

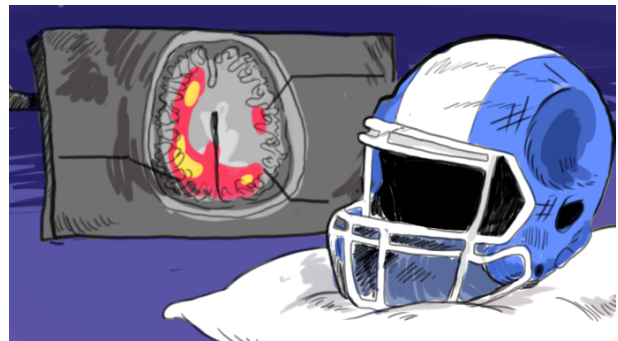
Head Injuries & American Football

American football is a rough and dangerous game. “Football is both notorious and cherished for its unapologetic, brute-force violence.”¹ Players suffer bruises, lacerations, torn muscles, dislocated shoulders, torn knee ligaments, broken bones, internal organ damage, and, occasionally, even paralysis. Football rules intentionally create high speed collisions between human beings, making such injuries inevitable and the sport controversial. And new knowledge about brain injuries have caused many people to call football immoral² and to advocate its abolition.³

A *traumatic brain injury (TBI)* is “a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or penetrating head injury.”⁴ A *concussion* is a form of TBI where the blow causes the brain to move rapidly back and forth, bouncing around in the skull and suffering various types of structural damage.⁵ Although concussions can carry serious consequences, they are termed a “mild” form of TBI because they are not typically life threatening. *Chronic traumatic encephalopathy (CTE)* is “brain degeneration likely caused by repeated head traumas.”⁶ *Repetitive head impacts (RHIs)* can cumulatively lead to CTE and early death, even though no single RHI results in a concussion.⁷

If only one thing is clear about the current science surrounding *sports-related concussions (SRCs)* and related brain injuries, it is that very little is clear about the current science. The field is surprisingly new. As told in the movies, a significant scientific breakthrough occurred in 2002 when an African-American neuropathologist in Pittsburgh named Bennet Omalu (played by Will Smith in the 2015 movie “Concussion”) performed an autopsy on Hall of Fame center Mike Webster. Dr. Omalu identified abnormal clumps of the protein tau in Webster’s brain, which he believed to be evidence of CTE.⁸ Such proteins develop in tangles that slowly strangle neurons and, consequently, inhibit brain function.⁹

Many recent studies point to how dangerous football is to players’ long-term brain health. These studies are broken down by football league level:



National Football League (NFL):

- Over two regular seasons (2012-2014), NFL players sustained 4,384 injuries, including 301 concussions. This statistic is up 61% from 2002-2007, perhaps reflecting an improvement of awareness and reporting.¹⁰
- In a study of 14,000 NFL players, researchers found that even head impacts insufficient to cause concussions can mount up over the years, leading to CTE and premature death.

An NFL player who plays 24 games increases the likelihood of premature death by 16%.¹¹

- A 2019 study of the brains of 223 football players with CTE and 43 players without CTE found that for each additional 2.6 years of play, the risk of developing CTE doubled.¹²
- Another study found that greater RHI exposure correlated with higher levels of plasma t-tau (a biomarker for CTE) in symptomatic former NFL players as compared to the study's control group.¹³
- Of 111 NFL players whose brains were donated for one study, 110 were diagnosed with CTE.¹⁴
- A 2012 study of 3,439 NFL players with five years or more in the NFL found that their neurodegenerative mortality was three times that of the general U.S. population, and four times higher for two subcategories: Alzheimer's disease, and Lou Gehrig's Disease (amyotrophic lateral sclerosis or ALS).¹⁵
- Other studies found that NFL players who suffered concussions were more likely to later be diagnosed with depression,¹⁶ dementia-related syndromes,¹⁷ Lou Gehrig's Disease (ALS),¹⁸ and erectile dysfunction.¹⁹

College & High School:

