

Healthy Youth Sports

Episode 1: Youth Football Health & Safety

Guest: Thayne Munce, Ph.D., FACSM

Transcript

00:00:16 Eric Utterback

Hello and welcome to Healthy Youth Sports Podcast presented by the National Youth Sports Health and Safety Institute, a partnership between the American College of Sports Medicine and Sanford Health. I'm Eric Utterback, director of the institute. This is a podcast where we'll talk about youth and adolescence, sports injury prevention, physical activity and health with some of the world's leading subject matter experts.

If you're an athlete, parent, coach or administrator, thank you for joining us today. You can follow us online at www.andyshsi.org on Facebook and Twitter at Youth Sport inst. That's youth sport. INST.

With me today is Dr. Thayne Munce, an assistant scientist and director of the athletic Health and Performance Lab at Sanford Research, a division of Sanford Health in Sioux Falls, SD.

Dr. Munce is a research sports scientist who studies the effects of repetitive head impacts and concussion on brain health and athletes. His work is highlighted by a multi-year study investigating head impact exposure and neurologic function and youth football players.

We have an outstanding show for you today, shining a spotlight on a very important topic of youth football, health and safety. So let's jump right in!

00:01:31 Eric Utterback

Dr. Munce, how are you?

00:01:33 Thayne Munce, Ph.D., FACSM

I'm doing great, Eric. Good to see you. Thanks for having me today.

00:01:35 Eric Utterback

You bet. It's great to see you too. It's been a few weeks since we've talked, but it's always wonderful having you on and and and get a chance to chat. Really excited as you are our first guest on the Healthy Youth Sports Podcast, I'm really excited about that. And before we kind of jump in and and talk about this important subject.

I would really like to have the listeners kind of get behind the the veil a little bit and and hear, hear how our guests kind of got to where they are in their careers. And so I'm going to put you on the spot a little bit here and just have you share a little bit about your life journey and and and why.

Why is it that you do what you do?

00:02:21 Thayne Munce, Ph.D., FACSM

Sure, and it's great to be here for the the first podcast! Yeah, I think like a lot of people in exercise and sports science and sports medicine. I got interested in this field as an athlete myself. So I was a multi-sport athlete growing up. I started to specialize in football in high school and played in college. And I've also had a strong interest in in science, so I've been looking. I was looking for a career that combined those two interests of sports and science.

I've always been interested in sports performance in sports medicine? And that's what led me to Penn State, where I got my graduate degree in kinesiology, with an emphasis in exercise Physiology.

And I I still had, you know, a lot of interest while I was in grad school. I studied human thermal regulation in grad school and had a little bit of overlap with some football related issues with heat stress and injury rest that are relevant to the work that I do today. And then after I graduated from from Penn State I took my first real job at the University of Illinois Chicago, where I was a clinical assistant professor in the Department of Kinesiology and Human Nutrition. There I primarily taught courses, and they did some research. There's mainly student led research in a variety of topics.

I was there for seven years and then I took essentially my current position at Stanford Health in Sioux Falls, SD in 2010. Around that time, that's when some of the research was starting to come out on the effects of repeated concussions on long term brain health in football players. It was also a time when the diagnosis of a disease, chronic traumatic encephalopathy had first been reported in a former NFL player. So there is a lot of interest and I think momentum building in brain health and health and safety in football and when I joined my position at Sanford, I have the opportunity to work with a sports medicine staff here at Stanford who are interested in concussions. So that was really my first introduction to that. The area of concussion and and brain health research.

00:04:34 Thayne Munce, Ph.D., FACSM

Because I was also moving home, so Sioux Falls is my home. I had relationships with our youth football organization and was able to leverage that into starting to study head impact exposure and brain health in youth football players. So in in many ways, it's kind of full circle kind of coming back home, but also going back to my roots and my interest in sports and football in particular and being able to address you know, really high profile sports medicine topic of concussion and brain health in the sport and as being a research scientist and in a healthcare system. So yeah, that's really how it all came together. And for the past, you know, 10 plus years I've been, you know, studying brain health and concussion in athletes with the primary focus on youth football players.

