



2010: The Year of The Concussion

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By **STEFANIE LOH**, The Patriot-News



The Associated Press

The Minnesota Vikings' Brett Favre was just one of many NFL players who suffered concussions this season.

Here's a link to The Patriot-News' complete concussions series

The fight has finally begun.

With new research initiatives, skyrocketing levels of public awareness, and the rapt attention of all the people who matter most, 2010 marked a watershed in society's understanding of the confounding, mysterious head injury that is the concussion.

"We've had a national explosion of interest in the area of concussion and mild traumatic brain injury," said Dr. Hunt Batjer, co-chairman of the NFL's Head, Neck and Spine committee. "And it was triggered by several things that happened

simultaneously."

Last year, research revealed that multiple concussions and blows to the head sustained over time could lead to a type of Alzheimer's-like dementia in retired football players. This year, society finally caught up with science, and growing concern has resulted in rule and policy changes from the NFL all the way down to the Pop Warner level of football.

There was heightened focus on concussion management from the NFL this 2010, and more emphasis on a rule enacted last season that prevented players who'd been removed from a game or practice with concussion symptoms from returning unless they were cleared by an independent neurological expert.

The result?

Earlier this month, the NFL reported a 21 percent increase in the number of concussions reported this season.

Batjer views this as an uplifting sign that the suck-it-up-and-play culture of the NFL is finally changing, and that bodes well for the millions young football players across the country who look up to pro players as heroes.

"When your favorite football player on a Sunday is not returning to the game because of a concussion, you're probably going to argue with your coach or athletic trainer a lot less when you have to leave with a concussion because you know the big guy isn't returning either. That's powerful," said Dr. Matt Silvis, medical director for primary care sports medicine at Penn State, and a concussion specialist who works with young athletes.

"You take the NFL and NHL, and you have organizations that [until now] weren't really out there addressing this issue in a substantial way. But then this year comes, and it happens. It really meant something this year, and I applaud them for that because it's had a huge trickle down effect."

According to Jeff Shields, director of athletic training services at CPRS Physical Therapy (which supplies athletic trainers to about 18 high schools locally), about 20 to 25 percent more concussions have been reported this high school fall season.

The ongoing war in Afghanistan is another contributing factor to the boom in concussion research this year. U.S. Army statistics show that 62 percent of soldiers enrolled in the Army's Wounded Warrior program are suffering from traumatic brain injury or post-traumatic stress, and this has gotten the Department of Defense interested in concussion research.

"Military men and women are suffering concussion," Silvis said. "And when that's happening in the military, the military is interested in looking at it, so they're funding it too, and funding opportunities have increased because of media attention and recognition. This is a significant deal."

With so many factions of society working together to raise awareness on the issue of concussions and sports-related brain injury, The Patriot-News conducted interviews with some of the main players last week. Here's a look at what this year has them, and where they hope to push the issue in 2011.

1. PRO SPORTS



Dr. Hunt Batjer

Co-chairperson, NFL's Head, Neck, and Spine Committee

Professor and chairman of the Department of Neurological Surgery, Northwestern University Feinberg School of Medicine.

The NFL Head, Neck and Spine committee's efforts to raise concussion awareness in pro football has paid dividends, but there's still a lot to be done.

"I think some of the most important discoveries



The Associated Press

Dr. Hunt Batjer, and Dr. Richard Ellenbogen (right) testify before the House Judiciary Committee in May 2010.

this year are data," Batjer said. "We are seeing raw numbers now. The CDC has dramatically increased its estimate of sports-related concussions in the U.S., and I think the military data is also an eye opener.

Next year, the committee wants to introduce standard concussion care guidelines around the NFL, and perhaps disseminate this information to other levels of sports. The hope is that all healthcare professionals will eventually standardize the way they evaluate concussions.

Onfield testing is also high on Batjer's wish list for the future. He would like to start a database of NFL players who will be monitored by doctors throughout their careers. In the long run, this could identify trends to help researchers figure out whether there are genetic markers or factors that make some players more prone to concussion than others.

There's also much debate in the medical community over what causes the greatest damage: the severity of individual concussions, or the combined effect of blows to the head sustained over time.

"In my opinion, that's what the concussion issue will boil down to," Batjer said. "Cumulative career time exposure [to head impact] that could, in vulnerable populations, lead to permanent damage."

