

CHAPTER XX

#BANTACKLING: AN ISSUE OF ATHLETE WELFARE FOR WHY TACKLING SHOULD BE REMOVED FROM PHYSICAL EDUCATION AND SCHOOL SPORT

Adam J. White

The campaign to ban tackling

In March 2016, the Sport Collision Injury Collective (SCIC)¹, with the backing of other academics, medical practitioners and educationalists, called upon the United Kingdom (UK) government to remove tackling from schools' physical education (PE) classes. In their open letter, the SCIC highlighted that rugby has a high and serious risk of injury (Freitag *et al.*, 2015; Kirkwood *et al.*, 2015), that rugby injuries are not systematically recorded and analysed (Pollock, 2014), that most often contact rugby is a compulsory activity in school for boys (Nyiri, 2015; White, 2018), and that children's rights are thus not being respected and their voices not being sought or heard by the rugby authorities (White *et al.*, 2019).

The debate on whether rugby tackling should or should not be removed from the school context has been ongoing, with various organisations positioned on either side of this important issue (Pollock, White & Kirkwood, 2017; Tucker, Raftery & Verhagen, 2016). Rather than questioning the levels of harm associated with injuries in rugby, this discussion is split around the issues of informed consent and acceptable levels of risk, firmly positioning this as a socio-political issue (Quarrie *et al.*, 2017; White *et al.*, 2018). While this debate continues, young people are continuing to engage in contact codes of rugby – often without them (or their parents) being

¹ The Sport Collision Injury Collective is an inter-disciplinary group of academics and medical professionals who are concerned with injury in youth sport. Their work can be found at SportCIC.com.

required to give their informed consent – putting their physical welfare at risk. It is this social concern that I will attend to in this chapter, concluding that the removal of contact from rugby in physical education and school sport is both the only logical and viable solution available at this time (White, 2018).

Understanding injury in rugby

The first element to any public health debate, including that in sport, is to understand the magnitude of the problem; in this instance, injury (Pollock, 2014). The process for monitoring and recording injuries is often different across different sports, meaning “direct comparison of injury risk between sports remains difficult because of varying definitions of injury and heterogeneity in study methods” (Spinks & McClure, 2007, p. 556). Indeed, even injury monitoring within the same sport over time can be inconsistent, with a variety of injury definitions, categorisations, and methodologies to collect data being deployed (Freitag *et al.*, 2015). To address this, World Rugby defined a time-loss injury as “an injury that results in a player being unable to take a full part in future rugby training or match play” (Fuller *et al.*, 2007, p. 329). This means an analysis of the number of injuries (incidence) and the seriousness of the injury (severity) needs to be calculated (Van Mechelen, Hlobil & Kemper, 1992).

Given that rugby is a contact sport, it is not surprising that it has a high risk of injury. The Community Rugby Injury Surveillance Project (CRISP), funded by the Rugby Football Union², commented that adult “rugby union has a relatively high risk of injury compared with other team sports” (Roberts *et al.*, 2013, p.1). In the adult community game, findings from the first three seasons of the CRISP project established an injury incidence rate of 16.9 injuries per 1,000 hours

² This is the National Governing Body for rugby union in England.

of match exposure, with a mean time-loss of 7.6 weeks away from play (Roberts *et al.*, 2013). While there is no similar comprehensive approach to collecting epidemiological data in the youth or school game, there are a number of studies that explore the injury risk in these contexts. In a systematic review of 35 studies, Freitag and colleagues (2015) found a rate of 10.3 time-loss injuries per 1,000 hours of match-play for those under 21 years of age in rugby. In another systematic review of rugby injuries for those between 12 and 18 years, the incidence of time-loss injuries (more than seven days away from rugby) ranged between 1.6 to 2.5 injuries per 1,000 playing hours and from 7 to 8.4 injuries per 1,000 playing hours (Bleakley, Tulley & O'Connor, 2011).

