Concussions in Football - Understanding Injury, Safety, and Technology

This LiveStream covers concussions within the realm of sports and specifically football. Our experts, Robert Erb, Fred Barnett, and Dr. Russell Amundson, M.D., will discuss the following topics and other questions that you may have:

- What Are Concussions?
- How Do Concussions Happen?
- Current Technology Developed to Protect the Head
- Baseline Testing
- New Developments in Protection Technology
- Dangers of Concussions
- Recovering from Concussions
- Signs of Concussions

Concussions in football and other sports have received much national attention in recent years because of their prevalence in the sport, misunderstanding of the medical condition, and concern for youth and adult players' potential brain injuries. The reasons for the attention are valid and through this SportsU LiveStream, we aim to bring more knowledge to you about the issue, allowing us to better understand concussions and how we can use current technology, techniques, and tests to play a safer game.

PANEL EXPERTS

Robert Erb
President, CEO
Schutt Sports

Robert Erb is an expert from the world's #1 maker of football helmets, Schutt Sports. Erb has served for the past five years as the President and CEO at Schutt Sports and has led the company to a helmet market share in the NFL to over 30%. Erb has held leadership roles at Sports Brands International LLC, TaylorMade Golf Company, and Adidas America.

Dr. Russell H. Amundson, MD
Neurosurgeon
Einstein Medical Philadelphia

Dr. Russell Amundson, M.D., practices neurological surgery at Einstein Medical Centers in Philadelphia and Norristown, PA. Selected as a "2012 Top Doc" by Philadelphia Magazine, Dr. Amundson is a renowned neurosurgeon with over 20 years of experience. He graduated from State University of New York Downstate Medical Center College of Medicine and served residencies at Albany Medical Center.

Fred Barnett
Former NFL Wide Receiver
Philadelphia Eagles, Miami Dolphins

Fred Barnett is a former NFL wide receiver for the Philadelphia Eagles and the Miami Dolphins. He made the Pro Bowl following the 1992 season and played in the NFL for eight years. Barnett played college football at Arkansas State University. Through his college and NFL career, Barnett has had first-hand experiences with football concussions.

(Click here to watch the video)

Lou: Hi. I'm Lou Rusnock and I'd like to welcome everyone to our first ever live stream event here at Sportsunlimited.com as we get into August, obviously, football is on the minds of a lot of people out there, the NFL training camp started, college football pre-season poles are out. Texas is starting high school football this week, so a lot of people thinking about high school football and different kinds of football. With that, recently has come a thought of concussions.

So, we're here today to try and inform parents, players, athletic trainers and coaches about some of the facts, the myths, and the ways to help you get a little better idea of the information out there regarding concussions. Fortunately for me, I don't have to do it alone I have a nice panel of experts here with us today and seated across the table from me is a Dr. Russell Amundson from Einstein Medicals. Thanks for coming out today.

Dr. Amundson: Thanks for having me, Lou.

Lou: An expert in the helmet industry, we have the President and CEO of Schutt's Sports, Mr. Robert Erb. Robert.

Robert: Thanks.

Lou: And a former NFL player, Fred Barnett, someone who's had some experience with concussions in his playing games with both the Philadelphia Eagles and Miami Dolphins. Before we get in the concussions, I'd like to talk a little bit about football helmets. It's come a long ways since football started in the 1890's people started playing with the soft style, leather helmet. The first plastic helmet was introduce in 1939 and over the years face mask, air bladders, full face masks, chin straps, all kinds of things had been

add to it. Robert, I just wonder if you could kind of fill us in on. What happened maybe in the last five to ten years and how is the helmet industry changing?

Robert: Well, the industry is changing in response to material science and then they published academic research. You can imagine that this is obviously very topical. We have every incentive as helmet manufacturers want to reduce injury if we can both ethically, morally, and even financially given that there's ramifications to not making good products.

The way that they've changed probably the most is the technology is moving out of pace that heretofore hasn't existed much as the introductions of new foams and thermoplastic urethane and different ways of managing energy under a variety of different stresses, temperatures, and configurations, so as a renaissance of source in that football helmet industry and kind of exciting for everybody.

Lou: And Fred, you played the football obviously, you had a lot of helmets over your career. And do you remember having options as to football helmets? Do you remember what or did you just get it the standard issue and go from there?

Fred: We just got the standard issue. We had Riddell. There wasn't really an option as far as different brands. It was heavy as heck, I can remember that but it was just the standard. I played from '90 to '97, and I pretty much had a Riddell throughout my career.

Lou: Okay. I think I'd like to define exactly what a concussion is. It's a broad definition, it can cover a lot of different forms but Dr., why you go through and with just the basics of what is a concussion?

