



### **Structural, Functional, and Metabolic Brain Markers Differentiate Collision versus Contact and Non-Contact Athletes**

*Chruchill NW et al., Frontiers Neurol*  
[Doi: 10.3389/fneur.2017.00390](https://doi.org/10.3389/fneur.2017.00390)

In this study, researchers used a combination of MRI techniques to perform preseason brain scans on 65 varsity athletes. The athletes were split into three groups to represent their participation in non-contact, contact or collision sports.

Following multivariate analysis, the collision group was observed to display elevated fractional anisotropy and reduced mean diffusivity in white matter compared with other groups. In addition, the collision group demonstrated significant reductions in functional connectivity and the NAA/Cr metabolite ratio relative to the non-contact group, while the contact group overlapped with both groups.

When injury history was considered, it was noted that athletes with prior concussions demonstrated greater alterations in fractional anisotropy and functional connectivity, which the authors suggest might indicate a potential cumulative effect of concussion history on brain physiology.

Overall, these findings suggest that increasing levels of contact in sport are related to changes in the brain. However, the authors emphasize that these changes were not reflective of impaired day-to-day functioning.

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### **Sport and Sex-Specific Reporting Trends in the Epidemiology of Concussions Sustained by High School Athletes**

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The overall number of concussions for all sports combined was observed to increase from the 2005/6 academic year to 2014/15, as was the overall concussion rate, measured per 10,000 athlete exposures.

Based on 2014/15 data, girls' soccer had the highest rate of concussions among all high school sports recorded. The authors suggest that the increases observed in concussion rates may be related to the enforcement of updated traumatic brain injury legislation and highlight the need for future work in the girls' soccer population.

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### **Effects of Recent Concussion and Injury History on Instantaneous Relative Risk of Lower Extremity Injury in Division I Collegiate Athletes**

*Fino PC et al., Clin J Sport Med*  
[Doi: 10.1097/JSM.0000000000000502](https://doi.org/10.1097/JSM.0000000000000502)

This retrospective study used medical records to examine the association between concussion, previous lower extremity (LE) injuries and risk of LE injury.

Looking at records from 110 concussed athletes and 110 matched controls, concussion was associated with an increased risk of subsequent LE injury. These data support previous studies reporting a relationship between concussion and LE injury risk, an effect that many have suggested is caused by lingering concussion symptoms.

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## Spotlights

**New biomarker study launched in rugby union**