

Hard Hit

By Kirsten Weir

Is football too violent for the health of its players?



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In 2010, Owen Thomas, a 21-year-old University of Pennsylvania student, took his own life. When researchers examined Thomas's brain tissue afterward, they made a disturbing discovery: early signs of a disease called *chronic traumatic encephalopathy (CTE)*. Caused by repeated blows to the head, CTE is often seen in wrestlers, boxers, hockey players, and football players. Thomas was a defensive lineman for his college team.



(label, Owen Thomas)University of Pennsylvania

No one can say for certain whether playing football was linked to Thomas's early signs of CTE and his suicide. But repeated head trauma is the only known cause of CTE, and blows to the head are all too common on the football field. In the past few years, doctors have diagnosed the brain

disease in a worrisome number of professional football players. A national pastime is coming under serious medical scrutiny.

Weight Gain

Pro football players have gotten bigger over the years. Two decades ago, defensive ends weighed, on average, about 230 pounds. Now they tip the scales at 300 pounds. Their plays are more violent too. In 2010, 350 players ended the season early due to injury—almost twice as many as in 2006.

Today's high school football players are also bigger and faster, and their tackles harder, than they were a generation ago. Each season, one out of five high school players sustain head injuries, according to a report in the journal *Neurology*. Many, if not most, of those injuries are *concussions*. A concussion is a change in brain function caused by head trauma. It occurs when the brain crashes against the inside of the skull, says Jason Mihalik, a researcher at the Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center. "When the brain sustains a concussion, it goes into a frenzy," Mihalik says. The reaction can lead to impaired memory and reaction time, among other symptoms.

An athlete should never return to a sport before a concussion has fully healed, says Mihalik. The process takes at least a week, often longer. If a second head injury occurs before the first one has healed, a condition called *second-impact syndrome* can result. It can have serious, long-lasting consequences: amnesia, loss of mental ability, and even sudden death.

Second-impact syndrome isn't the only way that concussions can harm the brain. In some people, multiple concussions over years can result in CTE. CTE causes *dementia*, a severe loss of mental ability over time. Its symptoms include tremors, memory problems, paranoia, rage, and depression, which can result in suicide.

Until recently, virtually all cases of CTE were found in pro athletes. The early evidence of damage to Thomas's brain was alarming because Thomas was only in his early 20s and an amateur athlete. His case suggests that pros aren't the only ones who should be concerned about CTE.

Rule Reform

What can be done to make football safer? In 2010, the National Football League changed its rules to reduce helmet-first collisions. It has also established stricter rules governing when a player may return to the field after a head injury.

More than 4 million American kids and teens play tackle football, and rules are changing in their leagues too. Many states have passed laws requiring a young player to be cleared by a medical professional before returning to play after a concussion. "A kid who's playing with a concussion is really vulnerable," says Mark Hyman, author of the book *Until It Hurts: America's Obsession with Youth Sports and How It Harms Our Kids*. "If they get hit again, terrible things can happen to them."

Meanwhile, researchers are trying to better understand CTE—why some people are more vulnerable than others, for example. Many football players, concerned about the long-term impacts of their rough-and-tumble careers, have pledged their brains to such research after they die. In 2011, ex-Chicago Bears star Dave Duerson committed suicide. He left a note requesting that his brain be donated to the Center for the Study of Traumatic Encephalopathy in Boston. Duerson was once an outstanding athlete and businessman. His life had recently gone into a tailspin, and he was worried that he might have CTE.



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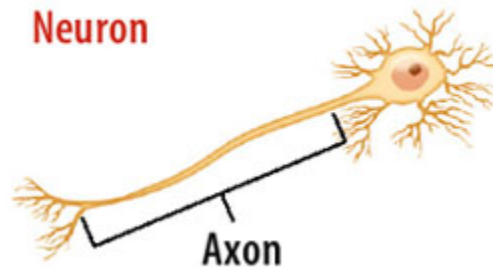
Young players who suffer concussions and give the damage time to heal completely before returning to the field probably don't have to worry about CTE, says Mihalik. "It's in situations where you don't tell someone that you have a concussion and you play through it and sustain repeated impacts—those are things that will set you up for long-term problems," he says.

In the end, a few weeks on the sidelines are better than years of brain damage. You may live and breathe for football, but should you give up your health and well-being for it?

Warning Signs

It's a myth that you have to black out to sustain a concussion. Loss of consciousness is sometimes, but not always, a symptom of a concussion. Here are the others:

A concussion harms the *neurons* (nerve cells) of the brain. It damages their *axons*, or filaments. It also throws *neurotransmitters* out of balance. Neurotransmitters are chemicals released by neurons that send messages from one neuron to the next.



Monica Schroeder/Science
Source/ Photo Researchers,
Inc.

- amnesia
- confusion
- *disequilibrium*

(balance problems)

- dizziness
- fatigue
- headache
- sensitivity to light or sound
- irritability
- memory problems
- nausea or vomiting
- neck pain
- personality change
- sleepiness
- sleep disturbances
- *tinnitus* (ringing in the ears)
- blurred or double vision; seeing stars



Sports Illustrated/Getty Images

If you notice the warning signs—in yourself or a teammate— tell a coach or a trainer. If any of those symptoms occur in the days or hours after a hit to the head, you should see a doctor.

Name: _____ Date: _____

1. What are neurons?

- A memory problems
- B medical experts
- C head injuries
- D nerve cells

2. The passage describes the problem of head trauma resulting from football. All of the following are solutions being adopted to address this problem EXCEPT

- A some states have completely banned young people under the age of 18 from playing contact sports
- B many states have passed laws requiring young players to be cleared by a medical professional before returning to play after a concussion
- C the National Football League has established stricter rules governing when a player may return to the field after a head injury
- D the National Football League has changed its rules to reduce helmet-first collisions

3. What can you conclude about Chicago Bears star Dave Duerson after reading the passage?

- A His problems were most likely not related at all to head trauma.
- B He probably had repeated head trauma from playing football.
- C He most likely didn't sustain any injuries that caused concussions.
- D If he did suffer from a concussion, it was probably only a minor injury.

4. Read this sentence from the passage: "A national pastime is coming under serious medical scrutiny."

In this sentence, the word **scrutiny** means

- A professionals
- B ownership
- C examination
- D punishment

5. The primary purpose of this passage is to describe

- A why young people should avoid playing contact sports that might cause head injuries
- B football-related head injuries and what is being done to solve the problem
- C the difference between the safety of amateur athletes versus professional athletes
- D the similarities between the careers of football players Owen Thomas and Dave Duerson

6. How many pro football players ended the season early due to injury in 2010?

7. Ex-Chicago Bears star Dave Duerson requested that his brain be donated to research after he died. [paragraph 3 after "Rule Reform"] What does that show about Duerson as a person? How do you know?

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

A concussion can cause many symptoms, including impaired memory, fatigue, _____ confusion.

- A yet
- B and
- C but
- D from

9. Answer the following questions based on the sentence below.

In the past few years, doctors have diagnosed a worrisome number of professional football players with chronic traumatic encephalopathy (CTE).

Who? _____

(have done) What? _____

When? in the past few years

10. **Vocabulary Word:** trauma: a serious injury or shock to the body.

Use the vocabulary word in a sentence: _____
