

## Athletes with broken brains

*Multiple concussions suffered on the playing field may have led to the suicide of one professional football player and the severe depression, dizziness, and constant headaches of many others. Do other athletes risk a similar fate?*

### How common are concussions in sports?

Nationwide, high school, college, and professional athletes suffer about 300,000 concussions a year. Football accounts for one-third of the total, by far the highest number of any sport. At the high school and college levels, some 20 percent of athletes who play contact sports have suffered at least one concussion. These figures have held steady for the last decade. But the problem has gained higher visibility in recent years, after concussions forced the retirements of several star players, including Dallas Cowboys quarterback Troy Aikman. He joined stars in other sports, such as hockey great Pat LaFontaine, whose six concussions drove him into premature retirement in 1998. More recently, concussions have gained additional prominence thanks to the work of an unlikely authority, former professional wrestler Chris Nowinski.

### What did Nowinski discover?

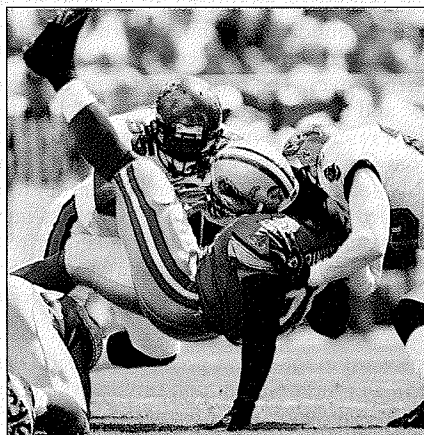
He began to study sports-related head injuries in 2003, after he retired from wrestling due to severe headaches, memory problems, and other symptoms associated with concussions. His 2006 book, *Head Games: Football's Concussion Crisis*, documented the concussion problem in the NFL and questioned whether the league was playing down concussions' long-term effects. After the suicide last November of Andre Waters, once a hard-hitting defensive back with the Philadelphia Eagles, Nowinski contacted Waters' family. Suspecting that repeated head trauma may have contributed to Waters' depression, he persuaded the family to allow doctors to exhume Waters' body and examine his brain.

### What were the doctors' findings?

Waters, who was 44 when he killed himself, had the brain tissue of an octogenarian in the early stages of Alzheimer's disease, reported pathologist Dr. Bennet Omalu of the University of Pittsburgh. Repeated concussions sustained while playing football, Omalu said, led to Waters' depression and suicide. It wasn't the first such case he'd seen. Omalu had previously examined brain tissue from Mike Webster, a former Pittsburgh Steelers center who died destitute in 2002, at age 50, after sinking into mental illness, and from former Steelers lineman Terry Long, who killed himself at age 45 by drinking antifreeze. In both cases, Omalu said, football concussions contributed to their deaths. Dr. Elliot Pellman, a medical advisor to the NFL, dismissed Omalu's conclusions as "speculative and unscientific." But a *New York Times* article about Waters' suicide prompted another retired player, former New England Patriots linebacker Ted Johnson, to go public with his own tale of concussions and depression.

### What was Johnson's experience?

Johnson said his troubles started after he suffered a concussion during a pre-season game against the Giants in 2002. He left



Doug Bond/Getty Images

*High-speed collisions can scramble the brain.*

the game and didn't return. At practice four days later, his coach, Bill Belichick, sent him into a full-contact drill, even though Johnson still felt disoriented. During the drill, he collided head-on with an offensive player, and tests later confirmed he had sustained a second concussion. He walked out of training camp for several days, returning only after the team threatened to release him and void his \$1.1 million contract. Johnson continued playing until the end of the 2004 season, suffering at least three more concussions. After his retirement, he sank into depression and became addicted to Adderall, the amphetamine prescribed to treat his depression. He blames the team for forcing him to play while he was injured.

### Couldn't he have refused to play?

Yes, but in the tough-guy culture of the NFL, says New York Giants center Shaun O'Hara, "if it's not bleeding and it's not completely broken, rub dirt on it and let's go." Players also have a strong economic incentive to play through injuries. NFL contracts, unlike contracts in professional baseball, basketball, and hockey, are not guaranteed, and players can be released at any time. If they are hurt and are subsequently cut, they can lose millions of dollars.

### Don't football helmets prevent head injuries?

"Helmets are not made to prevent concussion," says Dr. Mark Lovell, a sports injury specialist at the University of Pittsburgh. "They're made to prevent severe brain injury and skull fracture." On that score, they're effective, but concussions are different. A hard football hit is like being struck by a car going 25 miles per hour. When that sort of impact is concentrated on the head, the skull is protected from injury by the padded helmet lining. The soft brain, however, continues moving inside the skull before stopping abruptly—tearing nerves and scrambling chemical receptors. If the injury isn't allowed time to heal, repeated collisions can compound the damage. Doctors call the effects of such multiple concussions "second-impact syndrome," which can result in permanent mental impairment or even death.

### What is the NFL doing about concussions?

League rules now prohibit helmet-to-helmet contact. Since 1994, the league has conducted an ongoing study of concussions in active players; preliminary findings suggest there are no long-term effects from repeated concussions. But that contradicts the work of most researchers who have studied retired athletes. A 2005 study at the University of North Carolina at Chapel Hill, for instance, found that players who had suffered multiple concussions had an elevated risk of brain impairment and Alzheimer's. Still, that's not enough to stop young pros such as Indianapolis Colts running back Dominic Rhodes. "I think about it, dude, I really do," he says of the concussion risk. "But if you asked me, I'd do it 100 times again. I love football to death."