dietary fat. Aerobic fitness, 24-hour physical activity level, body composition, blood pressure, and dietary intake were assessed at baseline and following each dietary period. Results: During the low-carbohydrate diet period participants consumed 28.8 ± 12.6% of kcal from carbohydrate and 43.9 ± 10.4% from fat while during the low-fat diet period participants consumed a significantly greater percentage of carbohydrate (60.8 ± 9.4%) and a significantly lower percentage of fat (24.5 ± 7.5%), ($P<0.05$). Oxygen consumption, average 24-hour physical activity, body fat percentage, and blood pressure were not different between diet conditions ($P>0.05$). Conclusions: A short-term diet low in carbohydrate or fat did not influence 24-hour physical activity or physical performance.

24) THE ASSOCIATION BETWEEN ACE I/D GENOTYPE, PHYSICAL ACTIVITY, AND BLOOD PRESSURE IN YOUNG CHILDREN
MA Sarzynski, JC Eisenmann, KA Heelan & K Glenn. Michigan State University, MI, University of Nebraska-Kearney, NE, Iowa State University, IA

The purpose of this study was to determine if the ACE I/D genotype (DD, ID, II) modifies the association between physical activity (PA) and resting blood pressure (BP) in young children. Methods: 132 children (68 males, 64 females) were included in the analysis. Habitual physical activity was monitored using the MTI Actigraph accelerometer. Moderate-to-vigorous physical activity (MVPA) was determined based on the Trost cutpoint for activity counts. Systolic and diastolic blood pressure (SBP and DBP, respectively) were taken according to American Heart Association recommendations. Partial correlations, controlling for chronological age, were computed to assess the associations between PA and BP in the total sample and by genotype. Results: In the total sample partial correlations between MVPA and BP were low (SBP: r = 0.03; DBP: r = -0.09; MAP: r = -0.05). When divided into groups based on ACE genotype, no significant partial correlations were found between MVPA and BP. For example the partial correlations between MVPA and SBP were 0.20 for the DD genotype, -0.17 for the ID genotype, and 0.10 for the II genotype. Conclusions: The ACE genotype does not modify the association between physical activity and blood pressure in this sample of young children. #This work was supported by the American Heart Association (##0665500Z).

25) ANXIETY AND METABOLIC SYNDROME IN NORMAL AND OVERWEIGHT YOUTH
ME Holmes[1]& JC Eisenmann[2]. Michigan State University, East Lansing, MI[1] Iowa State University, Ames, IA[2]

BACKGROUND: The prevalence of the metabolic syndrome (MetS) among U.S. adolescents has been increasing over the last decade. The cornerstone risk factors - physical activity and diet - typically account for only a small-to-modest amount of the MetS phenotype in youth. Thus, there is reason to consider other possible etiological factors when examining MetS in youth. Stress is a ubiquitous term that is often used to describe the body's response to various physical, psychosocial, and environmental stimuli. In general, stress has been associated with poor metabolic health in adults; however, little is known about this relationship in children and adolescents. Likewise, little is know about individual contributors to stress activation, such as anxiety, in youth. The purpose of this study was to provide preliminary data on the relationship between trait-anxiety and MetS in a group of 8-18 year old boys (n=37). Specifically, we examined the whether the relationship between anxiety and MetS differed between normal weight and overweight boys. METHODS: Physical activity was assessed using the MTI Actigraph accelerometer and expressed as moderate, vigorous and total daily physical activity. Trait anxiety was quantified using the State-Trait Anxiety Inventory for Children. Because clinical manifestation of the MetS typically does not occur until later in life, a continuous metabolic syndrome score (MSS) was created. The MSS was generated by summing the age-standardized residuals for waist circumference, mean arterial pressure, glycosylated hemoglobin, and high-density lipoprotein-cholesterol. RESULTS: In the total sample, the correlation between anxiety and the MSS was low (r= 0.28) after adjustment for age, maturity, and physical activity. After separating the group into weight categories, anxiety was moderately associated with the MSS in the overweight group (r= 0.51). In contrast, there was no association in the normal weight group (r= -0.01). CONCLUSIONS: The results show preliminary but suggestive evidence that anxiety influences children's health differently according to weight status. Specifically, anxiety accounts for more of the variance in MSS in overweight children compared to normal weight children and should be considered in treatment strategies geared towards overweight youth. *This work supported by a grant from the Center for Designing Food and Improving Nutrition, Iowa State University-USDA CRESS.*

26) ENROLLMENT IN A HEALTHY LIFESTYLES CLASS ON PHYSICAL ACTIVITY IN COLLEGE STUDENTS
JJ Ode, JM Pivarnik FACSM, MJ Reeves, JC Anthony, DR Gould. Michigan State University, East Lansing, MI

PURPOSE: The purpose of this study was to assess the impact of enrollment in a healthy lifestyles class on physical activity participation in college students. METHODS: Students enrolled in a fall semester healthy lifestyles class (n=242), a spring semester healthy Lifestyles class (n=213), or a fall semester communications class (n=456) completed an internet survey at the beginning of a semester. Eighty-six % of these students completed a follow-up survey at the end of the semester. The frequency, intensity, and duration of physical activity were used to generate physical activity energy expenditure (expressed as logarithmic transformation of kcal/kg/week). The relationship between physical activity energy expenditure and the selected exposure variables was estimated using Generalized Linear Model and Generalized Estimating Equations (GLM/GEE). The effect estimates (beta), 95% CIs, and p-values were reported. RESULTS: GLM/GEE analyses revealed that at the beginning of the semester: 1) males were more active than females (beta=0.51; 95% CI=0.36, 0.64; P<.001), 2) students enrolled in either the fall or spring semester healthy lifestyles classes were more active than students enrolled in the communications class (beta =0.24; 95% CI=0.08, 0.325; P=.005), 3) kinesiology majors were more active then non-kinesiology majors (beta =0.27; 95% CI=0.11, 0.43; P<.001), 4) African Americans were less active than Caucasians (beta =-0.42; 95% CI=-0.71, -0.12; P=.005), and 5) those who watched more television were less active (beta =-0.072; 95% CI=-0.12, -0.021; P=.005). In addition, these results showed no

difference in physical activity throughout the semester between the fall healthy lifestyles class and fall communications class. In contrast, physical activity participation was more likely to increase during the semester in students enrolled in the spring healthy lifestyles class when compared to the fall communications class (beta =0.16; 95% CI=0.02, 0.30; P=.026) and the fall healthy lifestyles class (beta =0.19; 95% CI=0.03, 0.35; P=.018). CONCLUSIONS: The results of this study provide valuable information about the determinants of physical activity in college students and the impact of enrollment in a healthy lifestyles class. *This research was supported by the Plus One Active Research Grant on Wellness Using the Internet from the American College of Sports Medicine Foundation and the Student Awards Program grant from the Blue Cross and the Blue Shield of Michigan Foundation.*

27) ENERGY EXPENDITURE DURING DANCE STIMULATION VIDEO GAME PLAY

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Over the past 30 years National Health and Nutrition Examination Survey data suggest the prevalence of overweight in children aged 6 to 11 years and 12 to 19 years has increased approximately 200 percent. In an attempt to make students more active throughout the day, schools have begun to incorporate dance simulation video game play as part of their physical education curriculum. Previous reports suggest that dance simulation game play expends sufficient energy to meet the current American College of Sports Medicine guidelines. These reports have been based on subjects who have attained some minimal level of game play. PURPOSE: To quantify energy expenditure at a beginning level of dance simulation game play and compare this to a more traditional form of exercise. METHODS: Subjects were males (n=3) and females (n=7) between 13 and 18 years of age (15.3 ± 0.5 years) who had some experience with the dance simulation game. Energy expenditure was estimated via indirect calorimetry during the last 15 minutes of a 22 minute bout of steady state game play and during steady state exercise at six selected treadmill speeds (80, 94, 107, 121, 134 and 147 $m \cdot min^{-1}$. Additionally, maximal oxygen consumption was measured during treadmill exercise. Differences between energy expenditure during game play and treadmill exercise was determined using a within subjects design. RESULTS: Energy expenditure during steady state game play was not different than treadmill exercise at 80 $m \cdot min^{-1}$ (15.61 ± 1.34 vs. 16.07 ± 0.84 $kJ \cdot min^{-1}$ respectively). Conversely, energy expenditure during steady state game play was significantly lower than energy expenditure at all other velocities ($p \leq 0.05$). Mean maximal oxygen consumption was 45.1 ± 1.8 $ml \cdot kg^{-1} \cdot min^{-1}$. Relative steady state game play intensity was only 29%. CONCLUSIONS: While dance simulation game play at a beginning level does increase energy expenditure, it does not increase enough to meet established guidelines. Further, game play at the beginning level will not induce any significant training effects. Improvements in skill of game play potentially could raise energy expenditure to an acceptable level, but it is unclear how much practice this would entail.

28) DISORDERED EATING AMONG STUDENTS ATTENDING PRIVATE COLLEGES AND UNIVERSITIES

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REVIEW OF LITERATURE: The most current and robust review of the literature on disordered eating published by Hoek and van Hoeken (Hoek and van Hoeken 2003) reports students attending private schools have the second highest prevalence of anorexia nervosa among young females. Szmukler (Szmukler 1983; Wertheim, Paxton et al. 1992) reported a four fold increase in the number of students meeting identical criteria for anorexia nervosa when comparing students from state (0.2%) and private (0.8%) high schools. Currently, no studies exist that use established criteria (DSM III, DSM IIIR & DSM IV*) for determining prevalence of eating disorders among students attending private colleges and universities. BACKGROUND: Determining prevalence for disordered eating typically involves two stages. First, a large population is screened via a questionnaire for the likelihood of an eating disorder. Second, a random sample of "at risk" subjects identified in the first stage are personally interviewed by a trained clinician to determine the number of students meeting established criteria for one of three eating disorders (anorexia nervosa, bulimia nervosa, and binge eating). PURPOSE: The purpose of this study is to identify students attending private colleges and universities who are "at risk" for an eating disorder. METHODS: An eating disorder questionnaire was distributed to approximately 4000 students attending five different private colleges and universities. Students were asked to self report their level of struggle (not at all, rarely, somewhat, often, or a great deal) at various stages of development. RESULTS: 1305 students responded to the questionnaire (707 women, 598 men). Of those who responded, 89.85% reported not struggling at all, 4.96% rarely, 3.54% somewhat, 0.87% often, and 0.79% reported struggling a great deal during Jr. High School. In high school, 78.13% did not struggle, 9.76% rarely, 7.08 % somewhat, 2.[illegible] % often and 2.28 % struggled a great deal. In college, 82.54 % did not struggle, 7.87 % rarely, 7.32 % somewhat struggled, 1.50 % often struggled and 0.97 % struggled a great deal. Those reporting to somewhat struggle with an eating disorder 86% were female and 14% were male. Those who reporting struggling a great deal, 95% were female and 5% were male. CONCLUSIONS: Problems with eating disorders peak during high school years. A strong gender bias exists among students who report "struggling" with an eating disorder at private colleges and universities. *Diagnostic and Statistical Manual of Mental Disorders 3rd, 3rd Rev. ed and 4th ed. (American Psychiatric Association, 1980, 1987, 1994).

29) THE EFFECTS OF CARBOHYDRATE SUPPLEMENTATION ON FATIGUE DURING INTERMITTENT CYCLING IN HEALTHY YOUNG MEN

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Objective: The effect of carbohydrate supplementation on fatigue was examined in six healthy young men (22.8 ± 1.0 yrs) during an intermittent cycling protocol. Methods: Subjects consumed 1.5 g/kg of either a 22% carbohydrate (CHO) beverage or a placebo (PL) beverage 30 minutes before exercise and during exercise. The exercise consisted of three 12-min sets; each set was comprised of four 3-minute cycles. The 3-minute cycles involved exercise for 60 seconds at 150 W, a 10-second sprint against 0.05 kg/kg bw resistance, 50 seconds at 100 W, and 60 seconds of active rest with no resistance. Data from each 3-minute cycle was averaged for analysis. A two-way ANOVA (trial by time) was used to analyze the data and statistical significance was set at $P = 0.05$. Results: Mean power decreased from 729.2 ± 80.9 W to 638 ± 135.3 W in the CHO trial and from 722 ± 76.7 W to 657 ± 131.0 W in the PL trial. There were no significant effects for trial or interaction, but MP tended to decline over time ($P = 0.055$). RPE ranged from 4.9 ± 0.7 to 7.7 ± 0.4 in both trials and increased ($P = 0.000$) over time, but was similar between trials. There was a significant time by trial interaction effect for blood glucose. Pre-exercise blood glucose tended ($P = 0.056$) to be higher in CHO vs. PL. Blood glucose was higher in the PL trial after the third set ($P = 0.007$). Within the CHO trial glucose after each set decreased from the pre-exercise measure ($P = 0.036$, 0.005, and 0.045, respectively), but were not significantly different from each other whereas in PL, there were no significant differences between sets. Pre-exercise blood lactate

concentration was similar for CHO and PL trials (1.6 ± 0.4 mmol/L and 1.5 ± 0.4 mmol/L, respectively) and increased ($P = 0.005$) to 9.7 ± 3.5 mmol/L in the CHO trial and 9.1 ± 2.8 mmol/L in the PL trial after the first set and remained elevated to the end of the protocol. There were no significant differences for trial and there was no interaction effect. Conclusions: Carbohydrate supplementation elevated blood glucose level but does not appear to affect high-intensity intermittent cycling performance, anaerobic exercise metabolism, or perceived exertion.

30) EFFECT OF 7% CARBON DIOXIDE ON THE SOLEUS H-REFLEX RECRUITMENT CURVE

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The Hoffmann reflex (H wave) is a measure of afferent synaptic transmission via electrical stimulation. The motor response (M wave) denotes a direct muscle response via electrical stimulation. An H wave without a motor response can be recorded because electrical stimulation first activates group Ia afferent fibers, which are larger in diameter than motor axons. By gradually increasing stimulation intensity, first H waves, then M waves, and finally Hmax and Mmax can be obtained (the H reflex recruitment curve). Important parts of the curve include H reflex threshold, Hmax to Mmax ratio, and the latency of the H wave. PURPOSE: To examine the effect of inhaling 7% carbon dioxide on the recruitment curve of the soleus H-reflex. METHODS: Ten human subjects (5 male and 5 female) sat with hip at 90o flexion, knee at 120o flexion, and ankle at 90o flexion with surface EMG electrodes over the soleus muscle and a percutaneous electrical stimulator connected to the tibial nerve. Subjects then randomly breathed room air or a 7% CO2, 21% O2, balance N2 mix through a respiratory mask for 10 minutes. Then, electrical stimuli (1 per 10 sec) of random intensity were given until a complete H reflex recruitment curve was elicited while simultaneously collected EMG data at a recording rate of 2000 Hz. H reflex threshold, Hmax/Mmax ratio, and latency of Hmax were compared by a paired t-test, with statistical significance set at $p < 0.05$. RESULTS: H reflex threshold (as a percent of motor threshold) significantly increased from 0.92 (SD 0.09) to 0.97 (SD 0.12; $p < 0.05$) while on CO2. Hmax/Mmax ratio decreased significantly from 0.504 (SD 0.290) to 0.403 (SD 0.253; $p < 0.05$) while on CO2. Mmax remained unchanged ($p > 0.05$) while on CO2. H wave latency (in msec) significantly increased from 32.8 (SD 1.6) to 34.6 (SD 2.6; $p < 0.05$) while on CO2. CONCLUSIONS: Carbon dioxide reduces afferent synaptic transmission in the soleus muscle by slowing transmission, increasing threshold stimulus, and reducing H wave size. Since carbon dioxide production increases during muscular contractions, these results may have implications during exercise.

31) COMPARISON OF THE RELATIVE WEIGHT LIFTED AT TARGET OMNI-RES RPE BETWEEN OLDER AND YOUNGER ADULTS.

RF Gearhart, Jr.[1], KM Lagally[2], FACSM & SE Riechman[3], Ashland University[1], OH, Illinois State University[2], IL, Texas A&M University[3], TX

A number of studies have indicated that for young adults, perceived exertion is related to the intensity of resistance exercise. It is unknown if this relationship holds for older adults. PURPOSE: The purpose of this investigation was to evaluate perceptual responses to resistance exercise in older adults and to compare estimated perceptual responses to resistance exercise between younger and older adults. METHODS: Forty older (age = 64+3.1 yrs.) and forty younger (age = 21.8+2.5 yrs.) adult volunteers participated in a maximal strength assessment test for the knee extension exercise. Subjects estimated perceived exertion throughout the maximal test using the OMNI – Resistance Exercise Scale (OMNI-RES). The relative weights lifted (% 1RM) at RPE of 4, 6 and 8 on the OMNI-RES were compared between the two groups using a two-factor (Age X RPE) repeated measures ANOVA. RESULTS: The ANOVA revealed significant Age ($p < 0.01$) and RPE ($p < 0.01$) main effects as well as a significant Age X RPE interaction ($p < 0.01$). Post-hoc analysis of the interaction indicated that the % 1RM lifted was significantly different ($p < 0.001$) at RPE of 4 (57 vs. 45%) and 6 (70 vs. 62%), but not at RPE of 8 (83 vs. 80%) between the younger and older adults, respectively. The % 1RM lifted increased significantly ($p < 0.01$) as RPE increased for both groups. CONCLUSIONS: The results indicate that perceived exertion is related to the intensity of resistance exercise in older adults as well as younger adults. However, at lower RPE values, the % 1RM lifted is lower for older adults than for younger adults.

32) OXYGEN CONSUMPTION AND ENERGY EXPENDITURE DURING SEDENTARY AND PHYSICALLY-INTERACTIVE VIDEO-GAMING IN COLLEGE MALES

D VanDyke, K Kerekes, E Metzger, J Walton & J Bergsma. Calvin College, Grand Rapids, MI

There has been a simultaneous rise in obesity and sedentary leisure activity rates in children and young adults over the past two decades. With the advent of more physically-active video games like Dance, Dance Revolution and Wii, the video gaming industry has taken its first steps in helping counter the sedentary nature of their products. The purpose of this study was to compare the energy expenditure (kcal/min) and oxygen consumption (VO_2) patterns in college males in a sedentary and a physically-interactive video tennis game. METHODS: Ten college-age male volunteers, all familiar with both video games, underwent a maximal exercise treadmill test (Max1 metabolic cart) to determine maximal oxygen consumption ($VO2_{max}$) and heart rate (HR_{max}). One week later, at the same time of day, subjects played tennis doubles on a seated, sedentary video tennis (SVT) game (Mario Tennis) for 18 minutes. Following a 10 min. rest period, subjects played an 18-minute round of doubles using the Wii interactive video tennis application (IAVT) in which a player stands and swings a handheld remote. Oxygen consumption, heart rate, calorie expenditure, and RPE were monitored throughout the games. Mean values for VO_2, Peak VO_2, calorie expenditure, and HR were compared using an ANOVA post-hoc paired *t* test. RESULTS: The mean VO_2, HR, and kcal expenditure achieved during IAVT (7.61 $mL \cdot kg^{-1} \cdot min^{-1}$, 93.14 bpm, 2.99 kcal/min) were significantly higher than SVT (4.88 $mL \cdot kg^{-1} \cdot min^{-1}$, 80.07 bpm, 1.88 kcal/min). When reported as $\%VO_{2max}$ and $\%HR_{max}$, IAVT play elicited rates of 17.25% and 48.3% respectively, whereas SVT rates were 11.22% and 41.57%. Subjects reached a significantly higher Peak VO_2 on IAVT (9.86 $mL \cdot kg^{-1} \cdot min^{-1}$) compared to SVT (6.51 $mL \cdot kg^{-1} \cdot min^{-1}$). CONCLUSIONS: The standing, interactive tennis doubles video game elicited significantly higher values for all reported variables, leading to the conclusion that an interactive video gamer will work at a higher $\%VO_{2max}$, $\%HR_{max}$, and calorie cost compared to playing a similar, but seated, handheld video game. Nevertheless, neither game resulted in high enough values to cause a training effect, or burn significant calories. With a mean VO_2 = 7.61 $mL \cdot kg^{-1} \cdot min^{-1}$, the IAVT is comparable in energy expenditure to folding laundry or driving a car, suggesting that even an interactive video game touted as physically-active is still a low-active endeavor.

33) EFFECTS OF SELECTED WARM-UP PROCEDURES ON SPRINT PERFORMANCE IN YOUNG FEMALE SOCCER ATHLETES

R White, Q Lai, HJ Engels,FACSM, Wayne State University, Detroit, MI

Abstracts

continued...

PURPOSE: The purpose of this study was (a) to compare the effects of a standardized static versus dynamic warm-up protocol on short distance sprint performance in young female soccer athletes, and (b) to examine the effects of three different time intervals following the dynamic warm-up on the same performance outcome. METHODS: Nineteen high school varsity female soccer players (age: 16.2+0.7 yrs) each participated in one initial study familiarization session and four randomly assigned experimental test sessions consisting of a 10-min static warm-up with a 2-min time interval until performance testing (S2), and a 10-min dynamic warm-up with three different time intervals (2-min [D2]; 5-min [D5];15-min [D15]) prior to testing. All test sessions were separated by at least 48 hours and took place indoors. Performance testing consisted of a 9.14-meter sprint timed to 1/100th of a sec using a touchpad and infrared beam technology timing system (Model: Speed Trap I, Brower Timing Systems, Draper, UT). RESULTS: Repeated measures ANOVA on the warm-up conditions demonstrated a significant difference among the four different procedures ($F(3, 54) = 6.6$; $p<0.01$). Post hoc comparisons (Duncan's New Multiple Range Test) revealed that participants' sprint performance was faster following D2 (1.97+0.08 sec) and D5 (1.97+0.08 sec) warm-ups than in S2 (2.03+0.09 sec) and D15 (2.01+0.09 sec). CONCLUSION: This study extends previous research indicating an improved sprint performance immediately following a dynamic warm-up compared to a static warm-up. Moreover, the advantage of the dynamic warm-up diminished when the time interval from warm-up to sprint performance was elongated to 15 min.

34) RATES OF PLASMA LACTATE REMOVAL FOLLOWING A 100-YARD MAXIMAL SPRINT FREESTYLE SWIM

E Miller, B Foster, T Linn, K Vincent & CD Ianuzzo, FACSM. Wheaton College, Applied Health Science Department, Wheaton, IL

Swimmers often perform several maximal events within a short period of time at a swim meet, and therefore need to be able to quickly decrease plasma lactate concentrations in order to be at an optimal performance level for the subsequent events, therefore, many would be benefited by removing lactate from their blood following each race. Light exercise as a means of lactate removal following exhaustive exercise has long been known to be more beneficial than passive inactive recovery. Purpose: The purpose of this study was to compare active recovery by swimming and cycling with inactive recovery to determine if there were different rates of plasma lactate removal following a 100-yard maximal sprint swim. This research was aimed at improving performance in subsequent events. Methods: Peak plasma lactate concentrations were determined following a maximum 100-yard sprint swim and the decline was followed throughout a 20 minute recovery period. Maximum heart rates during cycling and swimming were obtained separately so that the heart rate reserve could be set at 50-65%. Subjects performed a 100-yard sprint freestyle swim followed by three recovery modes (i.e., inactive, cycling, swimming). Results: During swim recovery, A repeated measures mixed-model ANOVA was used to compare the difference between the mode of recovery and time (minutes post sprint) on plasma lactate levels. No significant difference was found in the rate of lactate removal between swimming and cycling recovery. 20 min post sprint plasma lactate concentration decreased significantly by 63% ($p< 0.05$) from the peak plasma lactate level concentration taken at 4 minutes post sprint. During the cycling recovery, the 20 min post sprint concentration decreased significantly by 57% ($p<0.05$) from the 4 min post sprint concentration. Both swimming and cycling decreased at a more rapid rate than inactive recovery ($p<0.05$). In contrast, tLactate concentration during inactive recovery declined the least (38%, $p<0.05$). The rate of decline in rate of plasma lactate removal concentrations between swimming and cycling were similar recovery. Conclusion: We concluded that blt was concluded that both cycling and swimming are significantly more similarly effective modes of decreasing plasma lactate removal concentrations post sprint swim than inactive recovery.

35) CHANGES IN FAT FREE MASS DURING CALORIC RESTRICTION, INCREASED PROTEIN INGESTION, AND STRENGTH TRAINING

T Sovcool, E Mitchell & P Walters. Wheaton College, Applied Health Science Department, Wheaton, IL

REVIEW OF THE LITERATURE: One of the troubling effects associated with weight loss is a decline in fat-free mass (FFM) that accompanies fat losses. Total fasting can result in 50% of weight loss coming from FFM (Garrow 1987). During very low calorie diets several investigators report between 20 - 40% of weight loss coming from FFM (HIll, Sparling et al. 1987; Donnelly, Jakicic et al. 1991; Donnelly, Jacobsen et al. 1994; Whatley, Gillespie et al. 1994; Ross, Dagnone et al. 2000). Resistance exercise seems to retard losses of FFM during caloric restriction with 7-25% of weight loss coming from FFM (HIll, Sparling et al. 1987; Whatley, Gillespie et al. 1994; Ross, Dagnone et al. 2000). BACKGROUND: Weight loss studies to date have used traditional models of resistance training as their experimental intervention. Periodized resistance training involves changes in intensity and volume have been reported to significantly increase FFM in both trained and untrained subjects when compared to traditional resistance models (Stone, O'Bryant et al. 1981; Willoughby 1993; Fleck and Kraemer 1996; Fleck and Kraemer 1997). PURPOSE: To determine if increased protein intake (1.8 g/kg of body weight) and periodized strength training may ameliorate the loss of FFM in men and women during caloric insufficiency. METHODS: Body weight and body composition measures (via Bodpod) were obtained on 24 subjects (12 men, 12 women) at the beginning and end of this 16 week study. During the study each participant consumed 500-750 Kcal less per day than their estimated caloric needs. Caloric needs were estimated using the Harris Benedict Equation. While maintaining a caloric deficit, each subject consumed 1.8 g of protein per kg of bodyweight. Each subject created a 3 day revolving diet that controlled for caloric and protein intake. In addition to dietary changes, each subject participated in a periodized strength training regimen consisting of 45 minutes of resistance training six days a week for 14 of the 16 weeks. Periodization consisted of varying intensities between 50-90% of 1RM and accompanying changes in volume. Periodized changes were made every two weeks. RESULTS: Females lost an average of 4.2 kg of fat mass (FM) while gaining 1.27 kg of FFM. Men lost an average of 6.27 kg of FM while gaining 0.13 kg of FFM. Differences in FFM changes between women and men were not significant at the 0.05 level. CONCLUSIONS: In light of existing literature, independent of gender, increased protein ingestion and periodized strength training may help minimize the loss of FFM during caloric restriction.

A Special Thank You to the MWACSM Board of Directors & Sponsors

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ANNUAL MEETING

OCTOBER 5 – 7, 2006

HOSTED BY
THE HERBERT H AND GRACE A DOW
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CENTRAL MICHIGAN UNIVERSITY

WELCOME

As immediate past president and program coordinator for this year's meeting, I wish to welcome you to the 2006 annual meeting of the Midwest chapter of the American College of Sports Medicine. I hope that the program that has been assembled this year will have appeal to a large number of members so that each of you will find something of interest and leave the meeting with helpful information for your everyday use. The program offers a number of special lectures, tutorials, workshops, and symposia that emphasize various topics in exercise and sports science. Please take advantage of as many of the educational and social activities as you can. Catch up with colleagues and mingle with some new friends during the next few days. Welcome to Central Michigan University and I hope you enjoy your meeting.

Elaine Filusch Betts, Ph.D., P.T., FACSM
Past President, MWACSM
Program Coordinator

Dear Guests,

On behalf of the Herbert H and Grace A Dow College of Health Professions at Central Michigan University, I welcome you to our campus. We are happy to host the Midwest Regional Chapter of the American College of Sports Medicine in this wonderful facility, and hope that you have an enjoyable time while visiting mid-Michigan.

Please take advantage of all of the academic and social activities planned during your stay. I hope that you enjoy the meeting and I look forward to seeing you at the keynote address on Thursday evening.

Marvis Lary, Ph.D.
Dean, Herbert H and Grace A Dow College of Health Professions
Central Michigan University

MWACSM Members,

Thank you for joining us at the 2006 MWACSM Annual Meeting. This year's meeting is being held in beautiful Mt. Pleasant, Michigan, which is the proud home of Central Michigan University. We hope you will feel at home at our host site, Comfort Inn Conference Center. Elaine Betts, the immediate Past-President has worked diligently to plan an outstanding meeting. In addition to the high quality science sessions, symposia, and tutorials, I hope you make time to join the planned social events with your fellow Midwest members. This event is a great opportunity to meet the professionals and students in the Midwest region. I personally find great satisfaction in this personal interaction. I like to hear what your latest research is about, how long it will be until you graduate, or where your career has taken you. Sharing our experiences, big and small, with those in our chapter makes us stronger and united as a whole. We will continue to offer such opportunities to our membership and we strongly encourage one and all to participate. In fact, I'm personally inviting you to share in the Midwest experience by becoming more involved in the Midwest Chapter. Please introduce yourself to me at the meeting, or send me an email at mwacsm@mwacsm.org. I feel very strongly about the benefits which can be gained by participating in your chapter, both on a personal level and for your chapter as a whole. I'm excited to share this with each of you. So please do not hesitate to contact me!

I also encourage you to mark your calendar for next year's meeting to be held in Columbus, Ohio. We are excited to showcase The Ohio State University's brand new and state of the art Recreation and Physical Activity Center. I'm looking forward to it, and I hope you will too! Lastly, please enjoy yourself and your Midwest companions at this year's meeting!

Best regards,

Carmen Babcock
MWACSM President

Conference Information

Registration

Thursday, October 5	**2:00 – 5:00 p.m. (Health Professions Building)** **6:30 – 7:15 p.m. (Bovee University Center Auditorium)**
Friday, October 6	**7:30 a.m. – 12:00 p.m. (Health Professions Building)** **1:30 p.m. - 4:00 p.m. (Health Professions Building)** **4:15 p.m. – 5:00 p.m. (Bovee University Center Auditorium)**
Saturday, October 7	**7:30 – 9:00 a.m. (Health Professions Building)** **8:30 – 9:30 a.m. (Park Library auditorium)**

Continuing Education Credits

The American College of Sports Medicine's Professional Education Committee certifies that this Continuing Education offering meets the criteria for 13 credit hours of ACSM Continuing Education Credit.

Meeting attendees can apply for this credit at the meeting registration area.

Planning Committee Members

Elaine F. Betts	Central Michigan University
Carmen Babcock	The Ohio State University
Amy Morgan	Bowling Green State University

Meeting Locations

Sessions are held in the Health Professions Building, the Bovee University Center and the Park Library. See program notes and maps for specifics. Park in lots 18 and 27.

Name Badges

Badges must be worn at all times to gain admittance to the poster sessions, educational sessions, and MWACSM social events. Please do not misplace your badge.

Program Evaluation

ACSM requests that attendees complete an on-line program evaluation within two weeks of the meeting.

The link to the MWACSM program specific survey is:

http://www.surveymk.com/s.asp?u=226372620512

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Special Events

Thursday, October 5

7:00 – 10:30 p.m.

Welcome and Opening Reception
Keynote Address
Bovee University Center Auditorium

Welcome Reception
Rotunda and Terrace Rooms
Bovee University Center

Dr. Elaine F. Betts, Past President of the Midwest chapter of ACSM and current meeting coordinator, and Dr. Marvis Lary, Dean of the Herbert H and Grace A Dow College of Health Professions, will officially welcome you to the 2006 Annual Meeting of the Midwest Regional Chapter of the American College of Sports Medicine.

Immediately following, the keynote speaker, Barry Franklin, Ph.D., of Beaumont Health Center in Royal Oak, MI, will address the attendees with a presentation entitled "Don't Be As Dumb As An Elephant: A Potpourri of Changing Health-Fitness Paradigms and Perceptions"

Following the keynote address, join your colleagues in the Rotunda and Terrace Rooms of the Bovee University Center for a welcome reception. Refreshments will be provided and a cash bar will be available.

Friday, October 6
12:00 – 1:30 p.m.

Luncheon and Business Meeting
Rotunda and Terrace Rooms
Bovee University Center

This annual event is always a nice way to catch up with colleagues and share a meal. The cost of this luncheon is included in your registration fee.

2:30 – 3:30 p.m.
Town Hall Meeting
Room 1259
Health Professions Building

Carmen Babcock, president of MWACSM and Steve Ketcyian, Vice President of ACSM, will discuss the strategic plans for the respective organizations.

2:00 – 5:00 p.m.
Student Fair
Atrium
Health Professions Building

Various universities and clinical facilities will be represented to speak with students regarding opportunities in their facilities.

5:00 – 6:00 p.m.
Special Lecture
Bovee University Center Auditorium

William Prentice, Ph.D., P.T., A.T.C. University of North Carolina, Chapel Hill, will speak on the topic of "Hydration and Heat Illness Issues: Guidelines for the Practitioner".

Saturday, October 6

8:00 – 9:00 a.m.
Presidential Lecture

Steven Keteyian, Ph.D., Henry Ford Hospital, Detroit, MI, will present "Finding Success in Failure: Exercise in the Prognosis and Treatment of Heart Failure".

9:00 – 12:00 a.m.
"Active Aging: Challenges Translating Evidence Based Research into Effective Community Programs"
Park Library Auditorium

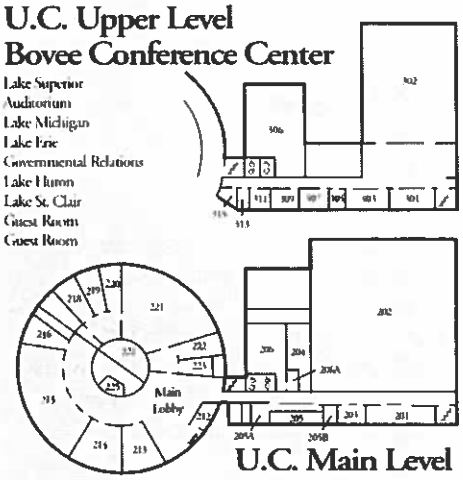
Wojtek Chodzko-Zajko,Ph.D. and colleagues from the University of Illinois, Urbana - Champaign.

GETTING AROUND

Bovee University Center Floorplan

U.C. Upper Level
Bovee Conference Center

301. Lake Superior
302. Auditorium
303. Lake Michigan
305. Lake Erie
306. Governmental Relations
307. Lake Huron
309. Lake St. Clair
313. Guest Room
315. Guest Room



U.C. Main Level

201. Residence Life & Dining Services
202. Bookstore Entrance
203. Auxiliary Services
204. Independant Bank
205. Campus ID Office
205A. University Center Office
205B. Business Office
206. Student Employment
212. Center Reservations & Information
213. President's Conference
214. Dean of Students
215. Career Services
216. Fireside
218. Maroon
219. Gold
220. Chippewa
221. Rotunda & Terrace A, B, C, D
222. Isabella
223. McPlenaur
225. Blimpies

CMU

central michigan university campusmap

Northeast Campus

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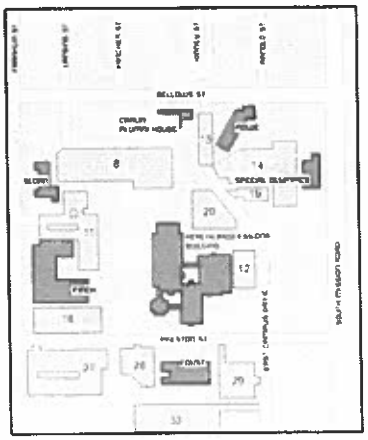
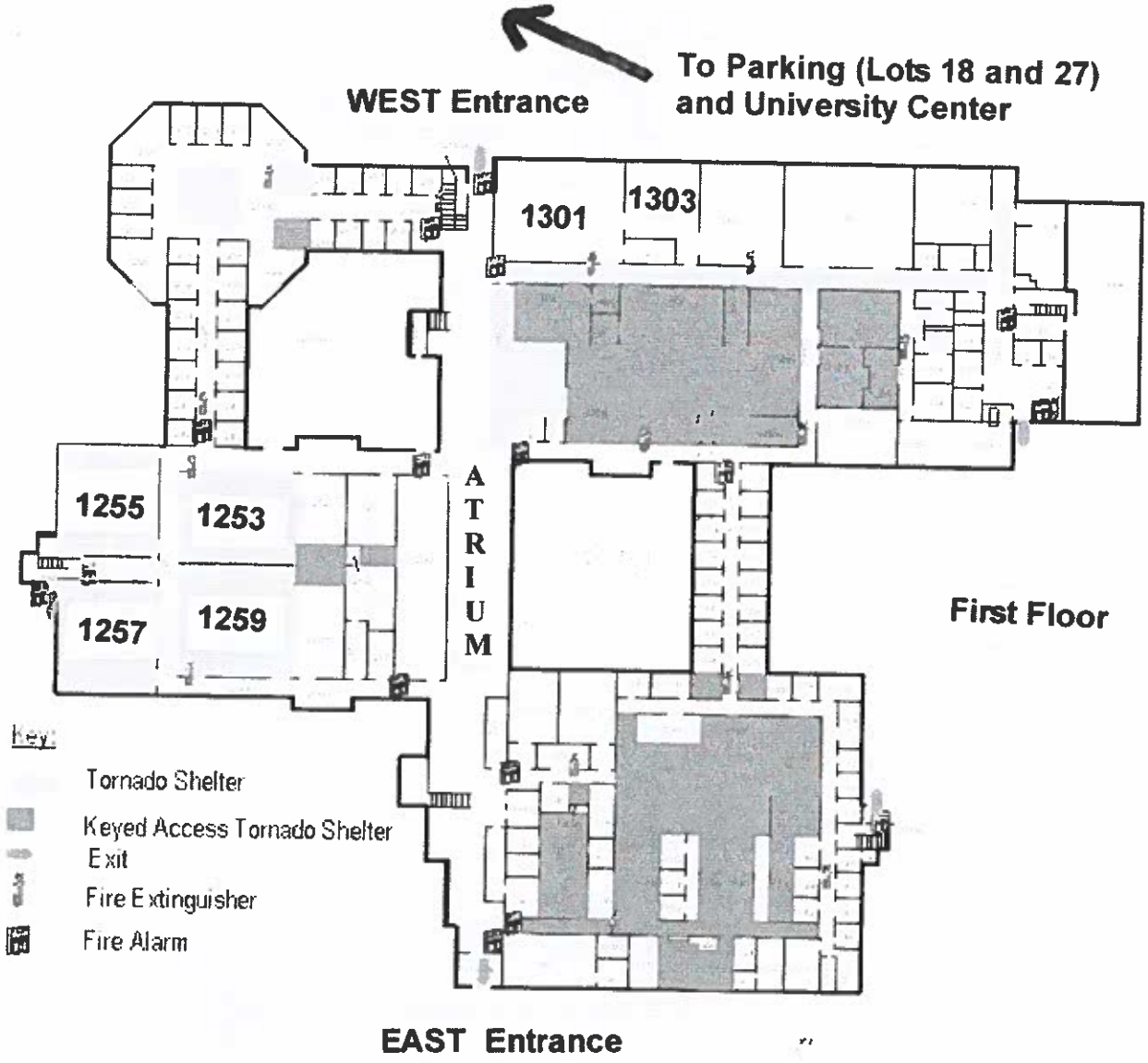
Lots 18 or 27 (over-flow)





Herbert H and Grace A Dow College of Health Professions Building

Central Michigan University

Conference Schedule

Program and room assignments for Thursday, October 5, 2006

Time	Health Professions Building	Bovee University Center
2:00 – 5:00	**Registration**	
3:00 – 5:00	**Faculty Vignettes and Building tours** Meet at registration desk	
7:00 – 8:15		**Keynote Address:** *"Don't be as Dumb as an Elephant...."*/ Franklin in the University Center Auditorium (2nd floor)
8:30 – 10:30		**Reception** in the University Center Rotunda room (1st floor)

Program and room assignments for Friday, October 6, 2006

Continental Breakfast in the atrium from 7:30 – 8:30 a.m.

Time	1253	1255	1257	1259	1301	Atrium	UC
8:00 – 8:30					**Session 1:** *Workshop* Tai Chi	**Session 4:** *Posters*	
8:30 – 9:00	**Session 2:** *Free Communica-tion #1*	**Session 3:** *Symposium* Community Weight Loss/Parr			Tai Chi	*Posters*	
9:00- 9:30		Parr			Tai Chi	*Posters*	
9:30 – 10:00	Unopposed Poster	Unopposed Poster	BREAK	BREAK	BREAK	*Posters*	
10:00 – 10:30	Unopposed Poster	Unopposed Poster			Tai Chi	*Posters*	
10:30 – 11:00	**Session 5:** *Tutorial* Authorship/ Pivarnik				Tai Chi	*Posters*	
11:00- 11:30	Pivarnik	**Session 6:** *Tutorial* Altitude/ Davis			Tai Chi		
11:30 – 12:00 –	Pivarnik	Davis			Tai Chi		
12:00 – 1:30 -	Business	meeting	and	Luncheon	@ the UC	Rotunda	Room
1:30 – 2:00	**Session 7:** *Clinical Cases*	**Session 8:** *Workshop* Pilates			Tai Chi		
2:00 – 2:30	*Clinical Cases*	Pilates			Tai Chi	**Session 11:** Student Fair	
2:30 – 3:00		Pilates	**Session 9:** *Tutorial* Pharmacology Levine	**Session 10:** *Town Hall* Keteyian/ Babcock	Tai Chi	Student Fair	
3:00 – 3:30			Levine	Keteyian/ Babcock	Tai Chi	Student Fair	
3:30 – 4:00	BREAK	Pilates (repeat)	BREAK	BREAK	BREAK	Student Fair	
4:00 – 4:30		Pilates (repeat)			Tai Chi	Student Fair	
4:30 – 5:00		Pilates (repeat)			Tai Chi	Student Fair	
5:00 – 6:00							**Session 12:** Special Lecture Hydration/ Prentice

Program and room assignments for Saturday, October 7, 2006

Continental Breakfast in the atrium from 7:30 – 8:30 a.m.

Time	1255	1259	Park Library
8 - 9	**Session 13:** *Presidential Lecture* *"Finding Success in Failure: Exercise in the Prognosis and Treatment of Heart Failure"/* Keteyian		
9 – 10	**Session 14:** *Symposium* "Assessing Cardiovascular Risk Factors in Children" Visich	**Session 15:** *Free Communication Session #2*	**Session 16:** Special Lecture ***"Active Aging"*** / Chodzko-Zajko
10 - 11			Active Aging
11 - 12			Active Aging

Meeting Sponsors

The Midwest ACSM wishes to acknowledge the following meeting sponsors:

Active Aging Partnership of ACSM
Sponsor of the Special Session:
"Active Aging: Challenges Translating Evidence Based Research Into Effective Community Programs" on Saturday, October 7.

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***"Don't Be As Dumb As An Elephant: A Potpourri of Changing Health-Fitness Paradigms and Perceptions"* given by Barry Franklin, Ph.D., on Thursday night.**

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***"Hydration and Heat Illness Issues: Guidelines for the Practitioner"*, given by William Prentice, Ph.D., P.T., A.T.C. on Friday, October 6.**

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PROGRAM

THURSDAY, October 5

3:00 – 5:00 p.m. *Health Professions Building Atrium*

FACULTY VIGNETTES AND BUILDING TOURS

Faculty from CMU's Health Sciences Program will explain the various functions of the laboratories in the Exercise Science program and elaborate on current activities and research. Tours of the $50 million Health Professions building will be available.

7:00 – 8:15 p.m. *Bovee University Center Auditorium*

KEYNOTE ADDRESS

"Don't Be As Dumb As An Elephant: A Potpourri of Changing Health-Fitness Paradigms and Perceptions"

Barry Franklin, Ph.D. – Beaumont Health Center, Royal Oak, MI

Dr. Barry Franklin is the Director of Cardiac Rehabilitation and Exercise Laboratories at William Beaumont Hospital in Royal Oak, Michigan. He holds adjunct faculty appointments as Clinical Professor of Exercise Science at Oakland University, Professor of Physiology at Wayne State University School of Medicine, and Clinical Professor, Department of Family Medicine at the University of Michigan Medical School. Dr. Franklin has served as the President of the Midwest chapter of the American College of Sports Medicine, President of the AACVPR, and as President of the American College of Sports Medicine. He is the author of numerous publications and books and is a popular presenter in his areas of expertise.

AEI TECHNOLOGIES

Sponsored by AEI Technologies

8:30 – 10:30 p.m. *Rotunda and Terrace Rooms, Bovee University Center*

OPENING RECEPTION

Join colleagues for the opening reception in a relaxing atmosphere. Snacks will be provided and a cash bar will be available.

Session 1: WORKSHOP

8:00 – 5:00 p.m. *Rooms 1301 and 1303 Health Professions Building*

Tai Chi For Arthritis: an introductory workshop on Tai Chi with a focus on health. Six movements will be taught for arthritis form by Sifu Dan Jones in this one-day workshop.

Dan Jones has over 36 years experience as a martial arts practitioner including 26 years of tai chi chuan and Won Chuen temple boxing and 12 years of combined experience in Japanese karate, tae kwon do, Wing Chun kung fu and Shorin Ryu karate. Dan graduated from the Won Chuen Temple Boxing Internal Kung Fu Academy in 1987 after obtaining the rank of Sifu (which means teacher in Chinese). He is a certified Tai Chi for Arthritis Master Trainer and Tai Chi for Diabetes Master Trainer. Dan is a certified police officer and security professional currently working for the Michigan State Senate. He has over 28 years of combined experience in law enforcement, hostage negotiations, personal protection and security management. Sifu Jones is the owner and founder of Moving Stillness, a training business that teaches and promotes the fluid and graceful art of tai chi chuan.

Session 2: FREE COMMUNICATION SESSION #1

8:30 – 9:30 a.m. *Room 1253 Health Professions Building*

2a

PHYSICAL ACTIVITY, STRESS AND THE METABOLIC SYNDROME IN 8-18 YR OLD BOYS
M E Holmes, J C Eisenmann, P Ekkekakis, D Gentile, Iowa State University, Ames, IA 50011

BACKGROUND: The origins of obesity and metabolic syndrome occur early in childhood; therefore understanding the impact of lifestyle factors on obesity and related metabolic disorders is an important child health issue. The purpose of this study was to examine the moderating effects physical activity may have on the relationship between measures of stress and metabolic syndrome phenotype in 8-18 year old males (n=37). METHODS: Physical activity was assessed using the MTI Actigraph accelerometer and expressed as moderate, vigorous and total daily physical activity. Television viewing (TV) and video game playing time were assessed via questionnaire. Stress was quantified as waking salivary cortisol and several self-report measures. A metabolic syndrome score (MSS) was generated by summing the age-standardized residuals for waist circumference, mean arterial pressure, glcosylated hemoglobin, and high-density lipoprotein. RESULTS: Correlations between physical activity and the MSS were low, but in the expected direction after controlling for age and maturity (r<-0.13). TV and video games playing time were significantly associated with the MSS (r = 0.39 and 0.43, respectively). School-related self-esteem (r=-0.46) and general appearance related teasing (r=-0.36) were significantly related to the MSS. Correlations between stress-related variables and the MSS ranged from r = 0.19 to

0.64 in the low physical activity group. No significant associations were observed between stress-related variables and the metabolic syndrome in the high physical activity group. CONCLUSIONS: The results show preliminary but suggestive evidence that physical activity buffers the relationship between aspects of stress and the metabolic syndrome.

2b

ACTIVITIES OF DAILY LIVING, FATIGUE, QUALITY OF LIFE, AND EXERCISE IN THE CANCER PATIENT.

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PURPOSE: The purpose of this study was to determine the effect of a therapeutic exercise regimen on activities of daily living (ADL) performance, fatigue, and quality of life (QOL) in patients undergoing treatment for cancer. METHODS: 30 cancer patients (various cancers; recently diagnosed; scheduled for surgery and chemotherapy or radiation) were randomly divided into experimental (12 females, 5 males; 61+7 yrs) and control (10 females, 3 males; 63+7 yrs) (mean+SD) groups. Subjects in both groups were measured on resting heart rate (RHR), ADL performance (treadmill walking, stair climb/descent, lifting/carrying, sit to stand, and functional reach), fatigue (Profile of Mood States Short Form Fatigue Subscale), and QOL (Ferrans and Powers Quality of Life Index-Cancer Version III) at four time points: post-diagnosis (baseline), post-surgery (~2-3 weeks post-baseline), 9 weeks post-baseline, and 16 weeks post-baseline. Experimental subjects participated in two exercise sessions per week for 16 weeks. Sessions were designed to target muscle groups/energy systems involved in the ADL tested. Control subjects received standard treatment for their cancer, but did not participate in structured exercise. RESULTS: A factor analysis was performed yielding four new variables: CARDIO = [(.5 x treadmill walking) ˆ (.5 x RHR)], WORK = [(stair climb & descent) + (lift & carry) + (sit to stand)]/3], HEALTH = [(.5 x QOL) ˆ (.5 x Fatigue)], and REACH = functional reach or balance. No significant differences were seen between the groups on baseline measurements. There were no significant differences between the baseline measures and the post-surgery values for either group. The rate of change from baseline to 16 weeks between the groups was found to be significantly different on all variables (significant improvement for the experimental group; significant decrement for the control group). The mean changes for the experimental group vs. the control group from baseline to 16 weeks are as follows: CARDIO (+65.5294 vs. -29.50), WORK (-5.298 vs. +3.5781), HEALTH (+1.8254 vs. -3.3656), and REACH (+1.1618 vs. -0.8077). Differences noted between 9 and 16 weeks were not significant. CONCLUSION: Cancer patients who are inactive during treatment experience significant decrement in ADL performance, QOL, and fatigue. An exercise regimen designed to target functional performance elicited significant improvement in ADL performance, QOL, and fatigue. A specific focus on the performance of everyday activities may make more sense from a practicality standpoint for the QOL of the majority of cancer patients.

2c

EFFECTIVENESS OF A COMMUNITY-BASED PEDIATRIC WEIGHT MANAGEMENT PROGRAM IN AT-RISK FOR OVERWEIGHT CHILDREN

K Wan, A Morton, L Snyder, P Waldsmith, T Rayner, R Jeffreys, B Phillips, R Claytor, Miami University, Oxford, OH, Cincinnati Children's Hospital Medical Center, Cincinnati, OH

PURPOSE: The purpose of this study was to determine the effects of a community-based pediatric weight management program in at-risk for overweight children. METHODS: 21 boys (10.4 _+_ 1.0 yrs) (mean _+_ SD) and 24 girls (10.1 _+_ 1.2 yrs) with a body mass index (BMI) _>_ 85^th percentile for age and gender participated in a 10-week intervention designed for 9 to

12 year olds. Height (HGT), body weight (BW), BMI, percent body fat (BF), fat mass (FM), lean body mass (LBM), aerobic capacity, muscular strength, endurance and flexibility were determined at baseline and at 10-weeks. Aerobic capacity was measured with the Progressive Aerobic Cardiovascular Endurance Run (PACER). Muscular strength was determined with 10-rep max (10RM) chest press (CP) and leg press (LP). Muscular endurance was determined with a paced curl-up test (CRLUP) and flexibility with the back-saver sit and reach on the left (SRL) and right (SRR) sides. Participants met 3 days per week and each session was structured to include 45-60 minutes of physical activity and concluded with an educational component. One session per week included a one hour nutrition education component for families of the participants. RESULTS: 17 boys and 21 girls (84%) completed the 10-week intervention.
In response to the weight management program, both boys and girls experience similarly significant changes in HGT, BW, BF, FM, LBM, PACER,
LP, CRLUP, SRL, and SRR. The mean changes in body composition and fitness measures from baseline to 10-weeks are as follows: HGT (1.5 _+_ .1 vs. 1.5 _+_ .1 m), BW (59.6 _+_ 15.4 vs. 60.4 _+_ 15.4 kg), BMI (26.6 _+_ 4.3 vs. 26.6 _+_ 4.2 kg/m2), BF (37.5 _+_ 7.5 vs. 35.1 _+_ 7.1%), FM (23.1 _+_ 10.0 vs. 21.9 _+_ 9.2 kg), LBM (36.5 _+_ 6.7 vs. 38.5 _+_ 7.4 kg), PACER (15.8 _+_ 8.3 vs. 19.8 _+_ 10.8 laps), CP (42.8 _+_ 53.9 vs. 54.6 _+_ 16.9 lbs), LP (65.4 _+_ 16.4 vs. 101.1 _+_ 23.3 lbs), CRLUP (24.2 _+_ 13.9 vs. 29.7 _+_ 13.8), SRL (20.0 _+_ 7.3 vs. 22.5 _+_ 9.0 cm), and SRR (19.5 _+_ 8.3 vs. 21.5 _+_ 7.8 cm). CONCLUSION: The 10-week weight management intervention was effective at producing favorable body composition and fitness changes in at-risk for overweight boys and girls. These results suggest that community-based pediatric weight management programs are an effective strategy for reducing the adverse health effects associated with being overweight.

Funded by: Ohio Department of Health

2d

CARDIAC GENE EXPRESSION AND LIPID PROFILE OF RATS PROVIDED ACCESS TO VARYING LEVELS OF PHYSICAL ACTIVITY

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Animal research has significantly contributed to knowledge about human health and disease, such as cardiovascular disease, metabolic syndrome, and cancer. Although the laboratory rat is a valuable research model, a potential problem arises in the typical environment in which laboratory animals live. The laboratory environment, where animals are forced to live in a standard cage, may affect the gene-environment interaction and render laboratory animals vulnerable to sedentary-related changes in gene expression and physiological function, particularly factors of cardiovascular health. **PURPOSE:** This study measured cardiac gene expression of two important regulatory genes of cholesterol biosynthesis: very low density lipoprotein receptor (VLDLR) and b-hydroxy-b-methylglutaryl-coenzyme A reductase (HMGCR) in animals that had varying levels of physical activity: none outside a standard cage (SED), bi-weekly hourly sessions in a large box (PA), and every other day access to a running wheel (EX). The study compared phenotypic changes in total blood cholesterol and triglycerides to determine the effect of activity-induced changes in gene expression on known phenotypic markers of cardiovascular health. **METHODS:** 108 Sprague-Dawley female rats were randomly assigned to one of the three levels of physical activity. Cardiac gene expression was measured in 16-month old animals using Affymetrix microarray gene chips. Blood triglycerides and total cholesterol were determined

biochemically from whole blood collections. **RESULTS:** At 16 months of age, there was a 100% up-regulation of VLDLR and a 20% down-regulation of HMGCR in the exercise group as compared to the sedentary group. These genes were also 100% and 20% changed when comparing PA to SED. Cholesterol and triglycerides in the exercise animals remained fairly constant while there was a trend for the sedentary and physical activity box animals to have elevated cholesterol and triglyceride levels by 16 months. **CONCLUSION:** Animals that resided solely in cages with no access to physical activity outside a cage, had changes in two cholesterol regulatory genes, VLDLR and HMGCR, and blood lipid profiles compared to regularly exercised animals. The changes in gene expression and physiological function suggest that laboratory animals are vulnerable to sedentary related changes and factors of cardiovascular health.

Supported by NIH Grant 1 R15 AG 20526-01A1.

Session 3: SYMPOSIUM

8:30 – 9:30 a.m. *Rom 1255 Health Professions Building*

Community Weight Loss Programs: Opportunities for University and Hospital Collaborative Research
Richard B. Parr, Ed.D. Mike Terwilliger, and Shara Haight – Central Michigan University and Central Michigan Community Hospital, Mt. Pleasant, MI

Collaboration efforts optimize professional expertise, services, and facilities. Central Michigan Community Hospital and Central Michigan University's community weight loss program is a working model of a mutually beneficial relationship that uses the best resources from each group for the benefit of the residence of Isabella County. Together we offer a research quality weight loss intervention program to community members who have limited access to intervention programs and who may otherwise participate in a loosely designed program. The hospital provides patients, clinical testing and administrative oversight while the University provides expertise and facilities for group education sessions. Undergraduate and graduate students at the University assist in implementing the weight loss program and gain practical hands -on experience with testing. Graduate students can access data for independent studies and thesis. Both CMCH and CMU benefit from the publicity gained through national presentations and publications.

Session 4: POSTER SESSION

8:00 a.m.– 10:30 *Atrium, Health Professions Building*

Authors will be present during an unopposed session from 9:30 – 10:30 a.m.

Abstract #1

DIURNAL VARIATIONS IN HEART RATE, BLOOD PRESSURE, AND PERCEIVED EXERTION DURING GRADED TREADMILL EXERCISE.

CL Abbott, PC.Knoblauch, CD Hayward, Spring Arbor University, Spring Arbor, MI 49283

PURPOSE: The purpose of this study was to determine if diurnal variations in blood pressure and heart rate present at rest are continued during exercise. Additionally, it investigated the existence

of diurnal variations in ratings of perceived exertion (RPE). METHODS: 14 college-aged males (20.5 + 3.5 yrs) (mean + SD) who reported being able to run a minimum of two miles performed two exercise ECGs; one in the morning within one hour of arousal and one in the evening, 12 hours after the initial test on a different day. Each participant was required to complete through level 4 of the Bruce Protocol. Blood pressure, heart rate, and RPE were recorded every two minutes during exercise, and three times during a five minute cool down. Dietary intake was controlled in the morning exercise bout but not in the evening exercise bout. RESULTS: The results were analyzed to determine if there was a significant diurnal variation in exercise blood pressure, heart rate, and RPE. This analysis showed that a diurnal variation did not occur in resting heart rate or blood pressure, although it has been found conclusively in other studies. A statistically significant variation in blood pressure and heart rate was evident at a few points during exercise, but these findings were not consistent overall. The results of this study imply that the diurnal variations observed at rest do not continue to occur under exercise intensities used for this study. There was also no noteworthy variation in RPE between the two exercise bouts, indicating that this psychological component does not fluctuate greatly throughout a 24-hour period at the exercise intensities used for the study.

Abstract #2

DOES BMI DETERMINE OBESITY LEVELS IN DIVISION I COLLEGE FOOBALL PLAYERS?

JA Adams, RP Claytor, Miami University, Oxford, OH 45056

PURPOSE: The purpose of this study is to determine whether Body Mass Index (BMI) is useful as a measure of obesity in division I college footballplayers. There has been recent controversy concerning the use of BMI in determining body composition in athletics and mainly in football players. METHODS: 86 male athletes participated in this study. Body weight (BW), height (HT), BMI, percent body fat (BF), fat mass (FM), and fat-free mass (FFM) were determined in this study. Air plethysmography was used to determine BF, FM, and FFM. Subjects were instructed to abstain from eating or drinking 4 hours before testing; avoid moderate or vigorous physical activity within 4 hours of testing; abstain from alcohol consumption 24 hours prior to testing; and wear compression shorts for testing. All subjects were able to fit into the instrument chamber (Bod Pod) and perform the maneuver for pulmonary plethysmography. BF of less than 20% was considered normal; BF of 20.1%-30% was considered overweight; BF greater than 30% was considered obese. BMI classifications were used from ACSM's Guidelines for Exercise Testing and Prescription, 7th Edition. The subjects tested were also split into three groups determined by position to further break down BMI as a useful measure of obesity. These groups were the big (B) (offensive line, defensive line), athletic (A) (quarterbacks, tight ends, running backs, kickers, and linebackers), and skilled (S) (wide receivers, defensive backs). RESULTS: 56 (65%) of those male athletes had a BF of less than 20% (Normal), 22 (25%) had a BF between 20.1%-30% (Overweight), and 8 (9%) had a BF greater than 30% (Obesity). Only 7 (8%)of those tested had a BMI18.5-24.9 (Normal), 48 (55%) had a BMI of 25.0-29.9 (Overweight), 31 (36%) had a BMI of 30.0-39.9 (Obesity). According to BMI 79 (91.86%) are overweight or obese. By air plethysmography 30 (34.88%) are overweight or obese. 65 of 86 (75.56%) subjects were misclassified as overweight or obese by BMI compared to air plethysmography. The B group 16 (67%) were misclassified. In the A group 28 (77%) were misclassified. In the S group 21 (80.8%) were misclassified. CONCLUSION: The use of BMI in Division I college football players is not an effective way to determine overweight/obesity levels.

Abstract #3

MUSCLE EXPRESSION AND PLASMA CHANGES OF TPA AND PAI-1 WITH ACUTE MAXIMAL AEROBIC EXERCISE

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PURPOSE: The purpose of this study was to assess changes in muscle expression and plasma levels of tissue plasminogen activator (tPA) and plasminogen activator inhibitor-1 (PAI-1) in response to an acute bout of maximal aerobic exercise.
METHODS: Six men (age: 21.17±2.56 years; height: 177.95±7.19 cm; weight: 72.08±11.8 kg; VO_2max: 59.64±5.85 $mL \cdot kg^{-1} \cdot min^{-1}$) participated in a maximal exercise treadmill test with blood and muscle samples being taken prior to and immediately following exercise. Muscle samples were obtained from the vastus lateralis muscle via percutaneous muscle biopsy following a 12-hour fast. Total RNA was isolated from the muscle, and subjected to DNase treatment. Total RNA was reverse transcribed, and skeletal muscle tPA and PAI-1 gene expression assessed by the polymerase chain reaction using gene specific primers. Muscle tPA activity was measured by plasminogen gel zymography. Venous blood was collected into an acidified citrate solution after a 12-hour fast to measure plasma tPA activity and antigen and PAI-1 activity. Samples were spun to obtain platelet-poor plasma and stored at -80C until assayed. tPA and PAI-1 activities were assayed using a bio-functional immunosorbent assay (BIA) (Biopool International, Sweden) whereas tPA antigen was assayed using an enzyme-linked immunosorbent assay (ELISA) (American Diagnostica, Greenwich, CT). RESULTS: There was an increase in muscle tPA mRNA (pre: 190.72±84.61 pixels; post: 268.74±49.77 pixels; p=0.159). Although not statistically significant, this possibly indicates an upregulation of tPA transcription in response to acute aerobic exercise. Muscle tPA activity (pre: 30.69±57.81 pixels; post: 40.17±47.66 pixels; p=0.742) and muscle PAI-1 mRNA (pre: 301.60±230.37 pixels; post: 337.79±263.13 pixels; p=0.309) showed little change in response to maximal exercise. Plasma tPA activity showed a significant increase in response to exercise (pre: 0.28±0.21 IU/ml; post: 6.02±0.22 IU/ml; p<0.0001) while plasma PAI-1 activity showed no change with maximal exercise (pre: 8.94±5.54 IU/ml; post: 5.67±3.08 IU/ml; p=0.116). There was a significant association between post-exercise muscle and plasma tPA activities (r=0.894; p=0.016). CONCLUSION: These results suggest a possible upregulation of transcription of tPA in skeletal muscle with no change in PAI-1 transcription, indicating a possible improvement in the fibrinolytic profile of skeletal muscle with maximal exercise. Also, there is a possible contribution of skeletal
muscle tPA to plasma tPA activity, possibly indicating that skeletal muscle can contribute to a positive fibrinolytic profile in plasma.

Abstract #4

ELECTROMYOGRAPHIC ANALYSIS OF TRADITIONAL AND ELASTIC BAND BENCH PRESS EXERCISES

A Deshpande, & JP Brandenburg, Northern Illinois University, De Kalb, IL 60115

PURPOSE: The study examined the mean and peak muscle activation (I-EMG) of the pectoralis major and triceps brachii of three different bench press conditions on a Smith machine.
METHODS: The exercise order was randomly determined for 11 physically active male students (age 23 ± 1.5 years, height 176 ± 10 cm, weight 81.7 ± 13 Kg). Following a familiarization session each subject performed the three bench press conditions. The conditions included: a) traditional bench press using approximately 75% of 1-RM (traditional), and b) bench press using 75% 1-RM combined with elastic bands (combined), and c) bench press using less than 75% 1-RM (to account for the resistance added by the bands) with elastic bands (adjusted). Each testing session performed on a single day, consisted of the three conditions and used 5 reps with a rest interval of 5 minutes between each condition. The order in which the bench press conditions were

performed was randomized and counter balanced. RESULTS: A repeated measures ANOVA (RM-ANOVA) revealed no differences in the mean and peak EMG of the pectoralis major and triceps brachii muscles during the concentric phase between any of the 3 bench press conditions. A RM-ANOVA for the mean I-EMG for combined protocol (pectoralis major muscle) showed greatest mean value (396.7 ± 118.8 mV, $p>0.02$). Peak I-EMG response for combined protocol (pectoralis major muscle) also showed highest mean value (613.4 ± 186.0 mV, $p>0.02$). Mean I-EMG for triceps brachii muscle showed slightly higher response for adjusted protocol (116.6 ± 58.6 mV, $p>0.02$). Peak I-EMG in the triceps brachii, recorded for the adjusted protocol was also higher (172.3 ± 88.4 mV, $p>0.02$) compared to the other two protocols. CONCLUSION: The results of the study suggest that all the three conditions are equally effective at activating the pectoralis major and triceps brachii muscles.

Abstract #5

USING SQUAT RM TESTING TO DETERMINE HAMSTRING RESISTANCE TRAINING EXERCISE LOAD

WP Ebben, JA Davies, NJ Long, ZD Pawlowski , LM Chmielewski, Marquette University, Milwaukee, WI 53201 and R Clewien, Concordia University Wisconsin, Mequon, WI 53097

PURPOSE: The purpose of this study was to determine if there is a linear relationship between the squat and a variety of hamstring resistance training exercises, and if this relationship differs based on gender. This study also sought to create prediction equations for the determination of hamstring exercise load based on the squat load. METHODS: Repetition maximums of the back squat, as well as 4 common hamstring resistance training exercises including the seated leg curl, stiff leg dead lift, single leg dead lift, and good morning exercise were determined for each subject. Subjects included 21 male and 13 female collegiate athletes. Data were evaluated with SPSS 13.0 using linear regression analysis to predict hamstring exercise loads from 6 RM squat data. RESULTS: Results of the analysis of all subjects indicated that squat load was a significant predictor of loads for each of the hamstring exercises. Separate analysis of female subjects revealed that squat load was not a significant predictor of loads for any of the hamstring exercises. Analysis of male subjects revealed that squat was a significant predictor of load for the seated leg curl (R squared = .58, $p<0.001$), stiff leg dead lift (R squared =.82, $p<0.001$), single leg stiff leg dead lift (R squared = .80, $p<0.001$), and good morning (R squared = .79, $p<0.001$) exercises. CONCLUSION: Based on the analysis of the male subjects, the following prediction equations were devised for each exercise: (a) seated leg curl load = squat load (0.18) + 5.32 kg, (b) stiff leg dead lift load = squat load (1.17) ^ 42.87 kg, (c) single leg stiff leg dead lift load = squat load (0.45) ^ 2.35 kg, and (d) good morning load = squat load (0.95) ^ 46.81 kg. Thus, hamstring exercise loads can be predicted from squat test results, for male subjects only.

Abstract #6

GENDER DIFFERENCES IN THE ACTIVATION OF THE HAMSTRINGS, QUADRICEPS, AND HAMSTRINGS TO QUADRICEPS RATIO DURING THE SQUAT.

WP Ebben and P Papanek, FACSM. Marquette University, Milwaukee, WI 53201

PURPOSE: The purpose of this study was to evaluate the hamstring (H) and quadriceps (Q) activation strategies during the squat in order to understand their functional synergy and to determine if there are differences based on gender. METHODS: Twenty-one male and 13 female NCAA division-I or NCAA division-III athletes (20.38 ± 1.77 years) volunteered for this study. All subjects performed an MVIC at 60 degrees of knee flexion for the hamstrings and quadriceps muscle groups, using the seated leg curl and squat, respectively. Subjects then performed 2 full range of motion repetitions of the squat using their 6 RM loads. Electromyography was used to quantify muscle activity using a two channel, fixed shielded cabled, Delsys Bagnoli-2 EMG system (Delsys Inc. Boston, MA, USA). Data were normalized to MVIC in order to compare H to

Q activation and determine H:Q ratios and to compared performance between genders. RESULTS: Data were analyzed with SPSS 13.0 for Windows (Microsoft Corporation, Redmond, WA, USA) using Pearson,s Correlations. Separate analysis by gender revealed that squat load was not correlated with pre-squat Q MVIC for either male (r = - 0.41) or female (r = 0.37) subjects. Similarly, squat load was not correlated with the percent MVIC of the Q during the performance of the squat for either male (r = 0.36) or female (r = -0.09) subjects. Squat load was correlated with pre squat H MVIC for female (r = 0.62, $p<0.05$), though not for male (r = -0.50) subjects. On the other hand, during the squat, squat load was correlated to H percent MVIC for male (r =0.69, $p<0.05$) but not female subjects (r = -0.15) as well as H:Q ratio for male (r = 0.58, $p < 0.01$) though not female (r = -0.09) subjects. CONCLUSIONS: Results suggest that the ability to activate the rectus femoris before (assessed as MVIC) or during the squat plays a limited role in the performance of the squat for both genders. During the squat, male subjects demonstrated a relationship between activating the H and squat load as well as higher H:Q ratios, suggesting that males are able to activate the H to a greater degree during activities where the Q is active, such as during the squat. Females demonstrate lower H:Q ratios, thus appear to be Q dominant and less able to activate the H, in relationship to the Q, as has been suggested in the literature.

Abstract #7

DEVELOPING A DIAGNOSTIC TOOL TO MEASURE VALGUS COLLAPSE IN COLLEGE AGED FEMALES

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PURPOSE: The purpose of the study was to examine the potential of identifying valgus collapse in the knees of females using Dartfish motion analysis software. METHODS: This study involved nine college-aged females between the ages of 18 and 24. These subjects performed stepping movements and both single- and double-leg squats while being taped with a digital video camera. Fluorescent sticky notes were placed on the knees and ankles of a participant to aid the tracking device in Dartfish. The footage was entered into the Dartfish software and analyzed using various tools, such as, the angle tracking device, Simulcam, distance tool, and vertical lines. Each of these tools was applied to various clips to assess possible valgus collapse in the subjects. RESULTS: The vertical lines and Simulcam were successful in identifying valgus collapse in a qualitative manner. The angle tracking device and the distance tool generated useful numerical measurements that could be placed in an Excel spreadsheet and analyzed. Dartfish was successful in identifying a difference between valgus collapse and healthy neuromuscular functioning of the knee. CONCLUSION: Dartfish motion analysis software was capable of identifying valgus collapse in college-aged females. Using Dartfish's innovative technology, four tools: angle tracking device, vertical lines, Simulcam, and distance tool, were used to detect valgus collapse. These findings suggest Dartfish could play a critical role in the early assessment of valgus collapse, thereby decreasing the risk of ACL injury in females through identification and development of appropriate training practices for those so identified.

Abstract #8

DO INSTRUCTIONS OF JUMP TECHNIQUE HAVE A DIFFERENT EFFECT ON FEMALES THAN ON MALES?

J Hayworth, M Winkler, L Felix, M Walsh. Miami University, Oxford, OH. 45056

Introduction: Non-contact injuries are responsible for a large number of injuries, particularly in female athletes. Recently a number of studies have demonstrated that
Instructions on jump technique can positively influence various parameters that are implicated innon-contact knee injuries. The **purpose** of this study was to evaluate if there are gender differences in the response to a set of simple instructions designed to reduce the incidence of

non-contact jumping injuries. **Methods**: Twenty five (13 men, 12 women) college basketball players performed 3 drop jumps from a box (height 31 cm). Upon arrival in the lab reflective markers were fixed to the basketball players' ankles, knees and hips. A video camera operating at 6o fields/second captured frontal plane kinematic data. After the initial 3 jumps the subjects were divided into 2 groups. The control group performed 3 more practice jumps. The experimental group received the instructions 'Drop off of the box, land on the balls of your feet with your knees already bent. Land as soft as you can and then jump as high as you can'. Both groups then performed 3 more drop jumps. **Results**: The women showed significantly ($p<0.05$) less knee adduction (valgus alignment) after the instructions compared to their baseline values. The males showed no difference. No difference in jump height was observed. Conclusion: Jumping instructions seemed to positively influence female technique and had no effect on male technique. It is possible that a different set of instructions could be needed that are gender dependent.

Abstract #9

PILOT STUDY TO DETERMINE THE USEFULNESS OF 6 MINUTE WALK TEST ON MORBIDLY OBESE ADOLENCENTS.

RM Jeffreys, T Inge, P Khoury, R.P.Claytor. Cincinnati Children's Hospital Medical Center, Cincinnati, OH 45206.

PURPOSE: To determine the usefulness of a clinically performed 6 minute corridor test in morbidly obese adolescents.
METHODS: Morbidly obese adolescents pursuing Roux en Y Gastric Bypass Surgery are followed by a multidisciplinary team that includes an exercise physiologist. At multiple time points, (Pre Treatment (PreTX, Pre Operation Education (PreOP), 2 Weeks Post Surgery (2 wk), and 4 Months Post Surgery (4M)) a 6 minute corridor walk test is performed. The walk covers a measured distance down a hospital corridor. Height, weight and calculated BMI are taken at each visit.
RESULTS: 12 patients completed the PreOP test with a mean BMI of 62.08±11.83, 10 patients have completed the 2wk test with a mean BMI of 59.75 ±13.79, with 8 patients completing the 4M test, mean BMI 47.77 ±12.66. Of those patients, there is a difference in 2 wk BMI $p<.002$ at 4M BMI $p<.0001$, but no difference in their 6 minute walk distance or speed at the 2 wk visit, $p<.75$ (2wk distance) and $p<.44$ (2wk speed). At 4M there is no difference in walk distance, $p< .07$(4M time) but a slight increase in walk speed $p<.01$(4M speed).
CONCLUSIONS: The 6 minute walk test has clinical relevance to confirm the functional limitations of morbidly obese adolescents. Walk distances are not correlated with BMI changes but seem to impact walking speed. In addition, periodic walk tests can support or refute self reported levels of physical activity.

Abstract #10

EFFECTS OF A PROGRESSIVE TRAINING PROGRAM IN OVERWEIGHT YOUTH

CJ Kist, RM.Jeffreys, KWan, R Claytor, Cincinnati Children's Hospital Medical Center, Cincinnati, OH 45206.

PURPOSE: To determine the increases in strength gains in overweight youth during a progressive, supervised group exercise program.
METHODS: We initially tested 49 youth (age =11.8±3.2 years; Caucasian 29, African American 17, Other 3; Boys 22, Girls 27) when they started a clinical pediatric weight management program; they were retested approximately 10 weeks later. To test overall strength subjects' preformed a 10 rep max(10RM) on the chest press(CP), upright row(UR), and leg extension(LE). We also tested their 30 second RM, at one resistance level less than their 10 RM using Life Fitness Circuit Equipment. Attendance was taken during each of the exercise sessions.

RESULTS: Youth came to the exercise program on average (13.6±6.8;min 3, max 33) sessions during the ten week period. Height increased significantly (61.8±5.8in vs.62.1±5.7in), weight slightly decreased (85.7±28.5kg vs.85.4±27.8kg) and BMI decreased significantly (34.1±8.1vs.33.7±7.8). 10RM significantly increased on all three pieces of equipment, 10RM CP(53.2±22.2vs.67.4±22.4), 10RM LE(70±29.3vs.85.5±22.3), 10RM UR(58.4±25.4vs.71±23.4). The 30 second max work(MW) also significantly increased on all three pieces of equipment, CP MW (631.5±343.7vs.884.5±378.4), LE MW (1054.8±566.5vs.1572.2±683.9),UR MW (743.7±405.8vs.1035.9+486.4). CONCLUSONS: A supervised exercise program which includes resistance training programs for overweight youth can be very successful particularly in overall strength gains. The study showed significant increases in strength as well as significant increases in the volume of work preformed in a short period of time.

Abstract #11

ACUTE EFFECTS OF STATIC AND PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF) STRETCHING ON MUSCLE STRENGTH AND RANGE OF MOTION

TD MacConnell and JE Davis Alma College, Alma, MI 48801

PURPOSE: The purpose of this study was to compare the acute effects of short (2 minute) static and proprioceptive neuromuscular facilitation (PNF) stretching protocols on quadriceps and hamstring muscle strength and knee joint range of motion (ROM). METHODS: Eight subjects participated in three different conditions: control, static stretching, and modified PNF stretching. In the control condition, knee ROM, peak isokinetic torque at 30°/s and 180°/s, and maximal voluntary isometric strength at 60° were measured. In the two experimental conditions, knee ROM was measured prior to execution of a specified, two-minute, stretching protocol. Post-stretching, knee ROM, peak isokinetic torque and maximal voluntary isometric strength were recorded as in the control condition. ROM and muscle strength variables were measured using a goniometer and a cybex dynamometer, respectively. In all conditions, surface EMG signals were recorded for the vastus lateralis and biceps femoris muscles during the isokinetic and isometric tests. RESULTS: Statistical analysis indicated a significant ($P \leq .05$) decrease in peak isokinetic torque at 30°/s during extension following static stretching and a significant ($P \leq .05$) difference in peak isokinetic torque at 180°/s between static and PNF stretching during both extension and flexion. There were no stretching- induced changes in isometric strength. CONCLUSION: Short duration static stretching appears to have a detrimental effect on muscle strength, particularly in relation to PNF stretching.

Abstract #12

CREATINE SUPPLEMENTED MUSCLE MAY EXPERIENCE ACCENTUATED MUSCLE DAMAGE

D McAlpine, S Ianuzzo, CD Ianuzzo FACSM. Applied Health Science, Wheaton College, Wheaton, IL.

PURPOSE: To compare the responses to eccentric contraction-induced muscle damage between a group of subjects ingesting creatine (CrG) and a placebo group (PG). METHODS: Eleven male college aged subjects participated in this study. All eleven performed an over-exertion protocol. Subjects in the (CrG) loaded 20 g of creatine (Cr) day-1 for 5 days prior to over-exertion and continued to ingest 5 g Cr day-1 for the remainder of the study. Subjects in the placebo group followed the same dosing regime. Measures of maximal isometric force (MIF), maximal isokinetic force (MIKF), creatine kinase (CK) activity and soreness (SOR) were monitored. These four criteria were measured pre-over-exertion, and on the following days: 1, 2, 4 and 8. RESULTS: There were significant differences ($P < 0.05$) between the two groups in CK levels on days 2, 4 and 8, as well as in MIF on days 1 and 4. CONCLUSIONS: In summary these data indicate that Cr supplemented muscle experiences accentuated muscle damage as well as short term muscle performance loss following an eccentric over-exertion protocol.

Abstract #13

PHYSICAL ACTIVITY, WORK CAPACITY, BODY COMPOSITION, AND STRESS: THEIR RELATIONSHIP TO SLEEP IN POSTMENOPAUSAL WOMEN

L Sammut, S Thaxton, JE Davis, H Yarandi., H-J. Engels FACSM, Wayne State University, Detroit, MI 48202

PURPOSE: The purpose of this study was to examine the relationship between physical activity, work capacity, common body composition indices, and perceived stress with daytime sleepiness, sleep quality, and sleep continuity in postmenopausal women. METHODS: 20 postmenopausal women (age: 54.4+5.7 yrs) without sleep apnea who suffered from a sleep maintenance or sleep onset latency disorder underwent laboratory testing to determine physical work capacity (VO2max treadmill test) and body composition (waist circumference, waist/hip ratio, BMI, % body fat from skinfolds). In addition, free-living physical activity and perceived level of stress over a one-week period were assessed as average steps/day (Yamax Digiwalker SW-200 pedometer) and with a one-item visual analogue scale, respectively. Data on sleep continuity was measured using standard all-night polysomnography. The Epworth Sleepiness Scale was used to measure global daytime sleepiness and the Pittsburgh Sleep Quality Index (PSQI) was used to measure subjective sleep quality. Data were analyzed using descriptive and correlational statistics. RESULTS: The sample had a mean VO2max of 20.5 (+3.5) (ml/kg/min), BMI of 26.8 (+3.2) kg/m2, 30.4 (+4.6) % body fat, waist circumference of 84 (+11.2) cm, and a waist/hip ratio of 0.80 (+0.08). Ambulatory physical activity levels were 8360 (+3624) steps/day and the average score for perceived level of stress was 62.7 (+19.5). At a probability level < 0.05, VO2max was positively correlated with sleep efficiency (r = 0.47) and negatively correlated with sleep onset latency (r = -0.67). BMI and waist circumference were significantly positively correlated with global daytime sleepiness (r = 0.70; r = 0.56) and % body fat was significantly positively correlated with self-reported sleep quality scores (r = 0.47). Percent body fat and waist/hip ratio were significantly negatively correlated with the amount of wake after sleep onset (WASO) (r = -0.50; r = - 0.48). Waist circumference was significantly positively correlated with numbers of WASO (r = 0.51). Physical activity was significantly negatively correlated with sleep onset latency (r = -0.65) and PSQI total score (r = -0.54). Perceived levels of stress were not significantly correlated with any of the sleep characteristics evaluated in this study. CONCLUSIONS: This study identified several significant relationships between physical activity, work capacity, and common clinical body composition indicators with both objective and subjective measures of sleep and daytime sleepiness. These findings may be useful for future research into the development of intervention strategies to help improve the sleep of postmenopausal women.
Funded by NINR 5 R01 NR008024

Abstract #14

CHANGES IN THE LACTATE THRESHOLD WITH INCREASING AGE

K Warner, S Ianuzzo, and C Ianuzzo. Applied Health Science, Wheaton College, Wheaton, IL

Current research indicates that as one ages there will be a shift inthe lactate threshold (LT). The decline in maximum heart rate withaging along with a lower VO2max and an increase in slow-twitch fibersmay result in a rightward shift in the LT. PURPOSE: To determine if there is an age related shift in the percent VO2max at which the LT threshold occurs. METHODS: Subjects were separated into three groups based on their age. The protocol involved a graded treadmill test,with blood lactate, heart rate, and oxygen uptake measured every three minutes. RESULTS: The mean age for Group 1 was 20.8 ± 0.04 years, Group 2 was 44.9 ± 5.5 years, and Group 3 was 59.7 ± 3.8 years. Mean LT occurred at 78.8 ± 7.5% VO2peak for Group 1, 78.3 ± 8.5% for Group 2, and 81.0± 8.4% for Group 3 (p=0.232). The LT occurred at an absolute VO2 of 47.7 ± 4.9 ml•kg-1•min-1for group 1, 41.3 ± 7.6 ml•kg-1•min-1 for group 2, and 42.7 ± 9.2 ml•kg-1•min-1 for group 3 (P=0.194). LT occurred at 91.7 ± 1.6% HRmax for Group 1, 90.1 ± 5.9% for Group 2, and 91.4± 4.1% for Group 3

(p=0.969). The LT occurred at an absolute HR of 175.7 ± 8.6 bpm for group 1, 154.5 ± 16.5 bpm for group 2, and 154.4 ± 11.3 bpm for group 3 (P = 0.001). CONCLUSION: When LT is expressed as a relative percent of maximum there is no rightward shift of the LT with aging nor is there a shift when expressed on absolute terms of VO2. There is significant shift in the LT when expressed as an absolute value of HR.

Abstract #15

OXYGEN KINETICS OF INTERMITTENT VERSUS CONSTANT LOAD CYCLING AT THE POWER ASSOCIATED WITH VO2MAX.

R Weese, W Light, and SJ McGregor. Eastern Michigan University, Ypsilanti MI.

Introduction: The purpose of this study was to compare the oxygen kinetics of two cycling training protocols. Previous research, in runners, has illustrated that performing intermittent run at 100% velocity associated with VO2 max (vVO2 max) for 30 s alternated with 30 s at 70% vVO2max until exhaustion results in a greater amount of time spent at VO2 max than a continuous run at 100% vVO2 max to exhaustion. This approach has not been investigated in cycling, therefore it was of interest to determine whether the same intermittent protocol would 1) elicit VO2 max in cyclists and 2) would the same intermittent protocol elicit greater time spent at VO2 max when compared to a continuous all out bout at 100% VO2 max. Methods: All procedures were approved by the Eastern Michigan University Humans Subjects Review Committee. Four trained males cyclists, (20.3 + 2.5 yrs; VO2 peak 51.7 + 2.3 ml/kg/min) used their own bicycles mounted to a Computrainer™ ergometer to perform an incremental test to exhaustion to determine VO2 peak and power associated with VO2 peak (pVO2 peak). From these, power levels for the continuous and intermittent trails were determined. The intermittent trial consisted of alternating 30 s efforts at 100% pVO2 peak and 70% pVO2 peak until voluntary exhaustion. The continuous trial consisted of a constant load bout at 100% pVO2 peak until voluntary exhaustion. Results: Time limit to exhaustion (*tlim*) was significantly greater in the incremental trial 8:52 ± (0:46) compared to the continuous trial 3:45 ± (0:54). Time limit at VO2 peak (*tlim* VO2 peak) was significantly greater in the incremental trial 4:41 ± (0:45) compared to the continuous trial 2:18 ± (0:31). ($P<0.05$) Conclusion: Vo2 peak was elicited in trained cyclists during intermittent intervals at 100% and 70% pVO2 max. Time to exhaustion as well as time limit at VO2 peak was significantly greater in the incremental trials compared to the continuous protocol performed at 100% pVO2max. Since training VO2 max is important from both endurance performance and overall health, information for the current study would be beneficial to cyclists, coaches, as well as individuals interested in improving cardiovascular health.

Abstract #16

SOMATOTYPE, BODY COMPOSITION, AND BIOENERGETIC PROFILE OF HIGH CALIBER MALE AND FEMALE YOUTH SOCCER PLAYERS

RL White, H.-J Engels, FACSM, Wayne State University, Detroit, MI 48202

PURPOSE: This study compared selected anthropometric and bioenergetic characteristics of age-matched male (MP) and female (FP) US Youth Soccer Olympic Development Program State Association pool players. METHODS: Twenty female (age 15.1 ± 1.1 years) and 20 male (age 15.1 ± 0.9 years) soccer athletes underwent standardized exercise physiology laboratory testing to determine somatotype (Heath-Carter method), body composition (hydrostatic weighing), maximal aerobic power (Bruce treadmill protocol), and anaerobic performance characteristics (Wingate test). RESULTS: Paired t-tests revealed, compared to age matched MP, the somatotype of FP exhibited more endomorphism (FP 3.2 ± 0.7; MP 1.9 ± 0.4) ($p<0.05$) and less ectomorphism (FP 2.8 ± 0.8; MP 3.8 ± 0.8) ($p<0.05$). While body weights were similar between groups, MP were on average taller (170.3 ± 7.6 cm) than FP (165.2 ± 5.6 cm)

($p<0.05$). Body fat percentage (FP 18.2 ± 4.7%; MP 9.6 ± 3.2%) and fat mass was higher while lean body mass was lower in FP ($p<0.05$). Regardless of whether the data was expressed in absolute (L/min) or relative terms (ml/kg LBM/min), MP had higher values for maximal aerobic power ($p<0.05$). For anaerobic performance characteristics, absolute values for mean anaerobic power were significantly greater in MP (452.4 ± 87.8 W) compared to FP (408.4 ± 60.1 W) ($p<0.05$). In contrast, absolute peak anaerobic power scores, although 9.3% higher in MP (632.79 ± 123.6 W), were not different to FP (578.9 ± 104.8 W) ($p<0.05$). There was also no difference between groups in peak and mean anaerobic power values expressed relative to lean body mass (W/kg LBM) ($p>0.05$). CONCLUSION: To our knowledge, this is the first study to provide a comparison by gender of talented youth soccer players who were of similar age, and had been identified by qualified coaches for high level of competition and training. Findings provide a basic profile regarding the anthropometric and bioenergetic characteristics of these young athletes in the world,s most popular sport.

Abstract #17

POST-EXERCISE HYPOTENSION IN SWIMMING AND CYCLING: CHANGES IN BLOOD PRESSURE, HEART RATE, AND FOREARM BLOOD FLOW

J Wilkie, R Shephard, J Davis, M Luetkemeier

Purpose: This study was designed to test whether participants who swim experience post-exercise hypotension in a manner similar to cycling. Methods: Six collegiate swimmers, 3 male and 3 female, participated in 3 conditions: swimming, biking, and sitting (control). Swimming and cycling were performed for 30-minutes at 70% of maximal heart rate reserve. Blood pressures, heart rates, and forearm blood flows were measured before each condition and for 2 hours during a recovery period. Results: Immediately following swimming and cycling, heart rate, blood pressure, and blood flow were elevated from rest. Both exercise conditions demonstrated a trend of decreased systolic blood pressure throughout the recovery period after 30-minutes compared to the sitting condition. Heart rates dropped during the recovery period after swimming and cycling but were higher than during the sitting condition. Peak blood flow reading occurred immediately after swimming compared to cycling, which occurred 20-min after exercise. Conclusion: Post-exercise hypotension was similar in swimming and cycling and may be attributed to changes in blood flow and heart rate.

Abstract #18

EFFECT OF HYPOXIA ON GRADED PRE-SYNCOPAL LOWER BODY NEGATIVE PRESSURE TOLERANCE

AR Wolford, EA Saylor, LR Longbucco, MJ Luetkemeier, and JE Davis, Alma College. Alma, MI 48801

PURPOSE: This study was designed to examine the effects of acute hypoxia on a graded, pre-syncopal lower body negative pressure test (LBNP). METHODS: To test the hypothesis that hypoxia decreases lower body negative pressure tolerance during a pre-syncopal test, 6 subjects (5 male, 1 female; 20.8 ± .98 yrs) breathed a gas mixture containing either 21%, 17%, or 13% oxygen on three different test dates. Once arterial oxygen saturations were stable, negative pressure was applied. Pressure started at -20 mmHg and decreased -10 mmHg every three minutes thereafter until pre-syncopal symptoms appeared. Heart rate, oxygen saturation, blood pressure, and perceived rate of exertion measurements were taken every three minutes during the test. RESULTS: Although changes in arterial oxygen saturations were significant between gas mixtures ($p <.05$), lower body negative pressure tolerances did not decrease significantly ($p >.05$). Furthermore, although there was a statistical increase in heart rate within groups with increasing levels of LBNP ($p <.05$), there were no

differences between gas mixtures. Lastly, blood pressure changes within and between groups were not significant at any level (p >.05). CONCLUSION: Hypoxia clearly decreases oxygen saturation. However, it appears as if this does not result in a concomitant decrement in LBNP tolerance.

Abstract #19

STUDENT PERCEPTIONS OF FAMILY INTEREST AND PARTICIPATION IN PHYSICAL ACTIVITY

LM Mudd, PW Bauer, JM Pivarnik, FACSM. Departments of Kinesiology, Epidemiology, and Physical Medicine & Rehabilitation, Michigan State University, East Lansing, MI.

The Michigan Action for Healthy Kids program aims to improve nutrition in youth, increase their physical activity (PA), and educate teachers, students and parents about nutrition, PA, and health. Family attitudes and beliefs about PA are important to the success of this process. PURPOSE: To evaluate the relationship between students' perceptions of family interest in PA and minutes of reported PA both before and after a school-based intervention. METHODS: Surveys were completed at two high schools (grades 9-12) in early Fall (1131 students; 48.2% male) and late Spring (1013 students; 47.6% male). Students reported total minutes of moderate and/or vigorous PA performed on the previous day. Perception of family interest in PA was coded as "Very", "Somewhat", or "Not Very". Difference in amounts of PA between family interest level was examined at pre- and post-intervention time points. RESULTS: Total PA minutes averaged (95%CI) 77 (73-80) and 70 (66-73) min for boys, and 59 (56-63) and 59 (56-62) min for girls in Fall and Spring, respectively. Prevalence values for perceived family PA interest were ~31% (Very), ~51% (Somewhat), and ~18% (Not Very). Total PA was highest for students who reported family interest as "Very" in both pre- and post surveys. When averaged over both time periods, minutes of PA associated with family interest levels of "Very", "Somewhat" and "Not Very" were 84 (80-88), 70 (66-73), and 67 (60-74) for boys, and 69 (65-74), 58 (55-61), and 45 (39-51) for girls, respectively. CONCLUSION: Perceived family interest in PA was associated with significantly more PA; highest levels occurred in students who felt their families were "Very" interested. However, the school-based intervention did not appear to alter the students' participation in PA or their perception of family interest in PA over the course of the school year.
Supported by the United Dairy Industry of Michigan and the USDA.

Session 5: TUTORIAL

10:30 a.m.– 12:00 *Room 1253 Health Professions Building*

Authorship and Publication Issues: Are There Rules or Just Opinions?

James M Pivarnik, Ph.D. – Michigan State University, Lansing, MI

To the rising graduate student, or new faculty member, research publications are expected and a way of life. That's what "we academicians" do. Some papers are single-authored; others seem to include more authors than subjects. Who makes the rules about authorship? Who should be included, and why? Who should not be included, and why not? Are these decisions made with strict guidelines, or is the process more haphazard than not? While these questions may seem trivial, and even trite, they are important, and form the backbone of our scholarly activities. This session is designed to shine a bit of light on this somewhat mysterious topic, offer opinions, and even raise a few eyebrows. Please come see and hear for yourself, and by all means, bring your opinions with you.

Session 6: TUTORIAL

11:00 a.m. – 12:00 *Room 1255 Health Professions Building*

Exercise Performance and Training at High Altitude
John Davis, Ph.D. – Alma College, Alma, MI

Decrements in exercise performance are apparent when acutely exposed to moderate and high altitudes. Paradoxically, long-term exposure to altitude can provide adaptations that improve performance both at altitude and upon return to sea level. The first part of this presentation will provide a historical perspective of human performance at altitude. It will also include a review of the physiological adaptations to acute and chronic altitude exposure. Next, recent research on exercise performance at altitude and the advantages of training at altitude when returning to sea level to compete will be presented and discussed. Finally, new areas of research will be proposed. At the conclusion of this session, participants will have a better understanding of the physiological adaptations to high altitude exposure, the effects of altitude on exercise performance, and the advantages of training at altitude for competition at sea level.

Session 7: CLINICAL CASE PRESENTATIONS

1:30 – 2:30 p.m. *Room 1253 Health Professions Building*

Each presenter will be allowed 20 minutes for case presentation, including questions and discussion. The format for each case includes: Presentation of history and physical findings, questions from the panel regarding history and physical findings, questions from the audience regarding history and physical findings, differential diagnosis, tests and results, comments from the panel and questions from the audience.

7a
Elbow injury- Gymnastics

Alysia Green
Michigan State University Sports Medicine Fellowship East Lansing, MI
Email:alysiagreen@yahoo.com
(Sponsor: Jeffrey Kovan D.O.)

HISTORY: A 15 year old high school gymnast who developed left elbow pain when she started her summer training program. She denies any specific injury but describes a gradual onset of left elbow pain posteriorly. She has no specific new skills that she is learning, however it could be related to the return to gymnastics activity overall since she had been resting due to a back injury. She used ice, heat and NSAIDs to help relieve her pain. She did not use any type of bracing or

taping. She has not done any home exercise program for her elbow. She denies any numbness, tingling, or radiation to her arm. She states she has the most pain with performing pushups, backhand springs, round-offs and vaulting. She denies any swelling, no clicking, popping, snapping or locking. She had no pain with her activities of daily living.

PHYSICAL EXAMINATION: She is tender to palpation of the left elbow at the olecranon, with mild swelling. There is no discoloration. The bursa seems slightly inflamed over the olecranon. There is some tenderness to palpation at the olecranon attachments. No tenderness to palpation of the medial or lateral epicondyles or proximal radial head. There was full active and passive range of motion without pain bilaterally at the elbow and wrists. Negative valgus and varus stress tests. She has pain with resisted pronation and supination of the forearm with strength 5/5 bilaterally. She has 4/5 strength with pain in the left elbow with elbow extension. No pain with elbow flexion or wrist extension.

