

Head trauma doesn't predict memory problems in NFL retirees, suggests new study

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A study of retired professional football players by researchers at UT Southwestern Medical Center has found that their cognitive abilities did

not differ significantly from a control group of similarly aged men who did not play football, nor did those abilities show significant change over one to five years. The findings, published in *Brain Injury*, suggest that exposure to concussions and head injuries among National Football League (NFL) players is not a predictor of neurocognitive decline later in life.

"This is the first study, to our knowledge, that has measured cognitive functioning over time in older NFL retirees, and it provides evidence that the degree of head-injury exposure does not relate to neurocognitive changes over time compared to carefully matched peers," said the study's senior author, Munro Cullum, Ph.D., Professor of Psychiatry, Neurology, and Neurological Surgery and Chief of Psychology at UTSW. "This is important given some of the media portrayal of cognitive impairment being routinely associated with a history of playing professional American football."

The effect of concussions and repeated hits to the heads on NFL players has been a source of heightened concern in recent years since a number of deceased former NFL players were found to have had chronic traumatic encephalopathy (CTE). CTE, a neuropathologic condition that has been linked to repetitive head trauma, has been identified in some former football players and boxers as well as military veterans exposed to explosive blasts. But its actual cause is unknown, and it can only be diagnosed through autopsy.

Medical experts have been challenged to better understand how repeated head traumas and other factors might contribute to degenerative changes in the brain. Previous studies have reported mixed findings on the relationship between head-injury exposure and neuropsychological functioning later in life. While some investigations have suggested former NFL players may exhibit lower verbal memory and executive function scores, others have not found differences compared to control

groups, according to [a review of the literature](#).

The latest investigation, by faculty and trainees from UTSW's Departments of Psychiatry, Neurology, Neurological Surgery, and Physical Medicine and Rehabilitation, included 53 former NFL players age 50 or older as well as 26 healthy controls and 83 individuals with [mild cognitive impairment](#) or dementia who did not play collegiate or professional contact sports and matched as closely as possible to the NFL retirees by age and education. The participants underwent clinical interviews that included concussion histories, neuropsychological testing, neuroimaging, and neurological exams. Twenty-nine players had follow-up evaluations ranging over one to five years.

The retired players in the study had an average of 5.63 concussions, 8.89 years in the NFL, and 115.12 games played.

The researchers report that retired football players had slightly lower memory scores compared to healthy peer controls but did not find this to be significantly associated with head-injury exposure. The findings held true whether the athletes had played non-speed positions (quarterback, lineman, linebacker) or those involving speed (running back, defensive back, receiver) during their playing careers. And the results did not significantly change in the follow-up evaluations.

"These results underscore that not all NFL retirees will have cognitive problems later in life, and they add to the complex and mixed literature on whether there is a clear dose-response relationship between head-injury exposure and later cognitive impairment," said Jeff Schaffert, Ph.D., Assistant Professor of Psychiatry at UTSW and the study's lead author. "Our finding that some NFL retirees may have slightly lower memory scores is not clinically meaningful and importantly did not relate to any measure of head-injury exposure we could evaluate."

Dr. Schaffert, who is a neuropsychologist, added that these latest findings are not the end of the story. "Future research will be critical to determine whether there is a subset of former athletes who may be most at risk," he said.

Dr. Cullum is a clinical neuropsychologist who specializes in the assessment of cognitive disorders. "This investigation was our first to evaluate cognitive functioning over time in these players," he said. "This also builds on our concussion-aging research exploring this and other risk factors for cognitive decline later in life."

Ongoing work in the field at UTSW includes the Concussion-Texas (ConTex) studies, which collect data on sports-related concussions among middle and high school athletes, and the multisite Care4Kids study of biomarkers and lingering symptoms following adolescent concussion.

"With our rich multidisciplinary research teams, UT Southwestern has been a natural environment to pursue [brain injury](#) and brain aging research," Dr. Cullum said. "Graduate students as well as postdoctoral fellows have contributed heavily to this line of work, and I'm proud to say that several of our faculty members doing this latest research were former trainees at UTSW."

Nyaz Didehbani, Ph.D., Associate Professor of Psychiatry and Physical Medicine and Rehabilitation at UTSW and a co-investigator on the study, said that brain aging research efforts are continuing with a new study called the College Level Aging Athlete Study. Researchers are investigating female and male athletes, now age 50 and older, who were part of the National Collegiate Athletic Association and the National Association of Intercollegiate Athletics.

"Our concussion research teams are unique in that our projects

encompass the lifespan from youth to aging retired athletes," Dr. Didehbani said. "The focus of this project is on athlete brain health over time to widen the scope to a larger representation of athletes."

Other researchers who contributed to the study include Christian LoBue, John Hart Jr., Heidi Rossetti, Kristin Wilmoth, Will Goette, and Laura Lacritz from UTSW and Michael Motes from The University of Texas at Dallas.

More information: Jeff Schaffert et al, Neurocognitive outcomes of older National Football League retirees, *Brain Injury* (2022). [DOI: 10.1080/02699052.2022.2143567](https://doi.org/10.1080/02699052.2022.2143567)

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