

Testimony Before U.S. House Judiciary Committee  
Hearing on Legal Issues Relating to Football Head Injuries  
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Mr. Chairman, members of the Judiciary Committee, I am honored to be here today and thank you for allowing me to provide this testimony. My name is Dr. Robert Cantu. I am a neurosurgeon who has spent the past 30 years of my career focusing on issues pertaining to sports-related concussion. As the author of the first return to play guidelines after a football concussion nearly 30 years ago and over 330 scientific publications, I have been fortunate to be able to participate in the development of and be a co-author on numerous international (Vienna, Prague, Zurich) and national NATA and ACSM return-to-play guidelines for athletes following concussion. I have been honored by being able to take care of tens of thousands of patients who have sustained concussions and other sports-related brain trauma, including many professional athletes. In addition to being Chief of Neurosurgery and Chairman of the Department of Surgery at Emerson Hospital in suburban Boston, I am a Clinical Professor of Neurosurgery at Boston University School of Medicine, where I am also Co-Director of the Center for the Study of Traumatic Encephalopathy.

We are here today because there is a growing awareness of the public health crisis we are facing due to the long-

term consequences of football-related brain trauma. Over the past several years, there has been growing and convincing evidence that repetitive concussive and subconcussive blows to the head in NFL players lead to a progressive neurodegenerative brain disease called chronic traumatic encephalopathy or CTE.

This Judiciary Committee hearing was scheduled soon after a newspaper report of a NFL-funded research study of 1063 former NFL players who were given a lengthy telephone survey which included, among many other questions, items pertaining to whether they were diagnosed as having dementia or other memory related diseases. The survey found the incidence of memory related disease/dementia to be 19 times the national average in the 30-49 year old age group and 6 times higher in the over 50 year old group. This comes as no surprise to those of us at the Center for the Study of Traumatic Encephalopathy at Boston University (CSTE), as we have found all brains studied of former NFL players who played after age 25 to have full blown CTE.

The question remains, however, are these survey findings accurate? Unfortunately the diagnosis of dementia cannot be made on a phone survey and the term "memory related diseases" is not a precise medical term. Thus this study's design is highly flawed. But, even though it is flawed, it has had the positive effect of increasing public awareness of this important issue.

I am here not to debate the merits of this study but to point

out that we have a serious public health problem today resulting from repetitive head trauma too often experienced by NFL players. The problem is much bigger than the NFL, however. It affects football players at all levels, including college, high school, and youth leagues. And it is not just in football, but other sports at high risk of brain injury, including hockey, soccer, lacrosse, among others.

The brain does not know what caused it to be violently shaken inside the skull, a football helmet to helmet hit, a left hook, a check against the boards, or even a blast injury in military combat. The response in all may be the conversion of a naturally occurring brain protein, tau, into a hyperphosphorylated form that is toxic to nerve cells and their connections. While our research shows that this abnormal accumulation of this protein is widespread throughout the brains of individuals with CTE, it is especially concentrated in medial temporal lobe structures and leads to the clinical triad of recent memory failure/dementia, depression, and lack of impulse control.

While most of the cases of CTE in the world's literature have been reported in boxers, nearly twenty cases in the last several years have been reported in former NFL players. Our group has recently reported a case of CTE in a man who had only played in college but who died tragically at the age of 42. Our group has even found the beginning evidence of CTE in an 18 year old high school athlete. Now that we are aggressively looking for CTE there has been a 40% increase in recognized cases in the

last two years, and this is but the tip of the iceberg.

Thus, I believe we have a serious public health problem and a massive under-appreciation of what head trauma, especially multiple traumas, at both the concussive and subconcussive levels, can lead to. There is no doubt that these injuries do lead to an incurable neurodegenerative brain disease called CTE which causes serious progressive impairments in cognition, emotion, and behavioral control, and eventual full-blown dementia. Obviously, not every athlete who experiences head trauma develops this disease. Future research will reveal additional important factors that make some athletes more prone than others to developing CTE. But the public health crisis is already here and we cannot afford to wait any longer to make changes to the way we play sports at high risk of head trauma. Blows to the head need to be minimized through rule and technique changes, especially in those sports such as football that are being played in a far different manner than originally conceived.

Thank you.