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S1 00:00 Hi, this is Tim Lightfoot, the director of the Huffines Institute. To start the podcast, I'd like to take the chance to tell you about this year's rendition of the award-winning Huffines discussion. HD6 will take place on Friday, November 11th from 1:00 to 4:00 PM in the Annenberg Presidential Conference Center here at Texas A&M. We're thrilled to have eight world leaders in sports medicine and human performance give their big ideas all in a language you can understand and use in your daily life. Dr. William Dexter, Dr. Russell Pate, and Texas A&M legend Mr. Dat Nguyen are just three of the eight exciting speakers here to share their thoughts on what's next in the field. We'll see you at Annenberg on November 11th, and if you can't make it here, all of these talks will be up on the podcast starting in January. Now, on to the podcast. [music]

S2 00:46 Welcome to the Sports Medicine Podcast, brought to you by the Sydney and JL Huffines Institute for Sports Medicine and Human Performance and the Department of Health and Kinesiology at Texas A&M University. At the Huffines Institute, we're always working to facilitate, apply, and bring you the most up-to-date coverage of the wide world that is sports medicine and human performance, all in a language you can understand and share with your friends. And now, here's our host, the director of the Huffines Institute, Dr. Tim Lightfoot.

S1 01:16 Hello and welcome to the weekly edition of the Huffines Institute for Sports Medicine and Human Performance podcast. I'm your host, Tim Lightfoot, and I want to welcome you and thank you for taking the time to download us and listen to us. As you know - as most of our regular listeners know - every week we strive to have someone interesting from the world of sports medicine and human performance on with us, talking about interesting and relevant topics and today is no exception. We have with us Dr. Jeff Potteiger from Grand Valley State University. Welcome to podcast Jeff.

S3 01:45 Hi Tim, it's great to be here.

S1 01:46 Well, we're really excited to have you. I'm going to tell the audience a little bit about you and then we're just going to jump into the conversation. One of the reasons we asked Dr. Potteiger on to the podcast is the for the topic we're going to talk about, but he's currently the dean of the graduate school and a professor in the Department of Movement Science at Grand Valley State University in Michigan. He has his PhD from Auburn University, and MS from McDaniel College, and a Bachelor's degree from Indiana University in Pennsylvanian. He's been at Indiana State University, University of Kansas, Virginia Commonwealth University, Miami University, and even started out as public school teacher in Pennsylvania. That was a formative time, wasn't it Jeff?

S3 02:26 It was because I had the opportunity to coach a little football and I know football is near to the heart of almost all Texans.

S1 02:35 That's right. And coming from Auburn a fellow SCC school, you can sympathize with us living and dying by the SCC football schedule right now, right?

S3 02:47 I do. I enjoyed my time at Auburn and I especially enjoyed going to the football games.

S1 02:52 And we've got Dr. Potteiger on today because he was featured prominently in an article that was published in the October edition of Texas Monthly, and many of our listeners are familiar with that magazine. And the title of that article was Big Men on Campus. And we've actually put a link to that in our show notes. And that article talked about the health risk associated with offensive and defensive lineman starting in the high school level. And what happens to them after they get out of football. And Jeff, you've done some work on this in the past. Tell us a little bit about how you got interested in the health of lineman.

S3 03:28 Sure Tim, great question. So, I mentioned previously that I had a chance to coach a little football in Pennsylvania when I finished my bachelor degree work. And at that point in time, I came to realize very quickly that size mattered in football. It was really a function of how big somebody could be. Speed was obviously important, but generally speaking, the bigger player did a little bit better. I became interested in size as it relates to football at that point in time and sort of followed that up with my work at Auburn. Again, taking a look at what was to be this foundation about size and health. When I started to look a little bit more closely at how big players had gotten over the years in football. I was really astounded. If you take a look at high school or college football players from 50 or 60 years ago, you would find that a player was considered big if they were 240 or 250 pounds.

S1 04:40 Well, they'd get run over nowadays, wouldn't they [chuckles]?

S3 04:42 You would get run over. I'm not sure you could make the team nowadays as an offensive or a defensive lineman, specifically, at that weight. You take a look at players now and they are, almost always, 320, 330 pounds. Because the bigger player generally does better on the offensive and defensive line.

