

## Can we reduce injury risk in rugby codes?

The New Zealand (NZ) led *Rugby Codes Research Group* (RCRG) of international collaborators, regularly engages with rugby organisations to provide multidisciplinary research with the goal of reducing injury risk for rugby codes. The demand for information about how to prevent and manage injuries in rugby codes throughout the world is unprecedented. This has led researchers to develop a better understanding of injury mechanisms and identification of risk factors, which ultimately guides development of injury prevention countermeasures.

This keynote shares RCRG injury prevention research approaches, and practical translation of research into NZ Rugby [Union] *RugbySmart* and NZ Rugby League *LeagueSmart* programmes. We discuss:

- 1) Types and impact of injuries (Accident Compensation Corporation [ACC] epidemiology studies, NZ *RugbyHealth* and UK *RugbyHealth* cohort studies);
- 2) Risk factors and causes of specific injuries using experimental studies (Head impacts and neck strength studies); and
- 3) Injury risk management approaches ('E's [Education, Environment, Enforcement, Engineering, Economics] of injury control; Haddon Matrix; Sequence of injury prevention) and associated initiatives utilised (*RugbySmart* intervention studies) to reduce sport injury risk.

*RugbySmart* was developed jointly by NZ Rugby and ACC based on the ACC *SportSmart* education programme developed in 1999. *RugbySmart* is a compulsory annual NZ accreditation education workshop for over 11,000 coaches and 2,000 referees in tackle grade rugby. *RugbySmart* focuses on preventing injuries by ensuring coaches are equipped with knowledge and skills to effectively prepare players for the physical demands of rugby with open-play running and multi-phase contact. *RugbySmart* aims to ensure coaches and referees are aware of their responsibility to keep players safe.

*RugbySmart* focusses on four elements, each updated annually based on research evidence:

- 1) Good technique in contact elements of the sport (e.g. tackles/scrums, rucks);
- 2) Physical conditioning appropriate to participation levels;
- 3) Best practice injury management (all injuries); and
- 4) Recognition and management of concussion injuries.

Since 2016 there has been evolution for *RugbySmart* beyond the coach and player education workshops in an attempt to reduce injury risk further. As a result, *RugbySmart* in 2016 included national implementation of the blue card concussion initiative, concussion education for general medical practitioners (GP), free concussion GP visits, first aid training for all clubs, and respect and responsibility education to address off field issues in rugby.

Multidisciplinary teams working with rugby code organisations have been successful in reducing injury risk in NZ.