

reckless play.²¹ For example, a player may increase their risk of injury if they tend to act impulsively, which can be very dangerous in rugby situations like a tackle.²² With the possibility of head injuries altering functional connectivity of the brain, further research on preventative equipment is important.²³ Alternatively to concussion prevention, there is strong evidence supporting certain equipment, like mouth guards, decrease the severity of lacerations and dental injuries.²⁴ Although World Rugby has approved protective equipment, it is not mandatory to wear. Without definitive evidence on reducing the risk of head injuries, it is unlikely that World Rugby will shift its voluntary protective equipment laws in the near future.

Over the years, there has been an increased interest in concussion education and symptom awareness. A primary example is World Rugby's investment in concussion-related research. Recently, World Rugby published findings on their Pitch-Side Concussion Assessment (PSCA) tool which had been piloted between October 2012 and June 2013.²⁵ The PSCA was used in elite competition to evaluate potentially concussed players. The study consisted of more than 700 matches and found that the PSCA tool, now the HIA tool, is 84.6% accurate in successfully identifying players with concussion.²⁵ Prior to the temporary substitution rule, 56% of players with a confirmed concussion remained on the field following injury. After the concussion assessment rule was in place, the rate has dropped to 12%.²³ Although World Rugby is heading in the right direction, further data gathered is still needed on collegiate-level players.

²¹ Garraway, W. M., Lee, A. J., Macleod, D. A., Telfer, J. W., Deary, I. J., & Murray, G. D. (1999). Factors influencing tackle injuries in rugby union football. *British Journal of Sports Medicine*, 33(1), 37-41.

²² Finch, C. F., McIntosh, A. S., & McCrory, P. (2001). What do under 15 year old schoolboy rugby union players think about protective headgear?. *British journal of sports medicine*, 35(2), 89-94.

²³ Johnson, B., Neuberger, T., Gay, M., Hallett, M., & Slobounov, S. (2014). Effects of subconcussive head trauma on the default mode network of the brain. *Journal of neurotrauma*, 31(23), 1907-1913.

²⁴ McIntosh AS, McCrory P, Finch CF, Best JP, Chalmers DJ, Wolfe R. (2009). Does padded headgear prevent head injury in Rugby Union football? *Med Sci Sports Exerc*.41,306-313.

²⁵ Fuller, G. W., Kemp, S. P., & Decq, P. (2014). The International Rugby Board (IRB) Pitch Side Concussion Assessment trial: a pilot test accuracy study. *British journal of sports medicine*, bjsports-2014.