- A study of former high school and college football players found that RHI exposure predicted later-life apathy, depression, executive dysfunction, and cognitive impairment.²⁰
- After a single season, college football players had less midbrain white matter than they had started with.²¹
- High school athletes are reluctant to report concussions.²²
- A 2017 study found CTE in 21% of donated brains of deceased high school football players.²³
- Over time more evidence has indicated that even mild concussions suffered by high school football players can cause serious consequences.²⁴
- Football causes more concussions than any other high school sport,²⁵ and these concussions can cause death.²⁶

Youth Leagues (Under 14):

- Youth football players average 240 head impacts per season. Some of these are high impacts comparable to those experienced in high school and college games.²⁷
- Children between the ages of 9 and 14 make up the largest cohort of football players in the U.S. They can suffer concussions from milder collisions than would be required to concuss a collegiate or professional player.²⁸
- According to research by neuroscientists, "There seems to be greater consequences if you're getting your head hit when the brain is rapidly developing [below age 12]."²⁹

- A study of former NFL players found that those who began playing football before age 12 tended to show greater later-life cognitive impairments as compared to those who began after age 12.³⁰

THE OTHER SIDE OF THE STORY

Given the results of the studies above, it is not surprising that there has been a strong outcry against football. However, the science in this area is truly not settled. Part of the reason is that “[m]ost of the time when a player has a concussion, standard medical imaging techniques do not show damage.”³¹ No “gold standard” for diagnosing concussions currently exists.³² Many researchers in the area recently published an article saying:

Contrary to common perception, the clinical syndrome of CTE has not yet been fully defined. Its prevalence is unknown, and the neuropathological diagnostic criteria are no more than preliminary. We have an incomplete understanding of the extent or distribution of pathology required to produce neurological dysfunction or to distinguish diseased from healthy tissue, with the neuropathological changes reported in apparently asymptomatic individuals.”³³

Neuropsychologist Munro Cullum argues: “I worry the pendulum has swung too far. The reality is that we still don’t know who is most likely to suffer a concussion, who will take longer to recover, how anatomic or genetic differences influence concussions, and who may be at risk of prolonged symptoms or developing cognitive problems later in life.”³⁴

Furthermore, many of the studies cited by those who would like to abolish tackle football have involved relatively small sample sizes.³⁵ Other studies have involved skewed samples, including one where all the NFL players’ brains had been donated because of mental declines that the donors had suffered before their deaths.³⁶

Most importantly, other studies seem to indicate that concussions may be more benign. Again, these studies are broken down by league level:

NFL

- A 2016 study found no elevated risk of suicide in a population of players with at least five years in the league.³⁷
- Another study of 35 former NFL players over age 50 who had sustained multiple concussions during their careers found no significant association between the length of careers, the number of concussions, and their level of cognitive function later in life.³⁸
- One study found no statistically significant difference between the all-cause mortality among career NFL players and NFL replacement players who played just three games during the strike of 1987.³⁹

- A 2007 study found that retired NFL players experienced levels of depressive symptoms no worse than those of the general population.⁴⁰

College & High School

- Suicide rates among NCAA football players are the highest among all sports, but they are substantially lower than the general population age 18-22 or college students in that age range.⁴¹
- A study of 3,904 Wisconsin men found no significant harmful association between playing football in high school and cognitive impairment or depression later in life.⁴²
- Reducing tackling in practices has reduced overall concussion numbers among high school players, even though the number of concussions in games has risen slightly. And concussion recurrence has been reduced, most likely by protocols guiding when it is safe to return to play.⁴³
- One expert said “It really seems right now that if your [football] practices are highly controlled and reduced as much as possible and you only play four years of high school, your [CTE] risk is probably pretty low.”⁴⁴

Youth Leagues (Under 14)

- Despite their heightened susceptibility to concussions, youth football players rarely sustain concussions because they are lighter and collide with less force than older players.⁴⁵
- In one study, use of newly-designed football helmets and safe tackling techniques eliminated concussions for 20 middle school aged players for an entire season.⁴⁶