Most recently, and germane to the school context, Archbold and colleagues (2017) conducted a prospective epidemiological study in Northern Ireland. Consisting of 28 schools or 825 players, Archbold and colleagues (2017) found 426 injuries across a season, impacting upon 38% of the study's participants. This equated to 29 injuries per 1,000 playing hours, with 49% of injuries (208 of 426) being so severe they resulted in 28 or more days away from play (Archbold *et al.*, 2017). One of the study authors commented, "The lighter players were less likely to sustain injuries. Larger players are used more during games ... with their higher injury risk correlating to a higher volume of collisions" (Bleakley, 2016). Similar studies in the school context have found comparable findings. For instance, Palmer-Green and colleagues found an injury incidence of 47 and 35 injuries per 1,000 playing hours for academies³ and schools, respectively (Palmer-Green *et al.*, 2013). Furthermore, Abernethy and MacAuley (2003) established that rugby accounted for 44.6% of Accident and Emergency school sport hospital admissions at one UK hospital, significantly higher than any other sport.

³ An academy is a component of the player development pathway for rugby union in England. Here, youth players are recruited and developed due to their potential to compete in elite rugby.

While there is some epidemiological data available from the school environment, as presented above, there is not sufficient data available for the physical education and school sport context (Pollock, 2014). The Health and Safety Executive (HSE)⁴ does not require schools to report if “an injury arises because of the normal rough and tumble of a game” (HSE, 2013, p 3), meaning there is limited understanding of the level of risk in this environment. Despite this, in their review of rugby union injury studies over the last decade, Viviers and colleagues (2018) found that injury trends remain consistent throughout all levels of play.

The tackle is the most common phase of play where injuries occur (Archbold *et al.*, 2017; Haseler, Carmont & England 2010). Freitag and colleagues (2015) found the percentage of injuries attributable to the tackle ranged from 39.6% to 64.0% across 11 original studies, and the recent Archbold and colleagues (2016) study found the tackle and other collision situations contributed 63.4% of injuries. Studies consistently and repeatedly show the tackle to be the most injurious phase of play across all age grades of youth playing full-contact rugby (McIntosh *et al.*, 2010; Palmer-Green *et al.*, 2013).

Traumatic brain injuries and long-term neurodegeneration

Concussion, often termed a mild traumatic brain injury, is particularly concerning within rugby, including youth rugby (Kirkwood *et al.*, 2015). For instance, in Archbold and colleagues’ (2017) study of school rugby, found 81 of the 426 injuries were diagnosed concussions. Likewise, Kirkwood and colleagues (2015) found up to 6.9 concussions per 1,000 player-hours for rugby union and up to 14.7 concussions per 1,000 player-hours for rugby league. It is no surprise that they suggest that concussion in rugby is a serious issue.

⁴ The Health and Safety Executive is the regulator for health and safety in the UK.

A concussion is a mild form of brain trauma (McCrorry *et al.*, 2017). The definition of a concussion is a somewhat dynamic concept in both sports medicine and general medicine, with different organisations continually (re)defining the condition (Meehan, 2017). This makes comparative research, particularly over time, problematic and unreliable. To address this, a number of sporting bodies developed the Consensus Statement on Concussion in Sport, which defines a concussion as “... a traumatic brain injury induced by biomechanical forces” (McCrorry *et al.*, 2017, p. 839). While traditionally a concussion was diagnosed by a loss of consciousness (Malcolm, 2017; McCrorry *et al.*, 2017; Meeham, 2017), today there are six recognised domains within concussion diagnosis: 1) somatic signs, 2) cognitive/emotional symptoms, 3) balance impairment, 4) behavioural changes, 5) cognitive impairment, and 6) sleep/wake disturbance (McCrorry *et al.*, 2017).