DIFFERENTIAL DIAGNOSIS:

1) Olecranon fracuture
2) Supracondylar fracuture of the distal humerus
3) Fracture of the radial head

TESTS AND RESULTS:
Elbow anterior-posterior, lateral and oblique radiographs:

- a discontinuity related to the posterior aspect of the olecranon which appears corticated. This is present partially within a concavity on the posterior aspect of the olecranon and appears to represent a longstanding change.

Repeat Elbow anterior-posterior, lateral and oblique radiographs (2 months following initial radiographs)

- presence of a separate bony fragment within a defect in the proximal end of the olecranon increased in fragmentation from the prior study

Computed tomography of upper extremity

- mixed sclerotic and lytic focus in the posterior olecranon fossa suggesting avascular necrosis

FINAL/WORKING DIAGNOSIS:
Olecranon osteochondritis dissecans

TREATMENT AND OUTCOMES:
1) Surgical intervention with open debridement, drilling and bone grafting to olecranon osteochondritis dissecans
2) Sling was used for one week post-operative
3) Range of motion and strengthening exercises started 3 weeks post injury

7b

Knee Injury in a Cheerleader

Pramod Mallipaddi MD
MSU- Kalamazoo Center for Medical Studies
Kalamazoo, Michigan

HISTORY: A 16-year-old female cheerleader injured her knee when she was doing a back walk over during a practice session a week ago. She heard a loud pop and the knee gave out. Her knee swelled immediately. She felt as though her knee cap went out of place. She has had a

previous patellar dislocation by her report. She had similar accident in December 2005. It was resolved on bracing the knee up. She tried the brace again, but it did not help. She never required reduction in the hospital. No discoloration is noted around the knee. Patient has pain of 5/10. She was able to bear weight on left knee. She does not hear any crackling sound. She has no other medical problems. No family history of any musculoskeletal disorders.

PHYSICAL: Vital signs were normal. Left knee: Appears swollen. Muscle strength appears to be decreased. There is tenderness on the medial aspect of the patella. Fluctuant swelling present, but no ballotement or crepitus. Lachman's test is negative. Medial and lateral collateral ligaments are normal on stress testing. No joint line tenderness. Negative cartilage exam. Apprehension test is positive. Right knee: Appears normal with no deformity or swelling. Muscle strength is normal. No tenderness. No fluctuation. No crepitus. Lachman's test is negative. Medial and lateral collateral ligaments are normal. No joint line tenderness. Negative cartilage exam. Apprehension test negative. No excessive patellar excursions.

DIFFERENTIAL DIAGNOSIS:
Patella fracture
Patella subluxation
Patella dislocation
Prepatella bursitis
Patellofemoral pain syndrome
Osteochondritis Dessicans
Symptomatic medial plica

TEST:
Xray left knee 4 views shows: Patient had a bilateral bipartite patella, which was an incidental finding. Possible patella on lateral view. Sunrise view shows calcification medial to patella which may represent avulsion of medial patella retinaculum.

FINAL WORKING DIAGNOSIS:
Patellar dislocation is the diagnosis.
MANAGEMENT:
She was placed in a knee splint. Motrin was prescribed. The athlete was recommended for medial plication for dislocated patella. At this time she is schedule for the procedure.

7c

Left Posterior Leg Pain – Waterskiing

James VanHuysen D.O. Sports Medicine Fellow, Michigan State University
Email: vanhuys1@msu.edu

History: 46 year old male presents to the clinic complaining of left posterior hamstring pain and difficulty ambulating. The patient was attempting "get up from the water on one ski" one week prior, when he felt a, "pop and tearing in his left buttock" as he was exiting the water and immediately fell. The patient had to be helped into the boat. The patient was seen in the local Emergency Department where he had x-rays done and was sent home with pain medication and crutches.

Physical Examination: Ambulating with crutches, left leg externally rotated. Tender to palpation at medial aspect of ischial tuberosity. With patient prone, visible defect appreciated at superior-medial aspect of thigh, with overlying patch of ecchymosis (approximately 6"x 6"). Strength 0/5 in hip extension while prone. Pt is able to flex his knee with some discomfort in the posterior thigh. Sensation grossly intact in bilateral lower extremities. Dorsalis pedis pulses are 2/4 bilaterally. No palpable calf tenderness bilaterally.

Differential Diagnosis:

1. Avulsion of hamstring tendon off ischial tuberosity.
2. Mid-substance hamstring tear.
3. Hip fracture
4. Hip dislocation

Tests and Results:

Plain films (taken in ER): Left hip A-P and Lateral, Pelvis A-P: no fracture or dislocation noted.

MRI of Left upper leg and pelvis: Near complete hamstring avulsion with redundancy and hematoma extending to mid-thigh. Some semimembranonsus fibers appear intact. No osseus fragment noted in the ischial tuberosity is noted.

Final Diagnosis: Left proximal hamstring avulsion.

Treatment and Outcomes:

1. Surgical repair of hamstring, ten days post-injury: tenodesis to ischial tuberosity.
2. Post-operative long leg knee immobilizer with knee flexion locked at 30 degrees.
3. Non-weight bearing with crutches for 4-6 weeks.
4. Patient is currently scheduled to be seen next week for his first post-operative visit.

Session 8: WORKSHOP

1:30 – 3:00 p.m. *Room 1255 Health Professions Building*

Pilates: An Introduction To How You Can Incorporate It Into Your Exercise Routine
Laura Harriman, Certified Pilates Instructor, Saginaw, MI

Pilates is one of the fastest growing exercise therapies. It is one of many movement therapies (yoga, Alexander technique) that have been shown to be medically beneficial for various disorders and medical conditions. This workshop will introduce concepts and give suggestions for incorporation of Pilates into exercise routines.

Session 9: TUTORIAL

2:30 – 3:00 p.m. *Room 1257 Health Professions Building*

Diabetes and Cardiac Rehabilitation: A Pharmacological Update
Shel Levine, M.S., M.S.A, C.E.S – Eastern Michigan University, Ypsilanti, MI

The purpose of this tutorial is to provide cardiac rehabilitation (CR) professionals an understanding of the medications used to manage type 1 and 2 diabetes mellitus. Obviously, CR professionals understand exercise and its effect in patients with cardiovascular disease. However, a majority of patients in CR programs also have diabetes mellitus. While most CR professionals may recognize names of diabetes medications, they may not understand the implications these have on an exercising CR patient, and on their lifestyle outside of CR. Therefore, the following objectives will be met: 1) review classification of Type 1 and type 2 diabetes mellitus, and impaired fasting glucose and impaired glucose tolerance; 2) discuss current pharmacologic interventions; 3) discuss how these medications affect exercise and the implications towards CR; and 4) discuss some of the emerging therapies that could potentially revolutionize diabetes management.

Session 10: TOWN HALL MEETING

2:30 – 3:00 p.m. *Room 1259 Health Professions Building*

ACSM Blueprint for the Future
Steven Keteyian, Ph.D., FACSM (Vice President of ACSM) and Carmen J. Babcock (President of MWACSM)

This session will provide a broad overview of the current draft (June 2006) of the Strategic Priorities and Performance Plan (2006 – 2011) for ACSM. The Strategic Plan (2005 – 2010) for the Midwest chapter will be addressed. Ample time for an open dialog for questions, input, feed back and discussion relative to the scope and direction of the plans will be allowed.

Session 11: STUDENT FAIR

2:00 – 5:00 p.m. *Atrium, Health Professions Building*
Various universities and clinical sites will have displays where students can ask questions and receive information relating to graduate programs and internship possibilities.

Session 12: SPECIAL LECTURE

5:00 – 6:00 p.m. *Bovee University Center Auditorium*

"Hydration and Heat Illness Issues: Guidelines for the Practitioner".

William Prentice, Ph.D., P.T., A.T.C. – University of North Carolina, Chapel Hill

Sponsored by Gatorade Sports Science Institute

About the speaker: William E. Prentice is recognized as an author, educator, and clinician. He received both BS and MS degrees from the University of Delaware, a PhD degree in sports medicine and applied physiology from the University of Virginia and BSPT degree in physical therapy from the University of North Carolina. He is a Professor in the Department of Exercise and Sport Science, and Coordinator of the Sports Medicine Program at the University of North Carolina at Chapel Hill. He is the author of nine textbooks, more than 70 journal articles and abstracts, and has made more than 150 lectures and presentations. Prentice served as the Athletic Trainer for the Women's Soccer Program at the University of North Carolina since1980 and during that period the team has won 17 NCAA and one AIAW National Championships. Prentice has been the recipient of numerous awards from the National Athletic Trainers Association. In June 2004, Dr. Prentice was inducted into the National Athletic Trainers Association's Hall of Fame.

About the session: This presentation will provide the latest guidelines and recommendations for any practitioner who may be concerned with making certain that athletes or any individual who is physically active is well hydrated. Prevention, recognition and appropriate management techniques for heat-related illnesses will also be presented. Sponsored by the Gatorade Sports Science Institute.

Session 13: PRESIDENTIAL LECTURE

8:00 – 9:00 a.m. *Room 1255, Health Professions Building*

"Finding Success in Failure: Exercise in the Prognosis and Treatment of Heart Failure"

Steven Keteyian, Ph.D., FACSM – Henry Ford Hospital, Detroit, MI

About the speaker: **Steven Keteyian** is Program Director of Preventive Cardiology, Division of Cardiovascular Medicine, Department of Internal Medicine, Henry Ford Hospital, Detroit, Michigan, 1981 - Present. Also, Dr. Keteyian is Director of the Henry Ford Clinical Exercise Physiology Core Laboratory, a research unit that supports multi-center randomized clinical trials investigating new medical, surgical and device therapies for patients with cardiovascular disease.

Dr. Keteyian earned his B.S. from Grand Valley State College (1978) and his Ph.D. from Wayne State University (1989). Dr. Keteyian is also an Associate Professor, Department of Physiology, School of Medicine, Wayne State University, Detroit, Michigan and a Clinical Professor, Exercise Science Program, Oakland University, Rochester, Michigan.

Dr. Keteyian is active in many professional organizations including the American College of Sports Medicine (Fellow, currently serves as Vice President). He is the author of more than 50 articles which have appeared in peer-reviewed scientific journals. He is co-author of three classroom textbooks; Associate Editor for *Medicine and Science in Sports and Exercise;* and a member of several editorial boards.

About the session: Attendees will understand the epidemiology, pathophysiology, clinical characteristics and evidence-based treatment regimens used for patients with chronic heart failure due to systolic and diastolic dysfunction. In addition, they will appreciate the ability of various parameters measured during cardiopulmonary exercise testing in determining prognosis in these patients. Finally, the mechanisms by which aerobic exercise training and resistance training reverse exercise intolerance and possibly clinical outcomes will be reviewed, including a review of the application and development of an exercise prescription. A very brief summary of the HF-ACTION trial will be provided.

Session 14: SYMPOSIUM

9:00 – 10:00 a.m. *Room 1255, Health Professions Building*

"Assessing Cardiovascular Risk Factors in Children. A University Approach: From Science to Community Service.

Paul Visich, Bill Saltarelli, Emma Fletcher, Marlene Wenta – Central Michigan University, Mt. Pleasant, MI

Cardiovascular disease (CVD) continues to be a major cause of death in the United States and particularly in the state of Michigan. Heart disease and stroke account for $403.1 billion dollars per year in the United States. The state of Michigan's death rate for heart disease is 234.2/100,000, which is substantially higher than the national rate of 222.7 (MDCH 2004; CDC 2004). CVD is associated with risk factors such as physical inactivity, hypertension, abnormal blood lipids, diabetes, smoking, family history, and obesity. While CVD is typically thought of as an adult disease it has been shown that these risk factors have been linked to blood vessel changes in children, which are manifested as fatty streaks on the inner lining of coronary blood. Based on this data, the Cardiovascular Health Intervention Program (CHIP) was developed at CMU for the purpose of- 1) educating Mid-Michigan children on CVD, 2) engaging CMU health/fitness majors to participate in this service learning project and 3) provide data for graduate and senior honor projects. The CHIP participants will share information pertaining to the rationale, methods, graduate projects, and potential future directions.

Session 15: FREE COMMUNICATION SESSION #2

9:00 -10:00 *Room 1259 Health Professions Building*

15a

PHYSICAL ACTIVITY AND SCREEN TIME BEHAVIORS AMONG HIGH SCHOOL STUDENTS: A LATENT CLASS ANALYSIS

JJ Ode, JM Pivarnik FACSM, K Bohnert, J Anthony, Michigan State University, East Lansing, MI

PURPOSE: Screen time behaviors such as television viewing or video game/computer use among high school students may replace time spent participating in physical activity. The purpose of this project was to extend the 2003 Youth Risk Behavior Survey data, which treated physical activity and screen time behaviors individually, by conducting a latent class analysis (LCA) and identifying subgroups of high school students with similar physical activity and screen time patterns. METHODS: 11,834 (6006 females, 5828 males) high school students answered questions on five physical activity behaviors (participation in vigorous physical activity, moderate physical activity, strength training, physical education, and sports) and two screen time behaviors (watching more than 2 hours of television, and playing videogames or using the computer more than 2 hours per day). Latent class analysis is a statistical technique used to discover the most natural and useful clusters (i.e. classes) of individuals based on multivariate categorical data. In the present study, LCA was used to identify classes of high school students with similar patterns of physical activity and screen time behaviors. LCA estimated 1) the prevalence of belonging to a particular latent class based on similar physical activity and screen time behaviors and 2) the probability of answering 'yes' to each physical activity and screen time behavior question within each class. RESULTS: LCA revealed four latent classes (class 1-4) for both high school boys

and girls. For girls, the probability of participating in physical activity behaviors was low in class 1 and moderate in class 2. However, both class 1 and 2 had moderate probabilities of participating in screen time behaviors. Both class 3 and 4 had high probabilities participating in physical activity behaviors. However, the probability of screen time behaviors was low in class 3 and high in class 4. For boys, both class 1 and class 2 had low probabilities of participating in physical activity behaviors. However, the probability of screen time behaviors was low in class 1 and high in class 2. Both class 3 and 4 had high probabilities of physical activity behaviors. However, screen time behaviors were low in class 3 and high in class 4. CONCLUSION: Participation in active behaviors is evenly distributed between the high, moderate, and low active classes. However, participation in screen time behaviors such as television and video game/computer use may not play a major factor in the membership of these classes.

15b

SPORT PARTICIPATION AND PHYSICAL ACTIVITY IN ADOLESCENT FEMALES OVER A FOUR-YEAR PERIOD

KA Pfeiffer, FACSM, M Dowda, RK Dishman, FACSM, KL McIver, JR Sirard, DS Ward, FACSM, and RR Pate, FACSM. University of South Carolina, Columbia, SC

PURPOSE: To determine the odds of engaging in future moderate-to-vigorous physical activity (MVPA) and vigorous physical activity (VPA) in adolescent female sport participants. A secondary purpose was to compare activity levels of three groups of girls, those who played sports at three time points, those who dropped out, and those who did not participate in sports. METHODS: Adolescent girls (N=429, 56% African American, age=13.6±0.6 years at baseline) were evaluated in 8th, 9th, and 12th grades. Demographic variables, sport participation, and physical activity (PA) data were collected using surveys. Height and weight were measured according to standard procedures. Crude and adjusted odds ratios (OR) were calculated to determine the association between sport participation and future PA behavior. All data are reported as adjusted OR with non-sport participants as the referent group for each grade. PA was also compared for three sport participation groups (non-participants, drop-outs, or three-year participants) using ANOVA. RESULTS: For MVPA, 9th grade participants were more likely to be active in 12th grade [OR = 1.74 (1.13, 2.67)], and 8th and 9th grade participants more likely to be active in 12th grade than non-participants [OR = 1.54 (1.01, 2.35)]. For VPA, sport participants had higher odds of being active at all future time points. Also, three-year participants were significantly more vigorously active than non-participants and drop-outs at all three time points ($p<0.01$). CONCLUSION: Adolescent girls who participate in sports in 8th, 9th, and 12th grades are more likely to be vigorously active in 12th grade. These findings are novel in providing evidence that sport participation contributes to overall vigorous physical activity during late adolescence, when overall physical activity is known to decline precipitously.

Supported by NHLBI 1RO1 HL57775.

15c

CHANGES IN BODY COMPOSITION AND DIET IN 1ST SEMESTER COLLEGE FEMALES

B Vystejnova [1], M Hughes [2], M Schmidt [3], and R Claytor [1, 3], [1] Department of Physical Education, Health and Sport Studies, Miami University, Oxford, OH; [2] Dept of Mathematics and Statistics, Miami University, Oxford, OH, [3] The Cincinnati Center for Nutritional Research and Analysis, Cincinnati Children's Hospital Medical Center, Cincinnati, OH

PURPOSE: This study was conducted to determine whether the college environment results in changes in body composition and diet in 1st year female students. METHODS: 40 freshmen college women (18.1± .335 yrs) (mean ± SD), 95% were Caucasians, were recruited for participation in the study that involved assessment of body composition (body weight, body fat,

NOTES

PROGRAM

2005

Annual Meeting

Hosted by
the Human Performance Laboratory
at Ball State University

of Research
in Exercise Physiology

September 29–October 1, 2005
Horizon Convention Center
Muncie, Indiana

BALL STATE
UNIVERSITY

The Ball Brothers Foundation is pleased to sponsor

Dr. Mark Hargreaves' Keynote Address "Integrative Physiology in a Molecular Age: Exercise Leads the Way" and Symposium: Physical Inactivity and Its Health-Related Consequences and Clinical Session 2

as part of the 2005 Midwest Regional Chapter of the American College of Sports Medicine Annual Meeting

The Ball Brothers Foundation also recognizes the scientific contributions made by the Ball State University Human Performance Laboratory and congratulates the Human Performance Laboratory on their 40th anniversary.

www.ballfdn.org

The Ball Brothers Foundation, in partnership with other philanthropic entities across Indiana, facilitates programs dedicated to support giving, volunteering, and seeking ways to enrich and broaden the quality of life.

The Human Performance Laboratory

40 Years of Research in Exercise Physiology

1965–2005

The Human Performance Laboratory (HPL) at Ball State University had its genesis in 1965 when Leroy "Bud" Getchell sought approval to start a lab that would study the science of exercise and fitness. He wanted to answer the question: "What's going on in the body and how might we make it go better?" This was a new trend at the time that was destined to affect the curricula of many physical education departments across the country.

Getchell started with a simple bicycle ergometer in a storage room in the back of the old Ball State gymnasium. Since Getchell was also coach of the basketball team, the university hired David Costill to run the lab, and that began 40 years of wide-ranging research into exercise, fitness, and human performance.

With the help of a grant to study the effects of exercise on patients with heart disease and a grant to study gastric emptying of athletic drinks, which were just coming on the market, Costill quickly turned the original lab into a busy and productive place. He was soon profiling the physiological attributes of runners, including the world-record holder in the marathon at that time, and began a series of biochemical studies into the storage and use of glycogen in the muscle. An early publication that would go through three updates over the next several years was *What Research Tells the Coach about Distance Running*.

In 1973, the lab moved into a new building behind the Field Sports Building and was expanded in 1974 and again in 1980. This building is affectionately referred to as the

The Human Performance Lab Today and Tomorrow

Today, the Human Performance Laboratory is conducting research on topics ranging from sports performance to clinical aspects of aging and space flight. As the lab moves forward, researchers will continue to mesh the fundamental tools of exercise physiology with more recent innovations in cellular physiology and molecular biology.

Current studies cover basic aspects of exercise physiology, from whole body response to aspects of cell physiology and molecular biology, and include the following projects:

- Aging and Exercise—The lab continues to conduct research, sponsored by the National Institutes of Health, on resistance training involving young and old adults.
- Space Flight and Bed Rest—In research funded by NASA, the HPL conducts whole and single muscle fiber contractile function measurements on crew members of the International Space Station before and after long-duration stays.
- Bear Research—As part of the lab's continuing interest in understanding cellular aspects of muscle atrophy with aging and unloading, the HPL has turned to Mother Nature and is conducting research on black bears before and after hibernation.
- Pediatric Exercise—Research involving children and exercise has been ongoing since 1990. Currently, the lab is studying the physiological adaptations resulting from pre-season and in-season training of high school cross country runners, and the effect of exercise on children with attention deficit/hyperactivity disorder.
- Adult Fitness/Cardiac Rehabilitation—Research evaluating the effects of exercise training as an adjunct therapy for various diseases including heart disease, diabetes, pulmonary disease, and cancer is being conducted, as well as studies on the accuracy and reliability of newer technologies used to assess physical activity.

"old" lab, and it soon filled up with a number of students from all over the country and abroad. Research continued in a number of areas, including glycogen usage, sports nutrition, product testing, and diabetes.

By 1971, Getchell was also busy with the beginnings of the Adult Physical Fitness Program (APFP), which would test and train classes of men and women, providing more than 30 years of data for students to use for research and study. He also published his first book, *Physical Fitness: A Way of Life*.

In 1980, Ball State began offering a master's degree in exercise science and a doctorate in human bioenergetics. By the mid-1980s, the APFP side of the lab, under the direction of Mitch Whaley and Leonard Kaminsky, was working with Ball Memorial Hospital and offering training in cardiac and pulmonary rehabilitation.

In 1990, the lab moved into a new building, often called the "new" lab. Much of the same research continued, but new areas also were being examined, including research on pediatric exercise, muscle function with microgravity, single muscle fiber physiology, molecular biochemistry, and muscle adaptation in aging.

After Costill retired in 1998, William Kraemer headed the lab for three years. Scott Trappe became acting director in 2001 and assumed permanent leadership in 2002. Over the years, the lab and its staff have been very productive, publishing several hundred articles of research and working with 37 doctoral students and numerous master's degree students.

1965

Human Performance Laboratory at a Glance

The Beginning
1965–1973
- Bud Getchell starts the lab in a closet of the gymnasium at Ball State University.
- David Costill becomes director of the lab.
- Research focuses on exercise and heart disease.
- The lab conducts studies on long-distance runners and muscle glycogen.

The "Old" Lab
1973–1990
- The lab moves into its own building at Ball State.
- Getchell initiates the Adult Physical Fitness Program, which expands to include a relationship with Ball Memorial Hospital for cardiac rehabilitation.
- Research continues on topics such as muscle glycogen, metabolism, sports nutrition, product testing, and diabetes.
- The HPL building is expanded, doubling the size of the structure.
- Ball State offers a master's degree in exercise science and a doctorate in human bioenergetics.

The "New" Lab
1990–2005
- The lab moves again, this time to new facilities in the Health and Physical Education complex at Ball State.
- Research topics include adaptations to exercise in children and adolescents, aging and exercise and muscle adaptation in older adults, and molecular biology research to address fundamental aspects of muscle adaptation with sports and clinical physiology issues.
- Studies on muscle function with space flight and microgravity begin. The HPL designs and tests exercise countermeasures to prevent muscle loss.
- Other research includes single muscle fiber physiology applied to study muscle mechanics with swimming, running, aging, bed rest, and space flight.
- Applied research is being conducted on the clinical benefits of exercise training and physical activity assessment.

Welcome

Welcome!

As president of the Midwest Regional Chapter of the American College of Sports Medicine, and on behalf of the Board of Directors and Program Committee, I would like to welcome you to the 2005 annual meeting.

This year's meeting is a truly exciting event, as it not only includes many clinical and research sessions by members of MWACSM, but it also features presentations by noted authorities in the fields of exercise science and medicine. The location of this year's meeting is the Horizon Convention Center in downtown Muncie, and the meeting is being hosted by the Human Performance Laboratory at Ball State University. The meeting is in honor of the 40th anniversary of the laboratory, which has made such a significant impact on the field of exercise science through its research and graduates.

Please take advantage of the many opportunities to hear cutting-edge research in both the clinical and basic sciences as well as network with colleagues and make new acquaintances.

Some of the many highlights of the meeting include the keynote address on Thursday evening, September 29, entitled "Integrative physiology in a molecular age: Exercise leads the way" to be given by Mark Hargreaves, Ph.D., of the University of Melbourne and the Town Hall meeting on Friday, September 30, with David Costill, Ph.D., and Leroy "Bud" Getchell, Ph.D., as well as many symposia with invited speakers who have made outstanding contributions to our field.

Again, welcome to the meeting, and I hope you enjoy the many scientific and clinical sessions and social events that have been arranged for this occasion.

Sincerely,

Elaine Filusch Betts, Ph.D., P.T., FACSM
President, MWACSM

Dear Guests,

On behalf of Ball State University, it is my pleasure to welcome you to the Midwest Regional Chapter of the American College of Sports Medicine Annual Meeting. Ball State and the Human Performance Laboratory are proud to be your hosts for this meeting.

We are delighted to be celebrating the 40th anniversary of the Human Performance Laboratory. What began with two maverick faculty members in physical education working out of a closet in an old gymnasium has become a leading center of research and innovation in the field of exercise physiology. This laboratory is poised to continue making meaningful contributions to the field through its research on human performance and clinical investigations in areas such as aging, space flight, children, obesity, and diabetes.

I hope you enjoy the meeting and look forward to seeing you Thursday evening at the keynote address.

Sincerely,

Jo Ann M. Gora
President
Ball State University

Dear Midwest ACSM Annual Meeting Attendees:

On behalf of the American College of Sports Medicine, it is my pleasure to welcome you to the annual meeting of the Midwest Chapter of ACSM, hosted this year by Ball State University in commemoration of the 40th anniversary of "The Lab."

In addition to meeting old friends and meeting the founders of the Lab, Dr. Bud Getchell and Dr. Dave Costill, you will be presented with an excellent program, with the keynote lecture delivered by Dr. Mark Hargreaves, professor of physiology from the University of Melbourne, Australia.

I am in attendance and look forward to meeting you.

Kind regards,

Carl Foster, Ph.D., FACSM
2005–2006 President, American College of Sports Medicine

Dear Midwest ACSM Annual Meeting Attendees:

It is our pleasure to welcome you to the Midwest Regional Chapter of the American College of Sports Medicine Annual Meeting. We have an exceptional program of national and international experts who should definitely challenge your thinking on a variety of relevant topics. We hope you have a wonderful experience and take the opportunity to visit with the exhibitors and network with many of your professional colleagues. We particularly look forward to seeing you at the Town Hall Meeting on Friday at 5:00 p.m. where Drs. David Costill and Bud Getchell will share their remembrances of the development of the Ball State University Human Performance Laboratory as we celebrate its 40th anniversary.

We look forward to meeting you, and we hope you enjoy the presentations and fellowship.

Sincerely,

MWACSM Planning Committee
George Branam, M.D.
Bruce Craig, Ph.D.
Matt Harber, Ph.D.
Lenny Kaminsky, Ph.D.
Tony Mahon, Ph.D.
Patrick Schneider, Ph.D.
Scott Trappe, Ph.D.
Todd Trappe, Ph.D.
Mitch Whaley, Ph.D.

Special Events

Thursday, September 29

7:30–10:30 p.m.
Welcome and Opening Remarks
Keynote Address
Exhibit Hall 1

Welcome Reception
Exhibit Hall 2

Mitchell Whaley, chair of the School of Physical Education, Sport, and Exercise Science at Ball State University; Jo Ann M. Gora, president of Ball State University; and Scott Trappe, John and Janice Fisher Professor of Exercise Science and director of the Human Performance Laboratory at Ball State University, will officially welcome you to the 2005 Midwest Regional Chapter of the American College of Sports Medicine Annual Meeting.

At 8:00 p.m., keynote speaker Mark Hargreaves, Ph.D., of the University of Melbourne, Australia, will discuss "Integrative physiology in a molecular age: Exercise leads the way." After the keynote address, join your colleagues in Exhibit Hall 2 for a welcome reception. Refreshments will be provided and a cash bar will be available.

Friday, September 30

5:00–6:30 p.m.
Town Hall Meeting
Sponsored by the Ball State University Human Performance Laboratory Class of 1982
Interurban Hall

Special guests David L. Costill, Ph.D., FACSM, former director of the Ball State University Human Performance Laboratory (1966-1998), and Leroy "Bud" Getchell, Ph.D., FACSM, founder of the Ball State University Adult Fitness Program (1965-1984), will discuss the origins and development of the Ball State University Human Performance Laboratory. Be sure to attend this lively discussion of 40 years of exercise physiology history.

Costill

Getchell

Saturday, October 1

12:00–3:00 p.m.
Open House at Human Performance Laboratory
Ball State University
School of Physical Education, Sport, and Exercise Science

Visit the Human Performance Laboratory at Ball State University to see where 40 years of exercise physiology history began. Tours will be available. Ample parking is available on campus across the street from the lab.

Keynote Speaker

Mark Hargreaves, Ph.D.

Mark Hargreaves is a professor of physiology at the University of Melbourne in Australia. He completed his bachelor's and doctoral degrees in physiology at the University of Melbourne and earned a master's degree in exercise physiology from Ball State University where he studied at the Human Performance Laboratory. His pre- and post-doctoral training includes two visits to the University of Copenhagen.

In his keynote address, Dr. Hargreaves will discuss "Integrative physiology in a molecular age: Exercise leads the way."

Dr. Hargreaves' research interests include physiology and metabolic responses to exercise, with an emphasis on the regulation of skeletal muscle carbohydrate metabolism. His current projects investigate the molecular regulation of the glucose transport protein GLUT4 in human skeletal muscle following acute and chronic exercise.

Dr. Hargreaves is a fellow of the American College of Sports Medicine, a board member of the Football Victoria Development and Victorian Institute of Sport, and a member of the AFL Research Board. He serves on the editorial boards of the *Journal of Applied Physiology, Medicine and Science in Sports and Exercise, Exercise and Sport Sciences Reviews, Clinical and Experimental Pharmacology and Physiology,* and the *Journal of Sport Sciences.*

Community Connection

Ball Memorial Hospital Medical Education
At 12 p.m. on Friday, September 30, Dr. Paul Thompson will present the lecture "How to Become a Lipid Expert or What to Do if the Statins Fail?" at the Ball Memorial Hospital Auditorium. The lecture is sponsored by the Ball Memorial Hospital Foundation and Pathologists Associated, Inc. Conference attendees are encouraged to attend this free program.

Kirkpatrick Lecture Series
After the Town Hall meeting on Friday, September 30, conference attendees are invited to attend the Kirkpatrick Lecture Series presentation "Energy In and Energy Out? Weight Loss Strategies for Older Adults," given by William J. Evans, Ph.D. Dr. Evans is director of the Nutrition, Metabolism, and Exercise Laboratory in the Donald Reynolds Department of Geriatrics at the University of Arkansas for Medical Sciences and a research scientist in the Geriatric Rehabilitation, Education, and Clinical Center in the VA Medical Center.

The lecture begins at 7 p.m., with a reception immediately following the presentation, and will be held at the Cornerstone Center for the Arts, 520 E. Main Street, Muncie, located just a few blocks from the Horizon Convention Center. The lecture is free and open to the public. The Kirkpatrick Lecture Series is organized by the Fisher Institute for Wellness and Gerontology at Ball State University.

Conference Information

Registration

Thursday, September 29	**12:00–8:00 p.m.**
Friday, September 30	**7:00 a.m.–12:00 p.m.**
Saturday, October 1	**8:00–8:30 a.m.**

Exhibits

Thursday, September 29	**6:30–7:30 p.m.**
	9:00–10:30 p.m.
Friday, September 30	**8:00 a.m.–5:00 p.m.**
Saturday, October 1	**8:00 a.m.–12:00 p.m.**

For a list of exhibitors, see pages 13–14

Continuing Education Credits Available

The American College of Sports Medicine's (ACSM) Professional Education Committee has granted a total of 15.0 hours of Continuing Medical Education and ACSM Continuing Education Credit for the 2005 Annual Meeting of the Midwest Chapter of ACSM taking place in Muncie, Indiana, on September 29-October 1. Meeting attendees can apply for this credit at the meeting registration area.

Planning Committee Members

George Branam, Ball Memorial Hospital
Bruce Craig, Ball State University
Matthew Harber, Ball State University
Leonard Kaminsky, Ball State University
Tony Mahon, Ball State University
Patrick Schneider, Ball State University
Scott Trappe, Ball State University
Todd Trappe, Ball State University
Mitchell Whaley, Ball State University

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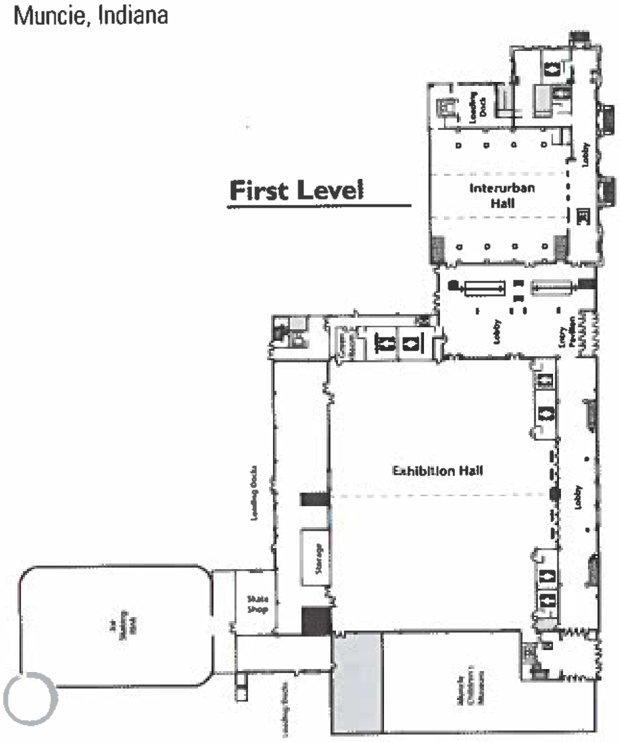
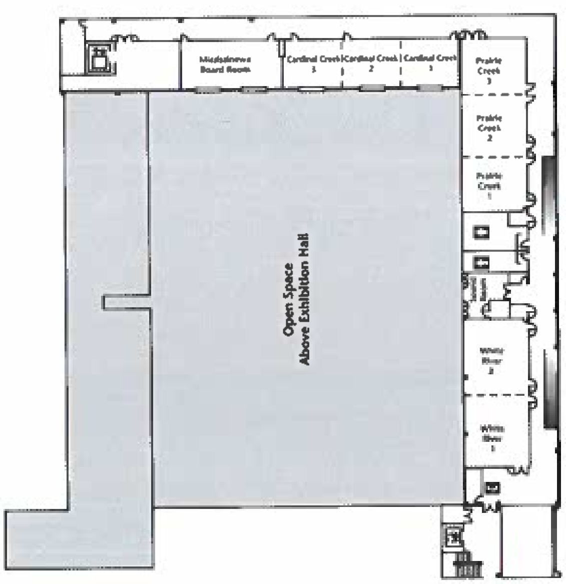
Getting Around

HORIZON
CONVENTION CENTER
765-288-8860
401 South High Street
Muncie, Indiana

First Level



Second Level

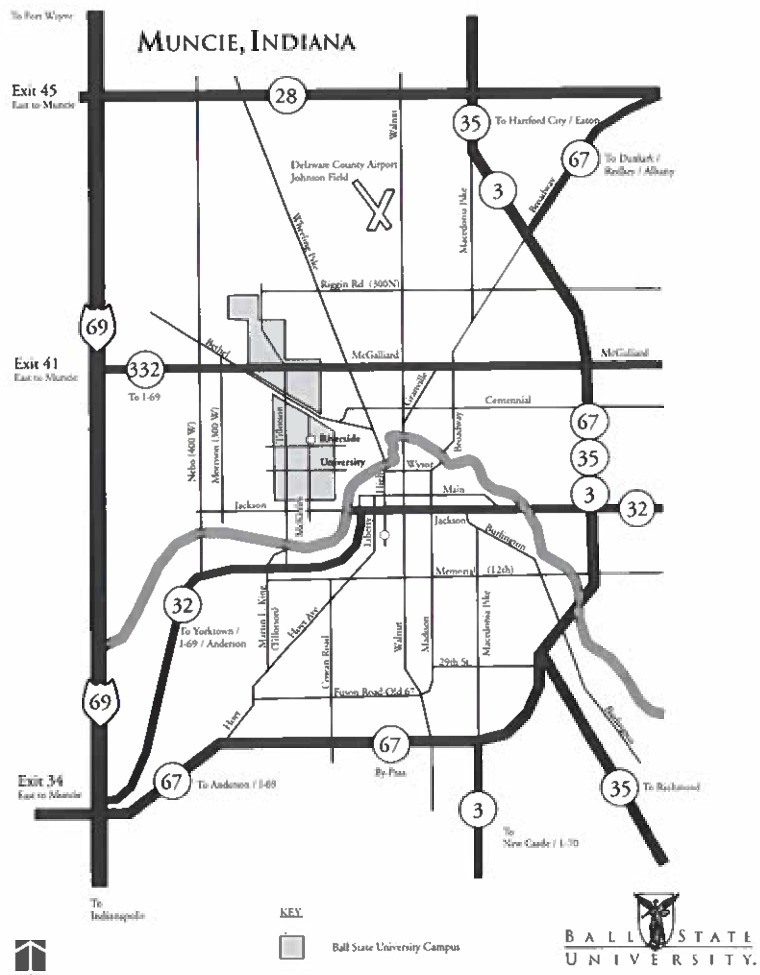


Directions

From the Horizon Convention Center to the Ball State University Human Performance Laboratory

From the Convention Center, go east on Adams Street, turn right (south) onto Franklin Street, and then turn left (west) onto Main Street (IN 32). Turn right (west) onto Jackson Street and then turn right (north) onto McKinley Avenue. Go straight (north) on McKinley for several blocks. The Human Performance Laboratory is just north of the intersection of McKinley Avenue and Neely (Petty) Avenue.

Parking in university parking lots is free on weekends. Parking meters are enforced on weekends. There is a parking lot just north of the intersection of McKinley Avenue and Neely (Petty) Avenue, directly across the street from the Human Performance Laboratory. Additional parking is available across the street and just east of the Health and Physical Activities Building and Irving Gymnasium; from McKinley, turn right (east) onto Neely Avenue.



Conference Schedule

Thursday
September 29, 2005

1:30–2:10 p.m.
Clinical Session 1
Sponsored by the Ball Memorial Hospital Foundation
These presentations will be repeated at 2:20–3:00 p.m.

Selecting the appropriate physical activity assessment tool
Prairie Creek Room
Patrick L. Schneider, Ph.D.
Ball State University
School of Physical Education, Sport, and Exercise Science
Adult Fitness/Cardiac Rehabilitation Program

Impact of exercise on lipid-induced insulin resistance
White River 1
Matt Harber, Ph.D., FACSM
Ball State University
School of Physical Education, Sport, and Exercise Science
Human Performance Laboratory

Is growth hormone really a fountain of youth?
White River 2
Laurie Wideman, Ph.D.
University of North Carolina-Greensboro
Department of Exercise and Sport Science

New concepts in cardiology: Detection and treatment of sub-clinical atherosclerosis
Cardinal Creek Room
Michael S. Wegner, Ph.D., FACSM
Kos Pharmaceuticals, Inc.
Medical Affairs

2:10–2:20 p.m.
Break

2:20–3:00 p.m.
Clinical Session 1
Presentations Repeated
See 1:30–2:10 p.m. for presentation titles

3:00–3:30 p.m.
Break

3:30–4:10 p.m.
Clinical Session 2
Sponsored by the Ball Brothers Foundation
These presentations will be repeated at 4:20–5:00 p.m.

Obstructive sleep apnea: New approaches to evaluation and treatment
White River 2
Anthony S. Kaleth, Ph.D.
Indiana University-Purdue University, Indianapolis
Department of Physical Education

Vascular benefits associated with habitual exercise in aging women
Cardinal Creek Room
Kerrie L. Moreau, Ph.D.
University of Colorado at Denver and Health Sciences Center
Department of Medicine, Division of Geriatric Medicine, Center for Women's Health Research

Coronary artery disease: Influence of genetics and exercise on thrombus formation
Prairie Creek Room
Paul Nagelkirk, Ph.D.
Ball State University
School of Physical Education, Sport, and Exercise Science
Exercise Science Division

Whole-body vibration: An alternative exercise modality
White River 1
Eric Dugan, Ph.D.
Ball State University
School of Physical Education, Sport, and Exercise Science
Biomechanics Laboratory

4:10–4:20 p.m.
Break

4:20–5:00 p.m.
Clinical Session 2
Presentations Repeated
See 3:30–4:10 p.m. for presentation titles

5:00–7:30 p.m.
Free Time
Take this time to enjoy dinner in one of Muncie's unique downtown eateries, check into your hotel, or catch up with old friends.

7:30–8:00 p.m.
Welcome and Opening Remarks
Exhibit Hall 1
Mitchell Whaley, Chair, School of Physical Education, Sport, and Exercise Science, Ball State University

Jo Ann M. Gora, President, Ball State University

Scott Trappe, John and Janice Fisher Professor of Exercise Science and Director of the Human Performance Laboratory, Ball State University

8:00–9:00 p.m.
Keynote Address
Sponsored by the Ball Brothers Foundation
Exhibit Hall 1

Integrative physiology in a molecular age: Exercise leads the way
Mark Hargreaves, Ph.D.
The University of Melbourne, Australia
Department of Physiology

9:00–10:30 p.m.
Welcome Reception
Exhibit Hall 2

Friday
September 30, 2005

8:30–11:30 a.m.
Concurrent Symposia

Symposium:
Exercise in Space: Lessons for Missions to Other Planets
Exhibit Hall 2
Sponsored by NASA

8:30–8:35 a.m.
Introduction by symposium chair

8:35–9:05 a.m.
Modified in vivo musculotendinous, neural, and endocrine function in absence of weight-bearing
Reggie Edgerton, Ph.D., FACSM
University of California, Los Angeles
Department or Physiological Science

9:05–9:35 A.M.
The effects of long-duration spaceflight on skeletal muscle structure and function in man
Robert Fitts, Ph.D., FACSM
Marquette University
Department of Biological Sciences

9:35–10:00 A.M.
Break—refreshments and exhibit area open

10:00–10:30 A.M.
Resistance exercise as a countermeasure to muscle dysfunction during simulated spaceflight
Per Tesch, Ph.D., FACSM
Karolinska Institutet, Stockholm, Sweden
Department of Physiology and Pharmacology

10:30–11:00 A.M.
Perspectives from 6-months aboard the International Space Station
Mike Finke
NASA Astronaut
Johnson Space Center, Houston, TX

11:00–11:30 A.M.
Questions and Answers, Panel Discussion

SYMPOSIUM:
Physical Inactivity and Its Health-Related Consequences
Exhibit Hall 1
SPONSORED BY THE BALL BROTHERS FOUNDATION

8:30–8:35 A.M.
Introduction by symposium chair

8:35–9:05 A.M.
Obesity: The precursor to cardiovascular and metabolic disorders
Paul M. Ribisl, Ph.D., FACSM
Wake Forest University
Department of Health and Exercise Science

9:05–9:35 A.M.
Physical activity and diabetes: New perspectives on human performance
Bret H. Goodpaster, Ph.D.
University of Pittsburgh
Division of Endocrinology and Metabolism

9:35–10:00 A.M.
Break—refreshments and exhibit area open

10:00–10:30 A.M.
From Heberden to Hambrecht: Exercise as a therapeutic tool for exertional ischemia
Carl Foster, Ph.D., FACSM
University of Wisconsin-LaCrosse
Department of Exercise and Sport Science

10:30–11:00 A.M.
The evolution of physical inactivity: From hunter-gatherers to modern technology-based societies
David R. Bassett, Ph.D., FACSM
University of Tennessee
Department of Exercise, Sport, and Leisure Studies

11:00–11:30 P.M.
Questions and Answers, Panel Discussion

12:00–1:30 P.M.
LUNCHEON
Exhibit Hall 1

1:30–2:30 P.M.
TUTORIAL SESSION
What's New in the 7th Edition of the ACSM Guidelines for Exercise Testing and Prescription?
Interurban Hall
SPONSORED BY LIPPINCOTT, WILLIAMS, AND WILKINS

The Editorial Team for the 7th edition:

Mitchell H. Whaley, Ph.D., FACSM, Senior Editor
Ball State University
School of Physical Education, Sport, and Exercise Science

Peter H. Brubaker, Ph.D., FACSM,
Associate Editor, Clinical
Wake Forest University
Department of Health and Exercise Science

Robert M. Otto, Ph.D., FACSM,
Associate Editor, Fitness
Adelphi University
Health Studies, Physical Education, and Human Performance Sciences

2:30–3:30 P.M.
TUTORIAL SESSION
Statin myopathy—exercise physiology and clinical medicine
Interurban Hall
SPONSORED BY KOS PHARMACEUTICALS

Paul D. Thompson, M.D., FACSM
Hartford Hospital
Preventative Cardiology

3:30–5:00 P.M.
POSTER PRESENTATIONS—Authors Present
Prairie Creek Room
SPONSORED BY PATHOLOGISTS ASSOCIATED, INC.

5:00–6:30 P.M.
TOWN HALL MEETING
Interurban Hall
SPONSORED BY THE BALL STATE UNIVERSITY HUMAN PERFORMANCE LABORATORY CLASS OF 1982

Origins and Development of the Ball State University Human Performance Laboratory
David L. Costill, Ph.D., FACSM
Director, Ball State University Human Performance Laboratory from 1966–1998

Leroy "Bud" Getchell, Ph.D., FACSM
Founder of the Ball State University Adult Fitness Program (1965–1984)

SATURDAY
OCTOBER 1, 2005

8:30–11:30 A.M.
CONCURRENT SYMPOSIA

SYMPOSIUM:
Carbohydrate Metabolism
Exhibit Hall 1
SPONSORED BY GATORADE

8:30–8:35 A.M.
Introduction by symposium chair

8:35–9:05 A.M.
Exercise and skeletal muscle CHO metabolism: From Milky Way to MEF2
Mark Hargreaves, Ph.D., FACSM
The University of Melbourne
Department of Physiology

9:05–9:35 A.M.
Mitochondrial bioenergetics and CHO metabolism: Pressing on the gas and stepping on the brakes
Darrell Neufer, Ph.D.
John B. Pierce Laboratory, New Haven, CT

9:35–10:00 A.M.
Break—refreshments and exhibit area open

10:00–10:30 A.M.
At the cross-roads of signal transduction—regulation of exercise—and insulin-mediated glucose transport in skeletal muscle
Juleen Zierath, Ph.D.
Karolinska Institutet, Stockholm, Sweden
Department of Surgical Sciences

10:30–11:00 A.M.
From molecules to medals: Skeletal muscle responses to training and implications for performance
John Hawley, Ph.D.
RMIT University, Australia
School of Medical Sciences

11:00–11:30 A.M.
Questions and Answers, Panel Discussion

SYMPOSIUM:
Aging, Physical Activity, and Diet
Exhibit Hall 2
SPONORED BY THE KIMBERLEY SCHULZE MEMORIAL FUND

8:30–8:35 A.M.
Introduction by symposium chair

8:35–9:05 A.M.
Molecular events leading to sarcopenia
Roger Fielding, Ph.D.
Tufts University
Nutrition, Exercise Physiology, and Sarcopenia Laboratory

9:05–9:35 A.M.
Lifestyle and aging: Is there an aging effect on insulin action?
John Kirwan, Ph.D., FACSM
Case Western Reserve University
Schwartz Center for Nutrition and Metabolism

9:35–10:00 A.M.
Break—refreshments and exhibit area open

10:00–10:30 A.M.
Exercise and aging: Cellular and whole body effects on insulin action
Joe Houmard, Ph.D., FACSM
East Carolina University
Human Performance Laboratory

10:30–11:00 A.M.
Macronutrient Intake and exercise: Effects of insulin action
Bill Evans, Ph.D., FACSM
University of Arkansas for Medical Sciences
Nutrition, Metabolism, and Exercise Laboratory

11:00–11:30 A.M.
Questions and Answers, Panel Discussion

12:00–3:00 P.M.
OPEN HOUSE AT HUMAN PERFORMANCE LABORATORY
Ball State University
School of Physical Education, Sport, and Exercise Science
See page 10 for driving directions.

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Clinical Session Summaries

Clinical Session 1
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Selecting the appropriate physical activity assessment tool

Clinical Session 1: Thursday, September 29, at 1:30–2:10 p.m. and 2:20–3:00 p.m.
Prairie Creek Room

Patrick Schneider, Ph.D., FACSM
Ball State University
School of Physical Education, Sport, and Exercise Science
Adult Fitness/Cardiac Rehabilitation Program

Despite the abundance of literature supporting the health benefits associated with leading a physically active lifestyle, our ability to accurately measure this multifaceted behavior remains a challenge. The Ball State University Adult Physical Fitness Program (APFP) has traditionally used a questionnaire approach to assess baseline physical activity levels of incoming participants. Questionnaires are among the most common subjective methods of assessing physical activity. Although questionnaires are easy to administer, inexpensive, and noninvasive, they are limited in their ability to assess ubiquitous, unstructured activity.

Over the past year, the APFP has implemented the use of motion sensors to better quantify baseline activity levels. Motion sensors, a more objective measure of physical activity, focus principally on quantifying body motion. Pedometers and accelerometers are the two most prominent forms of motion sensors.

Accelerometers are relatively expensive devices designed to quantify vertical acceleration and deceleration of the body and their output is often in the form of activity counts accessible by downloading the data. Although accelerometers can estimate with a fair degree of accuracy the amount of energy expended in various ambulatory activities, these devices are limited in their ability to estimate energy expenditure during activities such as lifting or carrying objects, walking up a grade, or climbing stairs.

Pedometers are also limited in their ability to estimate energy expenditure during non-ambulatory activity. However, these devices are much less expensive than accelerometers, provide the user with constant feedback on steps taken and are effective in measuring steps and calculating distance. The focus of this session will be to highlight the strengths and limitations of these physical activity assessment tools and to aid users in selecting the most appropriate tool for their specific objective.

Impact of exercise on lipid-induced insulin resistance

Clinical Session 1: Thursday, September 29, at 1:30–2:10 p.m. and 2:20–3:00 p.m.
White River 1

Matt Harber, Ph.D., FACSM
Ball State University
School of Physical Education, Sport, and Exercise Science
Human Performance Laboratory

Forty years ago, Sir Randle and colleagues observed a competitive relationship between fatty acids and glucose for substrate oxidation in various types of muscle. The global conclusion from their experiments was that excessive fatty acid availability impairs glucose metabolism, inducing insulin resistance.

Since these classic experiments, the detrimental impact of an abundance of lipid availability on insulin sensitivity has been more thoroughly characterized. Chronic exposure to an over-abundance of fat availability leads to an excessive accumulation of lipids in the peripheral tissues, resulting in a state of lipotoxicity. The alarming prevalence of obesity and related metabolic disorders, such as insulin resistance, in our society highlight the importance of understanding the relationship between fatty acids and glucose metabolism and emphasize the need to develop therapeutic tools to combat insulin resistance.

Exercise is one such tool that has received considerable attention for its positive influence on glucose metabolism. Research contributions from the Human Performance Laboratory and others have characterized the influence of exercise on substrate metabolism over the past several decades, determining that exercise alters both the utilization and storage of intracellular lipids and carbohydrates. A primary focus of our research is to evaluate the influence of exercise on lipid-induced impairments of glucose metabolism.
Recent data suggest that acute exercise can counteract the negative influence of excessive fat availability on insulin sensitivity. These data are encouraging, as they provide evidence that exercise may be an effective tool for the preservation of insulin sensitivity in populations vulnerable to a high lipid availability, such as with obesity. Future research is warranted to characterize the impact of exercise on reversing the insulin resistance that has become a hallmark of obesity. Furthermore, understanding the mechanisms by which exercise can counteract the negative influence of excessive fat availability can contribute to the development of therapeutic programs for the treatment and prevention of obesity.

Is growth hormone really a fountain of youth?

Clinical Session 1: Thursday, September 29, at 1:30–2:10 p.m. and 2:20–3:00 p.m.
White River 2

Laurie Wideman, Ph.D.
University of North Carolina-Greesboro
Department of Exercise and Sport Science

While the primary function of growth hormone (GH) is the promotion of linear growth during puberty, it also plays an important role in metabolism. GH deficiency has been associated with a number of diseases such as obesity, bone loss, muscle atrophy, and increased risk of cardiovascular disease. Interestingly, similar health problems are observed with aging and this similarity has been associated with the natural decline in GH secretion that occurs with aging. Truthfully, we do not fully understand all the cellular nuances of the episodic, pulsatile pattern of GH release or how aging alters this relationship.

Numerous studies, including several from our lab, have shown that acute aerobic or resistance exercise of sufficient duration and intensity is a potent physiological stimulus of GH release. While the exercise-induced increase in GH release is both robust and consistent, the importance of this response at the cellular level is still unclear. The exercise-induced GH response is blunted in older individuals, and as observed in aging studies completed in the mid-1990s by the Ball State University Human Performance Laboratory (HPL), the

rehabilitation for those individuals who cannot perform traditional exercises. WBV utilizes the body's own stretch reflex through a mechanical, oscillating stimulus to elicit rapid muscle contractions. This creates a hyper-gravity environment resulting in increased loads on the musculoskeletal system. The muscle contractions elicited by WBV are similar to those elicited by a traditional resistance training program, leading to an increase in strength and power.
Over the last year, researchers from the Biomechanics Laboratory, Adapted Physical Activity Program, and the Human Performance Laboratory (HPL) at Ball State University have come together to investigate the effects of WBV on several biomechanical and physiological variables. We are using a variety of subject populations to investigate how WBV affects maximal strength, bone density, postural control, and hormone levels. This work will provide a framework of information that may lead to a better understanding of how vibration therapy/exercise could be implemented to enhance the function and fitness of those with reduced mobility whether caused by disease or injury. This research initiative builds upon the HPL's 40-year history of studying exercise-training responses and conducting applied research in the area of physical activity.

Symposium: Exercise in space: Lessons for missions to other planets

Friday, September 30, at 8:30–11:30 a.m.
Exhibit Hall 2
SPONSORED BY NASA

National Aeronautics and Space Administration

Dr. Edgerton will discuss in vivo changes in musculotendinous strain properties in humans as a result of unilateral limb suspension, using magnetic resonance imaging to detect the dynamics and spatial heterogeneity in strain properties during isometric plantar flexor actions. He will also discuss how the neural control of locomotion is modified as a result of absence of weight-bearing imposed by spaceflight in the rhesus monkey and how the growth hormone response to exercise is depressed following absence of weight-bearing. Data demonstrating the efficacy of extremely brief periods of muscle stimulation in preventing muscle atrophy in the rat will be presented. This talk will highlight and provide evidence that weight-bearing activity is central to maintaining normal physiology.

Dr. Fitts' presentation concentrates on alterations in human skeletal muscle following long duration spaceflight. Data generated from nine crew members who spent six months aboard the International Space Station describe changes in muscle fiber size and types, structure, protein content, and single fiber physiology, determined in mm. soleus and gastrocnemius tissue samples, as well as data on global muscle size and in vivo muscle function. The influence of concurrent exercise and the importance of diet will also be discussed. This talk emphasizes the findings of a relationship between changes in skeletal muscle fiber structure and muscle function.

Dr. Tesch will review research, using human spaceflight analogs, supporting resistance training as an effective in-flight countermeasure to muscle dysfunction. It focuses on describing the efficacy of different exercise paradigms and protocols to offset changes in skeletal muscle function and size and motor control, single fiber physiology, and phenotype and potential differences in response across muscle groups with different general function or phenotype. Though this presentation will overview convincing data to support that brief episodes of resistance exercise could serve as an effective aid in maintaining muscle size, function, and integrity, it will also emphasize that any in-flight countermeasures employed must extend beyond preserving muscle size only.

Astronaut Mike Finke will provide insights from his recent 187-day stay aboard the International Space Station. He will overview the challenges of long-term exposure to microgravity and the types of exercise programs he performed while on orbit.

This presentation will be a unique opportunity for scientists and participants from the NASA space program to comment, evaluate, and discuss the most current and up-to-date exercise programs and devices for maintaining the health of crew-members while on orbit. There will also be an opportunity to discuss how the benefits of what we are learning from exercise prescription in space translate to exercise programs for special populations on earth.

Symposium: Physical inactivity and its health-related consequences

Friday, September 30, at 8:30–11:30 a.m.
Exhibit Hall 1
SPONSORED BY THE BALL BROTHERS FOUNDATION

More than 40 years ago, the cardiovascular disease epidemic reached its peak but started to decline in the mid 1960s, primarily due to changes in our lifestyle and improvements in medical care. Coronary death rates are down 50 percent since its peak but have slowed in recent years. There is currently an epidemic of obesity where over 60 percent of all Americans are either overweight or obese, and rates of Type 2 diabetes are rising in adults and children at alarming levels. Our poor nutritional habits and sedentary behaviors combine to create a toxic environment for all Americans. The consequence is an emerging condition called "Diabesity," which foreshadows a return of the cardiovascular epidemic we faced in the last century. The focus of this symposium is to briefly review the past, to examine the current status of our nation's health, and to apply the lessons from exercise science to project solutions for the future. Four exercise scientists with a connection to the Human Performance Laboratory at Ball State University will give their perspectives.

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- Paul M. Ribisl, Wake Forest University, *"Obesity: The precursor to cardiovascular and metabolic disorders"*
- [illegible]t H. Goodpaster, University of Pittsburgh, *"Physical activity and diabetes: New perspectives on human performance"*
- Carl Foster, University of Wisconsin-La Crosse, *"From Heberden to Hambrecht: Exercise as a therapeutic tool for exertional ischemia"*
- David R. Bassett, University of Tennessee, *"The evolution of physical inactivity: From hunter-gatherers to modern technology-based societies"*

Symposium: Carbohydrate metabolism

Saturday, October 1, at 8:30-11:30 a.m.
Exhibit Hall 1

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The 1980s was a period when much of the Human Performance Laboratory's research effort was directed at questions pertaining to carbohydrate metabolism during exercise. Four alumni from those years will present on aspects of carbohydrate metabolism.

[illegible]. Hargreaves will provide an overview of skeletal muscle glycogenolysis and glucose uptake during exercise, highlighting information gained from studies utilizing carbohydrate ingestion. More recent work on the molecular regulation of skeletal muscle GLUT4 expression by exercise will also be presented.

Darrell Neufer will summarize effects of exercise on the skeletal muscle expression of genes involved in the regulation on mitochondrial metabolism and then present new findings on mitochondrial bioenergetics and carbohydrate metabolism.

Juleen Zierath has been at the forefront of research elucidating the signaling cascades within skeletal muscle that are involved in the metabolic and mitogenic responses to insulin and exercise in health and disease. She will summarize these signaling events, with a particular focus on skeletal muscle glucose uptake.

Finally, John Hawley will outline the key skeletal muscle responses to training and how they translate into enhanced exercise performance.

This session will provide a 21st century perspective on various issues related to carbohydrate [illegible]bolism that have been investigated over the last 40 years.

Symposium: Aging, physical activity, and diet

Saturday, October 1, at 8:30–11:30 a.m.
Exhibit Hall 2

SPONSORED BY THE KIMBERLEY SCHULZE MEMORIAL FUND

At the turn of the 20th century, life expectancy at birth was 47 years on average, and only 3 percent of the population lived past the age of 65. In the United States today, average life expectancy has increased to 75, and more than 80 percent of all deaths occur after age 65. At the present time, people over the age of 85 constitute the fastest growing segment of the population.

Unfortunately, a large segment of the oldest old suffers from a variety of ailments that diminish quality of life and cost society an increasingly large amount of resources. These ailments develop over a lifetime and include memory disorders, arthritis, and the consequences of diabetes (renal failure, cataract formation, peripheral vascular disease, and atherosclerosis). Sarcopenia, age-related loss of muscle mass, contributes to weakness, decreased energy needs, and late-life disability. In addition, obesity and type 2 diabetes are increasingly common in old age. In fact, body fat content is the most powerful predictor of late-life disability among elderly people.

The objectives of the proposed symposium will be to outline the etiology of sarcopenia and type 2 diabetes. Molecular and lifestyle causes of sarcopenia will be discussed. In addition, the effects of age and physical activity on the development of diabetes as well as the effects of exercise on cellular and molecular event in subjects with impaired glucose tolerance and diabetes will be discussed. Finally, the influence of macronutrient intake and exercise in older, overweight men and women will be discussed.

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Tutorial Session Summaries

What's New in the 7th Edition of the *ACSM Guidelines for Exercise Testing and Prescription*?

Friday, September 30, at 2:30–3:30 p.m.
Interurban Hall
SPONSORED BY LIPPINCOTT, WILLIAMS, AND WILKINS

The Editorial Team for the 7th edition:

Mitchell H. Whaley, Ph.D., FACSM, Senior Editor
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School of Physical Education, Sport, and Exercise Science

Peter H. Brubaker, Ph.D., FACSM,
Associate Editor, Clinical
Wake Forest University
Department of Health and Exercise Science

Robert M. Otto, Ph.D., FACSM,
Associate Editor, Fitness
Adelphi University
Health Studies, Physical Education, & Human Performance Sciences

The purpose of this session is to update users of the *ACSM Guidelines for Exercise Testing and Prescription* on the recent publication of the 7th edition of the text. The three-member editorial team for the *Guidelines* will briefly review the process used in revising the text, highlight significant changes from the 6th edition, and answer questions from attendees on book content.

The 7th edition of *Guidelines* represents the next step in the evolution of this text first published by the ACSM in 1975. What started in 1975 as 48 pages of guidelines related to 1) admitting adults into exercise programs, 2) exercise testing administration, and 3) exercise prescription has evolved into one of the single most widely read and referenced texts of its kind in the world (more than 100,000 copies of the sixth edition have been sold since 2000).

The primary purpose of this revised edition was to present the most current information in a usable form for health and fitness and clinical exercise professionals, physicians, nurses, physician assistants, physical and occupational therapists, dietitians, and health care administrators. This edition continues the emphasis on preventing illness through physical activity and exercise in apparently healthy persons and those with risk factors, as well as on prescribing exercise for patients with diagnosed chronic disease. Furthermore, these guidelines acknowledge the efficacy of self-guided physical activity regimens for many individuals, and recommendations for such are provided at various places throughout the book.

Substantive revisions were made to most chapters to incorporate 1) the most current public health and clinical information, 2) state-of-the-art, research-based recommendations, and 3) accumulated feedback from readers of previous editions of the *Guidelines*. The quantitative data thresholds, clinical laboratory cutoffs considered "abnormal," and the normative fitness data found throughout the 5th and 6th editions have been carried forward and updated where appropriate. An exercise intensity classification table and a new table of health benefits from the dose-response perspective are included in Chapter 1. A new pre-participation screening algorithm is found in Chapter 2, along with a modification of the ACSM/AHA questionnaire. The algorithm and questionnaire, along with revised program supervision guidelines found in Chapter 7, are more closely linked to the ACSM risk stratification categories found in Chapter 2. Furthermore, the 7th edition contains guidelines for a broader spectrum of chronic conditions than found in previous editions, with the intent of presenting a lean set of essential testing and programming modifications while outsourcing additional supporting material to the *ACSM Resource Manual*.

Beyond the revisions to the content of this text, the flow of information throughout the book was intended to provide a continuum of coverage of topics that would serve both health and fitness and clinical exercise professionals. To this end, please note that Section I contains important information on benefits/risks of exercise (Chapter 1) and pre-participation screening (Chapter 2) that are relevant to all who deliver, or supervise those who deliver, exercise testing and prescription services.

Section II begins with pre-exercise assessment and interpretation guidelines (Chapter 3) that should be read by both the health and fitness and clinical professional. The health and fitness professional may then proceed to Chapter 4 for additional assessment and interpretation guidelines more relevant to the low-risk adult, whereas the clinician may want to proceed to Chapters 5 and 6 which provide clinical exercise testing and interpretation guidelines more applicable to the moderate to high-risk adult.

Section III, "Exercise Prescription," begins with a foundational chapter (Chapter 7) that is relevant for all who design and supervise exercise programs, regardless of the target population. A condensed version of the behavioral concepts presented in the 6th edition (Chapter 12) has been incorporated into the fundamental prescription principles in Chapter 7. The reader should have a solid grasp of the principles presented in Chapter 7 before progressing to Chapters 8–10.

Statin myopathy—exercise physiology and clinical medicine

Friday, September 30 at 2:30–3:30 p.m.
Interurban Room
SPONSORED BY KOS PHARMACEUTICALS

Paul D. Thompson, M.D., FACSM
Hartford Hospital
Preventative Cardiology

Hydroxy-methyl-glutaryl (HMG) CoA reductase inhibitors, or statins, are the most effective medications for reducing low-density lipoprotein cholesterol (LDL-C) and cardiac events in both coronary artery disease (CAD) patients[1,2] and in previously healthy subjects[3,4] Statins are so effective that they are presently the most prescribed drugs in the United States and the world. Statins are extremely well tolerated by the majority of patients, but they can produce a variety of muscle problems ranging from myalgia, cramps, and weakness to rhabdomyolysis with acute renal failure and even death. Almost no studies have examined the effect of these drugs on muscle strength and aerobic exercise performance.

How statins produce myalgia and muscle injury is unknown. One theory maintains that blocking cholesterol synthesis reduces the cholesterol content of skeletal muscle cell membranes, making

the membranes unstable, but muscle injury has not correlated with cholesterol reduction,[1] however, and blocking cholesterol synthesis with other drugs does not produce myotoxicity, making cholesterol reduction alone an unlikely culprit.[5] Alternatively, statins reduce the production of isoprenoids, such as ubiquinone. Ubiquinone, or Co-enzyme Q10, participates in electron transport during oxidative phosphorylation in mammalian mitochondria. Serum ubiquinone levels decrease with statin treatment probably because ubiquinone is transported in the LDL particle.[6] Intramuscular ubiquinone levels do not decrease, however, making ubiquinone an unlikely cause of the myopathy,[7] although no studies to our knowledge have examined ubiquinone levels in statin myopathic patients.[8]

More recent work suggests that a reduction in small guanosine triphosphate proteins (GTP) may contribute to the myotoxicity of statins. Farnesyl and geranylgerranyl pyrophosphate production is reduced by statin therapy. Farnesyl pyrophosphate (FPP) is required for the activation of small GTP binding regulatory proteins. These GTP binding proteins such as Ras, Rac, and Rho promote cell maintenance and growth and attenuate apoptosis.[9-11] Apoptosis, or programmed cell death, is designed to assist in the remodeling and maintenance of tissue structure, but when inappropriately activated, apoptosis can produce pathological conditions. Statins produce a dose-dependent increase in apoptosis in vascular smooth muscle cells (VSMCs).[12] Apoptosis in skeletal muscle, produced by reduced levels of small GTP binding proteins, could produce the skeletal muscle myopathy.

We have documented that statins increase the muscle injury produced by exercise[13-15] suggesting that exercise may provide insight into the pathologic mechanisms. This presentation will review how exercise physiology has contributed to an examination of this important clinical problem and will detail recent gene expression studies performed in association with researchers at the University of Massachusetts, Washington Children's Medical Center, and Columbia University.

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Origins and Development of the Ball State University Human Performance Laboratory

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Poster Abstracts

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Abstract #1

The Effect of Strenuous Aerobic Exercise on Skeletal Muscle Myofibrillar Proteolysis In Humans

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Relatively little is known about the dynamics of the skeletal muscle protein pool following aerobic exercise. Myofibrillar protein synthesis has recently been shown to be substantially elevated for three days after a strenuous 60-minute bout of one-legged aerobic exercise (Miller et al. J. Physiol, 2005), and this increase was surprisingly equal to or greater than what has been shown numerous times following resistance exercise over the same time course. Because net protein accretion is the sum of protein synthesis and degradation, we sought to directly measure skeletal muscle myofibrillar proteolysis in five healthy young males in response to an identical strenuous 60-minute aerobic exercise bout and at the same time points [illegible] and 24 hr postexercise and 48 and 72 hr postexercise in a subset of subjects). We measured skeletal muscle myofibrillar proteolysis by monitoring the release of the natural tracer 3-methylhistidine (3MH) from the vastus lateralis muscle into the interstitial space via microdialysis. Skeletal muscle interstitial 3MH concentration was no different ($P > 0.05$) from rest (5.16 ± 0.38 nmol•ml-1) after 6 (5.37 ± 0.55 nmol•ml-1), 24 (5.40 ± 0.26 nmol•ml-1), 48 (5.50 ± 0.74 nmol•ml-1), or 72 hours (4.73 ± 0.28 nmol•ml-1). These results suggest that proteolysis of the myofibrillar fraction of skeletal muscle is relatively refractory to an intense aerobic exercise stimulus for up to three days, despite the large increase in synthesis of this muscle fraction following the same exercise stimulus. The apparent net myofibrillar protein accretion in the hours and days after exercise may occur in order to offset the large elevation in mixed muscle proteolysis that has been shown during similar bouts of intense one-legged aerobic exercise.

Supported by NIH grant RO1 AG20532 (TT) and the University of Auckland, New Zealand, Travel Grant (BM)

Abstract #2

Eccentric Exercise Increases Alpha7 Beta1 Integrin Expression in Skeletal Muscle and Protects against Muscle Damage

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[illegible]ha7 beta1 integrin is a transmembrane glycoprotein in skeletal muscle that links laminin in the extracellular matrix with the cytoskeleton. Expression of this integrin is increased in patients with Duchenne muscular dystrophy and in mdx mice. We recently showed that trangenic expression of alpha7 integrin prevents the activation of signaling molecules associated with injury and protects against eccentric execise-induced muscle damage. This suggests that endogenous integrin also provides a protective mechanism against injury. PURPOSE: To determine if exercise-induced muscle injury increases the expression of alpha7 mRNA and protein in wildtype mice. METHODS: Five-week female mice either remained at rest or completed a single downhill running exercise (20 degree decline, 17 m/min, 30 min). Three (3hPEx), 24 (24hPEx), or 1 week post-exercise, gastrocnemius-soleus complexes were solubilized in Trizol to extract mRNA and in SDS buffer to extract protein. Semi-quantitative PCR was completed using primers for total alpha7 integrin and primers to distinguish the alpha7A and alpha7B isoforms. RESULTS: Downhill running resulted in a 6-fold increase in total alpha7 mRNA at 3hPEx ($P<0.05$), with levels returning to baseline 24hPEx. Both alpha7A and B isoforms were similarly increased 3hPEx. Alpha7B protein was increased 80% 24hPEx ($P<0.05$). CONCLUSIONS: Alpha7 beta1 integrin mRNA and protein are increased in response to a single bout of eccentric exercise and provide a mechanism that limits skeletal muscle injury.

Supported by the NIH and MDA

Abstract #3

The Influence of Training Status on ERK and Akt Phosphorylation in Human Skeletal Muscle

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PURPOSE: To examine the influence of training status on ERK and Akt phosphorylation (PHOS) at rest and following an acute bout of resistance exercise (RE). METHODS: Twenty-one young men comprised a sedentary (SED n=7; 21±2 y, 79±16 kg, 42±5 ml•kg-1•min-1, 48±9 kg 1-RM), a resistance-trained (RT n=7; 22±2 y, 90±8 kg, 47±5 ml•kg-1•min-1, 76±6 kg 1-RM), and endurance-trained group (ET n=7; 25±3 y, 69±5 kg, 66±7 ml•kg-1•min-1, 49±6 kg 1-RM) that performed three sets of 10 repetitions of unilateral knee extension at 70% of 1-RM. Vastus lateralis muscle biopsies were taken before, immediately post (PT-0), and 10 min post (PT-10) RE. Muscle tissue was analyzed for ERK and Akt PHOS using the ELISA method. RESULTS: There were no differences among the groups in ERK or Akt PHOS prior to RE. With RE, ERK PHOS increased ($p<0.05$) 47% and 54% at PT-0 in SED and RE, respectively, with no change in ET. At PT-10, all three groups had an increase ($p<0.05$) in ERK PHOS (RT>SED>ET). Akt PHOS decreased ($p<0.05$) 42% and 37% at PT-0 in SED and ET, respectively. At PT-10, Akt PHOS recovered ($p<0.05$) to pre-RE levels in ET. Akt PHOS was unchanged at PT-0 and PT-10 in the RT group. CONCLUSION: These data indicate that training status influences the magnitude and time course of ERK and Akt phosphorylation in response to an acute bout of RE. With chronic exercise, the observed differences in intracellular signaling may influence skeletal muscle adaptation.

Abstract #4

Myogenic Gene Expression at Rest and Following Acute Resistance Exercise in Young and Old Women

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PURPOSE: To examine mRNA expression of myogenic differentiation factor (MyoD), muscle regulatory factor 4 (MRF4), myogenic factor 5 (Myf-5), Myogenin, Myostatin, myocyte enhancer factor 2 (MEF2), and pyruvate dehydrogenase kinase 4 (PDK4) at rest and in response to a single bout of resistance exercise (RE) in young and old women. METHODS: Eight young women (YW) (23±2 y, 67±5 kg) and six old women (OW) (85±1 y, 67±4 kg) performed three sets of 10 repetitions of bilateral knee extensions at 70% of 1-repetition maximum. Muscle biopsies were taken from the vastus lateralis pre and 4 hours post exercise. Using real-time RT PCR, mRNA from the muscle samples was amplified and normalized to GAPDH. RESULTS: At rest, OW expressed higher levels of MyoD, MRF4, Myf-5, Myogenin, Myostatin, and PDK4, compared to YW ($p<0.05$). In response to RE, the YW increased ($p<0.05$) MyoD (88%), MRF4 (64%), PDK4 (697%), and decreased ($p<0.05$) Myostatin (55%). There was a trend ($p=0.06$) for an increase in Myogenin (60%) in YW. With RE, the OW increased ($p<0.05$) MyoD (89%) and PDK4 (246%), and decreased ($p<0.05$) Myostatin (57%). CONCLUSION: OW expressed higher mRNA levels of selected genes at rest. The higher resting myogenic mRNA levels in OW may reflect a basal stress in attempt to preserve muscle mass. When challenged with RE, the OW do not appear to respond to the same degree as YW. This differential response to RE may have implications for muscular adaptations to an exercise stimulus.

Supported by NIH grant AG18409

Abstract #5

Down Regulation of PGC-1a mRNA Levels Induced by Lower Limb Suspension Is Counteracted by Resistance Exercise

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It is implicit resistance exercise, as performed on Earth and using weights, cannot be performed in space. Recently, a resistance exercise device that uses the inertia of rotating flywheels to provide resistance, and thus is gravity independent, has been shown effective to counteract muscle atrophy induced by unloading. The present study addressed whether chronic exercise using this device is capable of also activating metabolic and vascular regulatory systems during muscle unloading. Three groups of ten or eleven men and women each, performed five weeks of either unilateral lower limb suspension (UL), UL and concurrent resistance exercise 2-3

times/wk (ULRE) or resistance exercise (RE) only. Biopsies were obtained before and after these interventions from m. vastus lateralis, and muscle volume was assessed by means of MRI. UL induced an 8.8% decrease in muscle size whereas ULRE (7.7%) and RE (6.1%) promoted an increase in muscle size. At the mRNA level we showed that UL induced down regulation of the metabolic regulatory co-activator PGC-1a and that this effect was counteracted by resistance exercise. Thus, ULRE showed unchanged PGC-1a levels. The stimulatory effect of RE was further supported by an increase in PGC-1a mRNA levels following RE. Neither group showed changes in the mRNA levels of the potential up regulator of angiogenesis VEGF-A. Thus, the results of the current study suggest the central metabolic regulatory factor PGC-1a is down regulated by unilateral lower limb suspension. Such response is counteracted by resistance exercise. Hence, chronic resistance training using the novel exercise approach employed here not only prevents muscle loss but may attenuate or offset metabolic changes induced by unloading as well.

Supported by NIH grant AG18409

Abstract #6

Proteolytic mRNA Expression in Response to Acute Resistance Exercise in Human Single Skeletal Muscle Fibers

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PURPOSE: To characterize changes in mRNA expression of select proteolytic markers in human slow (myosin heavy chain I, MHC I)- and fast (MHC IIa)-twitch single skeletal muscle fibers following an acute bout of resistance exercise (RE). METHODS: Muscle biopsies were obtained from the vastus lateralis of eight young healthy sedentary males (23±2yr, 93±17kg, 183±6cm) before, and 4 and 24 hr after three sets of 10 repetitions of bilateral knee extensions at 65% of 1-repetition maximum. The mRNA level of eight select markers of muscle proteolysis [tumor necrosis factor (TNF)-alpha, calpains 1 and 2, muscle RING finger 1 (MuRF-1), atrogin-1, cysteine-dependent aspartate protease (caspase)-3, B-cell leukemia/lymphoma (Bcl)-2, and Bcl-2-associated X protein (Bax)] were quantified using real-time RT-PCR. RESULTS: Generally, MHC I fibers had higher (1.6- to 5.0-fold; $p < 0.05$) mRNA expression pre- and post-RE. One exception was a higher (1.6 to 3.9-fold; $p < 0.05$) Bax/Bcl-2 mRNA ratio in MHC IIa fibers pre- and post-RE. RE resulted in a 2.2- to 4.8-fold increase ($p < 0.05$) in MuRF-1 at 4 hr post-RE compared to pre-RE, and a 1.6-fold increase ($p < 0.05$) in atrogin-1 at 4 hr post-RE compared to 24 hr post-RE in both fiber types. Caspase-3 mRNA increased ($p < 0.05$) 1.4- and 1.8-fold at 4 and 24 hr post-RE, respectively, in both fiber types. Bax/Bcl-2 mRNA ratio increased ($p < 0.05$) 2.2-fold at 24 hr post-RE only in MHC I fibers. There were no changes in TNF-alpha, and calpains 1 and 2 mRNA at 4 and 24 hr post-RE. CONCLUSIONS: These results suggest that MHC I fibers have a greater proteolytic activity before and after RE compared to MHC IIa fibers. The mRNA induction of MuRF-1, atrogin-1, and caspase-3 with RE suggest increased proteolytic activities of the ubiquitin/proteasomal and caspase pathways. This altered and specific proteolytic activity among slow- and fast-twitch muscle fibers indicate that these pathways may play an important role in the muscle remodeling process with RE.

Abstract #7

The Extent of Muscular Damage and Soreness Following a Marathon Run

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Muscular soreness can be significant for untrained individuals who participate in an unfamiliar physical task, but even a single exposure to an unaccustomed task can protect muscle from over-exertion and the resultant soreness. Thus, we asked the question, "To what extent does muscular soreness and disruption occur in highly trained persons who participate in a marathon run?" Venous blood samples were taken from five highly trained males, with ages ranging from 19-38 years, two days prior and the day following running the Chicago Marathon. Blood samples were centrifuged and the plasma frozen at -20C until assayed. Creatine kinase (CK) activity was determined kinetically at 37C using the reagent kit from Pointe Scientific, Inc. Cellulose acetate electrophoresis was used to separate MM-CK and MB-CK isoforms (DiaSys Europe Ltd.). Perceived muscular soreness one day following the run was estimated using a soreness scale of 1-10 with 1 defined as "not sore at all" to 9 being "extremely sore." Plasma CK activities prior to the marathon were 332+/-135(mean+/-SE) IU/L compared to 1610+/-159 IU/L ($p>0.01$) one day post-marathon. The mean perceived soreness rating was 8.2+/-0.8, with 4 of the 5 runners scoring themselves as 9 "extremely sore." There was no significant correlation between time to completion of the marathon and degree of soreness or between the CK activities and degree of soreness. The electrophoresis showed no differences in the MM-CK and MB-CK banding patterns pre- and post-marathon. It was concluded that even highly trained persons experience extreme muscular soreness and disruption when muscle is over-exerted by a familiar but extended challenge. Thus, the protective adaptation that occurs while training for a marathon does not fully extend to the actual event itself.

Abstract #8

The Efects of Creatine Supplementation on Eccentric Contraction-Induced Muscular Damage

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The purpose of this study was to compare the possible beneficial effects of creatine ingestion on alleviating muscular over-exertion injury. Two groups of five male college-aged subjects served as a control group (no creatine) and experimental group (creatine treated). The creatine group self-administered creatine prior to and up to 8 days following over-exertion. The tricep muscle group was over-exerted using an eccentric 15 set protocol on the KinCom apparatus. Venipunctures were done prior and following over-exertion on days 1, 2, 4, and 8 to determine plasma creatine kinase (CK) activity. Measurements of maximal isometric force (MIF), maximal isokinetic force, and perceived sensation of soreness were also determined on the same days as above. The creatine treated compared to the control group had elevated CK activities at all times post exertion that ranged from 8-320% but were not statistical significant. The MIF were lower in the creatine-treated group compared to the control but were not significant. These data indicate that the creatine treatment tended to elevate the CK release from muscle even prior to over-exertion as well as following, which suggests it affects the sarcolemmal membrane. These preliminary findings indicate creatine supplementation does not alleviate but may exacerbate muscular over-exertion.
Supported in part by a Wheaton College Aldeen Grant

Abstract #9

Delayed Onset Muscle Soreness and Resting Metabolic Rate Following Full-Body Resistance Exercise with Eccentric Concentration K

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PURPOSE: To determine whether full-body resistance training with an eccentric concentration would prolong delayed onset muscle soreness (DOMS) and changes resting metabolic rate (RMR)in resistance-trained (RT) men. METHODS: Nine RT male participants (mean ± SD; age = 22.67 ± 2.35 yr; height = 179.78 ± 5.93cm; weight = 83.98 ± 14.20kg, body fat = 15.54 ± 6.51%; fat-free mass = 69.78 ± 9.07kg; fat mass = 13.68 ± 9.07kg) were measured on four consecutive mornings for creatine kinase (CK), rate of perceived muscle soreness (RPMS), and RMR. After baseline measures on day one, DOMS was induced by utilizing a full-body resistance training protocol with a one-second concentric and three-second eccentric contraction duration. Eight sets of six repetitions were progressively loaded on eight different exercise machines using a rate of perceived exertion (RPE) measurement to monitor the intensity of each completed set. RESULTS: A single factor repeated measures ANOVA revealed significance displayed in the table below.

Time	k	kJ•kg•h	CK	RPMS
Baseline	6777 ± 231	4.05 ± 0.09	16 ± 45	0.69 ± 0.24
24 post	7043 ± 245*	4.22 ± 0.12*	499 ± 111*	3.56 ± 0.65*
48 post	7431 ± 235*	4.46 ± 0.12*	378 ± 86	2.58 ± 0.56*
72 post	7277 ± 197*	4.36 ± 0.13*	268 ± 59	1.05 ± 0.24

*p<0.05 significantly different than baseline

CONCLUSION: Our data suggest that full-body resistance training with an eccentric concentration will significa increase RMR for 72 hours post exercise.

Abstract #10

Salivary Cortisol Response to Familiar and Unfamiliar Exercise at the Same Intensity and Duration

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Cortisol is a hormone released in response to both physiological and psychological stress. The purpose of this study was to examine the salivary cortisol response to familiar and unfamiliar exercise of the same duration and intensity, with the hypothesis that the unfamiliar exercise of swimming would result in higher values than the familiar exercise of running for Division III soccer players. Ten male collegiate soccer players provided blood and saliva samples to determine the cortisol correlation. Each subject's maximal heart rate (HRmax) was determined using a treadmill protocol. On a following day, subjects swam at 75% of HRmax for 20-30 minutes. On a subsequent day subjects ran for the same time that they swam and at 75% HRmax. Blood lactate concentrations were similar prior and following both tests (pre/post-swim=2.74/2.36mM; pre/post run =4.02/3.1mM). Blood and salivary cortisol concentrations were similar. Salivary cortisol levels were significantly lower ($p<0.05$) prior to the run compared to post-run (36+29 vs.124+51ng/mL), whereas cortisol levels were high for both the pre-and post-swim event (131+25 vs.135+29ng/mL). We concluded that the more familiar exercise of running for soccer players was less stressful than swimming for the same duration and intensity.

Abstract #11
Effects of Carbohydrate Ingestion on Fasted Metabolism During Prolonged Running
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PURPOSE: The purpose of this study was to assess the effects of carbohydrate (CHO) ingestion on plasma concentrations of the energy providing substrates, blood glucose, (BG) and free fatty acid (FFA) during 90 min of moderate intensity running in fed and fasted states. METHODS: Six trained athletes (4 male, 2 female) completed three 90 min runs at 70% VO2max. The three trials were (1) fed, water only during exercise (FED), (2) fasted, water only during exercise (H2Of), and (3) fasted, CHO during exercise (CHOf). Fed subjects consumed a normal diet and ~300 Kcal prior to exercise; fasted subjects abstained from the evening meal and exercised prior to breakfast (18-20 h fast). CHO (6%, Gatorade Thirst Quencher) was supplemented at 1.3 g/kg bodyweight (60-75 g total CHO). BG was sampled via finger prick and glucometer at rest, 30, 60, and 90 minutes. Respiratory exchange ratios (RER) were also measured at these times. FFA and insulin (IN) were analyzed pre- and post-exercise by enzymatic colorimetric assay and a Mercodia Insulin ELISA kit read in an OpsysMR Microplate Reader, respectively. Data are presented as means±SEM. Level of significance was $p < 0.05$. RESULTS: BG was significantly higher at 30 min during CHOf compared with H2Of and FED (5.32±0.25, 4.46±0.25, 4.20±0.20 mM, CHOf, H2Of, FED, respectively). RER was elevated by CHOf compared to H2Of (0.92±0.02 vs. 0.87±0.01 VCO2/VO2). FFA increased 3.5 and 4-fold in FED and H2Of groups, respectively, while remaining near resting concentrations in the CHOf group. [illegible]creased >200% from the pre-exercise sample in FED, [illegible]creased 1.5 and 2.5-fold in H2Of and CHOf, respectively. CONCLUSIONS: These results demonstrate that ingestion of excess amounts of carbohydrate during 90 min of moderate intensity exercise can alter the BG, FFA, IN plasma profile and rates of CHO and FFA oxidation. The expected changes in these data with prolonged fasting and long-term exercise are not as dramatic as might be anticipated. Thus, carbohydrate supplementation in the form of a commercial sports beverage may not be a necessity for exercise of this intensity or duration.

Abstract #12
The Effect of High-Carbohydrate, Low-Fat And Low-Carbohydrate, High-Protein Diets on Rowing
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This investigation examined the possible benefits or problems of high-carbohydrate (low fat) and low-carbohydrate (high protein) diets on rowing. The body's metabolism will change with different fuel sources, but the changes in the physiological and biochemical mechanisms under exercise stress while on the low carbohydrate (high protein) diet still remains unclear. The study included 18 fit, non smoking males aged 18-40 years from Ohio University. During the seven-week study, subjects were asked to consume a high-carbohydrate (low fat) or a low carbohydrate (high protein) diet and follow [illegible]me rowing schedule. Data were collected on the [illegible]anthropometric, strength and endurance, and other performance changes. It was hypothesized that there would be a difference in anthropometric measurements and performance in the low-carbohydrate (high protein) group compared to the high-carbohydrate (low fat) group. All statistical analyses were performed on SPSS Advanced Models 12.0 for Windows. The results showed no significant difference ($p<0.05$) between the two groups in anthropometric, performance, and training variables. It was concluded that low-carbohydrate (high protein) diets do not provide any added benefits over a high-carbohydrate (low fat) diet.

Abstract #13
Influence of Explosive Muscle Actions on Post-Exercise O2 Consumption
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The purpose of this study was to examine the influence of explosive muscle actions on metabolic rate after resistance exercise (i.e., excess post-exercise O2 consumption, EPOC). Seven men (20±2.8yrs) performed two different exercise sessions using a plate-loaded squat machine and one control session (CON) in random order (one per week). Subjects performed the concentric portion of squats either explosively (EXPL) or slowly over 2s (SLOW) for four sets of eight repetitions (reps) with 60% of 1-RM. Eccentric rep time (2s each), total work, squat range-of-motion, and rest intervals between sets (90s) were identical for all squat protocols. Expired air was collected continuously for 20min before, during, and 1hr following exercise, and for 1.5hr during CON. Blood samples (25µl) were collected before, immediately after, and 15, 30, 45, and 60 min after each protocol and analyzed immediately for blood lactate concentration. EPOC was calculated in l.min-1 of O2 consumption (VO2) using the CON data as a baseline and was evaluated as fast EPOC1 (0-5min after exercise) and slow EPOC2 (6-60min after exercise). Exercise VO2, EPOC1, and EPOC2 were significantly greater ($p < 0.05$) during EXPL (1.05±0.13 l.min-1, 0.59±0.05 l.min-1, 0.07±0.01 l.min-1) compared with SLOW (0.95±0.14 l.min-1, 0.53±0.05 l.min-1, 0.04±0.01 l.min-1), respectively. Blood lactate concentration (mmol.l-1) was significantly greater ($p < 0.05$) after SLOW compared with EXPL (immediately, and 15 and 30 min after). In summary, squats performed with explosive muscle actions induced a greater EPOC than slow muscle actions when otherwise identical exercise protocols were performed. Thus, by simply performing the concentric portion explosively, recreational exercisers can increase their post-exercise metabolic rate, which could enhance weight loss.

Supported in part by the Department of Kinesiology, Anderson University

Abstract #14
Effects of Muscle Mass Recruitment and Prior Heavy Exercise on VO2 Kinetics During a Subsequent Bout of Heavy Exercise
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At exercise intensities exceeding the lactate threshold (LT), an additional increase in pulmonary oxygen uptake (VO2) of delayed onset leads to a VO2 that is higher than predicted from the VO2/work rate relationship for exercise performed below the LT. The physiological mechanism underlying this slow component (VO2 SC) remains unresolved, but previous studies suggest that the recruitment of less-efficient type II muscle fibers may contribute to the appearance of the VO2 SC. PURPOSE: To examine whether the VO2 SC is altered during a subsequent bout of heavy exercise by prior warm-up exercise requiring significantly different motor unit recruitment patterns. METHODS: Nine male subjects (26.6; 1.7 yrs, SE) performed repeated bouts of exercise during each visit, each bout lasting 6 min with 6 min of recovery between bouts. Surface EMG was recorded during exercise for monitoring motor unit recruitment and normalized relative to a maximum voluntary contraction that was obtained prior to exercise. During cycling-to-cycling trials (CYC1, CYC2), step transitions to a work rate (WR) corresponding to 50% of the difference between peak VO2 and LT (50%) were performed. During knee extension–cycling trials (KE, CYC3), bilateral knee extension exercise was performed at an intensity that elicited twice the motor unit recruitment (as indicated by the rectified amplitude of surface of EMG) compared to CYC1 and followed by a single cycling transition to a WR corresponding to 50%. VO2 was analyzed using a 3 component exponential model. RESULTS: The mean amplitude of the rectified EMG was higher ($p<0.05$) during KE (37.6 + 2.7 %MVC) than CYC1 (20.8 + 1.9 %MVC), CYC2 (21.6 + 1.9 %MVC) and CYC3 (19.8 + 2.1 %MVC). Kinetic analysis of VO2 indicated no difference between the time constants for the primary rise in VO2 between trials. The gain, represented by VO2/WR, was not different between bouts. The amplitude of the slow component (A3) was lower ($p<0.05$) in CYC2 (197 + 40 ml•min-1) and CYC3 (163 + 17 ml•min-1) compared to CYC1 (325 + 42 ml•min-1). CONCLUSION: Consistent with the results of previous studies, prior heavy warm-up exercise does not effect the gain or time constant for the primary rise in VO2 during a subsequent bout of heavy exercise. The additional recruitment of motor units during prior warm-up exercise did not affect the VO2 SC during a subsequent bout of heavy exercise suggesting that the recruitment of type II muscle fibers and the performance of fatiguing warm-up exercise does not appreciably affect muscle metabolism during a subsequent bout of exercise.

Abstract #15
Effect of Aerobic Exercise on Regulating Hormones of Appetite
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Background: An increase in obese population has caused the serious social problem in modern society. The obesity has been mainly developed due to the unbalance of caloric consumption, which was affected from plasma hormone levels of appetite control such as leptin, ghrelin, and insulin. However, the hormones of appetite control have not been well investigated in the situation of energy unbalance due to an acute exercise. Purpose: The objective of this study was to investigate the effects of acute aerobic exercise on the leptin, ghrelin, and insulin responses that were related to the appetite. Subjects: Seven college male students participated in the current study (age = 24.4±2.1 yrs; height = 174.4±4.2 cm; body weight = 71.3±3.9 kg; %body fat = 20.2±2.9 % VO2max = 47.9±3.5 ml/kg/min). Methods: All subjects randomly received three treatments, which were no exercise (Con), 10 km treadmill exercise (Ex), and the combination of 10 km treadmill exercise and glucose consumption (Diet) treatments. Ex treatment was 10 km treadmill running at moderate intensity with 3% grade and the Diet treatment was the 10 km running and then three consumptions of

glucose (1.5 g/kg bw) for 3 h recovery period. Blood samplings were performed at prior to exercise and 0, 60, 120, and 180 min after exercise, respectively. Plasma leptin, insulin, human growth hormone (hGH), and ghrelin were determined from radioimmunoassay. Results: Plasma leptin, ghrelin, and insulin levels were not significantly different among three treatments. However, the percent changes of plasma ghrelin concentrations in Diet treatment were significantly lower than those in Con and Ex treatments at 180 min after exercise, respectively. Conclusion: The results of the current investigation suggested that an acute bout of aerobic exercise (10 km treadmill exercise) did not affect the levels of plasma leptin, ghrelin, and insulin, but the glucose consumption during recovery period only did affect the percent change of plasma ghrelin levels.

Abstract #16
Gender Differences in Muscle Blood Flow During Isometric Contraction
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Previous investigations have demonstrated that time to exhaustion (TTE) is shorter in males compared to females during sustained submaximal isometric contractions. This discrepancy has been attributed to males generating a greater absolute force at the same relative intensity causing occlusion of the vessel supplying blood to the working muscle. PURPOSE: To determine if differences in muscle blood flow (MBF) between genders is associated with a reduced TTE during isometric handgrip exercise. METHODS: Eighteen subjects (9 male and 9 female, 24.2± 0.9 yrs old) participated in the study. Muscle blood velocity was measured continuously during exercise using Doppler ultrasonography and corrected to MBF by measuring brachial artery diameter. Prior to exercise, five maximum voluntary contractions (MVC) were performed for the determination of the target force during the fatigue protocol. Subjects were instructed to maintain the target force of 20% MVC. TTE was determined when the subject could no longer maintain the target force within 5% of their MVC value. For each subject, MBF was determined by normalizing the TTE to 100% and subsequently analyzing each 10% interval. RESULTS: MBF increased significantly from the onset of contraction to TTE in both males and females (19.269 – 66.313 ± 2.135 ml/min, $p<0.05$). A gender effect was observed at TTE's 60% ($p<0.05$). However, when MBF was corrected per 100ml of tissue, there was no significant gender effect. Males generated greater absolute force (401± 61.94 N) compared to females (215 ± 45.13 N). Due to large intersubject variability, TTE was not significantly different between genders (men = 262.8± 100.89, females = 336 ± 159.03, $p = 0.235$). CONCLUSIONS: There was no significant difference between genders in MBF based on the relative amount of force produced, indicating that MBF is not affected by the absolute force production differences observed between genders.

