



## Paper 23

**Title:** Heads Up Football Training Decreases Concussion Rates in High School Football Players

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**Objectives:** Concern over participation in football has grown over the past decade in part due to the risk of head injury. In response, the National Football League (NFL) teamed up with USA football to develop an educational training program, the heads up (HU) program, designed to teach proper preventative blocking and tackling techniques. The seasonal risk for concussion has been estimated at approximately 10% in high school football players. Adolescent football players were estimated to have the greatest frequency of 1-year risk when compared to youth and collegiate players. These findings combined with the concern over subconcussive impacts highlights the need for prevention programs emphasizing a reduction in head impacts during player contact. The purpose of this study was to prospectively compare cumulative concussion rates between high school players on heads up (HU) trained football teams versus teams that did not institute heads up (NHU) football training.

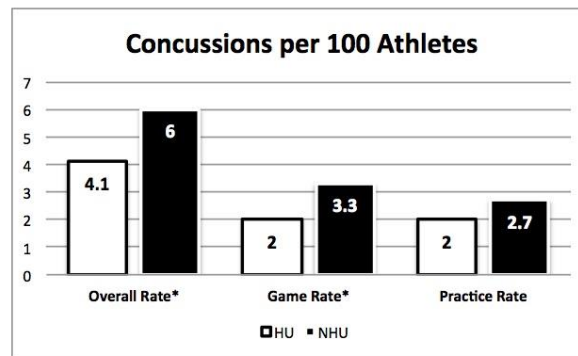
**Methods:** We monitored 2,514 high school football players during the 2015 competitive football season in the Upstate of South Carolina. Prior to the start of pre season football, at least one coach from 14 schools (n=1818 participating athletes) received heads up training from USA football. The HU trained schools were matched with a 10 schools (n=696 participating athletes) performing standard training and football practice. Random monitoring for proper coaching technique and instruction was performed at 3 time points during the season at each trained high school to ensure compliance with program guidelines. Therefore, 1,818 high school players participated in practices and games under the direction of a heads up trained coaches and 696 athletes participated without the benefit of heads up training. Athletic trainers at each school monitored and recorded injury information for all practices and games from the beginning of practice to the end of the playoffs for all schools. Cumulative incidence and incidence rate ratios of concussions were calculated with 95% confidence intervals to determine program effectiveness.

**Results:** We observed 117 concussion injuries. Players on the HU training teams sustained 75 concussions compared with 42 concussions on NHU teams. The HU rate of 4.1 concussions/100 players (95% CI =3.3-5.1) was significantly lower than the 6.0



concussion rate on NHU teams (RR= 1.5; 95% CI= 1.1-2.1). The HU football group resolved their concussions and returned to full participation 27% faster than athletes in the NHU football group (time-loss: 18.2 &#177; 10.6 days (95% CI= 15.8-20.6) vs. 24.8 &#177; 15.3 days (95% CI= 19.9-29.7) respectively).

**Conclusion:** This is the first paper to evaluate the impact of the training program on the incidence and recovery of concussion in high school football players. Our results support the use of USA football heads up training as an effective method to decrease the rate of concussions in high school football. The program also appears to reduce the concussion severity in these athletes.



\* Denotes significantly different rates