

Football Helmets and Concussions

*Take a look at the concussion epidemic plaguing football players.
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By Kathryn H. Anthony



Photo courtesy of Getty Images/skynesher

“In the United States, professional football is the most popular sport by a landslide. People love the history, competitiveness, and mostly the hard hitting of the sport. It is so popular because you can see the world’s greatest athletes compete with one another on such a physical level. But such an extreme physical level also shortens the careers of the best athletes of the game. It is hard for me to understand why there is not more money and time spent on the design of the helmets. This year, a team spent \$1.2 billion on a stadium while one of the best quarterbacks in the league, Ben Roethlisberger, got his fourth concussion by taking a knee to the top of the helmet. This does not seem right. As a spectator, I want to see the best possible athletes on the field. I do not want inadequate equipment design to hinder the game.” (Male, white, age 23, 6’, 180 lb.)

Sports-related concussions affect 1.6 –3.8 million people each year in the United States, and nearly 30 percent of these concussions happen to children between five and nineteen years of age. Male and female athletes in a variety of sports – football, hockey, baseball, softball, cycling, speed skating, horseback riding, and skiing, to name a few – wear helmets for protection. Yet the design of football helmets, an item worn nearly exclusively by male athletes, makes the players of this high-contact, dangerous sport especially vulnerable to injury.

Each year in the United States, roughly 1.1 million high school students play football, 3 million play youth football, and 100,000 combined play in the National Football League (NFL), college, junior college, Arena, and semipro. According to *Sports Illustrated*, eleven high school football players died before the end of 2015 during in-season and preseason incidents, and more than half the deaths were caused by head injuries. The *Sports Illustrated* article features heartbreaking profiles of each of the players struck down on the field. In 2014, eleven people died from high school football injuries; eighteen died in 2013. Data from the University of North Carolina’s National Center for Catastrophic Sport Injury Research revealed that more than one hundred children died from high school football-related injuries in the last decade. The dangers of suffering concussions while under the football helmet have prompted extensive national media coverage.

According to Dr. Douglas Casa, chief executive officer of the University of Connecticut’s Korey Stringer Institute (KSI), named after the NFL player who died from heat stroke in 2001, states and schools aren’t putting the right policies in place to protect their athletes. “The best practices are not being followed. . . . I’m kind of mystified, but people are just not implementing evidence-based medicine and policies at the high school level. I’m not saying they’re not interested in it, but they’re just not doing it.” KSI tracks states that meet basic standards for safety in sports. According to an October 2015 *Huffington Post* article, no state had met KSI’s minimum best practices when it came to concussion management, emergency action plans, and defibrillators.

According to an analysis of peer-reviewed studies on head trauma in high school sports, high school football players are nearly twice as likely as college players to sustain a concussion; they suffered 11.2 concussions for every ten thousand games and practices, while the rate for college players was 6.3. The authors of the analysis urged caution in interpreting the results, because many concussions go unreported and data is limited.

Researchers at Purdue University discovered brain damage in high school football players who had suffered concussions – as well as those who had not – and that repetitive hits to the head can cause as much damage as concussion-causing hits. The average high school football lineman receives

one thousand to fifteen hundred shots to the head during a single football season.

Another study, from the Colorado School of Public Health at the University of Colorado Anschutz Medical Campus, was the first national football concussion research to evaluate how helmets performed when worn by young athletes actually playing the game, rather than how helmets performed in impact testing in a laboratory. It revealed that all approved helmets evaluated in the study performed similarly, regardless of cost, and that older, reconditioned helmets performed similarly to new helmets as long as the reconditioning had been done recently (within twelve months prior to use). Yet players wearing old helmets that had not been recently reconditioned suffered longer concussion symptoms than those who wore new helmets.

Many of these concussions result in traumatic brain injury, the effects of which can last a lifetime. A significant impact to the head causes the brain to move about inside the skull and bump against bone. This can cause the brain to stretch and twist, breaking nerve fibers and blood vessels. Research suggests that even though professional football players – being bigger and stronger – collide with greater impact than younger players, children and teenagers may be even more likely to suffer from prolonged brain swelling after a concussion. High school athletes may take longer to recover than college or older athletes and may be more susceptible to complications. A team of researchers from Vanderbilt University School of Medicine, whose results were published in *Surgical Neurology International*, examined recovery from sports-related concussions among high school and collegiate athletics and found that athletes age thirteen to sixteen took longer to return to their neurocognitive and symptom baselines than athletes eighteen to twenty-two years of age.

They discovered statistically significant differences between the two age groups on verbal memory, visual memory, reaction time, and postconcussion symptom scale.

Concussions vary in severity, and symptoms can include headache, dizziness, nausea, vomiting, confusion, blurred vision, tinnitus (ringing in the ears), double vision, and loss of consciousness. Athletes who suffer repeated and severe concussions may experience long-term effects such as depression, memory loss, dementia, and other serious neurological problems.