Dr. Amundson: Sure. Well, concussion basically means to shake, so a concussion is a result of a shaking injury which occurs from an impact or rotational force. It doesn't necessarily have to be a head impact because the head is kind of like a ball of chain on the top of the neck. So if you get hit anywhere on the body or another part of the body hits another solid surface like another player or the ground, the head is going to rattle around, and the problem is the brain is inside of a fairly firm container, which is a skull.

And while the helmet can protect the skull from penetrating injury let say like a cleat going through your skull and damaging the brain directly or perhaps protecting from an impact that would actually crack the skull like cracking an egg. It may not really protect the brain from shaking inside and so you asked me to bring some models and we look at these models and we do get a sense of the skull being very hard, then the brain being inside here, but there's actually a little bit of room inside here. I often tell people it's like the pickles inside the pickle jar and they can get rattled around.

And the problem is now, the very base of the brain and the under surface is called the brainstem, and that's actually the part of the brain that has to do with maintaining your consciousness so if you get the brain rattled it doesn't have to necessarily be hit. It could be rotated and again the body can move and brain can move in relationship to the skull. That creates some torque or sheer force on the base of the brain, and if it's severe

enough it can affect the brainstem and the parts of the brain that account for consciousness, so you can lose consciousness. And as we talked about earlier it's only 1 out of 10, 10 percent of individuals will actually get knocked out from a concussion, but you can still have that shaking injury to the brain even without loss of consciousness.

If I may, going to use the Jell-O model just to, I think we look at this things pretty solid, but put it in fact the brain is actually kind of like Jell-O in terms of its actually consistency. And it is arrange, sort of as this model shows in layers and these layers actually have different sheer forces and different consistencies so when the brain get shook. I hope I don't ruin our shirts here.

Robert: Please don't.

Dr. Amundsen: As it get shook, you can see, although it stays inside, those layers may in fact be disrupted and that's the concern about concussion. So, I'm glad that work.

Robert: Me, too.

Lou: Okay. To put it in terms of a player or a coach to understand, have you, Fred, have you had any had known concussions in your career?

Fred: Interestingly, not known concussions, but I have been shaken. There were a number of times at least four to five times during games where I had to come out of the game, and I've experienced dizziness after a hit or after a fall. And at least twice, so interesting because as a football player, as someone who's been regimented as knowing exactly what to do, what to say and remembering plays or what have you, it's terrifying to be asked a question that you should know and you can ask that question.

And at least twice I can remember my trainer asking me a specific question, 'Where are you,' 'What are you doing,' and me knowing the answer, but not being able to verbalize it, and you know him to say, 'Just sit out for a minute,' and it brings about a whole dynamic of what concussions mean today opposed to yesterday, so to speak in the 90's, because from my standpoint, I had to get back on the field because I didn't have a guaranteed contract. So I just wanted to sit out only a few plays until everything was back in order, in order to get back on the field. So there had been a couple of times where I've been shaken to the point where I couldn't quite grasp easy information.

Lou: Robert, how has the helmet industry, how do you kind of respond to this because it's tough for people. You see a head, you see a helmet and you assume the helmet is going to stop what's going on inside your head, but really that's not the case.

Robert: No, no, really isn't. I don't think any responsible helmet manufacturers can claim that they can stop concussions. I think it's even hard to claim that you're going to be reducing the likelihood of a concussion largely because as we've learned here you're not talking necessarily about a hit to the head, and there's too many variables in any of that. You're, whether it's you're playing on artificial turf or grass, you're playing offense or

defense, what position. A wide receiver certainly has a different exposure level than say an offensive guard.

The quarterbacks because of the new rules are not getting hit about the head and shoulders like the once were, and I think that so what you can do is you can manage energy. And so if you take a modern football helmet as against say what Fred was wearing. These helmets have a tendency to be bigger; they are different shapes that are adding some strength, characteristics. If you notice up here you're going to be protecting the front boss on hits where most of the hits were taking place now.

On inside you can see that the materials have changed drastically and by putting a bladder next to the head, it allows at least for some degree of rotation even though the shear forces are taking place in matter of milliseconds. So reasonably speaking I think that what we have to say is that we can protect as best as materials science will allow us to protect and that what we're protecting against typically is impact forces, linear impact forces principally at this point and to some degree rotational or angular acceleration.

But what we don't know is that the underlying question of how are we going to stop an impact that's taking place with a brain that's sitting in a pool of cerebral spinal fluid? And how can we stop something that's really taking place at the molecular level and the cascade that results from that impact and the long term consequences of that?

Dr. Amundson: I'd like to go back comment that Fred made about being hit and having that inability to answer the question. and I think that key thing and in terms of concussion is recognizing that you've been concussed and really the fact the trainer recognize that was important because if it wasn't recognize and you we put back on the field, as you said you've got to make a play and you've got a bunch of people trying to bring you down. And if you can't think quickly and react quickly because you concussed you have a much greater risk of getting a second concussion, which could be way more serious.

