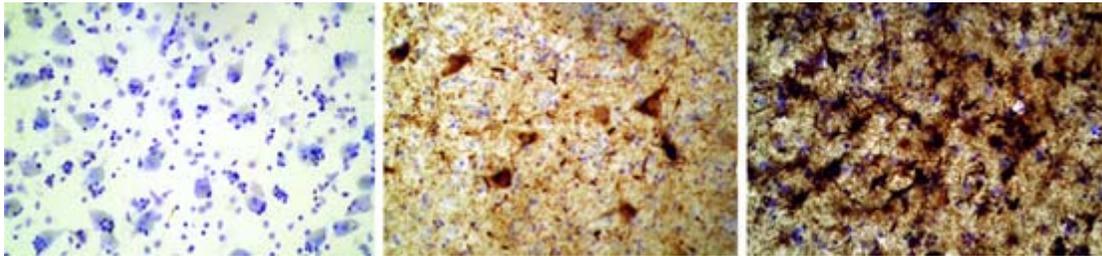


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NFL, U.S. Soccer Athletes Donate Brains to BU New center to study concussions and permanent damage

By Caleb Daniloff



(Above left) Microscopic brain section from a 65-year-old control subject, showing no abnormal deposit of tau protein; (middle) section from former NFL player John Grimsley's brain, showing abundant deposits of tau protein, an indicator of the degenerative brain disease CTE; (right) section from a 73-year-old world-champion boxer with end-stage CTE and dementia, showing severe tau protein deposition. (Below) Whole brain sections from the normal 65-year-old, from Grimsley, 45 years old at the time of his death, and from the 73-year-old world-champion boxer. Images courtesy of Ann McKee

Last fall, when former Houston Oilers linebacker John Grimsley forgot about the wedding of his son and future daughter-in-law that he'd been helping plan for months, his wife, Virginia, knew something was gravely wrong.

"We'd been talking about the wedding for weeks, then every day the week before," Virginia Grimsley says. "It was the big event. And then, the day before, my husband was running an errand and came back and said he'd run into so-and-so and that they were going to get together the next day. I was shocked."

Grimsley is convinced that her husband's alarming memory trouble, and perhaps even his untimely death from a firearms accident earlier this year, was linked to the nine concussions he suffered during nine seasons on the gridiron. Now, thanks to a groundbreaking study under way at BU's new Center for the Study of Traumatic Encephalopathy (CSTE), she may be closer to a definitive answer.

When John Grimsley died, his wife donated his brain tissue to CSTE, where it was analyzed by BU pathologists. The results, released this week, showed that Grimsley's brain exhibited pronounced chronic traumatic encephalopathy (CTE), a condition that is often seen in retired athletes, such as boxers, who have a history of repeated concussions. CTE is a progressive, degenerative disease associated with memory loss, confusion, impaired judgment, paranoid and aggressive behavior, depression, dementia, and parkinsonism. Grimsley, who played in the NFL from 1984 to 1993, is the fifth former player diagnosed with CTE since 2002. All five died untimely deaths.

Last February, Grimsley accidentally shot himself in the chest while cleaning his gun. He was 45 years old. "He'd grown up with guns his whole life," says his wife "Did he forget there was a bullet in the chamber? Was his visual perception off?"

Ann McKee, an associate professor of neurology and pathology at BU's [School of Medicine](#) and codirector of the new brain-study center, analyzed Grimsley's brain tissue sample. McKee says that while she cannot tie his condition directly to concussions suffered as an NFL linebacker, the pattern of degeneration is classic for CTE. "It could be mild trauma from any number of different sources, and concussion is one of them. The only thing I can say is that this pattern of change is associated with multiple mild brain traumas, and he had a history of concussion — one medically documented case and eight more that were not. So most likely that had something to do with it."

The new center at BU, financed primarily by the University and a grant from the [National Institutes of Health](#), will operate in collaboration with the [Sports Legacy Institute](#), a nonprofit founded last year by Chris Nowinski, a former Harvard University football player and professional wrestler and the author of [Head Games: Football's Concussion Crisis](#), and Robert Cantu, codirector of the [Neurological Sports Injury Center at Brigham and Women's Hospital](#) in Boston.

Nowinski, seen as a driving force behind the new center, suffered at least six concussions during his collegiate and professional sports career and has struggled with massive memory loss, depression, and headaches.

"I'd never been made aware in 11 years of collision sports that concussions can have such significant long-term problems and that as an athlete you can protect yourself by getting out of



play and resting your brain,” he says. “Our goal is to put this issue on the map and let scientists know there’s a population of people who need a unique type of treatment. I’d like to see the culture of concussions change so much in five years that there isn’t an athlete or coach who doesn’t know what the proper thing to do is when they get a concussion.”

The center will develop a multidisciplinary research program aimed at understanding the mechanisms of CTE, including neuropathology and risk factors. A second goal of the center is to sign up former athletes for clinical research studies to probe the link between their symptoms and their history of concussions. Finally, the center has launched a brain donation program for athletes, current and retired, with and without a history of concussions. A dozen athletes have already agreed to donate their brains after they die. That list includes former NFL players Ted Johnson, Frank Wycheck, Isaiah Kacyvenski, and Ben Lynch. Noah Welch, who played hockey for the Florida Panthers, and Cindy Parlow, a former member of the U.S. national soccer team, have also signed up.

Robert Stern, a MED associate professor of neurology and codirector of the [School of Medicine Alzheimer’s Disease Clinical and Research Program](#), analyzed Grimsley’s behavior in the years prior to his death. He says he hopes the work at CSTE will “lead to education and policy changes and provide impetus for improved protective head gear.”

“We really don’t know that much about this disease,” says McKee. “It’s been under the radar for years. We’ve known about it in boxers. People just thought if you stayed away from boxing or wore a helmet, you wouldn’t get it. But CTE can occur in a variety of different activities, and one of them is football.”

Virginia Grimsley says she plans to reach out to more NFL players, urging them to consider participating in the BU study. “The stigma needs to go away that you’re a sissy if you come out of the game and don’t go back in. A concussion is a big deal. It’s not just a ding.”

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