



Summary of Phase One Results

What was Phase One about?

The link between playing American football at the professional level and later-life brain disorders like chronic traumatic encephalopathy (CTE) and amyotrophic lateral sclerosis (ALS; “Lou Gehrig’s disease”) has received increasing attention over the past 15 years. Research has shown that former NFL players are more likely to die from CTE and ALS and are more likely to report cognitive and behavioral impairment and dementia during life. The long-term effects of college football participation remain largely unknown. This study was conducted by researchers at the Boston University (BU) CTE Center and had **two goals**. The **first** was to conduct a survey of the current overall health status of older former college football players compared with men in the general population. The **second** goal was to examine the mortality rate and causes of death in former college football players. The study results were published in the medical journal, *JAMA Network Open*, on April 20, 2022.

Who was studied?

The target sample for this study was all 447 former University of Notre Dame (ND) football players who were seniors during the 1964-1980 seasons, the era of coaches Ara Parseghian and Dan Devine. Of the 447 former players, 76 (17%) had died as of May 5, 2020. Health surveys were completed by 216 of the 375 (58%) former players who are still living. There were no significant differences in the study results between the 33 (15%) participants who played professionally and those who only played through college.

What were the findings?

Health Survey Results

Compared to a representative sample of men in the general population, former ND football players were:

- 5 times **more** likely to report cognitive impairment diagnoses during life
- 2 1/2 times **more** likely to report recurrent headaches
- 65% **more** likely to have cardiovascular disorders, and 80% **more** likely to have high cholesterol
- *In contrast*, the former college players were 48 percent **less** likely to have diabetes

Mortality Study Results

- Overall mortality among the former college players was significantly **lower** than the general US population of same age men
- Mortality from circulatory, respiratory, and digestive system conditions, and from lung cancer was also significantly **lower** than the general population
- Unexpectedly, mortality from brain and other nervous system cancers was almost four times **higher** in the former college players compared to the general population
- Mortality due to degenerative brain disease, specifically Parkinson’s disease and ALS, was **higher** in the former college players than in the general population, but this did not reach statistical significance

Summary of Results

Similar to previous findings of former NFL players, there are both positive and negative long-term health outcomes in former college football players. Additional research is needed to provide stakeholders, such as players, coaches, athletic directors, league officials, and healthcare providers, with objective data and guidance to maximize those factors that improve health outcomes and eliminate or reduce those factors that may increase the risk for later-life brain disorders.

What is the relationship with the University of Notre Dame?

This study was **fully independent of the University of Notre Dame**. In early 2018, several former ND football players from the Parseghian and Devine era were interested in having a research study conducted on the later life health conditions experienced in their cohort of teammates. They formed a Steering Committee with three co-chairs: Rocky Bleier ’68, David Casper ’74, and Vagas Ferguson ’80. The initial Project Coordinator was Ed Ziegler ’70, who contacted Dr. Robert Stern, Professor of Neurology at BU School of Medicine and the Director of Clinical Research for the BU CTE Center. Dr. Stern and his BU colleagues then began this collaborative effort with the former ND players, referred to as the **Independent Notre Dame Footballers Medical Research Project**. The Steering Committee obtained contact information for their teammates, spread the word about the survey, and raised funds to partially support the study. Learn more at: <http://independentndfootballers.com>.