

**Testimony of Mark Herceg, PhD
Director, Concussion Assessment and Treatment Services
Phelps Hospital, Northwell Health
Assistant Professor, Department of Rehabilitation Medicine
Zucker School of Medicine, Hofstra University**

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Good morning, Chairman Gottfried and members of the committee. Thank you for the opportunity to provide my testimony to this important discussion. My name is Dr. Mark Herceg. I serve as the Director of the Concussion Assessment & Treatment Services clinic at Phelps Hospital, Northwell Health, in Sleepy Hollow, NY. I am a neuropsychologist who has had an over 25 year career treating individuals with various degrees of brain injury, from concussions (mild) to severe. I was trained and spent the first 13 years of my career at NYU Medical Center. In 2015 the Brain Injury Association of New York honored me for my work with those with brain injury with the "Founders Award." I sit on the Executive Board of the Sports Neuropsychology Society, elected by my peers in 2015. I was the Westchester County Commissioner of Mental health from 2015-17. During my tenure, Westchester was the first county in New York State to create a concussion task force, comprised of physicians, school superintendents, athletic directors, athletic trainers, school nurses, students, and neuropsychologists. Our "Safer Sports" initiative developed a 10 point "best practice" guideline, distributed in the county to help all work together to assist our children. This initiative was endorsed by the Brain Injury Association of America and was the impetus for the Brain Injury Association of New York to re-start their concussion initiative in 2016, of which I was the first co-chair.

As we know well, concussions have been the hot button topic for well over a decade. In the 1990s, when I was in graduate school, this topic was not the big discussion it is today. Much has changed over 20-25 years, but we know much more about concussions today and yet we remain in the early scientific stages, regardless of what some may say. There are aspects of the injury, the background of each cohort examined, and recovery that we have yet to be firmly understand. And the simple reason is the human brain is the most unique and complex organ, with no two brains being alike. While it is important to have earnest discussions and research, and even criticism, it is also vital that we continue to examine the facts provided by scientific research, and not headlines, or well designed infomercials. No professional in this field that I know of, wants to harm children. I have three daughters, and while they don't play football, they have each been playing contact sports (ice hockey and soccer) since the age of 7. But my younger brother did play football, from Pop Warner (where I signed him up in 1987) through high school. I know he sustained injuries and a few concussions (one that I witnessed). But he graduated high school and college, and today he works in finance for the same company that hired him 20 years ago out of college. I have watched him climb the ranks and become very successful. And yet much of the public dialogue centers on brain "damage" but little on the resilient brain and how, due to neuroplasticity, it can recover and heal. It is important to not generalize, or focus on only one variable, and not confuse correlation with causation.

As I mentioned before, regardless of what some may say, the research is far from being conclusive. While meaningful work has come from fine institutions such as Boston

University, other studies from equally fine institutions have not found an incidence of neurocognitive or mental health problems. Studies from BU via online or telephone surveys/tests have linked age at first exposure and subconcussive hits over time to increased neurocognitive dysfunction. To date, subconcussive hits to the brain, frankly have not yet been well defined. Sub-concussions remain a research focused concept that have yet to make their way to clinical understanding. As scientists and clinicians, we have yet to identify clinically observable indicators of these injuries. But in contrast to the important work from BU, a recent study, in the news just last week, from the University of Colorado, found no link between contact sports, in this case football, in a study sample of almost 11,000. In fact, in this study, those who played football were also less likely to be depressed. Other studies (Solomon et al, 2016; Deshpande, et al 2017, Caccesse, et al, 2019) have also not found a link to contact sports (football) and later stage neurocognitive decline. Additionally, a recent study found CTE in 8 individuals without a history of brain injury (Iverson, et al 2019). It is true that many of the studies have not robustly examined children as young as 7. Each of the studies have flaws, and as a clinician and researcher, I cannot take sides but let the evidence guide me. The discussion in contact sports such as football has almost entirely focused on CTE. The simple truth is we don't know why some people get CTE and others do not. While members of the Boston University group have stated that there is a link between football and CTE, others from BU have presented slides at professional conferences that state "*repetitive impact exposure is a necessary but not a sufficient cause of CTE.*" In other words, not everyone who hits their head will get it. They have also stated that while "*post mortem description of the neuropathology of CTE has had an effect on public*

awareness, the public thinks that the science of CTE is more advanced than it really is."