Abstract #17
Effects of Positive Pressure on Autonomic Control of Heart Rate and Blood Pressure at Moderate Altitude
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PURPOSE: This study was designed to examine the responses of the autonomic nervous system during application of positive pressure at moderate altitude (11,209 ft.) and to test the hypothesis that a withdrawal of sympathetic innervation is responsible for the changes in heart rate and blood pressure. METHODS: Seven men and three women were put in a simulated positive pressure environment (Gamow Bag) and positive pressure was increased by increments of 0.2 psi from 0 to 2 psi. At each stage of positive pressure, measurements of heart rate and blood pressure were performed. A 3-lead electrocardiogram and spectral analysis were used to measure the autonomic control of heart rate. An automated blood pressure devise was used to measure blood pressure. RESULTS: Heart rates did not decrease significantly ($P > .05$) during the application of positive pressure at altitude, yet did decrease significantly ($P < .05$) during the two sea level tests. In addition, there was no correlation between fluctuations in heart rate and autonomic input to the heart. There were significantly lower systolic, diastolic, and mean arterial pressures with positive pressure relative to ambient pressure at altitude ($P < .05$). CONCLUSION: These data suggest that blood pressure was lower during the positive pressure condition because of the higher partial pressure of oxygen, which resulted in less of a reflex peripheral vasoconstriction.

Abstract #18
Effects of Ginko Biloba on Exercise Responses at Moderate Altitude
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Ginko biloba has been found to decrease the incidence and severity of acute mountain sickness (AMS), but how it influences exercise performance has not been reported. PURPOSE: This study was performed to determine if Ginko biloba helps reduce the symptoms of AMS and to determine its effects, if any, on exercise performance. METHODS: Ten individuals participated in this study (5 in the Ginko biloba group and 5 in the control group). The Ginko biloba group received 120 mg of Ginko biloba (TruNature) twice daily, five days prior to each testing bout. Meanwhile, the control group received a sugar pill, which they took twice daily, five days prior to each testing bout. The subjects all completed the Lake Louise Acute Mountain Sickness survey before exercising. Subjects then participated in a graded exercise test until exhaustion. Heart rate, blood pressure, oxygen consumption, RER, and performance time were measured before during and after the exercise. Testing was performed under four conditions: Sea Level 1 – sea level before altitude exposure, Altitude 1 – upon acute exposure to 11,209 feet, Altitude 2 – after two weeks exposure to altitude, and Sea Level 2 – sea level after altitude exposure. RESULTS: Blood pressure and heart rate were higher at any given exercise intensity upon acute exposure to altitude ($P<0.05$). However, there were no significant differences between the placebo and Ginko group for any of the variables. CONCLUSIONS: These data suggest that Ginko biloba does not appear to influence the responses to exercise at moderate altitude.

Abstract #19
Effects of Creatine Supplementation on Strength, Body Composition, and Power at Moderate Altitude
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PURPOSE: The purpose of this study was to determine the effects of 20 days of creatine supplementation on power output, lean body mass, and weight changes due to a stay at moderate altitude (11,209 feet). METHODS: Six males (aged 19-30 yrs) participated in the study after giving informed consent. Half of the subjects were randomly assigned to a placebo group and half were assigned to a creatine group (20 grams of Gaspari Brand SuperPump 250). Measurements of body weight, body composition, strength, and power were performed prior to altitude exposure, acutely upon ascent to altitude, after 2 weeks exposure to altitude, and immediately after descending to sea level. During altitude exposure, subjects participated in intense training sessions (5 x25 push-ups, 12 x 6 sec max sprints on a cycle ergometer, and a Wingate anaerobic power test). RESULTS: Under all conditions, subjects in the creatine group had greater body weight and lean body mass than the placebo group. The creatine group also had greater peak and mean power outputs compared to the placebo group. CONCLUSION: These data suggest that creatine supplementation at altitude might be beneficial for the maintenance of strength and muscle mass.

Abstract #20
Effects of Myo-Blast CSP3™ on C2C12 Cell Behavior In Vitro
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Proliferation of muscle precursor cells is under negative regulation by myostatin, a member of the TGF-ß family of proteins. Several lines of evidence demonstrate that disruptions in myostatin content or activity lead to excess muscle growth. The supplement Myo-Blast CSP3™ has been marketed as an inhibitor of myostatin activity, increasing muscle mass as a result. While the claims are based upon the ability of the active ingredient, a sulfated polysaccharide, to bind/inactivate myostatin, an increase in precursor cell proliferation in the presence of this supplement has yet to be directly tested. PURPOSE: The objective of this work was to test the hypothesis that Myo-Blast CSP3™ increases proliferation of C2C12 muscle cells in vitro. METHODS: C2C12 cells were maintained in DMEM/10% FBS/pen-strep at 37C/5%CO2. Cells were plated in 96 well plates at either 300 or 600 cells/well and incubated for 24 hours, allowing for attachment. Media was replaced with DMEM/10%FBS containing Myo-Blast CSP3™ at concentrations between 0.1 ug/ml and 1 g/ml. Proliferation was measured 96 hours after supplement addition. RESULTS: The proliferative response showed a biphasic response, with proliferation increasing between 0.1 and 10 ug/ml. At higher concentrations (0.1 mg/ml to 1000 mg/ml), however, cellular proliferation was reduced to levels below those measured in control wells (DMEM/FBS alone). This experiment was repeated in the presence of 200nM Dexamethasone, a known activator of myostatin expression. Again, proliferation was enhanced at lower concentrations of Myo-Blast but suppressed at higher concentrations. CONCLUSIONS: The unexpected ability of Myo-Blast CSP3™ to suppress C2C12 proliferation at higher concentrations suggests that careful in vivo examination of Myo-Blast CSP3™ bioavailability and action is essential.

Abstract #21
Effect of Caffeine on Lactate Threshold and Heart Rate Variability
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PURPOSE: Heart rate variability (HRV) is a measure of the variability from one heartbeat to the next; is vagally mediated; and has been found to change significantly

during the aerobic-anaerobic transition of exercise. Ventilatory threshold (VT) and HRV both have a strong relationship with autonomic control and previous studies have suggested that a heart rate variability "threshold" (HRVT) exists that coincides with VT during graded exercise. Caffeine, however, is a common stimulant that influences autonomic control and may therefore influence HRV. Therefore, the purpose of this investigation was to determine the influence of caffeine on HRV during progressive exercise. METHODS: Eleven subjects performed graded maximal cycle ergometry to volitional fatigue. The study was a randomized placebo controlled, double-blind design where each subject served as his/her own control (caffeine vs. placebo). Metabolic gas and ventilatory parameters were measured breath-by-breath averaged over 30 seconds, and blood lactate was measured every 3 minutes. Heart rate variability was determined using time domain indexes including standard deviation, coefficient of variation, and mean successive difference, which have been shown to correlate strongly with vagal tone. RESULTS: Caffeine consumption significantly ($p < .05$) increased blood lactate and reduced some indices of HV (coefficient of variation and mean successive difference) at rest. However, during exercise the placebo and caffeine trials where no longer significantly different for lactate, VT, or HRV. CONCLUSION: While caffeine has a significant impact at rest, it does not influence lactate threshold, VT, or HV during vigorous exercise.

Abstract #22

Effect of Gender on Fluid Balance and Performance after Pre-exercise Hydration Beverage Ingestion

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Pre-exercise ingestion of beverages containing electrolytes results in greater ad libitum water ingestion during exercise and improved fluid balance. We are unaware of any research regarding differential gender responses to pre-exercise hydration beverage intake. Ten men and eight women (24 ± 3 and 23 ± 2y; mean ± SD) exercised at 56±4% VO2peak in a thermoneutral environment (WBGT = 16.2 ± 1.6 C) for 90 min. Subjects ingested 355 ml of either chicken noodle soup (SOUP), a carbohydrate/electrolyte beverage (CE), or water (WATER) 45 min before exercise. Water intake during exercise was allowed ad libitum except in a second soup trial (SOUPCON) where water was given at times and volumes equal to CE. After 90 min of steady state exercise subjects performed a time trial in which they accumulated as rapidly as possible the amount of work equal to 30 min at ~60%VO2peak. Men and women exercised at similar %VO2peak in all trials ($p=0.35$). Ad libitum water intake, percent of fluid retained, and fluid balance responses were similar between men and women with additional water intake resulting in improved fluid balance during exercise after ingestion of beverages containing electrolytes. Women drank less water compared to males (740 ± 500 vs. 1400 ± 500g) regardless of trial. This effect persisted when water intake was normalized for body weight ($p < 0.05$). Urine output was not different between men and women, but percent water retention was lower in women (61 ± 18 vs. 83 ± 18%; $p=0.02$) due to the combined effect of reduced water intake and slightly higher urine output. Total fluid balance was not different in men and women (-445 ± 471 vs. -351 ± 471; $p=0.69$). No differences between genders existed for temperature regulation or performance. Although women maintained higher plasma sodium concentrations compared to men in all trials except SOUP, plasma osmolality, thirst rating, and cardiovascular function were not influenced by gender. Men utilized more carbohydrate during exercise and had lower plasma glucose concentrations than women. However, the increase in carbohydrate utilization did not affect ratings of perceived exertion. In summary, although women drank less water and retained less of the water ingested during exercise, fluid balance was similar to men.

Abstract #23

Breath Holding at Moderate Altitude (3400-M) and at Lowland

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Integrating signals from central and peripheral chemoreceptors that monitor changes in PO2, PCO2, and H+ controls inspiration. Breath holding represents a simple test of the relative influence of these factors. METHODS: Fourteen Alma College students participated in breath holding at 4-times, Lowland-1, at Alma, MI (243-m); Altitude-1, 1-day after ascent to Shrine Mountain Inn near Vail, CO (3,416-m); Altitude-2, 16-days after ascent to Shrine Mountain, and Lowland-2, 1-day after return to Alma. Each time participants held their breath for as long as possible after four different preceding conditions, normal breathing, hyperventilation, breathing into a bag, and running in place. RESULTS: Breath holding time was significantly shorter at Altitude-1 and 2 than at Lowland-1 and 2 regardless of the preceding breathing condition, and there was no apparent adaptation to living at altitude. Breath holding was significantly shorter than normal breathing after bag breathing and running in place and was significantly longer than normal breathing after hyperventilation. CONCLUSION: The hypoxic environment associated with moderate altitude shortened breath holding times. This was true regardless of whether breath holding was preceded by hyperventilation, breathing into a bag, or running in place.

Time in Seconds	Lowland-1	Altitude-1	Altitude-2	Lowland-2
Normal Breathing	43.6±16.4	24.4±14.3	27.2±10.6	42.8±21.3
Hyperventilation	86.1±27.8	43.9±14.6	41.1±13.6	77.1±33.1
Breathing into a Bag	31.2±16.5	15.9±8.1	20.6±11.3	31.9±16.4
Running in Place	27.8±9.7	15.6±8.4	16.4±7.2	26.4±9.3

Abstract #24

Temperature Regulatory Responses During Cycling Exercise at Moderate Altitude

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PURPOSE: This study was designed to investigate the differences observed in temperature regulatory mechanisms, specifically sweating rates and forearm blood flow, at moderate altitude (3400-m). METHODS: Five subjects (26.4±14.3 yrs, 1.72±07-m height, 74.2±14.5-kg weight) cycled for 45-min on four occasions: Lowland-1, at Alma, MI (243-m); Altitude-1, 1-day after ascent to Shrine Mountain Inn near Vail, CO (3,416-m); Altitude-2, 16-days after ascent to Shrine Mountain; and Lowland-2, 1-day after return to Alma. Cycling was performed at 70% of heart rate reserve on all four occasions. Sweating rates were measured during exercise using a 7-cm2 round disk composed of a continuous coiled capillary tube. Forearm blood flow was measured using venous occlusion plethysmography at 15 and 45 min during cycling. RESULTS: Exercise sweat rates tended to be lower at Altitude-1, .29±.20 mg/min and Altitude–2. .59±.49 mg/min than at Lowland-1, 1.69±1.62 and Lowland-2, 1.17±.91 mg/min. Forearm blood flow tended to be higher on the two cycling bouts performed at altitude than those at lowland. CONCLUSIONS: While these results are preliminary, individuals may have compensated for lower sweating rates at altitude by shunting more blood to the skin to take advantage of greater conductive heat loss.

Abstract #25

A Comparison of Venous and Capillary Lactic Acid Analysis for Measuring the Lactate Threshold: Preliminary Results

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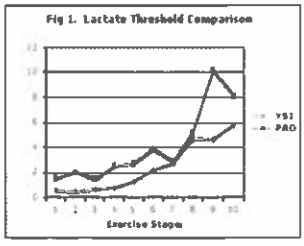
The ability to measure lactic acid using a hand held lactic acid meter would greatly enhance an athlete's ability to monitor performance. PURPOSE: The purpose of this study was to compare venous and capillary blood lactic acid techniques during a lactate threshold test. METHODS: Six healthy untrained subjects (1 female and 6 males) were recruited for this study and signed an IRB consent form. They were familiarized with the testing equipment, asked to perform a familiarization ride on a cycle ergometer, and then scheduled for a lactate threshold test (LT). The subjects reported to the laboratory in a semi-fasted state (no food 3 hours prior to exercise) with a minimum of 48 hours without exercise. Following 15 min of rest a 21-gauge Teflon catheter was inserted into an antecubital vein and kept patent with a saline drip. The LT required the subjects to cycle on a Quinton Lode Ergometer (Holland) with the initial workload set at 0 watts and a pedal rate of 60 rpm. The workload was increased by 30 watts in 3 min stages until the subject reached volitional fatigue. Venous blood samples (3 mls) were drawn before (pre) and after each exercise stage from a 3-way valve, and 25 ul of whole blood was used to measure lactic acid in a YSI Stat Plus analyzer. Capillary blood was drawn from the opposite arm after a single finger stick. The site was cleaned with alcohol and 5 ul of blood samples were transferred to chemical strips of an Arkray Lactate Pro meter. RESULTS: As shown in figure 1, the venous and capillary blood lactic acid values were well matched up to the eighth stage of exercise. It should be noted that all subjects were able to complete the fifth stage of exercise, and after that the numbers vary with participant drop out. DISCUSSION/CONCLUSION: The data presented here represents very preliminary data but do demonstrate that the collection of capillary blood can be as accurate as venous sample.



Abstract #26

The Relationship Between Lactate Threshold and Fat Metabolism in Young Untrained Subjects: Preliminary Results

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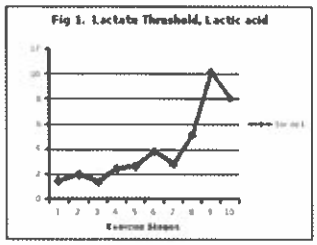
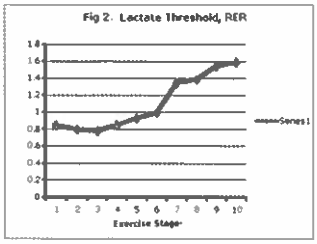
It has been shown that the lactate threshold is well matched to the onset of fat oxidation in an endurance trained athlete. PURPOSE: The purpose of this study was to determine if the appearance of vascular lactic acid

corresponds to lipid metabolism in young untrained subjects. METHODS: Eight healthy, untrained subjects (2 female and 6 males) were recruited for this study and signed an IRB consent form. They were familiarized with the testing equipment, asked to perform a familiarization ride on a cycle ergometer, and then scheduled for a lactate threshold test (LT). The subjects reported to the laboratory in a semi-fasted state (no food 3 hours prior to exercise) with a minimum of 48 hours without exercise. Following 15 min of rest a 21-gauge Teflon catheter was inserted into an antecubital vein and kept patent with a saline drip. The LT required the subjects to cycle on a Quinton Lode Ergometer (Holland) with the initial workload set at 0 watts and a pedal rate of 60 rpm. The workload was increased by 30 watts in 3 min stages until the subject reached volitional fatigue. Venous blood (3 ml) and capillary samples (via finger sticks) were collected before the test started and after each stage. Oxygen uptake (VO_2) and carbon dioxide (VCO_2) production was measured continuously. RESULTS: Individual data sets indicate that seven of the eight subjects reached a lactate threshold prior to converting to a fat burning mode (RER of 1). However, when the data are combined (see figs 1 and 2) that finding is questionable. DISCUSSION/CONCLUSIONS: The data presented here do not enable us to make any conclusions. However, the total number of subjects we plan to test in this study is 30 (15 males & 15 females) and the larger N should allow us to verify whether or not the lactate threshold of untrained subjects is related to fat metabolism.





Abstract #27

Access to Running Exercise Enhances Spatial Maze Performance in Aging Female Sprague-Dawley Rats

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Regular exercise has favorable effects on the development and maintenance of cognitive function with age. Animal research has shown that exercise improves while sedentary behavior impairs maze performance. Despite the importance of exercise to cognitive function, access to exercise is often overlooked in animal experiments where, unlike a natural setting, laboratory animals usually have little or no access to physical activity outside of a standard cage. In old age in particular, regular exercise has been shown to intervene significantly and enhance the performance of laboratory rats on a variety of mazes. PURPOSE: This study compared spatial maze performance in aging female Sprague-Dawley rats with different access to physical activity: (1) none outside a standard cage (SED) (2) twice-weekly physical activity in a large box (PA), and (3) regular running wheel exercise (EX). METHODS: One hundred eight Sprague-Dawley female rats were divided into three treatment groups. Monthly spatial maze performances were monitored by evaluating total time (up to 3 minutes) to collect 5 reinforcements (correct responses), working errors (returning to the same arm that contained the reinforcement), and reference errors (going to any of three of the eight arms that never contained reinforcements). RESULTS: Over 23 months of spatial maze testing, EX animals completed the maze in less time (113.5 +/- 5.2 sec) than both PA and SED animals (145.3 +/- 2.7 and 147.8 +/- 3.0 sec, respectively; $p < 0.05$) and, in turn, EX had a greater number of correct responses (4.33 +/- 0.15) than PA and SED animals (3.42 +/- 0.12 and 3.44 +/- 0.12, respectively; $p < 0.05$). CONCLUSION: Compared with animals that resided in a standard cage and those allowed twice weekly hourly access to physical activity, animals that had regular access to running wheel exercise showed enhanced spatial maze performance, indicated by less time needed to complete the task and more correct responses.

Supported by NIH Grant 1 R15 AG 20526-01A1

Abstract #28

Performance Characteristics of Extreme Altitude Climbers: The Spokane Study

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INTRODUCTION: This sea-level (602m) study carried out in one of the USA's climbing hubs, Spokane, Washington, documents descriptive physical and physiological data, as well as climbing performances of n = 9 extreme altitude climbers (EAC) who have successfully ascended and returned safely from extreme altitude (>5490m). The Spokane Study also explores traditional (VO_2max) and nontraditional methods (Hypoxic Ventilatory Response/HVR) for predicting performance outcomes at extreme altitude, as well as the acute and long-term consequences of exposure to hypobaric-hypoxia. METHODS: A sea-level study (602m) encompassing descriptive statistics and a meta-analyses comparing VO_2max ($ml.kg.min^{-1}$) values and climbing success, as well as comparisons with other historically significant EAC studies (The Silver Hut Expedition, The American Medical Research Expedition to Mount Everest (AMREE), and the Swiss and French Studies). HYPOTHESIS: Traditional sea-level tools for quantifying physical conditioning (i.e. VO2max) lack sensitivity and specificity in terms of performance outcomes at extreme altitude. There are other markers of predicting performance outcomes (i.e., HVR, years of experience, skill, and the economy of climbing) that more precisely address the EAC. RESULTS: *Physical Profiles:* Age (36±12.1years), Height (180.9±6.3cm), Weight (76.3±5.7kg), Adiposity (8.0±2.6%). *Pulmonary Function:* FVC (5.69L/108%), FEV1.0 (4.17L/96%), FEF25-75% (3.43L/76%) Note: Asthma in subjects, *JD, BC,* and chest trauma in *MC* from a near-fatal climbing accident. *Metabolic Demands During Exercise:* VO_2max ($54.88±6.2ml.kg.min^{-1}$), VEmax (169.56±20.38 L/min), HRmax (185±14.5bpm), Anaerobic Threshold/AT ($42.1±4.7ml.kg.min^{-1}$), AT% (71±3.3%). Note: Subject *JR* experienced a 20.3% decline (71.4 vs. 56.9 $ml.kg.min^{-1}$) in VO2max after spending three months above 5,334-meters) on Mount Everest. Data on *JR* were collected two weeks after return to sea-level. *Epidemiological Survey:* Acute Mountain Sickness (AMS) = 16 severe cases, High Altitude Pulmonary Edema (HAPE) = 1 case study, High Altitude Cerebral Edema (HACE) = 1 case study, Severe hypothermia = 3 case studies, Frostbite = 4 case studies, Disease = 20 severe case studies, Severe Trauma = 7 case studies. *Climbing Portfolios:* JR, 5 ascents above 8,000 meters, the first EAC to climb K2 (SEP 1978) without supplemental oxygen, the first simultaneous father/son ascent of Mount Everest in May 2003; CK, 1 ascent above 8,000 meters, 1981 02-ascent of Mount Everest on the AMREE Expedition, achieved 7-Summits of the World; JS, 1 ascent above 8,000 meters, summited Mount Everest in 1983; JD, 9 ascents above 5,490 meters; DS, 4 ascents above 5,490 meters; MC, 3 ascents above 5,490 meters; JC, 1 ascent above 5,490-meters; BP, 3 ascents above 5,490 meters, and youngest ascent of Mount Rainier (4,392m at 10 years of age); BC, 11 ascents above 5,490 meters. SUMMARY: Maximal aerobic capacity (VO2max), mean values (54.88ml.kg.min-1) for this group of elite EAC are comparable to the Silver Hut (48.20ml), French (55.80ml), Swiss (59.51ml), and AMREE (61.3ml) EAC studies; however, well below that of the Ball State Study on elite distance runners (77.4ml). Subject JR, the most successful EAC, in a previous case study achieved a VO2max of 71.4ml and is an accomplished ultra-marathoner and mountain biker. Paradoxically, however, JR has repeatedly retreated from the mountain with severe AMS, HAPE, and HACE. CK, on the other hand, with a previously fit, but not world-class VO2max (60.0 ml), has gone relatively unscathed in terms of illness at extreme altitude. This may be due to CK's record-setting hypoxic ventilatory response/HVR of 33.9 liters/min from a me of 21.2 l/min in a group of elite EACs. In the same stud RB Schoene, the climbers with a low HVR averaged only 5.6 l/min. The deciding factors in success at extreme altitude may include experience, and with experience comes age. The top five EAC in the Spokane Study were over 40 years (Mean Age = 46 years) and accumulated more ascents (50 ascents) above 5,490 meters; whereas in the younger group of climbers (Mean Age = 24.5 years), their inexperience shows (18 ascents above 5,490 meters). Physiologically, the best of both worlds is to have both a high VO2max and HVR. The HVR test should be prerequisite before going to extreme altitude, and VO2max testing and body composition assessment, pre- and post climb should be utilized to assess deterioration in cardiovascular conditioning and loss of muscle mass upon return to sea level. ACKNOWLEDGEMENTS: Thanks to Ken Hendrikson, RT, for his expertise and to Deaconess Medical Center, Spokane, Washington, for use of their Human Performance Laboratory.

Abstract #29

Determinant of Exercise Intensity for Mid-Aged Hypertension Male

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The risk of coronary heart disease increases with high blood pressure; therefore, exercise intensity should be very carefully decided with hypertension conditions. Special attention is now being focused on exercise prescription for improving VO2max and decline CHD, those with mild to moderate hypertension individuals.
PURPOSE: To determine the exercise intensity via doubl product (DP) and reviewed the ECG which exercise intensity can be a point for preventing myocardial ischemia

in middle-aged hypertension male. METHODS: We randomly assigned the 28 hypertension (HG) and 28 normal subject (NG) for exercise stress tests that measured HR, Double Product, and ECG variables. RESULTS: Mean age of the subjects was 46.3 years and resting blood pressure was 151mmhg for HG and 125mmHg for NG. Maximal oxygen uptake and maximal heart rate were very similar for both groups. There was a significantly higher on double product in HG than NG (p=0.001). There appeared to be a slightly low curve on ST segment for normal group but slightly increased curve for HG. However, there was a significant difference on ST segment at 12.2MET of exercise intensity. CONCLUSIONS: We recommend that 10MET of exercise intensity was the best point for preventing myocardial ischemia of mid-aged hypertension male which was the 30,000 double product point.

Abstract #30

Increased Arterial Stiffness Following Repeated Valsalva Maneuvers: Are Arterial Modulations with Resistance Exercise Pressure Mediated?

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Stiffening of large arteries is an independent risk factor for future cardiovascular events. While aerobic exercise reduces arterial stiffness, resistance exercise increases arterial stiffness. Mechanisms underlying arterial modulations with resistance exercise (RE) remain unknown. PURPOSE: To examine the role of blood pressure (BP) per se as a stimulus contributing to alterations in arterial stiffness following RE. Specifically, we sought to compare a RE bout to a non-exercise control bout designed to alter the BP profile in a similar pulsatile fashion. METHODS: Fourteen male participants completed, in a randomized fashion, a lower-body, unilateral RE bout and a repeated Valsalva Maneuver (VM) bout. Pulse wave velocity (PWV) was used to measure central (carotid-femoral) and peripheral (femoral-dorsalis pedis) arterial stiffness. Augmentation index (AIx) derived from radial pulse contour analysis was used as an index of systemic arterial stiffness. PWV and AIx were assessed before and 20-min after each perturbation. Beat-to-beat BP was assessed during bouts using finger plethysmography. RESULTS: Systolic BP, diastolic BP, mean arterial pressure, and pulse pressure changed similarly during both bouts. There was no change in AIx following VM (-7.3±2.7% to -3.3±5.0%) or RE (-7.7±2.9% to -6.4±3.3%). There was also no change in peripheral PWV following VM (8.9±0.3 m/s to 9.3±0.3 m/s) or RE (8.5±0.2 m/s to 8.4±0.2 m/s). An interaction was detected for central PWV as this value increased following repeated VM (7.1±0.3 m/s to 7.8±0.3 m/s) but not following RE (7.2±0.3 m/s to 7.2±0.3 m/s) (p = 0.032). CONCLUSIONS: Central artery stiffness increased following repeated VM. Even though presented with a similar BP load, arterial stiffness did not increase following RE. Thus, alterations in BP may not be the underlying stimulus governing modulations in arterial wall properties following acute RE.

Abstract #31

Ascorbic Acid Supplementation Reduces Severity of Exercise-Induced Asthma

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PURPOSE: Ascorbic acid (vitamin C) is a major antioxidant in the airways. Data on the effect of antioxidants on exercise-induced asthma (EIA) is equivocal, with well-designed studies showing both positive and negative results. Therefore, the aim of this study was to determine the effects of ascorbic acid (vitamin C) supplementation on the severity of EIA and to demarcate a possible mechanism by which ascorbic acid may reduce the severity of EIA. METHODS: Eight subjects with EIA participated in a randomized, placebo-controlled double-blind crossover trial. Subjects entered the study on their normal diet and were then placed on either two weeks of ascorbic acid supplementation (1500mg/day) or placebo, followed by a one week washout period, before crossing over to the alternative diet. Pre- and post-exercise pulmonary function was assessed at the conclusion of each treatment period. In addition, urine samples were collected pre- and post-exercise and assayed for the presence of proinflammatory mediators, cysteinyl leukotrienes (LT) C4-E4 and 9,11-prostaglandin (PG) F2, which have been implicated in the pathogenesis of EIA. Urine was also assayed for hydrogen peroxide (H_2O_2), as a marker of oxidative stress. Diet was monitored through 24-hour dietary recall to ensure that diet was not significantly different between the trials. RESULTS: Ascorbic acid supplementation significantly reduced ($p<0.05$) the mean maximum fall in post-exercise FEV1 (-6.4 ± 2.4%) compared to normal diet (-14.3 ± 1.6%) and placebo diet (-12.9 ± 2.4%). Ascorbic acid supplementation induced significant reductions ($p<0.05$) in LTC4-E4 on the ascorbic acid supplementation (5.3 ± 1.7 ng/mmol of creatinine) compared to the normal diet (15.0 ±4.0 ng/mmol/creatinine) and placebo diet (11.1 ±3.1 ng/mmol/creatinine). Similarly, 9, 11-PGF2 was significantly reduced on the ascorbic acid diet (8.5 ±1.7 ng/mmol/creatinine) compared to the normal diet (20.0 ± 4.5 ng/mmol/creatinine) and placebo diet (13.0 ± 1.8 ng/mmol). Furthermore, significant reductions ($p<0.05$) in plasma H_2O_2 were observed on the ascorbic acid diet (5.6 ± 1.3 mmol/L) compared to placebo (23.6 ±5.1 mmol/L) and normal diet (12.6 ±2.9 mmol/L). CONCLUSION: These data indicate that high dose ascorbic acid supplementation reduces the severity of EIA. This reduction in the severity of EIA may occur through a mechanism by which ascorbic acid supplementation reduces reactive oxygen species, thereby leading to a reduction in bronchoconstrictive mediators.

This project was funded in part by the Gatorade Sports Science Institute.

Abstract #32

Body Mass Index as a Predictor of Percent Fat in University Students and Athletes

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PURPOSE: Our purpose was to determine the accuracy of BMI as a measure of excessive body fatness in elite college athletes and to compare them with a reference group of college students. METHODS: A total of 226 (149 male, 77 female) Big Ten athletes and 213 college students (78 male, 135 female) from a large Midwestern University participated in the study. Three male groups: (1) non-lineman athletes, (2) football linemen, and (3) students and two female groups: (1) athletes and (2) students were created. Body composition (i.e., %fat) was determined via air plethysmography. Cut points of 20% fat for males and 30% fat for females were used to define over fat. Height was measured via a stadiometer, weight was measured via the BodPod calibrated scale, and BMI was calculated. A BMI cutpoint of 25 was used to define overweight. Using % body fat as the criterion measure, the sensitivity, specificity, and predictive values of BMI were calculated. Receiver operator characteristics (ROC) were used to derive optimal BMI cut points for body fatness. RESULTS: For the male non-linemen athlete group, sensitivity of BMI was high (1.0), but specificity was low (.27). Sensitivity was also high in the football linemen group (1.0). It was not possible to estimate specificity because only one individual was less than 20% fat. The sensitivity and specificity of BMI for the student group were (0.83) and (0.60), respectively. ROC analysis showed the optimal BMI cut points for the athlete, linemen, and student groups were 27.9, 34.1, and 26.5, respectively. For the female athlete group the sensitivity was 0.86 and the specificity was 0.78. For the female student group, the sensitivity was 0.43 and the specificity was 0.94. The optimal BMI cut point for female athletes and students was 26.7 and 22.7, respectively. CONCLUSIONS: The operating characteristics of the BMI classification system for overweight (i.e., 25 vs. <25) varies widely between different populations of college students. There is a high specificity in both non-lineman male athletes and football linemen, which results in few cases of over-fat individuals being classified as non-obese. However, the specificity is very low indicating that a large proportion of under fat individuals are classified as overweight. When compared to the male athletes, male students have a lower sensitivity, but a higher specificity. However, the optimal BMI cut points for all males suggest the current recommendations are too low. The sensitivity was higher and specificity lower in female college athletes when compared to students. The low sensitivity for students suggests a large proportion of over-fat individuals being classified as normal weight. The optimal BMI cut point suggests the current recommendations for overweight are too low in female athletes and are elevated in the general female student population.

Abstract #33

Impact of Walking 10,000 Steps/Day on Health and Functional Fitness

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The accumulation of 10,000 steps/day has been suggested as a reasonable goal for improved health benefits. PURPOSE: To determine whether individuals who accumulate 10,000 steps/day will demonstrate positive health and fitness benefits. METHODS: Twenty-eight sedentary individuals (n= 20 female, n= 8 male; age 60.4 + 5.51 yr) were randomly assigned into either a walking (W) (n=11) or control (C) (n=16) group. Following assessment of baseline walking levels, the W group was given a daily walking plan to help reach the goal of 10,000 steps/day within three weeks and then continued to train at 10,000 steps/day for 12 weeks. The C group was asked to maintain their current activity level during the 15-week period. Subjects were evaluated in the following measures: cardiovascular endurance (6 minute walk), resting heart rate, post-exercise heart rate, functional ability (8 foot up-and-go, chair stands flexibility), and cholesterol (total, HDL, total/HDL ratio) prior to and following the 15-week program. RESULTS: Significant changes over time were noted between groups (GxT) for 6 min walk distance ($p=0.040$), post-exercise HR ($p=0.020$) and total cholesterol (TC; $p=0.023$). While not statistically significant, the W group demonstrated improvements in total/HDL ratio (-11.06%), 8 foot up-and-go time (-0.09%), chair stands (7.36%), and flexibility (164%). The control group demonstrated declines or minimal change in each of these variables: total/HDL ratio (3.8%), 8 foot up-and-go time (0.7%), chair stands (1.87%), and flexibility (-175.9%).

CONCLUSIONS: A 15-week program accumulating 10,000 steps/day improves cardiovascular performance as measured by the 6 min walk test. In addition, this program positively influences a number of variables that are indicators of fitness and health.

Abstract #34
Baseline Fitness and Health Data in a Nationally Recognized Junior and Senior High School Physical Education Program
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This study's purpose was to collect baseline fitness and health data for the development of a CDC longitudinal fitness and health behavior related grant in children 13-18 years old from a nationally recognized PE program using a representative and random sample of students from five junior and two senior high schools. Because each junior and senior high school has a complete testing and fitness center (weight room, treadmills, and in-school options for special fitness activities, i.e., roller-blading or rock-climbing), we hypothesized that compared to normative data from both the Fitnessgram and national norms, such as the CDC's national growth charts for BMI, the results of this evaluation would show a strong positive effect on both fitness and health related variables. The total number of subjects tested was 270 (147 subjects from the junior highs (78 M/69 F), age 13.9 + 0.6 years; 123 subjects from senior highs (61 M/62 F), age 16.2 + 1.2 years). Because of the small number of subjects and a very culturally diverse sample population, subjects were not subdivided by race. The results indicated that in the junior highs 13% of males were overweight, which is 7.3% below the national average while only 11.6% of females were overweight or 7.5% below the national norms according to the children's body mass index 95th percentile of the CDC 2000 growth charts. For senior high students, 6.7% males and 8.2% females were overweight, which were 13.6% and 10.9% below national norms, respectively. More importantly, percent body fat measurements by BIA in the senior high students indicated that 100% and 83.6% of the males and females met or exceeded the Fitnessgram norms respectively for body composition. For all Fitnessgram variables tested (mile run, pacer, curl-ups, push-ups, sit and reach), on average 82.4% of males and 77.0% of females met or exceeded the Healthy Fitness Zone standard required scores.

Supported by a grant from PE-4-Life nonprofit organization

Abstract #35
Access to Physical Activity and Exercise: Effects on Spontaneous Tumors in Female Sprague-Dawley Rats
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The incidence of spontaneous tumors in Sprague-Dawley rats has ranged from 45-54%, with female rats having double the percentage compared with males. Mammary tumors account for most of the tumors. Tumors may induce cancer and other life-shortening diseases. Access to physical activity may influence tumor development. Animals that reside solely in a standard cage are extremely sedentary and this trait may enhance tumerigenesis. On the other hand, animals with access to physical activity may inhibit tumor development. Underlying mechanisms for why access to physical activity may impact tumorigenesis probably includes one or more of the following factors: reduced body weight, increased caloric expenditure, and a lower cumulative exposure to estrogen either by delayed menarche or increased number of anovulatory cycles, all of which are associated with regular physical activity. PURPOSE: This study compared the number, size, and age-associated incidence of spontaneous mammary tumors in female Sprague-Dawley rats with different access to physical activity: (1) none outside a standard cage (SED), (2) twice-weekly physical activity in a large box (PA), and (3) regular running wheel exercise (EX). METHODS: One hundred eight female rats were divided into three treatment groups and investigated and compared for tumor growth and development. RESULTS: Palpable tumors began to develop in all groups at around 59 weeks. SED animals had tumors that were greater in number and size compared with PA and EX. At 98 weeks, 14 EX rats had 36 tumors, 22 PA rats had 52 tumors, and 23 SED rats had 66 tumors. At 98 weeks, the SED group had the lowest percentage of tumor-free survival compared with PA and EX. CONCLUSION: Animals that resided solely in cages with no access to physical activity outside a cage demonstrated greater number and size of spontaneous mammary tumors, while access to physical activity and exercise for almost two years reduced spontaneous tumorigenesis in female rats.

Abstract #36
Effect of Age, Gender, and Aerobic Training Status on tPA Activity in Skeletal Muscle
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Decreases in tissue plasminogen activator (tPA) activity and/or increases in plasminogen activator inhibitor-1 activity result in impaired fibrinolysis, the capacity to lyse fibrin clots. Recent evidence suggests that skeletal muscle produces these fibrinolytic proteins and that their expression is modulated by aerobic exercise training (AT); however, data examining the effect of AT on skeletal muscle tPA activity is limited. The purpose of this study was to determine the effect of age, gender, and AT status on skeletal muscle tPA activity. METHODS: Muscle samples were obtained from the vastus lateralis via a percutaneous muscle biopsy following a 12-h fast in the following groups of subjects: young aerobically trained males (n= 7, VO2 max= 70.1± 6.7) and females (n=8, VO2 max= 50.6± 3.7); older aerobically trained males (n= 6, VO2 max= 51.9± 3.7); young untrained males (n=6, VO2 max= 58.9± 9.8) and females (n=6, VO2 max= 39.9± 7.2); and older untrained males (n=6, VO2 max= 39.6± 6.9). Skeletal muscle tPA activity was measured by casein-plasminogen gel zymography using a 14% polyacrylamide gel. Gels were incubated at 37C for 21 hours in Tris-Buffer (pH = 7.5) and stained with Coomassie Blue to determine band intensity. RESULTS: When comparing young and older men, age affected muscle tPA activity with older men having a higher activity compared to younger men (mean = 10395.4± 479.8 & 11522.1± 529.3pixels; p< 0.001). Additionally, AT status affected muscle tPA activity with untrained men showing a higher activity than trained men (mean= mean= 10705.2± 831.5 & 11156.0± 601.7 pixels; p< 0.05). When comparing young men and women, muscle tPA activity was not significantly different between males and females, however, there was gender by AT status interaction affect with the younger active females having a significantly higher muscle tPA activity (p<0.001) as compared with younger active females (means= 10893.0± 168.9& 10091.3± 180.6 respectively). CONCLUSION: The results of this study suggest that aging results in a higher muscle tPA activity in males. Furthermore, physical inactivity may result in higher muscle tPA activity in males but not females.

Abstract #37
Impact of Engineering Design on the Relationship between Accelerometry Activity Counts and Energy Expenditure
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There are three different types of accelerometry devices commonly used in physical activity (PA) research: triaxial, uniaxial, and the relatively recent omnidirectional. Each is purported to be effective in measuring PA, but there exist no studies that have simultaneously compared devices with these engineering schematics. Since accelerometers are commonly used in PA research, it is important to remain current regarding design advances in these devices. PURPOSE: To examine correlations between activity counts generated from uniaxial, triaxial, and omnidirectional accelerometers and energy expenditure (EE) determined by indirect calorimetry. METHODS: Forty-two adults (21 men, 21 women) age 48.9±7.6 completed four 6-min walking bouts at 53, 80, 107 m•min-1 and one self-selected speed (105.1±24.9 m•min-1) on a motorized treadmill while wearing one of each accelerometry device on both hips. Monitors were positioned according to either manufacturer recommendation, MTI (uniaxial), RT3 (triaxial), and Actical (Omnidirectional) or previous research. Metabolic variables (VO2, VCO2, RER, and kcal•min-1) were measured using rapid responding infrared (CO2) and electrochemical (O2) analyzers. Nine subjects (4 men, 5 women) repeated the same protocol within one month of the initial session to determine test-retest reliability. Pearson Product moment correlations were performed to assess the overall relationship between activity counts and EE (kcal•min-1) as the criterion measure. Z-ratios were calculated to examine differences in correlations and test-retest reliability was determined via the intraclass correlation coefficient (ICC) using a two-way mixed Cronbach's alpha model. Significance was set at $P < 0.05$. RESULTS: High correlations between monitors and velocity ($R = 0.81 – 0.88$) suggests that the monitors are sensitive to changes in velocity. Activity counts were highly correlated ($R = 0.83 – 0.85$; $P<0.01$) between monitors, indicating that all were providing similar estimates of EE. Correlations between activity counts and EE across all velocities were significant ($P<0.01$) for all accelerometers (MTI r = 0.78; RT3 r = 0.75; Actical r = 0.68) and there were no differences in correlations between devices. Test-retest reliability was strong for each accelerometer (ICC RT3 = 0.96; MTI = 0.85; Actical = 0.96) ($P<0.01$). CONCLUSIONS: These findings indicate that differences between uniaxial, triaxial, and omnidirectional acceleromtry devices are minimal and all three provide reasonable measures of PA during treadmill walking.

Abstract #38
Impact of Obesity on the Cardiorespiratory Response to Exercise
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INTRODUCTION: There is limited information describing the impact of body mass index (BMI) on the cardiorespiratory response to exercise. The purpose of this study is to describe the cardiorespiratory response to

exercise across various classes of BMI by gender. Methods: Two hundred sixty-four subjects were identified through a query of the Henry Ford Preventive Cardiology Outcomes (PRECO) database. Included were subjects 18-80 yr with no known heart disease, who performed a symptom-limited treadmill test with measurement of respiratory gas exchange and RER>1.05. Subjects were grouped based on their BMI. ANOVA was used to assess differences across BMI groups by gender. RESULTS: Peak VO2 data are shown in table. Among both men and women, peak VO2 per kg body mass decreased with increasing BMI, while absolute peak VO2 and percent predicted peak VO2 increased. Within each BMI group, peak VO2 was significantly lower in women compared to men. Among the three groups with BMI>30, women achieved a greater percent of predicted peak VO2 than men (92-104% vs 73-89%, respectively). CONCLUSIONS: In patients with obesity, the absolute ability (VO2, mL/min) of the cardiorespiratory system to respond to exertion remains intact. However, in terms of fitness, absolute peak VO2 is misleading given the marked reductions in relative peak VO2 (mL/kg/min) observed with higher BMI. Prediction equations are needed to better express this decrease in relative fitness.

Table

BMI	n	VO2 (mL/kg/min) Male	VO2 (mL/kg/min) Female	VO2 (mL/min) Male	VO2 (mL/min) Female	% Predicted VO2 Male	% Predicted VO2 Female
18.5-24.9	40	26.8±11.3	21.4±8.8	1997±884	1339±598	72±24	82±27
25.0-29.9	61	23.5±6.2	17.6±4.2	2113±622	1251±283	77±15	83±24
30.0-34.9	68	19.5±5.8	16.2±4.1	1991±572	1388±372	73±17	92±22
35.0-39.9	46	20.2±4.0	15.3±3.3	2337±465	1520±361	89±13	100±20
40.0	49	16.4±3.3	14.3±4.1	2448±370	1768±515	83±12	104±27
ANOVA, p	—	<0.0001	<0.0001	0.025	0.0004	0.002	0.005

Abstract #39
Evaluating the Predictive Ability of the Oxygen Uptake Efficiency Slope in Patients with Heart Failure

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BACKGROUND: Ventilatory efficiency is the best prognostic measure obtained from cardiopulmonary exercise testing of heart failure patients, but there are different methods to report it and its determination has not been standardized. Therefore, we investigated the relative prognostic power of a newer method, the oxygen uptake efficiency slope (OUES). METHODS AND RESULTS: Heart failure patients (n=355, 72% males, age 51 ± 10 years) had follow-up for at least five years from an exercise test. There were 145 events (41%, 133 deaths and 12 emergent cardiac transplants). Mean values were: peak oxygen consumption (VO2)17.3 ± 5.0 ml.kg-1.min-1, peak respiratory exchange ratio 1.13 ± 0.13, blood pressure 113 ± 18 / 78 ± 11, left ventricular ejection fraction 21.5 ± 7.7%. The mean OUES was 1606 ± 586 and it was a significant univariate predictor of mortality by Cox Regression (p<0.001). When considered within a base multivariable Cox model including ejection fraction, systolic blood pressure, peak VO2, sex, etiology, and heart rate it maintained its significant predictive ability (p=0.005). Peak VE/VCO2 slope was a better measure of ventilatory efficiency; the base multivariable Cox model explained 18% (generalized R2) of the mortality prediction, the base model improved to 19% with the addition of OUES but the base model improved to 23% with the addition of peak VE/VCO2 slope. CONCLUSION: Like other measures of ventilatory efficiency, OUES was a significant predictor of mortality in this large cohort of heart failure patients. OUES had a minor influence on the multivariable model and VE/VCO2 slope to peak exercise continued to be the superior expression of ventilatory efficiency in patients with heart failure.

Abstract #40
The Ability of Bioelectrical Impedance to Detect Body Composition Changes During a Physical Activity Intervention

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Body composition assessment is an important component of the individual health and fitness profile. OBJECTIVE: The objective of this study was to assess the ability of bioelectrical impedance (BIA) to accurately detect body composition changes compared with air displacement plethysmography (ADP) during a physical activity intervention in previously sedentary, overweight men and women. METHODS: Fourteen men (46+7 yrs) (mean+SD) and 22 (47+5 yrs) women with a body mass index (BMI) >25 kg.m-2 participated in a 10,000 steps per day intervention over 36 weeks. Body composition was measured by ADP and BIA at baseline, after 20 weeks and after 36 weeks. RESULTS: There was a significant difference in the ability of BIA to detect body composition changes compared to ADP in women but not men. Among women, BIA overestimated the change by 2.2+1.9% and 1.7+2.2% body fat from baseline to 20 weeks and from baseline to 36 weeks, respectively. Among men, BIA overestimated the change by 0.7+1.8% and 0.5+2.9% body fat from baseline to 20 weeks and from baseline to 36 weeks, respectively. In comparing body fat values at each measurement period, BIA underestimated percent fat in men and women.

	Baseline	20 weeks	36 weeks
Men			
ADP	34.5+6.5	32.6+6.7	31.7+7.2
BIA	33.1+6.3	31.6+6.3	30.8+6.9
Women			
ADP	48.1+5.3	46.2+5.7	46.6+5.3
BIA	45.1+4.0	45.6+3.8	45.4+3.7

CONCLUSION: BIA appears to be a suitable method for detecting body composition changes in men. However, BIA did not accurately detect body composition changes in women and, therefore, an alternative body composition assessment method should be considered for this population.

Abstract #41
A New Index to Improve Prognostic Assessment of Heart Failure Patients

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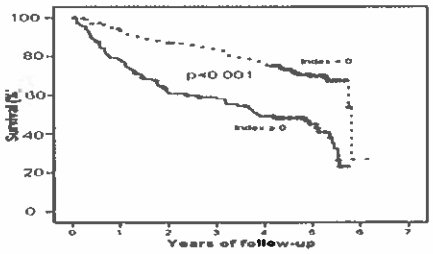
BACKGROUND: Clinically, peak oxygen consumption (VO2) has been the only exercise test variable that has been used for prognostic purposes in patients with heart failure. More recently, poor ventilatory efficiency during exercise has been shown to be the most prognostic variable obtained from cardiopulmonary exercise testing, especially when combined with a poor peak VO2. Therefore, the purpose of this study was to provide a simple, objective index involving these two variables to assess prognosis. METHODS AND RESULTS: Heart failure patients (n=355, 72% males, age 51 ± 10 years) had mortality follow-up for at least five years from an exercise test where peak VO2 (17.3 ± 5.0 ml.kg-1.min-1 with RER = 1.13 ± 0.13) and peak VE/VCO2 slope (37.0 ± 9.0) were determined. Cox regression analysis was used to create an exercise index score defined as one-half the peak VO2 subtracted from one-fifth of the VE/VCO2 slope. The mean index was −1.14 ± 3.79. Kaplan–Meier analysis displays statistically improved survival (Fig) for patients whose index was < 0 (n=228, 31% mortality) than for patients whose index was ≥ 0 (n=127, 58% mortality). CONCLUSION: The variables peak VO2 and VE/VCO2 slope can be combined to calculate a simple, objective assessment of prognosis in heart failure patients. A useful clinical cut point for the determination of an exercise index appears to be at a value of zero.



Abstract #42
Knee Joint Muscle Co-Activation Comparison between Females Participating in Low- and High-ACL Injury Sports

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It has been shown that co-activation of the musculature surrounding the knee joint provides dynamic restraint against high shearing stress that often takes place at the knee joint during athletic competition. However, it has also been noted that the high degree of quadriceps activation involved in deceleration and change of direction in not counteracted by a large hamstrings activation, but the hamstrings have been seen to contract at only ~30% of maximum during such maneuvers while the quads are contracting at ~130% of maximum. The hamstrings seem to de-activate in order to allow the leg to move efficiently allowing the stability of the knee joint to diminish. PURPOSE: To determine whether there is a difference in co-activation of the musculature surrounding the knee joint in basketball players who participate in a sport with high incidence of female ACL injury versus swimmers where there is low ACL injuries. METHODS: Five Wheaton College varsity women's basketball players (BB) and five Wheaton College varsity women swimmers (S) all without previous ACL injury jumped from a deep squat position through a forward to diagonal reverse to forward pattern on each leg. Peak pre-active and reactive muscle EMG activity was collected bilaterally from three muscles: vastus medialis oblique (VMO), medial hamstring (MH), and lateral hamstring (LH) using self-adhesive BIOPAC disposable monitoring electrodes that was processed with the BIOPAC MP35 system and TEL100L-RF remote monitoring system (BIOPAC System Inc., Goleta, CA). RESULTS: Raw graphical peak EMG activity data in the VMO is much greater than that of either the LH or MH for both groups and LH and MH activity was similar in both groups as well with higher activity being found in the MH. The initiation of VMO activity was later than the initiation of hamstrings activity, after the point when the hamstrings had reached peak activity. CONCLUSIONS: The differences were insignificant, but there may have been a trend toward partial deactivation of the hamstrings taking place in the BB group compared with S. Based on the graphical EMG data there was no difference in the co-activation pattern for subjects trained in these two sport activities.

Abstract #43

Electromyographic Analysis of "Balanced" and "Unbalanced" Positions during Piano Playing

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PURPOSE: The purpose of this study was to examine the muscle activity of the wrist/finger extensors and lateral deltoids of both arms during piano playing. Secondarily, this information would be used to begin to provide biofeedback to pianists for injury prevention. It was hypothesized that the balanced position would produce less muscle activity than the unbalanced playing position. METHODS: This study was conducted at the Conservatory of Music at Wheaton College. The subject was a professional pianist (55 y/o). All EMG data was collected using the BioPac MP35 with bipolar surface electrodes. Four tests were performed with EMG activity collected for the right and left lateral deltoids and the right and left wrist/finger extensors. A total of four tests were performed in which muscular activity was collected at four levels of electrode placement (R/L Deltoids and R/L Extensors). Test A consisted of six trials (1-3 balanced, 4-6 unbalanced) of held C-major chords played for 15 seconds. Test B included two trials (1 balanced, 1 unbalanced) of staccato C-major chords played for 15 seconds. Test C included four trials (2 balanced, 1unbalanced) right-hand-only broken C-major chords played for 8 seconds. Test D consisted of two trials (1 balanced, 1 unbalanced) of J.S. Bach's Italian Concerto played for 60 seconds. Balanced and unbalanced position was determined by the subject. Unbalanced position was characterized based on finger/arm tension and movement of arms mediolaterally. All EMG data was presented as the value of the area underneath a rectified, smoothed, and integrated curve. Independent t-tests were used to determine significant differences between the "balanced" and "unbalanced" playing positions ($p<0.05$). RESULTS: The difference between the total extensor activity in the balanced versus unbalanced position showed that there was over twice as much activity in the unbalanced position. The average and total muscle activity for each group was higher when played in the unbalanced position, and unbalanced had a larger effect on the extensors and almost no effect on the deltoids. However, there was no statistically significant difference between the left and right deltoid and in the right wrist/finger extensors. There was a statistically significant difference in the left extensors. CONCLUSIONS: In the most basic sense, this study showed that there was a large difference (although not statistically significant) in the amount of muscle activity between the balanced and unbalanced positions, confirming the hypothesis. More study needs to be done to further develop the idea that playing in a balanced position requires less muscular activity, which may lead to fewer overuse injuries than playing in an unbalanced position.

Abstract #44

Genetics an Intrinsic Risk Factor for Stress Fractures in Competitive Athletes

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Stress fractures are an overuse injury to bone resulting from accumulated repetitive load cycles. There is mounting body of indirect evidence that genetic factors could play a role in stress fracture predisposition. Identifying genetic variants which increase the susceptibility to stress fractures would improve identification of the pathophysiology and treatment of stress fractures. PURPOSE: To determine the influence of T to C transition within exon 2 of the vitamin D receptor (VDR) gene defined by endonuclease FOK1 on the risk of stress fractures in competitive athletes. METHODS: Twenty-seven competitive athletes, 12 with stress fractures and 12 without stress fractures volunteered for the study. Each athlete with stress fracture was matched with one control on the basis of age, gender, race, and sport. DNA analysis was done by restricted fragment length polymorphism. Medical and sports history was obtained through a questionnaire. RESULTS: Group comparisons indicated that the groups were equivalent in their body composition and stature. Chi-square analysis done on 24 subjects revealed no significant difference in the genotype distribution between the stress fracture and the control groups ($p = 0.65$). CONCLUSION: The VDR gene polymorphism is not a primary cause of stress fractures in competitive athletes.

Abstract #45

The Effect of Oral Contraceptives on Musculo-Tendinous Stiffness of the Knee Flexors

M.B. Colthrust, E.L. Dugan
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The purpose of this study is to investigate the relationship between oral contraceptive use and the musculo-tendinous stiffness of the knee flexors. Twenty-three females ranging in age from 20- 30 years and ten male participants (control group) also ranging in age from 20- 30 years participated in the study. Knee flexor stiffness of the female groups was tested after a blood draw in order to determine estradiol and 17-OH progesterone levels. A uniaxial accelerometer was used to assess knee stiffness at 30% and 50% of maximal voluntary contraction (MVC); stiffness was based on the exponential decay of the damped oscillation after a manual perturbation was applied to the lower leg. Men had higher knee flexor stiffness values than the women on oral contraceptives (OC) and the women not using OCs (Non-OC). The women in the Non-OC group had significantly higher estradiol values (127.2±60.7 pg/ml) than both of the Ortho-Tri Cyclen and Other OC groups (58.8±5.3 and 57.1±9.1 pg/ml), respectively. At 30% of MVC, the Ortho-Tri Cyclen group, the Other OC group, and women not using OC's had a mean stiffness of 249.3±94.5, 274.1±79.1 and 216.0±43.3 Nm/rad, respectively, and at 50% of MVC values of 290.2±70.7, 326.7±78.9 and 267.9±52.6 Nm/rad, respectively. No correlation was found between estradiol and stiffness. These results indicate that there was no significance between knee flexor stiffness of the OC and Non-OC groups.

Abstract #46

Isokinetic Stength and Functional Performance Assessment of Post-Rehabilitation ACL Reconstructed Knees

Kim Baran, Ashleigh Hall, William Souders, Siao Lynn Starkey, Kevin Carlson
Wheaton College, Wheaton, IL

PURPOSE: The purpose of this study was to examine differences in isokinetic strength and functional performance in males and females following anterior cruciate ligament reconstructive surgery. It is hypothesized that females will show a greater disparity in strength and overall performance between the injured vs. reconstructed knee when compared with their male counterparts. METHODS: Nine subjects, four male and five female (18-22 y/o), who had one surgically repaired ACL served as subjects. All subjects were within nine months to thirty-six months post-surgery (M = 20.5 months). All had completed a general physical therapy rehab protocol and were cleared to participate in any activity. Following a general warm-up protocol, a hop test for distance was conducted on both the non-injured and reconstructed knee. The hop test protocol followed that of Hiemstra, et.al. (2000). The Kin-Com 500H Isokinetic Dynamometer (Chattecx Corporation, Chattanooga, TN) was used to perform six trials of both concentric and eccentric contractions of the knee extensors at 90 deg/s for both legs. A ratio was calculated between the non-injured and reconstructed legs for both testing protocols. The ratios compared the hop distance, torque of concentric contraction, and torque of eccentric contractions for each subject by dividing the uninjured leg performance by the ACL reconstructed leg performance. The female ratios for each test were then compared with the male ratios for each test. An independent t-test was used to determine differences between groups ($P < 0.05$). RESULTS: Mean male hop ratio = 1.024, mean female hop ratio = 1.026. Mean male concentric ratio = 0.834, mean female concentric ratio = 1.183. Mean male eccentric ratio = 1.042, mean female eccentric ratio = 1.1. The independent t-test showed no statistical difference between tests across the two groups. CONCLUSIONS: The results of this study show no significant difference between males and females in either hop distance ratio or torque of concentric and eccentric contractions of the knee extensors. While women seem to be at a greater risk for initial ACL injury, the long-term performance does not appear to be affected by gender. Other aspects to determine in future studies would include the length of time since surgery, the type of rehabilitation program, the type of surgery performed, and daily activity level.

Abstract #47

Kinematic Changes in Landings of Fatigued Female: Possible Injury Considerations

M. Jones, K.Salzer, R. Carver, K. Broers, C. Creekmur, M. Walsh
Miami University, Oxford, OH

Most research on jumping and landing to date has been performed using male subjects. Because of gender differences in muscle architecture, upper/lower body strength proportions, bone alignment, and basic anthropometric proportions the data taken from the previous research on males may not be transferable to the female population. In addition, it has been reported that post adolescent females have a much higher incidence of knee injuries than males. Because of this there has been a recent increase in research on jumping/landing mechanics of females. Although this new research has documented a number of important findings regarding the basic mechanics of landing, researchers have neglected to examine the role of fatigue on jumping biomechanics in females. The purpose of this study was to examine kinematic parameters during both non-fatigued and fatigued states in females during landings. Fifteen subjects (9 females, 6 males) volunteered to participate in this study. The protocol was explained to all subjects and they all signed an informed consent waiver before any data collection. Although this study is focusing on females we had a small group of males perform the experiment to help determine if the measured factors were gender specific. Subjects were asked to perform a maximum counter movement jump (CMJ) every 15 seconds until they performed 100 jumps. Kinematic data was collected for every even jump using two digital cameras with a data collection rate of 60 Hz. Cameras were set up to capture sagittal and frontal plane movement. The video data was collected on a computer using the SIMI motion analysis

system. The parameters that were analyzed were: knee angle at landing (sagittal plane and frontal plane), minimum knee angle (sagittal and frontal plane), distance between the knees at landing and the minimum distance during landing, and flight time. The jumps that were analyzed were jumps 4, 6, 8, 10 (considered non-fatigued) and 90, 92, 94, 96 (considered fatigued). The first three jumps were excluded to let the subjects get a feel for the protocol, the last four jumps were excluded to prevent the subject's extra effort, or "second wind," during the final jumps to mask the effects of fatigue. Leg dominance was established by asking subjects they would kick a ball with for maximum distance. Reliability analysis was performed and most variables showed a high test retest reliability. There was a tendency that the fatigued jumps were not as repeatable. This may be a sign of neuromuscular fatigue. Jump height decreased insignificantly, ~ 1 cm, from the early jumps to the later jumps (~ 2 cm for males). The only pattern of interest with regard to female frontal plane kinematics was the knee angle in the frontal plane. A paired t-test found that the dominant leg showed a significant ($p<0.05$) change between the fatigued and non fatigued jumps between landing and maximum knee abduction (valgus moment). For females, sagittal plane kinematics showed trends of increased extension at landing and increased total ROM. These were not significant ($p<0.06$), but this is likely because of the small number of subjects measured to date. A straighter leg during fatigued landings has been reported previously for male subjects during running and jumping and seems to indicate the muscles inability to effectively cushion the landings. Geometrically a straighter knee at requires less muscular force to resist the forces that cause the knee to flex. In the literature to date, abduction at the knee (valgus moment) has been implicated in knee injury. These results seem to imply that fatigue may a risk factor for non-contact knee injuries.

Abstract #48

Kinetic Changes in Landings of Fatigued Females: Possible Injury Considerations

C. Creekmur, K. Broers, K. Salzer, R. Carver, M. Jones, M. Walsh
Miami University, Oxford, OH

It is well accepted that females sustain a higher incidence of knee injuries than males. Many of these are non-contact injuries in which the subject is landing or changing directions during a sporting event. Traditionally, the research on jumping and landing has been performed on male subjects. Recently, there has been an increase in research on jumping/landing mechanics of females. Although this new research has documented a number of important findings regarding the basic mechanics of landing, researchers have neglected to examine the role of fatigue on jumping mechanics in females. The purpose of this study was to examine kinetic parameters during both non-fatigued and fatigued states in females during landings. Fifteen subjects (9 females, 6 males) volunteered to participate in this study. The protocol was explained to all subjects and they all signed an informed consent waiver before any data collection. Although this study is focusing on females, we had a small group of males perform the experiment to help determine if the measured factors were gender specific. Subjects were asked to perform a maximum counter movement jump (CMJ) every 15 seconds until they performed 100 jumps. Force time was collected for every other jump using a Bertec force plate. The parameters that were analyzed were: jump height (calculated from flight time), peak impact force at landing, and the slope of the force curve from landing until the peak impact force. The jumps that were analyzed were jumps 4, 6, 8, 10 (considered non-fatigued) and 90, 92, 94, 96 (considered fatigued). The first three jumps were excluded to let the subjects get a feel for the protocol, the last four jumps were excluded to prevent the subject's extra effort, or "second wind," during the final jumps to mask the effects of fatigue. Reliability analysis was performed and all measured force parameters showed a high test retest reliability. Cronbachs alpha scores for the non-fatigued jumps were: jump height 0.993, impact force 0.980, slope 0.961. For the fatigued jumps, the Cronbachs alpha scores were jump height 0.993, impact force 0.971, slope 0.722. The repeatability of the measured parameters decreased somewhat for the fatigued measures. Jump height decreased insignificantly, ~ 1 cm, from the early jumps to the later jumps (~ 2 cm for males). The impact force for females increased from an average of 3039 N to 3228 N and the slope increased from 30564 N/s to 39983 N/s during the non-fatigue jumps and fatigued jumps, respectively. The male subjects showed only a very slight decrease in both impact force (4341 N to 4250) and slope (72638 N/s to 73803). Paired t-tests determined that none of these trends were significant. This is probably because we have only measured nine female subjects to date and these numbers are too small to expect statistical differences. Regardless of the lack of significance, these results are interesting because the increases in the force parameters of the female subjects are in spite of the fact that the subjects were jumping slightly lower heights and, therefore, are contacting the ground with a slightly lower impact velocity. The increase in impact force and slope can probably be explained by the fatigue in the muscles of the lower extremity and their inability to effectively dampen the impact at landing. A similar phenomenon has been seen in male runners who become fatigued. In addition, the decrease in repeatability of the fatigued measures indicates an increase in variability possibly caused by a decrease in neuromuscular control as a result of fatigue. These results seem to support the hypothesis that fatigue can contribute to non contact landing injuries.

Abstract #49

The Clear Cleat: Facilitator for Aerobic Activity for Persons at High-Risk For Lower Extremity Amputation?

E.E. Klein, R. Crews, S. Wu, D.G. Armstrong
Scholl's Center for Lower Extremity Ambulatory Research (CLEAR) at Rosalind Franklin University of Medicine and Science, Chicago, IL

Exercise and physical activity have not been studied extensively in persons with active diabetic foot wounds primarily because there is not currently a device that allows patients to exercise while sufficiently off-loading the ulcer site at the same time. The purpose of this project was to develop cycling foot gear that reduces forefoot pressure and contact area in the forefoot region. METHODS: Eight healthy participants rode a recumbent bicycle under three different cycling conditions for seven minutes each: a control condition with standard pedals and gym shoes (C), gym shoes in collaboration with a specialized cleat (GSC), and an offloading insole in collaboration with the specialized cleat (OIC). Pressure and contact area of the plantar aspect of the feet were recorded once each minute for a 10 second interval. RESULTS: Total contact area (cm2) was greatest in C ($p<.001$), rearfoot contact area was greatest in GSC ($p<.001$), and forefoot contact area was greater in C than during OIC ($p<.001$). Total peak pressure (kPa) was greatest in GSC ($p<.001$) and significantly reduced in OIC ($p<.001$). The rearfoot peak pressure was greatest during GSC ($p<.001$) and the forefoot peak pressure was greatest during OIC ($p<.001$). The total and rearfoot pressure-time integral (PTI) was greatest in GSC ($p<.001$); the forefoot PTI was significantly reduced in GSC and OIC ($p<.001$). Peak pressure was reduced by 65- 72% during cycling when compared to gait. CONCLUSION: The results of this study suggest that modifications to cycling foot gear may significantly reduce the peak plantar pressure of patients while cycling. This may play a significant role in the treatment of plantar neuropathic or ischemic foot wounds. Furthermore, it could potentially permit these otherwise sedentary individuals a basic form of safe aerobic activity.

Abstract #50

Is Player's Height a Factor in Basketball Free Throw Shooting?

Charles Woods; Rafael Bahamonde, FACSM; Fadi Soliman
Indiana University-Purdue University, Indianapolis, IN

In recent years, a great deal of media attention has been given to the poor free throw shooting percentage (FTP) of tall basketball players like Shaquille O'Neal (53%) and Ben Wallace (42%). Numerous theories by coaches have been proposed in an attempt to explain this poor performance without any scientific evidence to support them. One of these theories suggests that there is a relationship between FTP, height, and player's position (guard, forward, or center). PURPOSE: To examine if there was a relationship between players FTP, height, and position. METHODS: NCAA top 50 FTP statistics from 2001-2005 Division I and II were used in the analysis. Descriptive statistics, Pearson Product Moment correlations, and multiple regression techniques were used to analyze the data. RESULTS: Five hundred seventeen cases (N=517) were included in the analysis. The average number of free throws attempted by the players was 124 ± 38. Of the 517 cases, 228 were senior, 179 juniors, 87 sophomores, and 23 freshmen. An overwhelming majority, 413 were labeled as guard, 101 forward, and 3 centers. The average height of the players was 187.5 ± 11 cm with an average FTP of 87.4 ± 2.5. As expected, there was significant correlation ($p = .01$) between height and position ($r = .43$), but there was also a small but significant negative correlation between FTP and position ($r = -0.18$). A significant regression equation was found $F(2,515) = 10.7$, $p < .001$ but it had an R value of 0.2, which indicates that little of the variation in the FTP can be explained by the height of the player and position. CONCLUSION: There is little or no association between height, position, and FTP, and they should not be considered as factors in free throw shooting performance.

Abstract #51

National Study of Injury Rates in Football: 1987-88 vs. 1997-98 (College) and HS vs. College Teams (1997-98)

E.D. Zemper
University of Michigan, Ann Arbor, MI

Prospective data on exposures and injuries were collected from representative national samples of college football teams in 1987-1988 and from college and high school teams in 1997-1998. Patterns and rates of injuries for HS and college are similar with regard to body parts most frequently injured (knee, ankle, shoulder, head), most frequent types of injuries (ligament sprains, muscle strains, contusions, concussions), player position, and injury mechanism (being tackled, blocking, tackling, being blocked, sprints/running). Comparisons of the 1987-88 and 1997-98 college data indicate similar rates and patterns, except for a higher concussion rate and injury rate while sprinting/running, and slightly lower rates for strains,

contusions, and fractures during the later period. Ankle sprains are the most common injuries, followed by knee ligament sprains and concussions. During both time periods the game injury rate (31/1000 Athlete-Exposures) was about 8-9 times higher than the practice injury rate (3.5) for the college teams, while it was 5-6 times higher for the HS teams (17.4/1000 A-E game vs. 3.2 practice).

Abstract #52
Epidemiologic Overview of Concussion in Football
E.D. Zemper
University of Michigan, Ann Arbor, MI

Football injury and exposure data were collected from representative national samples of college teams in 1987-1990 and from high school and college teams in 1997-1998. From this large set of prospective data, analyses were done of concussion rates and patterns. The total data set involved over 20,000 player-seasons and over 1.75 million athlete-exposures to the possibility of injury. While the total injury rate per 1,000 Athlete-exposures (A-E) for college players was nearly the same during the two time periods (6.2 in '87-'90 and 5.9 in '97-'98), the concussion rate increased from 0.33/1000 A-E in '87-'90 to 0.58 in '97-'98. The high school concussion rate in 1997-1998 was nearly the same as the college rate (0.56/1000 A-E). During 1997-1998 between 55% and 75% of the concussions were caused by helmet-to-helmet contact. Most (95%) of the concussions did not involve loss of consciousness. The risk of concussion for those with a previous concussion was 6.0 times higher for college players during the earlier period, and 5.3 times higher during 1997-1998. The relative risk for HS players was 6.7 times higher.

Abstract #53
Knowledge, Attitudes, and Behaviors of Vending Machine Choices among Selected College Students
Stacey L. Ruholl
Eastern Illinois University, Charleston IL

Nutritional status among college students is a research topic that is limited in the literature. Multiple studies have assessed children and adolescents, but much remains to be discovered with the college student population. PURPOSE: (1) To investigate vending machine use among college students, (2) to examine knowledge of the nutrient content of foods in vending machines, and (3) to determine to what extent healthier choices would be made if they were made available and easy to identify among college students. METHODS: A 25-item survey developed by the researcher was used to answer the following research questions: (1) What are college students' attitudes and behaviors regarding use of vending machines? (2) To what extent would college students select healthier options from vending machines if they were available? and (3) What is the level of knowledge regarding the nutrient content of foods in vending machines among selected college students? Students from four sections of a "Fit for Life" class at a medium-sized Midwestern university made up the subject pool (n=90). The survey took approximately 15 minutes to complete. The data were analyzed utilizing descriptive statistics such as frequencies, t-test, and ANOVA. RESULTS: Students spent $0 to $20 per week on vending machine purchases (mean = $2.00). Items chosen most often were candy bars, other sweets, water, and Powerade. Most students (72.2%) reported that they would choose healthier items if they were available, and most students (76.7%) responded that they would choose healthier items if they were coded to easily identify them. Students' knowledge of the nutritional content is poor overall. Although, there was a statistical significance between females and males in mean total knowledge score (C.I. = 0.003). CONCLUSIONS: This study was significant for educators because it describes students' behaviors with vending machine purchases, and it demonstrates a need for more nutrition education. Also, educators need to make an effort to make available healthier options, as well as develop a coding system so healthy items are more easily identified. Future research in this area is necessary with a more diverse population and with various campuses across the country.

PROGRAM

MWACSM

Midwest Regional Chapter of the American College of Sports Medicine

AMERICAN COLLEGE
OF SPORTS MEDICINE

MIDWEST ACSM REGIONAL CHAPTER ANNUAL MEETING

PURDUE UNIVERSITY

NOVEMBER 5-6, 2004

WELCOME TO THE MIDWEST REGIONAL CHAPTER

AMERICAN COLLEGE OF SPORTS MEDICINE

ANNUAL FALL MEETING

NOVEMBER 5-6, 2004
PURDUE UNIVERSITY
WEST LAFAYETTE, INDIANNA

Dear MWACSM Members, Students, and Guests,

As Program Coordinator for the 2004 MWACSM Annual Meeting it is my pleasure to welcome you to Purdue University campus. One of the Chapter's Strategic Plan Objectives was to host a meeting on a campus to reduce the costs of the annual meeting. I hope that you will find many opportunities available to you during your time on-campus.

Please enjoy using your MWACSM portfolio and try to attend these important meeting events:

Keynote by Chris Rosenbloom, Ph.D– Friday evening
Keynote by Dottie Drake – Saturday afternoon
Student Social in the Purdue Memorial Union Recreation Center– Friday evening
Exhibitors' Displays/ Product Demonstrations / Posters – Saturday
Students Award Ceremony - Saturday luncheon
President's Lectures – both days during the Annual Meeting

Many individuals have contributed to make the meeting possible. I would like to thank Tim Kirby and Carmen Babcock in the MWACSM Executive Director's Office, Lynn Darby, last year's Program Coordinator, Chris Womack, MWACSM President, Lynn Millar Andrews University, Darlene Sedlock Purdue University and Alicia Gordon, Undergraduate Student from Baldwin –Wallace College and the following from Purdue University: Cody Sipe, Director A.H. Ismail Center for Health, Exercise & Nutrition and Tom Robertson, Event Planning and On-Site Coordinator.

We have many sponsors and Gatorade and Pfizer continue to support the national ACSM and the Regional Chapters. Lafayette Instruments has supported the President's Lectures. Again, I hope you enjoy the meeting and find a chance to network with many of your professional colleagues!

Sincerely,
Amy Jo Sutterluety, Ph.D., FACSM, Past-President, MWACSM

2004 MWACSM BOARD OF DIRECTORS

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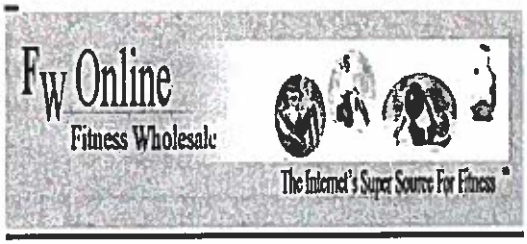
PROGRAM ACKNOWLEDGMENTS

THE MIDWEST REGIONAL CHAPTER OF AMERICAN COLLEGE OF SPORTS MEDICINE WOULD LIKE TO ACKNOWLEDGE THE GENEROUS FINANCIAL SUPPORT OF THE FOLLOWING ORGANIZATIONS:

- Gatorade Sports Science Institute®
- Pfizer®
- Lafayette Instrument®
- ParvoMedics
- Fitness Wholesale
- Human Kinetics
- The Health and Physical Education Division at Baldwin-Wallace College
- The Stewart Center at Purdue University
- Purdue Memorial Union at Purdue University
- Ismail Center for Health, Exercise and Nutrition



Human Kinetics

ACKNOWLEDGMENTS

THE MIDWEST REGIONAL CHAPTER OF AMERICAN COLLEGE OF SPORTS MEDICINE WOULD ALSO LIKE TO THANK THE FOLLOWING PEOPLE FOR THEIR SUPPORT IN MAKING THE MWACSM ANNUAL MEETING A SUCCESS:

ORAL COMMUNICATION /ABSTRACT REVIEWERS:
Chris Womack Ph.D. Michigan State University
Hermann Engels, PhD Wayne State University

REGISTRATION:
Tim Kirby, Ph.D., Carmen Babcock, Jaimy Lekan, and other OSU students at the MWACSM Executive Director's office

CONTINUING EDUCATION CREDITS:
ACSM has approved this meeting for 13 CEC's and the Weekend Warrior Workshop for 2 CME's.

STUDENT FORUM/SOCIAL:
Cody Sipe MA Ismail Center for Health, Exercise and Nutrition

CONFERENCE INFORMATION

OBJECTIVES

The 2004 meeting of the MWACSM is designed to:

- Enhance the scientific and clinical understanding of the physiological, biochemical, and psychological basis for the changes that occur during and following exercise in both normal and pathological states;
- Provide a forum for members and students to present research related to exercise science and sports medicine; and
- Promote interaction among scientists, clinicians, and students in related fields to provide new approaches to, and perspectives on, and problems in exercise science and sports medicine.

TARGET AUDIENCE

MWACSM members, ACSM members, clinicians, professionals, and students interested in the field of sports medicine and exercise science.

ACSM CEC's

"The American College of Sports Medicine's Professional Education Committee certifies that this continuing education offering meets the criteria for 13.0 credit hours of ACSM Continuing Education Credit."

ACSM CME's

The American College of Sports Medicine's Professional Education Committee certifies that this continuing education offering meets the criteria for 2.0 credit hours of ACSM Continuing Education Credit. Credit for the CEC will accrue by attending the "Weekend Warrior Workshop" on Saturday from 8-11 am. CEC forms may be obtained at the registration booth.

NAME BADGES

Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Please hold on to your badge!

MEETING LOCATIONS

All sessions and events will be held in the Stewart Center, Krannert Auditorium and East/West Faculty Lounge and Purdue Memorial Union Recreation Center. Room assignments for educational events are detailed in this program, along with a map of the facilities.

LUNCHEON BANQUET
The annual luncheon banquet is scheduled for Saturday from noon-1:30 pm in Union Building, East/West Faculty Lounges.

PLANNED SOCIAL GATHERINGS
Please plan to attend the social and student raffle 9-11 pm, Friday in the Purdue Memorial Union Recreation Center. It is located on the basement level of the Union building.

ANNUAL BUSINESS MEETING
This important business meeting is your opportunity to participate as an active voice in affecting the future of the Midwest Chapter of ACSM. Please plan to attend on Saturday afternoon, immediately following the banquet luncheon.

AWARDS
The annual 'Founder's Award', the Professional Awards, and MWACSM Student Awards Ceremony will be announced at the banquet luncheon on Saturday. The Founder's Award is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

WORKOUT PASSES
Workout passes for the Student Recreation Center at Purdue will be available for pick up at the MWACSM registration desk.

FUTURE MEETING SITE
The 2005 meeting will be at the Horizon Convention Center in Muncie, Indiana from Sept. 29-Oct. 1. Rooms will be blocked at the Roberts Hotel.

PURDUE MEMORIAL UNION FLOOR PLAN

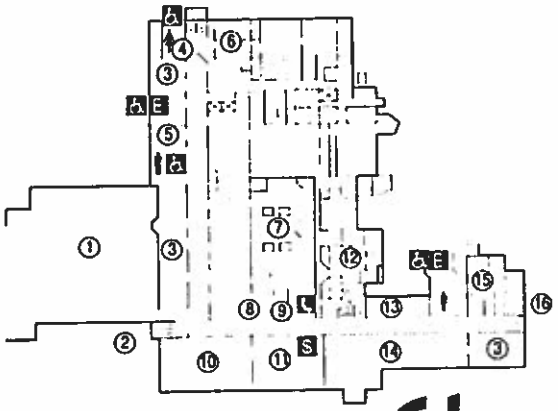
floor plan

purdue memorial union

Ground Floor

Stewart Center and Purdue Memorial Un

1 Future site of Envision Center
2 DAIS Development and Alumni Information Services
3 Dining Areas
4 Brass Rail Room 88
5 Cyber Cafe
6 Oasis Cafe
7 Union Market
8 Villa Pizza
9 Freshens
10 West LaPosada Dining Area
11 East LaPosada Dining and TV Area
12 Dining Services Office
13 Amusement Games Room
14 Pappy's The Original Sweet Shop
15 Catering and Events Office
16 PMU Recreation Center



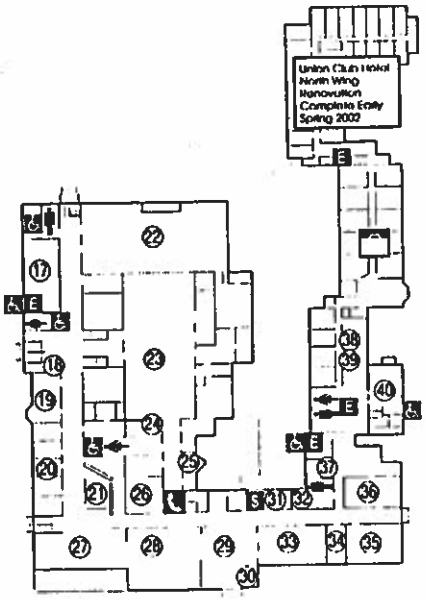
N

E Elevators
Restrooms
Handicap Access
Union Club Hotel Rooms
Phones
S ATMs

Main Floor

Purdue Memorial Union

17 Coat Check
18 Book of Great Teachers
19 Purdue Alumni Association
20 Alumni Gift Shop
21 BoilerCopyMaker
22 North Ballroom
23 South Ballroom
24 Room 136
25 Terrace Room 131
26 Card Services and Student ID 130
27 West Main Lounge
28 East Main Lounge
29 Great Hall
30 Visitors Information Center Kiosk
31 Check Cashing
32 Cashier's Office
33 Room 118
34 Room 112
35 Robert L. Ringel Art Gallery
36 Director's Office 108
37 Room 103
38 Union Club Reservations
39 Union Club Front desk
40 Union Club Lobby



Second Floor

Purdue Memorial Union

41 Purdue Student Union Board
42 Room 258
43 Room 256
44 Director's Dining Room 265
45 Council Room 263
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47 Lafayette Room 230
48 Sagamore Restaurant
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50 East Faculty Lounge 240
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56 President Emeritus Office 218
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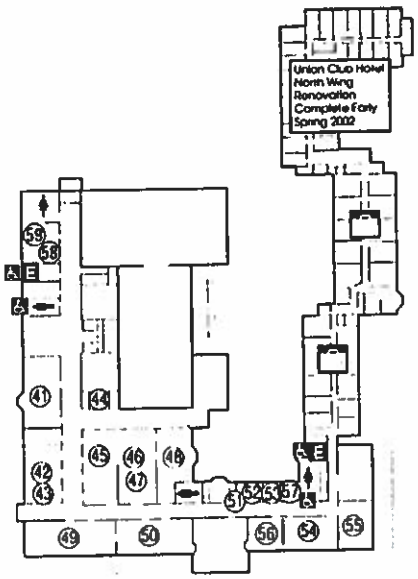
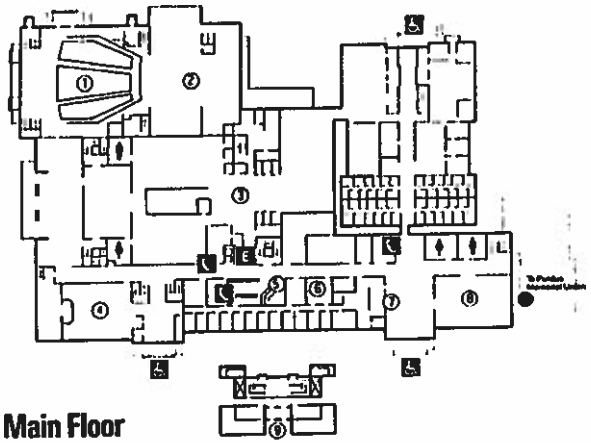
59 Panhellenic 286



floor plan

stewart center



N

E Elevators
Restrooms
Handicap Access
Union Club Hotel Rooms
Phones
S ATMs

Main Floor

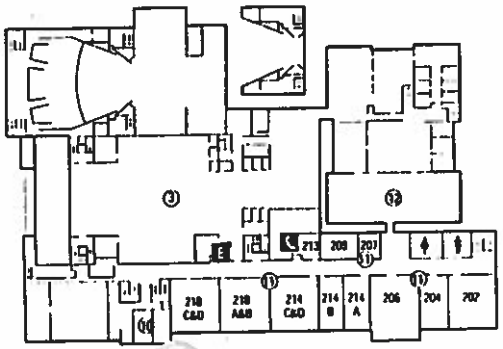
Stewart Center

1 Loeb Playhouse
2 University Theatre
3 Humanities, Social Sciences and Education Library
4 Fowler Hall
5 Stewart Newsstand
6 Conferences Division/ University Calendar Office
7 Conferences and Registration
8 Computer Lab
9 Hicks Undergraduate Library

Second Floor

Stewart Center

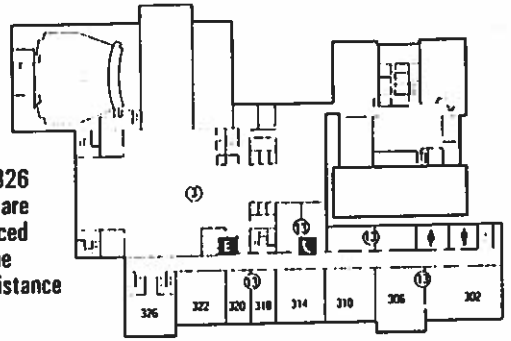
10 Catering Setup Facility
11 Meeting Rooms 202-218 Room 209 is setup for teleconferencing
12 Library Special Collections



Third Floor

Stewart Center

13 Meeting Rooms 302-326
These meeting rooms are technologically enhanced to accommodate online demonstrations and distance learning setups.



STEWART CENTER FLOOR PLAN

FINAL PROGRAM

FRIDAY, NOVEMBER 5, 2004

TIME	EVENT	ROOM
1:00 pm – 1:50 pm	Implementing the National Blueprint at the Community Level	310
1:00 pm – 1:50 pm	Ginseng: An Effective Aid for Exercise?	322
1:00 pm – 2:30 pm	How to Establish a Career in the Personal Training/ Fitness/Health and Education Profession	314
2:00 pm – 2:50 pm	Exercising for Attention: The Role of Exercise in Children with Attentional Disorders	310
2:00 pm – 4:15 pm	Oral Communications	322
3:00 pm – 3:50 pm	Why Access to Physical Activity Matters in Animal Research	310
3:00 pm – 4:30 pm	Metabolic Periodization	314
4:00 pm – 4:50 pm	Does Specificity of Exercise Really Matter?	310
5:00 pm – 7:00 pm	Dinner on your own	
7:00 pm – 8:30 pm	**Keynote Address:** **Chris Rosenbloom, Ph.D., RD** **"Carb Confusion: Helping Athletes Sort Through the Carb Quagmire"**	**214**
9:00 pm – 11:00 pm	Social, Purdue Memorial Union Recreation Center	

SATURDAY, NOVEMBER 6, 2004

TIME	EVENT	ROOM
8:00 am – 12:00 pm	Poster Display	214C/D
8:00 am – 10:50 am	Rotator Cuff Injuries and the Weekend Warrior	322
8:00 am – 8:50 am	High Velocity and Power Training for Older Adults	310
8:00 am – 9:50 am	Return to Competitive Sports after Severe Traumatic Brain Injury	314
9:00 am – 9:50 am	Exercise for Individuals with Arthritis	310
10:00 am – 10:50 am	Arthritis Tutorial	310
10:00 am – 10:50 am	Plyometric Training Tutorial	314
11:00 am – 11:50 am	The Role of Tailored Health Education and Exercise in a Healthy Lifestyle Intervention for Cancer Survivors	322
11:00 am – 11:50 am	NCAA Web-Based Injury Surveillance System	310
11:00 am – 11:50 am	Fundamentals of Teaching a Group Fitness Class	314
Noon – 1:30 pm	**Luncheon Banquet** Union Building East and West Faculty Lounges	
1:30 pm – 2:30 pm	**Keynote Address:** **Dottie Drake, RN** **"Confessions of a Fat Old Broad: Why People Like Me Don't Come to Your Health Club"**	**Krannert**

ORAL COMMUNICATIONS

FRIDAY 2:00 pm - 4:15 pm Stewart Center 322

2:00-2:15	Ott, et. al. "Determining Mean Arterial Pressure…Tachycardia"
2:20-2:35	Collinsworth, et. al. "Relationship Between Bone Density…Adult Males"
2:40-2:55	Klein, et. al. "Effect of Cycling Style…Competitive Cyclists"
3:00-3:15	Layman, et. al. "The Effect of Gender on ... Plasminogen Activator"
3:20-3:35	Francis, et. al. "Effect of Age and Aerobic Training…TPA Activity"
3:40-3:55	Zemper, "Application…Model of Health … Disabling Conditions"
4:00-4:15	Potteiger et. al. "Effects of Prior Aerobic…….. …Females"

POSTERS

SATURDAY 8:00 am -12:00 pm Stewart Center 214C/D

(Authors Present 9:00 am -10:30 am)

Poster #:

1. Marker, et. al. "Age-Related Changes…Biomarkers of Health"
2. Swartz, et. al. "Ambulatory Activity…Older Urban Adults"
3. Herman, et. al. "The Association…Energy Expenditure…Colon Cancer…"
4. Knous, et. al. "Comparison…On and Off Ice…Testing…Hockey Players"
5. Strath, et. al. "Comparison…Estimate Physical Activity…Older Adults"
6. Lilley, et. al. "Comparison…Assessing Waist Girth…Men and Women"
7. Nitz, et. al. "Percutaneous Electrical Stimulation…Quadriceps…Soreness"
8. Schisler, et. al. "Effect…Carbohydrates…Blood Glucose…Treadmill Exercise"
9. Schneider, et. al. "Effects…10,000 Steps…Overweight Men and Women"
10. Cole, et. al. "Endurance Training…Male High School Runners"
11. Peters, et. al. "Improved Aerobic Fitness…Overweight Youth….Program"
12. Kelley, et. al. "The Influence…Exercise…Activity…Metabolic Syndrome"
13. Schweitzer, et. al. "The Influence…Genetic Markers…Blood Pressure"
14. Kemper, et. al. "Kinematic Analysis…Drop Landings…Patellar Tendon…"
15. Vystejnova, et. al. "Maximal Aerobic…Pediatric…Weight Management…"
16. Parker, et. al. "Measurement…Physical Activity…Older Adults"
17. Malek, et. al. "Muscle Oxygen Saturation…Vastus Lateralis…Bosco…"
18. Mudd, et. al. "Neonatal…Ventilatory Responses…Low Birth Weight"
19. Wilson, et. al. "Relationship…Lactate…Perceived Exertion…Ice…"
20. Woodruff, et. al. "The Relationship…Running Economy…Distance Runners"
21. Steidl, et. al. "The Relationship…Anaerobic Metabolism…Cortisol Levels"
22. Ode, et. al. "Running Economy…Collegiate Basketball Players"
23. Frank, et. al. "Selected Kinematic Parameters…Walking Gait…Women"

PRESIDENT'S LECTURE

1:00 pm – 1:50 pm Room 310 # Contact Hours: 1.0 hour

IMPLEMENTING THE NATIONAL BLUEPRINT AT THE COMMUNITY LEVEL: THE COALITION FOR LIVING WELL AFTER 50

Roseann M. Lyle, PhD, FACSM (member ACSM)

The *National Blueprint for Increasing Physical Activity Among Adults Age 50 and Older (2001)* provides a framework for planning, collaborative action, and social change among organizations and agencies interested in improved aging through regular physical activity. The Coalition for Living Well After 50, an outgrowth of the Blueprint, is a community/campus partnership that envisions facilitating an environment in which people 50 and older may enjoy health and quality of life. The Coalition was created via a process similar to that of the Blueprint. Potential partners, representing a broad cross-section of the community, were invited to Leadership Summits to help determine the vision/mission, to provide insight as to resources available and gaps that remained, and to provide the infrastructure for the Coalition. Currently, more than 50 agencies and organizations are affirmed partners in the Coalition. Funding by the Indiana State Department of Health supported a community needs assessment and funding by the National Blueprint Partners Project supported marketing brochures, an Active Living Guide and a media campaign, including a community launch event. Results of the needs assessment are now providing direction for the creation of a local blueprint to guide the Coalition toward its vision in the future.

Dr. Roseann M. Lyle is a Professor in the Department of Health and Kinesiology at Purdue University. Her research interests are related to the health of women, and her research has been published in the Journal of the American Medical Association, American Journal of Clinical Nutrition, American Journal of Health Promotion, Medicine and Science in Sports and Exercise, Journal of Bone and Mineral Research & American Journal of Public Health. Dr. Lyle teaches courses in Health Promotion and has received the Department Award for Teaching Excellence. Dr. Lyle is an ACSM Fellow and the past chair of the College's SHI for Aging in Exercise Science and Sports Medicine. She is on the Editorial Board for the Journal of Aging and Physical Activity, serves on the Board of Directors for the Tippecanoe County Council on Aging and chairs the steering committee of the Coalition for Living Well After 50. She is a member of the American Society for Nutritional Sciences, the Jacob's Institute of Women's Health, the American Alliance of Health, Physical Education, Recreation and Dance, and the Council for Women's Nutrition Solutions, an all-women advisory board of leading health and nutrition experts.

SYMPOSIA

1:00 pm – 1:50 pm Room 322 # Contact Hours: 1.0 hour

GINSENG: AN EFFECTIVE AID FOR EXERCISE?

Hermann J. Engels, PhD, Wayne State University (member ACSM)

Extracts of ginseng have been used in Chinese medicine since ancient times and also have become highly regarded in many Western nations where people often associate their intake with an enhanced capacity to adapt to stress and alleviate fatigue. These claims about ginseng have led some researchers to examine whether it may be a useful nutritional aid for exercise. This presentation serves to review the exercise related literature on ginseng, its effects on human biological and performance measures, current views of its mode of action, and to offer perspectives for future research.

SYMPOSIA

1:00 pm – 2:30 pm Room 314 # Contact Hours: 1.5 hours

HOW TO ESTABLISH A CAREER IN THE PERSONAL TRAINING/FITNESS/ HEALTH AND EDUCATION PROFESSION

Ken Baldwin, M.ED, Purdue University-Ismail Center (member ACSM)

Ken Baldwin of Purdue University will facilitate the question and answers discussion and interaction with the audience. Ken Baldwin-Affiliations, MWACSM, ACSM, MFA, AAHPERD, IHRSA Nicki Andersen-IHRSA,IDEA Scott McClain-ACSM, IDEA Greg Mack-IDEA Carol Kennedy-ACSM Purpose: The purpose of the discussion is to allow the audience to ask questions of our expert panel of practioners and educators of how they started their career in the health, fitness, and education profession and where they see career opportunities developing. In addition, attendees will learn how to establish and short and long-term career track. Objectives: * Attendees/Students have an opportunity to learn how experts developed and created a career track for professional development and success. * Attendees will learn of opportunities in the health, fitness, and educational profession and how to best establish short and long term goals * Attendees will learn from "The Experts" perspectives about the current state of the health and fitness industry. * Attendees can learn how to establish a successful personal training and health/fitness business. Rationale: To provide the attendees the opportunity to ask from experts how to best prepare themselves for a career as a health and fitness professional.

PRESIDENT'S LECTURE

2:00 pm – 2:50 pm Room 310 # Contact Hours: 1.0 hour

EXERCISING FOR ATTENTION: THE ROLE OF EXERCISE IN CHILDREN WITH ATTENTIONAL DISORDERS

Anthony D. Mahon, PhD, FACSM (member ACSM)

Attention deficit/hyperactivity disorder (ADHD) is prevalent in 3-5% of US children, although the disorder is not restricted to childhood. The disruptive behaviors associated with ADHD include inattention, impulsivity and hyperactivity. These behaviors in turn negatively impact the child's social and cognitive development. The most common form of treatment for ADHD includes pharmacological intervention using stimulant medications. Generally speaking these medications are very effective in treating ADHD; however, there are several untoward side effects such as appetite suppression and elevated heart rate and blood pressure which raise concern over the use of these medications. For years, a prevailing belief that physical activity and exercise may attenuate reduce disruptive behaviors has persisted, although surprisingly empirical data are lacking. In addition, the combined effect of exercise and stimulant medication is not well understood. In this presentation the disorder in general, as well as research that has examined the effect of exercise on behavioral and physiological responses will be discussed.

Anthony D. Mahon, Ph.D, is an Associate Professor in the School of Physical Education, Sport and Exercise Science at Ball State University. He also is a faculty member in the Human Performance Laboratory and serves as Associate Chair, Division of Exercise Science in the School of Physical Education, Sport and Exercise Science. He received his MA and Ph.D. from the University of Maryland where he majored in exercise physiology. His research interests center upon the acute responses and chronic adaptations to exercise in children and adolescents. In his current research Dr. Mahon is examining the effect of exercise on physiological responses and behavior in children with attention disorders.

ORAL COMMUNICATIONS

2:00 pm – 2:15 pm **Room 322** **Stewart Center**

DETERMINING MEAN ARTERIAL PRESSURE AT DIFFERENT LEVELS OF EXERCISE TACHYCARDIA

A. Ott, C. Molenhouse, D. Paul, W. Lingle and C. D. Ianuzzo. Kinesiology Department, Wheaton College

The purpose of this study was to derive an equation for determining mean arterial pressure (MAP) during exercise tachycardia. During resting heart rates, the diastolic period comprises 2/3 of the cardiac cycle, but is reduced significantly during exercise tachycardia. For this reason, current methods may underestimate MAP at elevated heart rates. In this study, subject's heart rate (HR) and blood pressure (BP) were determined during rest and at 120, 140, 160, and 180 bpm while the participant exercised on a cycle ergometer. Heart rates were determined using an electrocardiogram and BP using a manual sphygmomanometer. Actual systolic portions of the cardiac cycle were measured from the peak of the R wave to the peak of the T wave and ranged from 23-72% of the entire cycle. A new equation for systolic fraction was derived: Sf=0.01exp(4.08-48.73/HR), where Sf=systolic fraction. A one-way ANOVA was used to determine statistical differences. While similar at rest, the derived systolic fraction was statistically different from the traditional 0.33 at all elevated heart rates ($p<0.05$). Incorporating this equation, the new formula for determining MAP is MAP=DBP + Sf(PP), where DBP=diastolic blood pressure and PP=pulse pressure. Thus, it was concluded that the derived equation gives a more accurate value of MAP during exercise.

