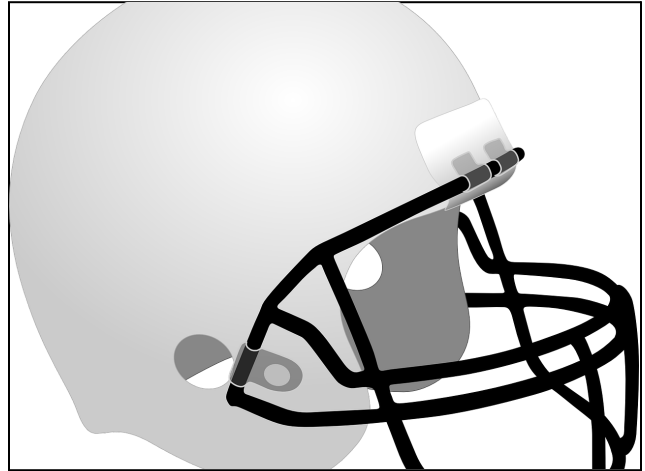


## American Football

Recent research has found that rapid rotation of the head (angular kinematics), when paired with linear forces, can lead to a concussion. Consequently, new helmet technologies have aimed to reduce head angular kinematics. However, some of these technologies have not yet been thoroughly evaluated.

One such technology is the Radian Diffusion System (RDS) that has been incorporated into the American Football helmet design. This system uses an additional intermediary liner that reduces angular motions.

[A study](#) by researcher Darcie L. Yount et al., published in *Sports Engineering* found that this technology may not significantly reduce linear and angular head kinematics. Three helmet types were evaluated: with RDS, without RDS, and modified RDS. There was no “clear linkage” between helmets with RDS and a reduction of linear head kinematics. Furthermore, no overall differences were observed for angular accelerations and peak angular velocity.



However, these tests were conducted on models with stiff and restricted neck movement. Thus, these results may be inconsistent with actual head responses in humans. Because of some limitations associated with this study, further research is needed to verify these findings.