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FOOTBALL AND THE BRAIN

Steve Kroft examines the state of concussion safety and science in football, especially in the NFL

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The following script is from "Football and the Brain" which aired on Nov. 15, 2015. Steve Kroft is the correspondent. Draggan Mihailovich, producer.

If you are one of the millions of people who watched football before this broadcast -- many of you on this network -- you know that NFL players get their brains rattled on a weekly basis and for some of them the long-term consequences may eventually offset the glory of playing the game. After a decade of denying a link between onfield concussions and brain impairment later in life, the NFL finally acknowledged the connection and is now trying to reengineer the sport to fit the medical science. It's changing the rules, trying to reinvent equipment and funding scientific research that might endanger its future both as the country's most popular sport and as a multibillion-dollar industry. Not since football was nearly banned a hundred years ago has the sport been under the microscope the way it is today and all of it has to do with matters of the brain.



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Just minutes into the very first Sunday of this NFL season, Cleveland Browns' quarterback Josh McCown knocked heads at the goal line. It was the kind of violent hit that millions tune in every week to see. In years past, McCown might have stayed in the game. But after he failed a concussion assessment, he was taken off the field, and not allowed to return to action for two weeks. These days if a concussion is even suspected, players are removed from the game, even if they don't like it.

It's just one of 39 changes that have been made to make the game safer. Helmet-to-helmet hits are now illegal. The kickoff, one of the most dangerous plays in football, has been moved up to discourage returns and high-speed collisions and independent neurologists are not only stationed on both sidelines to look for signs of brain trauma, there are now athletic trainers high above every stadium with the authority for the first time to stop the game if they believe an injury has gone undetected.

"I DO BELIEVE IT'S SAFER. BUT INJURIES ARE PART OF ACTIVE SPORTS AND THEY'RE CERTAINLY PART OF FOOTBALL. FOOTBALL IS A CONTACT SPORT."

["Ooh. Tag it. He got up but he got drilled."]

All of this has happened under the watch of NFL Commissioner Roger Goodell who told us that concussions are down 35 percent since 2012.



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NFL Commissioner Roger Goodell / CBS NEWS

Steve Kroft: You think the game is safer than it's ever been before?

Roger Goodell: I do. I'm convinced of it. I think the changes that we've made have had real results. And we're seeing that.

Steve Kroft: But do you believe it's safe?

Roger Goodell: I do believe it's safer. But injuries are part of active sports and they're certainly part of football. Football is a contact sport.

Despite the changes and the reduction of concussions, there are still a lot of them. On the average, a half-a-dozen a week, according to the NFL's own figures.

Steve Kroft: Can you take the violence out of football?

Ed Reed: No.



Ed Reed / CBS NEWS

Ed Reed retired earlier this year after 12 seasons as one of the NFL's all-time great safeties. During his career, he dished out as many hits as he took.

Ed Reed: Football is a reaction sport.

Steve Kroft: You can't choreograph it.

Ed Reed: You can't. It's not a movie. We always said it's not suit-and-tie on the football field.

Steve Kroft: How many concussions do you think you've had?

Ed Reed: That I remember? I'd say three or four.

Steve Kroft: You think about the future. Do you worry about the fact that you've banged your head and had a lot of high speed collisions.

Ed Reed: Yeah, I am worried about it. I think about it because something could come out of me have been running into people all my life.

What worries Reed and the NFL and what's behind all of these changes is something called chronic traumatic encephalopathy or CTE, a degenerative brain disease that was primarily associated with boxers until 13 years ago. That's when a neuropathologist in Pittsburgh, Dr. Bennet Omalu, found it in the brain of Steelers Hall of Fame center Mike Webster during an autopsy. CTE can only be diagnosed in the dead. The late Hall of Fame tight end John Mackey had it and so did 87 other former NFL players with serious symptoms whose families donated their brains to an ongoing study being conducted at Boston University.

Steve Kroft: Do we really know that playing football causes CTE?

Dr. Robert Stern: Do we really know that smoking causes cancer?

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Dr. Robert Stern, who directs the clinical research for Boston University's CTE Center, says the science is still in its infancy but the evidence indicates a strong connection.

Dr. Robert Stern: We know from all the neuropathologically confirmed cases of CTE that every case has had one thing in common, a history of repetitive head impacts. That means that...

Steve Kroft: It's not good for you.

Dr. Robert Stern: It's not good for you. It's a necessary variable to get this disease. But just because you hit your head a bunch, doesn't mean you'll get the disease. So we have to figure out why one person gets it and another person doesn't.

To be clear most NFL players don't. Stern says the number of confirmed cases is still small. Thousands of former NFL players seem to be unaffected.

Dr. Kevin Guskiewicz: One of the challenges, Steve, is that concussions are sort of like snowflakes, there are no two alike.



