

## Truth, Justice, and the NFL Way

### Review: League of Denial: The NFL, Concussions, and the Battle for Truth

By Philip E. Stieg, M.D., Ph.D.

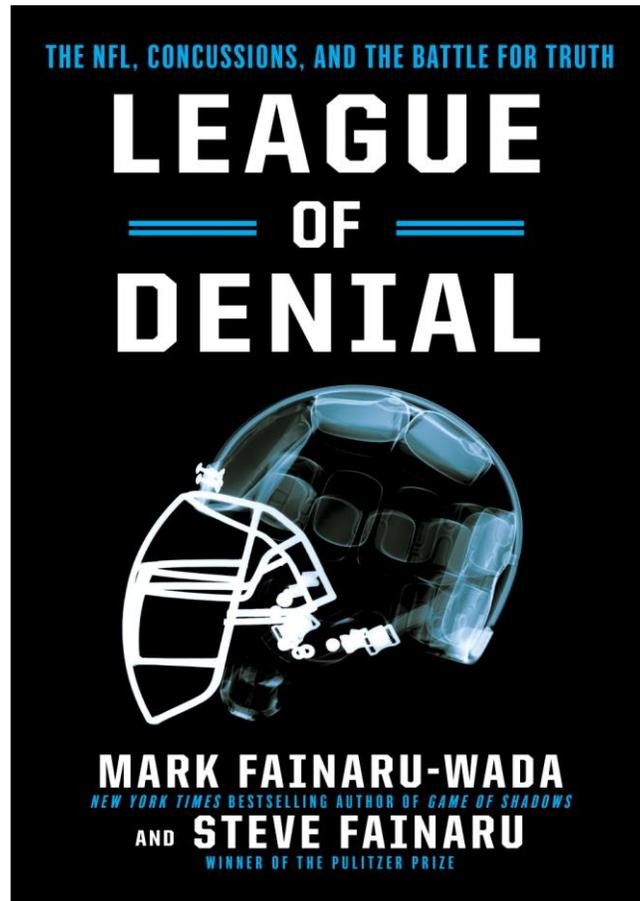


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*Our reviewer, Philip E. Stieg, a neuro-trauma consultant on the sidelines of NFL games, is no stranger to the violence of football. In his review of League of Denial by Mark Fainaru-Wada and Steve Fainaru, Stieg finds the sports-concussion crisis to be a difficult subject. Beyond the heart-wrenching stories of the players that the authors use to illustrate the impact of chronic traumatic encephalopathy (CTE), as well as the moral and legal pressure and competition to advance the science, one undeniable fact remains: We still have much to learn about CTE and its impact on the future of professional football.*

This engaging book, by respected investigative journalists (and brothers), explores the evolving story of chronic traumatic encephalopathy (CTE) among professional football players over the past four decades. It begins in 1974 at the start of the career of Mike Webster, the All-Pro football center who played 15 seasons for the Pittsburgh Steelers. Webster's death in 2002 was attributed to CTE, making him the first professional football player to be diagnosed posthumously with the brain disease. The authors use Webster and other star players—such as Dave Duerson and Junior Seau, both of whom committed suicide and were found on autopsy to have suffered from CTE—to tell the larger story of National Football League (NFL) players and league leadership as they grappled with the unfolding story of brain trauma on the gridiron.

Both the incidence of CTE and its causal relationship with concussions are controversial issues, and the science behind them is still unfolding. This book is a retrospective review of the subject, with the advantage of hindsight and the accompanying whiff of Monday-morning quarterbacking. The authors do an excellent job documenting the debate surrounding the diagnosis of CTE, along with its cause, prevalence, and outcome, and skillfully weave the personal player accounts into the more complex story of public relations and legal liability. The legal outcome remains unsettled after a federal judge in January denied the preapproval of a \$765 million settlement of NFL concussion claims to cover 20,000 retired players for 65 years. The medical issues regarding CTE and the factors leading up to it, however, persist.

An open discussion about the role that repeated concussions play in the development of CTE started in 1996. The authors compare the NFL's role in that conversation to the role played earlier

by tobacco companies as they refused to acknowledge any relationship between lung cancer and cigarette smoking. That comparison seems unfairly harsh, since the CTE story includes a complex interplay between willing partners and publicity seekers (players, owners, scientists, doctors) who unfortunately had to discuss a medical issue that had no clear definitions or vocabulary at the time.

Only recently have scientists agreed upon the clinical definitions of concussion and mild traumatic brain injury. Even today there is no gold-standard diagnostic test for concussion and no clear data on when it is safe for a player to return to action. For most of the time period this book covers, the science was even more speculative. Nevertheless, the authors' apparent agenda means that anyone associated with the NFL is described as self-interested and corrupted by dollars, while dissenters are characterized as world authorities, at a time when there really weren't any. Agenda aside, the authors create a highly readable account of the developing story, and I enjoyed their prose and progression of ideas.

The authors do an excellent job capturing the personal and behavioral characteristics of all the participants in this complicated scenario. The science on concussion is complex enough, and the subject tackled by the authors is even more confusing because of the personalities involved and the jockeying for personal gain that went on throughout the era. Industry-funded research has an inherent conflict of interest, and the authors accurately characterize the egos, self-promotion, and financial and reputational gain sought by all the characters in this story. What the authors don't adequately capture or characterize, however, is how all the complex interpersonal relationships and conflicts of interest obfuscated the central issue, which presumably is player safety. The authors

also downplay the athletes' own role in the story. Self-promotion, greed, and conflict of interest at multiple levels made this a much more complex issue than it needed to be.

Moreover, the authors suggest throughout the book that CTE is an epidemic, although at the time of publication there was a total of only 50 reported cases, 33 of which occurred in NFL players. The hyperbolic prose helps to lead readers to the authors' preordained conclusion.

Both the NFL and the dissenters were unfortunately guilty of not following the age-old rule of the scientific method. As a scientist, I would propose a null hypothesis and take a prospective rather than retrospective approach: eliminate all the confounding variables and prospectively follow patients with the intention of demonstrating statistical significance. Future data will always be confounded by drugs, smoking, alcohol, and other risk factors, such as genetics, family history, and ethnicity. But rather than being led to the authors' conclusion, readers would be better served by being helped to understand how complex the diagnosis and treatment of mild traumatic brain injury and its possible outcome, CTE, can be.

Overall, I found *League of Denial* to be a great weekend read. The authors are to be commended for their compilation of data and description of circumstances that, although flavored, are accurate.

The book clearly demonstrates that we need more data, which should be derived from independently funded studies to eliminate accusations of bias. I totally agree that research funds should be directed through the National Institutes of Health. The NFL appears to be continuing its

support for definitions, protection, and rule changes. Only if all parties remain focused on the science, and on player safety, will this issue be resolved fairly.

**Bio**

Philip Stieg, M.D., Ph.D., is neurosurgeon-in-chief of New York-Presbyterian/Weill Cornell Medical Center and chair and founder of the Weill Cornell Brain and Spine Center. Stieg, a neurosurgeon with expertise in cerebrovascular disorders and skull-base surgery, is also a past chair of the Congress of Neurological Surgeons, former president of the Society of University Neurosurgeons, and a widely published author and internationally known lecturer. Stieg is also one of the editors of the textbook *Intracranial Arteriovenous Malformations* (Nurse Education Series, Brigham and Women's Hospital, Boston, Massachusetts: 1989).