00:05:19 Eric Utterback

Fantastic Journey and and we're definitely glad that you're in the space.

So that is a perfect segue, concussion, right? The big word in football, regardless of whether it's youth or the collegiate level or even in the professional level, when people think about health and safety and football, concussion obviously is that is one of the first words that come that comes to mind. So let's definitely start there. Can you describe what a concussion is and and why football players are at risk?

00:05:51 Thayne Munce, Ph.D., FACSM

Sure, a concussion is a traumatic brain injury induced by biomechanical forces. Typically it's a direct blow to the head, although it can be caused by an indirect blow to the body that causes a whiplash

effect. But essentially what happens is that the brain moves violently inside of the skull. That causes stretching and shearing of the the cells within the brain. And that leads to neurologic impairment, and concussion is marked by clinical signs and symptoms such as headache and nausea. Feeling like you're in a fog. You can have difficulties with concentration and memory. You have problems with sleep sensitive to light and sound, so a whole host of different signs and symptoms that are related to that neurologic impairment that occurs to the injury and and it's different for every individual. You know, we often talk about with the concussion that if you've seen one concussion, you've seen one concussion because it manifests itself differently in, in different individual.

00:06:51 Thayne Munce, Ph.D., FACSM

And this is not an injury that only happens in football. I mean, it can happen in, in literally any sport. So that's important to note. But you know, football is a high-speed collision sport and and players are certainly at risk and and encounter high speed collisions and head impact exposure while participating in the sport. So there is a higher risk in football than most other sports and sport epidemiological evidence shows us that or demonstrates that if you compare football to sports like basketball, baseball, softball, soccer, you know, football typically is at the top of the list, there are some sports like rugby and and ice hockey and boxing where higher rates of concussion are reported, but certainly in football, the the risk is relatively high and it's also, a very popular sport, so we hear a lot more about the concussions that take place in football than perhaps some other sports, and that's why there's been a lot of attention on it. And I think one because of just that the prevalence of the injury and also just the profile of the sport itself.

00:07:59 Eric Utterback

Alright, so following that up this next question would probably be twofold.

Number one, how? How common is it for a youthful football player in general to get a concussion? And I ask that specify in general, because I'm curious on how common is it and then how? How common has it been for youth football concussions that you've found or seen in your study that you're doing there at there at Sanford? And then how does that compare to older players?

00:08:38 Thayne Munce, Ph.D., FACSM

Sure. One thing to note from from the tap is that injury surveillance in youth football and youth sports in general is really lacking in in the United States. And that's one area where we really need to advance and and do a better job of assessing the injuries that take place in the sport. That being said, there have been some studies that have been conducted to try to understand how often injuries including concussion occur in youth football, that the largest study of its kind that I'm aware of has shown that about the 2% of youth football players on an annual basis get concussed. And just for the point of definition, when we're talking about youth football players, that's typically younger than high school age. So we would categorize younger than high school age differently than high school players. And so that roughly 2% compares to about 5%, which has been reported at the high school and collegiate level. 5% of football players on an annual basis getting concussed and then at the NFL level, the number that's reported the most recent number is about 9% of NFL players are getting concussed.

00:09:49 Thayne Munce, Ph.D., FACSM

Now there's a few things to take a note: one, concussions are notoriously underreported. We know in high school and collegiate athletes at up to 50% of concussions go undiagnosed on an annual basis, which means that roughly 5% rate that's been observed in studies, we probably need to double that to get a true rate of enough concussion occurrence in in high school and collegiate players. It's possible. Then at the youth level that also could be happening. And as I mentioned, that injury surveillance is just very poor at the youth level, so it's certainly possible that youth players do have fewer concussions on an annual basis, but it's also important to recognize that youth players typically have fewer games and fewer practices, so they have fewer what's known as exposures. Exposures to the injury. So on a session by session basis, it's probably much closer to the rate to what you would see at the at the high school and collegiate level.