Robert: Yes, that'd be fair. I mean the definition of concussion is evolved and has changed and particularly over the last six, seven years when back in and we're going way back. Little behind leather helmets but not much. but still a concussion at that time was a knocked out. How long were you knocked out? Now, it's any mental alteration, right?

Lou: Fred, does that mean, did you hear of other players having concussions? Was it something was even talked about the 90's?

Fred: We call them dings like a bell ding. I mean it's interesting today where we are in terms of concussions. I mean you see guys get hit and even today just talking to some player who I played with, it's amazing or surprising that a guy would be out for two weeks for a hit that look like nothing. And we took hits that were much more severe, and we were back in the game after a few plays or the next game.

But I guess terminology. I can't remember even hearing the word concussion through my career. It was just you got dinged, he's out, or he got dinged and he's out a game or

two games or what have you. But the term concussion really wasn't something that organizations or trainers were really driving toward the players, but now they are.

Dr. Amundson: Well, we become more sophisticated in recognizing very subtle changes in behavioral issues and neuropsychological testing. Even on off [inaudible 13:15] online or off the field testing a balance testing and just little scrutinizing with baseline tests, and just after the effect testing where you can pick up subtle things and recognize that brain's been impaired, and again with that impairment you're at risk for secondary injury. And the problem is if the brain is impaired and it's trying to heal and just right forcing it into a strenuous activity, which could just be training, not even going back to play, that actually slows down the repair, I guess the analogy might be over a hamstring pull. I mean if you hobbled off the field with that until you were able to run again you probably wouldn't go back in the game.

Fred: Now, what's interesting is that I've playing in the 90's with guys on specifically on our defense. I mean guys like Reggie White, guys like Andre Walters, Seth Joyner. Those guys were very, very physical and as you're talking, I can remember a number of times just thinking, boy these guys, something is wrong with them, they're crazy.

And there was a possibility that they were suffering from a concussion, a week or two ago that they are back in the game. They're back in the game this week, back in the game this play, and all of the sudden they are this crazy people, and there was no testing, there was no cognitive testing after they were out, out of play to see if they were able and capable of one back in the game the next play or the next game. I was to some degree fortunate to be a part of a team that was so charismatic and had so many personalities, but as you say then I'm thinking probably some of these guys' personality was a result of concussion because they were so physical.

Robert: And the game is changed dramatically and fortunately now, anyway they're considering making further changes to the rules to at least–because the game of football is always going to be violent. It is a contact and collisions sport, almost by definition. But as you seen some of the 1900's the flying wedge gets outlawed and then close lining gets outlawed and then you can't grab the face mask, and then you can't hit the quarter back above the shoulders and you can't hit a wide receiver that's not looking, and so you're seeing evolution right before your eyes on how we can do this.

At the same time, however, you're seeing people getting bigger and faster and stronger and it's just a remarkable thing amount of energy. I was talking to a physicist [inaudible 15:58] and asked him to give me an equation that would help us kind of recognize where we should really be worried about our testing and he said it's akin to jumping out of a second-story window. The type of impact of a pro level running back running head long into an outside linebacker.

Lou: I believe, I think it's important that your decision just an NFL problem. You don't have to be 6'5", 300 pounds to cause a concussion or to get concussion. It's something that's happening on all levels of football and especially important I think is the youth. How

important is it for youth sports, youth football players that they recognize the symptoms of concussion and report to someone.

Dr. Amundson: Well, I think just to reiterate what we run through before, I mean the recognition of that the child suffer a concussion is very important. Obviously, we can't rely on a child to self report and the adult's supervising should recognize, and again I think as you said about the physics, if it looks like it was a big hit, maybe be a little more careful and scrutinizing. But I guess someone could be on the side of the play and still get in and try to be aware of that.

The recommendation currently for children is that if they have some signs and symptoms of a concussion is recognized, they should not return to play the same day. And then there's a very fairly well structured and it's pretty well pointed out on the CDC website, which we reference our listeners to. They've got the Heads Up program, and it's actually for players and coaches and parents that really spells out some good guidelines.

But after concussion there's a very strict return to play regimen, and it really as rest until you're symptom free, and the symptom can be headache, dizziness, which is like kind of feel a little foggy and you can't be taking medication for the headache, so it's symptom free at rest and that includes school just cognitive activity, just reading, watching TV, is really not to be done because it chews up brain energy and keeps it from healing.

So once not symptomatic, asymptomatic from that, then light activity just to get the heart rate up and nothing strenuous, no heavy weight lifting or anything that is going to strain. Again, if symptom free, progressing next to more strenuous activity and then if that's tolerated, which includes weight lifting, then progressing to sort of cognitive play and running plays where you got to be physically active and thinking about what you're doing again without contact. And then if all that is tolerated then moving up into actual practice, and then finally into full contact.

And that can take six weeks. And essentially if the individual feels symptoms that are any kind of stage, they move back. They go back, and I think that's the big change over with recognition of concussion that it just takes that long to heal.