Studies such as these provide ammunition for those who defend organized football as an institution. However, many such studies were funded or carried out by the NFL, owners of NFL franchises, universities that earn millions of dollars from football, and other interested parties. Given the obvious conflict of interest, the studies have been criticized on that ground.⁴⁷ There is also evidence that the NFL sought to influence the findings of some of the research it funded.⁴⁸ In addition, evidence indicates (and is consistent with the self-serving bias) that industry funding of research often influences results.⁴⁹

The NFL has taken other concrete steps to respond to the controversy. It paid more than \$750 million to settle a civil lawsuit by former players.⁵⁰ The NFL has also changed rules to discourage helmet-to-helmet contact,⁵¹ and has instituted protocols for safely returning concussed players to the field.⁵²

On the other hand, while football helmets can prevent fractured skulls, they will likely never be able to prevent concussions.⁵³ Studies indicate that there are helmets that may decrease concussions,⁵⁴ but neuroscientist Julie Stamm says: “No helmet will ever be concussion-proof, because the brain still moves inside the skull. And for the same reason, a helmet alone will not prevent CTE.”⁵⁵ Furthermore, while the NFL has banned helmet-to-helmet hits, these are

neither the only nor the most common cause of concussions.⁵⁶ Professor Goldberg argues that “there is little evidence that such incremental changes [e.g., in tackling techniques] have a substantial risk-reducing effect.”⁵⁷

Some people accuse the media (and others) of hysterically overhyping the dangers of tackle football to the brain.⁵⁸ Other people believe that media discussions have impeded needed change in minimizing sports violence.⁵⁹ At the end of the day, the jury still seems to be out on the question of whether you can go to a football game or watch one on television and still feel good about yourself for supporting a sport that seems to cause irreversible traumatic brain injuries.

General Discussion Questions

1. Which approach do you think should be used to determine the ethicality of banning, or at least seriously reforming, football to reduce head trauma? Utilitarian? Deontological? Explain why and how using that approach might play out.
2. If you apply Systematic Moral Analysis to the question of whether or not it is moral to continue to support and/or play football, do you get different results for different league categories and age groups? Explain. Is there a case to be made for “justified harm” in any of these leagues? Why or why not?
3. New Yorker writer Ingfei Chen observed that Fisher-Price had been required to recall a collapsible crib that was associated with 32 infant deaths. Five million cribs had been sold. Chen noted that “there is no such thing as an acceptably risky crib,” but contrasted it with sports like football where “hazards are part of their attraction.” She asked: “How much risk is too much?”
 - a. How do we answer that question? What factors go into each side of the equation?
 - b. Are the answers different for NFL players, college players, high school players, and under-14 players? Discuss your reasoning.
 - c. Is this an ethical issue? A policy issue? A political issue? All three? Explain.
4. Chen also points to the uncertainties of the science, noting: “For now, these complexities make certain questions about the disease unanswerable. If subconcussive blows are the cause of C.T.E., how much impact is too much? How do the tau clumps relate to the clinical syndrome—do the lesions fully explain the mood and memory problems? (Probably not; other kinds of brain abnormalities, such as inflammation or damage to neural wiring from head injuries, may play a role.)”⁶⁰ Chen further notes that the type of decades-long study that might resolve these issues would be terribly expensive and that no such study is on the horizon.⁶¹ In light of this continuing uncertainty, how do we decide whether (and how) to