00:10:45 Thayne Munce, Ph.D., FACSM

That being between 5 and 10% is probably a a reasonable estimate of players that get concussed on an annual basis, and and that's consistent with the work that we've seen. You know, in our own work, in our own study over. You know we're into our, we'll be starting our 12th year here pretty soon. You know we've only documented 9 or 10 physician diagnosed concussions in our youth players over that period of time. We measured the head impacts of the players and one thing that we've also reported is that concussion only occurs about once for every 3700 head impacts that a youth player experiences. So for many youth players, you know that the risk is there, but it's not maybe as overwhelmingly high as may be expected, or that people may get out of reading some, you know, articles in the media or seeing some things online where it's represented that almost every player gets concussed. If on an annual basis or if you're playing football. But nevertheless, even if you look at 2.5 to 5% up to 10% rate of concussion in youth football. That still translates to 50,000 to maybe upwards of 100,000 youth players are on an annual basis who are getting concussed just because the participation numbers are so high.

It is a public health issue. I mean, when you start talking about 10s of thousands of players that are getting concussed on an annual basis, something that we need to pay attention to and we need to continue doing our work of trying to reduce that rate.

00:12:25 Eric Utterback

How long does it take for a concussion to heal?

Is there a difference between the age of the athlete and what are some of those long-term consequences?

00:12:40 Thayne Munce, Ph.D., FACSM

This is an area that's really advanced in the last 10 to 15 years. When I started to do this work, it was often reported that most people will recover from the concussion in seven to 10 days. That was the time frame that was typically used and and reported. We now know that that is longer.

So the largest study of its kind studying concussions is the NCAA DoD Care Consortium, which got numerous schools and and they've reported that medium median recovery time. That means full return to play is about 13 days, so about 50% of collegiate athletes return at about 13 days, and the majority of athletes are returned by 28 days or four weeks after the injury, and that holds pretty well for youth athletes as well. Children and and adolescents. Though there is some research suggesting that the youth

athlete, the adolescent athlete, does take longer to return. So in general you know two to four weeks is the time frame in which most youth athletes are going to recover and be back to school, back to sport after suffering, suffer from a concussion. But some do take longer and do have persistent symptoms after 28 days.

00:14:02 Thayne Munce, Ph.D., FACSM

In terms of long term consequences, there is research suggesting that people who have a history of concussions are more at risk for subsequent concussions down the road. And you know that's true for a lot of injuries, you know, ankle sprains, knee injuries that risk of prior injury is often the the greatest risk factor moving forward for subsequent injuries. Fortunately, it does seem that once bit of a is allowed to properly heal and if someone doesn't have any of the situations that exacerbate the the initial injury that the long term consequences are typically very minimal, that people can, fully recover and have minimal adverse effects on quality of life or Wellness and health later on in life. So that's something that athletes and parents should know that it it can't be a scary injury be cause it's your brain. Of course it's getting injured, but most people heal and recover and and don't have any lasting effects later on in life.

00:15:07 Eric Utterback

So rightfully concussions do get a lot of the attention in football and for any context for that matter, but they aren't the only concern for a player's brain health. Isn't that correct?

00:15:21 Thayne Munce, Ph.D., FACSM

That that is correct and and that's another area that we've really learned a lot about just in recent years. In the last five to 10 years or so. And this additional concern has to do with the repetitive head impacts that nearly all football players experience. So it's not just that single acute injury. Traumatic injury of a concussion. But understanding what effect does getting him to have repetitively over the course of a practice, the game, and entire season have on the brain.

Because that is trauma, even though it's at a lower level, that is trauma and it's advanced to the point where we recognize what's known as sub concussion or sub concussive changes that result from these repetitive head impacts and how we know that these changes occur is largely through neuroimaging studies that look at how the brain functions metabolic activity of the brain and neural activity, blood flow in the brain. And it's been shown that after a season some football players and some contact collision sport athletes in other sports as well have changes in their brain compared to people who don't play contact collision sports and those changes are related to the number of impacts often and the severity of impacts that the players experience over the course of the season.