Lou: And you mentioned the CDC and the Heads Up program. Robert, I know you did, you've in the last month works with Edmund. March explained a little bit with a little video showing, you know what you guys have done with that?

Robert: Sure. I mean, this is an evolving research and I think that the only to really keep pace with what's going on and what we're learning about this is you got to defer to the experts and then in our case it's the CDC. We're big believers and the Heads Up program. Those really interested, coaches, administrators can go online and actually take a little mini course and how to identify and what to be looking for concussions.

So, we wanted to encourage the household and in our warning label apart from just saying, you know the obviously that a football helmet can't stop the concussion and it's

not going to stop a broken neck and you can suffer a head injury, and the only way to really avoid that is not to play the game at all, because apparently the band doesn't seem to be getting as making concussion as the guys that they're playing on the football field. We now are adding to that, on the back a helmet on the warning label that references directly to, for smart phones, so that you can take a app, you can quickly get this information, you can get access to the video and into the research, and the great things that the CDC are doing right now.

Lou: So, what's your reaction on the warning label on helmet? Is that something you had experience with? Concussion facts? I mean, did you get any of that kind of stuff in 20 years ago?

Fred: No, no. I mean, I think it's great, but you know, that's something you know, players are not going to look at, of course, parents and responsible guardians. As you've mentioned, we take a chance, we take a chance. It's very dangerous sport. It's a sport that, at this point with some other things that I'm experiencing. I have a two-year-old son and everybody's thinking now is he's going to be this great football player, and my choice will be for him not to play football unless that's something that he really wants to do because of what I'm experiencing.

Regardless of what the warnings are, I just feel that you take a chance. The percentage of guys who suffer concussions, compared to the percentage of guys who plays very small, but you just take a chance. You could be part of that low percentage and could be fortunate to be not part of it.

Robert: Yeah. I think to the other side of that coin, which I don't think you're suggesting either, is that there's benefit to football and there's benefits to sports in general. We're talking about football today, so this is the applicable to cheerleading, this is applicable to any numbers for like gymnastic, hockey, soccer.

There's no way to bubble wrap your kid and have them sit at home with a video game and get the experiences that they can get on a football field. There's not just the discipline, but the camaraderie that's built and the learning and the knowledge and the socialization, and there's all sorts of benefits that one takes in the considerations. Same as like going down a ski slope has this inherent risk, it also has its inherent joys, and I think that's what we celebrate about the game itself.

Lou: I think one thing is, is there a cure at all? Is there something that you can, there's no pill you can take. If there's something you can definitely do to cure a concussion?

Dr. Amundson: To cure a concussion, no. No, I think to prevent a concussion you can think first perhaps and paraphrase that, because that's an injury prevention program. Again, maybe a good reference for folks. Yeah, again to use Think First, their tag line is 'Use your mind to protect your body,'

So it's again play smart, you know stop the play, not the player maybe another thing to think about. I just said it's an inherently dangerous activity with a lot of joy and it's

always important weigh that balance. But I think if you're playing the game correctly and carefully, you can reduce your risk. And I think the biggest thing is if it happened as you said, if you're the unfortunate person has a concussion, which is a chance you take, recognize it's happened and then reduce your risk at the second injury by staying out of the game until you're ready to come back.

Because there really isn't a reverse, there's no pill you can take, there's no operation anybody can do. It's like that Jell-O where we can spend an awful lot of time trying to get that back the way it was, but it's not going to happen.

Lou: You mentioned tackling and, Fred, I think you can probably speak to this point that, what kids is being taught now is probably different down what you were learning as far as heads up and tackling techniques. Can you go through kind of the differences?

Fred: Well, it's definitely a little different now and to support what you said, Dr., if I have to do it all over again, I would play the game differently. I wouldn't probably be as tough as with my head as I was when I played. I mean, I was considered one of the tough wide receivers. I didn't have to run around you, I could run through you.

And there were number of times that I experienced, me going through a guy and kind of being busy and shaking it off. But as, to answer your question, I think the game is being played a little smarter now with the fact that concussion are at the forefront. Concussion are being looked at different now and being the focus now. I think the game is being played a little different now, and I think that it will cut down. Probably cut down on concussion if that's, if everyone is conscious of how to play the game differently.

Robert: I think it supported by research; I mean they've done a lot of studies here recently that suggested that if you cut down on the amount of practice, full-contact practices that you're reducing the probabilities. Again the risk is always going to be there, but the likely can be reduced just by managing practices different.

Back in the day you'd put your, you know when were taught, put your face mask into the numbers. I mean, all of that is has change, the Oklahoma drill, door drill, who can meat grind through a practice. All of that is kind of changed.

And I would say, fundamentally if the officials are less reluctant to throw a flag, you're going to see a dramatic change right, just like you did on face guards. And I think that if coaches are more sensitive to this, school district are more sensitive and rec leagues and education for parents and players, you're going to do a whole lot of this.

