INTRODUCTION

- Auto racing is associated with inherent injury risk due to high speeds and risk of collisions.
- Epidemiology of concussion in auto racing is limited, but concussion incidence may be high relative to other sports [1,2].
- In addition to risk of concussion during crashes, drivers experience repetitive head acceleration events during normal racing scenarios.
- Exposure to repetitive head impacts in contact and collision sports has been associated with neurological changes [3] and increased risk of neurodegenerative disease [4].
- Head acceleration exposure in auto racing has not been well described, especially at the grassroots level where safety advancements and requirements are less prevalent.
- Measurement and characterization of typical head acceleration exposure during racing can help inform safety interventions.
- Objective: Characterize head kinematics experienced during open-wheel dirt track racing with an instrumented mouthpiece sensor.

METHODS

- Four drivers (ages 16-19, 1 female) competing in a national midget car series were enrolled in the study.
- Drivers wore a custom instrumented mouthpiece containing a tri-axial accelerometer and gyroscope [5] (Figure 1).

RESULTS

- Drivers participated in 547 driver-overs during 41 days of racing at 25 different tracks.
- Racing data was recorded from an estimated 480 driver-overs (87.8% of all driver-overs).
- 2600 racing laps and 9 crashes were recorded by mouthpieces and segmented via film review.

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REFERENCES