00:16:45 Thayne Munce, Ph.D., FACSM

Now we don't know exactly what the health effect of that because by definition it's a sub concussion doesn't have any outward signs or symptoms, so you can't clinic clinically diagnose it. But we know again through some of our tools through neuroimaging and and even more recently even in some of our own work we've used EG to see brain wave activity change after a season that these changes exist, but we don't know what that means. Down the road for health, the concern is that there's this neurodegenerative disease chronic traumatic encephalopathy that that we've identified earlier that has been found after death in former NFL football players Other athletes in other sports, soccer, rugby

rodeo, boxing. Virtually any sport where people can get hit in the head. This this disease has been diagnosed and the best evidence today suggests that it's not a history of concussion, but a history of repeated brain trauma. That's the leading risk factor for this disease.

00:17:50 Thayne Munce, Ph.D., FACSM

And and that doesn't mean that everyone. Is going to get it or everyone develops it, but it's certainly something to be concerned about. So this idea that getting hit in the head repetitively leads to something custom changes in in your brain while you're still playing and how that relates to the development of the neurogenic disease, those are the the gaps that we need to fill in that we need to have a better understanding about. So yes, not just concussion but repetitive head impacts is part of the equation because that's really, again, leads potentially down the road to adverse effects later in life.

00:18:29 Eric Utterback

So most definitely and obviously you mentioned the CTE and like you reiterated earlier, we've heard a lot about that disease and former NFL players. And for good measure, a lot of parents who have kids playing football at such a young age, they've been concerned in recent years for this. So what is really the risk for youth football players when it comes to CTE? Or should parents be worried; how do they manage this?

00:19:02 Thayne Munce, Ph.D., FACSM

There's a lot of unknowns about this disease, about the the risk and prevalence of this disease, particularly for youth players. Nearly all of the studies that have been done of deceased athletes are from former professional players and a smaller percentage of collegiate players, but nearly all the cases that have been recognized, diagnosed come and people who have played the sport for many years past high school and and past the the youth playing this And even within those groups, we don't know what the real risk of developing the diseases, much less for the younger players, but what I can tell you is that if the leading risk factor is repeated brain trauma or history of repetitive head impacts that that exposure is far less in high school and in youth football than what it would be in college and the NFL, and the cumulative effect over all those years. So if you think about somebody who may start playing football when they're 10 years of age and maybe only plays three or four years as a youth football player and doesn't even play in high school, well, or maybe they do even play in high school--the vast, vast majority of those individuals are never going to go on and and play in college I mean right now the numbers are about 6.5% of high school players go on to play collegiate football and less than 2% of collegiate players ever go on to play in in the NFL.

So the probability of any high school player playing in the NFL is much less than 1%. So you're talking about outliers that we have an understanding of this disease of CTE. But the vast majority of people who only play through high school football experience far less head impact exposure in their playing days than those other those older individuals. So logically you would expect that the risk would be much greater in that population and I think just the observation that there haven't been hardly any cases at all recognized among people who have only played through youth football, and I know there have been a handful or so of cases of former high school football players being recognized with the disease.

But the fact that that's so rare that it's even been observed suggests that that the risk is probably. You know, quite low and what I can say even more confidently is that the risk would be exceedingly lower than it would be for a former collegiate or NFL player.

00:21:51 Eric Utterback

Well, that sounds like good news to me.

00:21:54 Thayne Munce, Ph.D., FACSM

I think so, and I think that's something that parents and players need to hear because it is scary. I mean for the individuals who have suffered from that disease and then have suffered, you know, late night, late life, cognitive problems and behavioral problems, it's no joke and it's very serious and and no one wants to go through that. No one wants to see a family member go through that, but this there is a thing called risk exposure. There are differences in risk based on the exposure to factors that increase your risk for a disease or a condition and the extent to which repetitive head impacts are a risk factor for CTE, which again appears to be a leading risk factor. That exposure is going to be far less for younger players and and the cumulative effect over the years of playing is going to be far less for someone who even someone who only plays through high school football. Compared to the typical NFL players, so people need to understand that you can't just lump all football players together, that there's differences in risk based on exposure to the game.