In the end fundamentally though it's a self-reported injury. I mean, unless the guy is walking into his teamwork or into circles muttering to himself or knocked unconscious. It still requires that player to feel comfortable enough to come to the sideline and say, 'Coach, I feel dizzy or I've got a headache.'

Fred: To support what's you're saying it was interesting. I can remember talking to a number of teammates when we were with the Dolphins looking forward to Sunday, so we can

have a break because we were hit all week. Jimmy Johnson had us going live all week and knowing that on Sunday at least we will have a few plays off. We would have half time, you know, we could get a break, you know during the game.

Talking to guys now and knowing what's, seeing what's going on and training camps now with. Guys, they're at picnics. There are number of days where they can only hit now, so it's, I think it's steadily changing.

Dr. Amundson: The awareness may go along way, and you look other with public health issue and seatbelts, you know 20 years ago it's not cool to wear a seatbelt, and now it's periodically uncool if you're not wearing a seatbelt and texting and driving. It just will take some awareness, and I think if we can forward that, particularly through this event. I think we've come up with something, but getting the word out that you can't prevent concussion you've got to be careful and got to be aware of it. I think that's an important function.

Lou: What are the risk and danger of multiple concussions, of not reporting a concussion and going back into a game or not taking that time off before you play again? What risk do you run by doing that?

Dr. Amundson: Well, we touched on this a little bit earlier that if you're concussed, your brain is not working right. So, your balance is off, your memories off, your cognitive skill especially your ability to make a decision is off, your reaction time is off. All those things are the things you needed to be an effective player. So, you're not going to be effective and you're more at risk to get hurt again. I think that's one big risk.

Particularly in young individuals there's a unique situation where you can have this, what you called Second Hit Syndrome. Where if you go back in and get a second concussion while your brain is still recovering from the first concussion, which I said earlier it could take as long as six weeks. There's almost, it's not exactly but it's almost like you have an allergic response and you could get a rapid brain swelling which can be a fatal event. That would be really most consequential effect.

There's some concerns about well repetitive injury or even just a second injury, just impaired the brain's ability to repair. I think that there's some evidence that suggested if you have that second concussion while you're recovering from the first, then the healing process takes that much longer. Long-term effects, I think they're beginning to recognize that it's a potential problem and as we talked about earlier, we're not sure if the full story is in on that, but there's some concern about that as well.

Lou: To get in to some questions that we got in response to hosting this event, Robert, the first one I think would be for you. Someone had asked, 'How long does a football helmet last and you can them reconditioned? Does that have any kind of positive or negative effect on all football helmet?'

Robert: There's no real easy answer to something like this, because it's dependant right? I don't believe that time is necessarily your issue because obviously a football helmet that's

been used by a middle linebacker and thrown down against the ground and housed outside in a barn or something like that. You've got a different life expectancy than say a place kicker's helmet. I don't think that time is really something that you should focus on, which goes to your next question about reconditioning.

I think reconditioning and recertification of football helmet is a crucial part of the game. I mean, just being assure that the part are all in the right place, that they're the original equipment manufacturers parts and not something that is been kind of coupled together in somebody's garage. It's very important to the ultimately to the performance of that product.

Lou: Another question we got in, I think from what Fred has said about just got dinged and having concussions. Are all the sudden more people getting concussions, is this a disease or something that's happened? That wasn't happening 10 years ago or is it just a, now we're maybe paying a little more attention to them?'

Dr. Amundson: I'll have to say probably would be a little more conscious of the problem. They just said the game may have change a little bit in term of body mass and they maybe more force on the field. I'm not a football expert but I assume that the game has been pretty comfortable over the last couple of decades and people began to hit hard and probably it just that getting dinged. Now we're just calling [inaudible 31:30].

Fred: I was hoping you did this, I hope you didn't disagree or disagreed.

Robert: Because if you go back in time, again a little of history and context, I mean, if you got around the 1900's where you are sustaining somewhere in the neighborhood of 38 deaths a year, due to the game of football. You can see that the injury rate of catastrophic injury anyway has been reduced dramatically and the awareness of concussions now is growing exponentially due to the media.

I think that in the end like you said, it could be a little bit of everything. That maybe, maybe the game evolved into more a violent context. Maybe it's an awareness issue or that we even have the database from emergency rooms from the first time to really go through and do some serious analysis on this, but the fact of the matter because I think overall when you take all under consideration, this is probably been something that's been going on for years and is now at the forefront. At least we have a conversation going about this.

Lou: Fred, I think this would be a good question for you. Someone had asked, 'Is it better to start at a younger age, so you learn to play the right way?' And I know some people will hold out their kids, and not let their kids play, but do you think if people learned proper technique at the young age that would maybe be better for them in a long run?