2:20 pm – 2:35 pm **Room 322** **Stewart Center**

RELATIONSHIP BETWEEN BONE DENSITY AND STRENGTH, LEAN MASS, AND FAT MASS IN YOUNG ADULT MALES

TA Collinsworth, KE Sparks, KD Little, SG Zeigler. Cleveland State University

While fat mass (FM), lean mass (LM) and muscular strength (MS) have been related to bone density (BD) in females, these relationships have not been well studied in males. PURPOSE: To assess the relationship between BD and MS, LM, and FM in young adult males. METHODS: 25 healthy, active, young adult males were enrolled. Body composition was assessed by four-site skinfolds with the Jackson-Pollock equation used to estimate % fat (%F), FM and LM. DEXA (Lunar Prodigy) was used to assess BD of the total body, lumbar spine, femur neck, radius and ulnar. A one-repetition maximum was used to assess MS of all major muscle groups. Pearson correlations (r) were obtained between LM, FM, and MS of each muscle group with all BD sites. RESULTS: Subject characteristics were (mean + sd): Age (yrs) = 23.3 + 4.0; Ht (cm) = 173.7 + 4.4; Wt (kg) = 80.9 + 14.6; %F = 18.9 + 8.6; FM (kg) = 15.7+ 9.7; LM (kg) = 65.3 + 7.8. Significant ($p < .05$) and similar correlations were obtained between LM (r range = .429 to .639), FM (r range = .443 to .578), and MS of the pectoral, deltoid, and upper back muscle groups (r range = .398 to .626) with all BD sites except the lumbar spine. Based on r2, upper body MS, LM, and FM accounted for 16-41% of the variance in BD. CONCLUSION: Similar to what has been reported in young adult females, MS, LM, and FM were significantly related to BD in young adult males.

2:40 pm – 2:55 pm **Room 322** **Stewart Center**

THE EFFECT OF CYCLING STYLE ON PHYSIOLGICAL PARAMETERS IN COLLEGE AGED COMPETITIVE CYCLISTS

E. E. Klein, M. Walsh, R. Cox, Miami University

The current data on highly trained elite and world class cyclists suggests that using a spinning cycling style (low resistance and high cadence) is the most metabolically effective. The purpose of this investigation was to determine if two different cycling styles, spinning and mashing, with an equivalent workload resulted in different oxygen consumption and metabolic efficiency responses in ten college-aged (5 male, 5 female) competitive cyclists. Each participant underwent a cycling specific maximal oxygen consumption test. The maximal workload was used to calculate 80% of the maximal workload for the spinning and the mashing (low cadence and high resistance) protocols. Oxygen consumption (VO2) and time of test were used in the statistical analysis. Spinning resulted in a 6% higher average VO2 than did the mashing protocol even though the calculated workloads were equivalent. Spinning also resulted in a lower time of test than the mashing protocol. Both variables were significantly different between the conditions ($p<.01$). The results of this study suggest that mashing may be a metabolically more efficient cycling style for college aged competitive cyclists.

3:00 pm – 3:15 pm **Room 322** **Stewart Center**

THE EFFECT OF GENDER ON PLASMA TISSUE PLASMINOGEN ACTIVATOR

CM Layman, RM Francis, PM Johnson, PR Nagelkirk, AM Coughlin, JT Lemmer, CJ Womack, FACSM. Human Energy Research Laboratory. Michigan State University

Fibrinolysis, the capacity to lyse clots is an independent risk factor for cardiovascular disease and occurs due to the conversion of plasminogen into plasmin via tissue plasminogen activator (tPA). Because of potential gender influence on the fibrinolytic profile, many studies evaluating fibrinolytic responses and adaptations to exercise include only one gender. The purpose of this study was to determine gender differences in tissue plasminogen activator (tPA) activity in trained males and females. Seven aerobically trained males and five aerobically trained females participated in the study. Subjects were non-smokers and were not taking any medications, including oral contraceptives. Venous blood samples were obtained from all subjects in the morning following a 12-hour fast. Samples were collected in an acidified citrate solution to preserve tPA activity. For the females, samples were obtained within 3 days post-menses. tPA activity was assessed using an enzyme-linked immunosorbancy assay. Mean plasma tPA activity was compared between males and females using an independent t-test. There were no significant differences between the groups and the mean plasma tPA activity was almost identical for both genders (females = 0.79 + 0.52 IU/ml, males = 0.81 + 0.21 IU/ml). These data suggest that there are no gender differences for plasma tPA activity in healthy, younger subjects provided that females are tested within three days post-menses.

3:20 pm – 3:35 pm **Room 322** **Stewart Center**

EFFECT OF AGE AND AEROBIC TRAINING STATUS ON PLASMA TPA ACTIVITY

RM Francis, CM Layman, PM Johnson, PR NagelKirk, CJ Womack FACSM, and JT Lemmer
Michigan State University

Fibrinolysis, the capacity to lyse blood clots, decreases with advancing age and is an independent risk factor for the development of cardiovascular disease. Tissue plasminogen activator (tPA), the main enzyme of the fibrinolytic pathway, converts plasminogen to plasmin which functions to lyse blood clots. The aim of this study was to determine the effect of age and aerobic exercise training status on plasma tPA activity in healthy young and older males. Aerobically trained and untrained older (> 50 years) and younger (< 35 years) males were recruited for the study. Seven trained and untrained younger males (VO2max = 70.1±2.5 & 58.9±4.0 ml/kg/min, respectively) and six trained and untrained older males (VO2max = 51.9±1.5 & 39.6±3.1 ml/kg/min, respectively) participated in the study. Venous blood samples were obtained after a 12-hour fast via venipuncture of an arm vein. Prior to the venipuncture, subjects assumed a semi-recumbent position for 15 minutes to eliminate postural effects on fibrinolysis. Five ml of plasma were collected into acidified citrate tubes and spun to obtain platelet-poor plasma. Samples were stored at -80 degrees Celsius until assayed. Plasma tPA activity was measured by enzyme-linked immunosorbancy assays (ELISA) in duplicate for each subject. Intra-assay coefficients of variation for the Fibrinolysis Research and Genetics Laboratory are consistently < 5% for these measurements. An Analysis of Variance (ANOVA) showed a significant effect of training status ($p < 0.05$) on tPA activity. Additionally there was a significant age by training status interaction ($p < 0.01$). The interaction resulted from significant differences in plasma tPA activity between older trained and untrained men (1.14 ± 0.08 IU/ml & 0.60 ± 0.17 IU/ml, respectively), without any significant differences between trained and untrained younger men (0.81± 0.08 IU/ml & 0.87 ± .11 IU/ml, respectively). The results of this study indicate that aerobic exercise training elevates tPA activity in older but not younger men.

3:40 pm – 3:55 pm **Room 322** **Stewart Center**

Application of a Model of Health Promotion for Persons with Chronic Disabling Conditions

E. Zemper, Ph.D. University of Michigan

A model of health promotion for persons with chronic disabling conditions proposed by Stuifbergen et al. (2000) indicates quality of life results from a complex interaction among contextual factors (severity of condition), antecedent variables (barriers, resources, self-efficacy, acceptance), and health-promoting behaviors. Accordingly, interventions for this population should strive to enhance social support, decrease barriers, and increase health-related self-efficacy. This was the basis for a pilot study of a wellness intervention designed for persons with spinal cord injuries, consisting of six four-hour sessions covering exercise, stress and lifestyle management, and nutrition. Pre- and post-intervention data using standard psychometric measures showed significant improvement ($p<0.05$) in the intervention group in several variables related to exercise, nutrition, stress management, and health-related self-efficacy. One and two year follow-up data showed a gradual return to pre-intervention levels, indicating a possible need for periodic 'booster interventions' to maintain the gains accomplished by the intervention.

4:00 pm – 4:15 pm **Room 322** **Stewart Center**

THE EFFECTS OF PRIOR AEROBIC EXERCISE ON POSTPRANDIAL LIPEMIA IN AFRICAN-AMERICAN AND CAUCASIAN FEMALES

J.A. Potteiger, FACSM, K.A. Shannon2, R.M. Shannon2, J.N. Clore2, C. Gennings2. 1Miami University, 2Virginia Commonwealth University

INTRODUCTION: Repeated exposures to exaggerated levels of blood lipids may hasten the progression of atherosclerosis. PURPOSE: To determine if ethnicity influences postprandial lipemia after a bout of aerobic exercise. METHODS: This study utilized a randomized crossover design. Healthy, untrained Caucasian (CA) (n=6) and African American (AA) (n=6) women (age (y), CA 27.0±3.3, AA 21.6±1.4, BMI (kg/m2) CA 25.0±0.93, AA 25.8±0.79) participated in two treatments (control and exercise), each conducted over 2 d. On day one, subjects rested (control), or walked at 60% of maximal oxygen uptake for 90-min (exercise) and then consumed a post exercise meal equal in caloric volume designed to maintain energy balance. On day 2, after a 12 h overnight fast in the General Clinical Research Center, subjects consumed a high fat meal (HFM) consisting of 1.7 g fat, 1.65 g carbohydrate, 0.25 g protein per kg fat free mass and equal to 95 kJ of energy per kg fat free mass. Blood was collected pre-meal and at 0.5, 1, 2, 3, 4, 5, and 6 h post HFM and analyzed for triacylglycerol (TAG), glucose, and insulin concentrations. Areas under the curve were calculated for each blood variable. RESULTS: A significantly lower TAG AUC was observed for AA (0.86±0.24 mmol/L/6h) following exercise when compared to CA (2.25 ±.50 mmol/L/6h). There were no significant differences in glucose AUC or insulin AUC between groups in response to exercise. CONCLUSIONS: Our data suggest that exercise performed ~13 hrs prior to an OFTT significantly reduces postprandial lipemia in African Americans compared to Caucasians. It appears that African American females may have an increased ability to dispose of TAG following exercise and a high fat meal. Supported by American Heart Association #0151374Z.

PRESIDENT'S LECTURE

3:00 pm – 3:50 pm Room 310 # Contact Hours: 1.0 hour

WHY ACCESS TO PHYSICAL ACTIVITY MATTERS IN ANIMAL RESEARCH

Helaine Alessio, PhD, FACSM (member ACSM)

Animal research has contributed in numerous significant ways to advances in knowledge about health and disease. Within animal models, however, there are a number of factors that can and cannot be controlled, and some of these might distort our knowledge about nutrition and exercise. Despite advantages associated with animal research models, potentially confounding problems exist, such as the way animals are housed and the manner in which they are fed. In most experiments animals do not have access to physical activity and are fed ad libitum. These conditions set animals up for hyokinesis and obesity. Biomarkers of health including body weight, girth, resting blood pressure and heart rate, blood lipids, reactive stress, oxidative stress, select gene expressions, among others, will be compared in animals having different access to physical activity outside a standard cage, ranging from none to regular wheel running. Most of the evidence indicates that a minimal level of exercise is necessary to distinguish positive health in animals that have access to either physical activity or exercise.

Helaine Alessio is a Professor in the Exercise Science program in the Physical Education, Health and Sport Studies department at Miami University. She served as President of the Midwest American College of Sports Medicine in 2001 and is a Fellow of the American College of Sports Medicine. Her research includes the study of risks and benefits associated with physical activity, specifically related to oxidative stress. Other research areas include aging, and the association of hearing, speech and fitness. The National Institutes of Health and National Cancer Institute have funded her work.

SYMPOSIA

3:00 pm – 4:30 pm Room 314 # Contact Hours: 1.5 hours

METABOLIC PERIODIZATION - HOW DIET AND EXERCISE INTERVENTIONS PLAY A MAJOR ROLE IN ALTERING A PERSON'S METABOLIC PROFILE FOR THE TREATMENT AND PREVENTION OF OBESITY

Craig E. Broeder, Ph.D. - Fellow NAASO MS in Nutrition/Physiology; Ph.D. in Exercise Physiology/Metabolism Benedictine University (member ACSM)

Historically, the long-term success for helping obese individuals lose weight and successfully maintain his or her new improved body composition profile is not good. The most successful weight management programs include diet, exercise, and behavioral interventions. Unfortunately, diet and exercise interventions are most often generically designed. That is to say a general exercise intervention including endurance and/or resistance training in combination with some type of macronutrient dietary intervention such as reduced kcal intakes, low-fat or high-protein diet intervention are often prescribed. Usually, little consideration is given to the metabolic consequences of the weight loss intervention utilized. For example, when kcal intake is less than 1000 kcals below a person's energy expenditure demands, resting metabolic rate begins to decline within 24 to 36 hours. It is also very clear from the literature that the thermogenic properties of a meal vary widely across the different macronutrients. Thus, it is important to consider the metabolic consequences of a respective diet and exercise weight loss treatment on a person's metabolic profile. For example, Dulloo et al., (1997) showed the metabolic interactions between fat and fat-free mass regain following a severe dietary restriction period (i.e., a 60% reduction in required kcal intake) is significantly different. In fact, there appears to be an accelerated resynthesis of adipose tissue compared to lean tissue following extended periods of severe negative energy balance. Therefore, this presentation will discuss how various diet and exercise practices alter a person's metabolic profile with a special emphasis on the consequences related to preventing and treating obesity. This talk will be designed to provide useful information for both the obesity clinician and researcher.

PRESIDENT'S LECTURE

4:00 pm – 4:50 pm Room 310 # Contact Hours: 1.0 hour

DOES SPECIFICITY OF EXERCISE REALLY MATTER?

Lynn A. Darby, Ph.D (member ACSM)

Physiological and biomechanical variables (e.g., type of exercise, body position, type of muscle contraction) can be manipulated to evoke particular physiological responses to exercise. Thus, responses to exercise training and testing depend on the consistency of these variables. This consistency is the principle of exercise specificity. Exercise is said to be "specific" if the exercise training, testing, and expected responses "match" because muscle groups (e.g., arm vs. leg exercise), body positions, energy pathways, and neural patterns, etc. may vary greatly with the type of exercise completed.

The purpose of this presentation will be to review factors that make exercise training and exercise tests "specific" for walking, running, water exercise, step aerobics, and swimming. In addition, how these factors effect the heart rate / VO_2 relationship, and separate heart rate, VO_2 and blood pressure responses across different exercises will be reviewed. Practical applications for adjusting exercise prescriptions and determining exercise economy will be discussed.

Lynn A. Darby, Ph.D., is an Associate Professor, and Chair of the Kinesiology Division in the School of Human Movement, Sport and Leisure Studies at Bowling Green State University, Bowling Green, Ohio. Her research focuses on quantifying and comparing how the manipulation of certain exercise characteristics (i.e. body position, impact, combinations of arm and leg involvement) can change the physiological responses to different types of exercise (e.g., aerobic dance, step aerobics, water exercise, and running). In collaboration with students and colleagues, her work also focuses on delineating how these factors can change the economy of exercise (i.e., energy cost), and can correlate with biomechanical factors that affect the economy of movement. She was the President of MWACSM for 2002 and is currently the MWACSM Regional Chapter Representative.

KEYNOTE ADDRESS

7:00 pm – 8:30 pm Room 214 # Contact Hours: 1.5 hours

CARB CONFUSION: HELPING ATHLETES SORT THOUGH THE CARB QUAGMIRE

Chris Rosenbloom, PhD, RD, LD

Active people and athletes are asking if carbs are "bad." And, athletes want to know if carbohydrate should be reduced in the diet. This presentation will provide information on low carbohydrate diets and the appropriateness (or inappropriateness) for recreational and competitive athletes. Terms such as "net carbs," and "low impact carbs," will be discussed, as well as the pros and cons of using the glycemic index for athletes. Research, although scant, on weight loss and low carbohydrate diets will be reviewed. Recommendations for evaluating food products claiming to be low carb will be discusses, as well as recommendations for athletes on choosing the appropriate amount and type of carbohydrate containing foods.

Dr. Chris Rosenbloom is currently associate dean for Academic Affairs in the College of Health and Human Sciences and an associate Professor in the Department of Nutrition at Georgia State University (GSU) in Atlanta, Ga. She has been a faculty member in the Department of Nutrition at GSU since 1980, teaching courses in sports nutrition, medical nutrition therapy, and geriatric nutrition. Dr. Rosenbloom has an adjunct faculty appointment with the School of Applied Physiology at the Georgia Institute of Technology (Georgia Tech). In addition, Dr. Rosenbloom has been the nutrition consultant to the Georgia Tech Athletic Association since 1987. She also is a sports nutrition consultant to athletic teams at Georgia State University, to The Atlanta Beat, a WUSA team, and the Atlanta Hawks, an NBA team.

Dr. Rosenbloom's education includes a bachelor's degree in foods and nutrition from Kent State University with a dietetic internship from the University of Minnesota. She later moved to Atlanta where she received her master's in nutrition education and her doctorate in sociology with a gerontology certificate from GSU.

Dr. Rosenbloom was a member of the Olympic Medical Support Group for the 1996 Olympic Games, served as an assistant medical administrator and was the liaison to the food service contractors, feeding athletes, official and volunteers during the Olympic Games. Additional professional involvements include serving as a national media spokesperson for the American Dietetic Association (ADA) from 1992-2003. She has extensive media experience and conducts over 100 media interviews a year in television, radio, and print media. She currently serves on the executive committee of Sports, Cardiovascular, and Wellness Nutritionists (SCAN) and is the editor of the ADA publication, Sports Nutrition: A Guide for the Professional Working with Active People, 3rd edition (2000). Dr. Rosenbloom was named Outstanding Dietitian for the State of Georgia by the Georgia Dietetic Association.

Gatorade Sports Science Institute

NOTE: Dr. Rosenbloom is a member of the GSSI Speaker's Bureau and is sponsored by Gatorade Sports Science Institute.

POSTERS

8:00 am – 12:00 pm Stewart Center Room 214C/D Authors Available 9:00 am – 10:30

1. AGE-RELATED CHANGES IN PHYSICAL ACTIVITY AND EXERICSE AND ITS ASSOCIATION WITH BIOMARKERS OF HEALTH

A.L. Marker, N.B. Schweitzer, H.M. Alessio, FACSM, A.E. Hagerman, K.J. Vonder Haar, K.A. Michalak. Miami University

Sedentary and physically active lifestyles strongly influence biomarkers of health in negative and positive ways. Age plays a mediating role and can intensify health changes resulting from sedentary and physically active lifestyles. The purpose of this study was to monitor age-related declines in physical activity in female Sprague-Dawley rats with different access to physical activity and correlate the changes in physical activity with biomarkers of health and disease. From the ages of 3 to 12 months, quantity of physical activity was tracked in animals residing in a standard cage with 1) no physical activity outside the cage (SED) (n=36); 2) access to physical activity in an open arena setting for one hour, twice-weekly (PA) (n=36); and 3) access to a voluntary running wheel on alternate days (EX) (n=36). Amount of physical activity performed in twenty-four hours was monitored in each of the three groups. Select biomarkers of health that were monitored include: resting systolic (SBP), diastolic (DBP) and mean arterial blood pressure (MAP), resting heart rate (RHR), blood lipids, and body weight. From 3 to 12 months of age distance covered (miles/24 hour) declined from 8.74 to 2.54 (EX), 0.16 to 0.075 (PA), and 0.07 to 0.039 (SED). An age-related decline of 70.9% (EX), 53.1% (PA) and 44.3% (SED) in distance covered was observed. No differences were observed in SBP, DBP, MAP, RHR, body weight and blood lipids at 12 months of age. Although physical activity levels have significantly declined with age in each of the groups, biomarkers of health have not been significantly influenced by varied access to physical activity.

2. AMBULATORY ACTIVITY, BMI AND WAIST CIRCUMFERENCE IN OLDER URBAN ADULTS

AM Swartz, SJ Strath, MA Parmenter, and SJ Parker. Exercise Physiology Laboratory, Department of Human Movement Sciences, University of Wisconsin-Milwaukee

Purpose: This study was designed to investigate the relationship between indices of body composition and daily accumulated walking in older adults living in an urban environment. Methods: Data were collected on 82 community dwelling older adults (71.8y +/- 7.7y; 27.8 kg•m-2 +/- 5.18 kg•m-2; 27 male, 55 female) who were free of any disease or condition that would negatively impact daily physical activity. Measures of waist and hip circumference, body height, and body mass were collected. Body mass index (kg•m-2) was calculated. Participants were asked to wear a pedometer (Yamax SW-200) during all waking hours for 7 consecutive days immediately following the anthropometric assessment. Total steps accumulated per day were recorded by the participant on an activity log. Results: Twenty-four participants were classified as normal BMI (18.5-24.9 kg•m-2), 38 of the participants were classified as overweight (25.0-29.9 kg•m-2), and 20 were classified as obese (>29.9 kg•m-2). The data showed a strong inverse relationship between BMI and average steps/wk ($r=-.458$, $p<0.001$) and between waist circumference and average steps/wk ($r=-.375$; $p=0.001$). ANOVA revealed a significant difference between the number of steps accumulated per day by the individuals in the normal BMI category (6954 +/- 3040 steps/d) and the obese category (3496 +/- 1755 steps/d; $p<0.001$), but no difference between steps accumulated by normal BMI and overweight (5270 +/- 3154 steps/d; $p=.078$) or by overweight and obese ($p=.080$). Categorizing individuals into recently published step categories

(Tudor-Locke, 2004), of sedentary (n=48, BMI= 29.7 +/- 5.5 kg•m-2), low active (n=11, BMI= 25.17 +/- 3.3 kg•m-2), somewhat active (n=14, BMI= 25.4 +/- 2.8 kg•m-2), and active/highly active (n=9, BMI= 24.5 +/- 2.2 kg•m-2) demonstrated an inverse dose-response relationship between mean steps/d and BMI classification [$F(3, 78) = 6.9$, $p<0.001$]. Conclusion: This study shows that older adults living in an urban area who are more active tend to have healthier levels of BMI and waist circumference. Additionally, when categorizing older adults by activity levels using published cut-offs designed for the general population, the majority of older adults in this sample were classified as sedentary. Supported in part by the UW-Milwaukee Center on Age & Community Fellowship Grant (Strath).

3. THE ASSOCIATION BETWEEN ENERGY EXPENDITURE AND COLON CANCER RISK REDUCTION: A MINI META-ANALYSIS

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OBJECTIVE: The purpose of this study was to analyze existing data examining colon cancer risk reduction associated with an increased amount of leisure-time physical activity. METHODS: A meta-analysis using Stata 7.0 was performed, and only studies using the Compendium of Physical Activities (Ainsworth et al., 2000) to assign MET-scores to leisure-time physical activities were included in the analysis (4 studies: 2 including males and females; 1 including males; 1 including females). Subjects from the studies were combined and categorized as either having a "low" (< 2 MET hours-per-week), "moderate" (> 2 MET hours-per week, < ~18 MET hours-per-week) or "high" (> ~18 MET hours-per-week) amount of total weekly energy expenditure. Additionally, caloric expenditure was estimated based on energy expenditure in MET hours-per-week for individuals of a variety of body weights. RESULTS: No significant difference in colon cancer risk was reported for males or females exercising a "moderate" amount versus sedentary individuals (OR = 0.88, p = .70 - Males; OR = 0.83, p = .23 - Females). Males and females exercising a "high" amount had a significantly reduced colon cancer risk versus sedentary individuals (OR = 0.52; p = .002 - Males; OR = 0.63; p = .011 - Females). CONCLUSION: While additional studies (reporting caloric expenditure and using the Compendium) are necessary to further examine the relationship between energy expenditure and colon cancer risk, increased energy expenditure greater than approximately 18 MET hours-per-week may be associated with a reduction in colon cancer risk.

4. COMPARISON BETWEEN ON AND OFF ICE PHYSIOLOGICAL TESTING OF COLLEGIATE HOCKEY PLAYERS

J.L. Knous, J.M. Pivarnik, FACSM, C.J. Womack, FACSM, D.P. Carrier. Michigan State University

Rationale: Laboratory testing may aid coaches and trainers in their evaluation of conditioning programs designed to enhance players' fitness levels. However, in ice hockey, there is concern that laboratory results may not correlate with on-ice performance. Historically, investigators have performed physiological testing on ice hockey players using cycle ergometry or treadmill (TM) modalities, but few studies have been conducted on-ice. Thus, the purpose of this investigation was to compare the metabolic and physiologic responses of hockey players during TM running and ice skating. Methods: Male varsity ice hockey players (N=17, Age=20.2±1.5 yr, Ht=182.6±6.1 cm, Wt=81.5±5.3 kg) from an NCAA Division I institution performed two incremental exercise tests to volitional exhaustion; one on a motorized TM and the other on-ice. For both protocols, subjects performed 3 min work stages with 90 sec rest in between each stage. Expired respiratory gases were collected continuously during exercise (SensorMedics 2900 on TM; VmaxST on-ice) and heart rate (HR) was obtained via telemetry or EKG. Finger stick blood samples were obtained for lactate measures during rest stages. Differences in test

conditions were evaluated via ANOVA. Results: Peak oxygen consumption (VO2max), minute ventilation (VE), and HRmax were significantly lower (P<0.05) on-ice compared to treadmill running. The HR/VO2 relationship across exercise stages differed between test conditions; for every 1 ml/kg/min increase in VO2, HR increased three beats/min on-ice, but only two beats/min during TM running. Lactate threshold occurred at a higher % VO2max on-ice (94% VO2max; HR=168 beats/min) compared to the TM (74% VO2max; HR =168 beats/min). Table 1: Average (SD) physiological values for the sample (N=17) On-Ice Treadmill ---------- VO2max (ml/kg/min) 45* (6) 61 (3) Hrmax (beats/min) 180* (10) 198 (9) La max (mmol/L) 13.2 (2.4) 13.5 (1.4) Ve max 129* (13) 161 (15) R max 1.33 (0.09) 1.08 (0.10) RR max 57 (7.5) 56 (8.3) ---------- * indicates significant difference between test conditions (P<0.05) Conclusions: These results show that VO2max and HRmax values are lower on-ice, possibly due to less muscle mass used during skating compared to running. Players appear to accommodate for a decreased aerobic potential during skating by having enhanced ability to perform at a high exercise intensity without significant blood lactate accumulation.

5. COMPARISON OF METHODS TO ESTIMATE PHYSICAL ACTIVITY LEVELS IN OLDER ADULTS

SJ Strath, AM Swartz, MA Parmenter, and SJ Parker. Exercise Physiology Laboratory, Department of Human Movement Sciences, University of Wisconsin-Milwaukee

Purpose: To compare 4 methods of estimating physical activity (PA) in a sample of community-dwelling older adults. Methods: 80 individuals (27 male, 53 female) wore a MTI actigraph accelerometer (ACC), a Yamax SW-200 pedometer (PED), and completed a daily PA log for 7 consecutive days. At the end of the 7-day assessment period individuals completed the Physical Activity Scale for the Elderly (PASE). Three published cut-points were used to classify ACC data into resting/light, moderate, and vigorous intensity activity. PA logs were scored using published energy cost classifications to derive MET-min-1 in similar intensity categories. Data were analyzed using descriptive statistics, rank-order correlations, and one-way repeated measures ANOVA. Results: There was fair to good agreement between the ACC measures, PED, PA log and PASE for total PA, with correlations ranging from r = 0.20 to 0.71 (P < 0.05). Moderate activity estimates from the ACC measures and the PA log demonstrated fair to modest agreement (r = 0.23 to 0.45, P < 0.01). Weak to fair associations for vigorous activity between ACC and PA log estimates were evident with values ranging from r = 0.02 to 0.17, depending on method used to derive ACC cut points. Although correlations between the three published ACC cut points were modest to good for moderate activity (r = 0.52 to 0.87, P < 0.01), vigorous activity (r = 0.27 to 0.66, P < 0.05), and total activity (r = 0.52 to 0.88, P < 0.01), mean estimates of time spent in each absolute intensity category significantly differed. Mean (SE) ACC estimates for moderate, vigorous, and total PA ranged from 17.7 (2.1) to 238.7 (8.7) min/d; 0.1 (0.1) to 1.3 (0.6) min/d; and 18.0 (2.1) to 238.7(8.7) min/d; respectively. Conclusions: Overall, motion sensors, PA logs, and surveys reflect PA behavior; however, similar to other findings in the general population, ACC estimations of time spent in PA revealed substantially different estimates depending on the cut point utilized in this older adult population. Supported in part by the UW-Milwaukee Center on Age & Community Fellowship Grant(Strath).

6. A COMPARISON OF TWO METHODS OF ASSESSING WAIST GIRTH IN MEN AND WOMEN

T Lilley, J Dobbs, L. Kaminsky FACSM, Ball State University

Purpose: This study investigated and compared two recommended methods of determining waist girth measurements and how any differences may impact a subject's disease risk stratification based on waist girth. Methods: One hundred one subjects (61 F/40 M; age 18-88 yrs) were measured at each site (Standard measurement: narrowest location between the xyphoid process and the umbilicus. USDA (United States Department of Agriculture) measurement: at the level of the iliac crest) by the same technician using one tension regulated tape measure. Results: Standard measurement results were 82.25 + 15 cm vs USDA measurement results of 87.25 + 15.5 cm. When evaluating disease risk it was found that 15 subjects were at increased risk for cardiovascular disease (>100 cm for both genders) using the standard measurement site, while these 15 subjects, plus 6 others were placed at increased risk using the USDA measurement. Conclusions: Though age, gender, and BMI altered the relationship between the two sites, this study shows that in a sample including both genders and a large age range, more individuals will be identified as "increased risk" using the USDA measurement than the standard measurement.

7. DOES PERCUTANEOUS ELECTRICAL STIMULATION OF THE QUADRICEPS INDUCE DELAYED ONSET MUSCULAR SORENESS?

M. Nitz, G. Johnson, N. Cooney, J. Thompson, and C.D. Ianuzzo. Kinesiology Department, Wheaton College

This study tested whether percutaneus electrical stimulation of the quadriceps could induce delayed onset muscle soreness (DOMS) in healthy, sedentary female college students (n=5). During the testing three leads were placed on each thigh, one positioned on the vastus lateralis and one on the vastus medialis motor points, determined to be roughly three inches superior to the knee joint, with the third lead placed roughly four inches inferior of the inguinal fold. The 30 minute stimulation protocol involved 4 minutes of constant stimulation at 20mA followed by 26 minutes of alternating low (6 mA) to gradual strengthening (20 mA) contraction. Venous blood samples were taken immediately prior, immediately post-stimulation, and 24h post-stimulation. A biochemical measures of work intensity and muscle damage were based on the blood concentrations of lactate (LA) and creatine kinase (CK), respectively. Hematocrits were also obtained with each of the blood samples to control for hemoconcentration. CK concentration pre-stimulation (51.4+4.0 IU/L @370C) and 24 hours post-stimulation (63.0 + 9.5) were not statistically significant ($p<0.05$). Blood [LA] indicated no LA generation by the muscle, with pre-stimulation values of 0.86 + 0.14 mM and post stimulation values of 0.94 + 0.12 mM. Based upon these findings it was concluded that this electrical stimulation protocol does not activate the muscle at the contractile intensity necessary to induce delayed onset muscular soreness or damage.

8. EFFECT OF CARBOHYDRATE INGESTION ON BLOOD GLUCOSE OF FASTED RUNNERS DURING LONG-TERM TREADMILL EXERCISE

J.A. Schisler, J.N. Miller, D.K.Wiebracht, A.S. Temple, S.L.E Starkey, & C.D. Ianuzzo, FACSM. Kinesiology Department, Wheaton College

This study investigated the effects of a carbohydrate (CHO) supplement on blood glucose (BG) of fasted (20 hours) female runners (n=5) during a 90 minute treadmill run. Fasting resulted in a lowering of BG levels pre-exercise. Water ingestion during exercise had no effect on BG, whereas, CHO ingestion increased the BG level, which was significant after 90 minutes of running (83 vs. 102 mg/dL, $P<0.05$). R values were significantly higher (0.82 vs. 0.92, 0.83 vs. 0.91, and 0.82 vs. 0.90 VCO2/VO2, at 30, 60, and 90 min, respectively, $P<0.05$) in the CHO fasted group. We concluded that CHO ingestion can return and maintain BG at normal levels in fasting subjects during long-term exercise.

9. EFFECTS OF A 10,000 STEPS PER DAY GOAL IN OVERWIEGHT MEN AND WOMEN

P.L. Schneider, D.R. Bassett, FASCM, D.L. Thompson, FACSM, N.P. Pronk, K.M. Bielak, Ball State University

PURPOSE: The purpose of this study was to compare the effects of a 10,000 steps per day exercise prescription on body composition in overweight men and women. METHODS: 20 men (48 + 6 yrs) (mean + SD) and 37 women (46 + 8 yrs) with a body mass index (BMI) >25 kg.m-2 participated in a 10,000 steps per day intervention. Body weight (BW), BMI, percent body fat (BF), fat mass (FM), fat-free mass (FFM), waist circumference (WC) and hip circumference (HC) were determined at baseline, 20 weeks and 36 weeks. Ambulatory physical activity was assessed daily using the Yamax Digi-Walker SW-200. Participants were not given any instruction regarding dietary intake. RESULTS: 15 men and 24 women (68%) completed the 36-week intervention. In response to a 10,000 steps per day exercise prescription, ambulatory activity increased from 5,232 to 9,159 steps per day. Men and women experienced similarly significant improvements in BW, BMI, BF, FM, WC and HC. When the effects of adherence (defined as averaging >9,500 steps per day) to the exercise prescription were examined, the adherers significantly reduced BW, BMI, BF, FM, WC, and HC after 36 weeks, whereas the non-adherers experienced little or no change in these variables. The mean changes in body composition variables in the adherers vs. non-adherers from baseline to 36-weeks are as follows: BW (-4.5 vs. 0.3 kg), BMI (-1.6 vs. 0.1 kg.m-2), BF (-3.2 vs. –0.5%), FM (-4,7 vs. –0.4 kg), WC (-3.1 vs. 0.0 cm), and HC (-2.9 vs. –0.9 cm). CONCLUSION: The 10,000 steps per day exercise prescription was effective at producing favorable body composition changes in overweight, middle-aged men and women. These results suggest that this amount of activity is an effective strategy for weight management in this population.

10. ENDURANCE TRAINING ADAPTATIONS IN WELL-TRAINED MALE HIGH SCHOOL RUNNERS.

A.S. Cole, M.P. Horn, M.E. Woodruff, and A.D. Mahon. Human Performance Laboratory, Ball State University

The purpose of this study was to examine the effects of two phases of endurance training (summer and in-season training) in previously well-trained male high school cross-country runners. Ten males 5.9 kg), from the same high school± 4.3 cm, and 62.6 ± 1.0 yrs, 178.8 ±(17.0 training program, participated in the study. Testing occurred pre-summer (June), post-summer (August), and post-season (November). Running economy (RE) and blood lactate concentration ([BLa]) at 7.0, 8.0, and 9.0 mph, VO2max, isokinetic knee /sec), and°extension strength at four movement speeds (60, 120, 180, and 240 vertical jump (VJ) height were measured. VO2max (ml/kg/min) increased from 71.0 5.5 in November; however, only± 4.7 in August to 73.8 ± 3.7 in June to 73.0 ± June and November were significantly different ($P < 0.05$). RE (ml/kg/min) 1.9 at each speed, respectively in± 2.2 and 52.0 ± 2.4, 45.9 ±averaged 40.6 June and did not change over the course of the study. Isokinetic strength 24,±(ft-lbs) at each progressively faster movement speed were respectively 165 25 in June, decreased (P± 24 and 88 ± 21, 113 ±140 < 0.05) in August and returned to the June values when measured at the end of the season. VJ height 6.8 cm in August (P± 7.1 cm and 53.7 ±was 54.0 > 0.05) but increased ($P <$ 7.5 cm in November. In August, [BLa] changed less across±0.05) to 57.4 increasing speeds compared to June and November ($P < 0.05$); however, all other changes were not significant ($P > 0.05$). In conclusion, VO2max appears to change across different phases of cross-country training in high-school runners, whereas RE did not vary. The reduction in muscle strength over the course of summer training was mitigated when higher intensity in-season training occurred. The physiological significance of these adaptations as they relate to distance running performance requires further research Funding provided by the Gatorade Sport Science Institute and Ball State University.

11. IMPROVED AEROBIC FITNESS IN OVERWEIGHT YOUTH WITH PARTICIPATION IN A CLINCIAL WEIGHT MANAGEMENT PROGRAM

J. Peters, B. Vystejnova, M. Hughes, W. Mays, T. Knilans, R. Claytor. Miami University, and Children's Hospital Medical Center, Cincinnati, OH

Two-hundred, sixteen youth (ages 6-18) completed Phase I of a multidisciplinary pediatric weight management program(CWMP). The CWMP included bi-weekly nutritional counseling and participation in after-school structured exercise sessions(at least once/wk) for approximately 16-20 weeks. Prior to and following this intervention program each child completed a maximal graded treadmill test(GXT). Overall, absolute VO2max(ml/min) and relative VO2max(ml/kg/min) was significantly increased following the CWMP (ml/min=2189+/-615 vs 2413+/-684; $p<0.02$: ml/kg/min=24.9+/-4.6 vs 29.2+/-5.8; $p<0.01$). Additionally, treadmill time(TT) was significantly increased following the intervention (11.9+/-3.6 min. vs 15.1+/-4.2 min.). Pretest and posttest measures of maximal heart rate (HR), systolic blood pressure (SBP), and respiratory quotient (R) were not significantly different. Further analyses suggested that Caucasian participants increased VO2max(ml/kg/min) more than African-American participants (2.9+/-0.49 vs 4.3+/-0.35; $p<0.01$). There were no age and gender differences in the improvement in VO2max. These data suggest that youth, regardless of age, gender, and race, who complete a 16-20 week CWMP can significantly improve aerobic fitness.

12. THE INFLUENCE OF EXERCISE AND PHYSICAL ACTIVITY ON THE METABOLIC SYNDROME

D.J. Kelley, J. Borawski, N.B. Schweitzer, A.M. Snedden, A.E. Hagerman, and H.M. Alessio, FACSM. Miami University

Physical activity and exercise are key factors related to health. A new disease, the metabolic syndrome has been investigated. It is a combination of three or more health risks that dramatically increase the chance of death from heart disease. The National Cholesterol Education Program (NCEP) in the Adult Treatment Panel III (ATP III) defines metabolic syndrome as the presence of three of the five following criteria: hypertension, hyperglyceridemia, low levels of high-density lipoprotein, insulin resistance, and obesity. The purpose of this study was to compare physiological markers associated with metabolic syndrome in animals subjected to: 1. sedentary lifestyle in a standard cage (SED), 2. twice weekly physical activity in a large box outside the standard cage (PA), or 3. regular exercise in cages equipped with running wheels (EX). SED PA EX PHYSIOLOGICAL MARKERS Systolic Blood Pressure (mmHg) 148.4 +/- 2.2 148.7 + 1.7 143.5 + 1.4 Body Weight (g) 322.1 + 5.6 324.3 + 4.6 325.4 + 4.5 Total Cholesterol (mg/dL) 65.7 + 3.9 65.3 + 3.7 64.8 + 3.7 HDL (mg/dL) 39.8 39.8 36.6 Glucose (mg/dL) 152.6 + 11.2 155.3 + 7.9 163.4 + 12.4 Insulin (°g/L) 0.84 + 0.09 0.49 + 0.12 0.41 + 0.06 GIRTH MEASUREMENTS Superior to xyphoid process (mm) 15.9 + 0.3 16.2 + 0.2 16.0 + 0.2 Inferior to last set of ribs (mm) 16.7 + 0.3 17.0 + 0.2 16.7 + 0.3 36% between anus and xyphoid (mm) 17.5 + 0.4 17.7 + 0.2 17.3 + 0.3 Superior to iliac crests (mm) 16.7 + 0.3 16.8 + 0.2 16.5 + 0.3 At six months, SED animals met NCEP and AP III criteria for the metabolic syndrome Regular running wheel exercise, but not physical activity eliminated most of these criteria. Supported by NIH grant 1 R15 AG 20526-01A1.

13. THE INFLUENCE OF PHYSICAL ACTIVITY AND EXERCISE ON PHYSIOLOGICAL AND GENETIC MARKERS OF BLOOD PRESSURE

N.B. Schweitzer, A.E. Hagerman, and H.M. Alessio, FACSM, Miami University

The interaction of genetics and environment play a major role in health and disease. Environmental conditions such as access to physical activity may influence specific gene expressions that regulate critical physiological functions. In laboratory research it is unclear if the gene-environment interaction of a sedentary lifestyle predisposes laboratory animals to hypokinetic diseases such as hypertension. The purpose of this study was to compare gene expressions and physiological markers of hypertension, in animals subjected to: 1. sedentary lifestyle in a standard cage (SED), 2. twice weekly physical activity in a large box outside a standard cage (PA), and 3. regular exercise in cages with running wheels (EX). Systolic blood pressure (SBP) was highest in the SED (140.6+ 3.1 mmHg) vs. EX (129.8 + 2.6 mmHg, $F1,28= 6.33$, $p < 0.05$). SBP was correlated with gap junction membrane channel protein alpha 1 (Gja1), farnesyl diphosphate farnesyl transferase 1 (Fdft1), and very low-density lipoprotein receptor Vldlr ($r = 0.48$, 0.41, and 0.46, respectively, $p < 0.05$). Gja1, a regulator of cell-cell signaling and heart rate, was lower (324 + 62 vs. 366.7 + 75, $p < 0.05$) and Fdft, a regulator of lipid biosynthesis, was higher (5713 + 101 vs. 5097 + 145, $p < 0.05$) in SED vs. EX. These results indicate that a sedentary environment can influence gene expressions linked to hypertension. Supported by NIH Grant 1 R15 AG 20526-01A1.

14. KINEMATIC ANALYSIS OF DROP LANDINGS IN SUBJECTS WITH PATELLAR TENDON PAIN

J. Kemper, D. McAlpine, E. Handschke, J. Kolmodin & K. Carlson. Department of Kinesiology Wheaton College

The purpose of this study was to examine the differences in knee landing kinematics between subjects with jumper's knee (patellar tendonitis) and subjects with healthy knees. It was hypothesized that subjects experiencing patellar tendon pain would exhibit greater knee flexion than unaffected individuals. Eight males ranging in age from 18 to 23 years participated in the study. Subjects either complained of unilateral or bilateral anterior patellar tendon pain. Diagnosis of patellar tendonitis was not made by a physician. After an appropriate warm-up, subjects were asked to perform a drop landing off of a 0.40 meter plyometric box. They landed on the affected limb and were instructed to land as they normally would. They were then asked to perform the same task on the unaffected limb. Each condition was completed three times. Video data was captured in the sagittal plane at 60 Hz. Video digitization and analysis was completed using the Ariel Performance Analysis System software by Ariel Dynamics. Knee flexion angles, knee angular velocities, and time to peak knee flexion were analyzed between the affected and unaffected limbs of the subjects. A one-way ANOVA was used to determine significant differences between the two limb conditions. It was concluded that the maximum knee flexion angle and time to maximum knee flexion was significantly different between the two limb conditions ($p < 0.05$). Thus, it was concluded that subjects who complained of patellar tendon pain displayed greater knee flexion and a larger time interval to peak knee flexion upon landing when compared to the unaffected limb.

15. MAXIMAL AEROBIC FITNESS IN A PEDIATRIC CLINICAL WEIGHT MANAGEMENT PROGRAM

B. Vystejnova, J. Peters, M. Hughes, W. Mays, T.Knilans, R. Claytor. Miami University and Children's Hospital Medical Center, Cincinnati, OH

Five-hundred, forty-eight youth(ages 5-19 yrs)completed an initial maximal, graded, treadmill exercise test(GXT)as part of an initial evaluation for participation in a clinical weight management program(CWMP). 89% of the GXT's were considered maximal tests by standard criteria. 64% of children ages 5-8 yrs. were able to complete a maximal test(51/80); 92% of those ages 9-13 yrs.(286/310) and 96% of the youth ages 14-18(151/158)completed a maximal test. VO2max(ml/min) was significantly and positively correlated with BMI while VO2max(ml/kg/min)was negatively correlated with BMI in each of the age categories; r=-0.56(5-8); r=-0.62(9-13); r=-0.61(14-18). Overall, males exhibited a significantly greater VO2max as compared to females when VO2max was adjusted for body weight(males=25.6+/-5.0 vs females=24.6+/-4.3; $p<0.05$). VO2max unadjusted for body weight (ml/min) was not significantly different between males and females or African-American (AA) and Caucasian(C) youth; however, when VO2max was adjusted for body weight C exhibited a significantly greater VO2max(C=26.3+/-4.7 vs AA=23.2+/-3.7; $p<0.0001$). These data suggest that the majority of overweight youth participating in a CWMP can complete a maximal effort treadmill test. These data provide limited support that males and C exhibit a higher VO2max(ml/kg/min) upon entry into the program.

16. MEASUREMENT OF PHYSICAL ACTIVITY AND ITS IMPACT ON AFFECT IN OLDER ADULTS

SJ Parker, SJ Strath, AM Swartz, and MA Parmenter Exercise Physiology Laboratory, Department of Human Movement Sciences, University of Wisconsin-Milwaukee

Purpose: To examine the impact of three different assessment instruments (two objective and one subjective) on the relationship between physical activity (PA) level and affect/mood among older adults. Methods: Pedometers (PED), accelerometers (ACC), and the Physical Activity Scale for the Elderly (PASE) were administered to measure one full week of daily PA among adults aged 55-87 (n=80). Positive and Negative affect over the previous month were measured using the Positive and Negative Affect Scale (PANAS). PA levels measured by PED and ACC were positively correlated with positive affect (r=.292, p=.009/r=.222, p=.058, respectively), and negatively correlated with negative affect (r=-.331, p=.003/r=-.265, p=.018, respectively). Seven-day recall (PASE) failed to show any significant relationships between PA level and positive (r=.055, p=.63) or negative (r=-.144, p=.212) affect. To investigate whether a bias toward higher or lower PA confounded PA recall, activity scores from the three assessment instruments were divided into dichotomous high or low activity level groups. Independent sample t-tests indicated significantly less negative affect for PED (t[77]=2.3, p=.024) and ACC (t[79]=-2.01, p=.048) measurements, and a weaker difference between higher activity level and positive affect for PED (t[77]=1.7, p=.091) and ACC (t[79]=-1.74, p=.085) measurement. There were no differences in positive (t[78]=-.683, p=.497) or negative (t[78]=1.38, p=.171) affect between high or low activity level when measured by PA recall. Effect size calculations further support this trend. Conclusion: These results suggest that relationships between PA and psychological variables, such as affect, appear dependent upon the particular PA measure utilized. Supported in part by the UW-Milwaukee Center on Age & Community Fellowship Grant (Strath).

17. MUSCLE OXYGEN SATURATION IN THE VASTUS LATERALIS DURING WINGATE AND BOSCO TESTS

D.M. Malek, A.C. Snyder, FACSM, R.W. Wilson, M. Stenlund, B.P. Edlbeck, J.C. Dorman Department of Human Movement Sciences Human Performance Laboratory University of Wisconsin-Milwaukee

Due to the availability of invasive technologies it is possible to calculate muscle oxygen saturation (StO2) while performing exercise tests. Thus, it is feasible to examine an athlete's StO2 during rigorous anaerobic activity. Two tests of anaerobic ability, the Bosco 60-second jump test and the Wingate 30-second cycling test have been used predominately to determine maximal power. PURPOSE: The purpose of this study was to examine muscle oxygen saturation during these two anaerobic tests to determine if muscle oxygen utilization occurred during these high intensity exercises and if so, to determine if the rate of utilization was similar between the two tests. METHODS: Regional and National speed skaters completed both the 30-second Wingate cycling test and the 60-second Bosco jump test. During the Wingate test, resistance is set according to body weight and the athlete cycles maximally for 30-seconds. During the Bosco jump test, the athletes were instructed to jump as high and as often as possible, with hands on hips from a knee bend of approximately 90 degree. Jumping took place on a timing mat to measure time-on and time-off the mat. StO2 was measured via near infrared spectrometry on the vastus lateralis muscle. RESULTS: StO2 decreased rapidly in both exercise tests, reaching values near or less than 10% saturation by 15 seconds during the Wingate test and 25 seconds during the Bosco test. Blood lactate levels were 13.3 +/- 2.6 mM for the Wingate and 12.0 +/- 2.0 mM for the Bosco test. CONCLUSION: Even thought these tests were very anaerobic as indicated by the lactate levels, oxygen utilization occurred in the muscle during the first half of each test.

18. NEONATAL CORRELATES OF VENTILATORY RESPONSES TO EXERCISE IN 8-10 YEAR-OLD CHILDREN BORN WITH VERY LOW BIRTH WEIGHT

L.M. Mudd, P.A. Nixon, FACSM, L. Washburn, H.B. Hamilton, M. Schechter, T.M. O'Shea. Wake Forest University

PURPOSE: To examine the relationships between neonatal characteristics, including birth weight (BW), days spent on mechanical ventilation (MV), and postnatal treatment with dexamethasone (DEX), with ventilatory responses during exercise in children born prematurely with very low birth weight (VLBW; <1501 g), at 8-10 years of age. Treatment with postnatal dexamethasone has documented benefits on pulmonary function in premature infants as indicated by fewer days on MV; however, long-term effects are unknown. From 2002-2003 follow-up of a randomized controlled trial of DEX therapy in VLBW children was completed. Data for 38 VLBW children who completed a maximal exercise test were analyzed for this study. Among these children, 20 (9 male) were treated postnatally with a 42-day course of DEX, and 18 (9 male) received placebo (CON). METHODS: Neonatal data were retrieved from a research database. Each child performed a graded maximal exercise test on a cycle ergometer. Ventilatory responses were measured breath-by-breath via a MedGraphics metabolic cart and included minute ventilation (VE), respiratory rate (bf), and tidal volume (VT) at peak exercise. The nadir of the ventilatory equivalent for carbon dioxide (nadVE/VCO2) was determined to reflect submaximal ventilatory efficiency. RESULTS: For the overall group, BW was positively correlated with VE ($r=.472$, $P=.003$), while time spent on MV correlated positively with nadVE/VCO2 ($r=.356$, $P=.036$). Further analyses revealed that these relationships were limited to the CON subgroup in which BW was correlated with both VE ($r=.698$, $P=.001$) and VT ($r=.531$, $P=.023$), and days spent on MV was positively correlated with nadVE/VCO2 ($r=.487$, $P=.047$). Among the DEX subgroup, no significant correlations were observed between ventilatory responses to exercise and BW or MV. CONCLUSION: For VLBW children not exposed to DEX therapy, BW was significantly associated with greater VT and VE at peak exercise, while more time spent on MV was associated with worse ventilatory efficiency during exercise as indicated by a higher nadVE/VCO2. No correlates of ventilatory responses to exercise were observed in the DEX group. Our results infer that postnatal DEX treatment disrupts the adverse effect MV may have on ventilatory efficiency during exercise. Further research is warranted to determine correlates of ventilatory responses to exercise in VLBW children treated with DEX.
Supported in part by a General Clinical Research Center Grant RR M0107122, the WFU Science Research Fund, and Brenner Children's Hospital Intramural Funding

19. RELATIONSHIP BETWEEN BLOOD LACTATE CONCENTRATION AND RATING OF PERCEIVED EXERTION DURING INCREMENTAL CYCLE AND ICE ASSESSMENTS

R.W. Wilson, A.C. Snyder, FACSM, M. Stenlund, J.C. Dorman, B.P. Edlbeck, and D.M. Malek Department of Human Movement Sciences Human Performance Laboratory University of Wisconsin – Milwaukee

In the monitoring of athletes, the concentration of blood lactate levels ([HLa]) and rating of perceived exertion (RPE) are often used during assessments. Previous research from our laboratory has shown that the ratio of [HLa]:RPE can indicate over-reaching in cyclists and thus is useful in monitoring athletes. However, the ratio has not been compared in athletes using different types of training methods to determine if similar results occur. PURPOSE: To compare the ratio of [HLa]:RPE in junior and senior aged members of the US Speedskating's regional and national teams during cycling and speed skating. METHODS: The subjects participated in two assessments – Incremental sub-maximal – Maximal bike (Cycle) and Incremental sub-maximal ice (Ice) – on two separate days with an appropriate recovery time in between test days. Ice assessments involved four stages at different workloads. Cycle tests involved between three and five sub-maximal stages. RESULTS: During both tests there was a positive correlation between [HLa] and RPE. For the most part, the [HLa]:RPE ratios

were greater during Ice tests when compared to the ratio during the Cycle tests. CONCLUSIONS: While RPE at corresponding stages may be similar, the resulting [HLa]:RPE ratio is much greater from Ice tests due to the higher [HLa] levels. Therefore, cross-comparison of results cannot be made directly.

20. THE RELATIONSHIP BETWEEN RUNNING ECONOMY AND MAXIMAL OXYGEN UPTAKE IN TRAINED ADOLESCENT FEMALE DISTANCE RUNNERS

M.E. Woodruff, A.S. Cole, A.D. Mahon, and M.P. Horn. Ball State University Human Performance Laboratory

The independent characteristics of good running economy (lower submaximal VO2) and a high maximal oxygen uptake (VO2max) have been related to distance running success. However, the interaction between these two measurements is not well-defined in young adolescent runners. Therefore, the purpose of this study was to evaluate the relationship between running economy (RE) and VO2max in a group of homogeneously-trained adolescent female distance runners. Nineteen 6.5 kg) performed two 6-min± 6.3 cm; 55 ± 1.0 yrs; 168 ±subjects (15.9 submaximal treadmill runs at 7.0 and 8.0 mph, respectively. Running economy was defined as the VO2 (ml• kg-1 •min-1) at each speed and the delta VO2 from 7.0 to 8.0 mph. Subsequent to the final RE speed, VO2max was measured using a graded exercise test to maximal voluntary exhaustion. Oxygen consumption was assessed using standard open circuitry spirometry techniques. Running economy at 7.0 and 2.9 ml• kg-1 •min-1,± 2.7 ml• kg-1 •min-1 and 46.8 ±8.0 mph were 41.3 1.0 ml• kg-1 •min-1. VO2max averaged±respectively. The delta VO2 averaged 5.5 5.9 ml• kg-1 •min-1. Pearson correlation analyses revealed a significant±58.0 relationship between the delta VO2 and VO2max ($r = 0.56$, $p < 0.05$). However, there were no significant relationships between RE at each velocity and VO2max ($r = 0.20$ at 7.0 mph; $r = 0.38$ at 8.0 mph). Although RE was not significantly related to VO2max, the delta VO2, another measure of economy, was related in a manner that suggested the runners with the highest VO2max tended to be less economical with respect to the change in VO2 from one speed to the next. In conclusion, future research in this area should focus on the interaction between VO2max and the biomechanical and metabolic influences of RE as it relates to this population. Funding provided by the Indiana Academy of Science and Ball State University.

21. THE RELATIONSHIP OF EXERCISE INDUCED ANAEROBIC METABOLISM AND PLASMA CORTISOL LEVELS

N.E. Steidl, G. Fleming, C. Nelson, A. Hall, and C.D. Ianuzzo, FASCM. Departments of Kinesiology and Biology, Wheaton College

The purpose of this study was to determine the relationship between anaerobic metabolism as indicated by plasma lactate [LA] concentration and physiological stress as represented by plasma cortisol [C]pl levels during different types of exercise. Five subjects worked on a bicycle ergometer at a ~75% of their maximal heart rate (HRmax) for 30 minutes. Venous blood samples were taken pre and post exercise. The following week the same subjects did 3 minutes of lunges and venous samples were taken pre and post exercise. Hematocrits were determined on each sample to correct for hemoconcentration. Results showed a significant increase in plasma [LA] from pre-cycling to post-cycling (0.70+ 0.29 vs. 2.58+0.69mM, $p=0.034$), and a significant increase from pre-lunges to post-lunges (0.52+0.17 vs. 3.29+2.05 mM, $p=0.002$). [C]pl did not change significantly following the lunges session (166+15 vs. 171+40 ng/mL) despite the significant increase in plasma [LA]. This indicates [C]pl was not directly related to plasma [LA]. Although there was a significant rise in [C]pl during cycling (124+36 vs. 172+28 ng/mL), there was no correlation between the percent change in plasma [LA] and the percent change in [C]pl during the endurance ($r=0.456$) or resistance ($r= -0.546$) exercise. From these data it was concluded that anaerobic metabolic stress represented by plasma [LA] does not relate to changes in the stress hormone cortisol.

22. RUNNING ECONOMY IN MALE AND FEMALE COLLEGIATE BASKETBALL PLAYERS

J.J. Ode, J.M. Pivarnik, FACSM. Michigan State University

RATIONALE: Previous work has shown gender differences in running economy in elite athletes. To our knowledge, this has not been studied in basketball players. The purpose of this study was to examine the gender differences in running economy in male and female NCAA Division I basketball players. METHODS: Anthropometrics (height, weight, % fat) were obtained on 56 (18 women, 38 men) NCAA Division I basketball players. Following these measures, all participants completed a discontinuous maximal treadmill protocol that featured 3 min run stages with 90 sec rest stages. Expired respiratory gases (SensorMedics 2900) and heart rate (EKG) were measured continuously throughout, and finger stick blood samples (for blood lactate) were obtained during resting stages. Oxygen consumption (VO2) at the third min of stage 2 (6 mph, 5% grade) was used as an index of running economy. Gender differences in economy were evaluated using ANOVA, and simple correlations were run between VO2 at stage 2 and heart rate, minute ventilation, lactate, percent fat, height, and VO2max. Multiple regression was performed to determine the best predictors of VO2 at treadmill stage 2. RESULTS: Results of ANOVA indicated no significant gender differences in economy during stage 2 of the treadmill protocol (women: 42.7 ± 3.2 ml.kg-1.min-1, men: 42.7 ± 2.7 ml.kg-1.min-1). Simple correlation showed VO2max to be the only variable related to VO2 at stage 2 ($r2=0.47$; $P<0.001$). However, results of multiple regression analysis showed that entering either gender or height into the model accounted for an additional ~10% of the variance in VO2 at stage 2 ($r2=0.57$; $P<0.001$). CONCLUSIONS: On average, running economy did not differ between men and women collegiate basketball players. However, if VO2max is held constant, either gender or height can account for significant variance in running economy. The direction of the relationship indicates that taller players (i.e., men) were more economical than shorter players (i.e., women).

23. SELECTED KINEMATIC PARAMETERS IN WALKING GAIT OF ELDERLY AND YOUNG WOMEN

E. Bollweg, E. Frank & K. Carlson. Department of Kinesiology Wheaton College

The problem addressed with this study was to determine stride length, center of gravity (CoG) velocity and swing/stance phase timing differences in gait between young and older women. Five active females between the ages of 18 and 24, as well as five active females ranging in ages of 72 to 78 were analyzed. After an appropriate warm-up and subject preparation, each subject was asked to walk at a self-selected pace through a 10-meter walking area. Each subject performed three trials of this protocol. Video data was collected in the sagittal plane at 60 fps. The Ariel Performance Analysis System (APAS) was used to produce the kinematic data from the video. One complete stride was analyzed within each subject trial. Velocity of the CoG was examined at heel strike, foot flat and toe off of the right limb. CoG velocity at heelstrike for the young group was 1.35 + 0.15 m/s, and for the elderly group was 1.14 + 0.20 m/s. CoG velocity at foot flat for the young group was 1.55 + 0.37 m/s, and for the elderly group was 0.76 + 0.22 m/s. CoG velocity at toe off for the young group was 1.62 + 0.20 m/s, and for the elderly group was 1.28 + 0.19 m/s. Stride length for the young group was 1.24 + 0.09 m, and for the elderly group was 1.12 + 0.11 m. Percentage of stride time in swing for the young group was 36.60 + 2.20%, and for the elderly group was 33.87 + 2.92%. Percentage of stride time in stance for the young group was 63.40 + 2.20%, and for the elderly group was 66.13 + 2.92%. A one-way Analysis of Variance (SPSS) was used to determine statistically significant differences between the two groups among the measured variables. All variables tested showed significant statistical differences ($p < .05$). Thus, it was concluded that the young women walked with a greater velocity, longer stride, more time in swing phase, and less time in stance phase.

SYMPOSIA

8:00 am – 8:50 am Room 310 # Contact Hours: 1.0 hour

HIGH-VELOCITY AND POWER TRAINING FOR OLDER ADULTS

Cody Sipe, MS, Ismail Center, Purdue University (member ACSM)

High-velocity and power training for improving function in older adults is a relatively new concept for both researchers and practitioners. While more evidence is certainly needed in this area the preliminary results are very promising. Due to the initial evidence, this approach is gaining more and more attention and may well be the most significant exercise paradigm for older adults since high-intensity strength training. This session will cover the rationale and evidence for using high-velocity and power training to improve function in older adults and will demonstrate techniques and movements. The discussion will include definitions of these training techniques, current training methodologies and practical considerations. By the end of the session attendees will be able to: define high-velocity and power training; understand the evidence for utilizing high-velocity and power training with older adult populations; describe appropriate exercise training protocols to increase contractile velocity and muscle power in older adults; and apply training techniques and progressions to current training methodologies and recommendations.

SYMPOSIA

8:00 am – 9:50 am Room 314 # Contact Hours: 2.0 hours

RETURN TO COMPETITIVE SPORTS AFTER SEVERE TRAUMATIC BRAIN INJURY

Joseph E. Hornyak, MD, PhD, University of Michigan, Dept. of Physical Medicine and Rehabilitation (ACSM member)

Traumatic brain injury (TBI) is a common cause of morbidity and mortality in children and young adults. Guidelines exist for return to athletic competition after mild TBI or "concussion", but there is little, if anything, in the medical literature on return to competition after severe TBI. The goal of rehabilitation is to return a person to as much of their pre-morbid activities as possible, including recreational activities. This course will provide a review of severe traumatic brain injury, epidemiology, pathophysiology and outcomes. This will be followed by a case discussion on returning to competition after severe TBI and current mild TBI guidelines.

WORKSHOP

8:00 am – 10:50 am Room 322 # Contact Hours: 2.0 hours

ROTATOR CUFF INJURIES AND THE WEEKEND WARRIOR

Jonathan Reeser, MD PhD

Designed for mobility rather than stability, the shoulder is susceptible to injury when subjected to the demands of "overhead" sports such as baseball, tennis, and volleyball. Although acute trauma can occur, the majority of shoulder pathology is the result of overuse. Repetitive overload can precipitate a cycle of tissue injury that, if not interrupted, may eventually result in shoulder pain and impaired performance. The most important dynamic stabilizer of the shoulder joint is the rotator cuff - a group of four muscles that act eccentrically to keep the humeral head well-positioned within the glenoid fossa. Among overhead athletes, rotator cuff dysfunction typically occurs concomitantly with scapular dysfunction. This module will present an integrated overview of the evaluation and treatment of rotator cuff dysfunction, examining the underlying anatomy and pathomechanics to arrive at a functional approach to the management of shoulder pain in the "weekend warrior".

Jonathan Reeser, MD PhD, is a physiatrist at the Marshfield Clinic, where he chairs both the Department of PM&R and the Institutional Review Board. With clinical and research interests in sports medicine, he chairs the USA Volleyball Sports Medicine and Performance Commission, and is a member of the Medical Commission of the Federation Internationale de Volleyball. He also serves on both the Medical Education Committee of the American College of Sports Medicine and the Editorial Board of the International Council of Sports Science and Physical Education. Born a Buckeye, he nevertheless has grown to enjoy rural Wisconsin life with his wife and two sons.

PRESIDENT'S LECTURE

9:00 am – 9:50 am Room 310 # Contact Hours: 1.0 hour

EXERCISE FOR INDIVIDUALS WITH ARTHRITIS

Lynn Millar, PT, PhD, FACSM (member ACSM)

Arthritis is one of the most common problems affecting activity, and is identified as the "nation's leading cause of disability among Americans over age 15." More than 70 million adults have some form of arthritis or chronic joint pain, with osteoarthritis and rheumatoid arthritis being the most common forms. Exercise is one of the most effective forms of treatment for arthritis. This session will explore some of the classic, as well as the most recent research, related to exercise for individuals with arthritis. Acute and chronic responses to aerobic, resistance, and flexibility exercise will be discussed, highlighting recommended training modifications. In addition, alternate approaches to exercise will be discussed, including water aerobics, tai chi, and yoga.

Lynn Millar is a Professor of Physical Therapy at Andrews University, where she serves as the research coordinator and assistant program chair. She has published numerous articles in the area of exercise with special populations and rehabilitation. Last year she authored the text "*Action Plan for Arthritis*", a joint project between ACSM and Human Kinetics. Her current areas of research include work with track athletes, individuals with MR, injury prevention and treatment, and other therapy related topics. Lynn has been a member of MWACSM since 1990, and served in many capacities, including President in 1998.

TUTORIAL

10:00 am – 10:50 am Room 310 # Contact Hours: 1.0 hour

FITNESS ASSESSMENT AND EXERCISE PRESCRIPTION FOR INDIVIDUALS WITH ARTHRITIS

Lynn Millar, PT, PhD, FACSM (member ACSM)

While traditional fitness assessment techniques and exercise prescription may be used for individuals with arthritis, modifications are often warranted. As the number of individuals with arthritis increases, the chance of working with an individual in a health/fitness setting becomes greater. The purpose of this tutorial is to: 1) Identify contraindications and precautions to testing and exercise, 2) Discuss fitness assessment and exercise prescription techniques with specific recommendations on how to modify protocols and programs, and 3) When possible, demonstrate appropriate fitness assessment techniques for involved joints.

TUTORIAL

10:00 am – 10:50 am Room 314 # Contact Hours: 1.0 hour

PLYOMETRIC TRAINING: THEORY AND APPLICATION

Roop Jayaraman, M.S. and Ph.D. Albion University (member ACSM)

Plyometric training became popular during the late 1970s primarily for improving jumping ability. Plyometrics is often described as explosive-reactive" power training because it involves powerful muscular contractions in response to a rapid stretching of the involved musculature. This type of "stretch-shortening" contractions is not a pure muscular event; it is a combination of an involuntary reflex (i.e. a neural event), which is then followed by a rapid muscular contraction (i.e. voluntary muscular event). This workshop will begin with a review of skeletal muscle and central nervous system physiology. This discussion will be followed up with a review of the pertinent biomechanical literature with regard to the use of plyometrics for both performance enhancement and injury prevention. Specifically, the workshop will focus on those mechanical parameters that are typically assessed among clinical and applied settings for recreational and athletic populations. Lastly, the applied section of this workshop will focus on the practical implementation of plyometrics for sport performance enhancement. Many sport-specific plyometric drills will be demonstrated in an effort to broaden the attendees' knowledge of this training methodology. Proper use and progression of these drills will be addressed, and coaching cues will be shared so that practitioners can immediately utilize this information in different settings.

PRESIDENT'S LECTURE

11:00 am – 11:50 am Room 322 # Contact Hours: 1.0 hour

THE ROLE OF TAILORED HEALTH EDUCATION AND EXERCISE IN A HEALTHY LIFESTYLE INTERVENTION FOR CANCER SURVIVORS

Lucinda A. Pfalzer, PhD, PT, FACSM

The physical complications and emotional problems as a result of cancer and its treatment can linger for years. These problems/complications include cardiovascular and cerebrovascular events, pulmonary, musculoskeletal and neurological complications, lymphedema, psychosocial dysfunction that lead to functional limitations, disabilities and economic hardship, and second cancers or cancer recurrence. Increased physical activity and exercise training, nutritional counseling and stress management have been used independently during acute treatment in women with breast cancer and individuals after bone marrow transplant (BMT) to prevent secondary complications and problems from cancer and its treatment. Few of the reports in the literature have: 1. examined the effects of exercise in other cancer survivors outside of breast cancer and BMT, 2. combined these interventions in a comprehensive interdisciplinary tailored health promotion program to promote healthy behaviors including increased physical activity or 3. examined the effects of these interventions on quality of life and economic costs. Purpose: To determine the economic, behavioral and biologic outcomes of a three-month interdisciplinary tailored health promotion program for cancer survivors after medical treatment. Research Design: A two group, experimental design with one group undergoing the interdisciplinary health promotion program (HP group) and the second group acting as a control group (C) for comparison. The results of the pilot project will be reported.

Dr. Pfalzer is a Professor of Physical Therapy in the Doctor of Physical Therapy Program and Associate Director of Research and Post-Professional Education in the Physical Therapy Department at The University of Michigan-Flint. She is responsible for coordinating and assisting student research projects in the graduate DPT professional program and post-professional program. Cindy has focused her teaching and research efforts on the role of exercise in prevention and intervention for chronic injury and disease populations. Dr Pfalzer was granted her PhD from the Ohio State University upon completion of her dissertation research in 1988 entitled "The Responses of BMT Patients to Graded Exercise Testing Prior to Transplant and After Transplant with and without Exercise Training. While a graduate research associate in the Department of Exercise Physiology and College of Nursing at The Ohio State University she worked on a funded NIH grant examining the effects of exercise training on patients with stage II breast cancer receiving chemotherapy. She is currently a co-PI on a 1.3 million dollar NIH funded 3-yr. grant examining health disparities. Dr. Pfalzer is a Fellow of the American College of Sports Medicine, Past-President of the Oncology Section of the APTA and recipient of the Oncology Section's Jeri F. Walton Career Service Award, a recipient of the MPTA Richard E. Darnell Research Award and a member of the Board of Directors of the MPTA.

PRESIDENT'S LECTURE

11:00 am – 11:50 am Room 310 # Contact Hours: 1.0 hour

NCAA WEB-BASED INJURY SURVEILLANCE SYSTEM (ISS): APPLICATIONS, RESEARCH OPPORTUNITIES AND SYSTEM DEMONSTRATION.

Randall W. Dick, MS, FACSM (member ACSM)

The NCAA Injury Surveillance System (ISS) has been a vital component in the Association's risk-management, policy-development and rules-making processes since 1982. It is also recognized as the largest continuous collection of college athletics injury data in the world. These data have been used by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports, various sports and rules committees and researchers as a foundation for decision-making.

In August 2004, the NCAA converted from a paper-based to a Web-based injury data collection system for 17 sports in August 2004. Real time data collection and access is possible over the entire academic year, not just the traditional sport season, so that the out-of-season conditioning, nontraditional seasons and other activities can be monitored. More sports will be added to the system over the next few years. The lecture today will discuss practical application of these data to real sports medicine problems such as heat illness and anterior-cruciate injuries. Using the ISS for special studies and gaining access to the fifteen years of collected injury data for research purposes also will be discussed. The presentation will conclude with an on-line demonstration of the current Web-based system.

Randall W. Dick, MS, FACSM works as Associate Director of Research/Injury Surveillance System at the National Collegiate Athletic Association NCAA). Since 1987, he has been a liaison to the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports working with sports medicine issues ranging from eating disorders and HIV in sports to ACL injury prevention and injury surveillance. He has developed effective collaborations with other major sports medicine organization and sport governing bodies to jointly address these and other issues. In January 2003, he left his committee liaison role to direct the Association's efforts to develop a web-based injury data collection system and accessibility to and application of the resulting data. Mr.. Dick represents the NCAA on the NATA College / University Athletic Trainers' Association, is a Fellow in the American College of Sports Medicine and is a member of the United States Lacrosse Sports Sciences Committee.

SYMPOSIA

11:00 am – 11:50 am Room 314 # Contact Hours: 1.0 hour

FUNDAMENTALS OF TEACHING A GROUP FITNESS CLASS

Carol Kennedy, MS, Indiana University, Dept. of Kinesiology (ACSM member)

Are there some common principles/guidelines for group exercise classes that bind them all together? With the explosion of different group fitness classes like indoor cycling, sports conditioning, step, trekking, etc. how does one evaluate group exercise leaders and make sure these classes are safe, effective, and fun for the participants? This discussion will provide an overview of an evaluation form/tool used in the academic class "Methods of Group Exercise Instruction" at IU to grade group exercise presentations. We will also review current group cohesion research, which tells us that group exercise is a mainstay in the fitness industry. Group cohesion is essential for long-term adherence to exercise programs in general. A DVD of different forms of group exercise will also be shown for those who are new to the group exercise experience in general. We need to embrace and enhance the experiences in our group fitness classes for our participants in order to help them achieve active healthy living.

SATURDAY, NOVEMBER 6

LUNCHEON BANQUET

Noon – 1:30 pm Union Building East and West Faculty Lounges

KEYNOTE SPEAKER

1:30 pm – 2:30 pm Krannert Auditorium # Contact Hours: 1.0 hour

CONFESSIONS OF A FAT OLD BROAD: WHY PEOPLE LIKE ME DON'T COME TO YOUR HEALTH CLUB

Dottie Drake, RN

As an RN since 1973, Dottie Drake has brought her health care experience and knowledge to the fitness environment through "Fitness First for Women, Seniors & Baby Boomers", a health club she founded in 1998. After reading the surgeon generals report on exercise and feeling the affects of aging herself, Dottie felt called to teach people to stop focusing on death and learn how to regain their strength and live again. The problem was there was no place geared for her or the 80% of the de-conditioned population to exercise.

In May of 1998, Dottie opened her first health club, a 1,200 sq. ft. facility focusing exclusively on the underserved population of women, seniors, and the physically challenged. "Fitness First" was the first club in the nation to combine these populations in an exclusive health club setting and the response was overwhelming! To compensate, Dottie had to expand to a 5,000 sq. ft. facility within the same year. In February of 2000 she opened her second location with the third following only 8 months later.

Today, Dottie is recognized as a pioneer in the fitness industry. Her health clubs have been featured in The New York Times, Club Industry, Club Business Industry, Family Magazine, Fitness Management Magazine, International Council on Active Aging, Journal on Active Aging, The Nursing Spectrum and Advance for Nursing. Her MIRACLES FITNESS program has been recognized nationally by winning the 2002 Nu-Step Pinnacle Award of Excellence for designing senior programs.

Bowling Green State University
Bowen-Thompson Student Union

WHEN
November 7-8, 2003 (Friday-Saturday).

HOTEL INFORMATION
Bowling Green Days Inn
1550 E. Wooster Street
Bowling Green, OH 43402 US
Phone: 419-352-5211 Fax: 419-354-8030
On Interstate Highway 75, Exit 181, across from Bowling Green State University. Recently renovated. Free deluxe continental breakfast. $47 per night. More information: www.mwacsm.org.

GENERAL INFORMATION
Visit us on-line @ www.mwacsm.org

ABSTRACTS
The abstract submission date is September 1, 2003. Submission forms and guidelines can be obtained on-line @ www.mwacsm.org (go to the annual meeting page and a link to forms will be noted at the bottom of the page).

REGISTRATION
Complete the included registration form or on-line @ www.mwacsm.org. A discounted registration fee is in effect until October 15 (postmark date). Cancellation of registration must be made before October 15, in order to receive a full refund. A $20.00 processing fee will be applied to cancellations made between October 15-25. No refunds will be granted after October 25, 2003.

MWACSM Annual Meeting
Tentative Schedule

Friday, November 7, 2003 (Afternoon 1-5 pm):

President's Lectures:
My Olympic Experience and How We Increase Performance in Figure Skaters, Roger Kruse, M.D.

Interrelationships of Exercise, Mood, and Self-Esteem in Obese Populations, Bonnie Berger, Ed.D.

Is it Safe to Exercise Patients with Heart Failure? The Development and Design of a Trial to Answer this Question, Steven J. Keteyian, Ph.D., FACSM

Tutorial:
30 Minutes? 60 Minutes? 10,000 step? More Than Before? How Much Physical Activity is Enough? Cody Sipe, M.S.

Workshop:
Program Planning and Evaluation: Asking the Right Questions, Stephen M. Horowitz, Ph.D.

Friday Evening:

Keynote Address sponsored by the Gatorade Sports Science Institute
Muscle Soreness: From Microtears to Microarrays
Priscilla Clarkson, Ph.D., FACSM

Evening Social, BGSU Bowen Thompson Student Union Pub

Saturday, November 8, 2003

Oral Presentations / Posters (8:30-11:30 am; 1:30-4:30 pm)

President's Lectures:

Ultraendurance Exercise, Mark Langenfeld, Ph.D FACSM

Developing a National Strategy to Promote Physical Activity in the Mid-life and Older Population, Wojtek Chodzko-Zajko, Ph.D.

Increasing Patient Compliance in Cardiac Rehabilitation through the use of Tele-medicine Technology, Ken Sparks, Ph.D., FACSM

Creatine: Does it really work? Priscilla Clarkson, Ph.D., FACSM

Motor Development: New Approaches to Old Questions, Mary Ann Roberton, Ph.D.

Symposia:

Reducing Disability and Increasing Function in Older Adult Populations: Does Exercise Really Work? Cody Sipe, M.S., Dan Ritchie, M.S., and Ken Baldwin, M.S.

Evaluation and Training Methods Designed for Competitive Rowers, Carmen J. Babcock, M.A., Shannon Ghizzoni, B.S., Heidi Deep, B.S., and Maxi Meissner

Peripheral Arterial Disease and Exercise, Jonathan K. Ehrman, Ph.D., FACSM

Management of Head Injury in the Injured Athlete, Henry Goitz, M.D., Jeffrey Noftz, P.T., M.D.

Creating a Model Health Promotion Program, Brenda Reeves, Ph.D.

Tutorials:

Sports Dermatology, Brian B. Adams, MD

2003 Cardiovascular Clinical Trials Update, Robert L. Bard, M.A.

Case Study Method of Instruction: Integrating Classroom and Clinical Experiences, Thomas Cappaert, Ph.D., ATC

A Practical Approach for Training Individuals with Parkinson's and Multiple Sclerosis, Dan Ritchie, M.S.

Cardiopulmonary Exercise (CPX) Testing
Jon Ehrman, Ph.D., FACSM, CA Brawner, B.S.

Prescribing Exercise: Building on the Guidelines
Clinton A Brawner, B.S., Dennis Kerrigan, M.S.

Workshops:

Weekend Warrior Workshop: Lower Back - Sponsored by Pfizer

Analyzing & Correcting Posture and Body Alignment
Ken Baldwin, M.Ed. and Stacey Trock

Designing exercise programs for those with orthopedic concerns, Laura Kennett, M.S., ATC

Managing Conflict in the Workplace, Stephen M. Horowitz, Ph.D.

What Do You Want To Be When You Grow Up and How Do You Get There? Brenda Reeves, Ph.D.

Concluding Roundtable Discussion - MWACSM Student Awards Ceremony

PROGRAM

AMERICAN COLLEGE OF SPORTS MEDICINE

MIDWEST ACSM REGIONAL CHAPTER ANNUAL MEETING

BOWLING GREEN, OHIO

NOVEMBER 7-8, 2003

BGSU

WELCOME TO THE MIDWEST REGIONAL CHAPTER

AMERICAN COLLEGE OF SPORTS MEDICINE

ANNUAL FALL MEETING

NOVEMBER 7-8, 2003
BOWLING GREEN STATE UNIVERSITY
BOWLING GREEN, OHIO

Dear MWACSM Members, Students, and Guests,

As Program Coordinator for the 2003 MWACSM Annual Meeting it is my pleasure to welcome you to our BGSU campus. One of the Chapter's Strategic Plan Objectives was to host a meeting on a campus to reduce the costs of the annual meeting. I hope that you will find a variety opportunities available to you during your time on-campus. The Bowen-Thompson Student Union opened in Spring of 2002 and is a focal point for campus activities. The meeting rooms, facilities, and lounge areas will be an ideal atmosphere for you to enjoy the formal as well as informal activities associated with our annual meeting.

Please enjoy using your MWACSM portfolio and try to attend these important meeting events:

Keynote by Priscilla Clarkson, Ph.D., FACSM – Friday evening
Student Social/Raffle in the Black Swamp Pub – Friday evening
Exhibitors' Displays/ Product Demonstrations / Posters – Saturday, McMaster Room
Students Award Ceremony to conclude the Annual Meeting, Saturday at 4:30 pm.
President's Lectures – both days during the Annual Meeting

Many individuals have contributed to make meeting possible. I would like to thank Tim Kirby and Carmen Babcock in the MWACSM Executive Director's Office, Helaine Alessio, last year's Program Coordinator, Amy Jo Sutterluety, MWACSM President, and the following from BGSU: Dr. Josué Cruz, Dean of the College of Education and Human Development, Dr. Bonnie Berger, Director of the School of Human Movement, Sport and Leisure Studies, Dr. Amy Morgan, KNS Division faculty member, Lisa M. Day, graduate student, HMSLS, Assistant Program Coordinator, Phillip Al-Mateen, graduate student, HMSLS, Carrie Barnes, undergraduate, Exercise Specialist major, Karen Weber in Event Planning, and Mickey in Catering.

We have many sponsors and Gatorade and Pfizer continue to support the national ACSM and the Regional Chapters. Pepsi has supported the attendance of approximately 90 BGSU graduate and undergraduate students. Again, I hope you enjoy the meeting and find a chance to network with many of your professional colleagues!

Sincerely,
Lynn A. Darby, Ph.D., Past-President, MWACSM

2003 MWACSM BOARD OF DIRECTORS

EXECUTIVE OFFICERS

Amy Jo Sutterluety, PhD	President	Baldwin Wallace College	asutterl@bw.edu
Lynn Darby, PhD	Past-President	Bowling Green State Univ.	ldarby@bgnet.bgsu.edu
Chris Womack, PhD	President-Elect	Michigan State Univ.	cwomack@msu.edu
Timothy Kirby, PhD	Executive Secretary	The Ohio State Univ.	kirby.1@osu.edu
Brenda Reeves, PhD	Secretary	Grand Valley State Univ.	reevesb@gvsu.edu
Lynn Millar, PhD, FACSM	Regional Chap. Rep.	Andrews University	lmillar@andrews.edu

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Cindy Bouillion, PhD	Board Member	Univ. of Findlay	bouillon@mail.findlay.edu
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Cody Sipe, MA	Board Member	Ismail Center for Health, Exercise and Nutrition	csipe@sla.purdue.edu

STUDENT REPRESENTATIVE

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MWNEWS EDITOR

Carmen Babcock, MA	MW News Editor	The Ohio State Univ.	babcock.11@osu.edu

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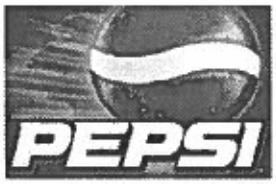
PROGRAM ACKNOWLEDGMENTS

THE MIDWEST REGIONAL CHAPER OF AMERICAN COLELGE OF SPORTS MEDICINE WOULD LIKE TO ACKNOWLEDGE THE GENEROUS FINANCIAL SUPPORT OF THE FOLLOWING ORGANIZATIONS:

- Gatorade Sports Science Institute®
- Pepsi®
- Pfizer®
- Wood County Hospital, Bowling Green, Ohio
- The School of Human Movement, Sport and Leisure Studies at Bowling Green State University
- The College of Education and Human Development at Bowling Green State University
- The Bowen-Thompson Student Union at Bowling Green State University
- The Student Recreation Center at Bowling Green State University



BGSU

ACKNOWLEDGMENTS

THE MIDWEST REGIONAL CHAPER OF AMERICAN COLELGE OF SPORTS MEDICINE WOULD ALSO LIKE TO THANK THE FOLLOWING PEOPLE FOR THEIR SUPPORT IN MAKING THE MWACSM ANNUAL MEETING A SUCCESS:

PROGRAM PLANNING COMMITTEE:
Lynn A. Darby, Ph.D., Amy Jo Sutterluety, Ph.D., Chris Womack, Ph.D., Helaine Alessio, Ph.D., and Lisa M. Day

ORAL COMMUNICATION /ABSTRACT REVIEWERS:
Thomas W. Nesser, Ph.D. Indiana State University
Roberta Pohlman, Ph.D. Wright State University

REGISTRATION:
Tim Kirby, Ph.D., Carmen Babcock, Jamie Lekan, and other OSU students at the MWACSM Executive Director's office

CONTINUING EDUCATION CREDITS:
ACSM has approved this meeting for 14 CEC's and the Weekend Warrior Workshop for 2 CME's.

STUDENT FORUM/SOCIAL:
Jamie Lekan, Carrie Barnes, Elizabeth Maxson

EXHIBITORS:

HUMAN KINETICS®

PRODUCT DEMONSTRATION:

VIASYS™ HEALTHCARE
Excellence For Life

CONFERENCE INFORMATION

OBJECTIVES

The 2003 meeting of the MWACSM is designed to:

- Enhance the scientific and clinical understanding of the physiological, biochemical, and psychological basis for the changes that occur during and following exercise in both normal and pathological states;
- Provide a forum for members and students to present research related to exercise science and sports medicine; and
- Promote interaction among scientists, clinicians, and students in related fields to provide new approaches to, and perspectives on, and problems in exercise science and sports medicine.

TARGET AUDIENCE

MWACSM members, ACSM members, clinicians, professionals, and students interested in the field of sports medicine and exercise science.

ACSM CME's

The American College of Sports Medicine's Professional Education Committee certifies that this continuing education offering meets the criteria for 14 credit hours of ACSM Continuing Education Credit. Credit for the CEM will accrue by attending the "Midwest Regional Chapter ACSM Annual Meeting."

ACSM CEC's

The American College of Sports Medicine's Professional Education Committee certifies that this continuing education offering meets the criteria for 2 credit hours of ACSM Continuing Education Credit. Credit for the CEC will accrue by attending the "Weekend Warrior Workshop" on Saturday from 1-4 pm. CEC forms may be obtained at the registration booth.

NAME BADGES

Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Please hold on to your badge!

MEETING LOCATIONS

All sessions and events will be held in the Bowen-Thompson Student Union. Room assignments for educational events are detailed in this program, along with a map of the Bowen-Thompson Student Union.

LUNCHEON BANQUET

The annual luncheon banquet is scheduled for Saturday from noon-1:30 pm in 202B BTSU, the Community Room. In addition, refreshments will be available Friday afternoon in registration area (Dimling Family Lounge), and the evening during the social in the Black Swamp Pub. Other dining opportunities are available in the BTSU.

PLANNED SOCIAL GATHERINGS

Please plan to attend the social and student raffle 9-11 pm, Friday in the Black Swamp Pub on the first floor of the BTSU. Snacks will be served and there will be a "cash bar".

ANNUAL BUSINESS MEETING

This important business meeting is your opportunity to participate as an active voice in affecting the future of the Midwest Chapter of ACSM. Please plan to attend on Saturday afternoon, immediately following the banquet luncheon.

AWARDS

The annual 'Founder's Award' and the Professional Award will be announced at the banquet luncheon on Saturday. The Founder's Award is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

The MWACSM Student Awards Ceremony will be from 4:30-5:00 pm, Saturday in 202B BTSU, the Community Room.

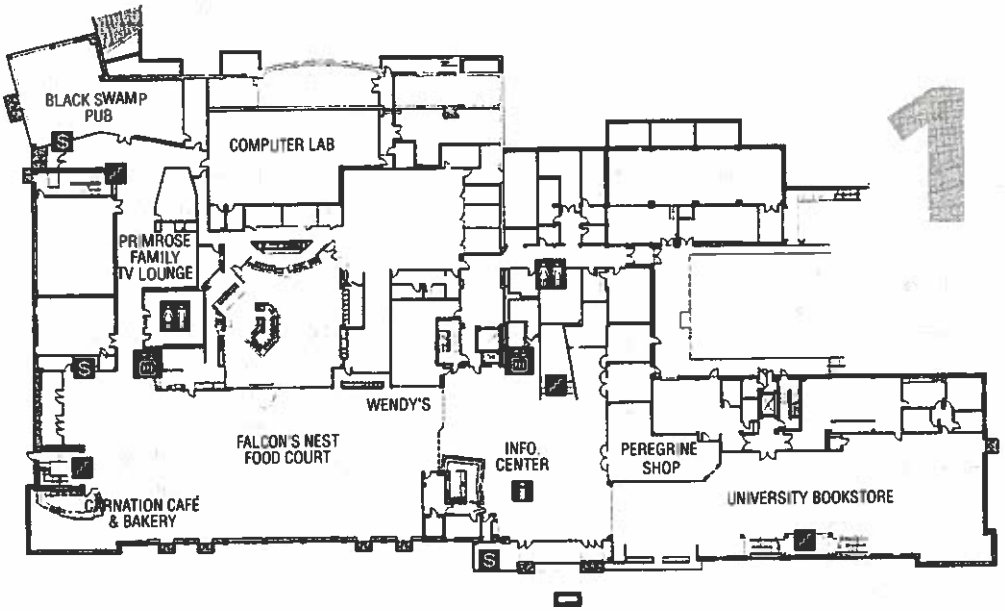
WORKOUT PASSES

Workout passes for the Student Recreation Center at BGSU will be available for pick up at the MWACSM registration desk.

FUTURE MEETING SITE

Fall 2004: Purdue University, Lafayette, Indiana

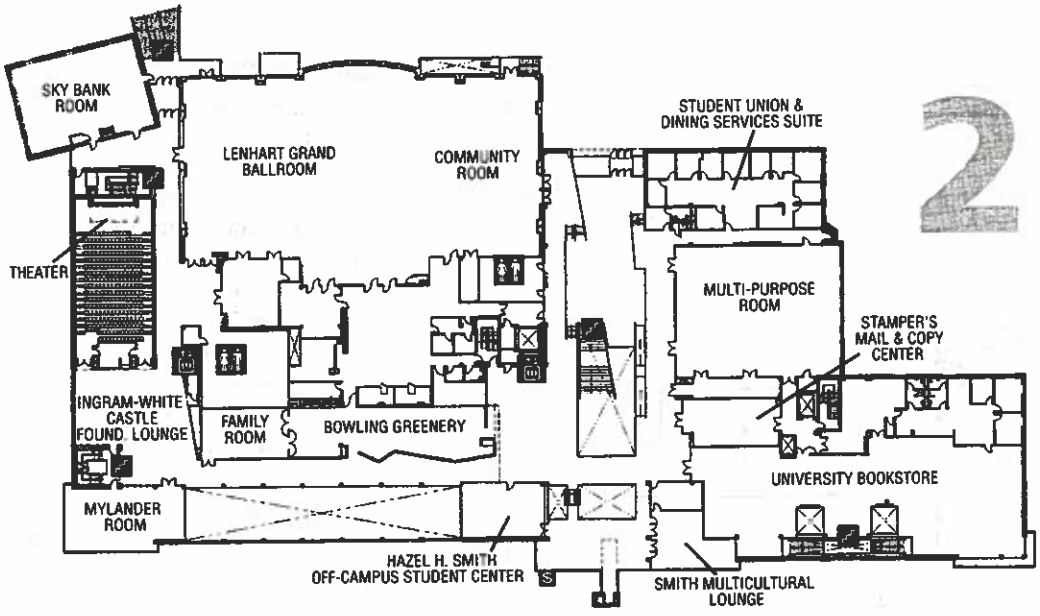
BOWEN-THOMPSON STUDENT UNION FLOOR PLAN



ATM
Elevators
Information Center
Stairs

FIRST FLOOR

Black Swamp Pub
Carnation Café & Bakery
Computer Lab
Falcon's Nest Food Court
Information Center
The Peregrine Shop
Primrose Family TV Lounge
University Bookstore
Wendy's

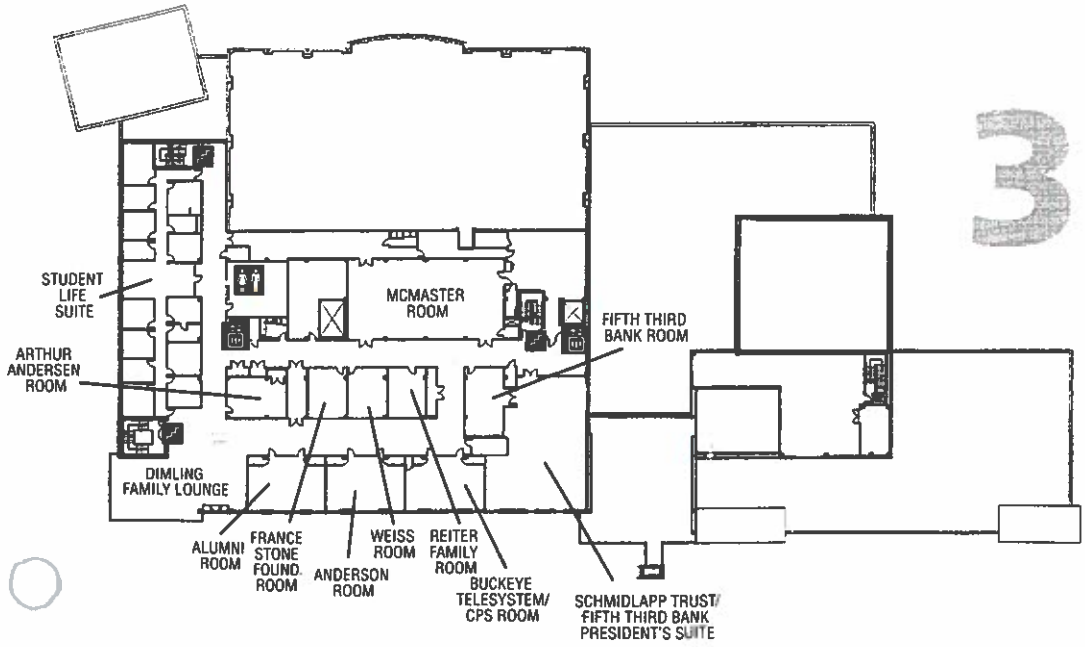


SECOND FLOOR

201A/B	Sky Bank Room
202A	Lenhart Grand Ballroom
202B	Community Room
206	Theater
207	Mylander Room
208	Family Room
228	Multi-purpose Room
231	Student Union & Dining Services Suite

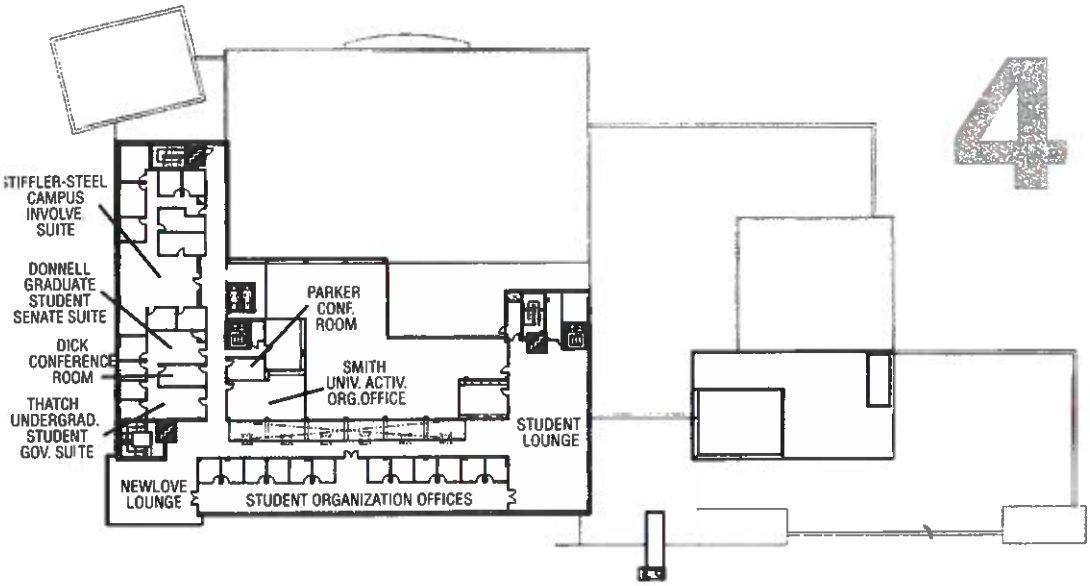
Hazel H. Smith Off-Campus Student Center
Ingram-White Castle Foundation Lounge
Smith Multicultural Lounge
Stamper's Mail & Copy Center
The Bowling Greenery
University Bookstore

BOWEN-THOMPSON STUDENT UNION FLOOR PLAN



THIRD FLOOR

301	Student Life Suite
306	France Stone Foundation Room
307	Weiss Room
308	McMaster Room
309	Reiter Family Room
310	Fifth Third Bank Room
311	Schmidlapp Trust/Fifth Third Bank President's Suite
314	Buckeye TeleSystem/ CPS Room
315	Anderson Room
316	Alumni Room
318	Arthur Andersen Room
	Dimling Family Lounge



FOURTH FLOOR

401	Stiffler-Steel Campus Involvement Suite
402	Donnell Graduate Student Senate Suite
403	Dick Conference Room
404	Thatch Undergraduate Student Government Suite
407	Parker Conference Room
408	Smith University Activities Organization Office
	Newlove Lounge
	Student Lounge
	Student Organization Offices

FINAL PROGRAM

FRIDAY, NOVEMBER 7, 2003

TIME	EVENT	ROOM
1:00 pm – 1:50 pm	My Olympic Experience and How We Increase Performance in Figure Skaters	314
1:00 pm – 1:50 pm	A Practical Approach for Training Individuals with Parkinson's and Multiple Sclerosis	315
2:00 pm – 2:50 pm	Is it Safe to Exercise Patients with Heart Failure? The Development and Design of a Trial to Answer this Question	315
2:00 pm – 2:50 pm	Creating a Model Health Promotion Program	314
2:30 pm – 4:40 pm	Oral Communications	316
3:00 pm – 3:50 pm	Interrelationships of Exercise, Mood, and Self-Esteem in Obese Populations	314
3:00 pm – 3:50 pm	2003 Cardiovascular Clinical Trials Update	315
4:00 pm – 5:20 pm	Program Planning and Evaluation: Asking the Right Questions	314
4:00 pm – 5:20 pm	Use of Muscle Oxygen Saturation in Exercise and Training	315
5:30 pm – 7:30 pm	Dinner "on your own" or Workout at the SRC	
7:30 pm – 9:00 pm	**Keynote Address:** **Priscilla Clarkson, Ph.D., FACSM** **"Muscle Soreness: From Microtears to Microarrays"** **Sponsored by the Gatorade Sports Science Institute**	206
9:00 pm – 11:00 pm	Social – Black Swamp Pub	First Floor BTSU

↑ aging - an issue, not a problem
50% women aged 75 & over - no physical activities

SATURDAY, NOVEMBER 8, 2003

TIME	EVENT	ROOM
8:30 am – 4:30 pm	Poster Display	308
8:00 am – 8:50 am	Prescribing Exercise Building on the Guidelines	314
8:00 am – 8:50 am	What Do You Want To Be When You Grow Up and How Do You Get There?	315
9:00 am – 9:50 am	Developing a National Strategy to Promote Physical Activity in the Mid-Life and Older Population	314
9:00 am – 9:50 am	Evaluation and Training Methods Designed for Competitive Rowers	315
9:00 am – 9:50 am	Sports Dermatology	316
10:00 am – 10:50 am	Creatine: Does it Really Work?	314
10:00 am – 10:50 am	30 Minutes? 60 Minutes? 10,000 Steps? More Than Before? How Much Physical Activity is Enough?	315
10:00 am – 10:50 am	Increasing Patient Compliance in Cardiac Rehabilitation Through the Use of Tele-Medicine Technology	316
11:00 am – 11:50 am	Motor Development: New Approaches to Old Questions	314
11:00 am – 11:50 am	Peripheral Arterial Disease and Exercise	316
Noon – 1:30 pm	**Luncheon Banquet**	202A
1:30 pm – 4:30 pm	**Weekend Warrior Workshop: Lower Back Sponsored by Pfizer**	202A
1:30 pm – 2:20 pm	Reducing Disability and Increasing Function in Older Adult Populations: Does Exercise Really Work?	314
1:30 pm – 2:50 pm	Managing Conflict in the Workplace	315
1:30 pm – 2:50 pm	Management of Head Injury in the Injured Athlete	316
2:30 pm – 3:30 pm	Case Study Method of Instruction: Integrating Classroom and Clinical Experiences	314
3:00 pm – 4:20 pm	Skeletal Muscle Injury, Degeneration, and Regeneration: Models and Therapies	315

SATURDAY, NOVEMBER 8, 2003 (cont.)