00:23:02 Eric Utterback

Coming off the swirl of that topic of CTE and just many of other type of injuries that can be acquired playing contact sport such as football. We've seen recent efforts throughout the US to limit the starting age of tackle football to like 12 or 14 years of age. What are your thoughts? I mean is, is there really an appropriate age for kids to start playing the sport?

00:23:32 Thayne Munce, Ph.D., FACSM

Yeah, I think the short answer to that is no, you're right. There have been some state laws that have been introduced to regulate the age at which tackle football is being played and those ages, are typically even 12 or 14, as you mentioned and those laws have largely been based on some studies, which have shown an association between starting to play the game younger and some late life cognitive effects. But there are other studies that dispute those findings and and show the exact opposite, that playing the younger age is not related to late life cognitive effects, and there are limitations in all the studies.

You know, one thing I also would point out that is a limitation is that a lot of those studies have been based on the play that has happened decades ago, and we know that football today is a lot different than it was even 10 years ago, much less 20 and 30 years ago. So again, I think the evidence is not on firm ground for those types of studies that suggest the younger ages have a relation to bad long term health outcomes. That being said, the appropriate age at which to start is really an individual decision. You know this is something that USA football, the governing body for youth football in the United States really stressed through their youth football development model in which you look at football like you should really look at all your sports: as a developmental pathway.

And understanding the maturity of the child, what's the right pathway? What's the right entry point into the sport? And for some people just physically, from a maturation standpoint, from a cognitive

standpoint, starting tackle football at age 7-8 or nine just may not be appropriate for them. It just may not be the right entry point for them in the sport so the USA football development model is basically suggesting that there are multiple entry points, that can be flag football that can be hybrid flag-tackle, it can be tackle football, that's really meant to fit the capabilities and the maturity of the athlete at his or her age. And therefore there isn't really a right age at which to start playing the sport, but rather we should encourage people to become active in sports like football, that they enjoy and that they can learn basic athletic development skills, not just sport-specific skills, but just how to be an athlete, how to move, how to be physically fit, how to interact with their teammates and benefit from the social aspect of play. And that's going to be different for every individual, and that's something then that a parent and a child. You have to determine what that right age is.

You know, I will say from my own research and just speaking from the research that I've conducted, I am not concerned from a safety perspective about someone starting to play football before the age of 12 or before the age of 14. I think that the evidence that we have in our own research and the broader body of evidence, it does not suggest that is going to put players at risk for long term health consequences. What I'm more concerned about is that the person is physically ready and mentally ready and socially ready. You know, to play the game at whatever age they start at and that's something I think the parents need to take into consideration. It's something that often gets brought up in in many different sport contexts about, I want to get my kids started as early as possible and they're gonna fall behind. And we know that's not the case with football. There is some skill development that's necessary and certainly getting some of that foundational skill, work done for blocking and tackling, it's possible that that may help and actually help the players be safer when they're older if you get that work done earlier. But we haven't really done studies on that to be able to say one way or another. So again, I think it really comes down to the the maturity, the development of the child and seeking that appropriate entry point for them, regardless of what the chronological age is.

00:28:06 Eric Utterback

So you touched on a really important piece. I thought it's kind of slipped it in there, and I'm a huge fan of this. So for two old guys, yourself and myself, who started in flag of football and actually had the opportunity to play through college, we were blessed to have an opportunity to do that. I'm a huge fan of seeing flag football being introduced as another pathway or entry into the sport. You mentioned not really having a specific age to start, I think that the flag football format really allows a lot of kids, boys and girls—even now we're even seeing a lot of girls participate in flag football, but it just it lets them have the opportunity to develop their skill set right and and kind of entry into tackle football. I think when they really have a sense or understanding of it. But football, I think, allows the kids to have a good time and enjoy their friends and and just kind of absorb the sport at kind of at maybe at their pace. So huge fan of that.

