

# Philadelphia Daily News

## Deadly aftershocks

### Repetitive head trauma might be cause of brain disease in NFL players

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BEDFORD, Mass. - What Lisa McHale would like you to know is the way it once was, not the way it ended. Because it is vital to her that you know her husband Tom as she will always remember him - the intelligent, principled, fun-loving man she fell for so long ago back in college. Away from the violence that unfolded each Sunday on the football field, where he played on the offensive line for 9 years in the NFL for the Eagles and two other teams, the 6-4, 290-pound Tom McHale could fill up a room with his presence. Good guy: Loved his wife, doted on his three boys, and remained loyal to his old pals from childhood. Lisa remembers she was "instantaneously crazy about him" and that would never change, even as she now catches herself saying: "I just wish you could have known Tom when he was Tom."



Gradually, he became a stranger to her. In the years that followed his departure from the league in 1995, during which he opened some restaurants and worked in real estate in the Tampa area, McHale began taking OxyContin and other drugs to quell the pain that had settled in his joints. "Physically, he had the body of a far older man," says Lisa, who by 2005 became aware that "something was terribly, terribly wrong." Tom had lapsed into a depression. The man who once embraced life with such energy and enthusiasm became withdrawn socially, what Lisa would

later describe as a shell of his old self. He told Lisa he was hooked and entered rehab but he relapsed, again and yet again before Lisa asked him to leave in May 2008; Tom had begun using while the children were in the house. Within a week Tom had died in his sleep from an accidental drug overdose at the apartment of a friend. He was 45.

Chances are it would have ended there as just another sad casualty of addiction were it not for a telephone call Lisa received from Chris Nowinski, the founder of the Sports Legacy Institute and co-director of the Center for the Study of Traumatic Encephalopathy at the Boston University School of Medicine. From what he understood of how McHale died, Nowinski suspected that years of repetitive head trauma had left him with Chronic Traumatic Encephalopathy (CTE), a brain abnormality that renders one susceptible to memory impairment, emotional instability, erratic behavior and problems with impulse control. Nowinski asked Lisa if she would allow the brain of her deceased husband to be analyzed.

She agreed.

And the findings she was later presented with seemed to explain everything.

Tom had an acute case of CTE. According to Dr. Ann McKee, a CSTE co-director and neuropathologist who specializes in degenerative brain disease, McHale exhibited significant pathology in areas of the brain that control inhibitions, impulsivity, insight, judgment, memory, emotional liability and aggressive behavior. While McKee says there is "no direct link" between the damage she discovered and drug dependence, she speculated that McHale was probably experiencing "these weird connections," that he could well have been using drugs not just to feel better physically but also to ease the psychological turbulence that forms in concert with dying brain cells. Lisa remembers that Tom had written in a diary that he was overwhelmed by the continual feeling that he was having a nervous breakdown.

"I had come to grips with the fact that he had died of addiction, but it seemed to me as if something else was going on with him," Lisa says. "He had worked hard in recovery but just did not get any better. The poor man was confused. And then I looked at the slides of his brain tissue and I understood why.

"He was losing his mind. And our minds are who we are."

The delivery usually comes to the lab, though McKee says sometimes it will come to her home if the hour is late. The brain is placed in two layers of plastic bags filled with wet ice and secured in a bucket. The bucket is sealed with tape and placed in an even larger plastic bag of wet ice, which is then packed inside a styrofoam container and shipped in a cardboard box preferably no later than 14 hours after death. McKee and her small staff then photograph the brain, weigh it and cut it in two: One part is frozen at 80 degrees below zero for use by ensuing generations of scientists; the other part is placed in a fixative and used to harvest tissue that can be placed on slides for examination under a microscope. All of this takes place in an austere brick building at the Veterans Administration Hospital in suburban Boston, where McKee has affixed a sign to her door that asks ironically: "Got Brains?"

"Once a delivery was inadvertently dropped off at the wrong address, so it ended up with a neighbor," McKee says as she slips on a pair of surgical gloves in the morgue. "I can only imagine what they were thinking when they got it."

A wry chuckle, then unnecessarily: "By the way, I would not touch anything."

Evaluation of the specimens always begins with a blind analysis, a search for abnormalities that could lend clues to how a person lived - and died. In the case of McHale, McKee knew he had played football at Cornell and in the NFL but no more. However, the evidence she found of CTE led her to certain assumptions, which were only confirmed when she spoke with Lisa McHale and became aware of the issues that faced Tom in his final days. McKee says: "In a way you come to feel as if you know the person you are working on." At that point the object she is probing is no longer an inert entity but a piece in an elaborate puzzle that could explain sometimes odd behavioral patterns that preceded or even contributed to death. "It becomes a question of: Can you connect the dots?" McKee says. "You try to correlate their clinical symptoms with your pathologic findings."

