

Spring June 5th, 2012

# Brainstorm: Head Injuries and the National Football League, Part 1: An Introduction

John J. Medina Ph.D.

Follow this and additional works at: <https://digitalcommons.spu.edu/brainstorm>

 Part of the [Neuroscience and Neurobiology Commons](#)

---

## Recommended Citation

Medina, John J. Ph.D., "Brainstorm: Head Injuries and the National Football League, Part 1: An Introduction" (2012). *Brainstorm*. 11.  
<https://digitalcommons.spu.edu/brainstorm/11>

This Book is brought to you for free and open access by the Publications at Digital Commons @ SPU. It has been accepted for inclusion in Brainstorm by an authorized administrator of Digital Commons @ SPU.

# Head Injuries and the National Football League, Part 1: An Introduction

By: John Medina | Posted: June 5, 2012

---



This is all about head injuries and the National Football League. I have some mixed feelings writing about this subject mostly because — big surprise — it is not a pretty story.

Please don't get me wrong. I *love* American football. I grew up in an era when the Dallas Cowboys' wide receiver Bob Hayes streaked across the TV screen like a human meteor to catch a pass from "Dandy Don" Meredith. At one point in the receiver's career, Bob Hayes was the fastest man alive. I remember thrilling to Fran Tarkenton scrambling over the backfield as if his feet were on fire. (For you NFL whippersnappers out there, Fran was quarterback for the Vikings 1961-66). Former Raiders' coach John Madden once joked that the way he calmed his team down was to throw raw meat into the Oakland locker room, slam the door shut and wait 30 minutes.

I love this stuff, OK?

There is a story emerging from the world of brain sciences that suggests my love affair might need a cooling down period, however. This story gets its ice from former players such as [Dave Duerson](#), a four-time pro-bowler defensive back who played for the Bears, Giants, and Cardinals. He wrote a suicide note that chillingly read, "Please, see that my brain is given to the NFL's brain bank." Then he shot himself in the chest, presumably not to disturb any brain tissue that scientists might use to discover what was wrong with him.

Researchers have investigated tissues like those from Dave for a reason: Is there a relationship between past participation in a professional contact sport, present brain damage, and future mental illness — even suicide? Football and depression and too many head hits, and pretty soon, do you have, as mentioned, an ugly story?

It has gotten quite a bit of ink, including a *Time* magazine cover.

Though the concerns are quite valid, there is something missing in most of these stories: the critical neuroscience behind the concern. This leads to inevitable over-interpretations — and what may be a growing mythology — regarding the emerging story about professional contact sports and head injuries. I would like to use this space to fill in this gap. For the next several blog entries, we are going to explain the neurobiology of sports-mediated head injuries. Our focus will be specific: American football and its relationship to one particular disorder called chronic traumatic encephalopathy (CTE). I hope that you, armed with this science, will find yourself in a better position to evaluate studies on football players and closed-head injuries.

That will be a good thing. Studies are coming as fast as a Baltimore blitz, and not just for football. Many research laboratories are studying CTE by looking at contact sports ranging from boxing and soccer, to rugby and the NHL.

Here's a summary of our multipart journey:

We'll start with a history of the definitions of CTE and concussion. CTE is often confused with concussion and in these first entries I will discuss how to tell the difference. Then we'll move to a general explanation of what happens when the brain gets hit, specifically discussing the disturbing physics of closed-head injuries. We will continue with the molecular and cellular effects generated by such brain damage, and why there is such controversy about what actually happens. The series concludes with a critical evaluation of the ongoing work, and what to look out for as studies progress in our understanding of the relationships between CTE and football.

If you are a regular reader of this blog, you already are aware that I have a very low tolerance for uncontrolled — even uncontrollable — variables in any attempt to link brain tissue to brain behavior. Many rumors already swirl around the NFL, head injuries, and mental health issues, with ample legal reasons to be careful. More than 100 former NFL players are suing the league, claiming debilitating behavioral effects from head injuries suffered as active players.

It is not a pretty story, no matter how you look at it. Let's see if there is also a scientific story, too.

---

## Comments