60 MINUTES: SEGMENT EXTRAS

THE FUTURE OF FOOTBALL?

And none of them good according to Dr. Kevin Guskiewicz who has been researching the link between football and brain trauma at the University of North Carolina for more than a decade. His studies indicate that players are five times more susceptible to dementia later in life if they've sustained three or more concussions. He and his team have examined 650 former NFL players.

Dr. Kevin Guskiewicz: Four out of every five that come through our door look pretty good. It's, it's sort of what is it that creates this perfect storm that puts somebody on that slippery slope at a younger age toward developing this neurodegenerative disease.

And there's no consensus. Dr. Stern at Boston University isn't convinced there is a direct link between concussions and CTE. He thinks it may be tied to the accumulation of thousands of lesser subconcussive hits -- the kind that linemen absorb on every play.

Dr. Robert Stern: We're talking about the overall exposure to repetitive head impacts, not a single injury, not a single concussion.

Steve Kroft: That's an occupational hazard...

Dr. Robert Stern: That's an occupational hazard. That's part of playing the game of football.

To reduce the amount of head banging, the NFL and the Players Association have limited the number of full contact practices during training camp and the regular season. And the league is spending millions to try and soften the blows...



60 MINUTES: SEGMENT EXTRAS

THE EVOLUTION OF THE GAME

In Seattle, the University of Washington and a company called Vicis are developing and testing a new kind of helmet with seed money from the NFL. The materials and technology are so secret Vicis wrapped the outer shell so competitors wouldn't get a peek at it. They're hoping to reduce concussions by 50 percent. Jeff Wilks is the NFL's senior vice president for health and safety.

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Jeff Miller: I'm not gonna suggest that there's any one idea that's a silver bullet. I think that we're going to be able to, over time, disrupt the helmet industry.

Steve Kroft: What do you mean disruptive?

Jeff Miller: Helmets are fantastic at doing what they were intended to do, which is prevent skull fracture. But to be designed against concussive injury is a much bigger challenge. But to the extent that the NFL can encourage other inventors, two guys in a garage somewhere, to come up with a better helmet, then we're taking that on as our responsibility to do so.

The NFL is also providing money to develop materials to put underneath the turf to cushion impacts. The league estimates that seven percent of all concussions are caused by heads slamming into the turf. That's what happened with Kansas City's Jeremy Maclin in October.

The NFL has sent one of its biggest checks -- \$30 million -- to the National Institutes of Health for research primarily focused on the brain. Six million of that is going to Boston University, which has produced some of the most damaging evidence linking football to brain injuries and is trying to determine how widespread CTE is.

Steve Kroft: Are you concerned about what they may find? Are you worried that...

Roger Goodell: No, we don't Steve...

Steve Kroft:...that you're sowing the seeds of your own destruction?

Roger Goodell: No. We want the facts. We think the facts will help us develop better solutions. And that's why we're advancing medical research. That's why we're funding directly to Boston University on some of this research.

The big breakthrough will come if and when a test is developed to diagnose CTE in the living.

Dr. Robert Stern: That's the focus of pretty much every day of my life.

Steve Kroft: How close are you?

Dr. Robert Stern: I am pretty confident that we're gonna be able to diagnose people while they're alive pretty accurately, somewhere in five to 10 years.

If it happens there will finally be answers to a lot of questions but some tricky new ones will also be raised. Who would have access to the information and how would it be used?

Steve Kroft: If they'd had a test when you were playing, would you have wanted to take that test?

Ed Reed: If they're going to give me this test and this test is going to be a negative towards me as a player and I gotta go home now and I can't play this game anymore, no. I don't wanna know till after. I don't wanna know until when I'm retired. No guy would want that. No player would want it.

There has already been one controversy over another test that involves putting sensors in football helmets.

[Dr. Kevin Guskiewicz: These are the six single-axis accelerometers...]

Kevin Guskiewicz and his staff at North Carolina have been using the Tar Heel football team as lab rats to collect data, measuring the frequency and the force of every hit to the head.

["This is one impact? This is one impact"]

Guskiewicz used information from the sensors to help persuade the NFL to move its kickoff in 2011. But keeping track of the number of hits has become a political football. The NFL outfitted two of its teams with the sensors for half a season in 2013, then pulled the plug. We asked the NFL's Jeff Miller why.

Jeff Miller: The results were not what we were hoping they would be. And the Players Association, in large part, wanted to discontinue the testing. And we respect that decision.

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Steve Kroft: What do you mean not what you were hoping for?

Jeff Miller: We were, we were, we were hoping for more, for, for more accurate analysis. It just wasn't, yet.

Dr. Kevin Guskiewicz: Yeah. Well, I sit on their committee and I'm able to tell them I disagree.