- reform or even abolish football when we have lives on one side of the scales and livelihoods on the other?
- a. Do these choices remind you of the COVID-19 pandemic when governments, in deciding whether to shut down society and later when to reopen it, had to weigh lives vs. livelihoods? Why or why not?
5. The NFL and universities, among others, urge no rash actions until there is more concrete proof of a causal link between concussions and adverse health outcomes. Others suggest that the uncertainty favors taking actions now rather than waiting until too much damage is done, as happened with tobacco.⁶² Sports sociologist Matt Ventresca argues: “As sports executives and researchers issue precautionary calls for more conclusive evidence, countless athletes are exposed to repeated head impacts without the benefits of future knowledge gained from pending scientific investigations.”⁶³ Professor Daniel Goldberg claims that the Precautionary Principle⁶⁴ demands that we prevent youngsters from playing football even if the evidence that it will cause serious damage to their brains is not yet clearly established.⁶⁵ “[W]aiting for robust evidence of causality is historically a very poor guideline for maximizing population health.”⁶⁶ Other public health experts similarly argue that the evidence of risk is sufficiently high to meet both parts of OSHA’s test for “significant risk of material impairment of health” that justifies government intervention.⁶⁷ In the face of medical uncertainty, what is the proper approach to this debate?
- a. Where should the burden of proof lie?
 - b. Which approach do you find more persuasive, and why?
 - c. Do you think this an ethical issue or just a policy issue? Explain.
6. Regarding sports concussions, President Obama stated: “We have to change a culture that says ‘you suck it up and play through a brain injury.... [Reporting a concussion] doesn’t make you weak, it means you’re strong.” On the other hand, President Trump has stated that rule changes to diminish head injuries are “ruining the game.”⁶⁸ Are politics, as well as ethics, involved in this debate? Discuss your reasoning.
7. One scientist said: “Don’t forget there’s risk in everything we do. Riding a bicycle carries risk and not a whole lot of parents are not letting their kids ride a bike. So, we just need to kind of put it in context.”⁶⁹ Do you find this argument persuasive? Why or why not?
- a. Is your opinion altered by the fact that the scientist quoted above is the neurologist for the Michigan State University football team?
8. Some argue against paternalism and in favor of individual choice, believing that adults (at least) should be able to choose to engage in boxing (and presumably to play football) despite its potentially adverse consequences for brain health.⁷⁰ Using John Stuart Mill’s Harm Principle,⁷¹ others argue that the individualists overlook the damage that such a choice by a football player might have on others. For example, on the people the player might later beat up in a rage caused by brain deterioration, on the burden on caregivers of caring for a dementia-ridden patient, or the sorrow a premature death might cause

relatives, and the burden on society caused by high medical expenses to take care of an impaired ex-player.⁷² Where do you stand on the paternalism vs. individual choice debate? Support your position with data and facts.

Discussion Questions on the NFL

1. Many people who are in favor of abolishing football or significantly reforming the way it is played are pro-choice when it comes to abortion, minor drug use, and assisted suicide. Why, then, do you think they oppose letting adults choose freely to play football?⁷³ Can these contradictory positions be reconciled? Explain.
 - a. How about the reverse—why do many people who believe football players should be free to decide what they do with their bodies take decidedly un-libertarian positions on issues such as abortion, marijuana legalization, and assisted suicide? Explain.
2. Our society allows people to voluntarily choose to undertake many risky professions, including coal miners, fire jumpers, soldiers, underwater oil rig welders, and others.⁷⁴ Why, then, should NFL players not be able to do the same?
3. Steve Almond argues that “a civilian leisure class ... has created, for its own entertainment, a caste of warriors too big and strong and fast to play a child’s game without grievously injuring one another.”⁷⁵ Do you think this a moral issue? Why or why not?
 - a. Relatedly, should fans of the game be ashamed of themselves? Why or why not?
4. One suggested solution to the concussion problem is to outlaw helmets on the theory that players will be forced to reduce headfirst collisions and other trauma-causing actions.⁷⁶ Does this sound like a viable solution to you? Explain your reasoning.
 - a. The co-chair of the NFL’s Health and Safety Advisory Committee has said that the committee thinks helmets are part of the culture and tradition and will not be outlawed in the foreseeable future.⁷⁷ Football’s rules have been changed frequently over the years, so why do you think this is different? Or is it?
5. Some take the view that the NFL has acted like the tobacco industry did when it was confronted with lawsuits seeking to prove to juries that smoking caused cancer.⁷⁸ In light of very strong evidence associating football violence with brain injuries, the NFL’s goal has simply been to “manufacture doubt” and thereby delay regulation.⁷⁹ Do you think that is true? Why or why not? Do you find it to be a moral issue? Explain.
6. African-Americans make up 12.6% of the American population but 68% of NFL rosters. Thus, they are disproportionately exposed to concussions and other injuries that arise from the game. This has led some to suggest that the NFL is a modern plantation.⁸⁰ And that concussions present not just a public health issue but also a social justice issue.⁸¹ Are these fair criticisms? Discuss your reasoning.
 - a. Do you think these critiques are counterbalanced by the fact that the riches that are often lavished upon NFL players go disproportionately to African-Americans as well? Explain.

