

Study cites youth football for issues

By Tom Farrey | [ESPN.com](https://www.espn.com)

Former NFL players who played tackle football as young children were more likely to have thinking and memory problems as adults, a Boston University study published Wednesday in a medical journal found. Researchers tested 42 retired players between the ages of 40 and 69 and found that those who started playing football prior to age 12 performed "significantly worse" on three measures: estimated verbal IQ; executive function, which includes reasoning and planning; and memory impairment. The study is published in *Neurology*, the medical journal of the American Academy of Neurology.

"They were worse on all the tests we looked at," said Dr. Robert Stern, lead author and a professor of neurology and neurosurgery. "They had problems learning and remembering lists of words. They had problems with being flexible in their decision-making and problem-solving."

The authors concluded that incurring repeated head impacts in football between the ages of 10 and 12, a critical and sensitive window for brain development, may increase the risk of later-life cognitive impairment. During those early years, the brain is rapidly building connections between neurons.

"We have findings from former NFL players, so it can't be generalizable to the rest of the football-playing public," Stern said. "But it does suggest something that I think makes logical sense. The logic is you shouldn't hurt your brain over and over and over again as a child."

The top medical official for Pop Warner, the nation's largest and oldest youth football organization, dismissed the study as "flawed." Dr. Julian Bailes, chairman of its medical advisory committee and co-director of the Northshore Neurological Institute in Evanston, Illinois, told "Outside the

Lines" that the sample is too small to draw any conclusions from, and that the results of NFL players cannot be compared to that of athletes who never made it to that level.

"There's absolutely no information on the number of concussions that the [study subjects] had in high school or college, or the severity of the concussions," he said. "I think what probably happened is lots of them get no concussions in youth, but three in high school, five in college and 10 in the NFL. They're trying to say it's the age of first exposure that is the problem, when it's more likely cumulative exposure." Stern said the study was designed to control for that factor. The subjects were split up in a manner so that each group played a similar number of years in tackle football, with a similar number of concussions. The players who started the game later lasted slightly longer in the NFL, 8.67 years compared with 7.02 years.

He also called for additional studies with larger sample sizes. A spokesman from the NFL could not be reached for immediate comment.

The study, funded by the National Institutes of Health, comes as participation in youth football has been declining: From 2008 to 2013, the number of children ages 6 to 12 participating regularly in football fell 29 percent, to 1.3 million, according to the Sports & Fitness Industry Association, which commissions an annual household survey of sport participation rates. Baseball, basketball, soccer and other sports also experienced declines in that age group, though football's drop was much steeper than most.

An Associated Press analysis of the 51 youth concussion laws in each state and the District of Columbia finds that fewer than half contain all of the key principles of the model legislation.

A few institutions are also responding to health and safety concerns: The New York City Council on Friday held a public hearing over a proposal to require doctors to be present at all youth games, and trainers or doctors at all full-contact practices. And the LA84 Foundation, which funds youth sports in California, in December 2013 added criteria to its grant application

stating that it would no longer provide support to community sport organizations that offered tackle football before age 9.

Dr. Robert Cantu, a neurosurgeon and colleague of Stern's at Boston University who did not work on the study, said that young brains are more vulnerable to hits because they lack the coating on the nerve fibers, called myelin, that provides strength and helps transmit information. In 2011, Cantu began advising families with children to avoid tackle football and stick with flag football if possible through age 14.

"Youngsters, especially between the ages of 10 and 12, are developing connectivity networks, especially between the temporal lobe where we house our memory and emotions, and the frontal lobes where our executive functions are, our insider judgment," he said. "If there is an injury, these pathways are going to be altered, and it can have a significant effect on what the personality of the individual is going to be. He may not have been programmed genetically to wind up with problems with depression or cognitive issues, but that can be the net result."

Stern and his co-authors cite studies showing that children ages 9 to 12 can incur an average of 240, and up to 585, head impacts per season. Bailes places that number at closer to 65, though he sets the threshold for a head hit at 30Gs, which he called a "significant" hit. His number also assumes the child is playing on a team that abides by Pop Warner rules passed in 2012 limiting full-contact drills to one-third of practice time and no head contact at all except during games.

An independent, Virginia Tech study placed the number at 158 head impacts, if a program abides Pop Warner's rules.

"If it's 60 to 100 low-level hits a year, I think that's pretty safe," Bailes said. "Kids are going to be banging their heads falling out of trees and off bikes, anyway. So I don't see any real epidemic here."

Bailes said the youth football experience of the players today differs from that of the NFL veterans who Boston University studied, players who came up during the 1960s through '80s. "They played and practiced under arcane protocols of recognizing and recording concussions, and under

different coaching styles than we see today," he said. "This is a study of the way it used to be. This is really a study of old-timers."

Gerard Gioia, chief of the division of pediatric neuropsychology at Children's National Medical Center in Washington, D.C., said the study underscores the need for a longitudinal study of youth athletes that captures events and changes over time. To date, NIH and other funding of brain injury research in sports has largely gone toward looking at adult athletes.

"The design of the study does not allow one to make any firm conclusions about the relationship between these variables," said Gioia, a member of the medical advisory committee for USA Football, which is supported by the NFL. "Nevertheless, these results do suggest that we need further study of any such possible relationship."

Stern said the study is "one piece of information" but valuable, given the lack of research on football-related head trauma in the pediatric population. It also is consistent with research demonstrating that children and adolescents are more susceptible to poor outcomes from concussions, and that reduced intelligence has been reported following concussions.

"More research has to be done," he said. "The dilemma is whether we wait for more and more and more research before changing something, or do we try to alter decision-making based on a combination of logic and early research findings?"

Cantu, who is a senior medical adviser to the NFL, said that the new study's findings buttress his recommendation about playing flag football instead of youth tackle football.

"To allow your child to be subjecting themselves to repetitive head injury at a very early age when they could be doing the sport a different way and minimizing their chances [of brain injury], to me, is just insane," he said. "It's wrong. We should not be allowing this to happen."

"Tom Brady didn't play football until high school. He picked up the game pretty quickly."