S1 05:07 I think I saw Baylor University has a 400 pound lineman now.

S3 05:12 Exactly. So, when you talk about players wanting to get bigger so that they can perform better, I think it really started at the professional level. We had players that were 270 or 280 pounds. Then that caused the college players to get a little bit bigger. And then that caused the high school players to get a little bit bigger. And now when we've got NFL players that are again, routinely 300 pounds plus - there's this trickle-down effect that it's sometimes referred to. What that simply means is that you've got big NFL players, you've got big college players, and you've got big high school players.

S1 05:59 So it just-- as you said, trickles down. And so these kids that are high school - 14, 15, 16 are getting huge.

S3 06:08 They are. We took a look at some data from athletes, or football players I guess I should say, in the Greater Cincinnati Catholic League, and what we found is that most of the offensive and defensive linemen on these high school football teams were routinely 260, 270 pounds. I played high school football, albeit a long time ago, we had one player in our team who weighed 220 pounds and we thought he was just huge [chuckles]. And again, nowadays, I'm not sure he could make one of the teams in this Cincinnati Catholic League. he would probably be too small.

S1 06:52 Wow. So there's a competitive advantage to being large for these kids, but after that, there is no health advantage to that, is there?

S3 07:06 Well, I guess that's still open to debate. So if you're bigger as an offensive and defensive lineman, you're probably going to be more successful. I think if you're an offensive lineman, you're bigger, you have more mass, you can push the defensive players around. And so if it's a running play, you have more of an opportunity to create a running lane. If it's a pass play, you have a little bit of an advantage to protect your quarterback. And on a defensive side, the opposite is true. If you're big, it's harder for an offensive player to move you out of the way, and if you're big, you've got that much more mass that you can try to get to the running back or you can try to get to the quarterback and create a little havoc on the offense.

S3 07:58 But when you become that big, you put on all that body mass, there's a certain amount of it that's muscle tissue. Generally speaking, there's also a certain amount of it that's fat tissue. And so if you take a look at an offensive or defensive linemen that's 300 pounds, 25, 30, maybe 35% or more of that could be fat, and with that excess fat comes an increased risk for various disease conditions. So we know that in the general population, a higher level of body fat tends to lead to an abnormal blood lipid profile, maybe higher level of cholesterol or maybe higher levels of the LDL cholesterol, the bad cholesterol, probably lower levels of the good cholesterol, or the HDL cholesterol. With higher levels of body fat, you have an increased risk for insulin resistance, maybe the development of pre-diabetes, higher levels of body fat can contribute to elevated blood pressure. And all these risk factors combined together can lead to a condition that health experts call metabolic syndrome. And what we know about metabolic syndrome is that if you have three of the five risk factors, you're probably going to have an increased risk for developing cardiovascular disease and likely premature death.

S1 09:28 Now, the football players though, aren't they somewhat protected by the activity they do?

S3 09:34 Good point, and they are protected by the activity to a certain extent. But it is not uncommon for offensive and defensive linemen to be diagnosed with high blood pressure. So high blood pressure is a cardiovascular disease condition in and of itself. And it contributes to the development of cardiovascular disease. It's also a risk factor for other disease conditions. So yes, even though these athletes are very active, playing a sport at a very high level, they still are at risk for this disease condition when they're playing. But the real concern happens whenever they stop.

S1 10:17 Then it gets even worse because they--

S3 10:19 Then it gets--

S1 10:20 --stop being active, right?

S3 10:21 Exactly right. So you have these individuals that have carried this tremendous amount of body weight, they've been very active, they've developed nutrition patterns or eating patterns that are tough to break. And so if you're practicing two or three hours a day, and you're lifting weights, and you're being physically active, you can eat a lot of calories and you can get away with it. Once you stop, then it becomes very, very problematic. And you see a lot of excessive weight gain in former college

and professional football players. They just have a difficult time readjusting their nutritional intake to match what their physical activity level is.