3:00 pm – 4:20 pm	Analyzing & Correcting Posture and Body Alignment	316
3:30 pm – 4:20 pm	Cardiopulmonary Exercise (CPX) Testing	314
4:30 pm – 5:00 pm	**MWACSM Student Awards Ceremony**	202B

ORAL COMMUNICATIONS

FRIDAY **2:30 pm-5:25 pm** **316 BTSU**

2:30-2:45	Wickman, et.al. "Hyperventilation/Gas Exchange…Heart Failure"
2:50-3:05	Vekaria, et. al. "Prediction of Mortality in Heart Failure…"
3:10-3:25	Duong, et. al. "Prognostic Ability of Ventilatory Efficiency…"
3:30-3:45	Cole, et. al. "Aerobic Exercise Char...M/F Adol. Runners…"
3:50-4:05	Tobar, et. al. "Mood State Responses…Swimmers…Anxiety"
4:10-4:25	McCarroll, et. al. "Correlation of Body Fat/O_2…Fire Fighters…"
4:30-4:45	McCarroll et. al. "A Review…External Counterpulsation…"
4:50-5:05	Rogers et. al. "Physical/Psych. Effects…Children…Autism"
5:10-5:25	Masterson, et. al. "The Role...Age Changes…Skeletal Muscle…"

POSTERS

SATURDAY **8:30 am-4:30 pm** **308 BTSU**

(Authors Present, 10:00-11:30 a.m.)

Poster #:

1. Ode, et. al. "Long Term Effects…Diet/Exercise…Body Size…"
2. Cadel, et. al. "Assessing Self-Perceptions…Body Wt./Eating Behaviors…"
3. Mahon, et. al. "Bone Content …M/F…Adolescent Runners"
4. Horn, et. al. "Muscle Strength/Power Char… Adolescent M/F Runners"
5. Edlbeck, et. al. "R/L Leg Muscle Oxygenation…Split Squat Ex…Speed Skaters"
6. Malek, et. al. "Max Oxygen Uptake of Speed Skaters…Skating/Cycling,"
7. Anderson, et. al. "Change in Start Position…Effects on Horizontal…Swim Start"
8. Dorman, et. al. "Comparison…Slow Component Phase/Oxygen Saturation…"
9. Coughlin "Time Course…Fibrinolytic..Max Exercise"
10. Harper, et. al. "Changes in Landing…Upper-Limb Motion …ACL-Recons…"
11. Donnelly, et. al. "The Effect of Head Position…Squat Exercise
12. Johnson, et. al. "Myostatin Inhibits Activity…Transcription Factors Myod…"
13. Nagelkirk, et. al. "The Influence of the Ace I/D…on Plasma PAI-1…"

PRESIDENT'S LECTURE

1:00-1:50 314 BTSU

MY OLYMPIC EXPERIENCE AND HOW WE INCREASE PERFORMANCE IN FIGURE SKATERS

Roger Kruse, M.D., *Sports Care*, Toledo, Ohio

An internationally known sports medicine expert, Dr. Kruse serves as Program Director of the Sports Care Fellowship Program. He is Board Certified in Family Practice and a member of the American College of Sports Medicine and the American Medical Society of Sports Medicine. Dr. Kruse received his undergraduate degree from Ohio State University and his medical degree from the University of Cincinnati College of Medicine.

Dr. Kruse's extensive resume includes: Head Physician, United States Olympic Team in Nagano, Japan, Physician, United States Olympic Team in Lilihammer, Norway (speed skating and figure skating), Medical Advisor, United States Olympic Team in Salt Lake City, Utah, Head Physician, University of Toledo (NCAA Division I), and Director of Sport Science for the United States Figure Skating Association. He has also served as Drug Crew Chief for the New York and Boston Marathons as well as the 1996 Summer Olympic Games in Atlanta.

Dr. Kruse's involvement in Sports Medicine is not limited to injury assessment and treatment. He founded Sports Care's Performance Enhancement Program, a sport specific training program that designs and oversees training programs for amateur and professional athletes. Chris Perry (winner of 5 PGA tour titles), Sarah Hughes (Olympic Gold Medallist), Amy Peterson (5 time Olympian), John Zimmerman (U.S. National Champion in pairs figure skating) and Dan Jansen (Olympic Gold Medallist) are just a few of the athletes who have benefited from Dr. Kruse's expertise.

Dr. Kruse is an internationally sought after speaker on a wide variety of sports medicine topics ranging from injury assessment and treatment to performance enhancement. He is a spokesman for Proctor and Gamble and is a member of the Gatorade's speaker's bureau.

TUTORIAL

1:00-1:50 315 BTSU

A PRACTICAL APPROACH FOR TRAINING INDIVIDUALS WITH PARKINSON'S AND MULTIPLE SCLEROSIS

Dan Richie, M.S., A.H. Ismail Center for Health, Exercise and Nutrition,
Purdue University

Purpose: To review the current literature and guidelines for working with populations with disease limitations, specifically Parkinson's and Multiple Sclerosis. Share personal experiences from working with these populations. Objectives: To discuss what fitness professionals can do with all populations who have severe limitations, due to lack of motor control, and loss of ambulatory skills. How to help diseased individuals maintain muscle mass and strength. Show practically what forms of exercise and types of movements work effectively and safely for these individuals. Rationale: Fitness professionals will be sought out by these clientele for help in maintaining any attainable level of fitness. Individuals with these degenerative diseases will often not qualify for physical therapy through their insurance, and will at some point in the advance of the disease need direct assistance for any mode of exercise.

PRESIDENT'S LECTURE

2:00-2:50 315 BTSU

IS IT SAFE TO EXERCISE PATIENTS WITH HEART FAILURE? THE DEVELOPMENT AND DESIGN OF A TRIAL TO ANSWER THIS QUESTION

Steven J. Keteyian, Ph.D., FACSM, Henry Ford Heart & Vascular Institute, Detroit, Michigan

"Steven Keteyian, PhD, has more than 20 years of experience working as a clinical exercise physiologist. He is program director of preventive cardiology at the Henry Ford Heart and Vascular Institute. Dr. Keteyian is an American College of Sports Medicine fellow and author of two college textbooks, and numerous professional publications. He earned his PhD from Wayne State University."
From the Human Kinetics Publishers website:
http://www.humankinetics.com/products/showproduct.cfm?isbn=0736002529

SYMPOSIUM

2:00-2:50 314 BTSU

CREATING A MODEL HEALTH PROMOTION PROGRAM

Speaker: Brenda Reeves, Ph.D., Grand Valley State University

This presentation will provide an overview of critical factors to consider in developing a successful health promotion program. Objectives: - To review the needs assessment process for an organization and program development. - To develop integrated business and marketing plans linked to the organization. - To develop and implement the program with an assessment plan to include an evaluation of return on investment. - To summarize the impact of a three-year employee wellness program at Grand Valley.

PRESIDENT'S LECTURE

3:00-3:50 314 BTSU

INTERRELATIONSHIPS OF EXERCISE, MOOD, AND SELF-ESTEEM IN OBESE POPULATIONS

Bonnie Berger, Ed.D., Bowling Green State University

"Bonnie G. Berger is a professor and director of the School of Human Movement, Sport, & Leisure Studies at Bowling Green State University. She has published two books and more than 75 journal articles and book chapters, and has present ~ 90 scholarly papers at national and international conferences, as well as applied presentation in business and industry.

Berger is a charter member, fellow, and certified consultant of the Association for the Advancement of Applied Sport Psychology (AAASP). She is also founding member of the Exercise and Sport Psychology Division (Div. 47) of the American Psychological Association and a charter member of the North American Society for the Psychology of Sport and Physical Activity. Presently she is section editor of the *Journal of Applied Sport Psychology*. From "About the Authors" for the textbook: *Foundations of Exercise Psychology* (2003). Berger, B.G., Pargman, D. & Weinberg, R.S. Champaign, IL: Human Kinetics.

FRIDAY, NOVEMBER 7

TUTORIAL

3:00-3:50 315 BTSU

2003 CARDIOVASCULAR CLINICAL TRIALS UPDATE

Robert L. Bard, MA, Division of Cardiovascular Medicine,
University of Michigan

The purpose of this tutorial is to provide the most recent results of major adult cardiovascular clinical trials, and to discuss novel clinical trials that are currently active. The primary objective of the tutorial is to provide each participant with a general knowledge of late-breaking clinical trials, and those trials that were presented at the 2002 American Heart Association and the 2003 American College of Cardiology Scientific Sessions. Specific objectives include: 1. To identify the trials with the largest impact over the past 1 year in the different areas of adult cardiovascular medicine (interventional cardiology; cardiac function and heart failure; vascular disease, hypertension, and prevention; myocardial ischemia and infarction). 2. To summarize each trial and discuss the methodology, strengths and weaknesses, clinical impact, and future research that is associated with each trial. 3. To discuss novel clinical trials that remains active, with a specific emphasis on surgical and electrophysiological research in human heart failure. Rationale: The number of cardiovascular clinical trials is growing, with many surprising and significant advances over the past few years. According to W. Bruce Fye, President of the American College of Cardiology, "On average, a new cardiovascular clinical trial is launched every other day". Therefore, there is a need for tutorials at allied health conferences to help disseminate this information.

WORKSHOP

4:00-5:20 314 BTSU

PROGRAMM PLANNING AND EVALUATION: ASKING THE RIGHT QUESTIONS

Stephen M. Horowitz, Ph.D., FAWHP, Health Promotion / School of Family & Consumer Sciences, Bowling Green State University

This seminar will provide participants with a way to plan and evaluate their Wellness program in a comprehensive, scientifically-sound manner. It will address ways to identify data sources and variables to analyze as a basis for strategic planning, designing programs to target high-risk employee groups, setting measurable goals, and methods for evaluating program success. The session will combine both theory and application allowing participants to leave with a clearly identified approach to program planning and evaluation that will be useful for overcoming many of the typical organizational obstacles facing worksite Wellness professionals. Program Objectives: By the end of the session, participants will be able to:
1. Identify data resources and variables that can be targeted for evaluation purposes. 2.Write specific objectives based on program goals. 3. Interpret evaluation data to assess program impact. 4. Describe various methods for evaluating program outcomes. II. Program Outline Content areas will be covered through a combination of lecture using overheads, discussion, and small group activities. Participants will receive handouts and sample forms that can be used in doing strategic planning at their own worksites. Activities followed by "(PCW)" will be offered only during a pre-conference workshop. Key content areas that will be addressed are: 1. Identifying data resources and measurable variables as part of wellness strategic planning. A

lecture/discussion format with overheads will be used to address data and sources related to demographics (Age, sex, race, marital status, educational level), health (Biometrics, lifestyle behavior), disability, safety, EAP, health care costs, cultural norms, and organization climate and support. The characteristics of a positive organizational climate will be discussed. A sample management survey will be provided. (For the PCW, additional emphasis will be placed on assessing the organizational climate to maximize program support and direction. Small groups will engage in activities addressing the steps wellness professionals can take to promote this type of environment. 2. Designing wellness programs using specific objectives and assessing program impact. Once the general direction of a program has been set by the mission statement, specific operational goals for accomplishing the mission can be established. Writing appropriate objectives will be discussed. Participants (PCW) will do a small group activity to practice writing program objectives that are specific, measurable, attainable and realistic, with clear deadlines for completion. After goals and evaluation standards have been established, appropriate strategies will be identified for attaining program goals. Lecture and overheads will be used for discussing strategies. Small groups will work on an activity to formulate specific strategies related to identified goals (PCW). 3. Utilizing scientific methods for evaluating program outcomes. This segment will be covered through lecture, overheads (and individual hands-on activities -- PCW). Examples of ways to present disability claims, safety, medical surveillance, lifestyle behavior, and health care utilization will be presented. Participants (PCW) also will have the opportunity to complete exercises in calculating Return on Investment (ROI) as a means of assessing program impact.

TUTORIAL

4:00-5:20 315 BTSU

USE OF MUSCLE OXYGEN SATURATION IN EXERCISE AND TRAINING

Ann C. Snyder, Ph.D., University of Wisconsin, Milwaukee

Over the past couple of years, I have been involved in examining muscle oxygen saturation with the use of Near-infrared spectroscopy (NIRS). Initially, we performed a resting study, and found that body position (standing, sitting in chair, sitting on floor and lying on floor) affected muscle oxygenation. We have since examined exercise and muscle oxygenation concurrent with lactate threshold and the kinetics of oxygen uptake and also followed triathletes through a training season and determined the adaptations that occurred with training. We and others have examined different types of exercise, including running, cycling, skating, rowing, etc. What I would propose for the MACSM meeting is that I would give an overview of the current state of the knowledge in muscle oxygen saturation and the use of NIRS in enhancing exercise and training.

ORAL COMMUNICATIONS

2:30– 2:45 316 BTSU

HYPERVENTILATION AND GAS EXCHANGE SAMPLING INTERVALS SIGNIFICANTLY ALTER VENTILATORY EFFICIENCY CALCULATIONS IN PATIENTS WITH HEART FAILURE

M. M. Wickman, N. Duong, M. Vekaria, J.M. Nicklas, R.L. Bard, University of Michigan

Background: Ventilatory efficiency, as expressed by the V_E/VCO_2 slope, is predictive of mortality in patients with heart failure but there is inconsistency in the way it is calculated and reported. Therefore, the purpose of this study was to investigate the effect of hyperventilation and different sampling intervals on V_E/VCO_2 slope calculation and to determine if these factors influenced the survival predictions. Methods and Results: Heart failure patients (n=356) who took loop diuretics and had an ejection fraction < 40% underwent maximal cardiopulmonary exercise testing and were included in mortality trial for 3.8 ± 1.8 years. The mean age, peak VO_2, ejection fraction, and mean blood pressure were 51 ± 10 years, 17.3 ± 5.0 ml.kg-1.min-1, 21.5 ± 7.7%, and 91.4 ± 12.0 mm Hg, respectively. V_E/VCO_2 slopes were calculated using all of the exercise data and determined after omitting the first and last minute of exercise data to objectively assess the effects of hyperventilation. There was a significant difference between the exercise and omitted hyperventilation V_E/VCO_2 slopes and also between the 3 different sampling intervals: unaveraged (all data: 37.3 ± 10.3 / omitted hyperventilation: 36.3 ± 10.2), averaged by 8 breaths (37.8 ± 11.0 / 37.0 ± 11.4), and averaged by 15 seconds (37.5 ± 10.9 / 36.8 ± 11.4) (all $p < 0.001$). Although different, hyperventilation and sampling intervals did not change the prognostic ability of the V_E/VCO_2 slope by Kaplan-Meier survival analysis. Conclusion: Hyperventilation and different sampling intervals significantly alter V_E/VCO_2 slope calculations in patients with heart failure, but these differences did not change the slope's prognostic ability.

2:45-3:00 316 BTSU

PREDICTION OF MORTALITY IN HEART FAILURE PATIENTS WITH AN INDEX VE/VCO2 SLOPE AND PEAK VO_2

M. Vekaria, A. McMillan, N. Duong, J.M. Nicklas, and R.L. Bard, University of Michigan

Introduction: Low peak oxygen consumptions and high ventilatory efficiency slopes have been reported to be associated with increased mortality risk in heart failure patients. Therefore, we hypothesized that these 2 variables taken together may improve the prognostic ability of the cardiopulmonary exercise test in patients with CHF. Methods: All CHF patients referred for cardiopulmonary exercise testing were followed for mortality and cardiac transplantation. Peak VO2 was determined by a ramped treadmill exercise protocol standardized by the same investigator for all subjects. The ventilatory equivalent for carbon dioxide (V_E/VCO_2) was determined by graphing the slope of the relationship between ventilation and carbon dioxide during exercise. The V_E/VCO_2 index was defined as the ratio of ventilation and carbon dioxide divided by the peak VO_2 expressed in ml.kg-1.min-1. Survival was evaluated by Kaplan-Meier log rank statistics and common predictors of mortality were included as covariates using Cox regression analysis. Cardiac transplantation was treated as a censored event if performed as an

outpatient and as a death if performed status 1A. Results: Over the 18-month period, 356 patients underwent exercise testing. The mean V_E/VCO_2 index, age, peak VO_2, ejection fraction, and mean blood pressure were 2.5, 51 ± 10 years, 17.3 ± 5.0 ml.kg-1.min-1, 21.5 ± 7. 7%, and 91.4 ± 12.0 mm Hg, respectively. The V_E/VCO_2 index did not significantly predict mortality by Cox regression analysis (p=0.081), but it significantly predicted mortality when separated at the median (p<0.001) and grouped into quartiles (p<0.001). In other univariate Cox regression analyses, peak VO_2 and peak V_E/VCO_2 slope both significantly predicted mortality (p<0.001). V_E/VCO_2 index did not significantly predict mortality (p=0.761) when included with the covariates mean blood pressure (p=0.011), peak VO_2 (p=0.000), and ejection fraction (p=0.605). Conclusion: The V_E/VCO_2 index did not add prognostic value in patients with CHF above and beyond that provided by peak VO_2 and V_E/VCO_2. However, higher indices discriminated mortality risk when patients were grouped.

3:00-3:15 316 BTSU
PROGNOSTIC ABILITY OF VENTILATORY EFFICIENCY IN PATIENTS WITH HEART FAILURE

N. Duong, M. Vekaria, A. McMillan, J.M. Nicklas, R.L. Bard, University of Michigan

Background: V_E/VCO_2 slope obtained during cardiopulmonary exercise testing in heart failure patients is a strong predictor of mortality. A new assessment involving the lowest V_E/VCO_2 has recently been proposed as a preferred method to assess ventilatory efficiency in healthy subjects. Therefore, the purpose of this study was to compare the prognostic ability of the new method (V_E/VCO_2 output ratio) to the established calculation of V_E/VCO_2 slope in patients with heart failure. Methods and Results: Heart failure patients (n=356) who took loop diuretics and had an
ejection fraction < 40% underwent cardiopulmonary exercise testing. VE/VCO2 output ratio was defined as the average of the 3 lowest V_E/VCO_2 values after averaging the breath-by-breath data using the 30-second time average. The lowest V_E/VCO_2 (36.0 ± 8.9), V_E/VCO_2 slope (37.5 ± 10.9), and peak VO_2 (16.3 ± 5.0 ml.kg-1.min-1) were independent predictors of mortality by univariate Cox Regression analysis. The lowest V_E/VCO_2 did not add to the mortality prediction when compared by bivariate Cox Regression analysis with V_E/VCO_2 slope (p=0.004 vs. 0.919) or peak VO_2 (p=0.005 vs. 0.062). Conclusion: The lowest V_E/VCO_2 was reported to be a beneficial assessment of ventilatory inefficiency in healthy subjects, but it was an inferior predictor of mortality in a large cohort of heart failure patients who typically experience ventilatory inefficiency.

3:15-3:30 316 BTSU
AEROBIC EXERCISE CHARACTERISTICS OF WELL-TRAINED MALE AND FEMALE ADOLESCENT DISTANCE RUNNERS.

S. Cole, M.P. Horn, & A.D. Mahon Ph.D., Ball State University

Maximal oxygen uptake (VO_2max) and running economy (RE) have been shown to be important determinants of endurance performance. This study examined these variables in well-trained high school male and female distance runners. Nine females (15.9 + 1.1) and 11 males (17.0 ± 0.9 yrs) underwent treadmill testing. RE was measured during steady-state

exercise at 7.0 and 8.0 mph, and VO_2max was measured during a graded exercise test to maximal exertion. Data was collected approximately 2-3 weeks following the culmination of the subjects' competitive track season. Independent t-tests were used to compare the physiological responses in each group at each speed and at maximal exercise. Pearson correlation coefficients were used to examine the relationship of anthropometric and ventilatory variables to RE at each speed. Males were taller, heavier, and leaner than their female counterparts ($p < 0.05$). VO_2max was significantly higher ($p < 0.05$) for males (70.9 ± 3.5 ml/kg/min) than females (58.6 ± 5.9 ml/kg/min). When VO_2max was expressed relative to fat free mass, a significant gender difference persisted, however, the magnitude of the difference was reduced. At both submaximal running speeds, males performed at a significantly lower ($p < 0.05$) percentage of their VO_2max (57.9 ± 4.0% & 65.6 ± 4.3%) than the females (69.9 ± 8.4% and 79.5 ± 8.8%). The VO_2 (ml/kg/min) at each speed was not different between groups; however, when expressed relative to fat free mass, RE in males (44.1 ± 2.1 ml/kg/min and 50.0 ± 2.4 ml/kg/min) was superior ($p < 0.05$) to the values observed in females (51.7 ± 9.5 ml/kg/min and 59.4 ± 12.4 ml/kg/min). In males, percent body fat was significantly correlated to RE at 7.0 mph ($r = -.60$; $p = 0.05$) and tended to be correlated to RE at 8.0 mph ($r = -.53$; $p = 0.09$). None of the anthropometric and ventilatory variables were significantly correlated with RE in females. VO_2max is higher in well-trained adolescent males than well-trained adolescent females even when differences in fat free mass are taken into account. RE was similar per kilogram of body mass in both groups, however males had superior economy when expressed relative to fat free mass. RE was not correlated to anthropometric or ventilatory variables in females, but percent fat appeared to be related to RE in males. Differences in certain physiological attributes of well-trained males and well-trained females appear to account for much of the distinct advantages that males have in distance running performance.

3:30-3:45 316 BTSU

MOOD STATE RESPONSES TO OVERTRAINING IN COLLEGE SWIMMERS: THE ROLE OF TRAIT ANXIETY

D. A. Tobar & W. P. Morgan, FACSM University of Wisconsin-Madison

This study was designed to examine the role of trait anxiety and gender in responses to overtraining in men (n=100) and women (n=59) college swimmers. Trait anxiety (STAI) was assessed at baseline, while measures of mood states (POMS) were collected at baseline (September), during overtraining (January), and following tapering (February). Data were analyzed using 2 (gender) x 3 (conditions) repeated measures ANOVA with trait anxiety included as a covariate. Mood disturbance increased ($p<.05$) during overtraining and improved ($p<.05$) during tapering. Trait anxiety was not associated with differences in training volume ($p>.05$). Less desirable mood states at baseline ($p<.05$) were reported by swimmers with higher trait anxiety, but the increase in mood disturbance during overtraining was greater ($p<.05$) for swimmers with lower trait anxiety. Training volume increased ($p<.05$) during overtraining and decreased ($p<.05$) during tapering for men and women, but training volume for men was lower at baseline and higher at overtraining. Women tended ($p>.05$) to report less desirable mood states at baseline, but men and women were found to have similar mood state responses to overtraining and tapering. During tapering women reported an increase ($p<.05$) in tension whereas men reported no change, and the decrease in fatigue was greater ($p<.005$) for women.

It is concluded that: 1) swimmers with high trait anxiety were less vulnerable to mood disturbance than swimmers with low trait anxiety and 2) men and women college swimmers respond to overtraining and tapering in a similar manner. Based on archival data collected in part under grants from the Sports Medicine Council of the United States Olympic Committee.

3:45-4:00 316 BTSU
CORRELATION OF BODY FAT PERCENTAGE AND OXYGEN CONSUMPTION IN FIRE FIGHTERS

M.L. McCarroll, C.J. Babcock, & T.E. Kirby, The Ohio State University

The make-up of a champion athlete depends on highly developed systems of muscle mass, fat mass, genetics, and skill development. These same characteristics may have a significant influence on safety service personnel performing high levels of physical performance. Studies have revealed that maximal oxygen consumption is strongly correlated to incidence of on-the-job injury. As well, research has indicated safety service personnel generally have specific physique characteristics unique to their specific job requirements. It is imperative to gain knowledge on how body composition may or may not influence job performance. PURPOSE: To determine correlation between VO_2 peak and body composition of 1,258 male firefighters from Columbus, Ohio . METHODS: Skinfolds were taken in circuit on 1,258 firefighters, along with VO_2 peak measured by the Bruce Treadmill Protocol. RESULTS: The mean age was 37.9 ± 7.9 years. Percent body fat was estimated average for skinfold (18.4 ± 6.1) followed by VO_2 (40.6 +/-5.6) measured by treadmill stress test using Bruce protocol. A negative Pearson correlation coefficient existed between skinfold vs. VO_2 peak performance, $r = -0.604$ ($p<0.01$). CONCLUSIONS: This study demonstrates that body composition variables, especially body fat percentages, are related to functional capacity in one of the most physically demanding safety service occupations. The strenuous job of fire fighting requires the ability to overcome and maneuver heavy burdens, the findings here suggest fat-free mass may be a contributing factor in avoiding injury or even saving a life.

4:00-4:15 316 BTSU
A REVIEW OF ENHANCED EXTERNAL COUNTERPULSATION AND EXERCISE TOLERANCE

M.L. McCarroll, T.E. Kirby, & C.J. Babcock, The Ohio State University

The purpose of this review is to provide information regarding Enhanced External Counterpulsation (EECP) and exercise tolerance. A growing awareness and interest is surrounding the medical community with a fairly old concept with new attitude. According to the Heart Failure Society's symposium, EECP is a therapy that offers a wide range of benefits to an even wider scope of diagnoses in cardiovascular care. One emerging outcome has been improved exercise tolerance with hemodynamic changes after a number of one-hour treatments. The benefits to EECP have been advertised to be similar to those observed with regular physical exercise such as improved endothelial function, improved ejection fractions, and increased coronary circulation. The methods of this review were designed to find articles sowing exercise tolerance measured in any capacity following EECP treatment. The results of this review found investigators not measuring outcomes of exercise tolerance or capacity from

an exercise physiologist standpoint. Rarely, was exercise tolerance defined by maximal or peak oxygen consumption. Also, very little evidence was observed relating skeletal muscle differences due to left ventricular dysfunction to those experiencing exercise tolerance changes. There is a wide range of exercise capacity in those with left ventricular dysfunction, and the ejection fraction is clearly not a determinate of functionality. The follow-up studies appraised in this review, showed exercise tolerance was not being measured similarly to the methods that were contained in the original studies. In conclusion, this review covers some of the misconceptions about EECP and slightly inflated exercise tolerance results.

4:15-4:30 316 BTSU
PHYSICAL AND PSYCHOLOGICAL EFFECTS OF AEROBIC DANCE IN CHILDREN WITH AUTISM.
R.J. Rogers, A.M. Candel, J.A. Pintar, Youngstown State University

Research suggests that exercise and recreation therapy for individuals who suffer from autism helps develop independent living skills and enhances social interaction. Several studies have indicated that exercise positively influences both appropriate and inappropriate behaviors. Questions regarding the validity of conclusions drawn from these studies exist because of the small sample sizes employed. Therefore, the purpose of this study was to investigate the influence of music combined with group aerobic dance exercise on psychological and behavioral characteristics among autistic children. Thirty autistic students (2-14 years) who met the criteria for autism spectrum disorder according to DSM-IV were included. Based on functional levels, as determined by their educational institution, the children were placed into one of three classes. Each class exercised four times a week for thirty minutes over a six week period. Picture cards depicting the correct response desired from each child aided in the process of educating the participants. Psychological and behavioral assessment forms were completed by both parents and teachers at baseline, mid-point, and upon completion of the program. Statistical analyses were interpreted using SPSS 11.0. Repeated measure t-tests ($p=0.05$) indicated that group aerobic exercise resulted in significant differences in select psychological and behavioral characteristics. Evidence from this study suggests that group exercise therapy does play an integral part in the promotion of desired behaviors, both physical and psychological. The Paula and Anthony Rich Center for the Study and Treatment of Autism.

4:30-4:45 316 BTSU
THE ROLE OF AGE-ASSOCIATED CHANGES IN SKELETAL MUSCLE ON BLOOD PRESSURE IN STANDING
M. M. Masterson, A. L. Morgan, FACSM, C. E. Multer, C. A. Armstrong,
University of Toledo

Objective. Thirty percent of people aged 65 years and older living independently have experienced a fall. Muscle weakness, postural instability, and orthostatic hypotension (OH) have been identified as contributing factors to falls. However, the age-associated differences in these factors and the relationship between them is not clear. Therefore, the purpose of this study was to investigate the differences in lower extremity (LE) muscle activity, LE volumetric measurements, blood pressure (BP), heart rate (HR), and postural sway between young and old individuals upon

assuming an upright position. Methods. Two groups of 10 healthy males (20-24 yrs. and 65-82 yrs.) volunteered for this study. BP and HR were measured during supine resting and LE volumetric measurements were obtained immediately after supine rest. Electromyographic (EMG) activity of bilateral gastrocnemius and tibilias anterior muscles was recorded during a one-repetition maximal isometric contraction, followed by a second resting period. Subjects then stood quietly for 15 minutes while BP, HR, EMG, and postural sway on a force platform were measured for 20 seconds each minute. Results. Systolic, diastolic, and mean arterial BP of both groups significantly increased from supine values within one minute of standing (mean arterial BP: young = 86.5 to 96.9 mmHg, old = 100.3 to 114.0 mmHg). The BP variables remained elevated during the 15 minutes of standing with no instances of OH, despite a significantly attenuated HR response in the older group relative to the younger group (greatest mean HR recorded during 15 minutes of standing: young = 85 bpm, old = 73 bpm). There were no differences in EMG activity or postural sway between the two groups. Conclusions. Older subjects did not exhibit an increased incidence of OH, despite an attenuated HR response, nor did they demonstrate changes in postural sway or EMG activity. Therefore, it appears that BP is maintained by mechanisms other than changes in HR or LE muscle activity. Further research is needed to develop a better understanding of how LE muscle activity, BP maintenance, and postural instability interact as individuals age in order to develop effective interventions to reduce the incidence of falls in the older population.

KEYNOTE ADDRESS

7:00 – 9:00 pm 206 BTSU THEATER
MUSCLE SORENESS: FROM MICROTEARS TO MICROARRAYS
Speaker: Priscilla M. Clarkson, Ph.D., FACSM,
University of Massachusetts

Dr. Priscilla M. Clarkson is a professor of exercise science and associate dean for the School of Public Health and Health Sciences (SPHHS) at the University of Massachusetts, Amherst. She is a fellow in the American College of Sports Medicine (ACSM), and she has served as a member of the board of trustees. She served as president of the New England Regional ACSM Chapter and is the 2000 National ACSM president. She is the 1997 recipient of the ACSM Citation Award.

Clarkson has published more than 100 scientific research articles and has given numerous national and international scientific presentations. The major focus of her research is on exercise-induced muscle soreness and damage. She has also published in the area of sport nutrition, especially nutritional supplements for weight loss and muscle gain. Clarkson is currently the co-editor for the *International Journal of Sport Nutrition and Exercise Metabolism.*

Clarkson has served on the Massachusetts Governor's Panel to improve police training practices to prevent cases of rhabdomyolysis (muscle damage) leading to kidney failure during training. Clarkson serves on the Sports Medicine Review Board of the Gatorade Sports Science Institute, and as a scientific advisor to the International Life Sciences Institute. She currently serves as a member of the Science Working Group at National Aeronautics and Space Administration to develop laboratories for Space Station and a scientific advisor to the National Space Biomedical Research Institute. Clarkson has also served as a member of the National Collegiate Athletic Association Competitive and Medical Safeguards Committee.

SPONSORED BY GATORADE SPORTS SCIENCE INSTITUTE

Gatorade Sports Science Institute

9:00 pm – 11:00 pm, BLACK SWAMP PUB BTSU
MWACSM Social / Student Raffle; Snacks served – "Cash Bar"

POSTERS

8:00 a.m. - 4:30 p.m. 308 BTSU, Authors Available (10:00 a.m. -11:30 a.m.)

MS

1. LONG TERM EFFECTS OF DIET AND EXERCISE ON BODY SIZE AND BLOOD PROFILE IN OVERWEIGHT ADULTS

J.J. Ode, R.B. Parr, FACSM, J.E. Hornyak, J.N. Inungu, Central Michigan University

Obesity is a significant and widespread dilemma in the United States. Individuals that initially lose weight often struggle to maintain their weight loss. PURPOSE: To examine the long-term sustainability of changes in body mass, body composition, blood lipids, and blood glucose levels in previously overweight and obese subjects who participated in a low-calorie diet and exercise program. METHODS: Twenty-two subjects participated in a 10-week weight loss intervention program followed by a nine-month weight loss maintenance program. A 1200-calorie diet, incorporating the exchange lists from the American Diabetic Association, was used during intervention. Daily physical activity levels were recorded through use of pedometers. Throughout the nine-month maintenance, total caloric intake was increased to 12 calories per pound while daily exercise was continued. Body mass and body composition were measured prior to the 10-week intervention (pretest), prior to the maintenance program (midtest), and following the maintenance program (posttest). Data were analyzed by repeated measures ANOVA with significance set at $p < 0.05$. RESULTS: Body mass (-6.3 kg), body mass index (-2.3), percent body fat (-3.0 %), fat mass (-4.8 kg), hip circumference (-5.1 cm), and sagittal diameter (-3.6 cm) were reduced significantly during the 10-week weight loss intervention. There were also significant reductions in total cholesterol (-32.6 mg/dl), low-density lipoprotein cholesterol (-20.2 mg/dl), and blood glucose (-8.8 mg/dl) as a result of the intervention. There were small, yet non-significant, changes in body mass (+2.5 kg), body mass index (+0.7), percent body fat (-1.2 %), fat mass (+0.4 kg), and hip circumference (+0.8 cm) during the nine-month maintenance phase. Similarly, total cholesterol (+15.1 mg/dl), LDL-C (+13.2 mg/dl), and glucose (+4.2 mg/dl) did not significantly change during maintenance. Lean body mass did not change during intervention or maintenance. CONCLUSION: Nine-months following intervention showed that reductions in body mass, body composition, and blood profile measures can be maintained with diet and exercise.

2. ASSESSING SELF-PERCEPTIONS OF BODY WEIGHT AND EATING BEHAVIORS AMONG CHLDREN

UG

A.M. Candel, M.J. Matanin, J.A. Pintar, Youngstown State University

With childhood obesity reaching epidemic proportions, more emphasis is being placed on the need for children to attain their ideal weight. However, a child's perception of their own weight can influence their desire and ultimate potential of reaching such a goal. Therefore, the purpose of this study was to compare perceived body image with actual body mass index (BMI). The

sample consisted of 252 underserved students (n=137 boys; n=115 girls) aged 10-16 years. Each student completed a survey composed of 30 questions assessing self-perceptions of eating behaviors, physical activity levels, body image and general physical self-worth. For this investigation, questions specific to body image were analyzed using SPSS 11.0. All analyses were stratified by gender and BMI tertiles. Results indicated that of both boys and girls ranked in the highest BMI tertile, about three-fourths want to lose weight even though only one-third consider themselves to be too heavy. Of those ranked in the lowest BMI tertile, 6% of girls feel they are too heavy and an even higher 15.2% want to lose weight. The results were similar for boys in that more boys (11%) want to lose weight than feel they are heavy (2%). These results suggest that both boys and girls have altered perceptions of their weight when compared to their BMI level. This altered perception occurred regardless of whether they were considered in the high or low BMI tertile.

3. BONE CONTENT IN WELL-TRAINED MALE AND FEMALE ADOLESCENT RUNNERS

A.D. Mahon, Ph.D., A.S. Cole, and M.P. Horn, Ball State University

Childhood and adolescence are thought to be an optimal period of time during the lifespan for developing a healthy bone mass. Exercise training generally has a positive effect on bone mass; however comparisons involving well trained high-school athletes are limited. Therefore, the purpose of this study was to examine bone content in a group of highly trained high-school runners. Male (n =11) and females (n = 9) with a mean age (± SD) of 17.0 ± 0.9 and 15.9 ± 1.1 yrs, respectively participated in the study. Body composition measurements included percent body fat, whole body bone mineral content (BMC) and bone mineral density (BMD) as well as lumbar and hip BMC and BMD. Assessments of body composition were made using dual-energy X-ray absorptiometry (DEXA). Differences between genders were analyzed using independent t-tests and ANCOVA. Male runners were significantly older, taller, heavier and leaner than their female counterparts. Whole body BMC in the males (2.97 ± 0.23 kg) was greater ($P < 0.05$) than females (2.52 ± 0.34 kg) while whole BMD tended to be greater ($P < 0.07$) in males (1.21 ± 0.06 g/cm2) versus females (1.15 ± 0.08 g/cm2). Hip BMC was greater ($P < 0.05$) in the males (42.6 ± 3.2 g) compared to the females (35.3 ± 4.3 g), while lumbar BMC tended to be greater ($P < 0.07$) in males (69.3± 10.4 g) versus females (59.0 ± 12.6 g). Hip and lumbar BMD were not significantly different between groups. When whole body BMC and BMD as well as lumbar and hip BMC were adjusted for variations in age, height, weight, and percent fat, differences between genders dissipated. Differences in whole body and regional bone content in high-school male and female runners are mostly accounted for by differences in overall measures of body size.

4. MUSCLE STRENGTH AND POWER CHARACTERISTICS IN WELL TRAINED ADOLESCENT MALE AND FEMALE DISTANCE RUNNERS

M.P. Horn, A.S. Cole, A.D. Mahon Ph.D., Ball State University

UG

Recent studies have suggested that muscle power and muscle strength are an important determinates of running performance. A group of 20 well trained high school male (n=11; 17.0 ± 0.9 yrs) and female (n=9; 15.9 ± 1.1 yrs) runners were selected and tested in the period between the end of track season and the beginning of summer training for cross-country. Isokinetic knee extension strength was measured using a Cybex dynamometer at four movement speeds (60, 120, 180, 240?/sec). Muscle power was assessed from vertical jump height measured by a linear transducer. The data were analyzed using a 2-way (group by speed) ANOVA and independent t-tests. In males, torque across the four movements averaged 165.7 ± 22.6, 141.3 ± 20.3, 114.0 ± 23.2, 89.2 ± 23.6 Nm, respectively. In females, torque across the same speeds averaged 106.3 ± 23.6, 76.2 ± 19.8, 50.0 ± 19.1, 31.7 ± 9.4 Nm, respectively. At each speed, males generated greater torque than females ($p < 0.05$). When torque was expressed relative to fat free mass gender differences were still present. Absolute muscle power in males was 169.1 ± 24.9 W and in females was 129.0 ± 19.5 W ($p < 0.05$). When power was calculated using fat free mass, the measurement in males was 156.6 ± 21.3 W and in females was 106.4 ± 13.5 W ($p < 0.05$). The strength and power differences apparent in this study suggest gender variations among well trained high school runners are due to both quantitative and qualitative factors within the skeletal muscles.

5. RIGHT AND LEFT LEG MUSCLE OXYGENATION DURING SPLIT SQUAT EXERCISE IN SPEED SKATERS

B.P. Edlbeck, A.C. Snyder, FACSM, J.C. Dorman, and D.M. Malek, University of Wisconsin-Milwaukee

MS

Many athletes use resistance training to enhance muscular strength and endurance, with resistance determined as a percentage of a repetition maximum. However, the stress placed on the muscles is rarely determined. During a split squat exercise it is essential to distribute weight equally in both legs to insure equal development. Near-infrared spectroscopy (NIRS) is a recent technology that allows for non-invasive examination of muscle oxygenation during exercise. PURPOSE: The purpose of this study was to examine the right and left leg muscle oxygen usage during a typical split squat exercise workout to access whether proper muscle emphasis could be determined. METHODS: Six (5 male and 1 female) National and International caliber speed skaters (aged 24 ±6 yrs) were monitored while performing a split squat exercise. The procedure consisted of three sets of fifteen repetitions. A set consisted of fifteen repetitions with both the left and right legs forward. After each leg and between sets the athletes had a one minute rest period. The exercise protocol used was similar to the athletes' regular workout. Percent oxygen saturation (StO_2) of the right and left vastus lateralis muscles was measured continuously through the individual's exercise. RESULTS: The results were scattered between athletes. Resting StO_2 ranged from 96-53%, while the exercising StO_2 ranged from 68-0%. Two of the athletes showed no distinct dominance between left or right legs. Two athletes showed no dominance with the left leg forward, but when it was forward.

One athlete showed no dominance with the right forward, but the right leg was dominant when the left was forward. Finally one athlete showed dominance with the leg that was forward. CONCLUSION: Further research is needed to insure that StO_2 can be used to monitor muscle utilization during resistance exercise, however, our results seem to indicate that StO_2 might be able to indicate leg preference during the performance of a split squat exercise.

6. MAXIMAL OXYGEN UPTAKE OF SPEED SKATERS WHILE SKATING AND CYCLING

D.M Malek, A. C. Snyder, FACSM, B. P. Edlbeck and J. C. Dorman,
University of Wisconsin-Milwaukee

UG

Recent technology has made it possible to examine oxygen uptake away from the laboratory. Thus, measuring oxygen uptake while an athlete skates on a 400 m oval has become possible. As measurements have left the laboratory, it has also become apparent that possibly the methods used to obtain a maximal effort (generally an incremental exercise, INCR) may not be the best for athletes, who are much more used to covering a given distance in as short of time as possible (time trial, TT). Therefore, the purpose of this study was two fold: 1) to compare maximal oxygen uptake (VO2max) of skaters while skating on an indoor oval and cycling on their bikes using a computrainer and 2) to compare the VO2max of speed skaters while performing an incremental test and a time trial both skating and cycling. METHODS: Male speed skaters (n=7) performed four different maximal exercise bouts during a training camp: a) ice time trial, b) cycling time trial, c) ice incremental test, and d) cycling incremental test. The ice and cycling time trials were the same length (3 km for sprinters, 5 km for all-arounders). Oxygen uptake was determined through the use of a MetaMax 3X telemetry system for all tests. RESULTS: The VO_2max while cycling was higher for both tests (TT = 61.57 +/- 3.21 ml•kg-1•min-1, INCR = 60.90 +/- 7.49 ml•kg-1•min-1) than while skating (TT = 58.86 +/- 5.67 ml•kg-1•min-1, INCR = 53.71 +/- 4.89 ml•kg-1•min-1). The skating TT produced a VO2max approximately 10% greater than that during the skating INCR test, however, the cycling TT and INCR tests were very similar. Blood lactate values were slightly higher for the cycling TT and INCR test when compared to the skating tests, but not significantly so. CONCLUSION: Maximal oxygen uptake during speed skating may be lower than similar cycling exercises due to the static contractions that occur during speed skating. Further study, including submaximal exercise intensities, is needed in order to state this conclusively.

7. CHANGE IN START POSITION AND ITS EFFECTS ON THE HORIZONTAL VELOCITY IN THE SWIM TRACK START

M. Anderson, W. Reiman, J. Williams & K. Carlson, Wheaton College UG

The problem of this study was to compare how a change in relative angle between the femur and the tibia in the track start will affect horizontal velocity of a swimmer using the track style start. A total of nine dives were performed, three each at three different knee-bend angles (133, 143, and 153 degrees). The subject used was a 21 year-old male from the Wheaton College swim team. The video data was captured with a JVC 9800 DVL video camera at 60 frames/second. The video data was analyzed using the Ariel Performance Analysis System. The horizontal velocity of the swimmer for the 133 degree knee bend was 5.0 m/s when leaving the blocks and 3.8 m/s when entering the water. The horizontal velocity of the swimmer for the 143 degree knee bend was 4.6 m/s when leaving the blocks and 7.7 m/s when entering the water. The horizontal velocity of the swimmer for the 153 degree knee bend was 4.2 m/s when leaving the blocks and 6.5 m/s when entering the water. It was concluded that there was a larger velocity when leaving the blocks for the 133 degree knee bend and a larger velocity when entering the water for the 143 degree knee bend. Therefore, we determined that the angle of knee bend during a track start does affect the horizontal velocity and horizontal travel distance.

8. COMPARISON OF THE SLOW COMPONENT PHASE AND OXYGEN SATURATION DURING RUNNING AND CYCLING

J.C. Dorman, A.C. Snyder, FACSM, University of Wisconsin-Milwaukee MS

The purpose of this study was to determine if there was a difference in the slow component phase of oxygen uptake during running and cycling when subjects exercised at the same relative workload and to establish whether the difference was related to a decrease in percent muscle oxygen saturation (StO_2) of the working muscle (vastus lateralis in cycling and gastrocnemius in running). Eight male triathletes underwent two incremental exercise tests (5-6 minute stages per workload), to near maximal effort, and two maximal exercise tests, running and cycling. The tests were randomized and separated by 1 week. During the tests, StO_2, blood lactate (HLa), oxygen uptake (VO_2), and ratings of perceived exertion (RPE) were obtained during each workload. HLa was drawn one minute before the end of each stage and was graphed to determine lactate threshold (LT). StO_2 and VO_2 data points were graphed for the first workload >LT. The slow component phase was determined by a best fit line analysis. Results: (Mean +/- SD) Slope of the VO_2 line during the slow component phase of the run test was 0.32+/- 0.15 ml/min/kg/sec and during cycling was 0.68+/- .25 ml/min/kg/sec ($p<0.05$). Change in VO2 during the slow component of the run test was 1.37+/- 0.63 ml/min/kg, while during cycling it was 2.20+/- 0.83 ml/min/kg ($p<0/05$). The average StO2 during the slow component of the run test was 46.9%+/- 25.36% and during cycling it was 41.94%+/-10.94%. The StO_2 data of one subject during the running test was abnormally low which caused the results to not be significantly different between running and cycling. Conclusion: Further research is needed to conclude that the difference between the running and cycling VO_2 slow component is related to a decrease in StO_2 and as a result, low muscle StO_2 values contribute to the slow component phase of O_2 uptake kinetics.

9. TIME COURSE OF FIBRINOLYTIC CHANGE FOLLWING MAXIMAL EXERCISE

A.M. Coughlin Paton PhD

PURPOSE: Although there is a growing body of research evaluating fibrinolytic responses to exercise, there are no current standardized procedures with respect to post-exercise blood collection. While previous research has shown fibrinolysis to decrease rapidly following exercise, it is not known how long after exercise cessation that t-PA and PAI-1 begin to change. The time point at which blood samples are collected post-exercise could affect reported t-PA and PAI-1 levels. The purpose of this study is to determine the time course of t-PA and PAI-1 changes following acute maximal exercise. METHODS: Eight healthy males performed a VO_2max test using a treadmill ramped protocol. Blood samples were collected using an indwelling catheter before exercise and at 1, 2, 4, 6, 8, and 10 minutes post-exercise. Mean differences in t-PA activity, t-PA antigen, and PAI-1 activity at each time point were assessed using a repeated measures analysis of variance (ANOVA). Post hoc means comparisons were performed by contrasting the 1-minute post-exercise value against all other time points. RESULTS: As expected, both t-PA activity and t-PA antigen showed a significant increase from pre to post exercise. t-PA activity did not change from 1 minute to 2 minutes post exercise, but decreased significantly from 2 minutes to 4 minutes post exercise. Likewise, t-PA antigen remained elevated from 1 minute to 2 minutes post exercise but decreased from 2 minutes to 4 minutes post exercise. PAI-1 decreased from pre to post exercise, but did not change during the 10-minute post exercise period. CONCLUSION: Research evaluating the t-PA response to acute exercise should collect blood samples within two minutes following the cessation of exercise.

10. CHANGES IN LANDING KINEMATICS DUE TO UPPER-LIMB MOTION OF INDIVIDUALS WITH ACL-RECONSTRUCTED KNEES

J. Harper & K. Carlson, Wheaton College UG

The purpose of this study was to examine the effects of upper-limb motion on the lower-extremity kinematics of individuals with an ACL-reconstructed knee. Two male NCAA Division III athletes (21 years old) who had returned to competitive play were used as subjects for this investigation. Five trials of each leg were performed in which the subject was to jump off of one leg as high as possible and then land on the leg, which he took off from. During at least two of the five trials a ball was thrown to the subject and he was asked to catch it before he landed on the ground. There was at least two catch and two no-catch conditions per the five trials of each leg. Video data was captured at 60 frames/second with a JVC 9800 DVL camera. Reflective markers were placed on the wrist, elbow, acromion process, greater trochanter of the hip, knee, and lateral malleolus of the ankle. Marker placement was based on the method used by Plagenhoef (1971) for joint center determination. Kinematic data for the hip, knee and ankle were generated by the Ariel Performance Analysis System. A t-test was used to determine significant differences ($p < .05$) for the catch vs. no-catch conditions of each leg and between each leg. Significant differences were found for both subjects for the reconstructed knee between the catch and no-catch condition with hip angle, hip angular velocity and the

velocity of the center of gravity. Significant differences were also found for both subjects for the non-injured leg between the catch and no-catch condition with hip angle, knee angle, hip angular velocity and the velocity of the center of gravity. Significant differences between the reconstructed knee and the non-injured knee for the catch condition were found with the knee angle. Significant differences between the reconstructed knee and the non-injured knee for the no catch condition were found with the hip angle, knee angle and the velocity of the center of gravity. Based upon the conflicting results between both the knee and catch conditions it is difficult to make a solid conclusion about the effects of upper limb motion on the landing kinematics of the lower extremities.

11. THE EFFECT OF HEAD POSITION ON THE KINEMATICS OF THE SQUAT EXERCISE

D. Donnelly and W.P. Berg, Miami University

The purpose of this study was to determine if head position influences the kinematics of the squat exercise. Ten male collegiate football players performed a total of 30 trials of the squat (using 25% of their 1-repetition maximum) in the form of 2 sets of 5 repetitions under three different conditions. The conditions pertained to the extent to which the head was positioned differently during the exercise (i.e., head-up, head-neutral, head-down). Our hypothesis that the head-down position would result in disadvantageous movement kinematics was supported to some extent. Total linear displacements of the bar and hip were greatest in the head-down condition for both horizontal and vertical motion. Peak downward velocity of the bar was greatest in the head-down condition. The head-down condition also resulted in the greatest angular displacements at the trunk, hip and knee, and the greatest peak velocity of trunk flexion. Because of the potential for destabilizing movement patterns, it is recommended that the head-down position be avoided while performing the squat exercise.

12. MYOSTATIN INHIBITS ACTIVITY OF THE TRANSCRIPTION FACTORS MYOD AND p53 IN CULTURED C2C12 MYOBLASTS

P.M. Johnson and S.J. McGregor, Eastern Michigan University MS

Purpose: Myostatin (MSTN), a member of the transforming growth factor beta (TGF-b) family of cytokines, negatively regulates skeletal muscle growth by inhibiting both skeletal muscle proliferation and differentiation. Expression of the muscle regulatory factor MyoD is down regulated by MSTN, and this has been proposed as the underlying mechanism of MSTN's effect on skeletal muscle differentiation. Expression of another transcription factor, the tumor suppressor protein p53, is increased with MSTN over expression in myoblasts. Because p53 cooperates with MyoD and promotes expression of the muscle specific gene creatine kinase (CK), it was of interest to determine if MSTN treatment would affect activity of either of these transcription factors. Therefore, we determined the activity of MyoD, p53 and CK in proliferating myoblasts, and differentiating myotubes, and quantified the effect of MSTN treatment on these factors in confluent myoblasts. Methods: Nuclear extracts of C2C12 skeletal myoblasts were obtained at 80 % confluence and after 1 through 7 days of differentiation to

establish time of greatest transcription factor activity using the TransAm assay (Active Motif, Carlsbad, CA). CK activity was determined using CK reagent (Sigma Diagnostics, St. Louis, MO) and corrected for protein content using a BCA protein assay (Pierce Biotechnology, Rockford, IL). Surprisingly, maximal MyoD and p53 activity were determined to occur at 80 % confluence, prior to differentiation, therefore, treatment with recombinant MSTN (10 ug/ml) was initiated 24 h after seeding and maintained for 48 h, while PBS was added to control cultures. Results: MyoD activity exhibited a biphasic pattern which peaked at confluence, declined from days 1-6, and increased again at day 7 of differentiation ($p<.01$). Activity of p53 exhibited a similar pattern to that of MyoD, with peak activity occurring at confluence. In confluent myoblasts, MSTN treatment decreased the activity of both MyoD ($p=0.04$) and p53 ($p=0.02$), but not CK. Conclusions: These data provide unique evidence of the biphasic pattern of activity exhibited by MyoD in the transition from proliferation to, and during the progression of, differentiation in cultured myocytes. Additionally, we show that MSTN inhibits MyoD and p53 activity in confluent myoblasts. Future studies will examine the effect of MSTN in myotubes during the later stages of differentiation, during concurrent peak MyoD, p53 and CK activity.

13. THE INFLUENCE OF THE ACE I/D POLYMORPHISM ON PLASMA PAI-1 CONCENTRATIONS DURING EXERCISE

P.R. Nagelkirk, A.M. Coughlin, J.A. Cooper, C.M. Paton, K.H. Friderici, B.A. Wingerd, and C.J. Womack, FACSM, Michigan State University Ph.D.

Objectives: During physical exertion, the capacity to lyse inappropriate or excessive clot (fibrinolysis) increases to protect against exertion-related ischemic events such as heart attack or stroke, which are often caused by an occlusive thrombus or clot. Increased fibrinolysis during physical exertion is partially due to a decrease in plasminogen activator inhibitor-1 (PAI-1), the main circulating inhibitor of tissue plasminogen activator. The insertion/deletion (I/D) polymorphism of the ACE gene is associated with resting plasma PAI-1 concentrations. The present study sought to investigate the influence of the ACE I/D gene on the PAI-1 response to high-intensity exercise. METHODS: Fifty healthy, untrained males (mean $\pm$ SD, age = 26 $\pm$ 5yrs, ht = 180.9 $\pm$ 8.1 cm, wt = 86.3 $\pm$ 14.6 kg) performed a maximal exercise test on a motorized treadmill. Blood samples were obtained via clean venipuncture with subjects in a semi-recumbent position prior to and immediately following exercise. Blood was drawn into an acidified citrate solution and centrifuged to obtain platelet-poor plasma. PAI-1 activity and antigen were assessed using enzyme-linked immunoadsorbant assay. DNA was extracted from whole blood and amplified by polymerase chain reaction (PCR) using allele specific primers. PCR products were then electrophoresed in a 2% agarose gel and imaged with an ultra-violet transilluminator for genotype determination. Potential differences between subjects homozygous for the I allele (I) versus those possessing at least one D allele (D) for resting and exercise-induced PAI-1 activity and PAI-1 antigen were assessed using analysis of variance. RESULTS: There were no group differences for height, weight, age, VO2max, or peak heart rate ($p>0.05$). No significant difference was observed for PAI-1 antigen between groups at baseline (I=42.2 $\pm$ 26.5 ng/ml, D=30.2 $\pm$ 27.4 ng/ml, $p>0.05$) or post-exercise (I=38.6 $\pm$ 21.6 ng/ml, D=26.4 $\pm$23.3 ng/ml, $p>0.05$). Likewise, no differences were observed

for PAI-1 activity pre-exercise (I=15.0 ± 12.0 IU/ml, D=12.8 ± 13.4 IU/ml, p>0.05) or post-exercise (I=9.6 ± 8.1 IU/ml, D=7.7 ± 8.7 IU/ml, p>0.05). No group x time interaction was observed for either PAI-1 activity or antigen. CONCLUSION: The ACE I/D genotype has no effect on the PAI-1 response to high-intensity exercise.

TUTORIAL

8:00-8:50 314 BTSU

PRESCRIBING EXERCISE: BUILDING ON THE GUIDELINES

Clinton A. Brawner, B.S. and Dennis Kerrigan, M.S,
Henry Ford Heart &Vascular Institute, Detroit, Michigan

Although the "standard" recommendations may fit most people, individualizing the exercise prescription is important to obtaining the desired outcomes, especially among those with chronic diseases. Purpose: To briefly describe the benefits of exercise training and provide practical information on the exercise prescription for various clinical populations. Objectives: Develop: 1. An understanding of the benefits of cardiorespiratory and resistance exercise training for various populations. 2. The importance of prescribing exercise based on the patient's history in order to maximize safety and benefits.

WORKSHOP

8:00-8:50 315 BTSU

WHAT DO YOU WANT TO BE WHEN YOU GROW UP AND HOW DO YOU GET THERE?

Brenda Reeves, Ph.D., Grand Valley State University

This presentation will look at the three critical areas in preparing for your first professional job: 1) Developing critical knowledge, skills, abilities and attributes 2) Resume building 3) Perfecting the job search process Objectives: - To explore different job settings and opportunities for Fitness & Wellness majors. - To review basic competencies and skills needed in Fitness & Wellness, and to explore what professionals in different job settings are looking for in potential interns and employees to increase marketability. - To orient students to important factors to consider in getting the right internship and how to get the most out of their practical experience to build their resume and portfolio. - To review key elements in writing a winning resume and cover letter, and developing a presentation portfolio. - To introduce students to various Internet resources to assist them with their internship/job search. - To review key interview strategies. – To outline realistic job expectations upon graduation. This workshop will consist of three 20-minute presentations; each one will be followed by 20 minutes of group discussion and/or interactive learning experiences. Students are encouraged to bring a copy of their current resume and cover letter. Faculty advisors are also encouraged to attend.

PRESIDENT'S LECTURE

9:00-9:50 314 BTSU PRESIDENT'S LECTURE

DEVELOPING A NATIONAL STRATEGY TO PROMOTE PHYSICAL ACTIVITY IN THE MID-LIFE AND OLDER POPULATION

Wojek Chodzko-Zajko, Ph.D., University of Illinois

Wojtek's primary research interests are in the area of aging and physical activity. For the past fifteen years he has focused on the effect of exercise and physical activity on sensory, motor, and cognitive functioning in old age. In support of this research project, Dr. Chodzko-Zajko established on going longitudinal studies of exercise and aging at both Kent State University and the University of Alabama. Dr. Chodzko-Zajko served on the World Health Organization, Scientific Advisory Committee that issued Guidelines for Physical Activity in Older Adults. He also serves on the American College of Sports Medicine Strategic Health Initiative on Aging and Exercise. Dr. Chodzko-Zajko is Editor of the Journal of Aging and Physical Activity. He is also President of the International Society on Aging and Physical Activity. In 1999 he served as chairperson of the 5th World Congress on Physical Activity , Aging and Sports. As a result of his involvement with JAPA, the WHO and ACSM, Chodzko-Zajko is frequently invited to disseminate information about healthful aging as a keynote speaker in national and international meetings. Chodzko-Zajko has recently traveled to Korea, Iran, Oman, Japan, France, Belgium, Slovenia, Germany, Hong Kong and Israel in order to speak on topics related to aging and physical activity. Chodzko-Zajko is founding editor of the Journal of Aging and Physical Activity, the first journal dedicated to the scientific study of exercise and physical activity in older adult populations. Chodzko-Zajko is President of the International Society for Aging and Physical Activity, the international academic association of scholars in the area of aging and physical activity."

SYMPOSIUM

9:00-9:50 315 BTSU

EVALUATION AND TRAINING METHODS DESIGNED FOR COMPETITIVE ROWERS

Carmen J. Babcock, M.A., Shannon Ghizzoni, B.S., Heidi Deep, B.S., and Maxi Meissner, The Ohio State University

Purpose: To review current evaluation and training methods in competitive rowing and explore future areas of investigative research. Objectives: 1) Identify characteristics of successful rowers. 2) Explore methods of evaluating rowing performance. 3) Discuss the process of developing a rowers training program. 4) Discuss evaluating and enhancing rowing technique. Rationale: Rowing is a growing sport in the U.S. for both men and women. As the sport makes gains in popularity, the body of research associated with it continues to rise. The dissemination of information to those involved in training, implementation, and evaluation is warranted. As well, training, evaluation, and program implementation techniques that have been thoroughly investigated in this area may be applicable to other areas of sport.

TUTORIAL

9:00-9:50 316 BTSU
SPORTS DERMATOLOGY
Brian B. Adams, M.D., Department of Dermatology, University of Cincinnati

Most clinicians will encounter athletes with sports-related dermatoses in their practices. Knowledge of cutaneous conditions in the context of specific sporting events permits the clinician most effectively to treat athletes. This session will review the diagnosis and therapy of cutaneous disorders in athletes. Specific athletic events including wrestling, running, basketball and water sports will be discussed. Evidence-based medicine of sports-related infections will also be discussed.

PRESIDENT'S LECTURE

10:00-10:50 314 BTSU PRESIDEN'TS LECTURE
CREATINE: DOES IT REALLY WORK?
Priscilla Clarkson, Ph.D., FACSM, University of Massachusetts

TUTORIAL

10:00-10:50 315 BTSU
30 MINUTES? 60 MINUTES? 10,000 STEPS? MORE THAN BEFORE? HOW MUCH PHYSICAL ACTIVITY IS ENOUGH?
Cody Sipe, M.S., A.H. Ismail Center for Health, Exercise and Nutrition,
Purdue University

Purpose: To educate attendees about the current physical activity recommendations and the evidence behind them in a practical and engaging manner. Objectives: 1.Analyze the current physical activity recommendations by different professional organizations 2.Evaluate the scientific evidence regarding physical activity and health 3.Discuss the practical implications of the various recommendations. Rationale: It has been well documented that regular physical activity is an important component of a healthy lifestyle. However differing recommendations regarding the appropriate amount of physical activity have been published by various organizations. It has been suggested that these mixed messages may lead to confusion by the general public and can possibly be detrimental to physical activity levels rather than helpful. Health and fitness professionals work with a variety of community organizations and groups to develop physical activity programs. It is necessary, therefore, that they have a solid grasp of the scientific evidence and rationale supporting the various recommendations so that they can make informed decisions when developing programs and engaging the public. In addition it is helpful to discuss the practical implications that the various recommendations may have for individuals, populations and communities in general.

PRESIDENT'S LECTURE

10:00-10:50 316 BTSU

INCREASING PATIENT COMPLIANCE IN CARDIAC REHABILITATION THROUGH THE USE OF TELE-MEDICINE TECHNOLOGY

Ken Sparks, Ph.D. FACSM, Cleveland State University

"Dr. Ken Sparks is an Associate Professor in exercise physiology and health at Cleveland State University. Dr. Sparks has numerous research publications dealing with exercise performance and fitness, cardiovascular disease and it treatment, and has written two books concerning the physiology of training and performance of distance runners. His current area of research is in the area of tele-medicine, focusing on the rehabilitation of strode and pulmonary patients using Tran telephonic technology."

From the Cleveland State University website:
http://www.clevelandstate.edu/coe/departments/HPERD/hpfaculty/hpfaculty.html

PRESIDENT'S LECTURE

11:00-11:50 314 BTSU

MOTOR DEVELOPMENT: NEW APPROACHED TO OLD QUESTIONS

Dr. Roberton, Ph.D., Kinesiology Division / School of Human Movement, Sport and Leisure Studies, Bowling Green State University

Mary Ann Roberton is a recognized expert in the field of Lifespan Motor Development. During her career she has published 1 textbook, 10 book chapters, ~ 30 refereed journal articles, and numerous other publications and presentations on developmental sequences of hopping and throwing. Her current research focuses on: How Movement Changes and What Causes the Change; Application of Motor Development Information to Teaching/ Remediation of Motor Skills; Gender-Biased Language and How To Change Its Use.

SYMPOSIUM

11:00-11:50 316 BTSU

PERIPHERAL ARTERIAL DISEASE AND EXERCISE

Jonathan K. Ehrman, Ph.D., FACSM, Henry Ford Heart & Vascular Institute, Detroit, Michigan

There has been a recent increase in the interest of using exercise therapy to treat patients with peripheral artery disease (PAD). The purpose of this symposium is to provide an up-to-date look at the use of exercise and the clinical exercise professional to diagnose and treat patients with PAD. The objectives are to: 1. Provide an epidemiologic look at PAD. 2. Provide a pathophysiologic look at PAD. 3. Discuss the methods of PAD assessment as it pertains to the patient participating in clinical exercise programs. 4. Discuss the research associated with exercise training as therapy for patients with PAD. 5. Present the methods of using exercise to treat the patient with PAD.

LUNCHEON BANQUET

11:30-1:30 202B BTSU

Opening Remarks – Dr. Amy Jo Sutterluety, President, MWACSM
Lunch
The Importance of MWACSM – Dr. Richard Bowers, founding member of MWACSM
Founder's Award
Professional Award
Business Meeting

WEEKEND WARRIOR WORKSHOP: LOWERBACK

1:30-4:30 202B BTSU

Speaker: Joseph E. Hornyak, IV, M.D., Ph.D., Preventive Medicine and Rehabilitation, University of Michigan

OBJECTIVES:

- Identify, diagnose and manage common injuries to the lower back experienced by the weekend athlete population.
- Understand the functional anatomy and biomechanic components of injury in the lumbar spine region.
- Review specific concerns of lumbar spine clinical syndromes.
- Differentiate between appropriate lumbar spine rehabilitation and required surgical management.

This activity is supported by an Educational Grant from Pharmacia/Pfizer.

SYMPOSIUM

1:30-2:20, 314 BTSU

REDUCING DISABILITY AND INCREASING FUNCTION IN OLDER ADULT POPULATIONS: DOES EXERCISE REALLY WORK?

Cody Sipe, M.S., Dan Ritchie, M.S., and Ken Baldwin, M.S., A.H. Ismail Center for Health, Exercise and Nutrition, Purdue University

Purpose: To analyze the current literature regarding the effects of three forms of resistance training- traditional strength training, power training and functional training- on reducing disability and increasing function in older adults. Objectives: 1. Provide an overview and conceptual framework through which to understand function and disability. 2. Analyze the current evidence regarding the use of traditional strength training as an effective strategy to reduce disability and increase function of older adults. 3. Analyze the current evidence regarding the claim that power training may be an effective strategy to reduce disability and increase function of older adults. 4. Analyze the current evidence regarding the claim that functional training may be an effective strategy to reduce disability and increase function of older adults. 5. Make practical recommendations regarding the training of older adults. Rationale: Older adults are the fastest-growing segment of the population and suffer the most from decreased function and disability. Exercise training, specifically resistance exercise, has been heavily advocated as an effective preventive and rehabilitative strategy to increase function and reduce disability for this population. However, while exercise training has been shown to achieve a number of physiological benefits for older adults, such as increased strength, the existing data does not provide strong evidence that it results in an improvement in the day-to-day functioning of older adults. In addition there have been claims that different forms of resistance training, specifically power and functional training, can be more effective than traditional training methods. This presentation will examine the current body of evidence regarding these issues and make practical recommendations for fitness and health professionals as they work with older adults to increase function and reduce disability.

WORKSHOP

1:30-2:50, 315 BTSU

MANAGING CONFLICT IN THE WORKPLACE

Stephen M. Horowitz, Ph.D., FAWHP, Health Promotion / School of Family & Consumer Sciences, Bowling Green State University

One of the most stressful experiences at home or in the workplace can be interpersonal conflict. Each of us has co-workers, subordinates, supervisors, friends, or family with whom we deal on a regular basis. Most of the time these interactions are pleasant, but sometimes they can be quite distressing. We might supervise several staff or work with a difficult boss or co-worker. Occasionally, we have disagreements or misunderstandings with close friends and loved ones. Most of us will do almost everything we can to avoid conflict and confrontations. Part, if not all, of these concerns may stem from the individual's fear of "losing control" of the

situation or saying something, which might exacerbate the situation, rather than resolve it. How much easier life could be with less interpersonal conflict! This seminar won't solve all your problems for you, but it will certainly start you in the right direction. The presentation will provide individuals with a better understanding of why conflicts occur and offer ways to reduce or eliminate potentially stressful interactions. Participants will learn: (1) active listening and assertiveness techniques often employed by successful mediators; (2) techniques for dealing with aggressive individuals; and (3) how to use cognitive restructuring to help minimize their stress and ensure that their emotional responses are not distorted. Session Description and Outline A. A combination of lecture and discussion will address why conflict occur. Conflicts often arise because of misunderstandings, unclear communication, and distorted thinking. Lecture, discussion, and group activities will be used to explain the role of perception in conflict. Additionally, perceptions, related to loss of control and personal or professional threat, will be addressed. Everything we see and hear must pass through a perceptual filter. These filters are influenced by such things as past experiences, self-confidence, and self-talk. B. Lecture and demonstration will be used to explain the role of self-talk in creating potential conflict. Lecture, discussion, and group activity will be used to explore the role of distorted thinking in conflict and how a rational analysis can be used to correct distorted or negative self-talk, and ultimately, minimize conflict. Distorted thinking, which is frequently manifested by our internal dialogues, can create problems where none exist or can inflame situations by blowing issues out of proportion. A rational analysis is a method of doing cognitive restructuring, i.e., rationally analyzing a situation to assess how objective our perception of the event was, and modifying our self-talk to reduce potential stress and conflict. C. Lecture and discussion will be used to identify three styles of communication; assertive, passive, and aggressive. Examples of each type of communication will be offered with pros and cons for their use. Discussion and group activity will be used to teach the concept of assertive choice. Assertive choice is frequently, but not always, the desired behavioral option for managing conflict and reducing personal stress. The goal in assertive choice is to minimize stress and potential conflict, while enabling the person to feel good about the choice being made. D. Brief group discussion will be used to explain the role of poor communication as a source of conflict. There are three components in communication: the sender, the receiver, and content of the message. Making unclear statements or not interpreting the message correctly can lead to conflict. Discussion and group activity will be used to teach the concept of active listening and to identify the most common types of active listening responses that can actually inflame conflict. Active listening can help diffuse potential conflicts by recognizing and acknowledging anger/hostility as well as identifying the direction of that anger. It enables individuals to respond less defensively and more calmly. E. Lecture and discussion will be used to address behaviors that help individuals respond more effectively to aggressive individuals. Participants will learn three techniques, i.e., time out, broken record, and shifting gears that have been shown to work with aggressive individuals. These techniques can either dissipate conflict or prevent it from accelerating further.

SYMPOSIUM

1:30-2:50, 316 BTSU

MANAGEMENT OF HEAD INJURY IN THE INJURED ATHLETE

Henry Goitz, M.D., Jeffrey Noftz, P.T., M.D., Medical College of Ohio,
Christine Multer, ATC, Ph.D., University of Toledo

Purpose: Provide the participant with a practical understanding of the seriousness of head injury with its associated potentially emergent conditions such as concussion and spinal injury in contact sport. Identification, management, and prevention will serve as the basis for discussion. Objectives: 1. Illustrate the mechanism of head and neck injury in contact sport. 2. Understand the pathologic processes involved in head injury. 3. Learn to identify even the subtle symptoms involving concussion. 4. Recognize the clinical differences between burners/stingers and nerve compression and their management. 5. Become familiar with on the field management techniques of the injured athlete. 6. Learn the preventative techniques regarding head injury and new pre-season screening techniques. Rationale: Head injury is prevalent in contact sport at all levels of ball play. Health care providers must be able to recognize as well as appropriately manage and treat these potentially catastrophic events in order to maximize the safety of our athletes.

SYMPOSIUM

2:30-3:20, 314 BTSU

CASE STUDY METHOD OF INSTRUCTION: INTERGRATING CLASSROOM AND CLINICAL EXPERIENCES

Henry Goitz, M.D., Jeffrey Noftz, P.T., M.D., Medical College of Ohio, Christine Multer, ATC, Ph.D., University of Toledo

The purpose of this presentation is to provide educators with alternative teaching strategies, which can be used to promote the integration of classroom and clinical experiences using the case study method, and it's variations. An emphasis will be placed on techniques for writing effective cases that can be used with multiple teaching and presentation styles. Rationale The goal of using case method teaching is not primarily the dissemination of content (although that undoubtedly does occur), but to teach the skill of critical thinking and to develop higher-order skills of learning. Relative to Bloom's taxonomy of cognitive learning, cases attempt to focus less on "knowledge" than on comprehension, application, analysis, synthesis and evaluation. Cases seem ideally suited to provide context and relevance to didactic knowledge, are well suited to the collaborative or cooperative learning format in smaller groups but can be adapted quite easily to large discussion classes as well as large lecture-based classes. Case Writing an overview of specific case types will include the directed case, progressive disclosure and dilemma case types. Techniques in the construction and writing of these various types of cases will be discussed. Attendees will have the opportunity to construct a sample case using the methods discussed. Case Presentation. The presentation will offer an overview of several methods of case study teaching. The most common is the discussion format. This technique presents a dilemma that the students, with the instructor's guidance, must use to identify the

various issues and problems, possible solutions and consequences. The problem-based learning format utilizes a series of cases that are often linked by content and progress in complexity. The team-learning format uses cooperative/collaborative learning with small groups. Learning Assessment Principles involved in evaluating student performance using the case study method include developing clearly defined objectives and outcomes. Common methods to be discussed include objective testing, including multiple choice, short-answer and matching questions, oral exams, essay exams, clinical reasoning exercises, progressive problem solving exercises, peer evaluations, journals and personal reflections Conclusions Exercise science education can benefit from using the case study method of instruction because it provides several benefits to student learning including increased learning motivation, improved subject relevance and context, improvements in higher order thinking, improving student's understanding of the learning process and authenticity of content application. Challenges of this method include the time involvement, role anxiety for students and instructors and the ability to assess the effectiveness of the method.

TUTORIAL

2:30-3:20, 314 BTSU

Case Study Method of Instruction: Integrating Classroom and Clinical Experiences

Thomas Cappaert, Ph.D., ATC

The purpose of this presentation is to provide educators with alternative teaching strategies, which can be used to promote the integration of classroom and clinical experiences using the case study method, and it's variations. An emphasis will be placed on techniques for writing effective cases that can be used with multiple teaching and presentation styles. Rationale The goal of using case method teaching is not primarily the dissemination of content (although that undoubtedly does occur), but to teach the skill of critical thinking and to develop higher-order skills of learning. Relative to Bloom's taxonomy of cognitive learning, cases attempt to focus less on "knowledge" than on comprehension, application, analysis, synthesis and evaluation. Cases seem ideally suited to provide context and relevance to didactic knowledge, are well suited to the collaborative or cooperative learning format in smaller groups but can be adapted quite easily to large discussion classes as well as large lecture-based classes. Case Writing an overview of specific case types will include the directed case, progressive disclosure and dilemma case types. Techniques in the construction and writing of these various types of cases will be discussed. Attendees will have the opportunity to construct a sample case using the methods discussed. Case Presentation. The presentation will offer an overview of several methods of case study teaching. The most common is the discussion format. This technique presents a dilemma that the students, with the instructor's guidance, must use to identify the various issues and problems, possible solutions and consequences. The problem-based learning format utilizes a series of cases that are often linked by content and progress in complexity. The team-learning format uses cooperative/collaborative learning with small groups. Learning Assessment Principles involved in evaluating student performance using the case study method include developing clearly defined objectives and outcomes. Common methods to be discussed include objective testing, including multiple choice, short-answer and matching questions, oral exams, essay exams, clinical reasoning exercises, progressive problem solving exercises, peer evaluations, journals and personal reflections Conclusions Exercise science education can benefit from using the case study method of instruction because it provides several benefits to student learning including increased learning motivation,

improved subject relevance and context, improvements in higher order thinking, improving student's understanding of the learning process and authenticity of content application. Challenges of this method include the time involvement, role anxiety for students and instructors and the ability to assess the effectiveness of the method.

TUTORIAL

3:00-4:20, 315 BTSU

SKETAL MUSCLE INJURY, DEGENERATION, AND REGENERATION: MODELS AND THERAPIE

Jamie M. Lekan, B.S., et. al., The Ohio State University

Purpose: To review current knowledge of skeletal muscle injury and to explore current and future research areas in facilitating the regenerative process. Objectives: 1. Review current knowledge of physiological processes involved in skeletal muscle injury, degeneration, and regeneration. 2. Examine both congenital defects and senescent changes that occur in the aging process in skeletal muscle, focusing on degeneration and regeneration. 3. Discuss current and future therapeutic modes to enhance the regenerative process and address clinical application. Rationale: Skeletal muscle injuries impact function and treatments to hasten the natural healing process are important to a wide variety of individuals. This symposium will address these issues for researchers and clinicians.

WORKSHOP

3:00-4:20, 316 BTSU

ANALYZING & CORRECTING POSTURE AND BODY ALIGNMENT

Ken Baldwin, M.Ed. and Nichole Beelke, A.H. Ismail Center for Health, Exercise and Nutrition, Purdue University

This session will prepare attendees to assess and educate theirs client in all areas of posture and body alignment. The lecture develops a logical flow and sequence to describe, demonstrate, teach and analyze exercise movements and posture for your clients/students in an easy to follow manner. Participants will be educated in implementing the assessment techniques into your organization's current health and exercise testing program, review how poor posture and body alignment develop, evaluate the anatomical structures of the vertebral column and other extremities, and teaching techniques to analyze and evaluate body alignment, posture, relieve back pain and train cognitive methods via the Four Points of Posture and exercise movements. OBJECTIVES: Incorporate a Posture Program into your organization's current health and exercise testing program. Key Assessment in the design of your clients exercise program & prescription. Understand how to present all this Posture and Body Alignment "STUFF" to your client in a logical manner. Identify and describe the anatomy and line of gravity to overall standing posture. 5. Learn to implement the Four Points of Posture™ for ADL and exercise movements for your CLIENTS and YOURSELVES.

TUTORIAL

3:30-4:20, 314 BTSU
CARDIOPULMONARY EXERCISE (CPX) TESTING
Jon Ehrman, Ph.D., FACSM and C.A. Brawner, B.S., Henry Ford heart & Vascular Institute, Detroit, Michigan

CPX testing is widely used in research. Although used to various degrees between clinics, its value is increasingly being identified. Purpose: Describe the importance of CPX testing and the steps to acquiring accurate data. Objectives: Develop an understanding of: 1. CPX measures, including VO2, VT, OUES and others. 2. The use of CPX testing in clinical populations. 3. The importance of pre-test preparations of both the metabolic cart and the patient. 4. Keys to performing good CPX tests.

4:30-5:00 202B BTSU
CONCLUDING REMARKS
MWACSM Student Awards Ceremony

MWACSM Awards

NOTE: Please contact Tim Kirby or Carmen Babcock for additions and corrections to this list.

Year	Outstanding Free Communication (Student)	Outstanding Poster (Student)	Founders Award (est. 1994)	MW Chapter Research Award (est. 1993)	Outstanding Student	Outstanding UG Student
1989	D.N. Proctor, Ohio University					
1990	Carol Wiedeman, U. of Toledo					
1991				Amy Jo Casenhiser, U. of Akron		
1992	Condy McKnight, U. Toledo	Kevin Short, Purdue U.				
1993	Mary Sled (OSU) & C.M. Kasper (U. Toledo) -tie	DH Choi, Ball State			Glena DeJong	
1994	Deborah Leslie, Ball State U.	Kevin Ansberry, Miami U.	Tim Kirby			
1995						
1996						
1997	Christopher C. Cheatham, Kent State U.	Sean Mulroy, OSU				
1998			Richard B. Parr			
1999	J. Ty Hopkins, Indiana State U.	Leigh A. Mrotek, U. of Wisc-Milwaukee	Wayne E. Sinning			
2000	Cindy Anderson, Ball State U.	Cheri Teranishi, Purdue U.	Ann C. Snyder	David Wright, Ball State U.		Kindal A. Shores, Ball State U.
2001		S. Tsivitse, U. of Toledo	Darlene Sedlock			
2002			Jeff Edwards			

Course Objectives…..

At the conclusion of the Midwest American College of Sports Medicine Annual Meeting, participants should be able to:

- Evaluate and formulate a treatment plan for exercise-related injury to the shoulder, ankle and lower back.
- Understand the historical and applied uses of measured gas exchange during exercise in both normal and patients with pathological states.
- Recognize key nutritional, athletic training and sociologic issues associated with working with elite and professional athletes.
- Identify new approaches to using exercise training in the care of patients with heart failure, in children with weight management issues, and in older adults.
- Understand the issues associated with the use and application of various contemporary techniques used in the detection and scoring of calcium in coronary arteries.

Target Audience….

This meeting is targeted to healthcare professionals such as athletic trainers, exercise physiologists, physical therapists, family practice physicians, and nurses.

Accreditation….

Henry Ford Health System is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. Henry Ford Health System takes responsibility for the content, quality, and scientific integrity of this CME activity.

Designation Statement….

Henry Ford Health System designates this educational activity for a maximum of **15.25 credit hours in Category I** towards the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

In the state of Michigan, Category I physician credits are applicable to nursing CEU's.

Faculty Disclosure Statement…

All faculty participating in continuing education activities sponsored by Henry Ford Health System are required to disclose to the audience any relevant commercial relationships, and/or non-FDA approved use of a drug or a device that is included in the presentation.

Henry Ford Health System

2002

PROGRAM

Midwest ACSM

Annual Meeting

October 11 - 13, 2002

WELCOME TO THE MIDWEST REGIONAL CHAPTER AMERICAN COLLEGE OF SPORTS MEDICINE ANNUAL FALL MEETING

OCTOBER 11-13, 2002
THE HOLIDAY INN FAIRLANE - DEARBORN CONFERENCE CENTER AND HOTEL
DEARBORN, MICHIGAN

Welcome to the Annual Regional Chapter Meeting of the Midwest American College of Sports Medicine . The Program Planning Committee has worked diligently to put together a diverse program, providing an array of scientific and clinical presentations applicable to many areas of interest. We are excited to have experts in their fields, Jack Wilmore and Julie Burns, as keynote speakers for this year's meeting. Kent Falb will give a presentation on "A Look Inside the NFL-Some Reflections" at Saturday's banquet luncheon. New to this year's meeting is a Socratic debate, exploring "The Pro's and Con's of Ephedrine Use." As well, numerous social opportunities are available at the meeting this year, including a reception following the keynote address on Friday evening, breakfast gatherings Saturday and Sunday morning and plenty of opportunities to meet and greet.

We are pleased to have Dearborn as the host city for this year's meeting. The city of Dearborn was named for General Henry Dearborn, a distinguished physician and Revolutionary War hero who served as Secretary of State under President Thomas Jefferson from 1801-1809 and commanded the American Armies during the War of 1812. There are four major eras in Dearborn's history: the building of the Detroit Arsenal by the U.S. Army in the 1830s; the construction of the Rouge Plant by Henry Ford in 1917; the subsequent consolidation of two townships into the City of Dearborn in 1929, with a period of growth following World War II marked by a growing reputation for clean surroundings, excellent schools and public services, and low taxes; and finally, the construction of the Fairlane development by Ford Motor Land Development Corporation starting in 1970, and continuing today.

The Holiday Inn Fairlane Conference Center located in Dearborn Michigan, is conveniently located for easy access to all of the area's many attractions, including Henry Ford Museum and Greenfield Village, which together are the leading tourist attraction in Michigan.

We hope you take full advantage of the of the many programs, events, and social opportunities available at this year's meeting. On behalf of the Midwest Chapter, thank you for your attendance and participation at the MWACSM Annual Conference.

Helaine Alessio
Program Chair

2001 MWACSM
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25-30	PROGRAM EVENTS: SUNDAY, OCTOBER 13, 2002

PROGRAM ACKNOWLEDGEMENTS

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THE MIDWEST REGIONAL CHAPTER OF AMERICAN COLLEGE OF SPORTS MEDICINE WOULD LIKE TO ACKNOWLEDGE THE GENEROUS FINANCIAL SUPPORT OF THE FOLLOWING ORGANIZATIONS:

Henry Ford Heart Health Institute

Mc Graw Hill Healthy Learning

Gatorade Sports Science Institute

MedGraphics

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CONFERENCE INFORMATION

OBJECTIVES
At the conclusion of the MidWest American College of Sports Medicine Annual Meeting, participants should be able to:

- Evaluate and formulate a treatment plan for exercise-related injury to the shoulder, ankle and lower back.
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- Understand the issues associated with the use and application of various contemporary techniques used in the detection and scoring of calcium in coronary arteries.

TARGET AUDIENCE
This meeting is targeted to healthcare professionals such as athletic trainers, exercise physiologists, physical therapists, family practice physicians, and nurses.

ACSM CEC's
The American College of Sports Medicine's Professional Education Committee certifies that this continuing education offering meets the criteria for 12.5 credit hours of ACSM Continuing Education Credit. CEC forms may be obtained at the registration booth.

ACCREDITATION
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CME's
Henry Ford Health System designates this educational activity for a maximum of 15.25 credit hours in Category I towards the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

NAME BADGES
Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Replacement badges cost $5.

MEETING LOCATIONS
All sessions and most other events will be held in The Holiday Inn Fairlane Convention Center. Room assignments for educational events are detailed in this program, along with a map of the convention center. Signage in the registration area will direct you to special events.

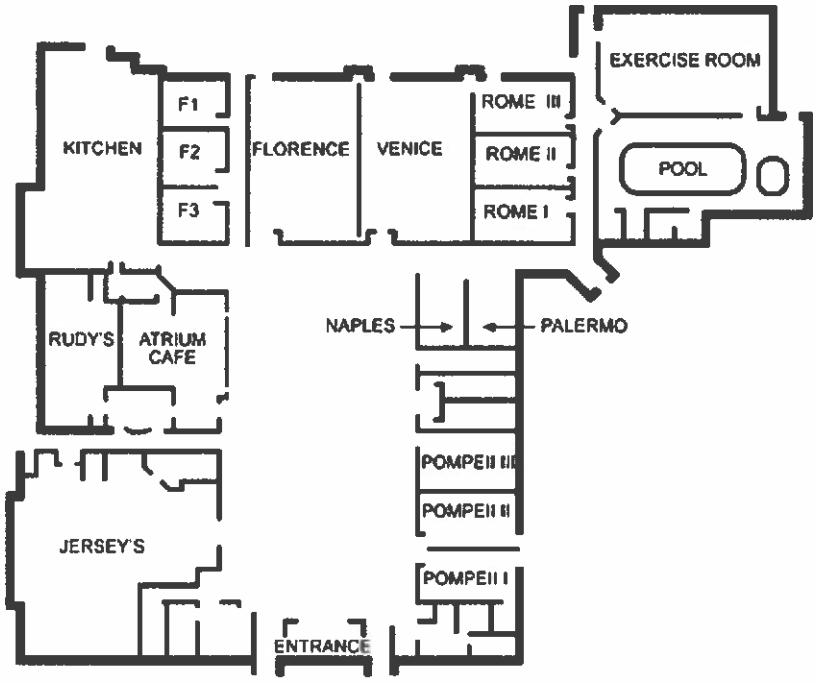
REFRESHMENTS & PLANNED SOCIAL GATHERINGS
An opening reception for all will be held immediately following the keynote address, in the Upper Terrace, Friday 8:15-10:00 pm. A luncheon is scheduled for Saturday afternoon at 12 pm. A student breakfast/forum will be held at 8:00 am Saturday morning. A breakfast honoring the past-presidents of MWACSM will be held on Sunday at 7:30 am. Various snacks will be available throughout the meeting.

ANNUAL BUSINESS MEETING
This important business meeting is your opportunity to participate as an active voice in affecting the future of the Midwest Chapter of ACSM. Please plan to attend on Saturday afternoon, immediately following the banquet luncheon.

AWARDS ANNOUNCEMENTS
The annual 'Founder's Award' will be announced at the banquet luncheon on Saturday. The **Founder's Award** is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

Awards in the amount of $150.00 will be made for the outstanding student poster and free communication . This award will be announced in the next issue of MWNews.

THE HOLIDAY INN FAIRLANE - DEARBORN
MEETING ROOM FLOOR PLAN



FINAL PROGRAM

FRIDAY, OCTOBER 11, 2002

TIME	EVENT	ROOM
5:00 pm - 7:00 pm	Registration	Lobby
7:00 pm - 8:00 pm	**Keynote Address: The HERITAGE Study, J. Wilmore, Ph.D.**	Florence & Venice
8:15 pm - 10:00 pm	Reception for All	Upper Terrace

SATURDAY, OCTOBER 12, 2002

8:00 am - 4:00 pm	Registration	Lobby
8:00 am - 8:55 am	Student Forum/Breakfast	Florence
8:00 am - 8:55 am	Organizational Meeting for State Registry	Florence
9:00 am - 9:55 am	Poster Session	Rome 1
9:00 am - 9:55 am	Tutorial: "Sport Nutrition in the Trenches: What Works and What Doesn't for Optimal Performance" J. Burns, R.D., M.S.	Rome 2 & 3
10:00 am -10:55 am	Poster Session	Rome 1
10:00 am-10:55 am	Tutorial: "Coronary Calcium Screening: From Theory to Practice" J. Ehrman, PhD, C.Brawner, B.S.	Rome 2 & 3
11:00 am -11:55 am	Tutorial: "The Use of Elastic Energy in Sports" M. Walsh, Ph.D., Miami University	Sicily
11:00 am -11:55 am	Symposium: "ACSM Certification and Registry Programs"- C. Stewart, ACSM	Rome 2 & 3
12:00 pm - 2:00 pm	Luncheon & Banquet Speaker, K. Falb, A.T.C.- "A Look Inside the NFL-Some Reflections"	Florence & Venice
2:00 pm - 3:30 pm	Symposium: "Gas Exchange During Exercise: Historical Tools to Contemporary Applications" J. Wilmore, Ph.D., C. Foster, Ph.D., S. Keteyian, Ph.D.	Rome 2 & 3
2:00 pm - 2:50 pm	Tutorial: "Syndesmotic Ankle Sprains - The Science and Experience" K. Falb, A.T.C.	Sicily
2:00 pm - 4:00 pm	Clinical Presentations, " Evaluations of: The Shoulder/The Knee/The Back" T. George, M.D., S. Karageanes, D.O., S. Mandel, M.D.	Florence & Venice
2:55 pm - 3:40 pm	Tutorial: "Fit or Fat: What Fitness Professionals Need to Know" C. Sipe, M.S.	Sicily
3:45 pm - 5:00 pm	Socratic Debate: The Pros and Cons of Ephedrine Use, Pro: K. Kohls, M.S., R.D., Con: P. Striet, C.P.T	Florence & Venice
5:05 pm - 6:00 pm	**Keynote Address: "Insights in Working with Professional Athletes" J. Burns, R.D., M.S.**	Sicily

SUNDAY, OCTOBER 13, 2002

8:00 am - 9:30 am	Registration	Lobby
7:30 am - 8:30 am	Breakfast for All (Honoring Past-Presidents)	Upper Terrace
8:30 am - 9:30 am	Oral Presentations	Rome 1 & 2
9:30 am - 10:45 am	Mini-Symposia: "Pediatric Weight Management: Nutritional and Physical Activity Issues" R. Claytor, Ph.D.	Rome 1
9:30 am - 10:45 am	Mini-Symposia: "Increasing Activity and Exercise in Older Adults" C. Sipe, M.S., R. Lyle, Ph.D.	Rome 2
10:50 am - 11:50 am	Tutorial: "Exercise and the Failing Heart" Steven Keteyian, Ph.D.	Rome 1
10:50 am - 11:45 am	Mini-Symposia: "Impact of an Employee Wellness Program in a University Setting" B. Reeves, Ph.D.	Rome 2
12:00 pm	Adjourn	

KEYNOTE ADDRESS

7:00 - 8:00 pm
FLORENCE & VENICE

EXERCISE AND HEALTH - THE HERITAGE FAMILY STUDY

JACK WILMORE

Jack Wilmore, head of the Department of Health and Kinesiology at Texas A&M University, will deliver the MidWest ACSM Annual Meeting opening keynote address, "Exercise and Health - The Heritage Family Study" on Friday, October 11th, at 7:00 p.m. at the Holiday Inn Fairlane Conference Center.

