**Background & Purpose**

- Concerns over the effects of sport-related concussion and exposure to repetitive subclinical brain trauma have accelerated injury prevention efforts.
- Current strategies target tackling techniques, rule changes, and limiting the amount of full contact practices.
- No studies to-date have evaluated differences in impact risk between drills performed within a given practice session.

**Purpose:** Describe drill-specific frequency and magnitude of head impacts sustained by offensive and defensive linemen during in-season practices using helmet accelerometer data. Implications for prevention are discussed.

**Methods**

Data were collected from the University of Florida using the Head Impact Telemetry System (HITS). We analyzed 3,833 head impacts (>10g of linear acceleration) sustained by 4 defensive and 8 offensive linemen across 34 practice sessions during September and October of the Fall 2016 college football season. Of 16 possible drills, analyses were limited to those with at least 100 recorded impacts (n=8 drills, n=3,534 impacts). The following outcomes were tracked and analyzed:

- Number/avg. magnitude of impacts per drill
- Average number of HITS linemen per drill
- Total time (minutes) spent in each drill
- Number of impacts per minute spent in drill per athlete (Impacts/Minute/Athlete)
- Number of impacts prevented (per season and per 4-year college career) if each drill were shortened by 1 minute per practice.

**Results**

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*Table 1: Drill-Specific Head Impact Biomechanics.* The total number of impacts recorded in a given drill, cumulative time spent in the drill (Cumu. Min. in Drill) for the first two months of the season, and number of linemen wearing sensors (Avg. HITS Athletes in Drill), provided data for calculating the average number of impacts sustained by an individual lineman per minute of participation in the drill (last column).

**Drill Specific Rate and Magnitude of Head Impacts Sustained by Linemen during Football Practice: Implications for Exposure Prevention**

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**Table 2: Extrapolated Data Estimating Full Season Impacts per Drill Type.** Preventable impact estimates per lineman (last column) are based on a 1-minute reduction in each drill for each practice the drill is performed and calculated impacts per athlete per minute of drill (Table 1).

**Conclusions**

- Rate and magnitude of head impacts sustained by football linemen vary significantly between drill types.
- Quantifying impact frequency and magnitude within drills based on number of participants and length of time performing the drill may more accurately highlight “high risk” drills.
- Targeting high risk drills when attempting to limit exposure will maximize impact prevention efforts.
- Data from a single institution suggests a 1-minute reduction to drills during in-season practices can prevent almost 300 head impacts for each offensive and defensive lineman in their college career.

**Limitations**

Data are limited to a single collegiate institution. Practice and drill types are variable among programs. Several data points are extrapolated based on the first two months of in-season practices. These data assume relative consistency of head impact risk throughout the duration of a given drill, and between the first and second half of the season. Efficacy of drill-specific exposure reduction requires longitudinal tracking.