



Developing Systems to Decrease Head Impact in Tackle Football

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Although high school tackle football is the most popular US boys' sport, the prospect that chronic exposure to head impacts may cause permanent neuronal damage is alarming to parents and to those who want to assure the survival of tackle football.

This week, *Pediatrics* is early releasing an article and an accompanying Video Abstract, entitled "Drill Intensity and Head Impact Exposure in Adolescent Football," by Kyle Kercher PhD and colleagues at Indiana University, that describes a prospective study to examine the intensity of head impact exposure ([10.1542/peds.2022-057725](https://doi.org/10.1542/peds.2022-057725)).

The authors studied 74 high school football players over the course of one football season. All of the players agreed to wear mouthguards with sensors that monitored head impact frequency, peak linear acceleration, and peak rotational acceleration during every practice and game. Videos from all practices and games were recorded and reviewed.

The study team used USA Football's levels-of-contact system, which classifies drill intensity into 5 categories:

- Air: drills in which the player is unopposed and does not contact others
- Bags: drills that are run against a bag or a soft contact surface
- Control: drills that are run at an assigned speed before contact
- Thud: drills that are run at a competitive, high speed through the moment of contact
- Live: drills that are run in game-like conditions; this is the only level at which tackling should occur.

There were 2 hypotheses:

- There is an incremental increase in cumulative head impact exposure with these 5 categories
- Players who are linemen (defensive and offensive) and hybrid athletes (tight ends, running backs, linebackers) will have more cumulative head impact exposure from thud and live categories than skill position athletes (receivers, defensive backs, quarterbacks).

There were more than 7,000 head impacts recorded, with a median of 67 impacts per player. Live impacts had higher cumulative head impact frequency and magnitude per player, while air impacts had the lowest. Skill position athletes had the lowest cumulative head impact frequency and magnitude per player.

Many of us have patients who play or want to play football, and many parents are asking, “How do I make sure that my child doesn’t have longterm brain damage from playing?” Providing data from studies like this may result in changes in how practices are structured, so that cumulative head impacts are lessened.

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