Fred: I think so. If you have a young man who desired to play football. If he can learn the techniques as you've mentioned at the young age, he can kind of develop along with the technique. But at the same time too, it doesn't take away the fact that it is a dangerous sport. I played football, I played organized football in my senior year in high school. So,

tackling technique is one thing and I don't think you could learn a technique of how to get hit. That's a totally different thing. You have a lot of concussions from guys tackling, but you do have some concussions from guys getting hit. I don't know if there's a way teach a young man on how to get hit, that's just makes it a little difficult.

Robert: It's not just tackle football, I mean even flag football has its inherent risk of people running to each other, and running very fast and diving for a ball. Really, this is, I know this is a football program, but the truth of the matter is just in general, people need to be taught in the inherent dangers and when you're hurt, let people know.

Lou: Robert, someone had asked about aftermarket products and third party products being used on helmets and that's really recently become something that a lot of people are looking at and saying, 'If I put something on my helmet maybe I won't get a concussion.' How could you speak to that point and what could you say to a parent that thinks that that's going to be a fix for this?

Robert: I guess I have a couple reactions to that. The first is that you should go to the NOCSAE website. NOCSAE is the National Operating Committee Safety of Athletic Equipment and the committee has taken a position on this that says that the license to have a NOCSAE label that says what a helmet can and cannot be to be on a football field is the aftermarket products will effectively void out that certification.

And you need that, because otherwise you can imagine you get in to a lot of garage mechanic-type of situations where people are monkeying with the equipment. And there's nobody accountable for it. Because certainly as an equipment manufacturer our position is it's not ours anymore. You decided that you wanted to put the 302 Voss engine into your VW, you know that's like, 'Congratulation, interesting concept. You're on your own.'

NAERA which is the National Athletic Equipment Reconditioner Association has taken a similar stance on this. It is like aftermarket products cannot, you cannot recondition the helmet back to its original state if it has this stuff in it. I guess what I would say is I think that innovation is important, and I'm not going to suggest that people can't come up with better ideas outside of the four corners of our lab.

I'll defend ourselves by saying it something that we spend a great deal of time thinking about and working on, so that if somebody is doing something differently, it will be a bit surprising to me. That said, look those people that are selling that and making those types of claims should be accountable. They should take out insurance policies that can cover, and if they done injury and they should certainly seek certification of some kind with a regulatory body.

Lou: Okay. Fred, a question I think. You kind of touched on a little bit because you wouldn't feel comfortable letting your son play football now. I mean there are a lot of good factors to football? A lot of bad, some bad?

Robert: He has two after all.

Lou: Could you kind of maybe expand upon your feelings a little bit in that. I mean I'm sure there's some good that you took away?

Fred: Well, yeah. Definitely, it's some good things that I took away. I think, I guess what I'm saying, to be more clear, that I wouldn't let him play in young age, you know six, seven, eight years old. I probably wouldn't let him play full contact football at that age.

In high school if he desired to play, I probably would let him play. I've run into a number of parents who have their kids lifting weights at 10 years old and wanting for me to counsel them about how to get a 12 year old stronger, and just seeing so many examples were parents were so adamant about making a toddler to some degree an All-Pro. I really, I just don't want to be that type of parent.

So but once he's in high school, Brooklyn is his name, so once he's in high school if he has a desire to play, I would definitely let him play. Football has been wonderful for me you know besides some other things that I'm experiencing you know physically. Football as you mention, the camaraderie just the whole experience, it's really kind of a made my life what it is today.

I'm very happy. I'm into to the community. I'm doing a lot of different things and it has been to some degree the stage that's really you know put me on; put me where I am right now. So, I can attribute you know where I am and the success that I've had after football to football.

So, I don't want to say, give anybody the impression that I hate the game. I really love the game but it's still you know a dangerous sport. I think we all agree with that.

Lou: So, another question doctor? Will concussion feel different to let say a 7 to 9 year old than it would to an 18 year old to a 25 year old?

Dr. Amundson: It's a bit of a question. I don't know if I have the exact answer. I think you're going to have in a sense the physiologic effects, if you will, the actual effects on the brain should be comparable, as we talked about earlier, balance and reaction time and memory and things like that.

Is a seven year old going to be able to express as well to their coach as an adult? Probably not, but they certainly can complain of headache which is a very common symptom if their head doesn't feel right, if they feel dizzy, if they feel sick to their stomach, if they just don't feel right. I think you've got to read that the child just as you know the child has a tummy ache and don't want to go to school, you got to read it right.

Lou: And someone had asked this question as well kind along this line. Is there a way to distinction between the headaches? I mean you can get a headache from very large variety of ways, but between a headache and a concussion after effects?

Dr. Amundson: It's are they causally related. I mean you know if your child got dinged earlier in the day then got a headache. I think the bell should ring in your head, this is a concussion.