Autopsies conducted by Mc-Kee and others in her field have shown that "the dots" lead back to CTE, which for years had been considered a form of dementia suffered largely by boxers. CTE has been found in 10 of the 11 deceased football players whose brains have been examined in the laboratory. Dr. Bennet Omalu, the chief medical examiner for San Joaquin (Calif.) County and author of the book, "Play Hard, Die Young: Football Dementia, Depression and Death," discovered the presence of CTE in three Steelers: center Mike Webster (heart attack); guard Terry Long (suicide) and tackle Justin Strzelczyk (high-speed car crash); and Eagles safety Andre Waters (suicide). McKee has discovered it in McHale, who played 21 games at guard and tackle for the Eagles in 1993 and '94; former Houston Oilers linebacker John Grimsley (self-inflicted gunshot wound); two NFL players who have not yet been publicly identified; and two non-NFL football players who also have not been publicly identified. None of the former players found with it was younger than 36, but McKee did encounter evidence of the abnormal tau protein deposition that is the precursor of CTE in a deceased 18-year-old football player. Says McKee: "And that is extraordinary. Someone that age should not have that."

Head blows that were once shrugged off as just having your "bell rung" have become an increasing concern for ex-players who participate in contact sports. Nowinski, a former Harvard football player and pro wrestler who suffered some serious head trauma, has signed up 116 former athletes to donate their brains for study as part of the CSTE Brain Bank Registry - including former Flyers star Keith Primeau, who had to quit playing because of a series of concussions. While there is not yet enough data accumulated to draw any firm conclusions, that day is not far off - perhaps just 3 years. "Ideally, we would like to have 50 brains or so," says Mc-Kee, who says the study has been receiving an average of "around a brain per month." Nowinski says that as the word of his program has spread he has been hearing from concerned spouses of former players who have shown signs of declining cognitive ability. Such accounts are supported by a 2007 survey of 2,552 former NFL players by Center for the Study of Retired Athletes at the University of North Carolina: 37 percent had a higher risk of Alzheimer's disease than other men their age.

So what does the NFL have to say? For years, the league has argued that there is "no conclusive proof" of a link between playing football and the development of cognitive impairment. But unlike the head-in-the-sand position it took under former commissioner Paul Tagliabue, the NFL has adopted a proactive stance toward concussions under successor Roger Goodell. In the wake of a concussion conference the league held in Chicago in June 2007, the league has embraced more enlightened guidelines on the supervision of concussions, which has included the enactment of rules to prevent "unnecessary helmet impacts." NFL spokesman Greg Aiello said "the injury has been treated more carefully than it has ever been and the players are more aware of it." A formal statement issued by the league stressed in part "there continues to be considerable debate within the medical community on the precise long-term effects of concussions and how they relate to other risk factors, including preexisting conditions or family history."

Elsewhere, the statement argued: "Hundreds of thousands of people have played football and other sports without experiencing any problem of this type."

CSTE co-director Dr. Robert Cantu replies: "That is bosh!"

"There is no statistical study of those people," says Cantu, a clinical professor of neurosurgery at Boston University. "There is no way of knowing that unless an autopsy has been conducted."

As part of its own study into concussions, the NFL committee on Mild-Traumatic Brain Injuries invited Nowinski and Mc-Kee to appear before them May 19. Neither side would comment specifically what was discussed, but McKee says: "They seemed interested in hearing what we had to say." Cantu applauds the league for bringing them in but hopes that it ends up being more than just "lip service," that it is instead the beginning of a probe that addresses the central unanswered question has engaged CSTE: "Can we connect with a black line between playing football in the NFL to these abnormal tau protein depositions?" Cantu concedes that a prior condition or a genetic predisposition could play a part, but says there is no existing data that points to drug use as a contributing factor. Says McKee: "Of the six players I have looked at, there is no evidence that two of them had ever used anabolic steroids. [Skeptics] love to point to anabolic steroids as explanation."

Concussions have captured the headlines, but it could be somewhat more complicated than that. In fact, Cantu says it is "the total brain trauma" that a player absorbs and "not just the number of concussions" that leave him vulnerable to CTE (which Cantu thinks has been generally misdiagnosed as Alzheimer's disease). Consequently, Cantu says that while NHL players are hit just as hard or harder than NFL players, NFL lineman such as Webster, Long, McHale and others were at jeopardy because of the way their heads were "violently shaken" on every play - not enough to cause a concussion perhaps, but enough to cause cumulative injury from repetitive subconcussive insult. Says McKee, holding up a slide of a McHale sample: "What we have is a continual acceleration/deceleration of the brain inside the skull."