The author of the books *The Wilmore Fitness Program* and *Sensible Fitness* and the coauthor of *Physiology of Sport and Exercise and Health* and *Fitness through Physical Activity,* Wilmore is a former executive director of the National Athletic Health Institute. He has won awards for contributions to his field from the Association for Employee Health and Fitness and the American Academy of Kinesiology and Physical Education.

He has held leadership posts with such organizations as the American Heart Association and National Association of Sport and Physical Education, and he has served as a consultant to the President's Council on Physical Fitness and Sport, California Highway Patrol, and Los Angeles Lakers basketball team, among others.

HERITAGE FAMILY STUDY: THE ROLE OF GENES IN FITNESS

Why is it that some people become more fit and healthy by taking up an exercise regimen, but other people who exercise regularly can't seem to alter their risk factors for such health problems as heart disease or diabetes? Age, gender, and race have been ruled out as reasons for this in various studies. The Heritage Family Study, funded in 1992 by the National Institutes of Health at five different institutions, was designed to examine the importance of genetics in a person's ability to use exercise to improve his or her health indicators. The study's results to date appear to show that genetics, in ways not yet completely clear, play a significant role in how effective exercise regimens can be in prevention strategies for persons at risk of heart disease or diabetes. The Heritage Study will continue through 2001 and a third phase is being planned to extend the study for an additional four years. "The large size of the study (800 men and women in more than 200 families) and the fact that it includes African-Americans and European-Americans allows scientists to view the conclusions to date as especially reliable. These results will have a significant influence on understanding the role of exercise in the management of patients' risk factors for these diseases and, we hope, will lead to more effective treatments, even gene therapy." - Arthur Leon

Presentation Objectives

1. To understand the scientific foundation that led to the design of the HERITAGE Family Study.
2. To understand the complexities of designing and implementing a comprehensive, multi-centered intervention study, including the importance of quality control and reproducibility of test results.
3. To understand the basis of differences in the response of selected variables to 20 weeks of controlled exercise training.

RECEPTION

8:15 - 10:00 pm
UPPER TERRACE

An opening reception for all meeting attendants is planned immediately following the keynote lecture. Refreshments will be served.

STUDENT FORUM/BREAKFAST

8:00 - 8:55 am
UPPER TERRACE

The Saturday morning breakfast reception is intended for all meeting attendants. The student forum is an excellent opportunity for students to explore educational and professional opportunities in the Midwest region. This session is coordinated by Chris Womack, Ph.D. and Brenda Reeves, Ph.D.

POSTER SESSION

9:00 - 9:55 am
ROME 1

Melissa Potts	The effect of static stretch time on the duration of hamstring flexibility	Sat A 9:00-9:55
Chris Herman	The utility of heart rate and RPE in determining oxygen uptake during high-intensity exercise	Sat A 9:00-9:55
Jessica Sobolewski	Comparing a 6 minute walk on land vs. a 6 min walk in the water	Sat A 9:00-9:55
Dawn P. Coe	Criteria for determining maximal effort during VO2 max treadmill testing in female youth	Sat A 9:00-9:55
Brad Manor	Predictors of four tasks among functionally limited elderly adults	Sat A 9:00-9:55
Tina Hayter	He effect of electrical muscle stimulation on resting metabolic rate	Sat A 9-9:55
Brittany L. Dodrill	Seasonal changes in total cholesterol in functionally limited elderly adults	Sat A 9:00-9:55

THE EFFECT OF STATIC STRETCH TIME ON THE DURATION OF HAMSTRING FLEXIBILITY
M.A. Potts, T. A. Cappaert, Central Michigan University, Mt. Pleasant, MI / Rochester High School, Rochester, MI

Objective: Previous studies have found static stretching increases muscle flexibility. Research has compared 15, 30, 45, and 60 second holds for static stretch, however the study of the duration of flexibility gains has been limited. The purpose of this study was to determine the hold time that would result in the greatest duration of flexibility after a single static stretching session. The duration of flexibility after a 30-second and 60-second static stretch were compared. Design and Setting: Subjects were randomly assigned to one of three groups: control, 30-second static stretch, and 60-second static stretch. Active knee extension measurements, as measured by degrees of deviation from vertical, were taken before and after stretching for all three groups. The independent variable was the time duration of the static stretch. The dependent variable was the duration of hamstring flexibility following the stretch. Subjects: Twenty-four in-season high school athletes (age = 15.9 + 1.38 years; height = 168.1 + 12.4 cm; weight = >64.9 + 18.3 kg) with limited hamstring flexibility (> 20° loss of full active knee extension with 90° hip flexion) participated. Measurements: Active knee extension measurements (with the hip positioned in 90° of flexion) were taken at pre-stretch, 0, 1, 3, 6, 9, 15, and 30 minutes post stretch for all three groups. Results: Repeated measures ANOVA was used to determine the presence of significant differences ($p<0.05$) within the

groups. Tukey&post-hoc testing indicated a significant increase in knee extension in the 60-second static stretch group that lasted 3 minutes after the stretch. Measurements after 3 minutes were not significantly different. The 30-second static stretch group did not produce a statistically significant increase in knee extension after the stretch. Conclusions: The results suggest that a one time 60-second static stretch significantly increased hamstring flexibility for 3 minutes after the stretch. A one time 30-second static stretch did not significantly increase hamstring flexibility. Therefore, a 60-second static stretch is more effective than 30-seconds or no stretch in increasing hamstring flexibility. Longer duration, frequency, and the influence of activity should be further examined.

THE UTILITY OF HEART RATE AND RPE IN DETERMINING OXYGEN UPTAKE DURING HIGH-INTENSITY EXERCISE

C.W. Herman, P.R. Nagelkirk, A.M. Coughlin, and C.J. Womack, FACSM. Human Energy Research Laboratory, Michigan State University, East Lansing, MI 48824

The purpose of this study was to determine whether exercise protocols based on heart rate (HR) and ratings of perceived exertion (RPE) elicited steady-state oxygen uptake (VO2) during high-intensity aerobic exercise. Nine sedentary males (age = 24 ± 4.5 yrs.) completed three 15-minute submaximal exercise cycle ergometer tests based on: 1) constant power output (PO) corresponding to 75% VO2 max (PO75), 2) HR corresponding with 75% VO2 max (HR75), and 3) RPE response corresponding with 75% VO2 max (RPE75). VO2, HR, RPE, and blood lactate concentration [La-] levels were measured during all tests. A two-factor repeated measures ANOVA was used to compare VO2 at minute 3 and end-exercise. A one-factor repeated measures ANOVA was used to compare end-exercise HR, RPE, and [La-] for the three tests. Post-hoc means comparisons were performed using a Fisher's LSD test. A priori significance was established at $P < 0.05$. End-exercise VO2 was significantly higher than the respective minute 3 VO2 for the PO75 (3 min. VO2 = 2.22 ± .29 L/min; end-exercise VO2 = 2.59 ± .29 L/min) and RPE75 tests (3 min. VO2 = 2.24 ± .26 L/min; end-exercise VO2 = 2.40 ± .44 L/min), but not the HR75 test (3 min. VO2 = 2.26 ± .31 L/min; end-exercise VO2 = 2.36 ± .37 L/min). End-exercise VO2 was significantly greater for the PO75 test than both the RPE75 and HR75 tests, but there was no significant difference between end-exercise VO2 for the RPE75 and HR75 tests. No significant differences were observed between the three tests for VO2 at minute 3. Nor were any differences observed for end-exercise [La-] between the tests (PO75 [La-] = 7.38 ± 1.60 mmol/l; HR75 [La-] = 7.66 ± 2.37 mmol/l; RPE75 [La-] = 7.48 ± 2.63 mmol/l). End-exercise HR and RPE were significantly higher for the PO75 test (HR = 172.5 ± 12.8 beats/min.; RPE = 16.1 ± 2.0) than both the RPE75 (HR = 165.6 ± 17.2 beats/min.; RPE = 14.6 ± 1.1) and HR75 (HR = 161.1 ± 15.0 beats/min.; RPE = 13.9 ± 1.5) tests. There were no significant differences between the RPE75 and HR75 tests for either end-exercise HR or end-exercise RPE. Results suggest that using both HR and RPE are equally effective at reducing the slow component of VO2 that occurs during high-intensity exercise.

COMPARING A 6-MINUTE WALK ON LAND VS. A 6-MINUTE WALK IN THE WATER

J.L. Sobolewski, D. Boardley, R.V. Topp , A.L. Morgan, University of Toledo, Toledo, OH 43606

The 6-minute-walk-test (6MW) is a valid, reliable measure of functional exercise capacity that involves walking as far as possible on land in 6 minutes. Walking in water reduces weight-bearing effects while increasing workload due to movement against resistance. To date no study has compared a 6MW on land to a 6MW in the water. Therefore, the purpose of this study was to determine whether a 6MW in the water is comparable to a 6MW on land as a valid and reliable measure of exercise capacity in functionally limited elderly adults. Functionally limited was defined as scoring greater than 24 on the MOS SF-36. Ten functionally limited volunteers (7F, 3M; 66-82 yrs) performed three 6MW (one on land, two in water). The individuals performed the land 6MW around an oval track (386 ft), and the water 6MW across the width (40 ft) of a heated (89F) pool. The tests were conducted on three non-consecutive days to avoid possible fatigue. Measurements recorded included distance covered, resting heart rate (HRrest), heart rate (HR) at each minute of the test and

three minutes post-test, peak heart rate (HRpeak), and perceived exertion (RPE). Heart rates were measured via monitors (Polar, Electro Oy, Finland). Table 1 presents averages for each test.

Table 1	HRrest(bpm)	HRpeak(bpm)	Recovery(bpm)	RPE	Distance(ft)
Land	72.9±3.8	99.8±3.77	78.1±3.9	9.9±.74	1337.6±74.6
Water 1	70.1±2.8	89.5±3	73.6±2.4	10±.65	459.75±25.4
Water 2	72.4±2.6	90.3±2.3	72.6±2.	9.6±.48	473±23.5

A Pearson Product Moment Correlation revealed that distance covered for the two 6MW in water were highly correlated (r=.771; p<.01). HR measurements were also highly correlated between the two walks in the water, each significant at the .01 level, with the exception of measurements at 1-minute (r=.630, p<.051), and 2-minutes (r=.650, p<.042). HRpeak was highly correlated between the two 6MW in water (r=.803, p<.01). Repeated measures ANOVA revealed that distance covered on land was significantly greater (p<.05) than distance covered in the water. One-minute recovery HR was also significantly greater (p<.05) on land than in the water. There were no significant differences in RPE between the tests. This study presents intriguing data of a potentially better method for testing aerobic capacity in the functionally limited elderly population. As evidenced by the lower HR but similar RPE measurements, a 6MW in the water may be considered safer than a 6MW on land due to the decreased stress placed on the heart.

CRITERIA FOR DETERMINING MAXIMAL EFFORT DURING VO2max TREADMILL TESTING IN FEMALE YOUTH.

D.P. Coe and J.M. Pivarnik, FACSM. Michigan State University, East Lansing, MI 48824

Criteria used to determine whether a child or adolescent has given a maximal effort during a VO2max test typically include a precise lower limit for peak heart rate (HRpeak) and respiratory exchange ratios (RERpeak), and to a lesser extent, a plateau in VO2 with increasing exercise intensity. Specific criteria may vary among laboratories, and have been developed primarily with data collected from adults. Most studies performed on children and adolescents have included small samples of boys. PURPOSE Our main purpose was to determine whether different HRpeak and RERpeak cut points affect girls' VO2max values determined from incremental treadmill testing.
A secondary purpose was to determine if VO2max differs between girls who achieved a VO2 plateau (defined as <2.0 ml.kg-1.min-1) and those who did not. METHODS Our sample included 453 healthy girls (M±SD age=13.3 ± 1.65 yr, height 1.57 ± 0.08 m, weight 53.4 ± 13.3 kg) who participated in studies conducted in our laboratories over the past 10 years. Each participant completed a continuous incremental treadmill test to volitional exhaustion. Although the specific treadmill protocol differed among the studies, each girl was running at test end. Respiratory gases and HR were monitored continuously throughout the tests. HRpeak cut point groups were 0= 180-189 b.min-1 (n=80), 1= 190-194 b.min-1 (n=83), 2= 195-199 b.min-1 (n=84), 3= 200-204 b.min-1 (n=111), 4= >205 b.min-1 (n=95). RER peak cut point groups were 0= 0.90-0.99 (n=29), 1= 1.00-1.04 (n=63), 2= 1.05-1.09 (n=86), 3= 1.10-1.14 (n=98), 4= 1.15-1.19 (n=79), and 5= >1.20 (n=98). RESULTS MANOVA revealed that VO2max values differed significantly among the HRpeak groups, but not RERpeak. There was no interaction between the two criteria (Table 1).
TABLE 1
VO2max Values (M±SD) Among HRpeak and RERpeak Criteria Groups

HRpeak	**Group 0**	**1**	**2**	**3**	**4**	
VO2max (ml.kg-1.min-1)	34±7a	35±8a	38±7b	40±8b	42±7bc	
RERpeak	**Group 0**	**1**	**2**	**3**	**4**	**5**
VO2max (ml.kg-1.min-1)	37±7	37±9	38±8	38±8	38±8	38±7

Different superscript letters indicate significant VO2max differences among the HRpeak criteria groups (P<.001).
In studies where evidence of a VO2 plateau was examined, there was no difference between VO2max values of girls who reached a plateau (34±7 ml.kg-1.min-1; n=54) and those who did not (34±7 ml.kg-1.min-1; n=83). CONCLUSION On average, girls' VO2max values were not affected by choice of RERpeak criteria or requiring evidence of VO2 plateau. However, lower HRpeak cut points were associated with lower VO2max values. It is not known if this was a result of less effort by these study participants, or a cardiovascular limitation to their aerobic energy production.

PREDICTORS OF FOUR TASKS AMONG FUNCTIONALLY LIMITED ELDERLY ADULTS
B.D. Manor, J.L. Sobolewski, R.V. Topp, D. Boardley, A.L. Morgan, M.M. Fahlman, FACSM, N. McNevin. University of Toledo, Toledo, OH43606, University of Louisville, Louisville, KY 40292, Bowling Green State University, Bowling Green, OH 43403, Wayne State University, Detroit, MI 48202.

The aging process has long been thought to be associated with decreases in functional ability. While some of these functional declines may be related to irreversible changes associated with aging, other declines may be a result of deteriorating strength and aerobic capacity associated with disuse. The purpose of this study was to determine the predictors of four functional tasks among functionally limited older individuals. Ninety functionally limited volunteers (26M, 64F; 65-94 yrs) were timed while performing functional tasks including time to ascend and descend 24 stairs, and time to move from a standing to supine position and from a supine to standing position. Predictor variables included age, pain, upper and lower body muscular strength, and aerobic capacity. Right side knee extension/flexion and right side elbow extension/flexion were measured using an isokinetic dynomometer (Kincom 500H®). Aerobic capacity was quantified as the distance covered during a 6-minute-walk-test (6MWT). A Pearson product moment correlation revealed that age was correlated with time to move from standing to supine ($r = .30$; $p < .01$) and from supine to standing ($r = .40$ $p < .01$). Age and pain were unrelated to any of the functional tasks while all measures of upper and lower body strength and aerobic capacity demonstrated significant inverse relationships with all of the functional tasks ($r = .23$ - $.65$). Step wise regression analysis, using all of the significant correlating variables as independent variables revealed that aerobic capacity (23%) and leg flexion strength significantly predicted time it takes to move from a standing to supine position (total $r2 = .27$) and time to go from a supine to standing position ($r2 = .39$). Aerobic capacity was the only predictor variable of ascending and descending stairs accounting for 43% and 42% of the variance in performing these tasks respectively. The results show that aerobic capacity assessed through a 6-minute walk consistently predicted all four of the functional tasks examined. The results demonstrated leg flexion strength and aerobic capacity to be inversely related with time to perform functional tasks. The factors of age and pain, which are not responsive to exercise training, were not significant predictors of functional ability. Important predictors of functional tasks among functional limited older adults include strength and aerobic capacity. These predictors have been shown to be responsive to exercise training.
NIH#: R01 NR04929.01A1

THE EFFECTS OF ELECTRICAL STIMULATION ON RESTING METABOLIC RATE
C.L.Hayter, Miami University, Oxford Ohio, 45056, W.Knez, J.Coombes. The University of Queensland, St.Lucia Queensland, Australia, 4057.

Electrical Muscle Stimulation (EMS) is a highly regarded technical instrument used in the fields of medicine and physiotherapy. In EMS, small electrical impulses are sent form one electrode pad placed on the skin to another. These electrical impulses trigger a nerve to fire, causing the muscle to contract. Currently, EMS devices are being marketed toward the consumer public. The manufactures' claim that the devices are effective at decreasing the body fat and the body weight of the user, while increasing the users overall muscle tone. This study was done to determine the effect that EMS has

on resting metabolic rate. Metabolic rate was taken from 10 fasted (12 hours) subjects using indirect calorimetry with open circuit spirometry. Metabolic rate, R-Value and heart rate were measured for 50 minutes. The results concluded that although EMS produced an increase in lipid oxidation, it was not substantial enough to significantly increase metabolic rate or heart rate. To see changes in body composition from the EMS device, metabolic rate must increase. Thus, manufactures' claims that the use of EMS devices for the loss of weight are unfounded.

SEASONAL CHANGES IN TOTAL CHOLESTEROL IN FUNCTIONALLY LIMITED ELDERLY ADULTS

B.L. Dodrill, J.L. Sobolewski, D. Boardley, A.L. Morgan, M.M. Fahlman, FACSM, N. McNevin, R.V. Topp. University of Toledo, Toledo, OH 43606, University of Louisville, Louisville, KY 40292, Bowling Green State University, Bowling Green, OH 43403, Wayne State University, Detroit, MI 48202.

Total cholesterol (TC) levels are found to fluctuate with seasonal change such that total cholesterol is higher in the winter and fall and lower in the spring and summer. In general, males tend to exhibit a greater change (%) in TC than females. The purpose of this study was to determine if functionally limited elderly adults exhibit seasonal changes in TC levels. Eighty-nine functionally limited elderly individuals (61F, 28M; 66-94 yrs) were asked to fast for 12h prior to blood sampling. Whole blood was analyzed using an LDX analyzer (Cholestech, Hayward, CA). All volunteers were part of a 16-week exercise program and were randomly placed into exercise or control groups at baseline. Cholesterol measurements were taken at baseline (B), 8-weeks (8W) and 16-weeks (16W). Each measurement time was within a separate season: B in winter, 8W in spring, and 16W in summer. Mean TC levels for the group at B were 204.88 mg/dL, 186.74 mg/dL at 8W, and 180.18 mg/dL at 16W. These results represent a 12% decrease in TC from B to 16W: this change was significant when using tests of within-subjects effects. There were no significant differences between the exercise and non-exercise groups. Males and females responded similarly to the group as a whole. In summary, over 16 weeks, men averaged a 9% decrease in TC while women exhibited a 13% decrease. The results of this study agree with the literature on cholesterol levels and the seasonal effects that occur, regardless of change in exercise status.

NIH#: R01 NR04929.01A1

TUTORIAL

9:00 - 9:55 am

ROME 2 & 3

SPORT NUTRITION IN THE TRENCHES: WHAT WORKS AND DOESN'T FOR OPTIMAL PERFORMANCE

J. Burns, R.D., M.S.

Preview Saturday's keynote speaker Julie Burns in this informative tutorial. Burns is a registered dietitian of the American Dietetic Association (ADA) and a licensed dietitian in the state of Illinois. She is the founder of SportFuel, Inc., a sports nutrition consulting company in Western Springs, Ill. Burns is the nutrition consultant to the Chicago Blackhawks hockey team, the Chicago Bulls basketball team, the Chicago Bears football team and Northwestern University's varsity athletic teams. Burns provides guidance and presents sports nutrition information to coaches, athletic trainers and amateur athletes. She counseled former boxing Olympians and champions Montell Griffin (light heavyweight) and Leon Spinks (heavyweight). Burns also worked with Trent Dimas, a 1992 gold medal winner on the high bar, and cyclist Bred Beven.

Tutorial objectives :

1. Identify at least two frequently asked questions of sports trainers, nutritionists or other sports professional by athletes and how to effectively provide answers.

2. Explain appropriate food and fluid needs of athletes pre-, during and post- exercise.

3. Provide advice and guidance regarding evaluating dietary supplements and ergogenic aids for effectiveness and safety.

POSTER SESSION

10:00 - 10:55 am
ROME 1

Linda Jiminez	Effects of a weighted vest during stead-state walking in men and women	Sat B 10:00-10:55
Paul Nagelkirk	The influence of the 4G/5G polymorphism of the PAI-1 gene on plasma PAI-1 concentrations during exercise	Sat B 10:00-10:55
Karen King	Lower extremity strength training as prehabilitation for patients undergoing a TKA	Sat B 10:00-10:55
Marcia Abbot	The effects of exercise intensity on substrate utilization post exercise and post feeding	Sat B 10:00-10:55
L. Wellbery	Relationship between triaxial accelerometer and treadmill exercise	Sat B 10:00-10:55
Jack Skaggs	Changes in neuromuscular function in collegiate sprinters during an indoor season	Sat B 10:00-10:55
Robert L. Bard	3 Months Of Intensive Coronary Risk Factor Modification Is Not Sufficient To Improve Brachial Artery Endothelial Function	Sat B 10:00-10:55
Tom Cappaert	Quantity and type of abnormal exercise response during phase III and IV cardiac rehabilitation monitoring	Sat B 10:00-10:55
Lynn Millar	A comparison of stretching and strengthening protocols for correction of forward shoulder posture	Sat B 10:00-10:55

EFFECTS OF A WEIGHTED VEST DURING STEADY-RATE WALKING IN MEN AND WOMEN

L. Jimenez, Wayne State University, Detroit, MI 48202

This study compared the effects of external loading with an adjustable weighted vest during steady-rate walking exercise in men and women. Twenty-four healthy subjects (12 men and 12 women; age 25.8± 5.2 yrs) participated in six 10-min level-surface treadmill walking trials at a constant 3 mph speed without and while wearing a weighted vest loaded at 5, 10, 15, 20, and 25% of their body weight. The order of the six trials was randomized using a counterbalanced format. Respiratory gas exchange (VO2, RER) was measured by indirect calorimetry, heart rate (HR) by electrocardiography (R-R wave), and ratings of perceived exertion (RPE) using the original Borg scale. A two-way (gender by load) mixed design ANOVA revealed significant differences for VO2 (ml/kg/min), HR (bpm), and RPE scores among the different load conditions ($p<0.01$). Post-hoc analysis using Scheffé's test showed that comparisons between specific means invariably were significant ($p<0.05$) as long as non-neighboring load conditions were involved. In contrast, RER values >(0.84±0.05) remained similar in all trials ($p>0.05$). Further, no significant gender specific differences were observed for any of the variables examined ($p>0.05$). In conclusion, the present data suggest that men and women exhibit similar responses to steady-rate level walking with a weighted vest loaded up to 25% of their body weight. From a quantitative perspective, considerable loading is required to effectively augment the physiological demand of walking exercise using this specific approach.

THE INFLUENCE OF THE 4G/5G POLYMORPHISM OF THE PAI-1 GENE ON PLASMA PAI-1 CONCENTRATIONS DURING EXERCISE

PR Nagelkirk, AM Coughlin, CM Paton, BA Wingerd, and CJ Womack, FACSM. Michigan State University, East Lansing, MI.

OBJECTIVES: During physical exertion, the capacity to lyse inappropriate or excessive clot (fibrinolysis) increases to protect against exertion-related ischemic events such as heart attack or stroke, which are often caused by an occlusive thrombus or clot. Increased fibrinolysis during physical exertion may be partially due to a decrease in plasminogen activator inhibitor-1 (PAI-1), the main circulating inhibitor of tissue plasminogen activator. The 4G/5G >polymorphism of the PAI-1 gene is associated with resting PAI-1 plasma concentrations. The present study sought to investigate the influence of the 4G/5G polymorphism of the PAI-1 gene on the exercise-induced PAI-1 response. METHODS: Twenty-six healthy, untrained males (mean + SD age = 26 =+/- 5yrs, ht = 180.9 =+/- 8.1 cm, wt = 86.=+/- 14.6 kg) performed a maximal exercise test on a motorized treadmill. Blood samples were obtained via clean venipuncture with subjects in a semi-recumbent position prior to and immediately following exercise. Blood was drawn into an acidified citrate solution and centrifuged to obtain platelet-poor plasma. PAI-1 activity and antigen were assessed using amidolytic activity assay and enzyme-linked immunosorbancy assay, respectively. DNA was extracted from whole blood and amplified by polymerase chain reaction (PCR) using allele-specific primers. PCR products were then electrophoresed in a 2% agarose gel and imaged with an ultra-violet transilluminator for genotype determination. Potential differences between subjects with the three polymorphisms (4G/4G, 4G/5G, 5G/5G) for resting PAI-1 activity and PAI-1 antigen and the >exercise-induced change in PAI-1 activity and PAI-1 antigen were assessed using analysis of variance. RESULTS: Resting PAI-1 antigen (4G/4G = 25.85 U/ml, 4G/5G = 18.60 U/ml, 5G/5G = 16.79 U/ml) and resting PAI-1 activity (4G/4G = 16.24 IU/ml, 4G/5G = 9.13 IU/ml, 5G/5G = 5.65 IU/ml) were not different between groups ($p>0.05$). There were also no significant differences between groups for the PAI -1 activity response to exercise (4G/4G= -6.08 IU/ml, 4G/5G= -2.73 IU/ml, 5G/5G= -1.47 IU/ml) and the PAI-1 antigen response to exercise (4G/4G= -1.12 U/ml, 4G/5G= -2.27 U/ml, 5G/5G= -1.67 U/ml). CONCLUSION: The 4G/5G polymorphism of the PAI-1 gene does not influence the reduction in plasma PAI-1 observed during exercise.

LOWER EXTREMITY STRENGTH TRAINING AS PREHABILITATION FOR PATIENTS UNDERGOING A TKA

King, K.L., Morgan, A.L., Van Gorp, C, Greninger, L.O., and Topp, R. The University of Toledo, Toledo, OH

Knee pain associated with osteoarthritis (OA) leads to the increasing number of individuals who undergo total knee arthroplasties (TKAs). Postoperative recovery of functional ability may be expedited if a patient participates in preoperative resistive exercises. The purpose of this study was to determine the efficacy of prehabilitation on the recovery of functional ability in patients undergoing a TKA. Investigators used a cohort study design, in which five female volunteers (59-64 yrs), who were candidates for a primary, unilateral TKA, were placed into the control group (C) (n=2) or the experimental group (EXP) (n=3). The EXP subjects were evaluated seven weeks prior to their TKA (BL), within four days prior to their TKA (PRE), and four weeks postoperatively (PO). The C subjects were evaluated at PRE and PO. The EXP group participated in six weeks of lower extremity strength training, between BL and PRE, using resistive exercise bands. At each evaluation subjects were asked to perform a 30-second chair stand test (CS), the 8-foot up-and-go (8FT), the stair ascent (STUP)/descent (STDN), and a 6-minute walk test (6MNW). Due to the small sample size and differing time points of data collection, only individual data will be presented. It was expected that all subjects would not perform as well on functional tasks after undergoing a TKA, but that the EXP group would not slip as far as the C group below BL and PRE scores. However, improvements in function between PRE and PO were shown for the following variables: CS: 1 EXP and 1 C; 8FT: 1 EXP and 1C; STUP: 1 EXP; 6MNW: 1 EXP and 1 C. Although there was some evidence of improvement for the EXP subjects at PO, the positive effects of resistive training pre-operatively may become more apparent with a larger sample size and a longer period of preoperative resistive training.

THE EFFECTS OF EXERCISE INTENSITY ON SUBSTRATE UTILIZATION POST EXERCISE AND POST FEEDING

M.J. Abbott & R.H. Cox. Miami University, Oxford, OH 45057

This study examined the possible effects that varying exercise intensities may have on substrate utilization during the post exercise period. Twenty participants, ten males and ten females, were recruited to join the study. Two exercise sessions were developed based on the participants' maximal oxygen uptake on a cycle ergometer. One of the sessions was biking at 40% of the VO2max and the other was at 100% of VO2max. The maximum effort consisted of one minute of rest and one minute of cycling. Both exercise sessions were the equivalent of 150 kcal of work. Oxygen consumption and the respiratory equivalent were measured for approximately three and half hours post exercise. A standard meal was given to the participants at two hours post exercise. The results of this study show no statistically significant difference ($p<0.05$) in substrate utilization between the low intensity and high intensity post exercise periods. The Thermic Effect of Food, Excess Post-Exercise Oxygen Consumption, and sex differences were found in the post exercise period. It can be concluded that the males and females reacted differently to the varying exercise intensities.

RELATIONSHIP BETWEEN TRIAXIAL ACCELEROMETRY AND TREADMILL EXERCISE

L. Wellbery, S. Moore, L. Shine, P. Khoury, R. Claytor. Miami University, Oxford, OH 45056 and Children's Hospital Medical Center, Cincinnati, OH 45229

This study was done to determine the extent of the relationship between triaxial accelerometry (RT3), heart rate (HR), and O2 uptake (VO2) during rest (R) and graded treadmill exercise (GTE). Fifteen college-aged females (n=8, 64.3(11.7)kg; 65.2(3.5)cm) and males (n=7; 75.8(13.7)kg; 69.3(2.8)cm) completed 2 trials of GTE. Measurement of VO2 was counterbalanced with GTE trials and RT3 use on the right (RH) and left hip (LH). R consisted of sitting upright in a chair and then standing, each for 3 min. GTE consisted of 6 stages of exercise that were each 4 min. in duration (2mph-0%; 3mph-0%; 2mph-10%; 3mph-10%; 4mph-6%; 6mph-3%). The data were averaged across the duration of each R and GTE stage. Additionally, the use of 4 accelerometers was counterbalanced by trial (i.e.,

1 and 2) and hip placement (i.e., RH and LH) to examine the inter-instrument and intra-instrument reliability of this particular type of triaxial accelerometer. There were significant correlations between VO2 and RT3 (RH-0.85; p<0.0001; LH-0.87; p<0.0001), HR and RT3 (RH-0.86; p<0.0001; LH-0.87; p<0.0001), and HR and VO2 (trial1 and trial2-0.98; p<0.0001) during GTE. When the data from GTE stages >2mph-10% and 3mph-10% were taken out of the analyses the partial correlation coefficients for the VO2-RT3 relationship (RH-0.94; LH-0.96) were improved during GTE. These data suggest that accelerometry and VO2 are significantly related during GTE and that there does not appear to be a difference in this relationship based on the placement of the monitor on the RH or LH. However, these monitors may not be able to distinguish a change in the % grade during GTE even though the metabolic rate is increased. Also, t-tests revealed significant gender differences during the last 4 stages of GTE. Females exhibited significantly higher RT3 and lower VO2 during each of the last 4 stages of GTE. The within-instrument (RH vs. LH) correlation coefficient was 0.975; p<0.0001 and the between-instrument correlation coefficient within a given day was 0.979; p<0.0001. These data suggest that these particular accelerometers provide reliable and reproducible information during GTE. In summary, this study suggests that RT3 can be used to estimate energy expenditure during a variety of rest and exercise conditions. Also, there appears to be little variation within and between the use of this type of accelerometer. Lastly, the gender differences exhibited in RT3 and VO2 during GTE require further study but may be a function of biomechanical differences in stride frequency and length.

Funded by a Miami University Shoupp Award.

CHANGES IN NEUROMUSCULAR FUNCTION IN COLLEGIATE SPRINTERS DURING AN INDOOR SEASON

J. Skaggs, J.P. Babington, J.E. Edwards, J.C. Ozmun , R. Bergman.
Indiana State University, Terre Haute, IN 47809

The purpose of this study was to determine the changes in neuromuscular function as assessed by the Hoffman Reflex (H-reflex) in male Division I collegiate sprinters during an indoor competitive season. Ten male Division I collegiate sprinters (age: 19.6 +/- 2 yrs; mass: 77.19 +/- 4.17 kg; height 180.7 +/-2.9 cm) and a control group of eleven males (age: 20.6 +/- 2 yrs; mass: 75.99 +/- 9.11 kg; height 177.5 +/- 7.7 cm) volunteered to participate in the study. Standard H-reflex measurements were made on the soleus at four times during the season. The Wingate Anaerobic Test was used to assess anaerobic power. Body composition was estimated using hydrostatic weighing. A 2 X 4 (group by time) mixed design was used to detect differences. Group (Sprint vs. Control) was a between-subject variable and time was within-subject variable representing the four different measurement periods (base, mid, peak, and taper). Measurement time reflected changes in training volume with peak being the highest volume of training and taper reflecting a decrease in training volume. Dependent variables were soleus H-reflex, anaerobic power, and body composition. Soleus H-reflex differed in Sprint from peak to the taper measurement periods. Anaerobic Power differed in the sprinters from base to taper and peak to taper, while body composition changed throughout the season. Control did not change over the four measurement times in any of the dependent variables. Over the course of a Division I indoor track season, training volume appears to influence neuromuscular function as measured by the H-reflex.

3 MONTHS OF INTENSIVE CORONARY RISK FACTOR MODIFICATION IS NOT SUFFICIENT TO IMPROVE BRACHIAL ARTERY ENDOTHELIAL FUNCTION

RL Bard, RD Brook, S Rajagopalan, M Rubenfire, University Of Michigan Medical Center Ann Arbor, MI

Background: Endothelial dysfunction participates in both the initiation and the progression of the atherosclerotic process and is a marker for future cardiovascular risk. Therefore, we wished to determine the impact of multiple risk factor intervention in patients with high coronary risk on vascular function. Methods: Fifteen subjects enrolled an intensive 12-week coronary risk reduction program consisting of a 5-day residential program and 4 half-day follow-up sessions emphasizing nutrition,

exercise, stress management. A lipid profile, anthropometric assessment, and endothelial function were evaluated at baseline and after 3 months of intervention. Endothelial dependent [flow-mediated dilatation (FMD)] and independent [nitroglycerin-mediated dilatation (NMD)] vasomotion was determined using high resolution vascular ultrasonography of the brachial artery. Results: After 3 months of treatment patients had significant improvements in both their anthropometrics and lipid profiles, as displayed in the table. There were no significant changes in FMD or NMD.
*p<0.050, by paired samples t-test.

	Before	After
Body Weight (kg)	111 ± 29	103 ± 26*
Systolic Blood Pressure (mm/Hg)	133 ± 19	115 ± 13*
Diastolic Blood Pressure (mm/Hg)	80 ± 11	66 ± 9*
Waist Circumference (cm)	116.3 ± 18.1	106.7 ± 15.0*
Waist / Hip	0.95 ± 0.09	>0.909 ± 0.08*
Body Fat (%)	37 ± 11.2	36 ± 12
Total Cholesterol (mg/dl)	183 ± 27	154 ± 24*
Low Density Lipoprotein (mg/dl)	112 ± 27	92 ± 16*
High Density Lipoprotein (mg/dl)	40 ± 8	39 ± 11
Triglycerides (mg/dl)	183 ± 147	161 ± 81
FM(%)	4.5 ± 7.8	3.7 ± 3.9
NMD(%)	11.9 ± 9.6	12.6 ± 5.6

Conclusion: Despite anthropometric and metabolic improvements, these patients with high risk of future cardiac events did not show improvements in endothelial function after 3 months of treatment. A three month intervention may not be long enough to reveal changes in endothelial function, or FMD may not be an effective tool small groups of patients.

QUANTITY AND TYPE OF ABNORMAL EXERCISE RESPONSE DURING PHASE III & IV CARDIAC REHABILITATION MONITORING T.A. Cappaert Welltrack & Cardiopulmonary Rehabilitation, The Toledo Hospital, Toledo, OH 43606

The purpose of this study was to determine the quantity and type of abnormal exercise responses that occurred during scheduled EKG monitoring sessions for Phase III & IV cardiac rehabilitation. The medical records of 175 patients who had been enrolled in Phase III and/or Phase IV cardiac rehabilitation were analyzed. Informed consent and IRB approval were obtained. The time period studied was from September 1990 to September 1999. The subjects studied had a wide variety of indications for rehabilitation including myocardial infarction, CABG, PTCA, CHF and chronic angina. The total number of sessions analyzed numbered 3382. The medical records were searched for an incidence of an abnormal exercise response that occurred during a scheduled EKG monitoring session. If an abnormal response was documented, the medical record was further analyzed for the staff responses and eventual outcome of the episode. The abnormal response to exercise, the staff response and the eventual outcome were then categorized and the total number of each was tabulated. An incidence rate was then calculated based upon the total number of monitoring sessions and the total number of incidents. The data analysis demonstrated that 45 incidents of abnormal exercise response were documented during the study period. This results in an incidence rate of 1.33 incidents per 100 scheduled monitoring sessions. The type of response and its' percentage of the total

incidents noted is summarized in the table below.
Table 1. Abnormal Exercise Response Detected During Scheduled Exercise (n=45)

Type of Response Noted	% of Total
SaO2 < 88%	11.1
New EKG Rhythm Atrial Fibrillation Bundle Branch Block Junctional Rhythm Premature Ventricular Contraction Atrial Tachycardia Premature Atrial Contraction Supraventricular Tachycardia ST Segment Depression > 2 mm	31.1
Exercising Out of Target Heart Rate Range	46.7
Exercise Hypertension (>220/110mmHg)	8.9
Exercise Hypotension (< resting blood pressure)	2.2

Of the 45 incidents noted, the treating physician was notified for 22 or 48.8% of them. The remaining 23 or 51.2% of the incidents resulted in an adjustment of the exercise prescription with no further action taken. The following table summarizes the outcomes that occurred following the physician notification. These outcomes were either further evaluative procedures or changes to the patient care program. It should be noted that several different procedures/adjustments might have resulted from one incident.

Table 2. Outcomes Following Physician Notification After Monitoring Session Incident (n=22)

Type of Outcome	Total Number
Supplemental O2 to be used during exercise	2
Scheduled physician office visit	4
New medications ordered or current medications changed	13
Sent to emergency room	2
24-hour Holter monitoring	6
Blood analysis	3
Supplemental O2 to be used at home	1
Nuclear exercise stress test ordered	2
Cardiac catheterization performed	1

This study has provided evidence that abnormal exercise responses occur relatively infrequently during scheduled monitoring sessions and when abnormalities are present the outcome will often include utilization of additional medical resources. The present data indicate that monitoring sessions for maintenance phase cardiopulmonary rehabilitation can be instrumental in detecting abnormal exercise responses in this population, despite the relative infrequency of these problems.

A COMPARISION OF STRETCHING AND STRENGTHENING PROTOCOLS FOR CORRECTION OF FORWARD SHOULDER POSTURE. AL Millar, FACSM, BS Benedict & JL Brigner. Dept. of Physical Therapy, Andrews University, Berrien Springs, MI.

The purpose of this study was to compare the efficacy of exercise protocols of stretching, strengthening or a combination in correcting forward shoulder posture. Thirty-one individuals, between the ages of 19 and 52, who had "moderate" forward shoulder posture, and no history of shoulder trauma were included in this study. Subjects were randomly assigned to one of three groups: a stretching only group, a strengthening group and a combination of stretching and strengthening group. Pre and post measurements of resting scapular position, horizontal abduction and rowing strength were taken. Strengthening followed a modified version of the DAPRE system, using progressive resistance with Thera-Band elastic bands. Subjects were asked to perform their respective regimen 3 times per week, for a total of 6 weeks. Eighteen subjects successfully completed the program and post-intervention testing. All groups demonstrated significant improvement in resting scapular position ($p=.019$), but no significant difference was found between the groups. In addition, a small, but significant correlation of .568 was found between the improvement in scapular positioning and rowing strength. In conclusion, all three regimens helped to correct forward posture, with no one regimen being superior.

TUTORIAL

10:00 - 10:55 am
ROME 2 & 3

CORONARY CALCIUM SCREENING: FROM THEORY TO PRACTICE
Jonathon K. Ehrman, Ph.D., Clinton Brawer B.S., Henry Ford Heart Institute

This tutorial will focus on advances in our understanding of calcium screening in coronary heart disease, highlighting theory and the transitions to practical and clinical applications.

TUTORIAL

11:00 - 11:55 am
SICILY

THE USE OF ELASTIC ENERGY IN SPORTS
M. Walsh, Miami University, Oxford, OH 91403

Elastic energy plays an important role in most sport activities. From the obvious examples of spring board diving and trampoline jumping to more subtle examples such as running, the bench press and a giant swing on a high bar. The use of elastic energy in sports activities has been important as long as sports activities have been around. The extent to which we can use elastic energy in specific cases is not well understood. The most basic example of energy storage during sports is the Achilles tendon. Tendons are visco-elastic and can therefore store energy. Energy storage in the Achilles tendon has been shown to take place during walking and running, which indicates that elastic energy storage is an important topic with regard to sports as well as to every day life. Sport related examples are plentiful, but this presentation will focus on 2 examples: a giant swing on the high bar and the pole vault. During the giant swing on the high bar the athlete actively flexes and extends at the shoulders and hips to generate energy so that the giant swing is possible. During the traditional giant swing technique the hip and shoulder extension and flexion is only moderate compared to that of the newer power technique. Using strain gauges and video analysis the amount of energy produced using the 2 techniques can be compared. This analysis shows that the power technique allows the athletes to store more energy in the high bar, which is returned to the athlete at a later time (Arampatzis et al). The introduction of the fiberglass pole vaulting poles allows pole vaulters to store elastic energy in the pole which can be used by the athletes at a later phase of the jump. In addition to storing

energy that the athlete generates during the approach, the poles also allow the athletes to produce energy after take off through muscular work, making it possible for a pole vaulter to actually have a greater total energy during the later phases of his jump then at take off. A video analysis of the pole vaulters at the 1997 world championships in Athens in which the pole vault after take-off was divided into 2 phases (pole bend and pole recoil) (Falk, Schade, unpublished research) allows us to examine individual energy increases or decreases in energy during the pole vault.

SYMPOSIUM

11:00 - 11:55 am
ROME 2 & 3

ACSM CERTIFICATION AND REGISTRATION PROGRAMS
C. Stewart, ACSM

This symposium will provide an update on ACSM Certifications and the Registry for Clinical Exercise Physiologists. These programs provide a measure of competence for professionals in sports medicine and health and fitness.

LUNCHEON AND KEYNOTE SPEAKER

12:00 - 2:00 pm
FLORENCE & VENICE

A LOOK INSIDE THE NFL - SOME REFLECTIONS
KENT FALB, ATC

The luncheon speaker is a retired Certified Athletic Trainer and Licensed Physical Therapist. During his forty-year career in athletic training he spent thirty-four years with the Detroit Lions of the National Football League, thirty-three as the head athletic trainer. Falb will present a brief overview of changes in sports medicine over the past 35 years, the demands of sports medicine staff in the NFL, legal concerns, medical judgments, job security for sports medicine providers and personal anecdotes.

SYMPOSIUM

2:00 - 3:30 pm
ROME 2 & 3

Sponsored By: NEW LEAF HEALTH AND FITNESS PRODUCTS

Gas Exchange During Exercise: Historical Tools to Contemporary Applications
Jack Wilmore, Texas A&M, Carl Foster, UW-LaCrosse, Steven Keteyian, Henry Ford Heart & Vascular Institute

Gas Exchange During Exercise – From Scholander to Black Box

Objectives:
1. To understand the history of developing technology in gas exchange measures.
2. To understand the importance of careful validation of new technology.
3. To understand the critical need for calibration and determining reproducibility of results.

TUTORIAL

2:00 - 2:50 pm
SICILY

SYNDESMOTIC ANKLE SPRAINS - THE SCIENCE AND EXPERIENCE
Kent Falb, A.T.C.

This lecture will not utilize the Power Point presentation method or slides. From the speaker's past experience the audience will better comprehend and appreciate the subject with demonstration and the "hands-on" teaching approach.
The syndesmotic ankle sprain, or "high ankle" sprain, is not just a routine injury. In the past this injury may have been one of the most misunderstood, misdiagnosed injury in the practice of Sports Medicine. The frustration that confronts the athlete, coach, and health care provider will be addressed. The primary biomechanical functions of the involved joint will be reviewed. Falb's "hands-on" presentation will demonstrate the 2 primary mechanisms of injury. Appropriate and complete methodology for evaluation of this injury will be addressed. Falb will address recent literature regarding biomechanics, evaluation, lack of therapeutic plans, and his personal methodology relating to 40 years of experience in the NFL. With the understanding of the mechanics and the symptoms associated to this injury, future clinicians will be better suited to render appropriate prognosis and successful therapeutic plans.

TUTORIAL

2:55 - 3:40 pm
SICILY

FIT OR FAT? WHAT FITNESS PROFESSIONALS NEED TO KNOW
Cody Sipe, MS A.H. Ismail Center for Health, Exercise and Nutrition
at Purdue University

Obesity is considered a serious health epidemic as its prevalence in this country continues to climb. Since an increased level of body fat is associated with an increased risk of developing many diseases including cardiovascular disease, diabetes and some forms of cancer those overweight individuals are globally encouraged to get down to a "normal" or "ideal" body weight without regard for genetic predisposition, body type, health status or fitness level. As a result weight loss has become a multi-billion dollar industry that includes the selling of books, magazines, programs, exercise equipment, supplements and medications to help people "fix" their weight "problem". However recent research indicates that a person's health is more dependent on their level of fitness rather than fatness and that many health conditions can be ameliorated without achieving a "normal" or "ideal" body weight. It is imperative that fitness professionals understand the facts surrounding these issues since weight loss is a priority for the majority of individuals with whom they will work and they may be enticed to put personal financial gain before the best interests of their clients.

Objectives:

1- To provide the attendee with an understanding of the issues surrounding the fit versus fat debate by presenting a review of current research in a lively and entertaining manner.

2- To make applications for fitness professionals working in a variety of settings that can be used immediately.

3- To raise awareness of the ethical responsibilities of fitness professionals as they relate to the weight loss industry.

CLINICAL CASE STUDIES

2:00 - 4:30 pm
FLORENCE & VENICE

EVALUATION OF THE...

SHOULDER	Tony George, M.D
KNEE	Steve Karageanes, D.O.
BACK	Shlomo Mandel, M.D.

SOCRATIC DEBATE

3:45 - 5:00 pm
FLORENCE & VENICE

THE PRO'S AND CON'S OF EPHEDRINE USE

PRO: Kelly Kohls, Ph.D., R.D., Able Weight and Wellness Services, Lebanon, OH

CON: P.J. Striet, C.P.T., Cincinnati, OH

New! Please attend this year's program addition, a stimulating Socratic debate exploring the pro's and con's of ephedrine use.

KEYNOTE SPEAKER

5:05 - 6:00 pm
SICILY

INSIGHTS IN WORKING WITH PROFESSIONAL ATHLETES

JULIE BURNS, R.D., M.S.

Julie H. Burns is founder of SportFuel, Inc., (SportFuel.com) a sports nutrition consulting company in Western Springs, Ill. Burns is the nutrition consultant to the Chicago Blackhawks hockey team, the Chicago Bulls basketball team, the Chicago Bears football team and Northwestern University's varsity athletic teams. Burns provides guidance and presents sports nutrition information to coaches, athletic trainers and amateur athletes. She counseled former boxing Olympians and champions Montell Griffin (light heavyweight) and Leon Spinks (heavyweight). Burns also worked with Trent Dimas, a 1992 gold medal winner on the high bar, and cyclist Bred Beven.

Burns is a registered dietitian of the American Dietetic Association (ADA) and a licensed dietitian in the state of Illinois. Burns is a member of ADA's Sports, Cardiovascular and Wellness Nutritionists (SCAN) and Nutrition in Complementary Care. She also belongs to the Chicago Dietetic Association, The Illinois Dietetic Association, the Chicago Nutrition Association and the American College of Sports Medicine. Burns has served on numerous executive and committee boards for her local and national nutrition organizations. In addition, Burns has a faculty appointment at Rush-Presbyterian-St. Luke's Medical Center in the department of nutrition. She has served as director of research at the Chicago Center for Clinical Research, an affiliate of Rush-Presbyterian-St. Luke's Medical Center, where she specialized in cardiovascular experimental pharmaceuticals and nutrition research.

Burns co-edited the second edition of Cardiovascular Disease: Nutrition for Prevention and Treatment, a manual for health professionals published by the ADA. She was the cardiovascular editor from 1988-1995 for the Pulse newsletter, a SCAN quarterly publication. Burns also authored a brochure for the American College of Sports Medicine (ACSM) in 1997, "Stay Cool to Perform Best-A Guide to Fluid Replacement During Activity and Exercise," based on the ACSM's Position Stand on

Exercise and Fluid Replacement. She is a regular presence on Chicagoland's network and cable television and is frequently quoted in major newspapers.

Burns earned her bachelor's degree in dietetics from the University of Illinois at Champaign-Urbana and her master's of science degree in clinical dietetics from the Massachusetts General Hospital Institute of Health Professions. In 1995, Burns was awarded the Recognized Young Dietitian of the Year award by both the Chicago and the Illinois Dietetic Associations. In 1998, Ms. Burns was highlighted as one of ten top experts in her field by Harper's BAZAAR magazine.

Please join us for this insightful keynote lecture exploring the exciting experience of working with professional athletes.

MWACSM BREAKFAST

7:30 - 8:30 am
UPPER TERRACE

HONORING PAST PRESIDENTS

ORAL PRESENTATIONS

8:30 - 9:30 am
ROME 1 & 2

T. Cappaert	Incidence of Pathogenic Eating and Dieting Practices in High School Rowers	Sun A 8:30-8:45 ROME 1
Marcus Stone	Intrasession and intersession reliability of a method to electrically induce muscle cramp	Sun A 8:45-9:00 ROME 1
Ajwad S. Farah	The physiological response to lower body resistance exercise after coronary artery by-pass graft	Sun A 9:00-9:15 ROME 1
Richard Mikat	Effect of meal frequency on preprandial resting metabolic rate	Sun A 9:15-9:30 ROME 1
Robert L. Bard	Recovery from exercise predicts mortality independent of other typical predictors in congestive heart failure	Sun B 8:30-8:45 ROME 2
Adam Coughlin	The influence of tissue plasminogen activator polymorphisms on the fibrinolytic response to exercise	Sun B 8:45-9:00 ROME 2
Ben Philip	Does access to physical activity influence oxidative stress over time?	Sun B 9:00-9:15 ROME 2
Joanna M. Wojtowicz	Biomarkers of stress in old animals exposed to different types of physical activity	Sun B 9:15-9:30 ROME 2

INCIDENCE OF PATHOGENIC EATING AND DIETING PRACTICES IN HIGH SCHOOL ROWERS

T.A. Cappaert. Central Michigan University, Mt. Pleasant, MI 48859

The purpose of this investigation was to examine the types of eating/dieting behaviors, types of weight loss methods and prevalence of these behaviors in high school rowers. Subjects were fifty high school rowers from seven Midwestern United States high schools. Nineteen female rowers (4 open weight, 15 lightweight) and thirty-one male rowers (seven open weight, twenty-four lightweight) completed the questionnaire. During the spring competitive season, lightweight male teams must average less than 70.5 kg with no individual exceeding 72.2 kg. Lightweight female teams must average less than 59.1 kg. Open weight teams have no weight restrictions. An abbreviated version (22 questions) of the Diagnostic Survey for Eating Disorders (DSED) was presented to the subjects. This survey questioned the athletes about basic demographic and anthropometric information. Specific questions addressed dieting, binge eating, vomiting and laxative use. The effects of these behaviors on the athletes were also addressed. Questionnaires were distributed during the competitive season to be representative of in-season eating/dieting behaviors. Subjects returned completed questionnaires in envelopes absent of identifying marks. Subjects were informed of their right to refuse to answer any or all of the questions contained in the survey and were informed of the purposes and possible benefits of their participation in the study. Means and standard deviations and/or percentage of occurrence in the sample were calculated for all questions. Results were separated by gender and weight classification. Demographic data for the female subjects was as follows: Height: 166.2 ± 6.5 cm; Weight: 55.2 ± 5.4 kg; Age: 16.3 ± 1 year; Years of rowing experience: 1.75 ± .5 years. Demographic data for the male subjects was as follows: Height: 177.4 ± 7.6 cm; Weight: 66.8 ± 12.6 kg; Age: 16.1 ± 1 year; Years of rowing experience: 1.5 ± .6 years. Eighty-four percent (n=16) of the female rowers and 48.4% (n=15) of the male rowers reported having gone on a diet at some time in their lives. Fifty-six percent (n=22) of the lightweight rowers and 81.8% (n=9) of the open weight rowers reported having begun a diet at some time. The number of times a diet had been started within the last year was reported to be 5.1 ± 0.4 times by the females, 2.7 ± 2.2 times by the males, 3.6 ± 2.8 times by the lightweight group and 4.6 ± 4.6 times by the open weight group. The four most favored dieting methods, as chosen by the subjects, were restriction of sweets, restriction of fats, reduction of food portions and reduction in calories consumed. The most frequently chosen influence on eating/dieting behavior, regardless of gender or weight classification, was the teacher/coach. Fully 63.2% (n=12) of the females, 71.07% (n=22) of the males, 66.7% (n=26) of the lightweights and 72.7% (n=8) of the open weight rowers reported ever experiencing an occurrence of binge eating. On average, by gender and weight category, these individuals performed binge eating approximately 1.76 times · week-1. Forty-two percent of the females reported ever using self-induced vomiting for weight loss/control. Of those females that have used vomiting within the previous month, 15.8% use it once per month, 10.5% several times per month and 1 subject (5.3%) reported vomiting once per day for weight control. Three percent of the males have ever performed self-induced vomiting and of those who did in the previous month, the frequency was several times a month or once per week. Exercise, as defined as exercise used to control weight was used by 78.9% of the females once per day or more than once per day. Males reported that 40% never used exercise to control weight, 6.6% indicated once per month or several times per month, 40% indicated several times a week or once per day and 13.4% used exercise to control weight more than once per day. The individuals were also asked to indicate the incidences of fasting for weight control. Fasting was defined as skipping meals for an entire day. The female rowers reported that 33.4% never used fasting, 39% fasted once a month or less and 27.6% ranged from several times a month to more than once per week. Males reported that 63.3% never fasted, 16.7% fasted once per month, 10% fasted several times per month and 10% fasted once per week or several times per week. Overall, a third to half of all subjects reported some interference of the pathogenic eating behaviors with thoughts, feelings about themselves and personal relationships. In conclusion, these results indicate that pathogenic eating/dieting behaviors appear to be prevalent in high school rowers regardless of gender and include binge eating, vomiting, fasting and exercise. The results also indicate that these behaviors may have significant physical and mental impact on these athletes.

INTRASESSION AND INTERSESSION RELIABILITY OF A METHOD TO ELECTRICALLY INDUCE MUSCLE CRAMP

M.B. Stone, J.E. Edwards, C.D. Ingersoll, FACSM, J.P. Babington, R.M. Palmieri. Indiana State University, Terre Haute, IN 47809

Due to the unpredictable nature of the origin of muscle cramp, a reliable experimental model to induce muscle cramp would be an important first step in developing well-controlled studies that empirically test hypotheses regarding cramp. Though methods of cramp induction have been reported, the reliability of these methods has not been established. The purpose of this study was to investigate the intrasession and intersession threshold frequency reliability of a well-tolerated method to induce muscle cramp via repetitive electrical stimulation in 15 healthy subjects. A 2 sec train of 1 msec electrical pulses was applied to the posterior tibial nerve with a beginning frequency of 4 Hz. If a cramp failed to develop, we increased the frequency 2 Hz and after waiting 1 min applied the stimulus again. This method was continued until a cramp was induced in the flexor hallucis brevis muscle as determined by subject feedback, visible great toe flexion, and increased EMG activity. Once a cramp was induced, we waited 30 minutes and repeated these procedures. Subjects repeated the entire protocol twice. Thus, 2 cramps were induced on each of 3 days separated by approximately 48 hours for a total of 6 cramps. Threshold frequency for cramp induction was recorded. Intrasession and intersession reliability were estimated on threshold frequency using intraclass correlation coefficients (ICC (3,1)). Intrasession reliability for induced cramp for sessions 1, 2, and 3 was 0.844, 0.958, and 0.984, respectively. Intersession reliability among all trials was 0.963. These data show threshold frequency for this method of electrically inducing muscle cramp to be reliable within sessions and between sessions. This method of muscle cramp induction shows potential for use in controlled research by monitoring changes in threshold frequency following interventions.

THE PHYSIOLOGICAL RESPONSE TO LOWER BODY RESISTANCE EXERCISE AFTER CORONARY ARTERY BYPASS GRAFT

A.S. Farah, T. Cappeart, J.F. Bingle M.D., P.G. Brolinson D.O., L.O., Greninger, The University of Toledo, Toledo, OH 43606

Resistance training has been shown to have beneficial effects on related health and fitness variables, for different populations. This study looked at the physiological responses to lower body resistance exercise for patients with a history of coronary artery bypass graft. These participants were enrolled in a maintenance exercise program. The physiological mechanisms that were observed included: volume of oxygen utilization (VO2), minute ventilation (V1E), rating of perceived exertion (RPE), rate pressure product (RPP), heart rate (HR), and blood pressure (BP). In conjunction with the physiological measurements, the seated and supine positions where compared for level of metabolic use. Eleven male volunteers, with average exercise capacities of 6.4 METS, + 1.2, an average age range of 66.4 y/o, + 7.7, weight of 196.3 lbs. + 24.3, and body fat percentage of 24% + 3% participated in this study. The subjects were asked to perform a three-repetition maximum on the seated and supine leg press machines with testing a week apart. Statistical methods consisted of Microsoft Excel to evaluate the mean and SD of each variable, Correlation of RPE to each variable, and T-Test on each set of variables. The results were Seated -HR(bpm)81.1, SBP(mmHg)159.3, DBP(mmHg)86.9, VO2(ml/kg/min)7.2, V1E(L/min)20.8, RPE 11, and RPP 130.6. Supine HR(bpm) 82.1, SBP(mmHg)165, DBP(mmHg)88.8, VO2(ml/kg/min)8, V1E(L/min)20.9, RPE 11.4, and RPP 135.6. The results showed that there was no statistical difference between the seated or supine positions of the leg press in this population.

t-Test Values

Variables	p-Values
Heart Rate	0.366
Systolic BP	0.092
Diastolic BP	0.333

The correlation of RPE to the physiological data shows that there is a weak negative relationship between heart rate/RPE, systolic blood pressure/RPE, and rate pressure product/RPE, r = -0.22, -0.46, -0.43, respectively. The relationship of VO2/RPE, and minute

VO2	0.532
VE	0.885
RPE	0.294
RPP	0.153

ventilation/RPE, r = 0.27, and 0.36, respectively, show a weak positive relation. Diastolic blood pressure/RPE has virtually no relation with r = 0.06. In conclusion, the results demonstrate that resistance exercise can be performed safely if the participant can perform at a level of at least 2 MET's or more with no significant difference in position.

EFFECT OF MEAL FREQUENCY ON PREPRANDIAL RESTING METABOLIC RATE

R. Mikat, University of Wisconsin, LaCrosse.

It has been suggested by many diet and weight loss professionals that individuals interested in losing weight eat frequently throughout the day to maintain a normal metabolism rate. Research regarding intake frequency and resting metabolic rate (RMR) among free-living healthy adults is limited. Therefore, the purpose of this study was to examine the relationship between both meal frequency and feeding (meals plus snacks) frequency and RMR in a sample of healthy adult females who do not regularly exercise. Twenty-two women between the ages of 18 and 74 (Mean = 30 ± 15), volunteered as participants. Each participant kept a detailed diet diary for seven days. Following this, each had their morning preprandial RMR measured using indirect calorimetry. Subject's age and average caloric intake were controlled for with ANCOVA, which revealed that no significant difference ($F = 0.001$, $p = 0.981$) existed in RMR between subjects with high (>2.7) and low (<2.7) average meal frequencies. Moreover, there were no significant differences ($F = 0.601$, $p = 0.450$) in RMR between subjects with a high (>4.7) and low (<4.7) average feeding frequencies. This study, therefore, failed to support the hypothesis that daily meal and/or feeding frequency has a meaningful impact on RMR.

RECOVERY FROM EXERCISE PREDICTS MORTALITY INDEPENDENT OF OTHER TYPICAL PREDICTORS IN CONGESTIVE HEART FAILURE

R.L Bard, J.M Nicklas. University of Michigan, Ann Arbor, MI.

OBJECTIVE. The purpose was to determine the relationships between recovery from maximal exercise, b-blockade, and mortality in patients with CHF. METHODS. Following maximal cardiopulmonary exercise testing, CHF patients with reported left ventricular ejection fraction (LVEF) ; 40% and respiratory exchange ratio (RER);1.10 walked on the treadmill for 2 minutes and then lied in Fowler position for an additional 3 minutes with constant gas exchange collection. Recovery gas exchange kinetics were assessed by the half-time of decay (T1/2), defined as the amount of time needed to reach the mean value between the end of exercise and the end of recovery. A further analysis was performed for all subjects who achieved at least the ventilatory threshold. RESULTS. Ninety-four patients achieved an RER ; 1.10 and completed the recovery assessment. The average follow-up time was 3.2 ± 1.6 years; 26 subjects died, and 7 were transplanted. Unlike most CHF mortality studies, there was no significant difference (p=0.136) in peak VO2 between survivors (17.3 ± 4.3 ml/kg/min) and non-survivors (15.9 ± 4.0 ml/kg/min). The percent change in oxygen consumption between peak exercise and recovery (%Pk-Rec VO2) (p=0.003) was a much better predictor of mortality than peak VO2 (p=0.647) in multivariate Cox regression analysis. In univariate Cox regression analysis, T1/2VO2 (p=0.026), recovery VE/VCO2 (p=0.001), recovery VO2 (p=0.038), and %Pk-Rec (p=0.001) predicted mortality while peak VO2 (p=0.089) and recovery VE (p=0.074) did not. The table shows the p values when these variables were included in multivariate Cox regression analysis with typical predictors of CHF mortality: LVEF, mean blood pressure, etiology of CHF, and peak VO2.

	Variable	**LVEF**	**Mean BP**	**Etiology**	**Peak VO2**
Recovery VE/VCO2	0.030*	0.086	0.105	0.820	0.242
Recovery VE	0.020*	0.066	0.033*	0.518	0.024*

Recovery VO2	0.008*	0.039*	0.062	0.820	0.014*
%Pk-Rec VO2	0.012*	0.040*	0.065	0.695	0.807
T ½ VO2	0.188	0.060	0.038*	0.455	0.309

When an additional 22 patients who achieved ventilatory threshold were added, T1/2 VO2 (p=0.039) became the only statistically significant predictor of mortality among all other predictors. Patients on b-blockers had significantly greater (p=0.002) survival, yet T1/2 VO2 (p=0.292) was not different in patients with (n=27) and without b-blockade (n=67). Conclusions. Recovery gas exchange parameters predicted mortality, independent of peak VO2 and other typical predictors of mortality in patients with CHF. The presence of b-blockade did not influence the short term recovery while it improved survival.

THE INFLUENCE OF TISSUE PLASMINOGEN ACTIVATOR POLYMORPHISMS ON THE FIBRINOLYTIC RESPONSE TO EXERCISE

M. Coughlin, P. R. Nagelkirk, C. M. Paton, K. H. Friderici, B. Wingerd, J. M. Pivarnik, FACSM, C. J. Womack, FACSM. Michigan State University, Human Energy Research Laboratory, East Lansing, MI 48824

The purpose of this study was to evaluate the Alu-insertion (I)/deletion (D) polymorphism of the tissue plasminogen activator (tPA) gene to determine whether or not an association exists between these polymorphisms and the acute tPA response to maximal exercise. Twenty-four, healthy male subjects (age 26 ± 5.3 yrs, height 181.6 ± 7.5 cm, weight 87.3 ± 14.0) completed a maximal, ramped treadmill exercise test. Venous blood samples were obtained from an arm vein, before exercise and immediately post-exercise. Five ml of blood was drawn into a tube containing an acidified citrate solution and centrifuged to obtain platelet-poor plasma. tPA activity and antigen were determined using amidolytic activity assay and enzyme-linked immunosorbancy assay, respectively. Isolated DNA was amplified with allele-specific primers via polymerase chain reaction (PCR). The PCR products were electrophoresed in a 2% agarose gel and visually amplified, via ultraviolet illumination, to determine tPA genotype. We used a one-way analysis of variance to detect differences in resting tPA activity and antigen and in the increase in tPA activity and antigen with exercise between the three genotypes (DD, ID, II). Subjects with the DD polymorphism exhibited significantly greater increases in tPA antigen (17.00 ± 4.89 ng/ml) than the ID (12.87 ± 2.67 ng/ml) or II (8.75 ± 5.15ng/ml) groups. There were no significant differences between groups for resting tPA antigen (DD = 6.24 ± 2.41 ng/ml, ID = 5.38 ± 1.95 ng/ml, II = 6.38 ± 3.89 ng/ml), tPA activity (DD = 0.37 ± 0.16 ng/ml, ID = 0.24 ± 0.14 ng/ml, II = 0.26 ± 0.21 ng/ml), or change in tPA activity (DD = 12.05 ± 5.61 ng/ml, ID = 8.31 ± 3.28 ng/ml, II = 7.91 ± 4.00 ng/ml). Results suggest greater increases in tPA antigen following maximal exercise in sedentary individuals with the DD genotype.

MINI SYMPOSIA

9:30 - 10:45 am
ROME 1

PEDIATRIC WEIGHT MANAGEMENT: NUTRITIONAL AND PHYSICAL ACTIVITY ISSUES

Randal Claytor, Ph.D., Cincinnati Children's Hospital

This mini symposium includes data from an NIH-study at Children's Hospital in Cincinnati Ohio on weight management programs for children. The significance of unique nutritional and physical activity concerns in extremely obese children will be discussed.

MINI SYMPOSIA

9:30 - 10:45 am
ROME 2

INCREASING ACTIVITY AND EXERCISE PARTICIPATION IN OLDER ADULTS
Cody Sipe M.S., A.H. Ismail Center for Health, Exercise and Nutrition, Purdue University, Roseann Lyle Ph.D., FACSM, Department of Health and Kinesiology, Purdue University

Rationale: Seniors are not only the fastest growing age group in the country but they also represent the most inactive age group as well. Aging research has shown us that many of the declines previously associated with the aging process itself can now be attributed more to an inactive lifestyle. Physical activity and exercise intervention studies have also clearly demonstrated that virtually every sedentary older adult can benefit from adopting a more active lifestyle. However, there are many unique barriers and challenges that inhibit this group from doing so. Therefore it is important that exercise and health promotion professionals understand the many factors surrounding this important issue and develop strategies to overcome the barriers that prevent seniors from becoming more physically active.

Objectives:
1- Educate attendees about the most significant factors that affect physical activity and exercise participation in the older adult population.
2- Motivate attendees to develop and implement well-rounded physical activity and exercise strategies for the older adult population.
3- Describe the Coalition For Living Well After 50 as an example of how communities can increase physical activity and exercise participation among older adults.

TUTORIAL

10:50 - 11:50 am
ROME 1

EXERCISE AND THE FAILING HUMAN HEART
Steven Keteyian, Ph.D.

Controversial issues surrounding exercise and the failing heart will be explained in this tutorial.

MINI SYMPOSIA

10:50 - 11:45 am
ROME 2

IMPACT OF AN EMPLOYEE WELLNESS PROGRAM IN A UNIVERSITY SETTING
Brenda Reeves, Ph.D.

This mini-symposium will include information about the relationship between risk factors and medical claims costs, and the relationship between participation in a workplace wellness and medical claims costs.

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GENERAL INFORMATION

Visit us on-line @ www.mwacsm.org

ABSTRACTS

The abstract submission date is September 1, 2002. Symposium/Workshop/Tutorial proposal submission deadline is May 1, 2002. Submission forms and guidelines can be obtained on-line @ www.mwacsm.org (go to the annual meeting page and link to forms will be noted at bottom of the page).

REGISTRATION

Complete the registration form on the next page, or visit on-line @ www.mwacsm.org, for a registration form. A discounted registration fee is in effect until September 15 (postmark date). Cancellation of registration must be made before September 15, in order to receive a full refund. A $20.00 processing fee will be applied to cancellations made between September 15-25. No refunds will be granted after September 25, 2002.

TENTATIVE SCHEDULE

Friday, October 11, 2002

7:00-8:00 Keynote: Jack Wilmore-The HERITAGE Study
8:15-10:00 RECEPTION FOR ALL

Saturday, October 12, 2002

8:00-8:55 Student Forum/Breakfast
8:00-8:55 Organizational Meeting for State Registry
9:00-9:55 Poster Session
9:00-9:55 Tutorial: Julie Burns, R.D., M.S., "Sport Nutrition in the Trenches: What Works and What Doesn't for Optimal Performance"
10:00-10:55 Poster Session
10:00-10:55 Tutorial: "Coronary Calcium Screening: From Theory to Practice" Jonathan Ehrman, PhD, Clinton Brawner,BS.
11:00-11:55 Tutorial: "The Use of Elastic Energy in Sports" Mark Walsh, Ph.D., Miami University
11:00-11:55 Symposium: "ACSM Certification and Registry Programs"- Cathy Stewart, ACSM
12:00-2:00 Luncheon and Keynote Kent Falb- "A Look Inside the NFL-Some Reflections"
2:00-3:30 Symposium: "Gas Exchange During Exercise: Historical Tools and Contemporary Applications"
Jack Wilmore, Texas A&M, Carl Foster, UW-LaCrosse, Steve Keteyian, Henry Ford Heart & Vascular Institute
2-2:50 Tutorial-Kent Falb: "Syndesmotic Ankle Sprains-The Science and Experience"
2:55-3:40 Tutorial: Biomechanics, Mark Walsh, Ph.D.
2:00-4:30 Clinical Case Studies
Dr. Tony George, M.D. "The Shoulder"
Dr. Steve Kargeanes, D.O. "The Knee"
Dr. Shlomo Mandel, M.D. "The Back"
3:45-5:00 Socratic Debate-"The Pros and Cons of Ephedrine Use"
5:05-6:00 Keynote: Julie Burns, R.D., M.S, "Insights in Working with Professional Athletes"

Sunday, October 13, 2002

7:30-8:30 MWACSM Breakfast - Honoring Past Presidents
8:30-9:30 Oral Presentations
9:30-10:45 Mini-Symposia: "Pediatric Weight Management: Nutritional and Physical Activity Issues" Randal Claytor Ph.D., Cincinnati Children's Hospital, Miami University Mini-Symposia
9:30-10:45 Mini Symposia: "Increasing Activity and Exercise in Older Adults" Cody Sipe,M.S Roseann Lyle, Ph.D.
10:50-11:50 Tutorial: "Exercise and the Failing Heart" Steve Keteyian, Ph.D.
10:50-11:45 Mini Symposia: "Impact of an Employee Wellness Program in a University Setting" Brenda Reeves, Ph.D.

PHYSICIANS EARN CME's and PROFESSIONALS EARN CEC's (up to 14)

2002 MWACSM Meeting Registration Form

October 11 – 13, 2002 Dearborn, Michigan
Print /Type (*Information used for name badge)

Name* _____
Degree/Profession* _____
Affiliation* _____
Address _____
City/State/Zip _____
Phone # ( ) _____
Email _____

Fee Schedule (Registration must be postmarked by 9/15/2002 for reduced fee)

Circle All Appropriate Fees

	Pre-Registration by 9/15/02	Registration after 9/15/02
MWACSM Members		
Professional	$60.00	$80.00
Professional-in-Training & Student	$25.00	$35.00
Non-MWACSM Member (membership included)		
Professional	$90.00	$110.00
Professional-in-Training & Student	$40.00	$50.00
Single-Day Registration (Member) Date: _____		
Professional	$30.00	$35.00
Professional-in-Training & Student	$20.00	$30.00
Continuing Education Credit		
Member	$10.00	$10.00
Non-member	$15.00	$15.00
Spouse Luncheon	$15.00	$15.00

TOTAL: _____

Payment Method (Make payable to MWACSM)

Check _____ Money Order _____

Mail payment along with this form to: MWACSM
151 Larkins Hall
337 W. 17th Ave.
Columbus, OH43210

AMERICAN COLLEGE of SPORTS MEDICINE

FOUNDED 1954

AMERICAN COLLEGE of SPORTS MEDICINE

MWACSM
155 Larkins Hall
337 W. 17th Ave.
Columbus, OH 43210

Midwest ACSM

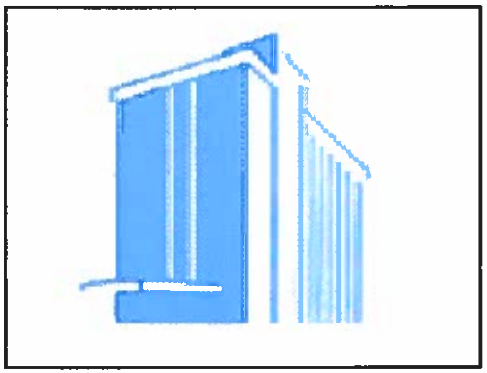
ANNUAL MEETING

COLUMBUS OHIO

OCTOBER 14-16, 2001

The Ohio State University Fawcett Center & Hotel

Meeting Site The Fawcett Center & Hotel located in Columbus, Ohio can be contacted at: (800)637-2316 or (614) 292-3238. Please mention MWACSM when making room reservations. The MWACSM room block and discount cut-off date is **September 17, 2001.**



www.fawcettcenter.com

October 14th - 16th
(Sunday - Tuesday)

Abstracts. The abstract submission date is September 15, 2001 (postmark date). Submission forms and guidelines are contained in the June issue of MWNews or can be obtained by contacting: Jeffery Betts, Ph.D. 125 Pearce Hall, Central Michigan University, Mt. Pleasant, MI 48859. Phone: (989) 774-2684, Fax: (989) 774-2908, or E-mail: betts1jj@cmich.edu

Information For more information contact the MWACSM office at: kirby.1@osu.edu.

Registration To register for the meeting complete attached registration form . A discounted registration fee is in effect until September 15, 2001 (postmark date). Cancellation of registration must be made before September 15, 2000 in order to receive a full refund. A $20.00 processing fee will be applied to cancellations made between September 15-25. No refunds will be granted after September 25, 2001.

Tentative Schedule of Events

Sunday, October 14
Registration
Tutorial: "What Does it Take to Succeed in the Interview?"
Oral Presentations of Abstracts
Poster session

Keynote: "When Winning Becomes THE Goal" John Lombardo, MD FACSM

Monday, October 15
Registration
Tutorial: "Exercise Treatment for Parkinson's Disease"
Oral Presentations of Abstracts
Tutorial: "Menstrual Cycle and ACL Injuries in Teenage Girls"
Symposium: "Treating Chronic Diseases with Exercise:A Look at Evidence-Based Clinical Outcomes"
Luncheon & Business Meeting
Banquet Speaker: Dr. John Lucas, Olympic Historian
Symposium: "Resistance Training for the Elderly"
Physician Case Presentations
Poster session
Symposium: "Immunity Challenge: Demystifying Exercise Immunology"
Keynote: "Muscle Soreness and Damage: the Aftermath of Overexertion Exercise" Dr. Priscilla Clarkson, FACSM

Tuesday, October 16
Registration
Student Breakfast & Forum
Symposium: "Arthrogenic Muscle Inhibition: Implications and Interventions in Joint Injury"
Symposium: "Personal Training: Implementing Programs in Various Populations"
Poster session
Tutorial: "Magnets and Medicine: What's the Attraction?"
Symposium: "Practical Skills and Information Needed Work with Obese Patients on Weight Loss Programs"
RCEP Examination
Adjourn

2001 MWACSM Meeting Registration Form

Print /Type (*Information used for name badge)

Name* _____

Degree/Profession* _____

Affiliation* _____

Address _____

City/State/Zip _____

Phone (___)_____

Email _____

Fee Schedule (Registration must be postmarked by 9/15/2001 for reduced fee)

	Pre-Registration by 9/15/01	Registration after 9/15/01
Circle All Appropriate Fees		
MWACSM Members		
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Professional-in-Training & Student	$25.00	$35.00
Non-MWACSM Member (Membership Included)		
Professional	$90.00	$110.00
Professional-in-Training & Student	$40.00	$50.00
Single-Day Registration		
(Member) Date _____	$30.00	$35.00
Professional	$20.00	$30.00
Professional-in-Training & Student		
Continuing Education Credit		
Member	$10.00	$10.00
Non-member	$15.00	$15.00
Spouse Luncheon	$15.00	$15.00

TOTAL: _____

Registration fee waived for student presenters.

Payment Method (Make payable to MWACSM)

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Columbus, OH 43210

AMERICAN COLLEGE of SPORTS MEDICINE

Midwest ACSM

ANNUAL MEETING

COLUMBUS OHIO

OCTOBER 14-16, 2001

Annual Meeting of the Midwest ACSM

The Ohio State University Fawcett Center and Hotel

www.fawcettcenter.com

Columbus, Ohio

October 14 - 16
(Sunday - Tuesday)

Attend the MWACSM annual meeting to learn from Symposia, Tutorials, Physician Case Presentations, Poster presentations, Free Communications, and Keynote Speakers. Learn more about graduate programs and internships in the regions. Network with other exercise professionals. Better yet, submit to make a presentation of your own!

Abstracts. The abstract submission date is August 15, 2001 (postmark date). Symposium/ Workshop/Tutorial proposal submission deadline is June 30, 2001. Submission forms and guidelines are contained in Midwest News or can be obtained by contacting: Jeffery Betts, Ph.D. 125 Pearce Hall, Central Michigan University, Mt. Pleasant, MI 48859
(989) 774-2684, fax (989) 774-2908,
betts1jj@cmich.edu

Meeting Site. The Fawcett Center Hotel in Columbus, Ohio can be contacted at: (800)253-3590 or (614) 292-3238. Mention MWACSM when making reservations. Room block and discount cut-off date is **September 17, 2001.**

Registration To register for the meeting complete the registration form on the next page. A discounted registration fee is in effect until September 15, 2001 (postmark date). Cancellation of registration must be made before September 15, 2000 in order to receive a full refund. A $20.00 processing fee will be applied to cancellations made between September 15-25. No refunds will be granted after September 25, 2001.

Information For more information contact the MWACSM office at: kirby.1@osu.edu.

2001 MWACSM Meeting Registration Form
October 14 – 16, 2001 Columbus, Ohio

Print /Type (*Information used for name badge)

Name* _____

Degree/Profession* _____

Affiliation* _____

Address _____

City/State/Zip _____

Phone # (___)_____

Email _____

Fee Schedule (Registration must be postmarked by 9/15/2001 for reduced fee)

	Pre-Registration by 9/15/01	**Registration** after 9/15/01
	Circle All Appropriate Fees	
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Non-member	$15.00	$15.00
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Registration fee waived for student presenters. TOTAL:_____

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PROGRAM

Midwest ACSM

Annual Meeting

COLUMBUS OHIO

OCTOBER 14 - 16, 2001

AMERICAN COLLEGE of SPORTS MEDICINE

WELCOME TO THE
MIDWEST REGIONAL CHAPTER
AMERICAN COLLEGE OF SPORTS MEDICINE
ANNUAL FALL MEETING

OCTOBER 14-16, 2001
FAWCETT CENTER HOTEL AND CONVENTION CENTER
COLUMBUS, OHIO

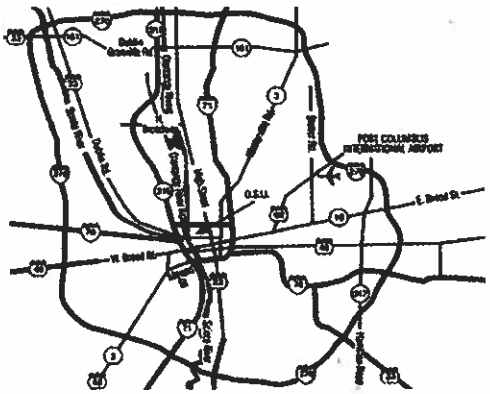
Welcome to the Annual Regional Chapter Meeting of the Midwest American College of Sports Medicine . The Program Planning Committee has worked diligently to put together a diverse program, providing an array of scientific and clinical presentations applicable to many areas of interest. We are excited to have Dr. John Lombardo, from The Ohio State University Sports Medicine Center and Dr. Chandan Sen from The Ohio State University Medical Center as keynote speakers for this year's meeting. Dr. John Lucas will give a presentation on the history of the Olympics at Monday's banquet luncheon. As well, we have planned various social opportunities this year including a tour of the renovated OSU football stadium and an evening pizza social.

We are excited to have Columbus as the host city for this year's meeting. Columbus is the largest city in Ohio, the 15th largest in the United States and the fastest growing city in the northeast quadrant. Points of interest in the Greater Columbus area include the Ohio Theater, the Martin Luther King Center, the Columbus Zoo, the Ohio Center of Science and Industry, the Wexner Center, the recently renovated State Capitol Building, and the newest downtown hot-spot - the Arena District.

The Fawcett Center, located on The Ohio State University campus, has been established as a national prototype for conference centers on major college campuses and is one of the largest university conference centers under one roof. It is situated just 15 minutes northwest of Port Columbus International Airport and within a 10 minute drive of downtown Columbus. The Fawcett Center is conveniently located for easy access to all of the area's many attractions.

We hope you take full advantage of the of the many programs, events, and social opportunities available at this year's meeting. On behalf of the Midwest Chapter, thank you for your attendance and participation at the MWACSM Annual Conference .

Jeff Betts,
Program Chair



2001 MWACSM
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MWNEWS EDITOR

Carmen J. Babcock, MA	MWNews Editor	The Ohio State University	babcock.11@osu.edu

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Bob Opplinger, Ph.D.	Iowa	University of Iowa	opplinger@blue.weeg.uiowa.edu
Shel Levine, Ph.D.	Michigan	Eastern Michigan University	shel.levine@emich.edu
Open Position	**Wisconsin**	**Contact Carmen J. Babcock:**	**babcock.11@osu.edu**

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10-16	PROGRAM EVENTS: SUNDAY, OCTOBER 14, 2001
17-33	PROGRAM EVENTS: MONDAY, OCTOBER 15, 2001
34-38	PROGRAM EVENTS: SUNDAY, OCTOBER 16, 2001

PROGRAM ACKNOWLEDGEMENTS

PROGRAM PLANNING COMMITTEE
Jeffery Betts, Ph.D.
Helaine Alessio, Ph.D.
Lynn Darby, Ph.D.
Elaine Betts, Ph.D.
Timothy E. Kirby, Ph.D.
Carmen J. Babcock, M.A.

REGISTRATION
Timothy Kirby, PhD
Carmen J. Babcock, M.A.

CONTINUING EDUCATION CREDITS
Elaine Betts, Ph.D.

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Bill Saltarelli, Ph.D.
Rich Parr, Ph.D.
Elaine Betts, Ph.D.
Timothy E. Kirby, Ph.D.
Carmen J. Babcock, M.A.

STUDENT FORUM
The Ohio State University Exercise Science Club

THE MIDWEST REGIONAL CHAPTER OF AMERICAN COLLEGE OF SPORTS MEDICINE WOULD LIKE TO ACKNOWLEDGE THE GENEROUS FINANCIAL SUPPORT OF THE FOLLOWING ORGANIZATIONS:

CONFERENCE INFORMATION

OBJECTIVES

The 2001 meeting of the MWACSM is designed to:

- Enhance the scientific and clinical understanding of the physiological, biochemical, and psychological basis for the changes that occur during and following exercise in both normal and pathological states;
- Provide a forum for members and students to present research related to exercise science and sports medicine; and
- Promote interaction among scientists, clinicians, and students in related fields to provide new approaches to, and perspectives on, and problems in exercise science and sports medicine.

TARGET AUDIENCE

MWACSM members, ACSM members, clinicians, professionals, and students interested in the field of sports medicine and exercise science.

ACSM CEC's

The American College of Sports Medicine's Professional Education Committee certifies that this continuing education offering meets the criteria for 15 credit hours of ACSM Continuing Education Credit. CEC forms may be obtained at the registration booth.

NAME BADGES

Badges must be worn at all times to gain admittance in the poster sessions, educational sessions, and ACSM social events. Please hold on to your badge! Replacement badges cost $5.

MEETING LOCATIONS

All sessions and most other events will be held in the Fawcett Convention Center. Room assignments for educational events are detailed in this program, along with map of the convention center. Signage in the registration area will direct you to special events.

REFRESHMENTS

Refreshments will be available at various sessions throughout the meeting. A luncheon is scheduled for Monday afternoon. A pizza social is scheduled for 7 pm Monday evening at Tommy's Pizza. A student breakfast/forum will be held at 8:00 am Tuesday morning. Additional dining opportunities are steps away at the Oxley's Café. For other dining options ask for information at the Fawcett Center front desk.

PLANNED SOCIAL GATHERINGS

Please plan to join in the tour of the recently renovated OSU football stadium at 6 p.m., Monday evening. At 7 pm plan to join your colleagues at Tommy's Pizza for a fun and appetizing social event.

ANNUAL BUSINESS MEETING

This important business meeting is your opportunity to participate as an active voice in affecting the future of the Midwest Chapter of ACSM. Please plan to attend on Monday afternoon, immediately following the banquet luncheon.

AWARDS ANNOUNCEMENTS

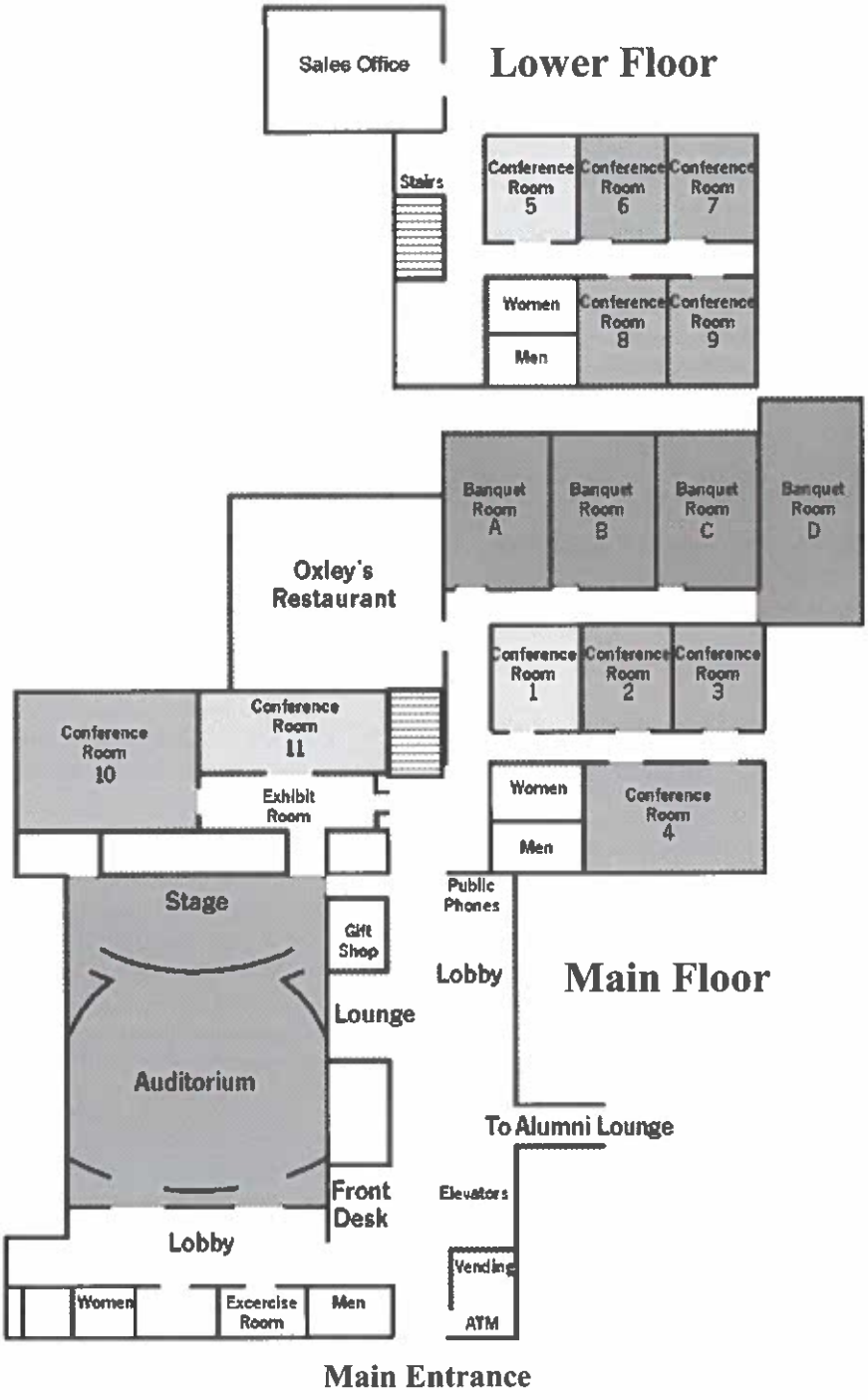
The annual 'Founder's Award' will be announced at the banquet luncheon on Monday. The **Founder's Award** is awarded to an active and contributing member of the MWACSM chapter. This award acknowledges the recipient of his/her dedication and professional contributions to the Midwest Chapter of ACSM.

Awards in the amount of $150.00 will be made for the outstanding student poster and free communication . This award will be announced in the next issue of MWNews.

FUTURE MEETING SITE

Fall 2002: Detroit Michigan at the Holiday Inn.

THE FAWCETT CONVENTION CENTER
FLOOR PLAN



FINAL PROGRAM

SUNDAY, OCTOBER 14, 2001

TIME	EVENT	ROOM
12:00 pm - 4:00 pm	Registration	Lobby
1:00 pm - 2:00 pm	Tutorial: "What Does it Take to Succeed in the Interview?"	2 & 3
1:00 pm - 2:00 pm	Tutorial: "The Value of Customer Service in a Medically-Based Wellness Facility	4
1:00 pm - 4:30 pm	Poster session	8 & 9
2:00 pm - 4:00 pm	Symposium: "Personal Training through the Lifespan"	2 & 3
2:00 pm - 4:00 pm	Symposium: "College Campuses: Fitness Opportunities"	4
5:00 pm - 6:00 pm	**Keynote Address** **Dr. John Lombardo, FACSM** **"When winning becomes THE goal"**	**Auditorium**

MONDAY, OCTOBER 15, 2001

TIME	EVENT	ROOM
8:00 am - 4:00 pm	Registration	Lobby
8:30 am - 9:30 am	Tutorial: "Exercise Treatment for Parkinson's Disease"	2 & 3
8:00 am - 11:00 am	Poster session	8 & 9
9:00 am - 11:30 am	Oral Presentations of Abstracts	4
9:30 am - 10:30 am	Symposium: "Menstrual Cycle & ACL Injuries in Teenage Girls"	2 & 3
10:30 am - 12:00 pm	Symposium: "Treating Chronic Diseases with Exercise: A Look at Evidence-Based Clinical Outcomes"	2 & 3
12:00 pm - 2:00 pm	Luncheon & Business Meeting Speaker: Dr. John Lucas, Olympic Historian	Banquet
1:00 pm - 4:00 pm	Poster session	8 & 9
2:00 pm - 3:30 pm.	Symposium: "Resistance Training for the Elderly"	2 & 3
2:00 pm - 4:00 pm	Physician Case Presentations	4
3:30 pm - 5:00 pm	Symposium: "Immunity Challenge: Demystifying Exercise Immunology"	2 & 3
5:00 pm - 6:00 pm	**Keynote Address** **Dr. Chandan Sen, FACSM** **"Revisiting the Significance of Oxidants and Antioxidants"**	**Auditorium**
6:00 pm	Tour of The Ohio State University Stadium	OSU Stadium
7:00 pm	Social Event - Tommy's Pizza	Tommy's Pizza

TUESDAY, OCTOBER 16, 2001

TIME	EVENT	ROOM
8:00 am - 10:00 am	Registration	Lobby
8:00 am - 9:00 am	Student Breakfast & Forum	8 & 9
9:00 am - 10:30 am	Symposium: "Arthrogenic Muscle Inhibition: Implications and Interventions in Joint Injury"	2 & 3
9:00 am - 10:30 am	Symposium: "Exercise Behavior Change from the Inside Out "	8 & 9
9:00 am - 10:45 am	Oral Presentations of Abstracts session	4
9:30 am - 10:30 am	Tutorial: "Magnets and Medicine: What's the Attraction?"	2 & 3
11:00 am	Adjourn	

ORAL PRESENTATIONS OF ABSTRACTS

MONDAY	9:00 – 11:00 AM	ROOM 4 (UPPER LEVEL)
9:00 – 9:15	Nagy, et.al. " Glutathione in Rats…"	
9:15 – 9:30	Philip, et al. "BP & BW in Rats…"	
9:30 – 9:45	Roeske, et al "Spatial Maze in Rats.."	
9:45 – 10:00	Byrnes, et al., "Blood Lipid Profile in Rats…"	
10:00 – 10:15	Krause, et al., "Joint Cryotherapy…Hoffman Reflex"	
10:15 – 10:30	Palmieri, et al., "Artificial Knee Effusion…"	
10:30 – 10:45	Fink, et al. "Hoffman Reflex.. Cycle Ergo…"	
10:45 – 11:00	Moustafa, et al., "Mechanics of Overhead VB..."	
11:00 – 11:15	Kerner, et al. "BMI & Mile Run Time…"	

TUESDAY	9:00 – 11:00 AM	ROOM 4 (UPPER LEVEL)
9:00 – 9:15	Stone et al., "Dose of Gingko Biloba…"	
9:15 – 9:30	Park, et al., "Post-Exercise Metabolic Rate…"	
9:30 – 9:45	Navalta, et al., "Comparison of Two Methods of VO2 Max in Boys…"	
9:45 – 10:00	Mikat, et al., "Total Body Volume without Lung Volume…."	
10:00 – 10:15	Craig, et al., "Hormonal Effects of Androstenedione in Elderly Men…"	
10:15 – 10:30	McGregor, et al., "Gene Expression..Injury…Mice..Microarray Analysis"	
10:30 - 10:45	Wright, et al., " The Effects of Phosholipase C Inhibition…."	

POSTERS

SUNDAY	1:00 TO 4:30 PM	ROOMS 8&9 (LOWER LEVEL)
Gajus, et al.,	The Ohio State University	(P-1)
Tsivitse, et al.	Toledo University	(P-2)
Mylona, et al.	Toledo University	(P-3)
Peterson, et al.	Toledo University	(P-4)
Horn, et al.	Ball State University	(P-5)
Eagan, et al.	Purdue University	(P-6)
Josyula, et al.	Purdue University	(P-7)

MONDAY	8:00 TO 11:30 AM	ROOMS 8&9 (LOWER LEVEL)
Markert, et al.	The Ohio State University	(P-1)
Hall, et al.,	Elmhurst College	(P-2)
Young, et al.	Illinois State University	(P-3)
Fahlman, et al..	Wayne State University	(P-4)
Doherty, et al.	Toledo University	(P-5)
King, et al.	Toledo University	(P-6)
Sobolewski, et al.	Toledo University	(P-7)

MONDAY	1:00 TO 4:30 PM	ROOMS 8&9 (LOWER LEVEL)
Kramp, et al.	Oakland University	(P-1)
Madej, et al.	Oakland University	(P-2)
Cohen, et al.	Indiana State University	(P-3)
Babington, et al.	Indiana State University	(P-4)
Fincher, et al.	Ashland University	(P-5)
Hipp, et al.	Ball State University	(P-6)
Darby, et al.	Bowling Green State University	(P-7)

TUTORIAL

1:00 - 2:00 pm

WHAT DOES IT TAKE TO GET AND SUCCEED IN THE INTERVIEW

Brenda D. Reeves, Ph.D. Grand Valley State University, Allendale, MI 49401.

