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**001 HEAD IMPACT DOES AND ‘NO-GO’ DEFICITS IN OLYMPIC AND NON-OLYMPIC SPORT ATLETES**

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**Background** The relationship between head impact dose and observable functional deficits remains unclear. While studies have almost exclusively examined American football athletes, introducing injury prevention measures. Males are more frequently exposed than females, heading rates increase with age, and there is substantial variation between players. Heading is a rare event in the youngest age groups, especially among females.

**Objective** We aimed to use an impact monitoring mouthguard (IMM) to quantify head impact doses in Olympic and non-Olympic Sports, identifying high-energy impacts on video as ‘No-go’ per the NFL protocol.

**Design** Retrospective meta-analysis from American football, basketball, boxing, ice hockey, karate, lacrosse, mixed martial arts, rugby, taekwondo, soccer.

**Setting** Sporting field

**Patients (or Participants)** 4500 impacts over 800 player-games.

**Interventions (or Assessment of Risk Factors)** Impact doses where the athlete was observed as ‘no-go’.

**Main Outcome Measurements** Kinetic energy transfer (KE), risk-weighted exposure (RWE), peak scalar linear acceleration (PLA), peak scalar linear velocity (PLV), peak scalar angular acceleration (PAA), peak scalar angular velocity (PAV), impact location, impact direction, ‘No-go’ status.

**Results** The median KE, RWE, PLA, PAA, PLV and PAV was 5 J, 0.0002, 20 g, 1500 rad/s, 10 rad/s and 1.5 m/s, respectively. American football athletes sustained the highest energy impact doses, boxers and mixed-martial artists sustained the highest cumulative dose for a day of competition. Ice hockey had the highest rate of ‘no-go’ impacts versus total impacts collected. Karate had the highest rotational kinematics. Of the nine (9) highest energy impacts to the side and rear of the head, all were ‘no-go’ impacts. Of the top eight (8) highest energy impacts to the front of the head, none were ‘no-go’ impacts.

**Conclusions** ‘No-go’ observations occurred in high energy impact doses to the rear and the sides of the head, while similar impact doses to the forehead seemed tolerable. Prospective Olympic athlete impact monitoring could help identify risky exposures.