2: COLLEGE SPORTS



Dave Klossner, NCAA Director of Health and Safety

At the NCAA's concussion summit in April, certified athletic trainers and physicians met to discuss concussion management practices. A few months later, the organization adopted legislation that required its member institutions to adopt a concussion management plan to ensure that any athlete who shows symptoms of a concussion will be removed from competition.

Since 2004, the NCAA has sponsored a study conducted by the University of North Carolina at Chapel Hill to track injuries throughout collegiate athletics. The NCAA hopes to release results of the study next spring, and it will include information on concussions sustained by student-athletes from 2004-09.

The NCAA has also worked with the CDC to produce a concussion awareness public service announcement that will air in 2011.

That spirit of collaboration, Klossner says, is "one of the biggest benefits from the last year.

"You've seen a number of agencies come together in messaging – us, the CDC, the NFL and the National Federation

of High Schools. And these organizations reach a large cohort of those who are physically active," Klossner says. "In the past, you might have seen solo attempts, but now we're working across the board to be consistent in messaging."

3: HIGH SCHOOL SPORTS

R. Dawn Comstock, Principal Investigator, Center for Injury Research and Policy, The Research Institute, Nationwide Children's Hospital

With most of the concussion-related research focused on professional and college level athletes, the high school demographic has been largely neglected.

But Dawn Comstock runs the only high school sports-related injury surveillance study in the country, and the data her team gleaned from the study this year showed that girls seem to have a higher risk of concussion, and they report different concussion symptoms than boys.

Boys tend to report amnesia and confusion or disorientation while girls are more likely to report drowsiness and greater sensitivity to noise.

Comstock says it's unclear whether the findings are a result of girls experiencing different concussion symptoms, or whether girls are just more likely than boys to report their symptoms.

"All the adults around young athletes need to be observant of all the signs and symptoms of a concussion and recognize that each symptom must be evaluated and resolved before the athlete can be returned to play," Comstock says. "When in doubt, sit them out."

4: PRIMARY CARE PHYSICIANS



Penn State Hershey Medical Center's Dr. Matt Silvis

Dr. Matthew Silvis, Assistant professor in family medicine and orthopedics, Penn State Hershey Medical Center.

As a specialist who sees a lot of sports-related concussions, Silvis' would like the new year to bring some guidelines on how to better treat post-concussive syndrome.

"There have been a lot of articles so far on the epidemiology of concussion, but very little on the treatment of concussion because we're [all trying to figure out] how to diagnose it. How do they happen? What happens after a concussion?" Silvis said. "I would love to see articles come out that talk about treatment."

At the moment, concussion doctors are learning as they go along. Silvis recommends that his patients take a fish oil supplement after concussions because a recent preliminary study conducted on lab rats indicated that a substance in fish oil could help the brain heal after a concussion. The study is not conclusive, and the fish oil has not been tested on concussed humans, but "my

perspective is that the downside is minimal and the upside is potentially very good in an injury where we don't have a lot we can do for treatment other than targeting specific symptoms," Silvis says.

Fish oil capsules are easily obtained, and Silvis suggests people look for the United States Pharmacopeia Seal on the bottle to ensure quality because the fish oil supplement industry is not regulated by the FDA.

Silvis has also started using mild, regulated exercise to aid the healing process in the case of unusually long-lasting concussions in which symptoms extend beyond six weeks.

"It helps with cerebral blood flow, which allows for healing," Silvis says. "It's a preliminary type of thing, but something we are starting to do clinically."

5: CUTTING EDGE RESEARCHERS



Dr. Bennet Omalu

Dr. Bennet Omalu, forensic neuropathologist **and Dr. Julian Bailes**, neurosurgeon; Co-founders, The Brain Injury Research Institute, WVU.

The man who discovered and coined the disease "Chronic Traumatic Encephalopathy" (an Alzheimer's-like dementia that results from multiple blows to the head suffered over a period of time) is once again on the verge of breaking new ground with a follow up discovery that will likely be made public by early 2011.

Omalu and Bailes' research continues to provide evidence that most of the CTE-positive brains they've studied share on common gene -- Apolipoprotein E-3, or ApoE-3.

Omalu has also been working on a paper to identify several different microscopic subtypes of CTE.

"The usefulness of that is that if there are some microscopic types of CTE, there might be something different about players who suffer from specific types," Omalu said. "It may help us understand the disease better."

