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VITAL SIGNS

Hazards: Football Head Injuries, Not So Cut and Dried

By [ERIC NAGOURNEY](#)

Those bone-jarring collisions on the football field that make fans wince and players tumble like rag dolls may not always be the real ones to worry about.

Researchers who outfitted college football players' helmets with devices designed to measure the speed, direction and force with which they hit their heads have found that there is no way to know for sure which blows will lead to a [concussion](#).

Writing in the December issue of *Neurosurgery*, researchers from the [University of North Carolina](#) presented their findings in three different reports looking at how hard players were hit, what position they played and whether they were playing in a practice or a game, among other things.

In one study, led by Kevin M. Guskiewicz, the researchers gave neurological exams to 88 players and then fitted their helmets with accelerometers.

During the season, any player suspected of having sustained a concussion was re-examined, with the results compared with those from earlier in the year.

In all, 13 concussions were found in the course of the study. But when the researchers looked at the nature of the collisions that caused them, they could find no hard and fast rule about what part of the head was hit or how hard and in what direction.

That means it may be even harder than believed to come up with good guidelines for coaches trying to decide whether to take a player out of the game.

"It may be difficult to establish a threshold for concussive injury that can be applied to all football players," the researchers wrote.

They suggested one explanation for why a relatively small impact might lead to a concussion. In one case, the researchers learned that a player who got a concussion in a practice had been hit in the head twice before that day and once the evening before.

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