S1 11:10 And especially the kids - and I think one of the points you made in the text of Monthly article - especially the kids who don't play football past high school, they're really in bad straights because at 18-years-old they're done with their playing days and often times they don't keep up their activity levels, and they certainly don't drop their eating. And so they really have problems.

S3 11:31 Exactly. So Tim, it starts with the high school coach who wants to try to develop this adolescent young man, individual, into a big football player, a big lineman. And of course, the high school athlete says, "Oh, if I get bigger and I get stronger, I can go on and play college football." Well, the percentages of that happening are pretty small. If you look at some of the national data, maybe two or three or 4% of high school football players actually go on and play college football at some level.

S3 12:08 The same thing happens at the college level. You get all of these college athletes who are pretty good athletes, they're playing in college, but yet a small percentage of them get to go on and play in either the NFL or even the Canadian Football League. You have 95, 97% of the athletes that play college and play high school football moving on to the next level. What do you have? You have someone that's gained a lot of weight, someone that's developed eating patterns that are not consistent with a reduced level of physical activity, so these individuals have a very difficult time losing weight.

S1 12:51 They aren't often the subject of studies, people don't normally look at them, do they?

S3 12:56 No, they're not. Because what happens is after you graduate from high school and while you were a high school football player, when you go out into your post high school career, even if you go to college, you're just another member of the general population. What we know about people who have excessive body weight in the general population is they tend to develop diabetes, they tend to develop high blood pressure, and they tend to develop cardiovascular disease, and they tend to develop orthopedic problems. All because they are carrying this excess body weight that's very difficult to get rid of.

S1 13:34 I think germane to this point, I think there was a study by the CDC that show that football linemen faced a 42% higher risk of dying from heart attack than others.

S3 13:44 That's true. There have been several studies that have identified an increased risk for offensive and defensive linemen compared not only to their other position players in football, but also compared to the general population. While they had this benefit of being physically active when they played, when they stop playing, that's when it really becomes problematic for these individuals.

S1 14:08 What can they do, Jeff? When they stop playing, I know you said it started with the coaches, do there need to be some post football programs put in place at all levels to help these kids, or what?

S3 14:22 Well, I think it would be great if we could do that, but realistically we're probably not going to have that happen, certainly at the high school level. It even becomes a little challenging at the college level because who's going to implement these programs? Who's going to provide resources for these programs? It's fine to have the NFL, which is generating a lot of revenue, develop programs for their player's post career, and I think you see a lot of that happening now particularly with the issues related to concussion. I think there are some programs that are becoming available for these individuals to help them get to a body weight that would be acceptable. But I know of no programs that are available at the college level or at the high school level.

S3 15:12 So that's where the majority of your players are going to have these problems. These guys that play at a high level, whether it be a division one college, or whether it's Division I-AA, or whether it's Division II, these players are done with their career. They are not moving on to the next level, and so now they are faced with a what if? Okay now, what if I had made it or now what do I do? What's my next step?

S1 15:42 Someone made the analogy - maybe it was you that made this analogy - that there's a lot of attention on concussions because of the brain injury. But in many aspects, this is as dangerous to individuals as concussion in the potential health ramifications.

S3 15:58 Tim, I think it has the potential to be as dangerous. The real challenge here is this is going to be something that happens 20 or 30 years down the line. And not unlike concussion injuries - I know that's receiving a lot of attention now and popular press and with healthcare professionals - but we can't allow these athletes who have been told to gain all this weight to get bigger, to get bigger, to get bigger. And then when their playing career is over, not do something that help them lose all that weight.

S3 16:35 I think we have a real sort of ethical issue here with not trying to help them get back to what is a normal body weight for somebody that's six foot four, or six foot five, or maybe taller, getting them back to a weight that is a healthy body weight. All

we're doing is sort of turning them out into the general population and saying, "Okay, good luck." Join a gym, participate in a structured weight-loss program, seek some type of mental help, medical help as well, to try to get them to a point where they're a healthy weight once again because they've been encouraged to gain this weight.

S1 17:23 In actuality, it's kind of a moral and ethical issue and we think of sport as promoting healthy behaviors, mental health, that's why so many of us are in business because we encourage people to be active for those reasons. But these individuals that have been healthy and have been at the top of their game, when they're done with their game they just kind of walk away and they have health problems.

