# Instrumented Mouthguards and Tackle Height Lowered in Rugby Union: A Game Changer?

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In another step forward, the use of Instrumented Mouthguards (iMGs) is being included by the RFU in their mission to reduce players' risk of concussion.

Following research across the 2020/21 season using Harlequins and other men's and women's top tier teams, iMGs are to be offered to all elite English teams this season. The RFU, Premiership Rugby and World Rugby have chosen Prevent Biometrics as the iMG provider for the season 2022/23.

The mouthguards contain a system that gathers data as the player wears it throughout the game. It then wirelessly transmits any information relating to a collision. This includes the location, direction and motion of the contact.

The RFU has stated:

> *"The Rugby Football Union (RFU), Premiership Rugby (PRL) and Rugby Players' Association (RPA) will continue to focus on reducing the exposure to head impacts and concussion risk within the elite men's and women's game during the 2022/23 season as part of its action plan."*

It added:

> *"Focus areas include instrumented mouthguards (iMGs). Following research, involving Harlequin's men's and Bristol Bears women, as well as the involvement of the Red Roses in a World Rugby-led study, instrumented mouthguards will be offered to all Gallagher Premiership, Allianz Premier 15s and England representative teams for the 2022/23 season."*

The key findings from the Professional Rugby Injury Surveillance Project (PRISP) were as follows:

- In 2020/21, the Premiership clubs' matches recorded 79 injuries per 1,000 hours. For the England men's team there were 96 injuries per 1000 hours.
- Concussion equated to 28% of all match injuries – and the most reported, although the number is quite static since the 2016/17 season.
- Training injuries accounted for 37% of the total. In matches, 48% of injuries were related to the tackle.

This season, the iMG data gathered will be combined with the trials already done in the 2021/22 season to assist the understanding of and care required when faced with head impacts in the elite game both during training and on match days.

Simon Kemp, RFU Medical Services Director said:

> *"Data from the 22-23 iMG roll-out will deepen our understanding and knowledge of head impacts and head accelerations and ensure we make evidence-based decisions as we advance player welfare."*

The data gathering and associated changes are not limited to the elite game. The RFU is also working with schools, clubs and colleges to make rugby union as safe as possible for players aged under 18 including altering the permitted tackle height in age grade rugby. The height was lowered from the shoulder level to the line of the armpit for the 2021/22.

The RFU has also announced plans to evaluate a waist-height tackle law variation in addition to making it a penalty offence for dangerous or reckless play if the ball carrier leads into contact with an opponent by making a sudden or late dip from below their normal running position. The aim being to take two heads out of the same air space to reduce the risk of high-risk tackle events to avoid the potential for concussion.

The evaluation of waist-height tackling began at Millfield School in September during a rugby festival involving approximately 180 U16 players where two teams wore iMGs. The games were also filmed in order to gather a full picture of the findings. Further festivals are planned with the research to be analysed by the University of Bath.

It just goes to show that in England, like elsewhere in other parts of the world, real steps are being taken to try and reduce the occurrence of high-risk events to further reduce the risk of players suffering head injuries and concussion.

The RFU is not alone in its endeavours to reduce the number of age grade head injuries as the FA have also been trialling banning deliberate heading on the football pitch by children under the age of 12. Governing bodies in other sporting disciplines are introducing similar head injury reduction techniques.

The concerns surrounding chronic traumatic encephalopathy (CTE) are ever present. A Field Study, led by Professor Stewart in 2019 and reviewed here, had found that professional footballers were three and a half times more likely to die of neurodegenerative disease than age-matched members of the population. Reducing incidences of heading the ball from an early age will only help to reduce persistent head to ball impacts and possibly the onset of CTE.

In a recent article in the *Telegraph* it has been suggested that "*former international rugby union players are 15 times more likely to suffer the devastating impact of motor neurone disease, according to landmark new research*". This research was also led by Professor Stewart at the University of Glasgow.

That said, players showing signs of early onset dementia who are blaming the cause on head impacts in the game have apparently been advised by World Rugby and several leading independent experts that a number of other factors could in fact be behind their mental decline.  The factors cited include depression, excessive alcohol consumption or unhealthy eating.

The world of sport still clearly has a lot to learn on this topic and with the degenerative brain condition CTE only able to be confirmed by a postmortem, evidence will keep evolving and discussions surrounding concussion in sport will remain controversial.

On the horizon, notably, is the International Consensus Conference on Concussion in Sport which takes place in Amsterdam on 27 and 28 October 2022. It will be interesting to see the conclusions drawn from that conference.