



## AAN 74<sup>th</sup> ANNUAL MEETING ABSTRACT

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**Abstract Title:** Duration of Ice Hockey Play and Chronic Traumatic Encephalopathy Risk

**Press Release Title:** Additional Years of Ice Hockey Play May Be Linked to Greater Chance of CTE

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**Objective:** To investigate the relationship between years of ice hockey play and risk for CTE neuropathology at autopsy.

**Background:** Chronic traumatic encephalopathy (CTE) is a neurodegenerative disease associated with exposure to repetitive head impacts (RHI) including from contact sports and military service. Previous work showed a dose-response relationship between CTE risk and severity and years of American football play. A similar dose-response relationship for ice hockey has not been investigated.

**Design/Methods:** 74 consecutive brain donors who played ice hockey from the Veterans Affairs-Boston University-Concussion Legacy Foundation and Framingham Heart Study Brain Banks [age range: 13-91; highest level of play: 7 (9%) youth, 25 (34%) high school, 22 (30%) juniors/college, 19 (26%) professional (1 unknown); 34 (46%) played an additional contact sport, including 32 (43%) who played American football] were assessed for CTE diagnosis, stage (0-IV) and cumulative neurofibrillary tangle burden across 11 brain regions commonly affected by CTE (range: 0-33). We estimated the association of duration of ice hockey play in years with each neuropathological outcome in linear models adjusted for age at death and duration of football play.

**Results:** 40 donors were diagnosed with CTE (54%). A dose-response relationship was observed between duration of ice hockey play and each outcome. Each additional year of play corresponded to a 23% increase in odds for having CTE (95% CI: 11%-36%;  $p < 0.01$ ), a 15% increase in odds for increasing one CTE stage (95% CI: 8%-22%;  $p < 0.01$ ), and a 0.03 SD increase in cumulative NFT burden (95% CI: 0.01-0.05;  $p < 0.01$ ). When limited to those who played hockey as their primary source of exposure ( $n = 56$ ), results remained similar.

**Conclusions:** This is the first study to find a dose-response relationship between years of ice hockey play and CTE risk and severity. Increasing ice hockey play may pose an increasing risk for CTE in a similar manner as American football play.

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