And I think the bigger recognition that we're seeing is that it really takes a good while for this to heal. It's like a soft tissue injury. It takes six weeks to get better and then you got to recondition it. So, the brain is, not to make light of it, but you know the brain is an organ, it's a body part. It takes time to heal.

Lou: Robert, couple question I think would be pretty well quick to answer here. People were asking the more money I spent on a helmet, does that mean I'm getting–some people asked a concussion-proof helmet, which we already debunked here, but does the money spent…

Robert: No, my competitors sell concussion-proof helmets. Schutt doesn't do concussion-proof helmets.

Lou: Does the money spent mean you're getting more protection? Why are helmets being made that aren't as expensive when that's supposed to protect me more? How is that? How do you look at that? How you respond to that, that the money factors and how that affects?

Robert: I think that there's confusion here. What effectively you're paying for is the fact that it's new. Like an automobile that comes out its first year, there will be subsequent models and improvements you every year that goes on. And naturally the car that comes out that's being introduced for as a 2014 model that's going to cost more than the 2013 that's going to cost more than the 2012

And really that is to take in the consideration the amount of research and development, the tooling cost and I mean it cost several hundred thousand dollars to get helmets. What I would say to anyone that asked is you know the helmet that fits the athlete the best and the athlete is most comfortable in, it's usually the right answer because fit is probably the most misunderstood part of this you.

Obviously, you see in the NFL particularly these days you see people kind of doffing their helmet without any effort whatsoever. That is not a good fitting helmet. The tighter that the helmet can fit with comfort, the better ultimately it's going to be doing its job, which is again managing energy not managing against the likelihood of the concussion.

Lou: Fred. Did you? You ever taught how to fit your helmet and how to properly inflate the bladder. Is that something that they would go over with you at any point?

Fred: No, no. When we first you know the beginning of the season we got a helmet and they did the fitting, and we usually keep that same helmet throughout the season. They would pump it with air and ask if it enough air, too much air, not enough or too less and just kind of shake it around and if it fit tight snug.

Unlike today, a lot of guys as you mentioned could just pull the helmet off. I couldn't do that, which was you know I guess a good thing because it had more snug fit. But you know being taught. No, there was something that was left up to our trainers, and I'm

hoping that they were taught and had the knowledge of how a helmet was supposed to fit.

Lou: The fit of a helmet is very important?

Robert: I think so. I'm not sure what else we can do. If you're wearing the wrong size of shoes you know you're more up at the beginning and injured, right? So, it's no different with helmets, and obviously, I think that is decision that people should take a little time and thought in making. You know there's a lot of knee-jerk decisions on this, and it's kind of silly that you know people are paying $450 for a bat in the hopes that their kid can get a couple more points or and RBI, and yet when they go shopping for a football helmet, they're not really taking the amount of time that I'd like to see them take in making that decision.

Dr. Amundson: Yeah, I'd like to put a plug in for that about fit because again not to get off speaking about football though with bicycle helmets it's very important that the bicycle helmet fit correctly, and it's worn correctly. I see a lot of kids riding with a helmet up here and when you go off a bike, you're going to be hitting here. And if the helmets above the impact zone it's not going to do any good. So, I think for the parents that are listening make sure the helmets fits well and it's worn correctly.

Lou: Someone, Fred, asks that the game seems more aggressive today than it did when they had played as a parent. I know you have a lot of camps and stuff. Is that something you see? Do you see it as a more aggressive game than today?

Fred: I think the media does a great job of showing the game. I think there are different camera angles now that we didn't see when I played. So, I think it looks more aggressive. I think the same things that are happening today happen when I played. I mean look at ESPN now they can zoom in on you a hit and see exactly if someone is poking a finger on an eye, and that something that didn't happen when we played. I think the game yesterday was just as aggressive as it was, as it is today rather.

Lou: Could that aggression, I mean just having more aggressive mentality is that going to lead to anymore kind of damage?

Dr. Amundson: Come on. You know the answer to that.

Lou: I'm not asking. These are my questions anymore.

Dr. Amundson: I think if your goal on the playing field, I haven't played the game, but I mean if your goal is to hurt the other person and that's what aggression is, then yeah I think you going to increase the risk of injury. If your goal is to make a good play, I mean generally I think you used the minimum amount of force to make the play, but that's the opposite of aggression.

Fred: And that's assuming that the game is more aggressive. I mean I don't think the game is more aggressive. At the same time too, I guess going back to the rules in understanding why you play the game and how you play the game, it's not really to hurt the other

person but to you know the rule is that a guy running and I'm supposed to tackle him you know this is how I do it. The objective is not I need to hurt this guy. I need to tackle him a certain way.

The best guys on the field are the guys who could do it the right way and make the play successful not necessarily someone who is aggressive. Being aggressive sometimes on a football field can hurt you because if you launch too quickly at the guy his body. So, it's really about playing within the rules and really understanding why you're doing something in the objective of the game overall.