If you want a sense of how much contact we're talking about, a study using helmet sensors on the high-school level showed that players can average 650 hits to the head per season.

Steve Kroft: That seems like a lot of head banging.

Roger Goodell: Well, that's why we're making the changes. And those changes are going all the way through to high school and youth football. Which is, "You don't need to train the way you trained before. You don't need to teach the way you taught before."

Seattle Seahawks coach Pete Carroll is tinkering with the very essence of the sport: tackling.

[" Hi, this is Coach Pete Carroll of the Seattle Seahawks."]

He's teaching the virtues of what he calls Hawk tackling where players use their shoulders and not their heads to bring down an opponent rugby-style. Carroll knows it won't work on every play. Football is too fast. He was one of the people who initially argued against changing the game.

Steve Kroft: You were late to this party in a way, weren't you? I mean, in terms of the new rules and safety rules.

Pete Carroll: Well, yeah, because I, I was an old-school guy. I was fighting for the way the game had always been played. And the first thing that hit when you're trying to make a play is your head. The whole thing about concussions has brought to light a total new awareness. And outta that a new awareness has brought adaptation. And you either evolve with it or you're, or you're, we're gonna mess it up.

Carroll is still concerned about the future of the sport and worries that mothers may stop allowing their kids to play tackle football. But Ed Reed has no regrets about the life he chose.

Ed Reed: Now that I know the dangers? Yes, I still would do it again. Why? 'Cause look at me. Look at my family. They're able to eat, they're able to have food and shelter over their head. Would I play football again? Yes.

Steve Kroft: We've talked to a lot of people. They seem to be worried about the survival of the game.

Ed Reed: You hearing people saying the game is gonna, I don't see football going nowhere. It's evolving. It's not going anywhere. Shhh, calm down.

Steve Kroft: You're not worried about it?

Ed Reed: No way! Football is not going anywhere.

"YES, I STILL WOULD DO IT AGAIN. WHY? 'CAUSE LOOK AT ME. LOOK AT MY FAMILY. THEY'RE ABLE TO EAT, THEY'RE ABLE TO HAVE FOOD AND SHELTER OVER THEIR HEAD. WOULD I PLAY FOOTBALL AGAIN? YES."

The game has been in this place before. In 1905 President Teddy Roosevelt had to intervene to save football after 19 deaths on the field led to calls to ban the sport. As a result, the forward pass was introduced to reduce impacts and later the leather helmet. Until now, the game has always been able to adapt...

Steve Kroft: You think the game will survive on its own?

Roger Goodell: I think the game will survive because we will continually seek to find the facts and adjust when we see those opportunities to make our game safer. And I think people want

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to see the game safer. We certainly want to see the game safer and we want those facts more than anyone.

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Steve Kroft

Few journalists have achieved the impact and recognition that Steve Kroft's 60 Minutes work has generated for over two decades. Kroft delivered his first report for 60 Minutes in 1989.

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60_MIN_FAN November 19, 2015 11:11PM

Roger Goodell: "We want the facts."

The NFL outfitted two of its teams with the sensors for half a season in 2013, then pulled the plug. We asked the NFL's Jeff Miller why...

Jeff Miller: "The results were not what we were hoping they would be."

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KUZIN-V-KNEE November 19, 2015 7:7AM

How about boxing and the brain (concussions)??

LIKE / REPLY

LIBRARIDAN50 November 18, 2015 10:10PM

Just save us from flag football...

LIKE / REPLY

GOLEW2000 November 17, 2015 8:8AM

Roger Goodell thinks "the game will survive because we will continually seek to find the facts and adjust when we see those opportunities to make our game safer." Accumulating "facts" as he puts it, is what medical research is about. Sadly, what is already known both about the harm from concussions and repetitive head impacts and the contribution of football to the incidence, provokes the question of whether it is ethical to allow, not to mention encourage, youth to participate in the one sport that makes the greatest contribution to this medical and public health problem. Youth and high school football, most of which takes place outside of rigorous clinical research frameworks, amounts to a large, national, unethical experiment, while Roger Goodell looks for facts.

LIKE / REPLY

BYRONVHARTUNIANMD November 16, 2015 10:10PM

Good interview. Let's get serious about equipment like the LEXBRACE that will allow excellent performance while reducing the whiplash effects of hits which cause concussions. See wbsite by same name for details. Thanks Steve.

LIKE / REPLY

GUARDIANINNOVATIONS.COM November 16, 2015 9:9AM

I find so much talk around in this interview. There is technology being used in college, high school and youth leagues that is helping and the NFL refuses to acknowledge it. We've approached them many times. Over 45,000 athletes are benefitting including the #1 college team in the NCAA and a NFL head coach's son. Why won't the NFL step up and help others with this technology?