The resume doesn't get you the job; it gets you the interview. To write a winning resume students need to understand the job search process and how to critically read a position available posting. With this information, the student can begin to organize and write the type of resume and letter of application that will get them past the "first cut" and invited for an interview. On the other hand, a poor resume and letter of application can prevent even the best candidate from getting an interview. The objectives for the first part of the presentation are:

1. Understand how the search committee evaluates resumes
2. Know how to critically read a position available posting to determine what to include in the resume and letter of application
3. Know how to format a winning resume
4. Know the resources on your campus to assist you

Once potential candidates are invited for an interview, there are several things that they need to be aware of to properly prepare for a winning interview, and get the job. The objectives for the second part of the presentation are:

1. Know how to prepare for an interview
2. Know what to include in an interview portfolio
3. Understand what weaknesses can come through in the interview process
4. Know the resources on your campus to assist you

Students with an emphasis in fitness and wellness should begin to prepare for their first professional job search by their sophomore year. They need to seek diverse opportunities both in and out of the classroom in order to develop their knowledge, skills, and abilities as well as build their working portfolio. However, students cannot count on academic and job related experiences alone to them a job; they must have excellent communication skills, both written and verbal. Time and again, potential candidates have been passed over because they could not adequately demonstrated their KSA's and professional experiences in their resume or in the interview. By understanding and properly preparing for the search process, potential candidates can succeed in getting the interview and the job.

TUTORIAL

1:00 - 2:00 pm

THE VALUE OF CUSTOMER SERVICE IN A MEDICALLY-BASED INTEGRATED WELLNESS FACILITY

Michael F. Hyek, Ph.D.

Historically, the push to acquire new members has driven the success of traditional exercise and health club facilities. Recently however, the primary focus has shifted to retention of existing members. Perhaps the greatest mechanism available to maximize retention rates is through quality customer service. This presentation will provide the elements of customer service used at the McConnell Heart Health Center. It will begin with historical perspectives on number of members and associated revenue. Next, how the satisfied customer can become the greatest avenue for new members. Then, how customer satisfaction survey scores can be used to identify areas where opportunities for improvement exist will be discussed. Finally, the key criteria for converting customers into advocates will be outlined.

POSTERS

1:00 - 4:00 pm

Gajus, et al.,	The Ohio State University	(P-1)
Tsivitse, et al.	Toledo University	(P-2)
Mylona, et al.	Toledo University	(P-3)
Peterson, et al.	Toledo University	(P-4)
Horn, et al.	Ball State University	(P-5)
Eagan, et al.	Purdue University	(P-6)
Josyula, et al.	Purdue University	(P-7)

FOUR-YEAR TREND IN BODY COMPOSITION IN COLLEGE STUDENTS

S.G. Gajus and N.Y.J.M. Leenders. The Ohio State University, Columbus, OH 43210

Obesity contributes to major health problems such as type 2 diabetes mellitus, hypertension, and coronary artery disease. The prevalence of obesity (defined as body mass index [BMI] $\geq$ 30.0 kg/m^2, using self-reported measures of body weight and height) in adults in the U.S. population increased from 12.0% in 1991 to 17.9% in 1998. The highest increase, 70%, was observed among the youngest ages, 18-29 y of age. The purpose of the present study was to retrospectively describe the trends in body weight and body composition in college students from 1996 to 2000. Methods: To monitor trends in body weight and body composition, and to present results from a specific population defined as college students (n=1,178 females, n=990 males) enrolled at a large mid-western university, data was analyzed from the Exercise Physiology Laboratory collected from 1996 to 2000. Body composition was determined by hydrostatic weighing (HW). Height and weight was measured simultaneously. Descriptive statistics were used to describe the distribution of body composition per each academic year. Prevalence of obesity was calculated based upon BMI (BMI $\geq$ 30 kg/m^2). An analysis of variance was used to determine whether body weight and percent body fat was significant different between academic year and sex. Results: Between 1996 and 2000, mean body weight did not change for both sexes, 63$\pm$11 kg in '96-'97 and 63$\pm$11 kg in '99-'00 for females and 78$\pm$12 kg in '96-'97 and 79$\pm$11 kg in '99-'00 for males respectively. Males were significantly heavier compared to females, 79$\pm$11 kg vs. 63$\pm$11 kg respectively (P<.0001). Similarly, percent body fat determined from hydrostatic weighing did not change per year for both sexes, 26$\pm$6% in '96-'97 and 27$\pm$7% in 2000 for females and 17$\pm$6% in '96-'97 and 18$\pm$6% in '99-'00 for males, respectively. Females have a significantly higher percent body fat compared to males, 26$\pm$6% vs. 17$\pm$6% respectively (P<.0001). Overall, 8% of the males and 5% of the females were classified as obese (defined as BMI $\geq$ 30 kg/m^2). Conclusions: These preliminary data document no changes in body weight and percent body fat among college students. Because of the health consequences of obesity, objectives, interventions and awareness activities should be developed targeting college students.

MUSCLE INFLAMMATORY CELL AND MYOD PROTEIN CONCENTRATIONS FOLLOWING DOWNHILL RUNNING

S.K. Tsivitse, S.J. McGregor, J.M. Peterson, T.J. McLoughlin, E. Mylona, & F.X. Pizza. The University of Toledo, Toledo, OH

Purpose: The purpose of this study was to examine the kinetics of muscle inflammatory cell and MyoD protein concentrations in rat solei following eccentric exercise. Methods: Male Wistar rats performed either downhill running (n=43; 17m/min, -16% grade) or normal cage activity (controls; n=6). Solei were obtained at the following post-exercise time points: 0h (n=6), 2h (n=6), 6h (n=5), 24h (n=8), 48h (n=6), and 72h (n=6). Neutrophil (HIS48+), macrophage subpopulations (ED1 + and ED2+) and MyoD protein concentrations were determined using immunohistochemistry. Results: Downhill running induced muscle injury as indicated by a significant increase (P≥0.05) in blood creatine kinase activity and histological signs of injury. Neutrophil and ED1+ macrophage populations were significantly higher at 24h post-exercise relative to controls. ED1+ macrophage concentrations were also significantly elevated at 48h post-exercise relative to control. The percentage of myofibers invaded by ED1+ macrophages, an indicator of necrosis, was also significantly higher at 24h relative to controls. Neither, ED2+ macrophage nor MyoD+ protein concentrations were significantly elevated at any post-exercise time-point. Conclusion: The results indicate that downhill running causes a mutual elevation in neutrophil and ED1+ macrophage concentrations but does not influence the concentrations of ED2+ macrophages nor MyoD+ protein concentrations.

CONTRACTION-SPECIFIC CHANGES IN INFLAMMATORY CELLS OF RODENT SKELETAL MUSCLE

E. Mylona, T.J. McLoughlin, T. Hornberger, K. Esser, and F.X. Pizza. The University of Toledo, Toledo, OH and The University of Illinois, Chicago, IL.

Eccentric skeletal muscle contractions are known to cause muscle injury and increase muscle neutrophnils and macrophage sub-populations (ED1* and ED2*). However, whether the non-injurious concentric contractions influence these muscle inflammatory cell concentrations is unknown. ***Purpose:*** The purpose of this study was to assess alterations in muscle inflammatory cell concentrations following eccentric and concentric skeletal muscle contractions. ***Methods:*** The tibialis anterior (TA), plantaris (PLN), and soleus (SOL) muscles of female Wistar rate (n=12) were exercised at 6, 24, and 72 h following electrical stimulation (ES). The contralateral muscles from each animal were used as controls (CT). ***Results:*** Both eccentric (TA) and concentric contractions (SOL and PLN) caused a significant elevation (p≥0.05) of neutrophil and ED1* macrophage concentrations compared to CT. ED2* macrophage concentrations were not elevated following concentric contractions and tended to be elevated (p=0.057) following eccentric contractions. ***Conclusions:*** Injurious eccentric contractions increased neutrophil and ED1* and possibly ED2* macrophage concentrations. The non-injurious concentric contractions appeared to also elicit marked elevations of meutrophils and ED1* but not ED2* macrophages.

IBUPROFEN AND ACETAMINOPHREN: EFFECT ON MUSCLE INFLAMMATION FOLLOWING ECCENTRIC CONTRACTIONS

J.M. Peterson, T.A. Trappe, E. Mylona, F.White, C.P. Lambert, W.J. Evans, F.X. Pizza. The University of Toledo, Toledo, OH and University of Arkansas for Medical Sciences, Little Rock, AK

Ibuprofen and acetaminophen are commonly used to reduce pain and inflammation after skeletal muscle injury. Ibuprofen but not acetaminophen is known to possess anti-inflammatory properties. Prior research using indirect measurements of muscle inflammation has produced conflicting results on whether a non-steroidal anti-inflammatory drug (e.g. ibuprofen) or an analgesic (e.g. acetaminophen) reduces muscle inflammation following novel eccentric contractions. ***Purpose:*** To examine the influence of ibuprofen and acetaminophen on intra

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muscular neutrophil and macrophage concentrations following a novel bout of eccentric exercise. ***Methods:*** Twenty-four males (25±3 y) were divided into three groups which received the maximal over-the-counter (OTC) dose of ibuprofen (1200 $mg \cdot d^{-1}$) or acetaminophen (4000 $mg \cdot d^{-1}$) or a placebo following 10-14 sets of 10 eccentric contractions at 120% of their concentric one-repetition maximum using the knee extensors. Biopsies were taken before and 24h after exercise from the vastus lateralis. ***Results:*** Macrophange and total inflammatory cell concentrations (neutrophils + macrophages) were elevated ($P<0.01$) after exercise but neutrophil concentrations were not ($P>0.05$). Acetaminophenor ibuprofen treatment did not blunt the intramuscular inflamma tory cell response when compared to placebo ($P>0.05$). Conclusions: These results suggest maximal OTC doses of acetaminophen or ibuprofen do not affect muscle concentrations of neutrophils or macrophages 24h after a novel bout of eccentric exercise.
Supported in part by McNeil Consumer Products Co. and NIH grant AG-00831.

SPECIFIC FACTORS IN TRAINING ELITE SKI JUMPING ATHLETES
B.Horn, S.Higgins, A.Walshe, R. Newton. Ball State University, Muncie, IN 47306

The purpose of this study was to determine the changes in impulse produced by three U.S. Olympic Ski Jumping Team Athletes as a result of a highly specific training program. The specific training exercises included the performance of an isometric squat for 5 seconds at the approximate knee and hip angles assumed prior to the jump. The other exercise involved concentric only squat jumps from the same body position and with 85% of 1RM back squat strength supported on the shoulders. Athletes were tested in May, June, July, August of 2001 for impulse produced during a concentric only squat jump which is highly specific to the takeoff phase.

Athlete	May	June	July	August
1	67.6	85.6	146.1	166.4
2	79.3	96.7	103.2	103.5
3	119.0	146.4	143.6	119.0

Although it cannot be directly attributed to the innovative exercises implemented in training, all three skiers greatly improved their world ranking over the training period. It should be noted that athlete 2 was injured prior to the July testing session so this may have affected his impulse values for the July and August testing. Obviously the statistical power of this study is limited by the small sample size but this data shows a correlation between this specific training program and performance, as indicated by increased impulse generation and a higher world ranking.

A COMPREHENSIVE HISTORICAL ACTIVITY QUESTIONAIRE (HAQ) FOR YOUNG WOMEN: DEVELOPMENT AND EVALUATION
M.S. Eagan, R. Lyle, D. Teegarden, Purdue University, West Lafayette, IN 47907

The purpose of this study was to evaluate the intrasubject reliability of a self-administered Historical Activiity Questionaire(HAQ) designed to estimated lifetime activity for female subjects (18–30 yrs). The HAQ examines activity participation divided by time periods(elemetary, middle, high school, post high school/college), activity categories (occupation, athletics, leisure, exercise), pre-assigned activity impact levels (1-3), and amount of lifting and carrying associathed with the selected activities. For a specific time period, the average number of hours per day spent for each activitiy was calculated, and the hours for all activitities were summed

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to obtain a composite estimate for that period (expressed as h/d). Also, h/d was totaled by activity category, impact level, across time periods, and for lifting and carrying. In addition, h/d of each activity was multiplied by an estimate of the metabolic cost of that activity (expressed as METs). Thirty-one volunteers (age 20.6 ± 2.7 yrs) froma a calcium intervention study repeated a duplicate portion of the questionaire (elemenatary through high school) at 6 pm. Pearson r of Spearman rank order correlations (if data were not normally distributed), as well as Cronbach's Alpha Coefficient (α) were used to analyze several of the activity variables. Overall cumulative activity recall repeatability in MET - h/d was $r=0.61$, $\alpha=0.75$, $p=0.0001$. Reliability of athletic participation recall was particularly high ($r=0.82$, $\alpha=0.92$, $p=0.0001$. H/d recall results were similar. Also, with the exception of impact level 1, activities broken down by impact level, yielded consistent results. Results suggest that the HAQ is a reliable instrument for evaluating lifetime activity in 18-30 year old women. Since the weakest recall occurred for middle school and occupation, more time should be dedicated to clarifying instructions for these sections of the questionaire.

This project was funded under the Dairy Calcium and Women's Health Study grant provided by Dairy Management, Inc.

HISTORICAL ACTIVITY AS IT RELATES TO CURRENT ACTIVITY, FITNESS, AND BODY COMPOSITION IN WOMEN.

L. Josyula, M.S. Eagan, R. Lyle, D. Teegarden, Purdue University, West Lafayette, Indiana, 47907

The purpose of this study was to examine baseline fitness and body composition in relation to self-reported historical activity in 153 women, age 20.1 ± 2.3 yrs, enrolled in the Dairy Calcium and Women's Health Study (DCWHS). We measured lifetime activity divided into time periods, activity categories, and impact levels usint the Historical Activity Questionaire (HAQ). Fitness and body composition parameters included resting heart rate (RHR), systolic and diastolic blood pressure, weight, body mass index (BMI), waist and hip circumference, and as measured by dual energy X-ray absorptiometry (DXA), body fat % (Bfat %), body fat (g) (FatG), and lean tissue (g) (LEAN). Spearman rank-order correlations were calculated. Activity values were in units of MET-h/d unless otherwise specified. Significant relationships ($p<0.05$) for historical activity time periods included middle school activity with Lean ($r=0.24$); high school activity with RPE ($r=0.45$), RHR (-0.19) and Lean (0.30); and lifetime activity with Lean ($r=0.26$) and RPE ($r=0.34$). Significant relationships for historical activity categories included lifetime athletics with RPE ($r=-0.41$), Bfat% ($r=-0.30$), FatG ($r=-0.21$), and Lean ($r=0.30$); lifetime leisure activity with RPE ($r=-0.17$); lifetime exercise with RPE ($r=-0.34$) and Bfat% ($r=-.20$). Significant regression models included high school activity as the best time period predictor for RPE and Lean. Lifetime athletic activity was the best activity category predictor for RPE. Also, h/d of activity in past years significantly predicted total post-high school activity h/d. Within regression models, the highest impact activities consistently had favorable relationships with the physciological components compated to lower impact activities. Results suggest that women who were active in childhood remain active in early adulthood. Additionally, past activity appears to provide prolonged fitness and body composition benefits. In particular, previous athletic participation may play an important role in helping women maintain a healthier lifestyle in the post-high school years.

This project was funded under the DCWHS grant provided by Dairy Management, Inc.

SYMPOSIUM

2:00 - 4:00 pm

PERSONAL TRAINING IN A COMMERCIAL FITNESS SETTING
Mark Myhal, Ph.D, Chair

Purpose: To expose the members of ACSM to a broad spectrum of personal training methodologies and issues related to personal training for various populations. Objectives: 1. To provide the members of ACSM with an overview of the personal training business as conducted in a commercial fitness setting; and 2. To outline training modalities for the general population; beginning and advanced lifters, and an aging population.
Rationale: Personal training programs are developed based upon the following: 1. The medical history of the client; 2. The specific goals/needs of the client; 3. The age of the client; and 4. The current fitness level of the client.
This symposium will address all aspects of personal training including training modalities for select populations, the business and administrative aspects of personal training, client management and recruitment, and perspectives related to personal training in a commercial fitness setting.

Presenters

Mark Myhal, Ph.D., The Ohio State University, Columbus, OH

Linda Wilkin, M.A., The Ohio State University, Columbus, OH

Jaimy Lekan, B.S. The Ohio State University, Columbus, OH

SYMPOSIUM

2:00 - 4:00 pm

COLLEGE CAMPUSES: OPPORTUNITIES TO ENGAGE IN HEALTHY BEHAVIORS
W.M. Sherman, Ph. D., Chair

Purpose/Rationale: In the United States, approximately 14 million students attend either 2- or 4-year colleges or universities. The university setting provides ample opportunities to participate in regular physical activity or exercise through sport and fitness programs, physical education classes and/or intramural sports programs. This is especially important because health beliefs and practices are still developing during these years. We will share perspectives on opportunities that exist on college campuses to engage in physical activity and what we know about this population with regard to their health behaviors.
Objectives: to raise awareness of opportunities that exist to engage in physical activity and other healthy behaviors in this population. To provide information in such that objectives, interventions and awareness activities could be developed targeting college students that can be applied to secondary educational settings throughout the nation.

Presenters

Mike Sherman, Ph.D., The Ohio State University, Columbus, OH
Opportunities to engage in healthy behaviors on college campuses

Nicole Y.J.M. Leenders, Ph.D. The Ohio State University, Columbus, OH
College students and their health behaviors

KEYNOTE ADDRESS

5:00 - 6:00 pm

When winning becomes THE goal

John Lombardo, MD, FACSM
THE OHIO STATE UNIVERSITY
SPORTS MEDICINE CENTER

Dr. John Lombardo is an 11th year member of The Ohio State University (OSU) Sports Medicine Center staff, and 8th year Head Team Physician for the OSU Department of Athletics.

Dr. Lombardo is a native of Brooklyn, New York. He did his undergraduate work at the University of Dayton. He graduated from Ohio State's College of Medicine in 1977 and completed his residency in family medicine in 1980 at St. Elizabeth Medical Center in Dayton.

From 1981-1990 Lombardo served as Medical Director of Sports Medicine at the Cleveland Clinic. During that time, he served as Team Physician for the Cleveland Cavaliers and medical consultant for the Cleveland Browns and the Cleveland Ballet.

Lombardo has had extensive involvement in several international competitions, including serving as Head Team Physician for the USA delegations at the World University Games in Yugoslavia in 1987 and the Winter Olympic Games in Calgary in 1988.

Lombardo returned to OSU in 1990 as Chairman of the Department of Family Medicine, Medical Director of the OSU Sports Medicine Center and team physician for the Athletic Department.

Lombardo also serves as an advisor for anabolic/androgenic steroids and related substances to the National Football League, and he is the past President of the American Medical Society for Sports Medicine.

TUTORIAL

8:30 - 9:30 am

EXERCISE TREATMENT FOR PARKINSON'S DISEASE
Shel Levine, Eastern Michigan University

The purpose of this presentation is to discuss the role of exercise in the management of Parkinson's disease. Along with medications, exercise is an essential ingredient in maintaining functional capacity and activities of daily living. Therefore, patients with Parkinson's disease are encouraged to exercise on a regular basis. As a student or working Exercise Physiologist, you may come across a patient with Parkinson's disease in a cardiac rehabilitation program, hospital wellness center, corporate fitness center, or even as s personal training client. It is essential to understand the fundamentals of exercise testing and prescription for patients with Parkinson's disease.

Objectives: Upon completion of this presentation the attendee will:

1. Learn acute and chronic effects of exercise in Parkinson's disease.
2. Learn pre-exercise recommendations for patients with Parkinson's disease.
3. Learn essential exercise prescription techniques for Parkinson's disease.
4. Learn how chronic exercise affects symptoms of Parkinson's disease as well as quality of life indicators.

POSTERS

8:00 - 11:00 am

Markert, et al.	The Ohio State University	(P-1)
Hall, et al.	Elmhurst College	(P-2)
Young, et al.	Illinois State University	(P-3)
Fahlman, et al.	Wayne State University	(P-4)
Doherty, et al.	Toledo University	(P-5)
King, et al.	Toledo University	(P-6)
Sobolewski, et al.	Toledo University	(P-7)

MICROGRAVITY-INDUCED DECONDITIONING AND ATROPHY OF UPPER-EXTREMITY MUSCLE IN HUMANS

C.D. Markert & W.J. Armstrong. Easter Michigan University, Ypsilanti, MI
Previous ground-based studies of skeletal muscle atrophy due to microgravity have investigated the effects of microgravity simulations on animal hindlimbs. This investigation used a model of partial immobilization and suspension of the upper extremity in human subjects. Study objectives were to determine the effects of upper-extremity atrophy on antropometry and both strength and energy output in an assortment of exercises. Six males (mean±SD) aged 26.8±6.8 years, height 180.25±6.6 cm, weight 77.5±14.6 kg, wore a bi-valve plaster

orthosis on the non-dominant arm for 2 weeks, before and after which the following anthropometric and strength assessments were taken: arm girth, arm volume, arm extracellular and intracellular fluid (ECF/ICF) volume, peak biceps and triceps strength, mean biceps and triceps strength, hand grip strength, and ergometry peak and minimum power output. It was hypothesized that girth and strength in the experimental arm would decrease relative to the control arm. Arm girth was measured by tape measure at mid-humerus, and arm volume was determined by water immersion. Arm ECF/ICF volumes were measured using bioelectrical impedance. Upper arm strength was measured using Cybex II isokinetic equipment. Grip strength was established by hand-grip dynamometry. A novel single-arm ergometry protocol was used to measure power output. A dependent t-test found no significant difference (ECF $p=0.448$ and ICF $p=0.765$) in fluid compartment values due to immobilization, and MANOVA found no significant ($p<0.05$) differences between pre- and post-treatment values for any of the measurements; however, non-significant trends o flosses in mean biceps and triceps strength, peak triceps strength, and hand grip strength were noted. Compliance of subjects with the immobilization protocol, as well as other limitations, may have impacted these results.

FITNESS SCORES, KNOWLEDGE AND BELIEFS DIFFER BY RACE IN 4TH AND 5TH GRADE STUDENTS

H.L. Hall, M.M. Fahlman, A. Kliber, C. Boyle. Wayne State University, Detroit, MI

There is a clear disparity in health in the United States such that African Americans and Hispanics are more likely to suffer from morbidity and mortality related to chronic disease than their White counterparts. While chronic disease does not manifest itself until late in life, the health behaviors that contribute to it begin in childhood and have a cumulative effect. Thus, direct intervention strategies aimed at high risk populations are appropriate. The purpose of this study was to determine if 4th and 5th grade African American and Hispanic students differ from White students in fitness levels, or fitness attitudes and beliefs. The study populations consisted of 612 students drawn from schools in a large Midwestern city and suburb. Students were given the Fitnessgram fitness test and completed a 46 item questionnaire designed to elicit responses regarding knowledge, attitudes and beliefs about physical activity. 432 students completed all aspects of the study and were used in the final analysis. Comparisons between races and genders were conducted using analysis of variance with a Tukey post hoc. A sample of descriptive statistics is as follows: White (n=228); weight=85.39±22.45 pounds; mile run = 679.64±154.89 seconds; curl up = 36.51 ± 23.24; pushups = 12.80 ± 9.55. African American (n=107); weight = 98.07 ± 35.48 pounds; mile run = 769.97 ± 195.00 seconds; curl up = 26.28 ± 17.74; push-ups = 8.51 ± 8.6. Hispanic (n=97); weight = 93.6 ± 26.5 pounds; mile run = 860.79 ± 231.67 seconds; curl up = 12.59 ± 12.35; pushups = 6.25 ± 7.47. There were significant race and gender differences in the one mile run ($p = 0.00$); curl ups ($p = 0.00$); push-ups ($p = 0.00$); and weight in pounds ($p = 0.001$). In general, White students scored better than African Americans who in turn scored better than Hispanic students. There were also significant differences in knowledge and beliefs about fitness with White students being more knowledgeable than their minority counterparts. Since minorities in the United States are at an increased risk of death due to disease caused in part by lack of activity, and some of these deficits manifest themselves as early as 4th grade, minority students need to be targeted for special interventions.

RATINGS OF PERCEIVED EXERTION AND HEART RATE DURING RESISTANCE EXERCISE IN TRAINED AND UNTRAINED LIFTERS

G. Young, K.M. Lagally, S.T. McCaw, FACSM, H. Medema, D.Q. Thomas, FACSM. Illinois State University, Normal, IL

This study examined ratings of perceived (RPE) and heart rate (HR) during resistance exercise in untrained and trained female weight lifters. Ten untrained and ten trained (recreationally) female volunteers (age=21.8 + 17. yrs) performed the bench press exercise for eight repetitions at 60% of their one-repetition maximum (1-R) and for six repetitions at 80% 1-RM. Total work was held constant by varying the number of repetitions performed during each intensity. The two intensities were performed in random order. Both an active muscle RPE (RPE-AM) and an overall body RPE (REP-O) were assessed immediately following each intensity. HR was also assessed following each intensity. A three-factor (Training X RPE (region) X Intensity) ANOVA with repeated

measures on the RPE and Intensity factors revealed significant ($p<0.01$) main effects for RPE and Intensity. No significant differences were found between trained and untrained individuals. There were no significant two-way or three-way interactions.

	60% 1-RM		80% 1-RM	
	RPE-AM	RPE-O	RPE-AM	RPE-O
Trained	11.8+1.6	11.3+1.4	14.6+1.1	13.4+1.6
Untrained	12.5+2.2	11.2+1.4	14.5+1.8	13.2+1.4

A three-factor (Training X Time X Intensity) ANOVA with repeated measures on the Time and Intensity factors revealed a significant ($p<0.01$) Training X Time interaction. HR increased significantly ($p<0.01$) in both groups from pre- to post-exercise, but the magnitude of the increase was significantly ($p<0.01$) higher in the trained group. HR for the two groups did not differ at either pre- or post-exercise in either intensity. These results indicate that both trained and untrained females perceive the intensity of resistance exercise similarly when performing exercise at the same relative percentage of the one-repetition maximum. This information supports the use of RPE as a method of monitoring resistance exercise intensity. In addition, the results suggest that HR is not related to perceptual responses during resistance exercise.

THE EFFECTS OF ENDURANCE TRAINING AND RESISTANCE TRAINING ON PLASMA LIPOPROTEIN PROFILES IN ELDERLY WOMEN

M.M. Fahlman, D. Boardley, C.P. Lambert, M.G. Flynn, FACSM. Wayne State University, Detroit, MI.

It has been shown that high levels of high-density lipoprotein cholesterol (HDL cholesterol) and low levels of low density lipoprotein cholesterol (LDL cholesterol) are associated with health maintenance in older women. Studies examining the relationship between exercise training and lipoprotein levels are equivocal and thus the effects of exercise training on plasma lipoprotein levels in the elderly remains unclear. The purpose of this research was to examine the effects of endurance and resistance exercise on plasma lipoprotein levels in elderly women who were active but non-exercising prior to the study. A total of 45 healthy, active women, aged 70-87, were randomly assigned to either an aerobic training (AT, 76 ± 5 yr, N=15), resistance training (RT 73 ± 3 yr, N=15) or control (C, 74 ± 5 yr, N=15) group. AT walked 3d/wk at 70% heart rate reserve. The duration on day one was 20 minutes and it was increased by five minutes each day until subjects were walking for 50 minutes (week 3). The exercise training session for RT consisted of one to three sets of eight repetitions of eight different exercises at 8RM, while C maintained normal activity. Weight and diet were unchanged across groups. Blood samples were obtained from all subjects at week 0 and week 11. Training resulted in a significant decrease in One Mile Walk times (pre = 20.2 ± 2.0 min; post = 17.1 ± 1.0 min) and heart rate at completion of the walk (pre = 108 ± 3 BPM; post = 98 ± 3 BPM) for AT and a significant increase in 8 RM of all RT exercise. Both AT and RT experienced increased HDL cholesterol (AT pre = 45.4 ± 3.5 mg/dl, post = 54.5 ± 2.9 mg/dl; RT pre = 47.1 ± 3.3 mg/dl, post = 57.4 ± 2.0 mg/dl) and decreased triglycerides (AT pre = 149.9 ± 10.9 mg/dl, post = 128.9 ± 15.2 mg/dl; RT pre = 113.5 ± 13.0 mg/dl, post = 84.6 ± 13.0 mg/dl) at week 11 compared to week 0. Control lipoproteins remained unchanged. RT also had significantly lower LDL cholesterol and total cholesterol compared to controls at week 11, (RT LDL = 89.0 ± 11.2, C = 132.1 ± 8.5 mg/dl; RT TC = 162.7 ± 12.2, C = 196.7 ± 8.2 mg/dl). Both resistance training and endurance training resulted in favorable changes to plasma lipoprotein levels for elderly women in only ten weeks. The fact that this occurred without concurrent changes in weight or diet is an indication that high intensity exercise alone can be used to modify lipoproteins in populations of healthy elderly.

A COMPARISON BETWEEN A STRENGTH AND A COMBINED STRENGTH AND AEROBIC TRAINING PROGRAM

Doherty, K.D., Morgan, A.L., Topp, R., NcNevin, N., Fahlman, M.M., Boardley, D., King, K.L.
The University of Toledo, Toledo, OH

Resistance training has been shown to improve strength and the ability to perform daily activities in the functionally limited. The purpose of this study was to determine if there was a difference in strength gains between a combined resistance and walking group (RWG) (n=12), a resistance-training group (RG) (n=15), and a control gro0up © (n=10) following 16 weeks of training in a functionally limited population. Thirty-seven functionally limited men and women (65-87) yr.) volunteered to participate in a 16-week program. The RG and RWG trained using Theraband®. The strength training protocol started at one set of eight repetitions three times a week and repetitions were increased by two every two weeks until two sets of twelve were reached. Subjects started training at a self-determined moderate tension (60-70% effort, RPE of 10-13) and were encouraged to increase their Theraband® color (i.e., resistance) as needed. Subjects in the RWG performed the same protocol as above for resistance training. The RWG also participated in a walking program that started at 10 minutes and increased by two minutes each week until reaching a 20-minute walk time. The subjects were tested at baseline and 16-weeks for maximal elbow extension and flexion, and knee extension and flexion strength (Kincom 500H). After subtracting baseline scores from 16-week scores, a T-score was calculated for each variable within each group. Elbow extension increased in the RG ($p=.046$, $\Delta=5.19$ lbs.) and RWG ($p=.001$, Δ-4.58 lbs.). Although not significant, knee flexion changed by 4 lbs. In RWG and 3.4 lbs. In RG. This slightly larger change in RWG may be attributed to the walking protocol. No changes were noted in the CG. However, over the three-year study the involvement of more subjects may lead to more significant results, which will allow for a future comparison of specific strength exercises with functional tests. In conclusion, strength can be increased in functionally limited individuals with resistance and combined resistance and aerobic training.

NIH #: R01 NR04929-01A1

FUNCTIONAL ABILITY IN THE ELDERLY AFTER A 16-WEEK EXERCISE PROGRAM: A PORELIMINARY STUDY

King, K.L., Morgan, A.L., McNevin, N. Fahlman, M.M., Boardley, D., Topp, R., and Doherty, K.D.
The University of Toledo, Toledo, OH

Maintaining functional ability plays a vital role in living a long and high quality life. Regular physical activity promotes the increase of strength and endurance in most populations. The purpose of this study was to determine if functional ability among functionally limited elderly individuals improved at the end of 8 and 16-weeks of an exercise program. Volunteer subjects, age 65 to 93 (n=48; males=13, females=35), were randomly assigned to one of four groups including a control (CT; n=9-10), resistance training (RG; n=10-15), aerobic training (AG; n=9-10), and a combined aerobic and resistance training group (ARG; n=11-12). All subjects were evaluated at baseline, 8-weeks and 16-weeks for their performance on five functional tasks, including a stair ascent/descent, arm curl test, chair stand test, and 6-minute walk test. In the stair ascent/descent the subjects were timed as they ascended and then descended 21 stairs. Subjects performed as many arms curls as possible in a 30 second period using hand held dumbbells (males=8lbs, females=5lbs). In the chair stand test the subjects were asked to sit in a normal straight backed chair and stand up as many times as possible in a thirty second period. The 6-minute walk test was used to measure ambulation distance for each subject. The data was analyzed using a repeated measures ANOVA. Although the exercise groups demonstrated increases ranging from 1-25%, statistically significant changes were not observed. The involvement of more subjects may lead to significant results at the conclusion of this three-year study. These results will assist in developing exercise programs for the functionally limited elderly.

NIH # R01 NR04929-10A1

THE RELATIONSHIP BETWEEN TESTS OF FUNCTIONAL ABILITY IN THE ELDERLY
Sobolewski, J.L., Morgan, A.L., Fahlman, M.M., McNevin, N., Boardley, D., Topp, R., The University of Toledo, Toledo, OH

Functional capacity in the elderly is related to quality of life. Therefore, the purpose of this study was to determine if an individual's performance on functional tasks is related to performance on other functional tasks. Forty-eight functionally limited volunteers (13M, 35F; 65-93 yr) were tested on a battery of functional and strength measures. Functional tasks carried out included time to ascend and descend 21 stairs, a six minute walk (total distance covered), a chair-stand in which the number of stands achieved in 30 seconds was recorded, and a test in which subjects were timed moving from a standing to supine position, and from supine to standing. Further, maximal knee flexion and extension were measured (KinCom 500H). Pearson Product moment correlations were calculated between all of the above mentioned variables. There was a strong relationship between the supine to standing and the ascending stair task ($r=.819$, $p<.01$) and between the supine to standing and the descending stair task ($r=.438$, $p<.01$), and supine to standing ($r=.332$, $p<.05$), indicating a relationship between quadriceps strength and functional ability. Knee flexion was related to knee extension ($r=.753$, $p<.01$) but not to any of the functional measures. Increasing quadriceps strength may ultimately maintain or enhance performance on functional tasks. In conclusion, quadriceps strength appears to be highly related to performance on functional tasks necessary for independent living.
NIH #: R01 NR04929-01A1

ORAL ABSTRACT PRESENTATIONS

9:00 - 11:00 am

9:00 - 9:15 am
EFFECTS OF DIFFERENT ACCESS TO PHYSICAL ACTIVITY OR EXERCISE ON GLUTATHIONE, OXIDIZED GLUTATHIONE, AND OXYGEN-RADICAL ABSORBANCE CAPACITY IN RATS
S. Nagy, R. Byrnes, B. Philip, H.M. Alessio, Ph.D., FACSM, A.E. Hagerman, Ph.D., and R.L. Wiley, Ph.D. Miami University, Oxford, OH

The purpose of this study was to determine if access to different frequency and intensity of physical activity and exercise affects select oxidative stress biomarkers. Male Sprague Dawley rats were separated into three groups (n=24): 1) having no access to physical activity outside of the cage, 2) having access to twice weekly physical activity in a large box, and 3) having regular voluntary access to a running wheel. At week 20 of the study, blood samples were collected from a total of thirty-six rats, 12 from each group. Glutathione (GSH), oxidized glutathione (GSSG) were measured in whole blood; oxygen radical absorbance capacity (ORAC) was measured in plasma samples:

	ORAC (Trolox units/ml)	GSH (μmolar)
No physical activity	1800±441	532±196
Physical activity	1849±262	802±175
Regular wheel exercise	1614±429	795±206

ORAC did not differ among the 3 groups. GSH was lower in the no-physical activity group ($p<0.05$) compared to the other groups. GSSG:GSH was similar in all groups. These results indicate that regular aerobic exercise or physical activity is associated with increased whole blood GSH, implying greater antioxidant protection. However, there is no alteration in antioxidant capacity in the plasma and no change in redox balance from physical activity or regular exercise.

9:15 - 9:30 am

EFFECTS OF DIFFERENT ACCESS TO PHYSICAL ACTIVITY OR EXERCISE ON BLOOD PRESSURE AND BODY WEIGHT IN A RAT MODEL

B. Philip, R.N. Byrnes, S. Nagy, K.H. Roeske, H.M. Alessio, FACSM, A.E. Hagerman, and R.L. Wiley. Miami University, Oxford, OH

The purpose of this study was to determine if access to different frequency and intensities of physical activity influences resting systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), heart rate (HR), and body weight (BW). Seventy-two male Sprague Dawley rats were separated into three groups (n=24) that were supposed to simulate a common human lifestyle: 1) The first group voluntarily exercised every other day on a running wheel, 2) the second group had access to twice-weekly physical activity in a large box, and 3) the third group gets no physical activity outside of their cage. The animals were monitored every week for blood pressure, heart rate, and body weights. Data from the first half (10^{th} week) of the study shows that Group 1 had the lowest mean BW (399.8±7.9 g) followed by Group 3 (446.2±9.3 g) and Group 2 (464.9±6.5 g). Analysis of data for week 18 show that as before, Group 1 had the lowest mean BW (483±9 g), $p<.05$ followed by Group 3 (533.7±9.7 g) and Group 2 (549.5±7.2 g). Week 6 of the blood pressure data shows that Group 1 had the highest blood pressure (week 6 mean SBP=151.1 mmHg, MAP=102.1 mmHg, DBP=78.2 mmHg). However, over time, and with continued access to exercise on a running wheel, SBP declined and was lowest in Group 1 (week 13 SBP=129.1 mmHg, MAP=103.8 mmHg, DBP=90.4 mmHg) $p<.05$, followed by intermittent switching between the remaining groups, with average means >140 mmHg. This data shows that access to regular physical activity every other day reduces blood pressure and body weight-both of which are implicated in cardiovascular disease. Physical activity performed twice weekly does not provide a strong enough stimulus for blood pressure and body weights to be positively influenced.

9:30 - 9:45 am

EFFECTS OF DIFFERENT ACCESS TO PHYSICAL ACTIVITY OR EXERCISE ON SPATIAL MAZE PERFORMANCE IN RATS

K.H. Roeske, R.N. Byrnes, S. Nagy, H.M. Alessio, FACSM, A.E. Hagerman, and R.L. Wiley, Miami University, Oxford, OH

Evidence suggests a link between physical fitness and cognition (Chodzko-Zajko & Moore, 1994, Radak et al., 2001). The purpose of this study was to determine if access to different frequency and intensity of physical activity and exercise affects spatial maze performance, which is an indication of cognition and adaptation. Male Sprague Dawley rats were separated into three groups (n=24): 1) having no access to physical activity, 2) having access to twice-weekly physical activity in a large box, and 3) having regular access to a running wheel. At weeks 12 and 16, performance on a spatial maze was evaluated:

	Reference errors	Working errors	Correct responses
No physical activity	Mean ± sem 1.50±0.31 Total: 18	.92±0.29 11	2.89±0.43 16
Twice weekly physical activity	Mean ± sem 10.67±0.19 Total: 8	0.08±0.8 1	2.54±0.47 0
Regular voluntary wheel exercise	Mean ± sem 1.33±0.32 Total: 10	0.17±0.11 2	2.50±0.46 20

No difference in mean reference errors, and correct responses among the three groups was found. But, total errors per group was highest in the no physical-activity group (N=11) and lower in the regular exercise (N=2) and twice weekly physical activity group (N=1). Total correct responses were highest in the regular exercise group, followed by no physical activity and twice weekly physical activity groups. Therefore, we conclude that access to physical activity or exercise does not influence average spatial maze performance in young rats, but individual differences are apparent.

9:45 - 10:00 am

EFFECTS OF DIFFERENT ACCESS TO PHYSICAL ACTIVITY OR EXERCISE ON BLOOD LIPID PROFILE IN RATS

R.N. Byrnes, S. Nagy, B. Philip, H.M. Alessio, Ph.D., FACSM, A.E. Hagerman, Ph.D., and R.L. Wiley, Ph.D.
Miami University, Oxford, OH 45056

Regular exercise improves blood lipid profiles (Gesquire et. al., 1998), and prevents cardiovascular disease while a lack of physical activity may contribute to sedentary lifestyle-related health risks including hyperlipidemia and artherogenesis. The purpose of this study was to determine if access to different frequency and intensity of physical activity and exercise affects blood lipid profile. Male Sprague Dawley rats were separated into three groups (n=24): 1) having no access to physical activity, 2) having access to twice-weekly physical activity in a large box, and 3) having regular access to a running wheel. At week 20, blood samples were collected from 12 from each group. Triglyceride (TG), high-density lipoprotein (HDL), very low-density lipoprotein (VLDL), and glucose data are shown:

	Triglycerides (mg/dl)	HDL (mg/dl)	VLDL (mg/dl)	Glucose (mg/dl)
No physical activity	139.0 ± 12.4	18.7 ± 1.7	27.8 ± 2.5	164.3 ± 8.0
Twice weekly physical activity	151.3 ± 9.2	22.2 ± 2.0	30.3 ± 1.8	168.0 ± 6.0
Regular voluntary wheel exercise	98.4 ± 10.8	14.1 ± 1.6	19.5 ± 2.1	159.1 ± 2.7

At age 20 weeks, there was a significant difference between Group 3 and both the twice weekly and no physical activity groups in TG, HDLs, and VLDLs ($p<.05$). Access to regular wheel running exercise was associated with healthier levels of blood lipids in comparison to either animals with access twice- weekly physical activity or no regular physical activity

10:00 - 10:15 am

JOINT CRYOTHERAPY MODULATES THE SOLEUS HOFFMANN REFLEX AND MUSCLE RESPONSE

B.A. Krause, C.D. Ingersoll, FACSM, J.E. Edwards, M.L. Cordova, FACSM, R.M. Palmieri, M.B. Stone. Indiana State University, Terre Haute, IN

Cryotherapy is widely used as a rehabilitative modality in the sports medicine community. Mechanisms driving motoneuron recruitment during and following cryotherapy are both local and central in nature. Joint cooling facilitates motoneuron pool recruitment and changes the M-response. The purpose of this study was to compare changes in the Hoffmann reflex (H-reflex) and the muscle response (M-response) before, during and after ankle ice application. Maximum soleus H-reflex and M-response measures were collected from each volunteer prior and following to ankle ice bag application. The stimulus sufficient to evoke 10% of each subjects maximum M-response was recorded. This stimulus intensity was used to evoke reflex discharges in the tibial nerve through the entirety of testing. H-reflex and M-response peak-to-peak amplitudes were recorded at 10min, 20min, 30min and 40min. An ice bag (1000g) of ice in a 1L plastic bag) was placed on the dorsum of the ankle for the first 20min of testing. Upon removal of the ice bag at 20min, the extremity was rewarmed passively. Nine healthy, physically active students (age=23.1±2.2yr: ht=169±10.1cm; mass=70.1±7.2kg) volunteered for this study. The soleus H-reflex and M-response demonstrated facilitation ($F_{4,32}=20.15$, $P<0.000$). Joint cooling increases the m response suggesting a centrally mediated state change in the motoneuron pool of the soleus. This state change may effectively lower the threshold for alpha motoneuron firing. The observed decrease in the H-reflex is likely a result of an antidromic effect caused by the increasing M-response.

10:15 - 10:30 am

ARTIFICIAL KNEE JOINT EFFUSION IMPROVES POSTURAL STEADINESS

RP Palmieri, CD Ingersoll, ML Cordova, SJ Kinzey, MB Stone, BA Krause. Sports Injury Research Laboratory, Indiana State University, Terre Haute, Indiana.
Applied Biomechanics Laboratory, California State University, San Bernardino, California.

Knee joint effusion is a common occurrence following knee injuries and surgeries. Relatively small effusions cause a reflex inhibition of the quadriceps musculature, which leads to muscular atrophy and quadriceps weakness. Increased neural drive to the soleus occurs following an artificial knee joint effusion. Due to the importance of the soleus in maintaining postural control, the facilitation seen in this muscle with knee joint effusion may affect one's ability to stand upright. Therefore, the purpose of this investigation was to determine the effects of an artificial knee joint effusion on sway path, sway velocity, mean power frequency, and selected spectral qualities of A/P and M/L center of pressure. Ten healthy volunteers
(20.1 ± 2.4 yrs, 168.0 ± 8.1 cm, 70.4 ± 13.3 kg) participated in this study. Baseline values (5, 10 second trials) were collected as subjects maintained a single-legged stance while wearing darkened goggles to minimize visual input. Following the initial trials, 60 cc of sterile saline were injected into the superolateral knee joint capsule. Following the knee joint effusion, data were again collected employing the same procedures used to gather the baseline data. Sway path decreased following knee joint effusion (pre-effusion mean = 92.3 ± 21.3 cm; post-effusion mean = 77.9 ± 24.7 cm). Sway velocity was also reduced following the effusion (pre-effusion mean = 9.2 ± 2.2; post-effusion mean = 7.7 ± 2.2 cm/sec). No differences were found pre to post effusion when examining the frequency characteristics of the center of pressure ($P > 0.05$). The results suggest following artificial knee joint effusion there is an increased ability to maintain an upright stance. The artificial knee joint effusion provided an additional sensory input thereby improving postural steadiness.

10:30 - 10:45 am

STATE OF ANXIETY AND HOFFMANN-REFLEX RESPONSES TO ACUTE BICYCLE ERGOMETRY AND RESISTANCE TRAINING

C.L. Fink, J.S. Raglin, FACSM. Indiana University-Bloomington, Bloomington, IN

The purpose of the study was to identify whether soleus Hoffmann reflex (H-reflex) changes were associated with state anxiety changes following acute bouts of aerobic or resistance exercise. Twenty-six physically active participants (13 M, 13 F; age22 ± 3 yrs) completed baseline soleus H-reflex recruitment curve and state anxiety (STAI-Y1) measures prior to 30-min of either resistance training or cycle ergometry at a self selected intensity. The soleus Hmax/Mmax ratio was used as a measure of motoneuron excitability. Post-exercise assessments of H-reflex and state anxiety were taken at 0-min, 45–min and 90-min. Repeated measures ANOVA revealed a significant ($P<0.05$) trials effect for state anxiety and H-reflex. Post-hoc analysis indicated that state anxiety was reduced ($P<0.05$) from baseline at 90-min post-exercise. H-reflex was reduced ($p<0.05$) at 0-min post-exercise for the bicycle ergometry condition but subsequent assessments did not differ from baseline. No changes in H-reflex were observed following resistance training. Correlational analysis revealed that state anxiety values were not associated ($r=.04$, $p>0.05$) with H-reflex measures. The independence of the H-reflex and state anxiety reduction following exercise were unrelated to H-reflex responses does support the tranquilizer effect explanation of exercise induced mood change.

10:45 - 11:00 am

THE MECHANICAL CHARACTERISTICS OF THE OVER HAND FLOATER SERVE IN VOLLEY-BALL

Moustafa B. Moustafa, Ahmed Kasra, Talha Houssen, Faculty of Physical Education, Helwan University, Cairo, Egypt.

The purpose of this study was to examine the mechanical characteristics of the overhand floater serve in volleyball. Specifically the objectives were to describe the mechanical characteristics of the ball's trajectory, to describe the characteristics of the player's performance, and establish principles to improve the performance level of the overhand floater serve. The researcher used the descriptive method based on the kinematographic analysis. The research sample included 18 trials of the overhand floater serve performed by the best four players in the Egyptian National Tournament (1994). The research results indicated that the total time to perform the overhand floater serve ranged from 0.54 sec to 0.72 second. The shorter the time the more effective the serve. The general trend of the arm angular velocity is characterized by a tendency to increase at the beginning of the course then decrease significantly when hitting the ball. The angular velocity of the player's hand during hitting the ball varied between 9.4 deg/sec and 17.2 deg/sec. The further the distance from the net, the higher the velocity of projection ($r=.83$, $p<0.001$). The velocity of projection should be greater than the critical speed to insure a more effective serve. The wrist, elbow, and shoulder joint angles should be as close as possible to 180° during hitting the ball to achieve the highest possible height of projection. This study also suggests a theoretical model for the overhand floaters serve with a jump.

11:00 - 11:15 am

BODY MASS INDEX, NOT SEDENTARY BEHAVIOR, INFLUENCES MILE RUN TIME

M.S. Kerner, A.B. Kurrant, Long Island University, Brooklyn, NY

Obesity among children and adolescents has increased in the past 20 years, with rates ranging between 6 and 33%. Physical inactivity contributes to weight gain and relative risk for coronary heart disease. How these variables may interact to modify cardiorespiratory fitness is unclear. We sought to observe the strength of the relationships between body mass index (BMI), weekly leisure-time sedentary behavior (television watching + internet use) (ST), and cardiorespiratory fitness, measured by one-mile run time (MR), in 129 high school girls (age 14.8±1.1 yr). MR correlated moderately with BMI ($r=.38$, $p<.001$), but not with ST ($r=.01$). Using Body Mass Index Standards we divided BMI into three groups: Underweight/Normal (<25.0 $kg \cdot m^{-2}$), Overweight (25.9-29.99 $kg \cdot m^{-2}$), and Obese/Extremely Obese (≥30.0 $kg \cdot m^{-2}$). ST was also divided into three groups: ≤ 2 $hr \cdot day^{-1}$ (Group 1), 2.01-4.0 $hr \cdot day^{-1}$ (Group 2), and ≥ 4.01 $hr \cdot day^{-1}$ (Group 3). Univariate ANOVA procedures indicated significant main effects for BMI but not for ST. No significant interaction effect was found. *Post hoc* tests with Bonferoni correction revealed that the Obese/Extremely Obese group was significantly different from the Underweight/Normal ($p>.001$) and Overweight ($p=.011$) gr0oups, but the Underweight/Normal and Overweight groups were not significantly different from each other. We conclude that BMI, not leisure-time sedentary behavior, influences cardiorespiratory fitness in this group of high school girls.

One-Mile Run Time (min) by Leisure-Time Sedentary Time and Body Mass Index			
	ST Group 1	ST Group 2	ST Group 3
Underweight/Normal	10.01	10.41	10.12
Overweight	10.68	10.44	11.07
Obese/Extremely Obese	12.61	10.73	12.74

SYMPOSIUM

9:30 10:30 am

ASSOCIATION OF MENSTRUAL CYCLE AND FEMALE ATHLETES AGE 14-18: POSSIBLE RESEARCH PROPOSALS
Sara Terrell, Graduate Student, Eastern Michigan University

The purpose of this tutorial is to examine current theories explaining the increasing number of Anterior Cruciate Ligament injuries in female athletes when compared to their male counterparts. Particular focus will be on the theory of the association of the menstrual cycle and ACL injury in young women. As a student or professional working as an Exercise Physiologist, Athletic Trainer, or Personal Trainer, you may come across a client need sport specific training. It is essential to understand the needs of female athletes when designing and implementing training and/or rehabilitation programs.

Upon completion of this presentation the attendee will:

1. Discover the current research material on the topic of ACL injuries in female athletes.
2. Discover directions for future research proposals, including possible methodologies for research.
3. Learn essential exercise prescription techniques for female athletes

SYMPOSIUM

10:30 - 12:00 pm

TREATING CHRONIC DISEASES WITH EXERCISE: A LOOK AT EVIDENCE-BASED CLINICAL OUTCOMES.
Jonathan K. Ehrman, PhD, FACSM, Henry Ford Heart and Vascular Institute; Steven J. Keteyian, PhD, FACSM, Henry Ford Heart and Vascular Institute

Purpose: Provide a concise, evidence-based overview of the effects of regular exercise in the treatment of chronic diseases. This will be accomplished by reviewing recent meta-analysis or landmark clinical trials.

Objectives:

1. Provide the attendee with an understanding of exercise and evidence-based medicine, the strength of randomized clinical trails, and the Cochrane Library database.
2. Using no more than 6 slides for each disorder, define the scope of the disease, patho physiology of the disease, unique methods associated with randomized clinical trials for the disorder, the results of randomized clinical trials, and potential mechanisms by which exercise contributes to disease treatment.

Rationale: Over the past 15 years the number of randomized clinical trials testing the safety and effectiveness of exercise in the treatment of variety of disorders has increased. It is known that exercise improves both intermediate as well as clinical outcomes (morbidity, mortality) for many diseases. It is important that professionals trained in exercise and exercise physiology be familiar with the current research findings related to exercise and disease treatment. Such information applies to not only those students who will work with patients but also those responsible to instruct students at the graduate and under-graduate level. This symposium will provide a concise yet up to date review of the recent research of findings that address exercise in the treatment of a variety of chronic diseases.

POSTERS

1:00 - 4:30 pm

Kramp, et al.	Oakland University	(P-1)
Madej, et al.	Oakland University	(P-2)
Cohen, et al.	Indiana State University	(P-3)
Babington, et al.	Indiana State University	(P-4)
Fincher, et al.	Ashland University	(P-5)
Hipp, et al.	Ball State University	(P-6)
Darby, et al.	Bowling Green State University	(P-7)

VOLATILE ORGANIC COMPOUNDS MEASURED IN EXHALED BREATH DURING EXERCISE
F. Kramp, G. Notarnicola, J.V. Seeley, C.R.C. Marks. Oakland University, Rochester, MI

The analysis of volatile organic compounds (VOCs) in breath may be associated with several physiological, psychological, and pathological conditions. A recently developed method for measuring VOCs has not been applied to breath collected during exercise. The purpose of this study was to apply dual secondary column comprehensive two-dimensional gas chromatography in identifying co eluting peaks of isoprene and pentane in exhaled air during rest and exercise. Exhaled breath (about 1.5*l*) was collected into a Teflon bag for each of 14 active subjects at rest and then at 35 minutes into stationary cycling at 85% of age predicted maximum heart rate. Two chromatographic readings from each sample were taken. This method was able to separate isoprene and pentane in all subjects and conditions. In addition, this method demonstrated a decreased peak height and total peak area of isoprene in every subject with exercise. Finally, pentane remained stable with exercise in all subjects. It is concluded that isoprene and pentane can bed separated and quantified in exhaled breath during exercise with this method.

BODY MASS AND EXERCISE HEART RATE RESPONSE NOT AFFECT BY WELLNESS/ PREVENTION EDUCATION IN FIRST YEAR MEDICAL STUDENTS
D. Madej, C.R.C. Marks, F. Stransky, B. Goslin, R. Jarski, S. Gorbis, Z. Comeaux. Oakland University, Rochester MI, Michigan State University, Lansing, MI, Ohio University, Athens, OH.

This study tested the hypothesis that wellness/prevention education during the first year of medical education will prevent reduced aerobic fitness and increased body mass/fatness in first year medical students. Two Osteopathic medical schools were identified in the Midwest for study. One school (G1) had lectures and demonstrations on the role of exercise, nutrition, and stress management for the prevention of lifestyle related diseases incorporated into first year courses. The other did not (G2). During the week before classes started (T1) and then nine months later (T2), volunteers (G1 n=52, G2 n=22) underwent a six minute submaximum bicycle ergometer test (power output of first test repeated for second test, heart rate monitored by a Polar) and had body mass, triceps skinfold (TSF) and exercise blood pressure measured. ANOVA, post hoc using dependent and independent t-tests, and $p<.05$ were used for statistical tests on SPSS. Results are reported below as mean (SD):

	HR(b/min)		SBP(mmHg)		DBP(mmHg)		BM(kg)		TSF(mm)	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
G1	147	145	148	141	75	76	70.1	70.3	16.4	16.0
	(7.9)	(13.4)	(17.1)	(22.6)	(9.0)	(11.1)	(13.6)	(12.7)	(7.3)	(6.8)
G2	150	151	165	160	72	70	71.8	73.4	17.2	15.9
	(14.8)	(16.7)	(23.7)	(23.8)	(12.4)	(8.8)	(16.0)	(16.4)	(7.7)	(6.7)

Analysis revealed no significant differences for heart rate and triceps skinfold. In addition, both groups were significantly different for SBP and both significantly different for DBP only at T2. It is concluded that the education had no effect during the first year for these variables.

RELIABILITY AND VALIDITY OF THE BOSCO MECHANICAL POWER JUMP TEST

M. Cohen, P. Babington, J. Skaggs, J. Ozmun, J.E. Edwards. Indiana State University, Terre Haute, IN

The Bosco Mechanical Power Jump Test (BT) is a measure of the mechanical power production of the legs during 15 to 60 seconds of maximal vertical jumping. The reliability and validity of the test have been questioned. Therefore, the purpose of the study was to determine the reliability and validity of the 60 s BT. Twenty-nine college age subjects (18 M/11 F) completed a timed 40 m sprint, 30 second Wingate Anaerobic Test (WAT), and two trials of the 60 s BT on different days. Testing order was randomized to eliminate any effects of testing order. Forty-meter sprint time was measured to the nearest 0.001 seconds using photoelectric cells. WAT was measured on a pan loaded Monarch cycle ergometer with the workload set at 7.5% of body weight. BT was performed on a switch mat interfaced with a PC that recorded the number of jumps, flight time and time in contact with the mat. Subjects performed as many maximal jumps as possible in 60 s while keeping their hands on their hips and bending their knees to approximately 90 degrees when in contact with the mat. Power was calculated from the total number of jumps in 60 s, flight time and time in contact with the mat. Intersession reliability was estimated for the BT using a one-way random effects intraclass correlation (ICC). Concurrent validity was estimated using the 40 m sprint and the WAT as criterion scores. Mean values for the two trials of the BT were 12.64±3.08 and 12.56±3.55 W/kg respectively. ICC estimate for the 60 s BT between sessions was 0.93. Mean values for the 40 m sprint and WAT were 8.941±1.055 s and 7.66±1.13 W/kg respectively. Correlation coefficients between the BT and 40 m sprint and WAT were –0.814 and 0.827 respectively (significant $p \geq 0.0001$). These data suggest that the BT is a reliable measure of mechanical power production of the legs. Furthermore, validity estimates of BT suggest it is similar to other measures of mechanical power reported in the literature.

MEAN ANAEROBIC POWER AND THE ABILITY TO DEMONSTRATE A PLATEAU IN OXYGEN CONSUMPTION

P. Babington, M. Silva, J.E. Edwards, and J. Ozmun. Indiana State University, Terre Haute, IN

Maximal oxygen consumption (VO_{2max}) has traditionally been used as a measure of cardiovascular fitness. The main criterion for determination of VO_{2max} is no further increase in oxygen consumption with an increase in work rate. Not all individuals are able to demonstrate a plateau during a continuous graded exercise test. Perhaps their inability to achieve this plateau is due to insufficient anaerobic capability. Therefore, the purpose of the present study was to investigate whether mean anaerobic power differed between individuals who reach a plateau and those that do not reach a plateau in maximal oxygen consumption during a continuous treadmill graded exercise test. Mean anaerobic power (Bosco Test) and either peak or maximal oxygen consumption were measured in 21 subjects (14 males, 7 females, 22.5±2.7 yrs). Group membership (PLATEAU vs. PEAK) was determined based on the subject's ability to attain a plateau in oxygen consumption (<2.1 ml·kg^{-1}·min^{-1} change in VO_2 with a change in workload). Independent t-tests were used to detect differences between groups. Eleven subjects (5 males, 6 females) met the criteria for membership in PLATEAU. The remaining 10 subjects (9 males, 1 female) comprised PEAK. VO_{2max} did not differ between groups (PLATEAU, 46.16±9.83 vs. PEAK, 53.09±3.98). No differences existed between groups in mean anaerobic power (PLATEAU, 16.22±2.48 W·kg^{-1} vs. PEAK, 17.02±2.92 W·kg^{-1}). The present study suggests there is no difference in mean anaerobic power between individuals who reach a plateau and those that do not reach a plateau in maximal oxygen consumption during a continuous treadmill graded exercise test.

THE EFFECT OF HIGH INTENSITY RESISTANCE TRAINING ON ISOTONIC STRENGTH AMONG COLLEGIATE FOOTBALL PLAYERS

G.D. Fincher II. Ashland University, Ashland, OH

Purpose: The purpose of this study was to examine the effects of a single-set, high intensity resistance training program on isotonic strength among collegiate football players. Methods: Forty healthy, highly resistance trained collegiate football players were randomly assigned to either a single-set, exhaustive high intensity (N=20) or multiple-set (N=20) group. Both groups performed heavy resistance exercise for 10 weeks. The high intensity group performed one set of 6-10 RM to volitional muscular fatigue for each exercise. The subjects were then urged to try additional repetitions until they were unsuccessful in completing a repetition. After this brief isometric contraction the set was terminated. The multiple-set group performed three sets of each exercise at 6-10 RM, but the subjects were not urged to try additional repetitions after volitional muscular fatigue. Isotonic strength data were collected at baseline and at 10 weeks by determining each subject's 1 PM and 10 RM squat and bench press strength. The change in isotonic strength was compared within and between groups. Results: (reported by mean change ± SD): The change in 1 RM squat and bench press strength (42.3 ± 30.1 lbs. And 20.8 ± 12.3 lbs., respectively) in the high intensity group was significant ($p<0.01$). The change in 1 RM squat and bench press strength (3.5 ± 7.3 lbs. And 3.3 ± 5.2 lbs., respectively) in the multiple-set group was also significant ($P<0.05$). The change in 10 RM squat and bench press strength (25.0 ± 13.6 and 19.8 ± 14.6 lbs., respectively) in the high intensity group was significant ($p<0.01$). The change in 10 RM squat and bench press strength (2.5 ± 5.0 and 9.0 ± 22.2 lbs, respectively) in the multiple-set group was also significant ($P<0.05$). The isotonic strength grains were significantly greater in the high intensity group than in the multiple-set group ($p<0.001$). Conclusion: The data from this study indicate that a single-set, exhaustive high intensity resistance training program elicits superior changes in isotonic strength than a multiple-set program among collegiate football players.

THE EFFECT OF ACUTE, HIGH-IMPACT EXERCISE ON BLOOD MARKERS OF BONE METABOLISM IN PRE-PUBERTAL CHILDREN

M.J. Hipp, A.D. Mahon, W.J. Kraemer, J.S. Volek and C.S. Anderson, Human Performance Laboratory, Ball State University, Muncie, IN

The mechanism underlying the exercise training-induced increase in bone density in children is unknown. Therefore, the purpose of this study was to examine the effect of acute, high-impact exercise on blood markers of bone formation (osteocalcin) and bone resorption (linear carboxyterminal telopeptides of type I collagen [Ctx] in pre-pubertal boys (n=4) and girls (n=4) with a mean age of 9.8±0.1 yrs. Physical activity and calcium intake were assessed using questionnaires, and body composition was measured using DEXA. Exercise consisted of five sets of 10 vertical jumps with a 2 minute rest between sets. Blood samples were obtained before and after exercise (24 and 72 hours). Pre- and 24- and 72-hour post-exercise osteocalcin and CTx levels at any time point, however, physical activity tended to correlate with total BMD ($r=0.67$, $P=0.07$). These results suggest that an acute bout of high-impact exercise may not be a sufficient stimulus to augment bone development in pre-pubertal children. Determining the influence of intensity, duration, and mode of exercise on bone development in children warrants further study.

SPECIFICITY OF A MAXIMAL AEROBIC DANCE BENCH STEP PROTOCOL

J.L. Marsh, L.A. Darby, FACSM, P.A. Shewokis, Bowling Green State University, Bowling Green, OH, R. L. Pohlman, Wright State University, Dayton, OH

The concept of "exercise specificity" is based on premise that exercise testing and training should be completed using the same physical activity. Precise physiologic responses to exercise occur by the use of specific muscle groups, biochemical reactions, and neural pathways. Strømme et al. (1977) supported this specificity concept because rowers, cyclists, and skiers completing three different max VO_2 tests did " better " on the max VO_2 test performed while doing the physical activity for which they were trained (i.e., runners > running max

(continued...)

VO_2; skiers > skiing max VO_2). Aerobic dance and step aerobic exercise combine exercises of both arms and legs. It has been estimated that 23 million and 10.8 million exercisers in the U.S. participate in these activities, respectively (SGMA, 1998). Previously, aerobic dance exercisers have completed maximal running tests to examine physiological responses (i.e., HR and VO_2) (Darby et al. 1995; Parker et al., 1989). It is hypothesized that step exercisers may have greater max VO_2 when tested using an activity specific, maximal aerobic dance bench step test (ADBST) (arms and legs) rather than a maximal running test (legs only). Female aerobic dance exercisers (N=18; 20.7±1.5 yrs) performed 3 maximal GXTs: 2 ADBST; 1 treadmill test (TMT). The ADBST consisted of 6, 3-min progressive stages of alternate lead, basic step, basic step with biceps curls, knee raise with pull-down, repeater knee with pull-down, lateral lunge with pull-down, and side squat with shoulder presses. Steps were performed at 32 steps×min^{-1} on an 8" step for stages 1-3, and 10" step for stages 4-6. Peak and max VO_2 (ml×kg^{-1}×min^{-1}), HR (b×min^{-1}), % HR max, % VO_2 max, V_E (l×min^{-1}), V_E/VO_2, RER, total exercise time (TET), and RPEs were recorded at the end of each stage and at volitional exhaustion for each test. Test-retest reliability was examined using one-way ANOVA intraclass correlation coefficients. Reliability was high for each stage between ADBST1 and ADBST2 and for max responses (HR max: $\underline{R}$ = .92; 95% CI =.80-.97;VO_2 max: $\underline{R}$ = .98; 95%CI =.95-.99. To test the specificity of the ADBST to the TMT, paired t-tests were calculated for max HR and max VO_2. A significant difference was found for max HR [t=-8.21p = .0001, f = -1.90, 1-b=.99]. No significant difference was found for VO_2 max [t=1.54, p = .14, f = .36, 1-b=.44]. It was concluded that the ADBST was both a valid and reliable protocol for assessing cardiorespiratory responses in these aerobic dance step exercisers and that max HR obtained from the criterion TMT was lower than from the ADBST. When training HR is prescribed from TMT HR max, HR is underestimated by 5-7 b×min^{-1} (i.e., ~2 ml×kg^{-1}min^{-1}) for aerobic dance bench step exercise. However, the necessity of using an "exercise specific" ADBST protocol for testing step exercisers warrants further study.

SYMPOSIUM

2:00 - 3:30 pm

RESISTANCE TRAINING FOR THE ELDERLY

Bruce W. Craig, David Wright, and Chris Fick, Human Performance Laboratory, Ball State University, Muncie, IN 47306

Rationale: There is general agreement in the literature that the decline in muscle strength the elderly experience is directly linked to a progressive loss in muscle mass. Resistance training has been shown to be an effective way to attenuate muscle loss, and is currently used in older populations to enhance muscle mass and strength. Although the ACSM position statement for Exercise and Physical Activity for Older Adults does include a section on strength training it does not contain specific guidelines. This has led to the development of exercise programs in which experience and a trial and error system has been used to establish workouts.

Purpose: Resistance training programs for the elderly are based on training techniques that have been established for young subjects. In most cases the techniques are modified to fit the older subject but have rarely been tested for effectiveness. Therefore, the purpose of this symposium will be to present the current information concerning aging and training techniques in an effort to develop some basic guidelines for the elderly.

Objective: The specific goal of this symposium will be to establish some basic guidelines for strength training in older adults. To accomplish this task the first two speakers will present a brief overview of the muscular changes that occur with age, and the current principles of strength training. The information they present will then be used in the third presentation to engage the audience in an exchange of ideas that will hopefully produce agreement on appropriate techniques for the elderly.

PHYSICIAN CASE PRESENTATIONS

2:00 - 3:00 pm

THIGH PAIN IN COLLEGE FEMALE SOCCER PLAYER

D. Mattern. The Ohio State University, Columbus, OH 43221

An 18-year-old college female soccer player presented to the training room with a complaint of left "quadriceps" pain. Initial onset was insidious, 3 weeks ago, after a training run in an area park. She had been working with the athletic training staff since that time with a presumed diagnosis of a muscle strain. The patient described the pain as deep and more like an ache. She also stated that "nothing seemed to stretch it." She also admitted that her right leg was now starting to hurt and her performance was beginning to suffer as a result of her pain. There was only one game left in the season.

She denied any history of trauma and no previous injury to either leg. She denied any other aches of pains and was not rehabilitating any other injury. She had no medical problems and was not on any medications (OTC or prescription). Her menses occurred regularly every 30 days, she ate a normal diet, and there was no family history of osteoporosis. Her preseason workouts consisted of swimming, biking, and running on a daily basis.

On physical exam, gait was normal, there was no deficit, swelling, tenderness with palpation or ecchymosis to the quadriceps muscles, and there was no asymmetry. Her strength was 5/5 and equal bilaterally. She did have vague pain in the left thigh with resisted hip flexion and adduction. Pubic symphysis was non-tender and she had a normal back exam.

Differential diagnoses included: muscle strain, stress reaction, stress fracture, referred hip pain, or referred pain from disc pathology.

Tests and Results: Because the athlete's pain had been present for only three weeks, a three phase bone scan was obtained. There was increased uptake in the mid shaft of the left femur, medially, compatible with a stress fracture. There was also slightly increased uptake in the right femur at the junction of the proximal and mid thirds. This was felt to be compatible with an early stress fracture. Plain films were obtained for correlation. The femurs were normal an no fractures or lytic lesions were identified. There was an ill-defined cloud-like calcification on the lateral aspect of the proximal femoral shaft of both femurs, measuring 10 cm on the left and 9cm on the right. The calcifications were felt to be consistent with the appearance of myositis ossificans post-traumatica.

The patient was given a diagnosis of bilateral femur stress fractures and her activities were immediately halted. She was given crutches for the initial 2 weeks and was recommended to limit her ambulation. She was provided a bone stimulator which was to be worn for 3 hours a day on each fracture site for a minimum of 2 months. At 1 month post-diagnosis, she was ambulating without crutches and without pain. At 2 months, she began a supervised exercise program as well as physical therapy. Her rehabilitation included aggressive stretching and strengthening of the lateral thigh structures. She gradually progressed into full activity and returned to competitive soccer in January.

MEDIAL FOOT PAIN IN A COLLEGIATE FOOTBALL PLAYER

D.L. Bright. The Ohio State University, Columbus, OH 43221

Purpose: The purpose of this presentation is to review an important cause of medial foot pain in a young athletic individual.

History: This case presents an 18-year-old male football player who had a three-day history of increasing medial pain foot pain. While he was participating in conditioning drills 3 days earlier, he gradually developed pain on the medial aspect of his right foot. He was unable to recall any acute injury but believes he may have everted the foot while running. The pain had progressively become more severe and he was unable to ambulate without discomfort. The pain was described as a dull ache, becoming sharp with weight bearing activities. He denied any history of prior ankle injury or similar discomfort in either foot.

(continued...)

Physical: Clinical examination of the bilateral lower extremity did not reveal any obvious deformity, swelling, or erythema. He had normal and symmetric active range of motion in both ankles. He reported some discomfort with resisted internal rotation, plantar flexion, and dorsiflexion. There was a bony prominence over the medial surface of the tarsal navicular. This palpable protuberance was very tender to palpation. Note was made of a similar prominence on the unaffected left foot which was not tender to palpation. There was no other bony tenderness. Compression of the forefoot did not cause any discomfort.

SYMPOSIUM

3:30 - 5:00 pm

IMMUNITY CHALLENGE: DEMYSTIFYING EXERCISE IMMUNOLOGY
Michael G. Flynn, PhD, FACSM; Kyle Timmerman, BS; Liu Jing, BS; Laura K. Stewary, MS; Brian K. McFarlin, MS

Purpose – The purpose of this symposium/tutorial will be to summarize the recent research in exercise immunology. We will employ a "light-hearted" presentation style with the information geared to the student/ professional with a rudimentary knowledge of immunology. We will use a "Survivor" theme and several catch phrases from the popular television broadcast to help us capture the imagination and enthusiasm of the audience and to help us to meet our goals – keep it fun, make it understandable and informative.

Objectives – Our primary objective will be to present information to the audience in a fun and familiar context, in the hope that it will make the material less intimidating and easier to understand. Each speaker will provide a concise summary and "take-home message" at the conclusion of their presentation and will endeavor to present material that is relevant to a general audience. Dr. Flynn will introduce the session, introduce each speaker and provide closing remarks. Each of the speakers, a Purdue graduate student, has been given an "immunity challenge" – make the material in their presentation understandable, interesting and applicable.

Rationale – Exercise Immunology is viewed by some as an unpleasant, difficult to understand area of study. The immune system is indeed redundant and complex and it is often difficult to untangle the sizable "web of research" that has been woven in less than two decades. Exercise immunology has grown substantially and researchers are beginning to provide information that has a broad appeal. :Thus, we will endeavor to present information that shows both the practical applications of the research and the astounding potential for continued study and growth in the area.

KEYNOTE ADDRESS

5:00 - 6:00 pm

Revisiting the Significance of Oxidants and Antioxidants

CHANDAN SEN, PH.D., FACSM
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Asst. Prof. of Surgery and Molecular & Cellular Biochemistry
Faculty, Molecular and Cell Developmental Biology
Director, DNA Microarray and Genetics Facility, Heart and Lung Research Institute
Chair, Committee of Graduate Studies, Department of Surgery
Co-chair, Committee of Research, Department of Surgery
Vice-Chairman of Research, Department of Surgery
Director of Research, OSU Center for Minimally Invasive Surgery

Several studies have consistently shown that exhaustive exercise results in increased production of reactive oxygen species (ROS) and oxidative stress (1-7). ROS are implicated in the pathogenesis of a wide variety of human diseases. Recent evidence suggests that at moderately high concentrations ROS such as H_2O_2 may act as signal transduction messengers (7-14). To develop a better understanding of the exact mechanisms that underlie ROS dependent disorders in biological systems, recent studies have been directed to investigate the regulation of gene expression by oxidants, antioxidants and other determinants of the intracellular reduction-oxidation (redox) state. The efficacy of different antioxidants to favourably influence the redox sensitive molecular mechanisms that are implicated in human disease should be a critical determinant of their therapeutic importance.

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SYMPOSIUM

9:00 - 10:30 am

ARTHROGENIC MUSCLE INHIBITION: IMPLICATIONS AND INTERVENTIONS IN JOINT INJURY

J. Ty Hopkins, PhD, ATC; Christopher Ingersoll, PhD, ATC, FACSM; B. Andrew Kraise, MS, ATC; Riann Palmieri, MS, ATC

Arthrogenic muscle inhibition (AMI) is a presynaptic, ongoing reflex inhibition of joint musculsature following distension or damage to the joint. Musculature surrounding the injured joint is inhibited, even though it is not damaged. This neuromuscular response results in deficits in strength, neuromuscular control, and a greater susceptibility to re-injury. AMI is a natural response designed to protect the joint from further damage. However, if the affected joint can be protected from further damage, active exercise can be employed to expedite the rehabilitation process. The purpose of this symposium is to discuss the implications of AMI specific to ankle and knee injury, interventions that may be used to reduce the negative effects of AMI, and future directions in AMI research. We will discuss an injury model that has been used to examine changes in the motoneuron pools of joint musculature, what changes those are, and what it means to the injured athlete. We will share data regarding the effects of a few interventions, including cryotherapy, on AMI. Finally, we will discuss some of the many questions that have been raised by these data, and what directions may be taken in the future.

SYMPOSIUM

9:00 - 10:30 am

EXERCISE BEHAVIOR CHANGE FROM THE INSIDE OUT

Jay Kimiecik, PhD, Miami University, Oxford, OH

This tutorial will introduce the idea that many mainstream approaches (Outside in) to motivating physically inactive people to exercise regularly do not match what is known about why and how people develop and maintain a physically active lifestyle (Inside out). Traditional Outside-In approaches will be critiqued and then three principles for effective behavior change programs will be presented: 1) Psychoemotional effect on change, 2) Intrinsic mindset shift for change, and 3) One to one to change. These three principles form the core of an Inside Out approach to exercise behavior change. Each principle will be presented and explained as well as how the inside out approach can – and has – been implemented as a YMCA of the USA exercise behavior change program. The tutorial will attempt to use humor whenever possible, includes video clips, and will contain audience interaction and discussion.

ORAL ABSTRACT PRESENTATIONS

9:00 - 10:30 am

9:00 - 9:15 am

A SINGLE DOSE OF *GINKGO BILOBA* DOES NOT AFFECT SOLEUS MOTONEURON POOL EXCITABILITY.

M.B. Stone, M.A. Vaughan, C.D. Ingersoll FACSM, J.E. Edwards, J.P. Babington, R.M. Palmieri, M.L. Cordova FACSM, B.A. Krause. Indiana State University, Terre Haute, IN

Ginkgo biloba (Gb) improves cognitive function in previously impaired subjects. If, as some suggest, choli-

nesterase inhibition is the mechanism by which cognitive function is improved we may also observe excitatory effects in the neuromuscular system. These effects would be manifested by changes in motoneuron pool excitability. The Hoffmann reflex (H-reflex) to Motor Response (M-response) ratio is an accepted method of measuring motoneuron pool excitability. Purpose: The purpose of this study was to determine if a single dose of *Gb* affects motoneuron pool excitability of the soleus muscle as measured by the H-reflex to M-response ratio (H:M). Methods: Initial soleus H:M were recorded from twenty healthy volunteers (6 male, 14 female; age: 22±3 y; height: 168±8 cm; mass: 65±8 kg). Subjects were then randomly assigned to one of three groups: control, placebo, or *Gb*. Control received no treatment, placebo received 180 g cellulose, and *Gb* received 180 g *Gb*. Placebo and *Gb* were administered in a double-blind manner. Max H and max M were then recorded 1, 2, and 3 h post-treatment. A 3 X 4 repeated measures ANOVA was used to analyze differences in H:M. Results: No differences were observed between treatments ($F_{2, 19} = 0.29$; $p=0.75$) or over time ($F_{3, 19} = 1.69$, $p=0.17$). Nor was there a treatment by time interaction ($F_{6, 57} = 1.31$, $p=0.27$). Conclusions: A single dose of 180 g of *Gb* does not affect soleus motoneuron pool excitability. Perhaps, to observe *Gb's* potential cholinesterase inhibitory effects in the neuromuscular system a longer, increased dosing schedule may be necessary.

9:15 - 9:30 am

POST EXERCISE METABOLIC RATE FOLLOWING DOWNHILL RUNNING

K.-S. Park, D.A. Sedlock, FACSM, J.W. Navalta, J. Andrews. Purdue University, West Lafayette, IN

A bout of eccentric exercise produces muscle damage and delayed onset muscle soreness (DOMS), the latter of which usually peaks approximately 24-48 h postexercise. It is also known that both muscle damage and DOMS are attenuated following a subsequent eccentric exercise bout. The purpose of this study was to investigate whether excess postexercise oxygen consumption (EPOC) measured for 1h and resting metabolic rate (RMR) measured up to 48h post-exercise would differ following level vs. downhill treadmill running. Seven untrained male volunteers (mean ±SD: age (yr)=25.6±2.3, ht (cm)=167±28, wt (kg)=75.8±12.5) performed a VO_{2max} test and three 40 min submaximal exercise trials eliciting ~70-75%VO_{2max}: a level running trial and two downhill running trials (DH1 and DH2). All testing took place early in the morning following an overnight fast and no strenuous exercise during the previous 36 h. For each trial, VO_2 was measured for 30 min prior to exercise (baseline RMR-day 1), during the 40 min exercise, for 60 min immediately following exercise (EPOC), and for 30 min at 24h (RMR-day 2) and 48h (RMR-day3) post exercise. The level running trial was performed first, DH1 was performed one wk later, and DH2 occurred 2 wk following DH1. Two downhill running trials were performed to investigate whether muscle damage affected post exercise metabolic rate. DOMS was rated for five lower body sites (buttocks, front of thigh, back of thigh, shin, and calf) at 24 h and 48h post exercise using a scale ranging from 1 to 6 (Rodenburg et al., 1993). One-way and two-way repeated measures ANOVA and Tukey post hoc tests were used for data analysis. There was no significant difference in EPOC among the trials (level=296±33, DH1=301±30, and DH2=292±28 ml/kg/60 min). However, VO_2 averaged over the last three min of the 60 min EPOC period was significantly elevated above baseline for the DH1 (3.4±.4 vs. 4.4±.5, $p<.0001$) and DH2 (3.3±.2 vs. 3.9±.3, $p<.005$) trials, but not the level trial (3.5±.3 vs. 3.8±.4 ml/kg/min, $p>.05$). RMR did not significantly differ among days 1, 2, and 3 of each trial, nor among the three trials. Downhill running produced significantly greater DOMS than level running ($p<.01$). It can be concluded that 40 min of downhill running at a moderately high intensity, which produced a significant amount of DOMS (and likely muscle damage), resulted in a prolonged EPOC (>1h). However, an elevated metabolic rate was not detected 24 or 48 h following exercise when DOMS was evident. In contrast, metabolic rate returned to the resting value within 1 h after running on a level grade. The physiological mechanisms involved in producing a prolonged elevation in metabolic rate following downhill running remain to be elucidated.

9:30 - 9:45 am

COMPARISON OF TWO METHODS FOR PREDICTING VO_{2max} IN ADOLESCENT BOYS WITH HIGH AND LOW LEVELS OF POHYSICAL ACTIVITY

J.W. Navalta, D.A. Sedlock, FACSM, C.M. Weaver, M. Kern, K.-S. Park, L.K. Stewart, K.L. Timmerman, J. Petitte. Purdue University, West Lafayette, IN

This study compared two methods for predicting maximal oxygen uptake (VO_{2max}) in adolescent boys with different levels of physical activity (PA). The Godin Leisure-Time Exercise Questionnaire (Godin and Shephard, 1985) was administered to 41 boys who were part of a larger research project investigating calcium retention.

They were then categorized into quartiles based on their PA score. Those who scored in the upper (X±SE score=131.2±8.2) quartile (UG; n=10, ht=164±3 cm, wt=59±6 kg, age=13±0.3) and lower (score=46.6±2.8) quartile (LQ; n=10, ht=170±3 cm, wt=72±7 kg, age=13±0.2) completed a PWC_{170} test using a mechanically-braked cycle ergometer. Initial work rate was 25W (50 rpm) with 25W with increases every 3 min. Heart rate (HR) was recorded at the end of each min and the test was terminated after completion of the work rate in which HR reached 170 b min^{-1}. The work rate then was used in the equation of Rowland et al. (1993) to estimate VO_{2max}. For the second method (MET), regression equations developed using HR and VO_2 values were used to predict VO_{2max} based on estimated HR_{max} (220-age). Data were analyzed using t-tests, a 2 (quartile) x 2 (method) mixed factorial ANOVA, and Pearson product-moment correlation coefficients (α=0.05). Results show that LQ was significantly taller (p=.05) but not heavier than UQ. PWC_{170} was similar between UQ (102±13 W) and LQ (104±13 W). VO_{2max} was significantly higher (p<.01) when predicted from PWC than from MET for both UQ (PWC=48±1, MET=42±2 $ml \cdot kg^{-1} \cdot min^{-1}$) and LQ (PWC=47±1, MET=36±2 $ml \cdot kg^{-1} \cdot min^{-1}$). Estimated VO_{2max} values using the two different methods were not significantly correlated (r=.40, p=.08). Adolescent boys with a relatively low physical activity level had a physical work capacity at HR-170 b min^{-1} similar to those who were relatively active. This finding suggests that although classified as having a relatively low level of physical activity, these boys manifest certain submaximal physiological responses similar to those who are more highly active. The PWC and MET methods used in this study yielded VO_{2max} values that were neither statistically similar nor significantly correlated. Predicting VO_{2max} in adolescent males may be somewhat difficult perhaps due to differences in physical maturation level. Therefore, caution should be exercised when selecting an equation to predict VO_{2max} in this population. Much more research is needed regarding validation of equations used to predict VO_{2max} in adolescents.

9:45 - 10:00 am

TOTAL BODY VOLUME ASSESSMENT WITHOUT LUNG VOLUME CORRECTION FROM DUAL DIGITAL-0PHOTOGRAPH ANTHROPOMETRY

R.P. Mikat, University of Wisconsin-La Crosse, La Crosse, WI

Duel digital-photograph anthropometry (DDPA) is a new development of potential value in the assessment of human total body volume (TBV), body composition and circumference measurement. Initial research with this method used lung volume assessments [functional residual capacity (FRC)] when creating regression formulas for the prediction of TBV. The purpose of this investigation was to assess the need for inclusion of FRC measurements in TBV regression formulas. Healthy female adults (n=18) (age 22 to 51) were evaluated for TBV by DDPA and hydrodensitometry from a single tester. FRC was measured using an oxygen dilution method. Results of regression analyses both with and without FRC are presented in the table below.

	R	R^2	SEE	TE
DDPA	0.00	0.98	1.57 Liters	1.66 Liters
DDPA and FRC	0.99	0.99	1.45 Liters	1.59 Liters

Results from stepwise linear regression analysis indicate that the inclusion of FRC calculations do not significantly improve predictions of TBV when using DDPA. Exclusion of lung volume assessments from the DDPA protocol will substantially reduce the cost and time of testing while making the evaluations more comfortable and convenient for subjects.

10:00 - 10:15 am

THE HORMONAL EFFECTS OF ACUTE ANDROSTENEDIONE SUPPLEMENTATION IN ELDERLY MEN.

B.W. Craig, D. Biggs, C. Fick, D. Wright, and K. Lim. The Human Performance Laboratory, Ball State University, Muncie, IN 47306

The purpose of this investigation was to determine if the acute androstenedione supplementation in elderly subjects could alter testosterone and estradiol responses. The subjects were elderly males who were separated into androstenedione (ANRO) and placebo (PLC) groups with a mean age ± SE of 62.3 ± 2.6 and 60.2 ± 1.0 yrs respectively. The BMI of the two groups was 26.5 ± 1.4 and 25.0 ± 1.6 respectfully. The subjects were tested af-

ter a 12 hr fast and a 21 Ga Teflon catheter was established in an antecubital vein prior to exercise. The subjects warmed-up and stretched for 10 minutes, and then were seated on a leg extension (Paramount) machine that was set at their pre-determined 10 RM. A 5 ml pre-exercise blood sample was taken and they performed 3 sets of 10 repetitions. They rested 1 minute between sets, and for 2 minutes following exercise and then moved to a leg curl machine (Paramount) and repeated the exercise routine. A 5 ml blood samples was taken before they moved and at 5, 15, 30, 45, and 60 minutes following the leg curl exercise. These tests were repeated after 7 days of ANDRO (300 mg/day) or PLC (cellulose) supplementation. From the 5th to the 7th day of supplementation the subject repeated a 2 day pre-supplement diet they recorded prior to testing. Androstenedione supplementation (300 mg/day) significantly elevated serum testosterone in the treated subjects, being 4.4 ± 0.6 pre- and 6.7 ± 0.6 post-supplement. The pre- to post supplement differences of the ANDRO group decreased slightly, going from a 44% to 29% difference from the 5 to 60-min. post-exercise measurements. The pre- to post-values for the PLC were the same. The ANDO treatment group also showed a sharp increase in estraviol levels after 7 days of treatment in some but not all of the subjects.

10:15 - 10:30 am

CHANGES IN GENE EXPRESSION FOLLOWING CONTRACTION-INDUCED INJURY IN MICE USING MICROARRAY ANALYSIS

S.J. McGregor, T.J. Koh, S.V. Brooks, F.X. Pizza, University of Toledo, Toledo, OH and The University of Michigan, Ann Arbor, MI

Purpose: To characterize changes in gene expression following contraction-induced injury using microarray analysis. *Methods:* Six C57B/6 mice (3-4 mo of age, 27.78 ± 3.31 g) performed 75 lengthening contractions of the extensor digitorum longus (EDL) while anesthetized. The EDL was excised from ambulatory controls (n=3) and experimental animals 6 (n=3) and 72 h (n=3) after the contraction protocol. Pooled samples of ^{33}P-dATP radiolabeled cDNA derived from the EDLs were hybridized to membrane arrays consisting of 1185 named genes from the mouse genome. Genes elevated, on average, more than 2 fold, or decreased 50%, on triplicate arrays were clustered using k-means analysis. *Results*: 127 genes were up-regulated 2 fold, and 7 genes were down-regulated 50% or more relative to control at 6 or 72 h. K-means analysis revealed, 4 up-regulated and 3 down-regulated clusters based on similarities in patterns of changes in gene expression. Cluster 1 and 2, elevated at 6 and 72 h, contained, contained primarily immediate early genes (IEG), heat shock proteins (HSP), and genes associated with inflammation. Interestingly, IEGs elevated at 6 h consisted of genes related to both growth (c-fos, jun, EGR-1) and differentiation (BTG-2, Tob) indicating these contrasting physiological processes are initiated early in recovery from muscle injury. Clusters 3 and 4 contained genes that were not elevated at 6 h, but expressed at least 2 fold at 72 h. These clusters included genes relating to growth (c-myc), differentiation (myogenin), inflammation (clusterin, osteopontin), DNA repair (RAD23) and structural components (vimentin, integrinα7). Elevated expression of genes for DNA repair may be indicative of impairment of proliferating cells, such as activated muscle precursor cells, as the cell-cycle may not progress until DNA repair is complete. Genes down-regulated at 6 h, but returned to baseline at 72 h (cluster 76; yin yang 1, nuclear factor-1B) were indicative of elevated retinoblastoma product (pRb) activity associated with differentiation. Cluster 7 contained genes (SOX4, WSB-2) related to immune function that were reduced greater than 50% at 6 h, but were not decreased at 72 h. *Conclusion:* Microarray technology, in conjunction with cluster analysis, identifies seven patterns of gene expression that begin to elucidate complex molecular events following contraction-induced injury.

Supported by NIH grant AR47599-01

10:30 - 10:45 am

THE EFFECTS OF PHOSPHOLIPASE C INHIBITION ON INSULIN STIMULATED GLUCOSE UPTAKE IN FAST TWITCH SKELETAL MUSCLE.

D.C. Wright, B.W. Craig, B.R. Barnes, K.L. Lim. Human Performance Laboratory, Ball State University, Muncie, IN 47306.

The insulin-signaling pathway in skeletal muscle has not been fully elucidated. Previous research from our laboratory has demonstrated that phospholipase C (PLC) inhibition in slow twitch rat skeletal muscle leads to a

significant decrease (35%) in insulin stimulated glucose uptake suggesting that PLC may in part mediate insulin stimulated glucose uptake. The purpose of the current investigation was to determine if a similar relationship between PLC inhibition and glucose uptake is present in fast twitch skeletal muscle. Male Wistar rats (200-250 grams) were anesthetized and the extensor digitorum longus (EDL) muscle split *in situ* and clamped at their resting length. Muscles were removed and sealed in oxygenated vials containing Krebs-Henseleit buffer, BSA, 2mM pyruvate and 18 mM mannitol and incubated in a shaking water bath (37°C, 60 cycles/min). Muscles were then incubated in the presence of 4mM glucose and the absence or presence of 100 μU/ml insulin and/or the PLC inhibitor U73122 (50 μM). Following a 10 minute rinse the muscles were incubated in [^{3}H]-3-*O*- methylglucose and [^{14}C] mannitol (to correct for extracellular space) and the given experimental condition for 10 minutes. Following the final incubation muscles were quick frozen in liquid nitrogen (-70°C), digested in 1N NaOH and glucose uptake determined by liquid scintillation counting. Insulin (i) stimulation led to a 225% increase in glucose uptake compared to basal (b) (3.52 ± 0.64 i, 1.57 ± 0.097 b μmol/ml/hr). PLC inhibition did not impact basal glucose uptake. However, the addition of U73122 to the incubation medium caused a 21% attenuation of insulin stimulated glucose uptake (3.52 ± 0.64 vs. 2.78 ± 0.53 μmol/ml/hr). The results of the current investigation demonstrate that PLC in part mediates insulin stimulated glucose uptake in fast twitch skeletal muscle though to a lesser degree than in slow twitch muscle. Further research examining the molecular intermediates involved in PLC activation and insulin signaling is needed to further clarify this relationship.

TUTORIAL

9:30 - 10:30 am

MAGNETS AND MEDICINE: WHAT'S THE ATTRACTION?

Elaine Filusch Betts, PhD, PT, FACSM

Rationale: Magnets have been used in medicine for many years in Eastern Europe, but have only recently gained attention in the United States. Numerous companies now market devices containing static magnets for use in various medical conditions, but provide limited information regarding the scientific basis for appropriate use.

Purpose: This tutorial is designed to educate the audience on the science of magnet use and the evidence for clinical application. The attendee will hear a brief history of magnet use in medicine, an overview of scientific studies involving static magnet usage, and learn the implications for the clinical use of magnets.

After attending this tutorial, the listener will:

1. understand the basic science underlying magnetism,
2. be familiar with the various types of magnets currently used in medicine,
3. be familiar with basic studies evaluating the efficacy of static magnet use,
4. understand the rationale for the application of static magnets in clinical conditions.

AMERICAN COLLEGE of SPORTS MEDICINE

Midwest Regional Chapter

2000 Annual Meeting Program

AMWAY GRAND PLAZA® HOTEL

Grand Rapids, MI
October 5-7, 2000

September 1, 2000

Dear Delegate to the Midwest American College of Sports Medicine:

I am pleased to extend a warm welcome to you. While you are here at the Midwest American College of Sports Medicine Meeting, you have the opportunity to experience first-hand why Grand Rapids is Michigan's fastest growing visitor destination and a favorite convention venue.

Our community has added more than $200 million in new cultural, recreational and sports facilities in the past few years. We are fortunate to have superb four-star accommodations immediately adjacent to our convention center. The hotel has an outstanding fitness center and for those who like to exercise outdoors, a run along the riverwalk adjacent to the Grand River is as easy as stepping out of your hotel.

Downtown has four excellent museums and you are here at an opportune time to take advantage of two special exhibitions. The Gerald R. Ford Museum is featuring *The World of Lewis and Clark* where visitors experience the surprises of the first trek across America. *Unending Frontier: Art of the West* at the Grand Rapids Art Museum is featuring art of the American West from its historical beginnings to the present day.

Just ten minutes from downtown is the Frederik Meijer Gardens & Sculpture Park, home to the largest tropical conservatory in the state. The Garden's new sculpture galleries have just opened with the dramatic works of renowned African American sculptor Richard Hunt.

Grand Rapids also has plenty of sports action. The highly anticipated Rees Jones-designed Thousand Oaks Golf Club is now open and another 20 outstanding courses are available nearby as well.

I hope that you and your family consider extending your stay through Sunday to truly take advantage of all the exciting options that Grand Rapids has to offer.

When you return home, check out our web site at *visitgrandrapids.org* to discover all of the activities that are available to you. With all that Grand Rapids has to offer, I'm confident that you'll enjoy your stay and we look forward to your return.

Sincerely,

Steve Wilson

Steve Wilson
President, Grand Rapids/Kent County Convention & Visitors Bureau

P.S. Stop by one of our helpful Visitor Information Centers, at 140 Monroe Center (just one block from the hotel/convention center), or at Gerald R. Ford International Airport.

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MWACSM Annual Meeting
October 5-7, 2000
Amway Grand Plaza
Grand Rapids, MI

Welcome to the 2000 Annual meeting of the Midwest Regional Chapter of the American College of Sports Medicine. The Site Selection and Program Planning Committees have arranged an outstanding meeting at an wonderful facility. The meeting program is diverse and offers a wide array of scientific and clinical sessions. We have also tried to organize social events to promote collegiality among the attendees including refreshment breaks each afternoon, a luncheon banquet on Friday and a continental breakfast as part of the student forum scheduled for Saturday morning. Highlights of the program include keynote addresses by Dr. Larry Armstrong from the University of Connecticut and Dr. Ed Coyle from the University of Texas at Austin. In addition there are a myriad of symposia and tutorial session, three oral presentation sessions and three poster presentations session. In addition there will be a special tutorial program on Saturday (in the Pearl Room) that is free to the attendees of the MWACSM meeting.

