

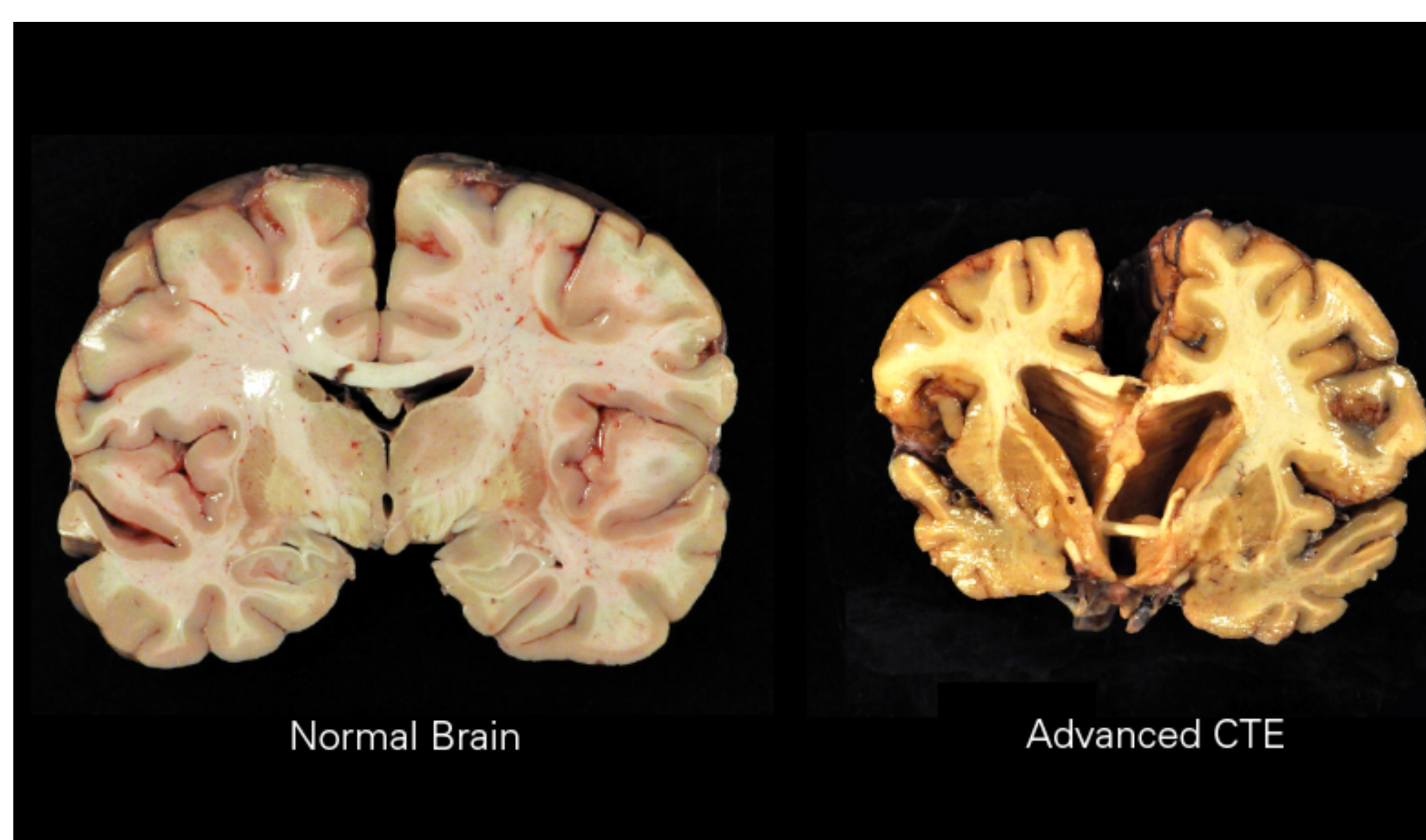
Aaron Hernandez and Chronic Traumatic Encephalopathy: A Case Study on Damaged Brains & Legal Culpability