She points to the border of the hippocampus, a curved ridge of tissue in the cerebral hemisphere associated with memory. "There can be no disputing the facts," McKee says of the area, the

discoloration of which stems from an accumulation of tau. "And you do not have to be a doctor to see it. Here it is. You can either pretend that it is not happening or just accept it."

She shrugs and with a sigh adds, "We are not splitting hairs here."

John Grimsley was an avid outdoorsman who was so adept at handling firearms that his wife Virginia used to call him "Grimsley Adams," a play on the old TV show about frontiersman Grizzly Adams. So when the former Houston Oilers linebacker accidentally shot himself while cleaning a pistol in February 2008, it seemed inconceivable to Virginia that her husband could have been so careless with a weapon. "I just wondered, 'How the heck could this have happened?' " says Virginia, who adds there was no indication that it was a suicide. In fact, the dying Grimsley reached for a cleaning rag to stanch the blood flow from the wound in his chest.

"John would have never wanted to leave this earth," said Virginia, whose husband was 45 when he died. "John loved life, and I know he would not have done that to me and our two sons. What I think happened is that he just forgot that there was still a bullet in the chamber."

Virginia had been worried about John. He had indeed become forgetful. Exasperated, she would find herself saying to him: "Honey, I told you that five times today." Worse, the "laid-back, slow-to-anger" man that she had known since they were teenagers in Ohio had developed a short fuse. Virginia would stare at him when he snapped at her and say: "Who are you?" Always, he would come around later and apologize, and Virginia would shrug and "just chalk it up to a bad day." But along with the personality change she saw in him there were other problems: headaches, insomnia and an increasing reliance on alcohol to numb the pain that shot through his shoulder and hands. Virginia explained it as a function of just getting older until she saw a documentary on Nowinski and the problems other former players were having.

Virginia told him, "Honey, you know we have always joked that you were hit in the head once too often. But this is not funny anymore."

"Oh, well," John replied. "We all took our blows to the head. That was just part of the game."

Virginia told him he should watch the documentary if it came on again.

He did.

"And he just sat there looking at the screen not saying a word," Virginia says. "And that just spoke volumes. I could see that he was scared."

No one looked beyond the here and now when it came to head trauma in the era that Grimsley played. In fact, former Baltimore Colts safety Bruce Laird says taking a blow to head was "a badge of honor." Laird had four concussions during his career and adds, "And that does not count the number of times I was knocked around." He remembers once he was so woozy that the

team doctors took his helmet away and hid it to keep him from playing again. Laird says, "I found it and went back in anyway." Even if it remained unspoken by coaches and teammates, it was the expectation that a player would "suck it up." In the case of Laird and countless others, that commonly occurred with the aid of what he calls "ammonia snappers."

"What they would do if you were out of it is break one open and give you a sniff of it," says Laird, who is a CSTE donor. "It would be like taking the cap off an ammonia bottle and taking a whiff of it. I remember I used to have our trainer carry them on his belt like bullets. I used them liked candy."

What it comes down to as far as former NFL linebacker Isaiah Kacyvenski is concerned is taking the decision to play or not to play out of the hands of the player, of establishing strict protocols that would essentially protect the player from himself. Kacyvenski says he had 15 concussions during his playing career at Harvard and in the NFL with the Seahawks, Rams and Raiders. "When your livelihood depends on hitting people, you have no choice but to 'tough through it,'" says Kacyvenski, a CSTE donor who remembers being blindsided in a game. Kacyvenski says he "wandered off the field, not sure of where I was." He says he was so out of it that he had no sense of smell, even when he took a deep whiff of an ammonia capsule. Says Kacyvenski: "So they gave me two. Huge whiffs - nothing. Close to a half-hour later, I was allowed to go back in the game."

But whatever hazards exist are shoved aside by young players trying to crack into the league. As he walked off the Eagles' practice field at the NovaCare Complex last week, guard Mike McGlynn said he was not sure if he has ever had a concussion. "I have had some headaches," says McGlynn, in his second year out of Pittsburgh. While he is well aware that players in the NFL are replaceable parts, he says he would not withhold a head injury from the coaches if he happened to get one. But safety Reshard Langford, an undrafted rookie out of Vanderbilt, says he could understand why a player would do it. He says: "What is the average length of a career - 2, 3 years? So the turnover is high." Second-year cornerback Jack Ikegwonu, out of Wisconsin, adds that head injury can be preventable "if you are taught well and learn how to tackle." While he says he has not had a concussion yet, he would not hesitate to report it, saying: "Your body is your temple." Ikegwonu adds that he has never heard of CTE.