It all goes toward the quest to figure out what causes CTE, and whether certain characteristics make some people more susceptible to the disease than others.

"We are finding out that CTE is not Alzheimer's disease, it's not Parkinsons, it's not mild cognitive impairment, and it's not Lou Gehrig's disease like some people have proposed," Omalu said. "We are finding out that for each of these diseases, a specific type of protein accumulates in the [brain]."

"The protein that accumulates from Parkinsons is not [the same as] the protein that accumulates from CTE. In my opinion, Muhammad Ali might not have Parkinsons, he might have CTE."

Omalu also wants to clarify one common misconception: "Concussions do not cause CTE. Concussions and CTE are both caused by repeated impact to the head. Concussions are part of the CTE spectrum."

6: THE MEDIA



New York Times Sports
Editor Tom Jolly

Alan Schwarz, sports science reporter, **Tom Jolly**, sports editor, The New York Times

The scope of science – however revolutionary – is limited without the media to disseminate the information.

"One of the most important things that happened last year was the media's focus on this," Comstock, of The Research Institute, said. "As a researcher, I can write and publish on it in a medical journal, and I'm flattening myself if I say several thousand people might read it.

"But [journalists] write one story and millions and millions of moms and dads and coaches will read it."

The New York Times was one of the first media outlets to report on the link between head trauma and permanent brain damage. Alan Schwarz's story in January 2007 on how former Harvard football player Chris Nowinski (now co-director of Boston University School of Medicine's Center for the Study of Chronic Traumatic Encephalopathy) and Omalu found signs of CTE in former Philadelphia Eagles' safety Andre Waters' brain got the ball rolling.

Since then, Schwarz has become the Times' sports science writer, and his coverage of concussions in sports has helped keep the issue at the forefront of the nation's consciousness. But in the beginning, the Times never fathomed that the story would take legs the way it did.

"It's one guy. At that point, we were thinking it should just be [about] football players. We didn't have any idea we'd be writing about it four years from now," Jolly said.

The story about one case of CTE led the Times to unearth another. And another. And another, until, "You start thinking, 'This does have legs'. All along, we thought, 'It's one thing for a pro athlete to decide [he's] going to risk [himself] for millions of dollars,'" Jolly said. "The real story is how it's a public health issue. All these kids who look up to pro football players and see someone smashing with their head and think that's the way we should play.

"We don't view our job as beating a drum and making people aware of the impact itself, but we continue to find new information that sheds light on the whole issue."

7: First Reactors

Jeff Shields, director of athletic training services, CPRS Physical Therapy; **Lynn Boutin**, athletic trainer, Red Land High School

There might be more high school athletes reporting concussions now than ever before, but from the athletic trainer's standpoint, concussion management and awareness is nowhere near where it should be.

For one thing, most area high schools have athletic trainers present at sporting events, but it's not universally required across the board. Some schools have no trainers, and you rarely see club teams with trainers, or trainers at youth sports events.

"Most of the youth sports never have a sports medical professional, and rarely do they have an athletic trainer at their events," Shields said. "I think that population, which is the largest population of people in sports, needs a lot of education done."

Here's another problem. At the moment, there is no standardization of care for concussions even within medical circles. Athletic trainers have all encountered cases whereby their student-athletes come back after a trip to the emergency room and report that the emergency room doctor diagnosed them with a specific grade of concussion (from 1-3, in terms of severity).

That's old-school concussion classification that's now obsolete.

Nowadays, as the saying goes, "being concussed is like being pregnant," Shields says. "Either you're pregnant, or not. Either you're concussed or not. They're doing away with the classifications.

Family physicians who don't see many patients with concussions can sometimes be less knowledgeable about the new standards of post-concussive care, and the information they give patients sometimes conflicts with the instructions dispensed by certified athletic trainers who've undergone concussion training.

It's a problem that could be overcome with the introduction of concussion care certification for all healthcare professionals, Shields says.

8: PLAYERS

Lauren Wilson, Hershey field hockey; **Elaina White**, Red Land field hockey

In the last year, high schools have made concussion education and management a priority, and it has paid off to some extent.

Hershey senior Lauren Wilson took a stick to the face in a preseason field hockey tournament earlier this year and sustained a concussion.