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THE BACKGROUND & DEFINITIONS

Chronic traumatic encephalopathy (CTE) is a neurodegenerative disorder caused by repeated head injuries over time. Characterized by a collection of neuropsychiatric symptoms (e.g., **cognitive impairment, personality changes, depression, and suicidality**), CTE histopathologically resembles Alzheimer's disease and can only be definitively diagnosed post-mortem on autopsy. **There is no cure.**



THE QUESTION

The post-mortem findings in Hernandez' brain tell an eerie story and bring to light a bigger question: **would we still have considered Hernandez guilty knowing the extent of his brain damage?**

THE DILEMMA

Aaron Hernandez was unaware that he had CTE during his lifetime. His lawyers and doctors did not take steps to determine if his brain capacity was normal. Notably, while functional neuroscience does not correlate fully with cognitive neuroscience, a basic CT/MRI of **Hernandez' brain may have raised alarms** about his mental status and prompted researchers to conduct further psychological testing.

WHEN CAN A LEGAL ARGUMENT BE MADE?

There are three major criminal sanctions that may apply to this case: **voluntary behavior, mens rea, and the insanity defense.** Under each of these categories, a defendant can argue that, in part to his neurologic diagnosis, he cannot bear the same nature of legal accountability for his actions as another, healthy human being. *Commonwealth v. Pirela* and *State v. Reid* established the precedent for this defense in criminal court.

POSSIBLE GUIDELINES FOR THE USE OF CT/MRI IN COURTS

1. **Understanding neuroimaging, its limitations, and its meaning:** If this evidence is to be admissible, judges, juries, and attorneys need to be trained in the value, meaning, and limitations of these scans — that these scans yield pictures that are then interpreted.
2. **Recognizing the slippery slope of inferring a state of mind:** Where do we draw the line between person-to-person variation and a serious abnormality that caused a crime to be committed? What are the parameters of an "average brain?" How different is "abnormal?" Case studies should be referenced to understand how abnormalities in specific regions could impact behavior.
3. **Protecting the privacy of the defendant:** Only pertinent neuroimaging information should be disclosed, and only for a specific purpose.
4. **Identifying the reliability and accuracy of the results:** At least two independent, separate tests must be conducted with more than one neurologist to corroborate the findings. If any inconsistencies are found, either between the two tests or between the neurologists' opinions, the information should be deemed inadmissible on the grounds of being unreliable.
5. **Implementing neuroimaging only when necessary:** Neuroimaging should not be open for use in every case, and protections around its use must be established.
6. **Avoiding neuroimaging as the "end-all-be-all":** Neuroimaging should never be used as the sole evidence provided to demonstrate the mental capacity of an individual.

CONCLUSIONS

Within the legal sphere, a defendant can show that thanks to his disorder, his behavior was not voluntary, that he lacked the mental state essential to enact the crime, or that he is lawfully insane. This defense, with the help of neuroimaging, could have changed the outcome of the Hernandez trial.

However, **the linear causality between a neurologic diagnosis and an individual's subsequent mental state and/or conduct remains unclear.** The legal system must carefully follow developments from research on neuroimaging to establish careful guidelines for the permissibility of neuroimaging in courts.



THE STORY OF AARON HERNANDEZ

Aaron Josef Hernandez began playing American football at eight years old, rising to fame over the years to eventually join the New England Patriots and become "the NFL's best tight end."

2013: Hernandez is charged with the first-degree murder of Odin Lloyd

2014: Hernandez is indicted on murder charges for a double homicide in Boston

2015: Hernandez is convicted of the first-degree murder of Odin Lloyd by a grand jury

2017: Hernandez is found hanging by his bedsheets in his jail cell

An autopsy later found that he suffered from **the most severe case of CTE ever recorded in a person his age.** He was 27 years old.

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