Sports-related concussion is a ‘hot topic’ in the media and medical press and its initial recognition, management and long-term outcome is a rich source of debate.

In most contact sports, including Gaelic football, hurling and rugby, play is characterised by periods of low intensity activity interspersed with bouts of high-intensity running and contact events whereby opposing players engage in physical confrontation. The risk of time loss due to injury is similar in rugby, Australian Rules and Gaelic football and much higher than in semi-contact sports such as soccer and field hockey. A four-year prospective study of injuries in Gaelic football showed higher rates of injury in training, but less frequent injuries in matches when compared to rugby. Most injuries in Gaelic football were ligamentous injuries in the lower limbs and concussion appears to be under-reported.

With the likelihood in rugby of one injury per team severe enough for a player to leave the pitch and with at least one attendance for a suspected concussion per match, there is clear evidence that those on the sideline should be trained to recognise potentially serious injuries. In non-professional rugby in England, from data collected over 3 seasons, there was a mean of 4.6 medical attendances for each team per match, with a higher rate of attendance at higher playing levels, possibly attributed to a greater number of contact events (tackles and rucks), more strength and conditioning, and greater levels of competitiveness. Thus if you are the nominated doctor on the sideline, you should anticipate you will be called into action. Often, no doctor is in attendance and if so, a referee, a member of the coaching staff, a physiotherapist, parent or fellow player should ensure the player is removed from play or training, and seek medical opinion if concussion is suspected.

Over the past 20 years, sports concussion has become one of the most researched topics in sports medicine. There is great variability in clinical presentation and recovery. Concussion is a clinical syndrome caused by either direct or indirect biomechanical forces to the brain, and manifests as a rapid onset of neurological dysfunction which typically resolves spontaneously. The Irish Rugby Football Union have produced an excellent guide to concussion in rugby union via the Safe Rugby Programme, and have backed it up with seminars for coaches, players and medical back-up staff. Concussion remains a clinical diagnosis and the most obvious marker for injury is a loss of consciousness only occurs in a small percentage of concussion presentations. A study highlighting the prevalence and attitudes towards concussion in schools rugby players in Ireland and showed a true concussion prevalence of almost 50% with a high probability of under-reporting. Both coaches and referees have key roles, as many games proceed without medical personnel present.
I personally have had the chastening experience of not seeing a head injury in a schools cup game and consequently not removing the player from the field as I should have done, and this was demonstrated clearly on subsequent video analysis. In essence if concussion is suspected by the referee, the team doctor, the coaching team or supervising parent, then the player should be removed from the pitch and should not return if at youth level. The ‘Recognise and Remove’ mantra is the only one to follow. Cervical spine injury should be assumed in any player who is unconscious after head or neck trauma in a match, and maintaining adequate cervical spine stabilization is critical until neurological function in all four limbs is evaluated and found to be intact and they player has no reported neck pain or cervical spine tenderness on palpation.

For concussion, no single sideline tool assures complete diagnostic accuracy although tools such as the updated SCAT 3 are available. The visible clues of suspected concussion include lying motionless on the ground, being unsteady or falling over, a vacant or dazed look, confusion, or very rarely a loss of consciousness. Recovery needs to be monitored very carefully and recent research has focused on biomarkers of neurological injury and the potential use of functional MRI or PET scanning, but these are still research tools. Conventional imaging (CT or MRI), is rarely indicated except if deterioration of clinical status, focal neurological deficits or prolonged loss of consciousness. Neuropsychological testing is very helpful, but cannot on its own determine the timing of a return to play. Players should have cognitive rest post-concussion whereby they limit activities that require focus, concentration and attention such as reading, studying, texting, videogame play and computer use.

A stepwise approach to return to play has a number of guiding principles including initial rest and recovery to pre-injury baseline, a graduated increase in physical activity (light exercise, advanced exercise, non-contact activity and full contact). In Ireland, 16 to 19 year olds are advised not to return to play until at least 22 days post-concussion compared to 13 days as recommended by the International Rugby Board. The rate of stepwise progression is contentious and dependent on the individual player, but may extend well beyond 3 weeks in some players. There is no doubt that many schools players stated that they would want to play in an important match even if still recovering from concussion. Peer acceptance and coach support are vital to avoid a too speedy return to play. Players are sadly willing to take risks, even if armed with knowledge of concussion, are reluctant to report concussion and are sometimes motivated to play despite concussion.
Prolonged post-concussion syndrome is suspected when symptoms fail to resolve in 2 weeks, and risk factors include a history of multiple concussions, female players, younger players and an increased symptom burden at presentation. The only independent predictor of a slow recovery from concussion is a high level of initial symptoms. Over 90% will have no symptoms within 4 weeks. Prevention of concussion has focused on protective equipment (such as mouth guards), cervical muscle strengthening, teaching young players how to tackle properly, and rule changes that govern the sport. In effect, protective headgear helps reduce head lacerations and mouth guards prevent dental injury but neither prevent concussion. Neck strengthening exercises do potentially lower concussion risk especially in youth and female players. The tackle area is where most rugby injuries now occur and application of the laws forbidding high tackles or clearing out at rucks need to be enforced. Medical Indemnity is an issue that has now been clarified in that the IRFU has put medical professional liability in place for medics (defined as physicians, consultants, general practitioners and physiotherapists), working within their scope of practice at club or schools games but you are required to register details with the IRFU medical department, and all serious injuries and concussions must be reported to the provincial branch on a designated form.

The best international advice (backed by anecdotal experience), is if any concerns regarding concussion the player should be immediately removed from play and should not return if at youth or school level. Spinal injuries have reduced dramatically since the scrum has been depowered in school and youth rugby but occasionally occur in high impact tackles. Strength and conditioning training, higher impact collisions, and high intensity games create a very exciting spectacle, but do place added burdens and responsibilities on medical personnel on the sideline. Weight (as opposed to age restrictions), tackle, and ruck law changes may be required to make schools and youth rugby safer. Similar principles apply to other contact sports. We need to encourage greater participation but aim to avoid serious injury including concussion.

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References
6. IRFU Safe Rugby booklet on Concussion