Because Hershey has its student-athletes take the



John C. Whitehead, The Patriot-News
Lauren Wilson suffered a concussion in the preseason, but recovered in

ImPACT test as a baseline at the beginning of the season, athletic trainers were able to detect that Wilson had a concussion and monitor her progress.

time to compete with the Hershey field hockey team this season.

"I definitely think it's important that every high school does the ImPACT test. It's a good tool in diagnosing concussions and lets kids know concussions are serious and need to be taken seriously, and not just a minor headache," Wilson said. "I think our high school has [emphasized concussion awareness] more in the last two and a half years, and I think we're more informed than other high schools in the area."

But perhaps the way the information is conveyed also matters.

Like Hershey, Red Land High School also conducts preseason ImPACT testing on its student-athletes, and the Patriots' sports teams also get the "this is what a concussion is" briefing from the athletic trainers.

But senior field hockey player Elaina White, who sustained a concussion with her club team in January that forced her out of competition until June, says she never fully comprehended the magnitude of the injury until she consulted Penn State Hershey's Silvis about her concussion and he explained the potential long-term effects.

Red Land's athletic training staff does take the time to explain concussions to athletes, but the problem lies in the execution and the way teenagers tend to gloss over what sometimes comes across as repetitive information.

"As of now, they're like 'Well a concussion is when your brain is boggled, these are the effects, this is what happens.' It's put out to be like every other injury, just like, every athlete know what a broken bone is. It's pushed to the side as just another injury," White said. "But concussions can't be treated as just another injury. I know from experience.

"I think they have to have a sit down with the athletes, have the trainer there, and a doctor like Dr. Silvis to talk about how serious it can be. Maybe even use an example of an athlete who wasn't cautious about a concussion. Sit down [and give] a meaningful explanation of what concussions are."

9: PARENTS

Glenda White, mother of Elaina White, Red Land field hockey player

After watching her daughter, Elaina, work her way back from what turned out to be a serious concussion that kept her out of sports for months, Glenda White is now concussion-savvy.

But she wasn't before.

And when Elaina first started exhibiting concussion symptoms after hitting her head in a field hockey game in January, Glenda wasn't sure what to do.

The Whites took Elaina to their family physician, but even though he identified her symptoms as a concussion, he didn't have any suggestions about post-concussion care aside from offering to write a note to excuse Elaina from school.

Red Land's athletic trainer, Lynn Boutin, eventually recommended that the Whites take Elaina to Silvis, at Penn State Hershey Medical Center. And only then did Glenda realize that concussions could result in serious long-term brain damage.

Still, that was in January. Over the course of the year, Glenda has noticed more information on concussions in the media than ever before.

"I think all parents should be informed on this. I have seen more articles in the paper over the past year and a half, and I wish I'd known all this [in January]. I felt really guilty as a parent that I could have permanently damaged her because I wasn't informed," Glenda said. "But I think I noticed it more this year because it was out there more, I think there was more exposure."

10: COACHES



Christine Baker, The Patriot-News

Palmyra's Will Haus sustained a concussion early last season, but coach Bill Waldron kept a close eye on him until he was back to normal.

Bill Waldron, Palmyra boys' lacrosse coach, Central PA Dawgs lacrosse coach

As the coach for both the Palmyra boys' lacrosse team, and the Central PA Dawgs club team, Bill Waldron estimates that he's had about four to five players go down with concussions this year.

One was Palmyra's Will Haus, a Duke-bound senior who was hit in the head in a game and ended up missing the next three games.

Haus was taken to the emergency room at Hershey Medical Center, Waldron said he monitored his player closely afterward.

But it helps that as a nurse anesthetist, Waldron is a healthcare professional well-versed with concussion care protocol.

Few athletic coaches have that kind of training, and at the moment, the PIAA doesn't require any specific concussion management course for all its coaches, Waldron said.

He thinks it would be helpful for coaches to take courses in concussion management, and for parents to also get more training on how to identify concussion symptoms.

"I think if your son or daughter is an athlete, you should be provided with information [from the school] about concussions," Waldron said. "On the whole, I don't think parents have enough information to really understand what occurs, and what to look for in their kids. Especially some of the long-term effects of concussions – like memory issues or the inability to focus in school – that sometimes go unnoticed or undetected.

"There's a lot of watching that needs to happen when a kids has a concussion, and that's really important."

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