

Institution: St Mary's University College
Unit of Assessment: 26: Sport and Exercise, Leisure and Tourism
Title of case study: Injury and concussion in rugby
<p>1. Summary of the impact (indicative maximum 100 words)</p> <p>The outcomes of this research have directly influenced practices and policies for injury prevention and player health in both rugby league and rugby union. Besides giving a detailed analysis of injury profiles in rugby league, the research has served to raise the profile and awareness of two major issues, heat stress and concussion.</p> <p>Presentations of research findings to members of the Rugby League Medical Association (RLMA) have enhanced CPD workshops, and resulted in bylaw changes in Rugby Football League medical standards. More recent work has highlighted the seriousness of concussion in both rugby league and union.</p>
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>Injury is often an unwanted consequence of sport participation, and Tator (2012) considered sport-related concussion to be a public health problem. An extensive body of work by Gissane and his co-authors has sought to examine and further the understanding of the potential for injury in several sports (Rugby League, Rugby Union, Rowing, and Gaelic Games). This research has been accomplished through a number of international collaborations (notably with colleagues in Ireland and New Zealand).</p> <p>A series of 14 articles have been produced which examine the incidence of injury in Rugby League. As part of this series it was possible to examine the effect on injury when the playing calendar was moved from winter to summer^{1 2} and the effect of the advent of fulltime professionalism. A medical and performance issue that concerned Rugby League medical staff was player hydration/dehydration as a result of having to play in higher temperatures. Initially, the Rugby Football League produced leaflets on the subject, and referees allowed support staff to enter the field provided they didn't interfere with play. Within three seasons, the controller of referees suggested that too many support staff were on the field, and that they were doing more than supplying water. The Rugby Football League then sought to limit the occasions on which support staff could go onto the field. This move concerned the Rugby League Medical Association. Their concern was that players would have a much reduced access to water, and less opportunity to drink. The issue was discussed at the RLMA AGM in 2000 and Dr Chris Wragg (Chairman) went back to the RFL to describe the medical position and requested that the RFL reconsider its position. He provided evidence in support of this request in the form of the Jennings et al (1999) research³ which described the risk involved.</p> <p>Sport related-concussion is seen as a major problem in team contact sports by sports medicine practitioners. Furthermore, the longer term consequences can be especially problematic with research suggesting a link between concussion and early onset dementia. Research has suggested that concussion is under reported, because the diagnosis and management is misunderstood. More recently, research by Gissane in collaboration with others has sought to describe the problem in both rugby codes^{4 5} and its costs⁶ more fully. It has also sought to make use of new tools (e.g. the King-Devick Test) that can be used to identify concussion.^{4 5} Attitudes towards concussion have changed. Personnel involved in sport, particularly medical staff, are now</p>

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keen to identify concussion rates, so that problems can be prevented in either the immediate, medium or longer term, in order to improve the safety of players.

3. References to the research (indicative maximum of six references)

1. **Gissane C**, Jennings D, Kerr K, White JA. Impact of the change in playing season on injury in rugby league football. *American Journal of Sports Medicine*, 2003;31(6):954-8.
2. **Gissane C**, Jennings DC, White JA, Cumine A. Injury in summer rugby league football: the experiences of one club. *British Journal of Sports Medicine*, 2003;32:149-52.
3. Jennings S, Robertson S, Jennings D, White J, and **Gissane C**. Body mass loss and dehydration in rugby league. *Coaching and Sports Science Journal*, 1998;3(3):31-3.
4. King D, Brughelli M, Hume P, **Gissane C**. Concussions in amateur rugby union identified with the use of a rapid visual screening tool. *J Neurol Sci.*, 2013;326(1-2):59-63.
5. King DA, Clark T, **Gissane C**. Use of a rapid visual screening tool for the assessment of concussion in amateur rugby league players. *J Neurol Sci.*, 2012; 320:16-21.
6. King D, **Gissane C**, Brughelli M, Hume PA, Harawira J. Sport-related concussions in New Zealand: a review of 10 years of Accident Compensation Corporation moderate to severe claims and costs. *Journal of Science and Medicine in Sport*, 2013; <http://dx.doi.org/10.1016/j.jsams.2013.05.007>

All references listed here are published in established peer reviewed journals. Regarding reference 3, this journal is no longer in print. All journal articles are available on request from the institution.

4. Details of the impact (indicative maximum 750 words)

This research has assisted in mitigating harm to players. It has further influenced professional standards and game legislation. Two specific examples of impact are presented here to illuminate this case study, demonstrating how impact has arisen from the body of research outlined above.

Firstly, a change in Rugby League bylaws, which occurred after a case was made by the Chairman of The RLMA to The Rugby Football League which occurred as a direct result of research undertaken by Gissane and colleagues and, secondly, raising the debate around concussion in sport globally, through research into the rapid assessment of concussion using the King-Devick test. The RLMA was successful in getting a bylaw regarding entering the field of play. Today, that bylaw is still part of RFL Medical Standards.

E.9 Hot Weather Code

When both clubs medical staff agree that the heat and/or humidity is such that players require additional water they should approach the Match Commissioner (or Referee if there is no Match Commissioner) to request one or both of the special measures below. (Where there is only one Doctor present he/she is entitled to make the request on his/her own). The Match Commissioner shall grant this request and shall ensure that the Referee, home Club secretary and broadcast

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partner are aware of his decision.

- *The positioning of water containers around the ground (ensuring that there is no danger to players or spectators) to enable players to help themselves.*
- *A two minute break at an appropriate natural pause in the game approximately half way through the first and second halves to allow players to take on extra water.*

From: RFL Medical Standards 2012 Section E page 59.

When the research^{1,2,3} was originally conducted, it was not only the Super League and the professional ranks that needed to be considered. For the first time, many amateur players played in the summer. The evidence and the consequent bylaw were important to those players also. Gissane was awarded the Esso prize for research by the Occupational Medicine Society in 2004, in recognition of research and its impact.

Concussion as a topic is currently being debated in public. As part of that debate, the research has been discussed extensively in online forums, and has featured in the mainstream press, e.g. the 'New York Times'. The research that has been conducted by Gissane and his fellow researchers has featured prominently in this discussion^{4,5,6}. The discussion in the media has included radio shows, television news shows and also newspaper reports, raising awareness and stimulating debate amongst a wide audience around this important issue.

The underpinning research focuses on the fact that anyone who participates in sport risks being concussed. At the grassroots levels of any sport resources and funding are often not available for some of the more sophisticated equipment available to professional sports persons. The importance of this issue was presented in an article in the journal *Neurosurgery* (Duenas et al. 2013), where Gissane's work was directly cited and highlighted. Yet, the risk is still present and coaching and support staff must be educated in recognising and assessing the injury. This has led to the interest in the research in the media. A simple test is employed, which can be used at several sporting levels for minimal costs. It has been able to identify un-witnessed concussion which has led to greater understanding of the incidence of concussion in sport.

5. Sources to corroborate the impact (indicative maximum of 10 references)

http://www.nytimes.com/2013/04/19/sports/rugby/club-measures-how-hard-rugbys-hits-really-are.html?pagewanted=all&_r=2&

<http://www.stuff.co.nz/national/health/8835085/Sport-concussions-hitting-ACC-hardest>

(<http://content.radionetwork.co.nz/weekondemand/wellington/71300.mp3>) and it continues on at the start of this link (<http://content.radionetwork.co.nz/weekondemand/wellington/71315.mp3>)

<http://www.stuff.co.nz/dominion-post/sport/8660698/The-school-of-hard-knocks>

<http://tvnz.co.nz/seven-sharp/monitoring-concussion-video-5395098>