But with that being said is there anything else that you're seeing out there that is helping make the sport safer, or what other efforts are there, whether it be you through USA football or other organizations? I mean are they? Are there recommendations or strategies to alter The way practices are run, you know fewer fewer drills during practice times that you know pit kid like up against kids where there's fewer, you know, head impacts and those types of things, you know, what are what are you seeing out there?

00:29:44 Thayne Munce, Ph.D., FACSM

You're right and there are a lot of efforts currently underway. A lot of them are being led by USA Football as the governing body. I think first and foremost education and awareness of concussion and brain injuries has really taken hold in the youth football landscape where coaches, many of whom are volunteer coaches, parents that don't have necessarily training because they didn't go to school to be a coach, they don't have a certification for being a coach, but they've volunteered because their child is playing. But the the understanding and awareness that concussions are and again repetitive head impacts as we talked about are an issue as I I think change the the mindset for the the current generation of coaches who are coaching youth football and in in such a way that...Yeah, I think when you and I played it was there...the aspect of let's hit to show you know how tough we can be or to make the kids tougher by making them hit. I think that was a pretty common philosophy and approach that that was taken and that still may be happening. I don't think it's happening as often at least in my own experience, happening as often as it was in the past.

Where USA Football has taken the lead and in other organizations like Pop Warner Football by instituting regulations or restrictions on contact time. So how much time you can spend in a given session doing full contact hitting or contact USA Football has issued recommendations on the number of practices and the length of practices and making that age specific so that as you get older that the number and duration of practices can increase but not having 7 or 8 year olds practicing five days a week for two hours at a time, which again may have happened at some point in the past. Outlawing certain drills. So a lot of us are familiar with the bull in the ring, the Oklahoma drill where they're drills that are just constructed to get the players to hit one another. And there's really no way that you can avoid getting hit or that you can win by another skill other than you're just making contact and understanding that the risk of injury is higher. Thae what you're actually teaching in those types of drills probably isn't going to translate as well to the playing field, so recommending to eliminate those types of drills, limiting the number of games that are played. Yeah, I think that in the past it was pretty common to only have one game a week, but I've heard of spring leagues and even football tournaments where you have multiple games in a given day, which again probably isn't the the smartest idea in the sport where you're experiencing these head impacts.

00:32:50 Thayne Munce, Ph.D., FACSM

So there are a lot of efforts underway. Again, I think it starts with coaching education and then some parameters around how much time you spend hitting, how many games and practices you actually play and the length of those games and practices, eliminating certain drills. And there have also been other recommendations by USA football to like eliminate the three-point stance for some interior lineman to avoid the head impacts, so a lot of concentrated effort.

I can speak to a study that we performed, which was looking at head impacts from a 2012, 2012 season to the 2019 season in middle school football player. And what we observed was a 79% reduction in the head impacts that the players experienced per session. So this is games and practices from the 2012 to 2019 season and this is in the league where they didn't change any rules. So they didn't eliminate kickoffs, they didn't eliminate tackling during the games nothing. And they actually didn't even have contacts restrictions during practice. The coaching staff stayed the same. The helmet stayed the same over that period of time, but we still saw the 79% reduction in head impacts, 81% reduction in practices, 69% reduction in games and we attribute this largely to the coaches education and how they taught.

They gained the types of drills that they used in practices how they taught the players to tackle and block and what was really interesting and cool I think is that not only did we see those numbers go down in practices where a lot of that is dictated by the.

But to see the numbers go down in games where the players are still playing full speed and full contact suggests that they were actually learning how to play the game differently. They were tackling differently without using their head, and I think that's really encouraging because that suggests that we can teach players how to play the game safer than we did in the past.