Because the symptoms of CTE are undetectable by screening and take years to develop, there is a palpable fear among players that they are in store for a sad reckoning, that old age could be some form of the misery that has engulfed former Baltimore Colts tight end John Mackey. Few players in the league were as articulate as Mackey, the former president of the players association. Laird says Mackey is institutionalized, unable to speak and has the characteristics of a small child; he and his former Colts teammates were instrumental in founding a program in honor of him called the "88 Plan" that has been co-sponsored by the NFL to lend aid to close to 100 other former players. Well aware of the pattern of disability that has ensnared some former players, which Nowinski thinks of as an "emerging lost generation of non-functional men," the 31-year-old Kacyvenski says it takes him longer to do the same things he did 10 years ago, and that he slips in and out of depression.

"Do I worry about the shape I will be in 20 years from now? Yes, I do," Kacyvenski says. "But I take it day by day. I have a wife and two children, and I want to contribute to society in whatever positive way I can."

Says Cantu: "Insofar as developing CTE is concerned, the fact that we have found it in 10 of 11 cases is not to say that this will be the batting average for the NFL. But what we know is that it does not show up during their playing careers, which is why Troy Aikman and Steve Young are not out of the woods yet. Both of them took poundings and are well-spoken enough to do TV. But it will not be clear for 15 or 20 years if they have developed CTE."

McKee says that the delay seeing symptoms of CTE is part of the problem. "Because the delay is 10 years or more, people no longer connect it to a head trauma they suffered 20 years ago," she says. "But I wonder whenever I hear a former player has beaten his wife, or lost his business because they were gambling like crazy, or ended up dead at the end of a scary police chase. Is there evidence of brain damage?"

Education is the unifying aim of the Sports Legacy Institute. Co-founder Cantu says that while CSTE is anchored in the study of CTE - which he calls "the worst of the worst" in terms of brain degeneration - the Sports Legacy Institute is aimed at helping players develop a better understanding of concussions and postconcussion syndrome. "We want to be able to let a player know when enough is enough," says Cantu, who adds that better equipment has given players "a false sense of security." He uses the NHL as an illustration: In the days before college players wore face shields, there was a problem with eye injuries that has now been eradicated. But Cantu says that the tradeoff has been "that game is now played more violently." No one could appreciate that better than Primeau, who says that head contact that used to be accidental has become intentional. Still suffering from "lightheadedness" whenever he exerts himself, Primeau says he hopes that by signing on with Nowinski he has an impact on the perceived severity of head trauma, which he says he overlooked in order to get back in the lineup.

Whatever issues exist at the pro level, youth sports is a platform of special concern for Cantu, who says that a young brain is especially vulnerable to injury. In an effort to address the problem of concussions, Washington state adopted legislation that prohibits players 18 years or younger suspected of having suffered concussions from playing again without the clearance of a licensed health care provider. But former Houston Texans center and CSTE donor Ben Lynch says there has to be widespread culture change when it comes to youth football, if only because young players and even their coaches take their cues from how the NFL conducts itself. Laird agrees and adds pointedly: "A parent deserves to know what the risks are before they allow their children to play."

Virginia Grimsley says she would not allow her sons to play in light of what she knows now. She says: "Both of them are in their 20s now, so it is not an issue for me."

And John?

Would he have still played?

Well, she says, he loved it, even if he could not have imagined how it would have ended for him, how there was that accident and that was soon followed by a telephone call that Virginia received as she was arranging the funeral with her pastor. A friend poked her head in the door to interrupt, and they sat down in another room.

The friend said, "Someone named Chris Nowinski called and . . . "

Virginia stopped her and said, "Tell him I know who he is. And I know what he wants. He can have it."

When Tom McHale played in the NFL, Lisa says she he "never once" heard her husband or his teammates even bring up the subject of concussions. "It was just not something he or anyone else even discussed back then," says Lisa, who has since had a conversation with a player who told her: "Oh yes, I remember one he had very, very well." But he took a whiff of an ammonia capsule and was out there for the ensuing series, unaware that by doing so he was placing himself in jeopardy. Lisa is certain that if Tom understood the consequences he faced, he would have never played football.

"Had he known how it would leave him - no," Lisa says. "Tom would have said it was not worth the price."

It has been more than a year since Tom died - May 25, 2008. He is buried not far from their home in Tampa. Whenever Lisa visits his grave, she thinks back on the sweet, cheerful man she once knew, and understands with profound sadness that she would never have him back again. Slowly, he had vanished before her eyes and would not have come back, even if he had conquered his addiction. Because Lisa says that if it had been just that - the drugs - she is certain that Tom would have found the strength to overcome it and be there with them. But she says her husband was "fighting something far larger in his head," and that the years ahead would have been arduous had he lived.

It was beyond Tom, she says.

It was beyond them both.

And there was nothing anybody could do. \*