- b. Do you think that the NFL would make more safety-related changes if white players dominated rosters? Why or why not?
7. It has been suggested at both the NFL and collegiate level that team physicians are faced with conflicting loyalties. They have a duty to preserve the players' health, but simultaneously feel pressure to get players back out on the field so the team can win.⁸² What is your opinion?
 - a. How might the self-serving bias impact team physicians' and trainers' judgments and actions?

Discussion Questions on High Schools & Colleges

1. In the wake of the recent pandemic, Oklahoma State head football coach Mike Gundy said "In my opinion, if we have to bring our players back, test them. They're all in good shape. They're all 18, 19, 20, 21 and 22-year-olds. They're healthy ... And people say that's crazy. No, it's not crazy because we need to continue and budget and run money through the state of Oklahoma."⁸³ One commentator cited this remark as stark evidence that "[t]he supremacy of commercial and hedonic interests over the social welfare has, unfortunately become indelibly imprinted into the ethical fiber of American culture."⁸⁴ Do you agree? Why or why not?
 - a. Do you see parallels between the debate as to whether to begin playing football again in the wake of the pandemic and the debate as to whether to abolish or reform football in light of the evidence on brain trauma? Explain.
2. Ramogi Huma, executive director of the National College Players Association, argued that schools should be required to fully inform [college] players about the risks of playing football now, including information about their susceptibilities to underlying health conditions. Do you agree?⁸⁵
 - a. Is this disclosure enough? Explain.
 - b. Are college (and high school) players sufficiently mature to make reasoned judgments based on such disclosures? Support your position with data and facts.
3. Statistician Ted Tatos⁸⁶ cites the California Supreme Court in University of California v. Rosen as ruling that "[s]tudents are comparatively vulnerable and dependent on their colleges for a safe environment. Colleges have a superior ability to provide that safety with respect to activities they sponsor or facilities they control."⁸⁷ Do you agree with this statement? Why or why not? How does it impact your position on the debate about concussions in football?

Discussion Questions on Youth Leagues (Under 14)

1. A public health professor has said that letting pre-teens play tackle football is “an abdication of moral responsibility for children’s welfare.”⁸⁸ Do you agree, or is this getting a little hysterical? Explain.
2. Empirical research supports the notion that allowing children to engage in dangerous forms of play is key to their optimal development.⁸⁹ It helps them learn to assess risks, for example. Based on such findings, philosopher John Russell has argued that children should be allowed to play tackle football.⁹⁰ He believes in the distinctive value of physically “self-affirming” behavior which he argues is available mainly in childhood. Russell states: “Dangerous sport in its best exemplars, particularly those in which substantial bodily danger is an immediate and ever-present risk, represents an opportunity for confronting and pressing beyond certain apparent limits of personal, and indeed human, physical and psychological capacities in ways not afforded by other normally available human activities.”⁹¹ On the other hand, Philosopher Patrick Findler argues that children may not be able to fully realize the dangers they face when playing football, and that other, less dangerous activities, can provide the benefits Russell desires.⁹² Whose argument do you find more persuasive, and why?
3. Daniel Goldberg observes that “there is also a crucial social and political question that is not simply a function of that empirical evidence base: to what risks is it acceptable to expose youths and adolescents?”⁹³ Is that risk level different than it would be for older players? Explain.
4. Would you prevent kids under 14 from playing tackle football? Why or why not?

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End Notes:

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