And that's a really concerted effort. Again, it has to start with coaches and it has to start with a program in place. This league that we worked with, implemented USA football's heads up tackling program and that seems to be effective. There are other programs I know that are that are available as well. But teaching kids to tackle and block without using the head, you avoid getting those head impacts as much in practice. But again, really interesting to see that that seems to be able to translate into the into the game as well. We don't know if this is happening throughout the United States or if it's unique to the the league and the team that we work with in in Sioux Falls, SD. I would like to think and hope that this is happening throughout the country.

00:35:36 Thayne Munce, Ph.D., FACSM

I suspect it is because again, there's just these campaigns and efforts to educate coaches and the great work that USA football is doing to provide these programs and instructional courses do coaches. So I think that the the prospect of the future is bright for football that we're on the right track. Actually creating a safer game.

Even within the tackle parameters, and we've talked about flag football as an alternative, as a separate entry point, but even within the game of tackle football making that version of the game safer as well.

00:36:11 Eric Utterback

Well, this is great. It's been wonderful insight and all. You know, one thing that I'm really encouraged about and a takeaway for me is, you and I have talked offline before about the sport of football and what's going on. And and I think we had a conversation one time where most volunteer coaches in any sport, really, they coach the way they were last coached. So if you have a well-intentioned, volunteer coach at a Bantam Football League, but if their high school coach or their college coach was in your face tough, which there's maybe nothing wrong with that, to some degree. But the constant hitting, those types of things, if that's taking place and then now you're coaching that way, especially in light of all these great educational programs that are out there now, a different way of teaching the the sport.

Think about now all these young kids who are being taught differently. And they go through the process from Bantam to middle school to high school and if they play beyond great. If not, they're still being taught a different way. So hopefully when it's their turn and they're now a volunteer coach, they're also teaching it the last way that they were taught. So my whole point of this is if you look at the whole spectrum, this may take 15, 16, 17 years to sort of play out, to maybe see some longer term effects, but that's kind of an encouraging take away for me with all this.

But with that being said, as we close, grateful for your time. I love talking with you. And I'm sure there are plenty of other topics that we might be able to bring you on and chat about on future shows. But as

we close, are there any final words of advice or encouragement for athletes of all ages that you'd like to start with.

00:38:12 Thayne Munce, Ph.D., FACSM

Sure. Yeah. And I think that what I'm going to say applies to all sports, but specifically for football players and parents of football players to keep in mind that the benefits of sport participation nearly always outweigh the risk. And as someone who has studied concussion and brain health and youth football players for over a decade, my opinion, looking at the current evidences that that is true for tackle football that the benefits outweigh the risk and it is difficult to quantify benefits. It's often difficult to quantify the risk. I said we've got shortcomings and injuries to real. So it's difficult to have empirical data comparing risk and benefits. But I think from a high level point of view, looking at the relative risk of this sport and knowing the benefits, the first hand benefits that I've experienced as a player and my teammates have experienced as a player and the kids that we continue to work with in our research studies that they're getting out of the game and that they keep on coming back and think injury is always on the back of a football players mind, but at the same time, had the fun and the competition and the things that they're learning is more at the forefront and keeps them coming back.

That should always be something that parents and players are thinking about. That if the sport of football has numerous benefits, and tackle football in particular, I think has some unique benefits that you can't get from from other sports because of the physicality, because of the collision issue because of having to trust your teammate and having to be so in tune with your assignment. Otherwise someone could get hurt. That those are things that you can learn and that you teach as a coach and the players understand and can carry with them into other aspects of their life. So, again, the bottom line is that I think the parents always need to keep in mind not just be focused on the risks, but also be thinking about the benefits of the sport and understand that the benefits of participation, you know almost always outweigh the risks.

00:40:29 Eric Utterback

Dr. Thayne Munce, thank you. And let's do it again.

00:40:34 Thayne Munce, Ph.D., FACSM

Sounds good, Eric. Thank you very much.

00:40:36 Eric Utterback

Take care.