On behalf of the Chapter, thanks very much for your attendance at this year's meeting. I encourage you to take advantage of all programs and activities which have been planned.

Sincerely,

Anthony D. Mahon, Ph.D.
Program Planning Chair

Program Acknowledgments

The following individuals have played an integral role in the planning of this year's meeting. Their willingness to give their time and effort to organizing the facilities and planning the sessions is greatly appreciated.

Site Selection Committee
Anthony D. Mahon, Ph.D.
Lynn Millar, P.T., Ph.D.
Darlene Sedlock, Ph.D.

Program Planning Committee
Jeffrey J. Betts, Ph.D.
Anthony D. Mahon, Ph.D.
Lynn Millar, P.T., Ph.D.

Registration
Timothy Kirby, Ph.D.

Abstract Review Committee
John Buckwalter, Ph.D.
Kathy Little, Ph.D.
Darlene Sedlock, Ph.D.

Student Forum
Audra Newcombe

Physician Case Presentations
Robert Baker, M.D.
Sandra Hoffmann, M.D.
Dan Ostlie, M.D.
Dilip Patel, M.D.

Special Tutorial Event
Brenda Reeves, Ph.D.

Continuing Education Credits
Helaine Alessio, Ph.D.
Anthony D. Mahon, Ph.D.

Program Sponsors

The Midwest Regional Chapter of the ACSM would like to acknowledge the generous financial support of the following organizations:

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Program Schedule
2000 Annual Meeting

Thursday, October 5

Time	*Event*	*Room*
12:00-4:00 pm:	Registration	North Concourse
1:00-4:00 pm:	Poster Presentations (Authors Present/Snacks 3:00-4:00 pm)	Vandenburg
1:00-3:00 pm:	Exercise Response and Prescription in Clinical Populations Symposium	Robinson
2:00-3:15 pm:	Oral Presentations	Pantland
4:00-5:00 pm:	Gatorade Keynote Lecture - Cardiovascular Responses to Prolonged Exercise: New Perspectives, Ed Coyle, Ph.D., FACSM	Pantland

Friday, October 6

8:00 am-4:00 pm:	Registration	North Concourse
8:30-9:30 am:	Contagious Diseases in Sports Symposium	Robinson
9:00-10:30 am:	Oral Presentations	Vandenburg A
9:00-10:00 am:	ACSM's New Guidelines for Exercise Testing and Prescription Colloquium	Vandenburg B
10:00-11:30 am:	Dietary and Herbal Supplements Symposium	Robinson
10:00-11:30 am:	Strength Training in Older Adults Symposium	Vandenburg B
12:00-2:00 pm:	Luncheon Banquet - Chris Meehan, Guest Speaker and Business Meeting	Pantland
1:30-4:30 pm:	Poster Presentations (Authors Present/Snacks 3:30-4:30 pm)	Vandenburg
2:00-3:00 pm:	What Controls Glucose Uptake in Skeletal Muscle Symposium	Robinson
2:00-4:00 pm:	Physician Case Presentations	Campau
4:30-5:30 pm:	Keynote Lecture: Unique Responses and Adaptations to Earth's Varied Environmental Stressors, Larry Armstrong, Ph.D., FACSM	Pantland

Saturday, October 7

8:00-11:00 am:	Registration	North Concourse
8:00-9:00 am:	Student Forum with Breakfast	Pres. Ford Room
9:00-10:00 am:	Oral Presentations	Vandenburg A
9:00 -10:00 am:	Using RPE for Exercise Prescription Symposium	Robinson
9:00-11:30 am:	Poster Presentations	Pres. Ford Room
9:00 am -12:00 pm:	Marketable Skills in the Fitness Industry	Pearl Room
10:00-11:30 am:	Exercise in the Management of IDDM and NIDDM Tutorial	Vandenburg B

The Lyon Room will serve as a speaker ready room.

Symposium
Thursday, October 5, 2000
1:00-3:00 pm

EXERCISE RESPONSE AND PRESCRIPTION IN CLINICAL POPULATIONS
Lynn Millar, Ph.D., P.T., Chair

The purpose of this symposium is to address research on exercise in some special populations and practical information regarding exercise prescription for each population. Three populations will be addressed: those with multiple sclerosis, stroke ,or mental retardation. These special populations are not commonly addressed in exercise prescription guidelines, but may be encountered by those working in large centers and more diverse populations. The presenters will not only address some of the current research pertinent to exercise for each group, but will also discuss clinical correlates of each disease, and precautions and contraindications to exercise. Practical tips and exercise examples will complete each presentation.

Objectives of this program are to briefly review current research related to the disease and exercise, but more importantly, for the participants to learn some of the concerns they should address when testing and designing exercise programs for these individuals. It is the objective of these presenters that the participants come away with practical information regarding exercise prescription for individuals in these populations.

This symposium will be aimed toward graduate level students, with a mixture of review and new information, blended with the presenters' individual experience. Exercise Response and Prescription in Clinical Populations

Presenters
Janet Mulcare, Ph.D., Andrews University - Dayton
Exercise response and prescription for individuals with Multiple Sclerosis

Kurt Jackson, M.P.T., Andrews University - Dayton
Exercise response and prescription for individuals with CVA

Lynn Millar, Ph.D., P.T., Andrews University
Exercise response and prescription for individuals with mental retardation

Oral Research Presentations
Thursday, October 5, 2000

2:00-2:15 pm:

FIBRINOLYTIC RESPONSE TO HIGH AND LOW-INTENSITY EXERCISE

J.M. Rasmussen, D.G. Vickers, C.M. Paton, P.J. Osmond, G.L. Davis, and C.J. Womack, FACSM. Michigan State University, East Lansing, MI 48824.

Fibrinolysis, the capacity to lyse inappropriate or excessive clot, increases during exercise. This response protects against atherothrombotic events and is related to both exercise intensity and duration. The purpose of the present study was to compare fibrinolytic response to high-intensity exercise versus long-duration, equicaloric low-intensity exercise. Ten healthy males (mean age = 26.6 ± 3.9 years, mean weight = 78.2 ± 12.3 kg, mean height = 177.7 ± 6.7 cm) were evaluated during two constant-load exercise tests on a cycle ergometer. The high-intensity test (HIT) was performed for 20 minutes at an intensity above lactate threshold (LT). During the low-intensity test (LIT), subjects exercised at 90% of LT until caloric expenditure was equivalent to the HIT (mean duration = 39.2 ± 4.3 min). Immediately before, immediately after, and one hour after exercise, fasting blood samples were obtained. Plasma from samples was analyzed for tissue plasminogen activator (tPA), which increases fibrinolytic activity, and plasminogen activator inhibitor-1 (PAI-1), the main circulating inhibtor of tPA. Changes in tPA and PAI-1 were assessed using a two-factor repeated measures analysis of variance (RMANOVA). Plasma PAI-1 activity significantly ($P < 0.05$) decreased during HIT (pre-exercise = 16.1 ± 1.7 AU/ml, post-exercise = 10.7 ± 2.4 AU/ml), but not during LIT (pre-exercise = 15.6 ± 1.8 AU/ml, post-exercise = 13.3 ± 1.4 AU/ml). There was a non-significant increase in plasma tPA activity during HIT (pre-exercise = 1.5 ± 0.2 IU/ml, post-exercise = 2.16 ± 1.3 IU/ml) and LIT (pre-exercise = 1.5 ± 0.3 IU/ml, post-exercise = 1.6 IU/ml) ($P = 0.06$ for RMANOVA). These results suggest high intensity exercise, performed above LT, elicits a greater fibrinolytic response than equicaloric exercise performed below LT.

2:15-2:30 pm

EFFECT OF ANDROSTENEDIONE SUPPLEMENTATION ON SERUM TOTAL CHOLESTEROL AND HDL CHOLESTEROL

C.A. Mueller, M.G. Flynn, FACSM, J. Liu, and A. Templin. Wastl Human Performance Laboratory, Purdue University, West Lafayette, IN 47907

The purpose of this preliminary study was to examine the effects of two weeks androstenedione supplementation on serum total, total HDL, HDL_2, and HDL_3 cholesterol. We also examined the effects of the supplementation on testosterone and estradiol levels. Ten apparently healthy and moderately fit men (age 30.1 7.5 years, 85.95 11.86 kg and 179.96 4.88 cm) participated in the study and ingested 300 mgd^{-1} androstenedione in three equal doses of 100 mg for two weeks (91.2% compliance). Blood was obtained from a prominent antecubital vein at 0600 – 0700 h following a 10 hr fast before and after the supplement regimen. Blood samples were analyzed for serum total, total HDL, HDL_2, and HDL_3 cholesterol using a stable Leiberman-Buchard reagent and appropriate controls. There were no significant changes in pre- to post-supplementation measurements for the following: serum total cholesterol (pre=141.420.0; post=137.618.6 mg * dl^{-1}; p=.3297), total HDL (pre=56.8 8.7; post=56.4 9.4; p=.4685), HDL_3 (pre=29.2 5.2; post=28.2 5.9; p=.3438) and HDL_2 (pre=27.5 7.1; post=28.2 5.2; p=.4033). The results of this study indicate that two weeks of androstenedione supplements (300 mgd^{-1}) did not influence serum total or HDL cholesterol levels, including the HDL subfractions HDL_2 and HDL_3, in healthy male subjects.

Oral Research Presentations
Thursday, October 5, 2000

2:30-2:45 pm

EFFECTS OF RIBOSE SUPPLEMENTATION ON PERFORMANCE DURING REPEATED HIGH-INTENSITY CYCLE SPRINTS

Witter, J., P. Gallagher, D. Williamson, M. Godard, and S. Trappe.
Human Performance Laboratory, Ball State University, Muncie IN 47306

The purpose of this investigation was to determine the effects of ribose supplementation on power output and fatigue during repeated high-intensity cycle sprints. Sixteen healthy college-aged subjects (24 ± 1 yrs, 77 ± 3 kg, 179 ± 1 cm) completed an 11-day supplementation period of either ribose (20 $g \cdot d^{-1}$; n=8) or placebo (glucose 20 $g \cdot d^{-1}$; n=8). After 72 hours of supplementation, subjects performed 5 days of high-intensity exercise 2 times per day for a total of 10 sessions. Each exercise session consisted of 15x10 second sprint at 7% body weight. Exercise was performed on a Monark cycle ergometer (Varberg, Sweden) that was interfaced with a personal computer which allowed for determination of mean and peak power output and fatigue index (Sports Medicine Industries, Inc., St. Cloud, MN). The ribose group had a larger change in mean power (4.2% vs 0.6%) than the placebo group over the 5-d training period. Furthermore, the ribose group had a greater peak power output ($p<0.05$, time), at last sprint session (11.4 watts·kg^{-1}) compared to the first sprint session (10.4 watts·kg^{-1}) while no differences were noted in the placebo group (pre=10.7; post=11.5 watts·kg^{-1}). There were no group x time interactions for mean power, peak power, and fatigue index. These data suggest that ribose supplementation may provide an ergogenic benefit over-time with high-intensity cycle exercise training.

Supported, in part, by Bioenergy, Inc.

2:45-3:00 pm

EFFECTS OF RIBOSE SUPPLEMENTATION ON ADENINE NUCLEOTIDE CONCENTRAION IN SKELETAL MUSCLE FOLLOWING HIGH-INTENSITY EXERCISE

P.M. Gallagher, D.L. Williamson, M.P. Godard , J. Witter, S.W. Trappe.
Human Performance Laboratory, Ball State University, Muncie IN 47306

The purpose of this investigation was to determine the effects of ribose supplementation on adenine nucleotide levels (TAN) in human skeletal muscle following high-intensity cycle exercise. An 11-day supplementation period of either ribose (20 $g \cdot d^{-1}$) or placebo (glucose 20 $g \cdot d^{-1}$) was employed using 16 healthy college-aged male subjects (24 yrs, 77 kg, 179 cm). After 72 hours of supplementation, subjects performed five-days of high-intensity exercise 2 times per day for a total of 10 sessions. Each exercise session was 15 minutes and consisted of 15 – 10 second sprint at 7% body weight. A 65-hour recovery period was completed following the five-day exercise period. Muscle biopsies were performed at four different time points during the supplementation/exercise period and analyzed for TAN. Following the exercise period, the TAN of the ribose group decreased 26% (7998 ± 231 to 5897 ± 227 nmol·g^{-1}) and the placebo group decreased 38% (7939 ± 271 to 4926 ± 308 nmol·g^{-1}). However, ribose supplementation partially attenuated the decrease in TAN ($p<0.05$). Although both groups displayed a similar pattern of recovery in TAN 65 hours following the 5-day exercise period, the ribose group returned to pre-exercise levels while the placebo group remained 23% below pre-exercise levels ($p<0.05$). These data indicate that ribose supplementation partially attenuates the decrease in TAN following five days of high-intensity cycle exercise. Thus, ribose may be beneficial in the short-term replenishment of TAN immediately following a high-intensity exercise bout.

Supported, in part, by Bioenergy, Inc.

Oral Research Presentations
Thursday, October 5, 2000

3:00-3:15 pm

THE EFFECTS OF PHOSPHOLIPASE C INHIBITION ON INSULIN STIMULATED GLUCOSE UPTAKE IN FAST TWITCH SKELETAL MUSCLE

D.C. Wright, B.W. Craig, B.R. Barnes, K.L. Lim. Human Performance Laboratory, Ball State University, Muncie, IN 47306.

The insulin-signaling pathway in skeletal muscle has not been fully elucidated. Previous research from our laboratory has demonstrated that phospholipase C (PLC) inhibition in slow twitch rat skeletal muscle leads to a significant decrease (~25%) in insulin stimulated glucose uptake suggesting that PLC may in part mediate insulin stimulated glucose uptake. The purpose of the current investigation was to determine if a similar relationship between PLC inhibition and glucose uptake is present in fast twitch skeletal muscle. Male Wistar rats (200-250 grams) were anesthetized and the extensor digitorum longus (EDL) muscle split *in situ* and clamped at their resting length. Muscles were removed and sealed in oxygenated vials containing Krebs-Henseleit buffer, BSA, 2mM pyruvate and 18 mM mannitol and incubated in a shaking water bath (37°C, 60 cycles/min). Muscles were then incubated in the presence of 4mM glucose and the absence or presence of 100 μU/ml insulin and/or the PLC inhibitor U73122 (50 μM). Following a 10 minute rinse the muscles were incubated in [^{3} H]-3-*O*- methylglucose and [^{14}C] mannitol (to correct for extracellular space) and the given experimental condition for 10 minutes. Following the final incubation muscles were quick frozen in liquid nitrogen (-70°C), digested in 1N NaOH and glucose uptake determined by liquid scintillation counting. Insulin (i) stimulation led to a 225% increase in glucose uptake compared to basal (b) (3.52 ± 0.64 i, 1.57 ± 0.097 μmol/ml/hr). PLC inhibition did not impact basal glucose uptake. However, the addition of U73122 to the incubation medium caused a ~20% attenuation of insulin stimulated glucose uptake (3.52 ± 0.64 vs. 2.95 ± 0.53 μmol/ml/hr). However this relationship did not reach statistical significance. The results of the current investigation demonstrate that PLC may in part mediate insulin stimulated glucose uptake in fast twitch skeletal muscle though to a lesser degree than in slow twitch muscle. Further research examining the molecular intermediates involved in PLC activation and insulin signaling is needed to further clarify this relationship.

Poster Research Presentations
Thursday, October 5, 2000
1:00-4:00 pm (Authors present 3:00-4:00 pm)

AGE AND GENDER RELATED DIFFERENCES IN NEUROMUSCULAR ADAPTATIONS TO TWELVE WEEKS OF PROGRESSIVE RESISTANCE TRAINING

Terpstra BT, Witter JR, Godard MP, Williamson DA, Galagher PM, and Trappe SW.
The Human Performance Laboratory, Ball State University, Muncie, IN, 47303

The intent of this investigation was to examine age and gender differences in neuromuscular adaptations following 12 wks of progressive resistance training(PRT). 39 healthy, untrained individuals were divided into four groups: older men((OM); 70±1.67; n=9), older women((OW); 73.75±1.76;n=8), young men((YM); 25.9±2; n=6) and young women((YW);22.2±1.2; n=6). Subjects participated in a bi-lateral knee extensor PRT consisting of 2 sets of 10 repetitions and 1 set to volitional failure at 80% of their one-repetition maximum(1RM), 3 days per week. Prior to and after completion of the PRT, subjects' right thigh muscles were evaluated for cross-sectional area (CSA) via computed tomography, maximal voluntary isometric contraction (MVC), specific tension((ST);MVC/CSA), maximal neuromuscular drive(IEMG), and 1RM. CSA increased (time, $P<0.05$) in all four groups following the PRT (4.35%±0.94 to 7.31%±3.87). Excluding OW, each group displayed an improvement (time, $P<0.05$) in MVC (OM 28.7%±5.06, YM 17.4%±5.8, and YW 17.8%±10.3). OM and YM demonstrated increases (time, $P<0.05$) in ST after completion of the PRT, 21.67%±4.88 and 12.5%±5.1, respectively. These two groups also improved (timeXgender, $P<0.05$) over their gender counterparts for this variable. IEMG increased (time, $P<0.05$) in OM and YM (37.8%±12.3 and 43.26±12.54, respectively) and both groups also showed improvements (timeXgender, $P<0.05$) over their gender counterparts. 1RM increased (time, $P<0.05$) in all groups (34.9%±7.9 to 57.3%±8). While all groups displayed increases in CSA and strength, ST and IEMG data indicate that neuromuscular drive may influence strength increases seen with resistance training to a greater extent in males than females, regardless of age.

This study was supported in part by NIH/NIA Grant AG154876.

MUSCLE VOLUMES AND RANGE OF MOTION OF THE LOWER LIMB 3 DAYS AFTER ONE-LEGGED CYCLING

S.C. Swanson and W.L.Weaver. Ohio Northern University, Ada, OH 45810.

The purpose of this investigation was to examine muscle volumes and range of motion in the lower limb after exercise that has previously been shown to increase muscle glycogen concentrations. Twelve college-aged subjects (20±1.1 yrs; 58.1±8.1 kg) performed one-legged cycling at 70% of one-legged maximal power output to exhaustion. One leg served as the exercise limb (EXE), while the contralateral limb did not perform any exercise and served as the control (CON). Immediately after cycling the subjects consumed 100 g of carbohydrate, and over the next 72 hours the subjects consumed 6 g of carbohydrates·kg^{-1}·day^{-1}. Measurements of limb volumes and range of motion of the lower limb were taken prior to and 72 h following one-legged cycling. Limb volumes of the upper, lower, and total limb were determined via a water displacement technique. Maximal muscle girth of the lower limb was determined via circumference measurements. Flexion and extension of the knee and hip joints were determined via goniometry. A single factor ANOVA ($p<0.05$) was used to test for significance between CON and EXE limbs. Limb volumes, muscle girth and range of motion were similar in EXE and CON limbs 3 d after carbohydrate consumption. Thus, it appears that a moderate carbohydrate diet does not alter muscle volumes and range of motion of the lower limb 3 d after one-legged cycling.

Poster Research Presentations
Thursday, October 5, 2000
1:00-4:00 pm (Authors present 3:00-4:00 pm)

INFLUENCE OF HIGH INTENSITY RESISTANCE EXERCISE ON NATURAL KILLER CELL CYTOTOXICITY IN YOUNG WOMEN

M.D. Phillips, M.G. Flynn, FACSM, J.P. Robinson, C.T. Teranishi, J. Liu, M. Horrall. Wastl Human Performance Laboratory, Purdue Cytometry Laboratory, Purdue University, West Lafayette, IN

Recently high intensity resistance exercise (RE) was observed to elicit a suppression in natural killer cell cytotoxic activity (NKCA) in resistance trained men. Many women are performing RE in an attempt to increase or prevent losses in skeletal muscle and bone mass; however, high intensity RE may have similar aberrant influences on host defense. The purpose of this study was to examine NKCA response to a single bout of high intensity RE in healthy, sedentary women aged 18-39 yr. In addition, we sought to compare a whole blood chromium release NKCA assay to a flow cytometry based method. Ten women completed two experimental trials (one exercise trial - EX, one control trial - CON) separated by at least 8 days. All subjects were acclimated to RE prior to the first trial. Subjects performed 3 sets of 10 resistance exercises at 80% of their 1 repetition maximum (1RM) (EX) or rested for one hour (CON). Blood samples were collected pre-exercise, immediately post-exercise, and two hours (2H) post-exercise, or at the same time points during the CON trial. NKCA and leukocyte phenotype were determined via immunofluorescence flow cytometry. Phenotypic differentiation was based on cell surface antigens: B cells - $CD2^-/CD19^+$; T helper - $CD3^+/CD4^+$; T cytotoxic - $CD3^+/CD8^+$, monocytes - $CD14^+/CD45^+$; NK cells - $CD3^-/CD16^+/CD56^+$. Peripheral blood mononuclear cells (PBMC) were isolated using density gradient separation techniques. Target cells (K-562) were labeled with 3,3'-dioctadecyloxarbocyanine perchlorate (DiO) and incubated (37°C,5%CO_2) for 2.5 hrs with PBMCs at 4 effector:target ratios: 100:1, 50:1, 25:1, 12.5:1. Target cells were differentiated from PBMC by their fluorescence at 530 nm. Propidium iodide was used to distinguish between live and dead target cells at 620 nm. As a comparison, target cells were also labeled with ^{51}Cr, and incubated (37°C water bath) with 150 µl whole blood for 4 hrs at 4 target cell concentrations ($2*10^6$, $1*10^6$, $.5*10^6$, $.25*10^6$/ml). Cell cultures were then centrifuged and 100µl of supernatant was counted for 5 min on a gamma counter. High intensity RE elicited an increase in 1:1 (NK:K562 cell) NKCA immediately post-ex using both assay methods. NKCA remained significantly elevated at 2H post-ex using the ^{51}Cr release assay, but returned to baseline in the flow cytometry assay. The flow assay resulted in significantly lower NKCA at all time points. The proportion of NK cells increased post-ex and remained significantly elevated 2H post-ex. The proportion of T helper cells decreased post-ex and remained significantly lower than pre-ex at the 2H post-ex time point. High intensity RE did not elicit a post-exercise suppression of NKCA when assessed using either assay method; however, there appears to be a difference in NKCA response between assay methods at the 2H post-ex time point which may be due to differences in incubation times or whole blood vs. isolation techniques.

THE EFFECTS OF RESISTANCE EXERCISE ON PERIPHERAL BLOOD CYTOKINE PRODUCTION IN WOMEN AGED 18-39 AND 65-79 YR

C.T. Teranishi, M.G. Flynn, FACSM, M.D. Phillips, J. Liu, M. Horrall. Wastl Human Performance Laboratory, Purdue University, West Lafayette, IN 47907

Endurance and high-intensity exercise has been shown to influence the production of various cytokines known to influence bone. No study has examined the effects of resistance exercise on cytokine production in women. The purpose of this investigation was to examine the effects of moderate-to-high intensity resistance exercise on cytokine production (IL-6, IL- I β, and TNF-α) from stimulated whole blood cultures in women aged 18-39 and 65-79 yr. Seventeen healthy pre- (n=9, 24 ± 3.5 yr) and post-menopausal (n=8, 71.6 ± 5.2 years) women volunteered for this investigation. Postmenopausal subjects were not taking any hormones and received personal physician approval prior to the start of the study. Subjects completed three days of acclimation to exercise during which 1 RM was determined for 10 exercises on Cybex resistance machines. Subjects completed either a resting control trial (REST) or a single bout of resistance exercise (EX) at 70-80% of 1 RM which included 2 sets of 8 repetitions and one set to volitional fatigue. Blood samples were taken prior to exercise (PRE), immediately after exercise (POST), and 2-hours after exercise (2H-POST). Blood was obtained at the same time points during the resting control trial and there was at least one week separating acclimation and the REST or EX trials. The blood samples were either stimulated with LPS (mitogen well) or left unstimulated (control well) and incubated (37 C, 5% C02) for 24-hours. The supernatants were then collected and frozen for later analyses of IL-6, IL-1β and TNF-α production by ELISA. No significant ($p<0.05$) interactions were found for Il-6, Il-1β and TNF-α, but Il-1β production was significantly lower POST compared to 2H POST ($p=0.0225$). Il-6 production was significantly higher during the EX compared to REST trial ($p=0.019$) and for older subjects compared with young ($p<0.001$). In conclusion, resistance exercise altered Il-1β and IL-6 production in stimulated whole blood cultures and IL-6 production was significantly higher in older than in younger subjects at rest and during the exercise trial.

Poster Research Presentations
Thursday, October 5, 2000
1:00-4:00 pm (Authors present 3:00-4:00 pm)

THE EFFECT OF STATIC MAGNETIC FIELDS ON ISOKINETIC MUSCLE FATIGUE

BJ Nickerson, A J Pemberton, EF Betts, FACSM, JJ Betts. Central Michigan University, Mt. Pleasant, MI 48858

Some studies report decreased pain with exposure to static magnetic fields, hypothesizing improved blood flow as a possible mechanism. This could delay the onset of fatigue. The purpose of this study was to determine the effect of static magnetic fields on local muscle fatigue. The study was a randomized, double blind, cross-over, using the variables magnet (SM) or placebo (P) and 1 or 3 hour wearing time. Thirty subjects (15 M/15 F; age 26 ± 6 yrs) completed each of the four treatments (P1, SM1, P3, SM3), in a random order, separated by at least 24 h. A 700 gauss magnet or a placebo was applied to the non-dominant biceps brachii for the indicated time, followed by isokinetic elbow flexion at 210°/ second until fatigue on the Cybex® II dynamometer. Fatigue was considered 50% of peak torque, or when the subject voluntarily discontinued exercise. Peak torque, time to fatigue, and number of repetitions to fatigue were measured and statistically analyzed. There was no significant difference between 1 and 3 h, thus data are pooled and presented in the table below. Males produced greater torques than F. The F subjects showed an increased elapsed time and number of repetitions to fatigue, whereas M did not. This data suggests that a 700 Gauss magnet can prolong the onset of muscle fatigue in F, but not M, during isokinetic exercise.

	PLACEBO			MAGNET		
	Torque (ft lbs)	Time (sec.)	Reps	Torque (ft lbs)	Time (sec.)	Reps
Female (n=15)	18 ± 2.8	46.4 ± 15.4	32.5 ± 11	18 ± 3.1	50.5* ± 17.9	36.7* ± 12
Male (n=15)	46 † ± 7.6	36.5 ± 7.9	26.4 ± 5.6	45 † ± 7.7	36.7 ± 6.7	26.4 ± 5.3

p=0.03 magnet vs placebo; † p = 0.05 males vs females

Funding provided by the College of Graduate Studies, Central Michigan University.

Keynote Lecture
Sponsored by the Gatorade Sports Science Institute
Thursday October 5, 2000
4:00-5:00 pm

Edward F. Coyle is a professor in the Department of Kinesiology and Health and is the director of the Human Performance Laboratory at the University of Texas at Austin. He received his BA degree in physical education for Queens College, his MA degree in exercise physiology from Ball State University and his Ph.D. in animal physiology from the University of Arizona. Dr. Coyle's expertise is in the areas of fat metabolism during exercise, cardiovascular responses to prolonged exercise, and the physiological integration of endurance performance. He has published an extensive number of papers in journals such as the *Journal of Applied Physiology, Medicine and Science in Sports and Exercise,* and the *International Journal of Sports Medicine*. Dr. Coyle serves on the Gatorade Sports Science Institute Sports Medicine Review Board and is a former Editor-in-Chief of the *International Journal of Sports Medicine*.

CARDIOVASCULAR RESPONSES TO PROLONGED EXERCISE: NEW PERSPECTIVES

Edward F. Coyle, Ph.D., FACSM. The University of Texas at Austin, Austin, TX

After ~10-min of prolonged moderate-intensity exercise in a neutral or warm environment, a continuous time-dependent "drift" in several cardiovascular responses is characterized by a decline in stroke volume (SV) and arterial blood pressure while at the same time a rise in heart rate (HR) maintains nearly constant cardiac output. We have recently used β_1-adrenoceptor blockade as a tool to prevent HR from increasing during the 10-60 min period of exercise. It appears that the decline in SV is related to the increase in HR and not to the classic notion that it is due to increased cutaneous blood flow. Furthermore, dehydration during prolonged exercise results in accentuated reductions in SV and concomitant hyperthermia that are clearly not due to increases in cutaneous blood flow. Instead, cutaneous blood flow declines as skin and system vascular resistance increase as the cardiovascular system attempts to maintain arterial blood pressure given the severe challenge of large reductions in cardiac output. Approximately one-half of the reduction in SV is due to reduced blood volume from dehydration. The remaining reduction in SV appears to be related to hyperthermia and its interaction with factors that further reduce ventricular filling, such as heart rate acceleration, as discussed above. The new perspective gained is that the progressive SV decline during prolonged exercise is not due to cutaneous blood flow but rather to heart rate acceleration and reduced blood volume.

Gatorade
Sports
Science
Institute.

Colloquium
Friday, October 6, 2000
9:00-10:00 am

ACSM'S NEW GUIDELINES FOR EXERCISE TESTING & PRESCRIPTION
Mitchell H. Whaley, Ph.D., FACSM, Ball State University
Associate Editor, ACSM Guidelines for Exercise Testing and Prescription (6th Edition)

This colloquium is intended to provide members of the MACSM with an informal opportunity to hear about and discuss the new 6th edition of the *ACSM Guidelines for Exercise Testing & Prescription (GETP)*. Dr. Whaley was the clinical associate editor of the textbook and will present pertinent information about the development of the textbook and identify some key revisions to the *GETP*. The session is intended for students, university professors and/or health/fitness or clinical professionals who use the *ACSM GETP*. There are numerous revisions to traditional chapters and several new chapters contained within the textbook. The session will be interactive with an emphasis on audience participation. It is hoped the attendees will leave the session with a better understanding of how the ACSM revises its *GETP* as well as some insight into the revised content of the textbook.

Note to Attendees:
A colloquium entitled *ACSM 's New Guidelines for Exercise Testing and Prescription: Analysis and Update* was presented at the National ACSM meeting in Indianapolis this June. The books' editorial team (Drs. Franklin, Whaley and Howley) were the presenters for the session. The subsequent session at the MWACSM meeting will provide more opportunity for discussion and questions from attendees.

Tutorial
Friday, October 6, 2000
10:00-11:30 am

CAN I JUST TAKE THIS STUFF UNTIL I NEED GLASSES?: A REVIEW OF THE EFFICACY OF DIETARY AND HERBAL SUPPLEMENTS
Chester J. Zelasko, Ph.D., Better Life Institute

Dietary supplements are used daily by millions of people who exercise from the daily jogger to the competitive athlete. There are three primary physical objectives for using supplements: to train harder, to recover faster, and to improve performance. These supplements are touted as a means to help the chronic exerciser reach those objectives by increasing energy, losing body fat, increasing muscular strength, and improving performance. The purpose of this tutorial is to present a review of the current literature on whether the use of dietary and herbal supplements are effective and more importantly, safe. This tutorial will provide information on whether the use of vitamins, minerals, herbs, and other supplements can attain the aforementioned objectives safely. The supplements reviewed will include vitamins C and E, calcium, magnesium, chromium, vanadium, conjugated linoleic acid, CoQ10, and the herbal preparations grape seed extract and other proanthocyanidins, ginseng, garcinia cambogia, gymnema sylvestre, and ephedra (Ma Huang).

Symposium
Friday, October 6, 2000
10:00-11:30 am

STRENGTH TRAINING IN OLDER ADULTS: EFFECTS ON SINGLE MUSCLE FIBER STRUCTURE AND FUNCTION
Scott Trappe, Ph.D., Chair

Advancing age is associated with a slowing of muscle movement and an increase in muscle weakness, which causes a substantial decline in physical performance. This decrease in skeletal muscle performance is often referred to as sarcopenia, which is characterized by an age-related loss in skeletal muscle mass, a decrease in muscle strength and increased fatigability. The basis of the problem associated with a reduction in muscle performance involves the functional characteristics of muscle at the cellular level. Resistance training, on the other hand, has been shown to enhance muscular strength and increase muscle mass, thereby attenuating the loss in muscle function observed in older adults. However, limited data are available to describe the cellular changes in skeletal muscle of older men and women.

Over the past two years we have been conducting several experiments examining the contractile behavior of individual slow-and fast twitch muscle fibers in response to resistance training in older men and women. The purpose of this symposium will be to discuss the changes observed in skeletal muscle function after a period of high-intensity resistance training in older adults. Topics to be presented will include: 1) whole muscle strength and size, 2) single muscle fiber protein isoforms, and 3) single muscle fiber contractile properties.

Presenters
Scott W. Trappe, Ph.D., Ball State University
Functional changes in single fiber physiology

Dave Williamson, M.S., Ball State University
Structural changes in single fiber morphology

Oral Research Presentations
Friday, October 6, 2000

9:00-9:15 am

RESTING METABOLIC RATE AND SUBSTRATE UTILIZATION IN ADOLESCENT AFRICAN AMERICAN AND CAUCASIAN GIRLS

J. Liu, J.Navalta, D. Sedlock, M. Flynn, K.S.Park, M.Phillips, H.G.Ji, J.Andrews, I.Y.Paik & C.M.Weaver. Wastl Human Performance Lab, Dept. of Foods and Nutrition, Purdue University, IN 47907

The purpose of this study was to obtain resting metabolic rate (RMR) and substrate utilization data in adolescent African American (AA) and Caucasian (C) girls. Thirty-four subjects completed testing (AA: n = 20; age 12.1±1.1 (SD) yrs; ht 156.2±6.9 cm; wt 51±12.5 kg; %BF (DEXA) 25.4±11.5; C: n = 14; age 12.3±1.1 yrs; ht 156.4±3.9 cm; wt 54.9±16.5 kg; %BF 29.1±11.6). All participants were transported to the laboratory in the morning for RMR testing followed immediately by a submaximal exercise bout. Subjects sat quietly for 30 min with metabolic measurements taken over the final 15 min period. After a 3 min warm-up at a speed of 3.5 mph and 0% grade and an additional 3 min at 3.5 mph and 4% grade, grade was increased directly to the target grade to elicit HR of 160-170 bpm. This target grade was determined from an accommodation trial administrated three days prior to the experiment. Subjects exercised at this steady state HR level for at least seven minutes while expired gases were collected. Oxygen uptake (VO_2), HR, energy expenditure (EE), and percentage of carbohydrate and fat utilization were averaged over the last ten minutes of rest and last five minutes of exercise. During rest, VO_2 was slightly higher in C than AA but the difference was not significant (4.7±0.7 vs 4.1±0.2 $ml*kg^{-1}*min^{-1}$ respectively). C had a slightly higher carbohydrate utilization rate (60.5±5.5 vs 53.6±6.4%) and a lower fat utilization rate than AA (39.0±5.4 vs 45.9±6.4%), although these were not statistically significant. EE was also similar in the two groups (C: 1.2±0.6 vs A: 1.0 ±0.2 $kcal* min^{-1}$). During submaximal exercise, however, AA VO_2 was significantly higher than C (24.7±0.7 vs 22.9±0.9, $ml*kg^{-1}*min^{-1}$ p=0.047). AA also had a significantly higher carbohydrate utilization rate compared to C (77.6±1.9 vs 70.3±3.3%, p=0.036) and lower fat utilization rate than C (22.1±1.9vs 29.3±3.3%, p=0.036). However total EE values were not significantly different between C and AA during exercise (C: 6.0±1.1 vs A: 6.2±1.2 $kcal* min^{-1}$). The difference in VO_2 and carbohydrate utilization can be explained partly by the differences of work intensity between AA and C girls. During the last three minutes before terminating the trial, HR was similar between groups (C: 168.0 bpm vs AA: 167.4 bpm), but workload in AA was significantly higher (AA = 6.4 vs C = 5.0 % grade, p=0.015). These data showing that adolescent AA girls require a higher workload to elicit similar HR and EE responses than C during submaximal exercise, indicate that AA girls are more energy-efficient, i.e., they utilize a greater percentage of carbohydrate and less fat, and have higher VO_2 (per kg) than C girls. It can be concluded that although metabolic values such as VO_2 and carbohydrate utilization in C and AA adolescent girls are similar during rest, they respond differently to submaximal treadmill exercise.

9:15-9:30 am

HEART RATE RECOVERY IN CHILDREN FOLLOWING AEROBIC EXERCISE

C.S. Anderson, A.D. Mahon, and M.J. Brooker, Human Performance Laboratory, Ball State University, Muncie, IN 47306

In adults, the manner in which heart rate (HR) recovers form aerobic exercise is related to aerobic fitness, such that the higher the level of aerobic fitness the faster the HR recovery. In children it is not clear whether a similar relationship exists; thus, this study examined the relationship between HR recovery and maximal oxygen uptake (VO_2max) in 16 boys (n = 8) and girls (n = 8) with a mean age of 10.8 ± 0.7 yrs. VO_2max was measured during graded exercise on a cycle ergometer. On 2 subsequent days the children performed the following cycle ergometer protocols: (1) 3 min warm-up at 40% VO_2max, 2 min rest, 5 min exercise at 85-90% of VO_2max, 2 min cooldown at 40% VO_2max, and 3 min rest, and (2) 3 min warm-up at 40% VO_2max, 2 min rest, 5 min exercise at 70 watts (W), 2 min cooldown at 25 W and 3 min rest. HR was assessed at 1 and 3 min post-exercise and HR recovery was calculated as a percentage of the exercising HR. Testing order was counterbalanced. Gender differences were analyzed with an independent t-test. Simple correlations were used to examine the relationship between VO_2max and HR recovery. VO_2max averaged 40.0 ± 5.1 $ml·kg^{-1}·min^{-1}$ in the girls and 46.0 ± 6.3 $ml·kg^{-1}·min^{-1}$ in the boys ($P > 0.05$). After exercise at 85-90% of VO_2max, HR averaged ~80% of the exercise HR at 1 min into recovery and ~60% at 3 min into recovery in both groups ($P > 0.05$). Nearly identical results were observed following the 70 W intensity. The correlations between VO_2max and HR recovery following exercise at 85-90% of VO_2max were $r = -0.17$ and $r = -0.08$ at 1 and 3 min, respectively, after exercise ($P > 0.05$). At 70 W the correlations between VO_2max and HR recovery were $r = -0.28$ at 1 min post exercise and $r = -0.12$ at 3 min following exercise ($P > 0.05$). These results do not support the notion that HR recovery is related to aerobic fitness in children. Using HR recovery as a means to quantify aerobic fitness in this age group is not recommended.

Oral Research Presentations
Friday, October 6, 2000

9:30-9:45 am

RELATIONSHIP BETWEEN PHYSICAL FITNESS AND ACTIVITY IN MICHIGAN CHARTER SCHOOL STUDENTS

K.M. Allor, D. Podulka, and J.M. Pivarnik, FACSM. Departments of Kinesiology and Osteopathic Surgical Specialties; Michigan State University, East Lansing, MI 48824.

The State of Michigan began to establish charter schools in the early 1990s. The physical education curricula used at charter schools may differ from that used at other schools, but there are no data available to assess physical fitness/activity profiles of charter school children. Purpose The purpose of this study was to determine the association between physical activity and fitness and to compare charter school students to those attending a parochial school. Methods Study participants were 158 4th-6th graders from three mid-Michigan charter schools (n=90) and one parochial school (n=68). Physical fitness was assessed with the shuttle run, curl ups, push ups, flexibility, and percent fat (skinfolds). Physical activity was assessed on two separate days using a modified one-day Physical Activity Recall (PAR). Results Correlation between number of laps completed in the shuttle test and physical activity was low, but significant ($r=0.19$, $P<0.05$) for the overall sample. Also, there was a significant negative correlation ($r=-0.49$, $P<0.05$) between number of laps completed in the shuttle test and sum of two skinfolds (triceps and calf). ANOVA revealed a significant difference between the schools in average MET-minutes of physical activity ($P<0.05$), number of laps completed in the shuttle test ($P< 0.05$), curl ups ($P<0.05$), and push ups ($P<0.05$). Conclusions. The weak correlation between aerobic fitness and physical activity, yet stronger negative relationship between fitness and fatness is consistent with existing literature. The two first-year charter schools involved in the project did not perform as well on the fitness tests compared to the more established charter school and the parochial school. Results indicate that a well-established physical education curriculum may improve the fitness profiles of students. Future studies should be performed as the charter schools continue to establish their curricula and student base.

9:45-10:00 am

CARDIOVASCULAR DISEASE RISK FACTOR PROFILES OF CHARTER SCHOOL CHILDREN

D. Podulka, K.M. Allor, J.M. Pivarnik, FACSM. Departments of Kinesiology and Osteopathic Surgical Specialties; Michigan State University, East Lansing, MI.

Since cardiovascular disease risk factors such as obesity, hypertension, and dyslipidemia have been linked to physical inactivity in adults, it is crucial that children develop an appreciation for exercise at a young age. Comprehensive and quality school physical education (PE) programs can and should facilitate this learning experience. Public and parochial schools have been available to students for many years. In contrast, charter schools have recently been established and are still developing their curricula, with many lacking traditional PE programs. The purpose of this study was to compare body mass index (BMI), blood pressure (BP), and lipid profiles in one parochial (P) and three charter schools (C1-C3). Methods Subjects were 162 (parochial n = 70, charter n = 92) 4th-6th graders (age=10.5±1.0yrs). Children's BMI values were calculated from standard weight and height measures. BP was measured under seated, resting conditions (Dinamap monitor). Lipid profiles (total cholesterol [TC], HDL, LDL, triglycerides [TG]) were determined using capillary blood samples (Cholestech LDX analyzer). Results Prevalence data for high BMI (Fitnessgram norms), high blood pressure (>95%tile, U.S. norms), and undesirable lipid levels (National Cholesterol Education Program) are listed in the table below.

	BMI	BP	TC	HDL	LDL	TG
P	24.6	10.0	9.5	2.7	5.4	21.6
C1	27.0	2.7	22.6	0	13.8	17.2
C2	32.0	8.0	27.3	5.3	21.1	42.1
C3	20.0	3.3	23.1	18.2	22.7	13.6

Conclusion Cardiovascular risk factor profiles vary among the schools evaluated, regardless of how long they have been established and quality of PE programs available to students. However, the most recently established charter school with the least developed PE program (C2) appears to show the worst profile among the students evaluated in the study.

Oral Research Presentations
Friday, October 6, 2000

10:00-10:15 am

PHYSIOLOGICAL ASSESSMENT OF A MEN'S DIVISION I NCAA HOCKEY TEAM

M.R. Green, D.P. Carrier, T. Newton, J.M. Pivarnik, FACSM. Departments of Kinesiology and Osteopathic Surgical Specialties; Michigan State University, East Lansing, MI.

Exercise testing has become an integral part of collegiate level hockey team evaluations. However, little research is available showing the athletes' physiological characteristics and relating them to performance. Our purpose was to (a) determine whether aerobic fitness, blood lactate levels, and body composition change over the course of a competitive hockey season and (b) to compare the physiological characteristics of the top and bottom power play and penalty killing lines (based on the coaches' evaluation). Methods: Testing was performed on all active players (age=21.0±1.4 yr; ht=180±6 cm; wt=84±6 kg) from an NCAA Division I school at pre-, mid-, and post-season. On all three visits, players completed a discontinuous treadmill VO_{2max} test (3 min stages) which included respiratory gas analysis, HR, and blood lactate [Lac] measures. In addition, each player's % fat was determined via hydrodensitometry. Results: There were no significant changes in pre- vs post-season physiological and anthropometric characteristics (see table).

	VO_{2max} ($ml \cdot kg^{-1} \cdot min^{-1}$)	HR_{max} ($b \cdot min^{-1}$)	[Lac] at 4th TM Stage (mmol)	% Fat
Pre-Season	56.8±3.3	196±6	7.5±1.7	13.2±4.6
Post-Season	59.1±3.8	198±8	7.8±1.8	13.6±3.6

Mid-season test results were used to compare top and bottom lines. Although no statistical analyses were performed due to small n, there was no apparent difference between values of the top and bottom power play lines. However, the top penalty kill line had higher VO_{2max} (61±1 vs 58±2 ml/kg/min), lower [Lac] at 4th TM stage (5.3±0.3 vs 8.8±1.1 mmol) and lower % fat (7.6±2.6 vs 15.5±3.1). Conclusion: On average, cardiovascular fitness and body composition of an NCAA hockey team is unchanged over the course of a season, possibly due to vigorous year-round conditioning. A player's ability to work at a high level of his VO_{2max} without fatiguing is a contributing factor to his placement on a top penalty kill line.

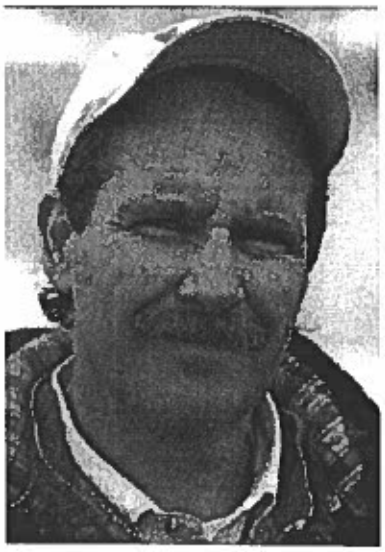
10:15-10:30 am

PHYSIOLOGICAL PROFILES OF A WOMEN'S NCAA CREW TEAM

C.D. Perkins, E.J. Siebel, J.M. Pivarnik, FACSM. Departments of Kinesiology and Osteopathic Surgical Specialties; Michigan State University, East Lansing, MI.

As a result of Title IX, women's crew is one of the fastest growing sports in the NCAA. However, little research has been done on these athletes. The purpose of this investigation was to a) describe the physiological profiles of the top 16 rowers on an NCAA women's crew team and b) assess the physiologic characteristics of the 8 rowers assigned to the top varsity boat (V8) using VO_{2max} and 2 kilometer (2K) time trial performance. Subjects were women crew team members from a Big Ten University (age=20.1±1.4 yr). Methods: At the beginning of pre-season training, we tested 16 athletes selected by the coach. On two separate lab visits, subjects completed the U.S. National Team $VO_{2\text{-}max}$ (3 min stages) and 2K time trial ergometer protocols. In addition to collecting expired gases, heart rates (HR) and blood lactates were measured before, during, and after each test. Results: Average (±SD) absolute VO_{2max} was 3858±404 $ml \cdot min^{-1}$ and HR_{max} was 189±10 $beats \cdot min^{-1}$. The athletes used ~96% of VO_{2max} and ~98% of HR_{max} during the 2K trial. Average 2K time was 7.55 min (range=7.33 – 8.02 min). Blood lactate was 11.8±5.2 $mmol \cdot L^{-1}$ following the 2K trial. Members of the V8 boat achieved VO_{2max} values 4% greater than novice boat (NB) teammates (3932±295 v. 3783±499 $ml \cdot min^{-1}$; ns). Average 2K times differed by only ~1% (7.50±0.14 v. 7.60±0.20 min; ns). HR did not differ between V8 and NB groups during either the 2K trial or Stage 3 of the VO_{2max} test (highest submax level achieved by all athletes). V8 athletes had higher VO_2 (~4%) and lower blood lactate (~-8%) during the 2K test, but the differences were not significant. Of the eight team members with the highest VO_{2max} and/or fastest 2K times, 4 rowed in the V8 boat. Conclusion: High aerobic fitness and fast 2K times were only partially predictive of varsity boat status. In addition to laboratory test results, other factors such as experience and rowing mechanics contribute to the process of selecting athletes for the top boat.

Luncheon Banquet
Friday, October 6, 2000
12:00-2:00 pm
Pantland Ballroom



Chris Meehan has been a reporter at the Grand Rapids Press since 1979. For the past nine years Chris has been the newspaper's health reporter. Prior to that he covered religion, business and education. He has a master's degree in journalism from Michigan State University and was the Michigan Journalism Fellow at the University of Michigan in 1988-89. His accomplishments include writing the mystery novel entitled *Blood on the Bridge* published by Thunder Bay Press as well as several awards for journalism including highest honors for feature writing from the Associated Press. The title of Chris' presentation is *Covering the Stories of What Makes Us Sick and What Helps Us to Stay Healthy*. This session is meant to be interactive so please do not hesitate to ask questions and share your thoughts throughout Chris' talk.

MWACSM gratefully acknowledges the

generous donations from

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in support of this luncheon banquet

Poster Research Presentations
Friday, October 6, 2000
1:30-4:30 pm (Authors present 3:30-4:30 pm)

ASCORBIC ACID AND NITRIC OXIDE PRODUCTION AS BIOMARKERS OF OXIDATIVE STRESS

P.G Peters, H.M Alessio, FACSM, A.E Hagerman, R.L Wiley. Miami University, Oxford, OH 45056

Increased production of reactive oxygen species (ROS) and reactive nitrogen species (RNS) are associated with hypertension. ROS and RNS have the capability to react directly with lipids, proteins, and nucleic acids or indirectly via biochemical signaling pathways. Nitric Oxide (NO) is one RNS involved in autocrine, paracrine, neurocrine and endocrine signaling. Previous research has shown that exercise is associated with an increase in NO production. This implies that oxidative stress occurs, in part, as a result of exercise-induced NO. In this study, we examined changes in RNS and ascorbic acid (AA) after six weeks isometric training (IET). Four middle-aged hypertensive female subjects, mean systolic blood pressure (SBP)=142.3 1.35mmHg, mean diastolic blood pressure (DBP)=89.7 4.91mmHg, mean heart rate (HR)=69.9 4.55 beats/min at rest, preformed a submaximal exercise prior and post six weeks IET. After the six weeks IET, all three cardiovascular variables were reduced SBP=131.5 9.91mmHg, DBP=87.5 5.56mmHg, and HR=66.0 4.08 beats/min. Blood levels of RNS and AA decreased (-18.6%, -6.7%) following acute submaximal exercise. After six weeks IET, AA levels were maintained as indicated by no pre-post exercise change (-.023%) and NO increased (9.6%) after acute exercise. This supports previous studies that IET has a beneficial effect on cardiovascular health possibly by improved basal control of the vascular system and/or strengthening the homeostatic buffering system in place to prevent oxidative damage during strenuous exercise.

VALIDITY OF URINE SPECIFIC GRAVITY AS A MEASURE OF HYDRATION STATUS AMONG COLLEGIATE WRESTLERS

RA Oppliger, FACSM, LA Popowski, GP Lambert, CV Gisolfi, FACSM and SA Magnes, FACSM. The University of Iowa, Iowa City, IA 52242

In 1998, the NCAA established new rules for the determination of a minimum competitive wrestling weight for collegiate wrestlers. Using a urine specific gravity (Usg) test, the athlete must demonstrate adequate hydration (Usg 1.020) prior to the determination of minimum competitive wrestling weight and at a certification weigh-in later in the season. The purpose of the present investigation was to compare hydration measurements by Usg with a criterion method, plasma osmolality (Posm). 51 subjects (47 wrestlers and 4 non-wrestlers) were tested prior to or following exercise to insure a range of Usg and Posm values. Usg was determined on-site, using a refractometer. Posm was assessed by freezing point depression using a Precision Systems Inc. computerized micro-osmometer (Multi-OsmetteTH)at subsequent time. The cut-off for hydration using Posm was 290 mOsm/kg. Pearson correlations between Usg and Posm were low (r=.255). However, 80% of the subjects (28/35) who were dehydration by Posm were also dehydrated by Usg. Among hydrated subjects by Posm, 31% (5/16) were hydrated using Usg. Raising or lowering the Usg cut-off to 1.023 and 1.015, respectively, did not improved the outcome substantially. We concluded that the current Usg cut-off (1.020) offers an adequate test for hydration and provides a better deterrent to dehydration than no test.

Sponsored by the
NCAA Committee on Competitive Safeguards and Medical Aspects of Sports

Poster Research Presentations
Friday, October 6, 2000
1:30-4:30 pm (Authors present 3:30-4:30 pm)

THE EFFECTS OF LEVEL OF SPINAL CORD INJURY ON CARDIORESPIRATORY RESPONSES DURING MAXIMAL EXERCISE

K.-S. Park, U.-S Kim, Seoul National University, Seoul, Korea

Results of studies that have examined the relationship between level of spinal cord injury (SCI) and cardiorespiratory responses (CR) are not always consistent. The discrepant results may be due to in part to studies focusing only on a specific level of SCI or, conversely, a study sample that is too heterogeneous with regards to factors that influence CR such as physical activity level. The purpose of this study was to characterize the relationship between all levels of SCI and CR during maximal exercise in well-trained spinal cord injured men. In addition, discriminant analysis was used to predict the maximal CR to exercise based on the level of SCI. Thirty-two healthy physically active (> 60 min/d, 2d/wk, 2yrs) subjects were divided into four groups (n = 8 each) : cervical segment (CS = age(yr) : 37.4±7.9(SD), wt(kg) : 66.8±9.5), higher thoracic segment (HTS : T1-T6 = age : 36.3±7.7, wt : 77.6±11.5), lower thoracic segment (LTS : T7-T12 = age : 33.5±7.9, wt : 63.0±2.6), and lumbar segment (LS = age : 32.6±7.3, wt : 70.4±6.3). Subjects participated in one bout of continuous incremental arm-exercise until exhaustion. Peak heart rate (HR peak), peak oxygen consumption (VO_2 peak), peak pulmonary ventilation (VE peak), ventilation equivalent (VE peak/ VO_2 peak) and O2 pulse (VO_2 peak/HR peak) were measured and analyzed using one-way ANOVA. HR peak showed significant differences between CS and all other groups (CS : 128±26, HTS : 178.6±9.7, LTS : 184.26±5.7, and LS : 168.5± 17.9 beats/min $p < 0.0001$). VO_2 peak (CS : 12.9±3.0, HTS : 22.2±4.0, LTS : 28.8±4.7, and LS : 33.9±3.7 ml/kg/min) and VE peak (CS : 37.1±9.5, HTS : 50.9±5.9, LTS : 77.8±18.0, and LS : 75.8±14.2 L/min) were significantly different among groups except between LTS and LS. VE peak/ VO_2 peak was significantly different, however, it did not correspond with level of SCI (CS : 43.5±9.3, HTS : 31.2±2.5, LTS : 42.6±6.0, and LS : 31.9±5.4). O_2 pulse, an index of stroke volume, was significantly higher in LS compared to all other groups (CS : 7.0±2.3, HTS : 9.2±2.2, LTS : 9.9±1.5, and LS : 13.4±2.7 mL/beat). The hit ratio of discriminant analysis was 93.75% demonstrating that the group classifications used in this study successfully reflects cardiorespiratory differences and corresponds with previous studies which have shown differences between spinal cord segments. It can be concluded that the thoracic 1 level and the thoracic 6 level may be physiologically important levels which distinguish significant differences in cardiorespiratory responses.

HAMSTRING FLEXIBILITY OF PRE PUBERTAL THROUGH POST PUBERTAL INDIVIDUALS

Millar, A.L., FACSM, Raasch, P., Robinson, Y., Saint-Jean, G., Wolff, C.F., W.L. Perry. Andrews University, Berrien Springs, MI 49104.

Many clinicians have suggested that hamstring flexibility changes during puberty, perhaps due to the rapid bone and muscle growth. The purpose of this study was to compare the hamstring flexibility of pre pubertal and pubertal individuals. Individuals between the ages of 8 to 30 (N=138) were tested for hamstring flexibility. Groups were clustered by age; 1 = 8-10 yrs, 2 = 11-12 yrs, 3 = 13-14 yrs, 4 = 15-17 yrs and 5 = 21-30 yrs. Hamstring flexibility was measured using the Active Knee Extension Test (AKE), which has been shown to be the best true measure of hamstring flexibility. Prior to testing, all subjects performed a standardized warm up. A long arm goniometer was used to measure the AKE, with the resultant value being recorded to the nearest degree. Each individual was measured twice, and the average of the two measures was used for the data analysis. The average flexibility, in degrees, for the groups was; 1 = 143.8±10.3, 2 = 145.4±12.5, 3 = 146.9±14.2, 4 = 158.2±13.3, and 5 = 160.8±14.3. An Analysis of Variance found a significant difference between the groups, with groups 1, 2 and 3 having less flexibility than groups 4 and 5. In addition, the relationship of the individual's hamstring flexibility to their participation in regular stretching, height and weight was investigated. There was no relationship between any of these variables and hamstring flexibility. Thus, although it has been suggested that hamstring flexibility alters during puberty, our data suggest that hamstring flexibility may actually improve during late puberty or post puberty.

Poster Research Presentations
Friday, October 6, 2000
1:30-4:30 pm (Authors present 3:30-4:30 pm)

REPRODUCIBILITY OF SHORT-TERM ANALYSIS OF HEART RATE VARIABILITY

W. Willmer, J. Ehrman*, FASCM, C. Marks, R. Jarski. Oakland University, Rochester, MI, * Henry Ford Hospital, Detroit, MI

The purpose of this study was to assess the reproducibility of heart rate variability (HRV) measures derived from short-term analysis in subjects with a history of a myocardial infarction and a healthy population. Additionally, the effects of age and gender on the reproducibility of HRV measures along with differences between time domain (TD) and frequency domain (FD) analysis were examined. Sixteen subjects were assigned into the following groups: Myocardial Infarction (MI) (n=4) and Healthy Subjects (HS) (n=12). The HS group was subdivided by age and gender: Old Control (OC) (43 ±7 years, n=4), Young Control (YC) (23 ±3 years, n=8), Male Healthy Subjects (MHS) (n=6), and Female Healthy Subjects (FHS) (n=6). Using a Biopac MP100 (Biopac Systems Inc.) data acquisition system, resting electrocardiograms were recorded with paced breathing and HRV analyzed at day 1 (baseline), seven days after baseline, and 28 days after baseline. The reproducibility was determined by the intraclass correlation coefficient (ICC) and is shown in the table below.

	INDICES	MI	HS	YC	OC	MHS	FHS	All Subjects
TD	# Normal - Normal Intervals	.89	.80	.85	.31	.10	.85	.86
	Mean Normal-Normal Length (msec)	.72	.80	.85	.30	.52	.85	.83
	Standard Deviation of Normal-Normal (msec)	.36	.54	.16	.87	.56	.43	.86
	% of Normal-Normal >50 msec	.95	.85	.86	.79	.53	.93	.90
	Beats per Minute	.81	.80	.86	.26	.54	.86	.85
FD	Very Low Frequency(VLF)(msec^2) ≤0.04Hz	.63	.80	.84	.51	.66	.83	.75
	Low Frequency (LF)(msec^2) 0.04-0.15 Hz	.59	.78	.59	.29	.40	.85	.69
	High Frequency (HF) (msec^2) 0.15 - 0.4 Hz	.33	.21	.31	.40	.05	.48	.23
	Total Power (TP) (msec^2) ≤0.4 Hz	.47	.43	.51	.21	.27	.57	.43
	LF (normalized units)	.37	.30	.50	.48	.32	.64	.31
	HF (normalized units)	.37	.29	.50	.47	.32	.64	.31
	LF/HF ratio	.26	.07	.43	.36	.22	.48	.14

The general findings were: 1) the MI had a similar reproducibility of HRV measures as HS; 2) the effects of increasing age on the reproducibility of HRV were equivocal; 3) FHS had a higher ICC's than MHS; 4) the TD analysis resulted in higher ICC values than the FD analysis. This study is limited by the small number of subjects in each group.

Symposium
Friday, October 6, 2000
2:00-3:00 pm

WHAT CONTROL'S GLUCOSE UPTAKE IN SKELETAL MUSCLE?
Bruce W. Craig, Ph.D., Chair

The usage of glucose by the muscle is controlled by a variety of factors, but the most important of these are insulin and muscle contraction. This symposium is designed to give you a basic understanding of the cellular mechanisms that control glucose uptake, and will explain how insulin and exercise influence the process. This will be accomplished through three different presentations. The first of these will concentrate on the mechanisms that regulate the movement of glucose into the muscle. Glucose uptake is a form of facilitated diffusion that involves both membrane and cytoplasmic carrier proteins. Current knowledge indicates that both insulin and exercise can lead to the movement or translocation of these carrier proteins

The second presentation will examine the stimulatory effects of insulin and exercise on glucose uptake by the muscle. Research has shown that both insulin and exercise enhance glucose uptake by stimulating the translocation process. However, it is quite clear that they operate through distinct signal pathways. The insulin-signaling pathway has not been fully described but two intracellular proteins, insulin receptor substrate 1 (IRS-2) and phosphatidylinositol 3-kinase (PI 3-K), have been shown to be essential to its function. Evidence is accumulating that suggests that PI 3-K can control downstream regulators such as, phospholipase C (PLC), protein kinase C (PKC) and AKT/protein kinase b (PKB). These interactions and their relationship to glucose carrier translocation will be discussed. The second half of this segment will discuss the recent findings implicating AMP dependent protein kinase (AMPK) as the metabolic fuel gauge of the muscle.

The final presentation will examine the influence of exercise training on glucose uptake and insulin sensitivity. Skeletal muscle is the major site for disposal for glucose, and it has been shown that exercise training can lead to increased insulin sensitivity within the muscle. The basis for this mechanism remains unclear but has been investigated in trained and untrained athletes using an euglycemic clamp technique. This technique gives researchers the ability to measure skeletal muscle insulin sensitivity. The presentation will concentrate on hyperinsulinemic-euglycemic clamp data and how it can be applied to the question of insulin sensitivity, training status, and insulin-signaling.

Presenters
Bruce W. Craig, Ph.D., Ball State University
Skeletal muscle glucose translocation: the basic mechanism

David Wright, M.S., Ball State University
Cellular effects of exercise and insulin on glucose uptake

David Williamson, M.S., Ball State University
Enhanced insulin mediated glucose uptake: the influence of training

Physician Case Presentations
Friday, October 6, 2000
2:00-4:00 pm

WRIST PAIN IN A GOLF PLAYER

D.R. Patel, K.J. Jackson, Department of Pediatrics, Kalamazoo Center for Medical Studies, Kalamazoo MI, Western Michigan University Sports Medicine Clinic; J.R. Smith, Hand Surgery Health Care Midwest, Kalamazoo, MI

BACKGROUND: Chronic or recurrent wrist pain in an active athlete may result from many underlying conditions. The significance for long term pain and disability varies depending upon the specific condition. Among the many causes for chronic wrist pain include injury to the distal radial physis, injuries to the triangular fibrocartilage complex, tenosynovitis, soft tissue impingement, carpal instabilities, distal radioulnar instability, entrapment neuropathies, capsulitis, and many others.

CASE DESCRIPTION: A 13 year old male presented with 2 month duration left wrist pain playing golf. There was no direct trauma to the wrist. Pain occurred daily, was deep seated, mild to moderate, heavy aching type, localized to wrist, and worsening over several days prior to presentation. No history of pop, snap, radiation, numbness, paresthesias. Examination revealed full range of motion at wrist. Minimal discomfort on full ulnar deviation. No swelling, erythema. Tenderness over ulnar aspect of wrist, over TFCC area; aggravated by compression and rotational stress to wrist. No tenderness over scaphoid. No signs of carpal instability. At this point the DIFFERENTIAL DIAGNOSIS of chronic wrist pain included: wrist sprain, injury to the triangular fibrocartilage complex, wrist capsulitis, stress injury to the distal radial physis, carpal instabilities. Plain films of the wrist were normal. The ulnar styloid was prominent. MRI of the left wrist showed a perforation of the triangular fibrocartilage complex. TREATMENT: Wrist immobilization; exploration and repair of the TFCC.

CLINICAL SIGNIFICANCE: Chronic or recurrent wrist pain in young active athlete should be thoroughly investigated to identify specific etiology. This will allow specific treatment considerations and will help counsel the athlete regarding prognosis and participation in sports.

RECURRENT KNEE PAIN IN A BASKETBALL PLAYER

B.M. Reeder and D.Patel, Michigan State University, Kalamazoo Center for Medical Studies, Kalamazoo MI

HISTORY: A 16 year old African American male with recurrent right knee pain originally presented to clinic after injuring his right knee while running interval sprints in basketball practice. He reported feeling a twist, but no pop was felt. He continued to run on his leg although complaining of 3/10 achy pain primarily on the medial aspect of his right knee with radiation to the right medial tibia. Thirteen months later he noted pain and swelling of the medial aspect of his right knee after playing basketball with no noted trauma or twisting movement. At that visit he commented that he had had intermittent pain and swelling of the right knee since the initial injury one year prior. A MRI was recommended at that time which the patient refused. Four months later the patient reported landing with his right leg externally rotated while coming down from a rebound while playing basketball. Medial right knee was noted immediately followed by medial knee swelling. The patient could not return to play secondary to pain and continued to have extreme pain with minimal weight bearing. PHYSICAL EXAMINATION: The patient walked with a limp favoring the right leg without bearing full weight. There was full range of motion passively. Fullness was noted on the anteromedial aspect of the right knee as well as joint line tenderness along the medial aspect of the right knee. There was no varus or valgus laxity. Lachman's was negative. Appley's grind was negative on initial examination. McMurray's test was inconclusive secondary to apprehension. DIFFERENTIAL DIAGNOSIS: 1. Medial meniscal tear 2. Medial meniscal degeneration 3. Medial collateral ligament sprain. 4 Osteochondritis dissecans 5 Pes anserinus tendinitis or bursitis 6 Synovial plica 7 Meniscal cyst. TESTS AND RESULTS: Radiograph (AP/Lateral/sunrise) Normal. MRI right knee Bilateral discoid menisci. 2. Extensive horizontal and vertical tear of medial meniscus. FINAL/WORKING DIAGNOSIS: 1. Bilateral discoid menisci; Extensive tear of medial meniscus. TREATMENT: NSAIDS and ice for symptomatic treatment. Saucerization and repair.

Physician Case Presentations
Friday, October 6, 2000
2:00-4:00 pm

SOCCER PLAYER WITH LT ELBOW DEFORMITY AND PAIN

Eric Jenkinson, M.D., Central Indiana Sports Medicine/Ball Memorial Hospital, Muncie, IN

History:

A 19 yo player presented to the trained with Lt. Elbow deformity and pain after she had fallen on it. She had lost her balance and tried to catch herself, landing on an outstretched arm. She had immediate pain and loss of motion. She described decreased sensation in the thumb and first finger. She was quickly evaluated and sent to the ER. Significant past medical history, she had an elbow dislocation approximately 4 months ago. She was cleared for full participation and was undergoing rehabilitation for it. She was not taking any medications and had no allergies to medications.

Physical:

She was afebrile and vitals were stable. She was awake and alert but in significant discomfort. Cardiovascular, lung and gastrointestinal exams were unremarkable. Exam of the Lt. Upper extremity showed gross deformity of the elbow - pronounced olecrenon and shortened forearm. There was marked swelling around the elbow. Range of motion was 10 degrees of flexion and extension from 90 degrees. There was generalized pain to palpation around the elbow without creptius. Range of motion of the shoulder and elbow were normal. There was decreased sensation to light touch and pin prick in the thumb and first finger. Also there was decreased strength with pinch of the thumb and first finger and wrist extension. There were good distal pulses.

Differential Diagnosis:

1. Elbow dislocation without fracture; 2. Elbow dislocation with fracture; 3. Fracture of Ulna or distal Humerus; 4. Nerve injury - Radial and Median

Test and Results:

Two views of the elbow - posterior and lateral elbow dislocation without fracture.

Final Diagnosis:

Recurrent Posterior Elbow Dislocation

Treatment:

Patient was given a hematoma block of Marcaine and close reduction was attempted. This was unsuccessful and the patient was taken to the operating room for closed reduction under general anesthesia. The patient was then placed in a posterior splint for a total of three weeks. The second week in the splint she was allowed to do active range of motion to 90 degrees. The third week in the splint she was allowed to do full active ROM. She was removed from the splint in the 4th weeks. She returned to soccer 5 weeks after the dislocation in a hyperextension brace. She has continued aggressive rehab. Currently, she lacks 10 degrees of full extension and has marked laxity of the UCL, but has had a full return of neurologic function.

Physician Case Presentations
Friday, October 6, 2000
2:00-4:00 pm

BACK PAIN IN A 14 YEAR-OLD FEMALE

Antje Southwick, College of Human Medicine, Michigan State University, Grand Rapids, MI

HISTORY

A fourteen year-old female, Hispanic basketball player presented with a 2-month history of lumbar back pain, which began during basketball season and progressively worsened. The back pain was located in the center and left of the lower back. She had numbness on the lateral side of her left leg, with pain that radiated into her left foot. It was felt when walking and there was pain associated with weight bearing on the left foot. The pain was described as constant. The patient had used Advil and a muscle relaxant, but was on no medications when seen. She had a history of regular periods and was not currently sexually active. She was not active in sports at the time of examination.

PAST MEDICAL HISTORY

The patient denied any bowel or bladder dysfunction, and denied the occurrence of a specific injury. Family history of back problems was negative and there was no history of rheumatologic problems.

PHYSICAL EXAM

Vitals - afebrile and stable
CV - regular rate and rhythm, no murmurs
Lungs -clear to auscultation bilaterally
Abdomen - soft, non-distended, non-tender, hepatosplenomegaly, no CVA tenderness
Musculoskeletal - decreased ROM with flexion and extension of the lumbar spine, significant paraspinous spasm. Negative point tenderness over spinous processes. Positive Trendelenburg sign when the right knee was lifted. No pain over SI joints, full pain-free ROM of hips. Apparent leg length discrepancy, L > R. Motor exam revealed normal strength, difficult to assess secondary to pain. Slightly decreased sensation to light touch over lateral left foot. DTR's + 1 knees and ankles. Positive straight leg raise in seated and lying position on left. Positive reproduction of symptoms with piriformis stretching on left. No joint effusions, no skin changes.

DIFFERENTIAL DIAGNOSIS

Muscle spasm/strain - paraspinal
Disc Herniation
Spondylolysis
Rheumatologic Process - Rheumatoid Arthritis, Ankylosing Spondylitis
Tumor - spinal cord, metastatic
Discitis
Scheuermann's Kyphosis
SI Dysfunction with Leg Length Discrepancy
Piriformis Syndrome
Pyelonephritis
GU Infection

TESTS AND RESULTS

CBC - slight neutrophilia (86.4%), slight lymphopenia (11.4%), otherwise normal
ASOT - normal
ESR - normal
C-Reactive Protein - normal
Rheumatoid Factor - normal
ANA Titer - normal
5 Views of Lumbar Spine - normal
MRI of Lumbosacral Spine - Central and left paracentral disc herniation at the L5-S1 level with impingement upon the root of L5 on the left.

Continued on next page

Physician Case Presentations
Friday, October 6, 2000
2:00-4:00 pm

FINAL DIAGNOSIS
Lumbar disc hernaition.

TREATMENT
Flexeril and Prednisone were prescribed at the initial office visit and spinal radiographs were ordered. The patient returned for follow-up one week after her original visit. She had significant improvement of pain but continued numbness of the left lateral leg. CBC, ESR, CRP, ANA, and RF studies and an MRI of the lumbosacral spine were ordered. Two weeks later she continued to have mild tingling and limited activity, but pain was decreased and gait was improved. She underwent physical therapy and was referred to an orthopedist for further evaluation. An epidural was performed. The patient was treated conservatively. Symptoms resolved and the patient remained pain-free.

ARM PAIN IN A RUNNER
D.K. Ostlie, Central Indiana Sports Medicine/Ball Memorial Hospital, Muncie, IN

History - 62 year old recreational runner presented with one week left arm pain. The pain occurred on the morning following a light run. He had pain in the distal arm and elbow region with some swelling. He denied any numbness or trauma. Over the subsequent week, the pain and swelling became constant. Arm strength and motion were reduced. He initially went to the emergency room, and was referred for follow up.

Physical - Patient in no distress. Left elbow with significant swelling. Pt very tender along the olecranon; radial head was mildly tender. Elbow flexion 5/5. Elbow extension 3-/5. Pronation normal. Passive supination produces tenderness. Shoulder is normal. Neurovascular exam normal.

DDx - 1) Triceps Rupture; 2) Olecranon fracture/Stress Fx; 3) Humeral Fracture/Stress Fx; 4) Radial Head Fracture; 5) Triceps Tendinitis; 6) Olecranon Bursitis

Test/Results - 1) Plain X-ray Elbow - Three small bony avulsions from Olecranon; 2) MRI elbow - Complete Triceps Avulsion

Diagnosis - Triceps Muscle Avulsion

Treatment - Surgical repair, Therapy, gradual resumption of activities

Keynote Lecture
Friday, October 6, 2000
4:30-5:30 pm

Larry Armstrong, FACSM, is an associate professor in the Human Performance Laboratory in the Department of Kinesiology at the University of Connecticut. Dr. Armstrong received his B.Ed. degree in biology and comprehensive science form the University of Toledo in 1971, an M.Ed. from Toledo in 1976, and his Ph.D. in human bioenergetics from Ball State University in 1983. His major areas of research include fluid balance and heat and cold related illness. A former collegiate distance runner, Dr. Armstrong has completed 14 marathons, climber Mt. Washington several times, and has worked the medical tent and collected research data for the Boston Marathon. He has authored over 60 research articles since 1982 and numerous other articles for educational and consumer publications.

UNIQUE RESPONSES AND ADAPTATIONS TO EARTH'S VARIED ENVIRONMENTAL STRESSORS

Lawrence E. Armstrong, Ph.D., FACSM. Human Performance Laboratory, University of Connecticut, Storrs, CT

Earth, third planet form the sun, contains an awesome array of surface environments, ranging from Antartica to the Sahara Desert and from Mount Everest to the Mariana Trench. Although each locale presents danger to human life, we attempt to explore, inhabit, and work in these extreme environments. Physical training and athletic competition are no different, in that some individuals exercise in extremes of temperature, humidity, solar radiation, wind speed, altitude, and water pressure. In response to exercise in severe environments, the human body may be able to maintain its temperature, fluids, and chemicals in balance until exercise ends. If not, fatigue or illness can result. It is also possible that the body will adapt to repeated exposures by reducing the magnitude of the changes in heart rate, core body temperature, or fatigue. But one thing is certain: each of the earth's environments challenges the body in a unique way. This presentation will provide an overview fo the human body's responses and adaptations to the following stressors: heat, cold, hyperbaria (e.g., underwater diving), hypobaria (e.g., high altitude exposure), air pollution, weather patterns (especially changes in air ionization), and biorythmic disturbances (e.g., transmeridian travel, sleep loss). Exercise, performance, acclimatization, habituation, and illnesses will be highlighted.

Oral Research Presentations
Saturday, October 7, 2000

9:00-9:15 am

CARDIOVASCULAR RESPONSE TO DOWNHILL WALKING

J.W. Navalta, D.A. Sedlock, K.-S. Park. Purdue University, West Lafayette, IN 47906.

The purpose of this study was to characterize the heart rate (HR), blood pressure (BP), and rate pressure product (RPP) responses that occur during downhill walking at various speed and grade combinations. Participants were fifteen healthy, physically active individuals (Young = 5M/5F; age 22±1 yrs (SE); ht 169.9±2 cm; wt 71.1±4 kg; Old = 3M/2F; age 65±2 yrs; ht 168.2±4.5 cm; wt 74.50±4.1 kg). Participants reported to the laboratory on two occasions to complete treadmill walking trials. During each laboratory visit, participants performed six 6-minute walking bouts interspersed with two-minute rest periods. Speeds of 2.5 and 3.0 mph were used with grades of 5, 0, -5, -10, -15, and -20%. Speed was counterbalanced between trials, and order of percent grade randomized within each trial. Trials were separated by at least seven days. HR was recorded every minute while BP was measured at the end of each bout. RPP was determined from the product of HR x systolic blood pressure (SBP) x 10^{-3}. Each dependent variable was analyzed using a mixed factorial ANOVA. There was no significant difference between age group for any dependent measure. HR was significantly different for both grade ($F = 41.4$, $p<0.0001$) and rate ($F = 17.1$, $p<0.001$). Tukey's post hoc analysis showed that HR during the 5% uphill bout (108.9±4 bpm) was greater than during all other grades, and -20% (98.8±3.2 bpm) also differed from all other grades. The HR response to 0% (94.7±3.7 bpm) and -15% (91.6±3.2 bpm) were different than the -5% (86.6±3.5 bpm) and -10% (87.8±3.6 bpm) grades. SBP response was significantly different between grade ($F = 26.49$, $p<0.001$), but not between rates. The 5% uphill (137.5±2.6 mm Hg) was higher than all other grades, while 0% (128.2±2.1 mm Hg) and -20% (130.9±2.4 mm Hg) were higher compared to -5% (122.6±2.2), -10% (124.5±2.3), and -15% (125.9±2.4) grades. RPP was significantly different for both grade ($F = 67.6$, $p<0.001$) and rate ($F = 8.5$, $p<0.01$). The 5% uphill bout (15.1±0.6) elicited a higher RPP than all other grades, -20% (13.0±0.4) also differed from all other grades, while 0% (12.2±0.5) and -15% (11.6±0.4) were different than the -5% (10.7±0.4) and -10% (11.0±0.4) grades. This is the first study to investigate cardiovascular responses that occur during downhill walking in both young and older healthy subjects. RPP is often used as an index of myocardial oxygen uptake or myocardial blood flow. Individuals who have angina pectoris upon physical exertion will experience symptoms when myocardial oxygen uptake exceeds a certain level. Thus the RPP is a measurement that is widely used in the clinical setting. It is reasonable to conclude from this data that downhill walking between -5 and -10% grades places less stress on the heart than walking flat or uphill. The value of downhill walking in the cardiac rehabilitation setting should be explored.

9:15-9:30 am

LONGITUDINAL GAIT ALTERATIONS OF ACL-INJURED INDIVIDUALS RECONSTRUCTED WITH THE HAMSTRING GRAFT

T.L. Holmes[12], S.T. McCaw[1], M.R. Torry[2], M.J. Decker[2], W.I. Sterett[2];
[1]*Biomechanics Lab, Dept. of HPER, Illinois State University, Normal;*
[2]*Steadman-Hawkins Sports Medicine Foundation, Vail, CO*

The use of the double loop semitendinosus-gracilis graft (DLSTG) is more common in ACL-reconstruction surgeries. Anecdotally, these patients show faster recovery times, particularly early in the rehabilitation phase, compared to B-PT-B reconstruction patients. Despite widespread use, gait alterations of patients reconstructed with the DLSTG have not been presented. The purpose of this study was to compare joint kinematics of DLSTG reconstructed patients to those of healthy individuals during walking at 6 and 12 weeks post-surgery. Eight DLSTG patients and eight healthy subjects walked at a self-selected pace and at 1.5 m/s, respectively. Video data were collected (60 Hz) to compute hip, knee, and ankle joint kinematics. The appropriate t-test (p 0.05) was used for specific planned comparisons.

RESULTS	**DLSTG Patients**		**Control**
Variable (units: degree)	**6 weeks**	**12 weeks**	**Group**
Knee Excursion	-8.4[a,b]	-11.5	-15.1
Knee Angle at Contact	-11.2 [a,b]	-6.6	-3.9
Knee ROM	31.2 [a,b]	38.0	42.2
Ankle Angle at Contact	5.6	10.2[a,b]	5.2
Ankle ROM	28.3 [a,b]	19.2	21.4

Note: [a] DLSTG significantly different 6 to 12 weeks
[b]significantly different from control group

At 6 weeks the DLSTG group exhibited reduced ROM at the knee joint and greater ankle joint ROMs. By 12 weeks, the DLSTG group exhibited similar gait kinematics, except for the ankle angle at contact. These results indicate that gate kinematics returned to near normal values at 12 weeks post-reconstruction.

Oral Research Presentations
Saturday, October 7, 2000

9:30-9:45 am

PERFORMANCE AND IMPROVEMENT ON 12-MINUTE WALK TEST DURING PHASE 2 CARDIAC REHABILITATION

D. Badenhop, FACSM, B. Chapman, T. Fraker, I. Smith. Medical College of Ohio, Toledo, OH 43614.

The purpose of this investigation was to evaluate performance improvement of Phase 2 cardiac rehabilitation patients on a 12-minute walk test and identify differences based on gender and referring diagnosis. Data was collected on 126 patients who performed a 12-minute walk test at weeks 1, 6, and 12 of a Phase 2 cardiac rehabilitation program. A repeated measures ANOVA using Wilks' Lambda criteria was performed to test for significance over time. All patients showed significant improvement in distance walked in 12 minutes from weeks 1 to 6 (2651 ft. to 3011 ft.), 6 to 12 (3011 ft. to 3270 ft.) and 1 to 12 (2651 ft. to 3270 ft.). No significant differences in improvement of 12-minute walk distance were observed relative to gender or referring diagnosis. Males and females increased the distance walked over 12 weeks of Phase 2 cardiac rehabilitation by 22% and 18%, respectively. Patients with a referring diagnosis of stable angina, valve surgery, and cardiac transplant showed the greatest improvement in distance walked of 32%, 32%, 30%, respectively. Patients with a diagnosis of PTCA, CABG, MI, or CHF showed moderate improvements in distance walked of 12.5%, 21%, 25%, and 24%, respectively. Patients in a 12-week Phase 2 cardiac rehabilitation program significantly improve distance walked in 12 minutes. There were no significant differences in improvement of 12-minute walk distance based on gender or referring diagnosis.

9:45-10:00 am

CRYOTHERAPY AND TENS DECREASE ARTHROGENIC MUSCLE INHIBITION OF THE VASTUS MEDIALIS

JT Hopkins, CD Ingersoll, FACSM, J Edwards, TE Klootwyk, Indiana State University, Terre Haute, IN 47809

Objective: Arthrogenic muscle inhibition (AMI) is an ongoing reflex inhibition of joint musculature following distension or damage to the joint. The extent to which therapeutic interventions affect AMI is unknown. The purpose of this work was to verify that the vastus medialis (VM) is inhibited using the knee joint effusion model and to investigate the effects of cryotherapy and TENS on AMI using this model. *Design and Setting:* A 3 x 6 analysis of variance was used to compare H-reflex data of treatment groups (cryotherapy, TENS, and control) across time (pre, post, 15 min, 30 min, 45 min, 60 min). *Subjects:* Thirty neurologically sound volunteers (age 21.82.4 yrs, ht 175.69.6 cm, mass 71.513.3 kg) participated in this study. *Measurements:* Hoffmann reflex measurements were collected using a percutaneous stimulus to the femoral nerve and surface electromyography of the VM. *Results:* H-reflex measurements from the cryotherapy and TENS groups were greater than measurements from the control group at 15 and 30 min. Cryotherapy was greater than TENS and TENS greater than control at 45 min. At 60 min, the cryotherapy group measurements were greater than TENS and control group measures. VM H-reflex measures at 15, 30, 45, and 60 min were reduced compared to the pre and post-injection measurements in the control group. VM H-reflex measures at 30, 45, and 60 min were greater than the pre, post, and 15min measurements in the cryotherapy group. No differences between time intervals existed in the TENS group. *Conclusions:* Artificial knee joint effusion results in VM inhibition. Cryotherapy and TENS both disinhibit the quadriceps following knee joint effusion, and cryotherapy further facilitates the quadriceps motoneuron pool.

Poster Research Presentations
Saturday, October 7, 2000
9:00-11:30 am (Authors present 9:00-10:00 am)

BODY COMPOSITION AND ISOKINETIC KNEE STRENGTH OF FEMALE HIGH SCHOOL VARSITY CHEERLEADERS

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High school cheerleading differs greatly from when it originated as a sideline activity in the early to mid 1900s. There has been a greater interest in competitive cheerleading in North America with the integration of dance and gymnastics. However, there is insufficient data available regarding the physiological characteristics of contemporary participants in this sport. Therefore, this investigation served to evaluate the body composition and isokinetic leg strength of high school varsity cheerleaders. Seventeen female cheerleaders (age: 16.9+/-1.0 years; height: 162.7+/-5.3 cm; total body weight (TBW): 57.5+/-4.9 kg [Mean+/-SD]) volunteered as subjects for this study. Each subject underwent hydrostatic weighing to determine percent body fat (%BF) and lean body mass (LBM). In addition, isokinetic knee strength (extension/flexion) was determined bilaterally from a set of three maximal contractions on a BIODEX dynamometer at 60 degrees per second to assess peak torque (absolute and relative). Hydrostatic weighing test results were 20.2+/-5.9 %BF and 45.7+/-3.0 LBM. The isokinetic knee extension test yielded the following values for the dominant and nondominant leg respectively: absolute peak torque: 102.4+/-33.5 Nm and 101.6+/-32.2 Nm; peak torque relative to TBW: 1.78+/-0.5 and 1.77+/-0.5; and peak torque relative to LBM: 2.3+/-0.7 and 2.2+/-0.7. Isokinetic knee flexion results for the dominant and nondominant leg, respectively, are as follows: absolute peak torque: 47.9+/-18.5 Nm and 49.8+/-15.5 Nm; peak torque relative to TBW: 0.83+/-0.3 and 0.87+/-0.3; and peak torque relative to LBM: 1.0+/-0.4 and 1.1+/-0.3. Present findings indicate that high school cheerleaders, as a group, are superior to the established norms for similar untrained female adolescents but inferior to other female high school athletes. Future research should focus on establishing a more comprehensive physiological profile of participants in this increasingly popular sport.

THE HECHT VAULT: POST-FLIGHT MECHANICAL VARIABLES AND JUDGES' SCORES

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The Hecht is one of the most important "common denominator" vaults that provides carry-over technical elements for learning more advanced vaults with increased effectiveness and safety. The purpose of this study was to identify the horse takeoff and post-flight mechanical variables that govern success of the Hecht vault. Subjects were 122 male gymnasts performing the vault at the 1995 World Championships. The vaults were filmed using a 16-mm motion picture camera operating at 100 Hz. Approximately 80 frames were digitized for each vault analyzed. The cubic spline smoothing was applied to the position data. Subsequently, the location of the center of mass (CM) in each digitized frame was computed. A deterministic model was developed to identify the mechanical variables that determine linear and angular motions of the Hecht vault. Correlational analysis was used to establish the strength of the relationship between the causal mechanical variables identified in the model and the judges' score. Significant correlations ($P < .005$) identified the following as important determinants of success: (1) large horizontal and vertical velocities and large angular momentum at takeoff from the horse; and (2) large angular distance, large average moment of inertia, and long time of post-flight. Furthermore, the maximum height of body CM and the horizontal distance traveled by CM in post-flight were significantly correlated with the judges' score. In conclusion, success of the hecht vault is most likely when the focus is on achieving: (1) large horizontal and vertical velocities as well as large backward angular momentum at takeoff from the horse by blocking and pushing off the horse "forcefully and rapidly" using the muscles of the shoulders and shoulder girdles to ensure great maximum height, large horizontal and angular distances, and long duration of post-flight that the judges seek in awarding a bonus point; and (2) large average moment of inertia by extending the body fully and maintaining the hecht or "fish-like" position throughout the post-flight to display "form" for an additional bonus point and simultaneously prepare for a controlled landing on the mat.

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THE INFLUENCE OF INVESTIGATOR COMMENTS REGARDING SHOE CONSTRUCTION ON REARFOOT MOTION IN WALKING

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The effects of footwear on gait patterns are not typically measured with double blinding of the varied shoe characteristic. Literature suggests that some subjects perception of shoe cushioning is altered by information regarding midsole characteristics. It has been suggested that a subject alters leg kinematic patterns with different footwear. The purpose of this study was to determine if comments regarding shoe construction could invoke a placebo effect on rearfoot motion during walking. 17 females volunteered for a study presented as a test of a new shoe material. Subjects walked (2.5 m/s) wearing three different shoe pairs (S). In actuality, S2 and S3 were harder than S1. The mislead group (n = 9) were told S1 and S3 were standard lab shoes, with S2 misleadingly described (written & oral) as constructed of unique new shock-absorbing material. A control group (n=8) walked in the same three shoes without any footwear description. Video data collected (120 Hz) in the posterior frontal plane quantified rearfoot (RF) motion for 10 trials for each subject in each shoe. Subjects rated perceived shoe cushioning and stability using a 15 point scale. Each subject s 10-trial mean for each RF and perception variable was entered into a mixed-factor (group by shoe) ANOVA ($\alpha = 0.05$). Results of no interactions or group effects, only shoe main effects, suggest that RF motion is not affected by shoe misinformation given to a subject.

THE EFFECT OF HIGH INTENSITY RESISTANCE TRAINING ON BODY COMPOSITION AMONG COLLEGIATE FOOTBALL PLAYERS

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Purpose: The purpose of this study was to examine the effect of a single-set, high intensity resistance training program on body composition among collegiate football players. **Methods:** Forty healthy, highly resistance trained collegiate football players were randomly assigned to either a single-set, exhaustive high intensity (N=20) or multiple-set (N=20) group. Both groups performed heavy resistance exercise for 10 weeks. The high intensity group performed one set of 6-10 RM to volitional muscular fatigue for each exercise. The subjects were then urged to try additional repetitions until they were unsuccessful in completing a repetition. After this brief isometric contraction the set was terminated. The multiple-set group performed three sets of each exercise at 6-10 RM, but the subjects were not urged to try additional repetitions after volitional muscular fatigue. Body composition data were collected at baseline and at 10 weeks utilizing skinfold measurements. The change in body composition (body fat %) was compared within and between groups. **Results** (reported by mean change ± SD): The change in body composition (-1.185 ± 1.5%) in the high intensity group was significant ($p < 0.002$). The change in body composition (-0.09 ± 0.45%) in the multiple-set group was not significant ($P > 0.05$). The loss of body fat was significantly greater in the high intensity group than in the multiple-set group ($p < 0.005$). **Conclusion:** The data from this study indicate that a single-set, exhaustive high intensity resistance training program elicits superior changes in body composition than a multiple-set program among collegiate football players.

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THE ROLE OF CREATINE SUPPLEMENTATION ON SWIMMING PERFORMANCE

J.T. Selsby [1,2], K.D. Beckett [1], S.T. Devor [2], and M. Kern [1]. College of Wooster [1], Wooster, OH 44691, and The Ohio State University [2], Columbus, OH 43210-1284.

The role creatine (Cr) supplementation may play on performance enhancement for swimming events has yielded inconsistent results. To date, most investigations have utilized only elite level swimmers, and have concluded that Cr supplementation was ineffective as an ergogenic aid. However, when lower caliber swimmers have been studied Cr appears to enhance performance. In order to gain further insight into the role Cr plays on swimming performance, we tested the hypothesis that Cr supplementation will enhance swimming performance in Division III male and female swimmers. Eighteen male and 13 female swimmers were assigned in a double blind, random manner to either a high supplementation group (.3g Cr/kg body mass), a low supplementation group (.07g Cr/kg body mass), or a placebo group. The Cr supplementation regimens consisted of a 5-day loading period for both high and low groups, which was followed by a 9-day maintenance phase where subjects consumed 2 g. Cr per day. The placebo group consumed an equivalent number of dextrose capsules over the 2-week period. Pre- and post-supplementation testing included a timed 50- and 100-yard sprint, four 50-yard sprints during a 2 min interval to assess the role Cr plays in recovery, and a 20 s. maximal effort bout on a swim bench ergometer. Compared with the low dose and placebo groups, the high dose group improved significantly in the 50- and 100-yard sprints. No improvements were found for the maximal effort swim bench ergometer test, or the four repeat fifty-yard sprints. In conclusion, partial support of the hypothesis suggests that Cr supplementation for swimming events is only effective for singular effort sprints but not for short term recovery, for example during interval swimming.

Supported by Copeland Memorial Fund

Symposium
Saturday, October 7, 2000
9:00-10:00 am

THE USE OF RATINGS OF PERCEIVED EXERTION FOR EXERCISE PRESCRIPTION: CARDIORESPIRATORY AND RESISTANCE EXERCISE
Kara Gallagher, Ph.D., Chair

Ratings of perceived exertion are commonly used as an alternative to heart rate for monitoring exercise intensity in a variety of exercise modes. It has been shown that exertional perceptions during exercise may influence the adoption and maintenance of a physically active lifestyle. Based on this information, it is suggested that RPE is the preferable method for monitoring and prescribing exercise intensity. Therefore, it is important to understand the factors that influence exertional perceptions and possible considerations for exercise prescription.

The purpose of this symposium is to provide the undergraduate and graduate exercise science student with a greater understanding of the use of RPE in exercise prescription. Students will learn how to choose an appropriate RPE scale, how to anchor subjects, factors that influence exertional perceptions, and how to develop exercise prescriptions based on exertional responses during exercise. This information can be applied to exercise prescription, research investigations, and for use in monitoring exercise intensity.

Presenters
Randall Gearhart, Ph.D., Southern Illinois University
Selection of scales and anchoring procedures

Kara Gallagher, Ph.D., The Miriam Hospital
Influences on RPE

Kristen Lagally, Ph.D., Illinois State University
RPE and exercise prescription

Tutorial
Saturday, October 7, 2000
10:00-11:30 am

EXERCISE IN THE MANAGEMENT OF INSULIN DEPENDENT AND NON-INSULIN DEPENDENT DIABETES

Shel Levine, M.S., M.S.A., C.E.S., Eastern Michigan University

The purpose of this presentation is to discuss the role of exercise in the management of insulin dependent and non-insulin dependent diabetes. Along with diet and medications, exercise is a key ingredient in optimal control of blood glucose levels. Therefore, patients with diabetes are encouraged to exercise on a more regular basis. As a student or working Exercise Physiologist, you may come across a patient with diabetes in a cardiac rehabilitation program, hospital wellness center, corporate fitness center, or even as a personal training client. It is essential to understand not only the effects of acute and chronic exercise on glucose uptake and metabolism but also the proper technique in exercise prescription for patients with diabetes.

Objectives: Upon completion of this presentation the attendee will:

* Learn treatment strategies for insulin dependent and non-insulin dependent diabetes
* Learn acute and chronic effects of exercise in diabetes
* Learn the importance of HbA1c in glucose control and the effects of exercise on HbA1c
* Learn pre-exercise recommendations for patients with diabetes
* Learn ways to prevent or minimize hypoglycemia during exercise
* Learn exercise prescription techniques for insulin dependent and non-insulin dependent diabetes
* Learn about diabetic complications with exercise – retinopathy, autonomic and peripheral neuropathy, nephropathy

Special Tutorial Event
Saturday, October 7, 2000
9:00 am - 12:00 pm

Note to Attendees: This event is being held separate form the MWACSM Meeting. However, you may attend this session free of admission charge if you choose.

MARKETABLE SKILLS IN THE FITNESS INDUSTRY
Brenda Reeves, Ph.D., Chair

In today's market, technology is exploding, and fitness industry has an increasing need for fitness professionals who can put theory into practice. However, these fitness providers also place a strong emphasis on personal attributes for customer recruitment, satisfaction and retention.

This tutorial is designed to (1) review common relationship and technical skills necessary for success in today's fitness industry; (2) present current scientific research and exercise guidelines in a format that is easy for students and fitness professionals to understand; and promote interaction and networking among local fitness professionals and university students.

Presenters and Topics
Julie Walton, Ph.D., Calvin College
What you need to know about fad diets and supplements

Kim DeLaFuente, M.A., Spectrum Health
10,000 steps to health: new directions for exercise prescription

Jeff Johnson M.S., Spectrum Health and Jim Scott, M.A., P.E.S., Grand Valley State University
Biometrics for today's professional: how do your skills rate?

Brenda Reeves, Ph.D., Grand Valley State University
Interpersonal skills to help you get and retain clients

HOTEL–Concourse Level