

Cognition in rugby union players decreases across season

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Researchers in Wales have published findings that over the course of a season cognition in professional rugby players decreases. The research also shows that they show a decline in brain blood flow and an increase in markers for oxidative stress. The scientific journal, *Experimental Physiology*, published the results.

From [traffic accidents](#) to collision sports, millions of people around the world experience head injuries every year. Head injury is an event where someone receives a blow to the head, which either causes [physical damage](#) or troublesome symptoms. If there are symptoms related to the hit, for example short-lived memory problems, a person might be described as having a "concussion."

However, many of the symptoms that people call a concussion, such as dizziness or headache can take place without any physical damage to the [brain](#). If doctors suspect that there is physical brain damage, they might diagnose "traumatic brain injury."

Researchers looked at 21 players from a professional rugby union team playing 31 games in the Guinness PRO-14 league. They identified player positions and determined life-long concussion history from medical records. They collected blood samples from players, so they could measure [oxidative stress](#), they also measured changes to blood flow in the brain and cognition using a common cognitive test.

Match events during each game were recorded using high-speed cameras. There was no difference between length of playing career between the groups.

Six concussions occurred during the season, five affecting forwards, and one affecting backs. This translates as 10 concussions for every 1000 hours of play. A decline in blood flow was seen in players, which was more marked in forwards. There was also an increase in the levels of markers of oxidative stress that didn't vary for different player position.

Scores on the memory and thinking tests decreased in both forwards and backs across the season but there was no difference between forwards and backs.

Dr. Susan Kohlhaas, Director of Research at Alzheimer's Research UK, said: "We know traumatic head injury is linked with an increased risk of dementia, but we don't fully understand how these events set dementia-causing processes in motion.

"Collisions in sport is an area of increasing scrutiny for [public health](#). The findings from this small study in rugby union players help add to our incomplete understanding of the risks involved with professional sports and the aspects of biology that may underly cognitive changes over the short term.

"We know exercise is good for our brain health, but longer-term and larger studies with suitable control groups are needed to add weight to these exploratory findings into concussion, and short-term brain health. One positive of the study is that researchers did look at a possible biological pathway for these events, however a link, if any, between concussion, blood flow, oxidative stress and long-term cognitive changes including dementia requires further research.

"To better understand the specific factors of a rugby professional's career that might affect their brain health, future studies should also consider collisions in training. Comparing rugby players with players of non-contact sports could also help to determine whether factors other than collisions could be playing a role in these findings.

"Funding for dementia research lags behind funding for other conditions. We need to see this change. Only with increased funding into dementia will we be able to help reduce the number of dementia cases, which are set to triple by 2050 and help bring about life-changing treatments."

More information: Thomas S. Owens et al, Contact events in rugby union and the link to reduced cognition: evidence for impaired

redox-regulation of cerebrovascular function, *Experimental Physiology* (2021). [DOI: 10.1113/EP089330](https://doi.org/10.1113/EP089330)

Provided by Alzheimer's Research UK

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