That is an important statement. As such, it is critical that we examine many other variables in CTE or brain injury and not just football. Equally important is we have yet to understand how the neuropathology of CTE translates to clinical symptoms. It is why I was one of over 60 international scientists to pen a piece in the prestigious journal *Lancet Neurology* calling for a balance when reporting CTE in March 2019. We just don't have all the answers yet.

As a clinician, research findings guide my treatment of those who sustain concussions and help them and their families make decisions. This is not to say I care about sports more than young developing brains, or that parents who allow their children to play football display bad parenting skills. But I know many former players and families who state that playing football, which includes youth football, changed their lives for the better. But as a scientist, how are we painting the arbitrary cut off lines for participation and risk? What makes head injury exposure at 12 worse than 13 or 14? Is it ok to hit your head at 13 or 14? Is it ok to hit your head in other sports? Why should a small, thin framed, 5'2" boy of 13 be allowed to play football but a 6', able bodied, strong, athlete at 12 not be allowed? Why limit it to only football? In NY State, why does a bike helmet only need to be worn until the age of 14? It becomes a slippery slope real quickly and we really don't have the science to back our responses to those questions right now.

It is premature for public policy to ban one particular sport or activity at this stage, with the research still undecided. Additionally, it is my understanding that a sport such as football has been making efforts to improve the safety of the game. We know the game is not played the same way today than it was 30 years ago. I know that in Westchester County for example, a diverse county of 1 million residents, that is not the case. I attribute this to the national increased public awareness, education, and also our concussion initiative in 2015.

In the meantime, there are many logical and reasonable things we can do to improve upon youth football, including:

- (1) better/more effective education for parents, athletes, and coaches regarding concussion recognition.
- (2) Elimination/ outlaw dangerous practices such as bull in the ring, Oklahoma drills
- (3) Limit contact practices in accordance with USA Football/Pop Warner, NHFS
- (4) Train coaches in newer methods of contact such as shoulder tackling/ Hawk Tackling

As a New Yorker, I am proud that since 2012 New York State has one the most comprehensive concussion laws in the country. However, if the health committee decides to focus solely on football, then I would be remiss to not address the various loopholes or issues within the current law that often lead to persistent problems post concussion. For example, the law allows any physician with a medical degree to diagnose, treat or clear students with concussion, regardless of the level of training. Many children are often evaluated by health care professionals or school district physicians who are not adequately trained in brain development or brain injury. Much of

this is because these professionals become “certified” by taking a 3 or 6 hours course on computerized neurocognitive testing. I have often witnessed children misdiagnosed, over diagnosed or under diagnosed, by clinicians who may be well intentioned but ill equipped. Banning one sport will still leave many poorly trained professionals to provide inadequate care to those with concussion.

Honorable members of the committee, virtually no physical activity is without risk. If we truly care about the brain, in all aspects and stages of life, then the focus also needs to include everything, like boxing, MMA, wrestling, school fights, or even riding a bicycle, not solely on youth tackle football. As we know well, 25 cyclists have died in NYC this year, yet legislators are examining ways to change signal lights or focus on vehicles, yet do not want cyclists to wear a bike helmet. But if we really care about the brain, then we cannot pick and choose where we want to wage a battle, nor decide what an infringement is and what isn't.

I mentioned in the beginning that my children play contact sports, and that my brother played football for 10 years from the ages of 7-17. Although I didn't play football, I played soccer, headed the ball many times, but sustained 4 concussions from body to head hits, with 2 concussions resulting in LOC. Somehow, I still obtained a PhD and have had a proud career. Why haven't I had serious effects? Or why hasn't my brother? Those are questions we haven't found an answer to yet.

We are all committed to the brain health and well being of our children. But we need to collect the data, let the science lead us, make informed decisions, and engage in a robust, civil discourse. Good public policy needs to be grounded in hypothesis confirming scientific findings. A policy that is not grounded on scientific findings, with a full grasp of all factors, can have unintended consequences.

Thank you for your time, for this hearing, and willingness to embrace this discussion without prejudice or predetermination.