

Chronic Traumatic Encephalopathy:

Legal and Policy Perspectives on Science

Dean Hashimoto, M.D., J.D.
Partners HealthCare Occupational Health Services
Boston College Law School

*Work Related Injuries Workshop
May 2 & 3, 2016*



Issues

- What is CTE?
- How has the debate between the NFL and its players led to divergent scientific perspectives about CTE?
- How has this CTE debate influenced our concerns about the risks from concussions in amateur athletes?



What is CTE?

- A neurodegenerative disease caused by repetitive brain trauma.
- Symptoms include: executive dysfunction, memory impairment, depression and suicidality, apathy, poor impulse control, and dementia.

Originally described in an 1928 paper about boxers being “punch drunk” by Martlund.

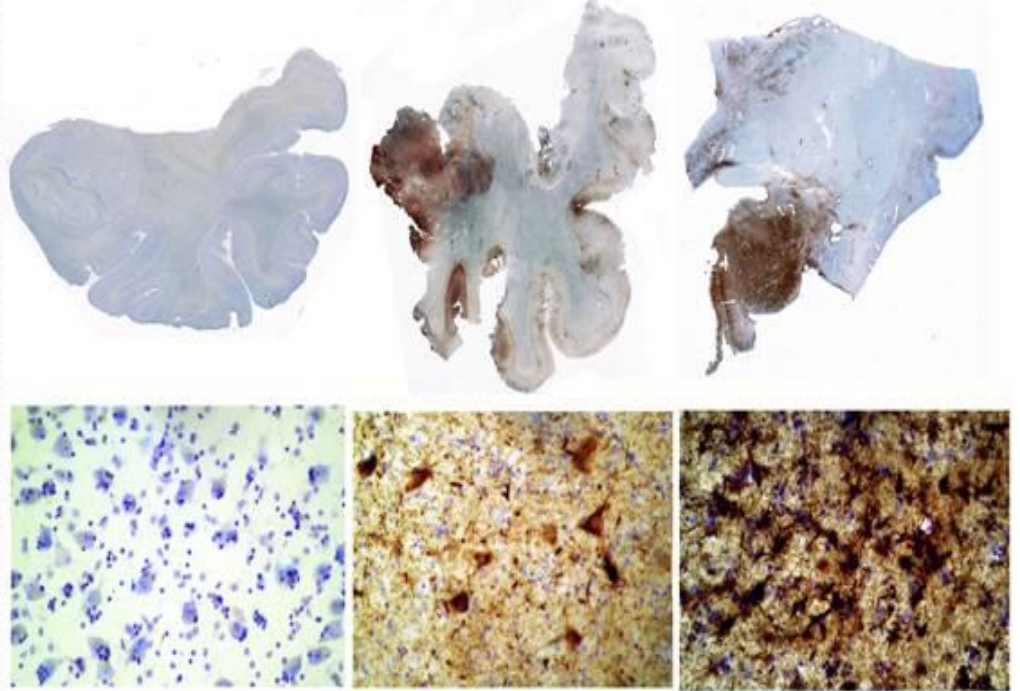
More recently described by Omalu and others in football players and other athletes.



Diagnosis by pathology on autopsy

Only diagnosed after death based on brain autopsy findings:

Tau proteins deposition and neuronal loss with clustering in certain brain areas, including the limbic system.



NFL Settlement

- \$1 billion to provide medical benefits and injury compensation for 4,500 retired football players for medical evidence of a qualifying medical diagnosis of severe cognitive impairment, dementia, Alzheimer's, Amyotrophic Lateral Sclerosis.
 - Baseline medical exams: \$75 million
 - Compensation: \$675 million; 50 % over 3 years and balance over 17 years.
 - Research and education: \$10 million
 - Costs of notice, settlement administrator, legal fees and litigation expenses
- NFL did not admit to negligence or intentional harm.

Polarized scientific viewpoints

NFL Players

- NIOSH study showed brain and nervous system disorders were more than 3 times higher among players than the U.S. average.
- (Baugh, Stamm, et al., 2012) 70 retrospective clinical examinations of deceased athletes: repetitive brain trauma is necessary linkage.

NFL

- (Karantzoulis and Randolph, 2013) There currently are no carefully controlled data to indicate a definitive association between sport-related concussion and increased risk for late-life cognitive and neuropsychiatric impairment of any form.
- The main conclusion from current studies is that severe brain injury may impact the onset of dementia, but mild brain injuries are not associated with the onset or progression of cognitive disorders later in life.



State of the Current Science

- Studies based on donations by former professional athletes to brain banks show a high prevalence of CTE among donors with history of repetitive brain trauma that correlate with their chronic symptoms.
- There currently are no carefully controlled data to indicate a well-defined and dose-response association between sport-related concussion and increased risk for CTE and other chronic neurological conditions.

Public health concern about young athletes

- What medical and administrative policies should be applied to amateur athletes in high school or college?



Policies regarding concussions in young athletes

Stricter policies needed: *Knight, New Yorker, Oct. 2014*

- Youth soccer and “the cost of the header”: 50,000 high school soccer players sustained concussions in 2010 alone. CTE may be only one type of head-injury-associated dementia. There may be varying presentations of it and varying pathologies of it.

Policies are becoming too strict: *Rothman, NY Times, Dec. 2015*

- 25% of all parents have considered barring children from a sport because of head injury risk.
- No well-designed study has yet addressed what severity or recurrence of head injury is needed to cause CTE.
- Practical advice: keep youth athlete away from contact sport until asymptomatic for at least 2 weeks.



Conclusions

- Need to acknowledge the gaps in scientific knowledge, while still taking practical steps to reduce risk, based on a public health precaution.
- Still too much risk of brain injury in professional sports.
- Need to find reasonable balance in promoting healthy organized sports for our youth.

References

- Baugh, CM, Stamm JM, et al. *Chronic traumatic encephalopathy: neurodegeneration following repetitive concussive and subconcussive brain trauma*. Brain Imaging and Behavior (2012) 6:244-254.
- Karantzoulis, S, Randolph, C. *Modern chronic traumatic encephalopathy in retired athletes: What is the evidence?* Neuropsychol Rev (2013) 23:350-360.
- Knight, S. *The cost of the header*, New Yorker, Oct. 2, 2014.
- Rothman, SM. *Parents, stop obsessing over concussions*. The New York Times, Dec. 22, 2015.