We've created safer Infill (cooler, smoother, and made with natural materials (corn & soy)) to replace crumbed rubber for Synthetic Turf, better lacrosse balls (don't grease or get hard) wooden baseball bats that don't break apart and other devices that better protect athletes. As Jeff Miller said "The NFL is looking to support inventors that will make the game safer. He's received numerous letters and e-mails from us and has our phone number. We're waiting on that call?

LIKE / REPLY

AUSSYNORM November 15, 2015 11:11PM

Head injuries are always a possibility in all sports however American grid-iron football leads the pack of all worldwide contact sports in head injuries (soccer, basketball, baseball, cricket, Aussie Rules Football etc.). 60 Minutes would do well to do an hour show comparing Australian Rules Football (AFL) with American Grid-iron Football. Aussie rules uses an oval field 2-3 times the size of an American grid-iron field, uses no pads or helmets, has 18 players on a side and every player runs about 15-20 km per game which lasts for 4-20 min. quarters with virtually no timeouts, the clock stopping when a goal is scored or ball goes out of bounds providing 10-20 seconds for a throw-in or center toss up. Australian rules football have far fewer head and body injuries than American football and all the players are at least twice as fit as the typical professional American pro football player given that each player has to run, jump, catch and move up and down the field with no time outs. After playing American football in high school and watching Aussie rules down-under for 4 years, as a spectator sport Aussie Rules is much more exciting and more fast moving than American Football will ever hope to be. The Australian AFL commission also adjust the rules to minimize injuries; no hitting above the shoulders or below the knees. It is unlikely that American Football would ever move toward Aussie Rules due to the big money involved in supporting and promoting grid-iron football. There also would be a dearth of players in the US who could have the strength, endurance, stamina, size, agility, ball handling and kicking capabilities to compete in Aussie Rules football. After you have viewed and researched Australian Rules Football matches please let me know what you think. If you have not watched any matches or Grand Finals don't bother responding.

LIKE / REPLY

JAYJAYBE November 15, 2015 11:11PM

@Aussynorm

Your support of Australian Rules football doesn't solve the quandary of American football. Most Australian Rules Football players would not want to play American football which is so violent that the helmets and pads aren't enough protection. That's the portent of this medical research...American football may become like rugby - or Australian Rules football.

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AUSSYNORM *November 16, 2015 0:12AM*

@Jayjaybe @Aussynorm you are correct. that is the point. nothing will make American football safer.. thicker pads, larger helmets will only intensify the injuries. you can put two tanks against each other and ram them at each other until one disintegrates. not much fines! the solution is to change the game to make it more athletic versus the way it is currently progressing. moving toward the rules of Aussie Rules football or rugby might be a step in the right direction.

LIKE / REPLY

WILLIAM DELANEY *November 15, 2015 11:11PM*

Helmet improvements will not stop concussion injuries. Reason: the brain rattles around in the skull like a stone in a tin can and that will occur with the best helmet made or any turf surface that will hold up a football player. In addition, there is a whip lash effect. Also, a severe blow to the top of the head can injure the spinal cord as occurs in infants dropped on their heads. A helmet won't stop that either. Didn't hear the above mentioned on your program. Ask your experts!

2 LIKE / REPLY

JAYJAYBE *November 15, 2015 11:11PM*

@William Delaney

Right on! But, actually, previous "60 Minutes" segments in recent years have dealt with the physiological aspects more directly. This time, they seem to be more interested in the general repercussions for accommodation by rules. They also didn't dwell on any of the lawsuits deriving from former NFL players. This is a much too complex and widespread issue than can be accommodated by 60 segments of "60 Minutes".

LIKE / REPLY

AK GRANNY MOM *November 15, 2015 11:11PM*

Yes to Rugby style tackles!! While we're at it let's reduce equipment costs and such severe health issues by playing rugby. Welcome the future---NRFL National Rugby Football League Hooray!!

1 LIKE / REPLY

WEAVER72 *November 15, 2015 9:9PM*

A good way to stop head to head collisions in football has always been debated. One article I read says take away all pads including the helmet. Why you may say. Simple, players (by instinct alone) make an effort not to use their head to tackle or try to gain more yards if they are not given the added protection. Players are more aware of their positioning during contact and also aware of their vicinity to the sidelines. There will always be head injuries, but nobody will try and use the helmet as a weapon. Something to think about.

Dr. Shannon Weaver, PhD

LIKE / REPLY

JAYJAYBE *November 15, 2015 11:11PM*

@Weaver72

Nice try, sort of! American football started without helmets...players died. The modern game is enormously more violent than when football was originally played. If you want football to be like rugby, football will become rugby...not the same sport.

LIKE / REPLY

WEAVER72 *November 16, 2015 6:6AM*

@Jayjaybe

The difference is men are pussies now compared to then. I have been involved in about every contact sport competing in all championship levels.

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