

Football helmet sensors help researchers demystify concussion in young athletes

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Even two years later, Sarah Clark grimaces sheepishly and insists she mishandled the concussion her oldest son sustained in ninth-grade football.

"I was woefully unprepared," says Clark, a researcher at University of Michigan and a self-proclaimed [football](#) mom at Skyline High School in Ann Arbor. "I did not do a good job at all. I made him do his math homework that night. I sent him to school the next day."

Like Clark, most parents don't realize the staggering number of hard hits young players sustain each football season, says Steven Broglio, director of the Neurotrauma Research Laboratory and assistant professor at the U-M School of Kinesiology.

Concussion gets quite a bit of media attention, but mainly at the professional level, Broglio says. Consider the latest to grab headlines: former Detroit Lions player and "Webster" star Alex Karras, named as the lead plaintiff in a head injury-related lawsuit against the NFL. However, most players who sustain concussions are high school kids who will never have a college or professional career.

Broglio's research using helmet sensors to measure impact shows that an average high school player takes roughly 650 impacts, with a maximum of more than 2,000 per football season. A concussion occurs at roughly 90 to 100 [g-force](#), which equates to smashing your skull against a wall at 20 mph.

One [misconception](#) is that the harder the hit, the worse the outcome. But Broglio's studies show that the magnitude of impact that causes the concussion doesn't predict the severity of injury. Every kid and every brain is different.

Also, there doesn't appear to be a [snowball effect](#) with concussion, he says.

"We used to think that if you took a bunch of little hits, then you were more likely to get a concussion from a smaller impact," Broglio says. "But our findings don't support that."

Basically, all it takes is one good hit to cause injury.

When Clark heard about Broglio's concussion research, she helped connect him with Skyline [High School](#) administrators, who were happy to participate. Broglio's research laboratory is now the very same football field where Clark's son was hit. The football teams practice and play in helmets outfitted with sensors that record impact location, magnitude and various other measurements that help Broglio understand what's going on at the bottom of the pile, who gets concussions and why. These measurements are sent wirelessly to a sideline computer monitored by Broglio and his team.

The next step in the research is to examine if there are any lasting effects to [concussion](#).

Provided by University of Michigan

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