Some NFL players suffering from chronic traumatic encephalopathy, a degenerative brain disease caused by repeated blows to the head, have ended up homicidal or suicidal. In 2011, former Chicago Bears star Dave Duerson committed suicide by shooting himself in the chest, in order to leave his brain to science. In 2012, Ray Easterling, former defensive back for the Atlanta

Falcons, killed himself with a gun. In an interview with Fox Sports, his widow, Mary Ann Easterling, said: “He felt like his brain was falling off. . . . He was losing control. He couldn’t remember things from five minutes ago.” Just a few weeks later, former San Diego Chargers and New England Patriots linebacker Junior Seau put a shotgun to his sternum and pulled the trigger. Easterling was the lead plaintiff in one of the player lawsuits against the NFL and had been well aware of the perils of concussions.

Roughly one hundred former NFL players filed a federal lawsuit, claiming that Riddell, NFL’s official helmet maker from 1989 to 2014, made false claims about its helmet’s ability to protect against concussions and brain injuries. In 2013, more than twenty thousand former NFL players sued the league, arguing that not enough was done to inform players about dangers of concussions in the past and still not enough is being done to care for injured players today.

In 2016, an appellate court affirmed the settlement in the \$1 billion lawsuit, providing up to \$5 million to individual players with severe neurological diseases. In the deal, the NFL admitted no fault and, according to a *New York Times* article, insisted that *all* retired players be included in the settlement, not only those who originally sued the league. Under the terms of the settlement, players will be paid up to \$5 million if they develop Alzheimer’s, amyotrophic lateral sclerosis (ALS), Parkinson’s, or severe dementia or if they had developed chronic traumatic encephalopathy (CTE) before the settlement was approved. The payment amount to each player is based on his age and number of years in the league. As the *New York Times* reported: “The emphatic decision by the appeals court on Monday moved the N.F.L. a step closer to ending one of its most contentious, embarrassing and expensive legal challenges. The spectacle of thousands of former players suing the league for lying to them, and the prospect that some players might have testified in court about the harm they suffered, led the league to promise to pay potentially hundreds of millions of dollars to former players in dire straits.”

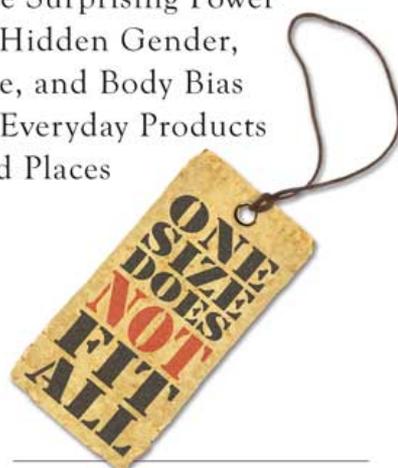
The concussion crisis was the centerpiece of the 2015 film *Concussion*, which tells the story of forensic pathologist Dr. Bennet Omalu (played by Will Smith), who discovered chronic traumatic encephalopathy while autopsying the brain of former Pittsburgh Steelers All-Pro Mike Webster. A PBS Frontline documentary, *League of Denial*, reported on football, the brain, and the NFL’s unethical behavior.

Yet as Ken Reed has argued in the *Huffington Post*: “As a society, we need to take the attention this film will generate and move it off the NFL and refocus it on youth and high school football. There are less than 2,000 players in the NFL. The number of youth and high school players in this country is greater

than three million.” Many high school athletes just use whatever equipment is available and suffer the consequences.

Defined by DESIGN

The Surprising Power
of Hidden Gender,
Age, and Body Bias
in Everyday Products
and Places



KATHRYN H. ANTHONY

*Foreword by Eric Schmidt, Executive Chairman and
Former Chief Executive Officer, Google*

Cover courtesy of Prometheus Books

Parents of football players should ask their coach or athletic director about the type of helmet that their team currently uses and its safety record. They must learn to recognize the symptoms of short-term and long-term brain injuries that can often go unnoticed as a result of concussions. Two excellent resources for parents and players are the Brain Injury Association and the American Academy of Neurology. In addition, as professor Dawn Comstock, senior author of the study at the University of Colorado, urged: “Many parents don’t think to ask if the helmet issued to their child is new or previously used or, if not new, when it was last reconditioned. Parents should be asking questions and not assuming that the helmet assigned to their child is safe.”

In 2015, three members of the US Congress introduced the High School Football Safety Study Act, which would require the Centers for Disease Control and Prevention to examine the causes of football-related deaths and make recommendations about how to prevent them. As Rep. Cedric Richmond (D-LA) stated: “It is our responsibility to ensure that we leave no stone unturned to make the game as safe as possible for young people and prevent these tragedies from happening in the future. Moving forward, I hope this legislation will start that process and begin a national conversation about how to better protect youth in football.”