S3 17:46 Absolutely. Again, for all the other position players in football, they're told to get bigger and stronger. But if you're a running back, or a wide receiver, or a linebacker you can get bigger and stronger, but you can't carry that excess body fat.

S1 18:02 You can't be 300 pounds [chuckles].

S3 18:03 No, you can't. Because in those positions, as you know, it's a lot about getting from point A to point B as fast as you can. Now that's somewhat true for the offensive and defensive line men but it's more about how big you are and the mass that you carry. It goes back to that issue of, "I have to protect the quarterback. So if I'm big and strong, I can carry that excess body fat then I can keep that defensive linemen off my quarterback."

S1 18:30 And it is about excess body fat. I think there was-- I saw a study where labelled actually at the Green Bay Packers from 2006-2011. And the offensive linemen got bigger, but that increase in size was primarily due to an increase in fat that they were carrying.

S3 18:45 Correct.

S1 18:45 And it's not much muscle, so it's not-- we look at these big guys and it's necessarily they have a lot of muscle but they also have a lot of fat.

S3 18:52 They do carry a lot of fat. And one of the things that I failed to mention earlier when I was talking about the various disease condition that come about with this excess body weight. One of the best predictors of cardiovascular disease as you know, and diabetes, and high blood pressure is abdominal body fat. And so you have a lot of these offensive and defensive linemen carrying an excessive amount of abdominal fat. Now whether it's just below the surface of the skin or whether it's around the organs, it still ends up being a very good predictor of someone's chance for developing high blood pressure or chance for developing diabetes. So when you take a look at your offensive and defensive linemen, yeah, they're big, but boy, they carry a lot of fat around the abdominal area. Not all of them, but most of them do.

S1 19:48 And all you have to do is watch on TV on Sundays and you can see that.

S3 19:51 Exactly. You know what, Tim, it doesn't even have to be on Sundays.

S1 19:56 Well, that's true.

S3 19:57 You can see it on Saturdays and you can see it on Friday nights.

S1 20:00 Friday nights, yeah. Jeff, it's been great having you on. We're running short on time here and our regular listeners know we give our guests an opportunity to give us their take-home message. So if there's one thing that you want the audience to remember from this podcast, what would that be?

S3 20:17 I think it's that, when we look at trying to make an athlete bigger - regardless of the sport, I know we're talking about football today - I think we have to do it the right way. I think it has to be monitored. I think it has to be done under the supervision of someone who's a trained professional, whether that's a strength and conditioning coach, whether that's an exercise physiologist, whether that's an athletic trainer. It has to be done the right way and it has to be monitored. Because if we have this weight gain be too fast and too excessive, where we put on a lot of body fat, I think it's going to set up these athletes for health problems later on. So my take-home passage would be, you really got to monitor the weight that you put on and how fast you put it on. And I do think--

S1 21:12 Great take-home message. I'm sorry, go ahead.

S3 21:13 I was going to say, I do think that you can do it in a healthy way.

S1 21:18 Right. Great take-home message. I know that's one that the audience will really resonate with. Jeff, I want to thank you for taking time out of your busy schedule to be with us today.

S3 21:29 Well, thank you Tim, it's been a pleasure.

S1 21:31 Been great having you on. And I want to thank all of you that are listening for taking the time to download us. Again, regular listeners will know that this is the time of the podcast when we have the podcast question of the week. And so here with the podcast question of the week is our producer, Kenneth McIntyre.

S4 21:46 What magazine featured Dr. Potteiger's research on high school football linemen?

S1 21:51 Great podcast question, Kenneth. Be the first individual to send us the correct answer via email at huffines@T-A-M-U.E-D-U and you'll win one of those nifty podcast t-shirts. Again, that's a new email address, huffines@T-A-M-U.E-D-U. And we look forward to getting those answers in. So again, thank you all for being here. Once more, Jeff, thank you for being with us today.

S3 22:19 Thank you, Tim.

S1 22:20 You're welcome. And we hope that all of you join us next week, when we'll have another interesting person from the world of sports medicine and human performance, and until then we hope that you stay active and healthy.

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