

# THE EFFECT OF TACKLING TRAINING ON HEAD ACCELERATIONS IN YOUTH AMERICAN FOOTBALL

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## ABSTRACT

**Background:** Many organizations have introduced frameworks to reduce the incidence of football related concussions through proper equipment fitting, coach education, and alteration of tackling technique.

**Purpose:** The purpose of this study was to examine the effects of training in a vertical, head up tackling style on the number of head accelerations experienced while tackling in a controlled laboratory situation. The authors hypothesized that training in a head up tackling technique would reduce the severity of head acceleration experienced by participants.

**Design:** Controlled Laboratory Study.

**Methods:** Twenty-four participants ( $11.5 \pm 0.6$  years old,  $60.5 \pm 2.2$  in,  $110 \pm 18.4$  lbs.) with previous playing experience completed a one-day training session on tackling technique utilizing a tackling dummy. A subgroup of these participants completed an additional two days of training with a 48 hour retention test. Head accelerations were analyzed at baseline and end of training. Feedback consisted of verbal feedback utilizing the Qualitative Youth Tackling Scale (QYTS) and video tackling playback.

**Results:** A significant reduction in the number of peak linear head accelerations over 10 g and peak rotational head accelerations over  $1885 \text{ deg/s}^2$  were found in dummy tackling after training in both the one day and three day training regimens. A significant change in QYTS tackling form score was found between pretest and post-test ( $p = 0.004$ ). Participants with larger steps had a 2.28, 4.42 and 4.14 increased odds ratio of sustaining head accelerations over 10, 15 and 20 g respectively.

**Conclusions:** Training in a vertical, head up tackling style decreased the number of head accelerations over threshold values sustained while tackling; decreased step length may be the driving factor in the effectiveness of this tackling form.

**Level of Evidence:** Level 3b

**Key Words:** Biomechanics, concussion, head injury, prevention

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The authors report no conflicts of interest.