Dr. Amundson: So, the question, I would reverse it to say is can you be an effective player and reduce the chance of injury? Which is what you were saying?

Fred: Exactly.

Robert: I think Fred made a living making sure that people were making aggressive mistakes. So, my understanding is he was trying to avoid contact, a great deal.

Lou: Another question we had was the difference between youth helmets and adult helmets and how that plays into concussion effects, which I think is we know the answer is really doesn't, but why don't you go into the difference maybe between those two.

Robert: Well, usually obviously size is different. The materials being used in the helmets typically are different. With kids helmets speaking for Schutt you know typically we're using a combination of thermoplastic urethane and gels like D3O that are you know energy-dampening type of gels.

When you get in to the pros that's different. The material on the helmet is soft as we tend to use polycarbonate in the varsity because we need something really very hard that won't crack or shutter. And with the children's helmets we're using ABS, and we're doing that because it tends to be a lighter material and so there's this constant battle of balancing weight with the padding and the benefit and the energy dampening capability, right?

Because obviously, yeah, we could make helmets that are bobble-head doll type of thing so nobody would wear them and they wouldn't be probably effective. Conversely we're not doing leather helmets either. So, it's constantly fine tuning what we can put into a helmet most we can put in without really affecting too greatly of the performance of the athlete on the field.

Lou: Doctor, few people had asked is it okay to let someone fall asleep after a concussion? I think you hear a lot don't let them fall asleep for a certain block of time.

Dr. Amundson: Yeah, I think that comes out of the concern that if you had an impact injury, there's a potential for the shearing force we talk about earlier to actually have a blood vessel burst on the surface of the brain or within the brain. And if it's significantly sized vessel and it's arterial bleeding, bleeding from an artery, the individual is going to develop a blood clot and that's going to happen really quick and usually within in moments or

minutes, and hopefully, it will be recognize that they're becoming impaired. Not just dizzy, they're losing function and becoming paralyzed and they are rushed to the emergency room and they're effectively treated.

There can be delayed bleeding which is where this concern comes from that maybe a slow accumulation of blood, and I think that's the concern for monitoring someone who's had a head injury. Obviously, if they had a significant injury, they should be taken to the emergency room, but if someone had a concussion, had some lost consciousness and they've been released to home care after evaluation, you can let them sleep because that's how brain heals, but you should wake them up every so often. I would say probably at least every two to four hours.

You don't have to have them wake up and come to the kitchen talk with you for 20 minutes, but just wake them up and make sure they respond much as they might morning when you wake them up. And if when waking them up you feel that they're not waking up the way you would expect and certainly if they are impaired when woken up, call 911 and get to the emergency room. I think that the worry zone is probably the first couple hours, first two to four hours.

Lou: We can start wrapping up here, but lastly, just kind of want to go around the table here and ask you guys if you had to say something to parents from a medical point of view, a helmet manufacturing point of view, a player point of view, I just want to give your thoughts on what would you say to them. What's the most important thing that they should be able to take from this here today?

Dr. Amundson: I would just really like to reinforce the need for prevention and recognition. Do what you can, play smart, use the right gear, and try to prevent the event from occurring. It's a long race. You may miss a particular play, maybe you lose a game, but you only have one brain and you've got it for your whole life. So, protect it and if something happens to it, recognize something not right and report it and get the care you need.

Robert: I concur that we only have one brain.

Lou: You've got another one on the table.

Robert: I think from my standpoint it's recognition that this is not a helmet manufacturers' problem or a coaches' problem or a parents' problem or an officials' problem or an administrator, school administrators' problem. This is something that's going to take all of us working together and learning from each other and over communicating for a period of time to bring about change.

What I'd say is there's probably nothing more that will affect the game faster than enforcement of the rules, which do not allow for spearing, head butting, ramming, or anything. In fact the first point of contact should never be the helmet.

I encourage everybody to you know use the internet to gather as much information as they can, so that they can understand and balance the joy and the excitement of well-played game with the inherent risk.

Fred: From this standpoint of the parents is to educate themselves about what the risks are and make the decision when you have a young man or young lady at this point. I've heard about young girls playing football. Just know the risk.

As far as high school, on to college is you know one thing I think is important is to not be macho. There are some guys who get dinged and just want to get back out there and not I guess give way to they got knocked out of the game so as to speak.

I think it's important for young men to listen to their bodies. That is something that throughout my career I felt I didn't do, and if something is not right, it's just not right. That's the most important thing is to you know be very conscious of your body and if you're not right, don't go in there.

Lou: I want to thank you all for taking your time to be here today, and hopefully, we were able to educate and inform some people. I wanted to let you know to keep checking back to Sportsunlimited.com/concussions for some more information on this. If you have a question, you can click the question and answer button at the bottom of the page, and we'll try to get back to you with the best answer that we can. Thanks a lot everybody for watching.