

## CTE IN FOOTBALL

- I. ABSTRACT
- II. INTRODUCTION
  - A. Type of audience paper is directed to
  - B. Statistics about how widespread disease is
    1. Most common in boxers and football players
  - C. Thesis
    1. Use of both knowledge of neurology and engineering to redesign the standard typical helmet
- III. THESIS
  - A. What needs to be done to reduce cases of CTE
  - B. What a perfect helmet should look like
  - C. What modern tech helmets offer and downsides
    1. They are expensive and are awaiting official approval
- IV. INTRODUCTION OF THE DISEASE
  - A. The scientific definition of CTE
  - B. General known facts about its development
    1. Slow disease
  - C. History of disease
    1. Originally called “punch drunk syndrome”
    2. First diagnosed in 2005 by Dr. Bennet Omalu
- V. SCIENCE OF THE DISEASE
  - A. Contains four stages, each with their own symptoms
    1. Symptoms include depression, memory loss, and aggression
    2. By the last stage, some patients fall into a state of dementia
  - B. P-tau multiplies in the brain, clogging it and eventually blocking blood vessels
  - C. Can only be diagnosed post-death
  - D. In each stage, more p-tau spreads shrinking the brain in size and blocking more blood vessels
- VI. COACHING AND NFL REGULATION
  - A. Coaches are required to teach players proper hitting style
  - B. NFL must regulate the game to penalize these dangerous collisions
- VII. THE HELMET
  - A. Originally players had little protection
  - B. Helmets do not reduce concussions, but rather only prevent skull fractures
  - C. When designing, one must consider all aspects including the player’s ability to be mobile

D. Modern helmets allow the brain to be shaken inside the skull, resulting in concussions

#### VIII. THE PERFECT HELMET

A. A safe helmet must slow down the incoming force within seconds and dissipate it

B. A gyroscopic mechanism can be used to isolate the force from the skull

C. Modern helmets lack this feature as they provide little cushioning that transfers most of the force straight to the skull

#### IX. CONCLUSION

A. The reward, in Islam, for saving a life is tremendous

B. This helmet will better the lives of generations to come, and that is counted as sadaqah jariyah

C. With this helmet redesign, football players can enjoy a healthy post-career life and the game of football will become more beautiful