The symptoms of concussion are “vague and heterogeneous” (McNamee, Partridge & Anderson, 2015, p. 193), with technology currently not sensitive enough to recognise the micro-injuries that characterise mild traumatic brain injuries (Cantu & Hymer, 2012; Malcolm, 2017). Therefore, concussion “diagnosis and prognosis [is often] complicated and contested” (Malcolm, 2017), particularly as the injury is invisible. Many of the symptoms of a concussion could easily be mistaken for a variety of other medical impairments, for example, veisalgia (a hangover), which can be problematic in sports with associated drinking and social activities (Anderson, McCormack & Lee, 2012). As such, many athletes, parents, coaches, officials, and volunteers in sport may find it difficult to differentiate a concussive injury (Meehan, 2011).

It is not only the difficulty in recognising and diagnosing a concussion that is an athlete welfare concern; the neurological outcomes, both short- and long-term, are alarming too (Pollock, White & Kirkwood, 2018). Post-Concussion Syndrome, which affects between 38% and 80% of those who suffer mild head trauma, means they will be symptomatic for extended periods of time

(Hall, Hall & Chapman, 2005). The debilitating impacts of this upon physical activity, sport participation, and everyday life can be significant.

In addition to Post-Concussion Syndrome, concussion has been linked to other significant neurological and neurodegenerative conditions. For instance, Sariaslan and colleagues (2016), using a birth cohort of over one million individuals under the age of 26 in Sweden, found a significant relationship between concussion and receipt of disability pension, psychiatric inpatient admissions or outpatient visits, premature mortality, low educational achievement, and receipt of state welfare payments. Similarly, concussion has been associated with increased risk of all forms of dementia and Alzheimer's disease (Li *et al.*, 2017). Others have established that those who have suffered a concussion have a two-fold risk of suicide comparative to the general population (Fralick *et al.*, 2018). Taylor and colleagues (2018) found that concussion negatively impacted cognitive functioning (based upon global cognition, verbal memory, visual memory, visual motor, reaction time, and impulse control), and that the effects were detectable over one year after the concussion. Furthermore, concussion is also linked with increased suicide attempts and suicidal ideation (Fralick *et al.*, 2018).

Most notably, following widespread media attention and the release of Sony Pictures' film *Concussion* (White & Franks, 2018), Chronic Traumatic Encephalopathy (CTE) has been associated with concussive and subconcussive traumatic impacts within contact sport (Omalu *et al.*, 2005, 2006), including rugby union (Stewart *et al.*, 2015). This neurodegenerative disease pathology "is associated with gradual onset of neuropsychological, psychiatric and behavioural disturbance followed by progressive cognitive decline" (Stewart *et al.*, 2015, p. 11). Thus far, American football is the only sport that has undertaken a substantial exploration into the brains of deceased athletes, finding that 110 of 111 brains tested could posthumously be diagnosed with CTE (Mez *et al.*, 2018). In summary, the long-term outcomes of concussion are significant and alarming.

Kirkwood and colleagues (2015, p. 506) comment that there is “a significant risk of concussion in children and adolescents playing rugby union and rugby league evident from the studies included in this systematic review”. In a systematic review of children’s concussive injuries across sports in the United States (US), Pfister and colleagues (2016) found that rugby had the highest incidence rate of concussion at 4.18 concussions per 1,000 athlete exposures. Ice hockey was second with 1.20 concussions per 1,000 athlete exposures, followed by American football with 0.53 concussions per 1,000 athlete exposures. The average was 0.23 concussions per 1,000 athlete exposures across all sports (Pfister *et al.*, 2016). Therefore, rugby has an 18-fold increased risk of concussion injury in comparison to sport generally, and an eight-fold higher risk of concussion than American football. Given the high incidence of concussion in rugby, each of these neurological outcomes are a concern for an athlete’s welfare.

The structure and provision of school physical education and school sport

The role of rugby union in the physical education and school sport curriculum is not clear. In the UK, physical education and school sport is a compulsory part of the National Curriculum in England and aims to ensure that all pupils “engage in competitive sports and activities” (Department for Education, 2013). While no sport is mandated via the National Curriculum, contact rugby union is a suggested sport for meeting the aims of the National Curriculum for physical education and school sport at Key Stages 3 and 4. Smith and colleagues (2007), using a sample of seven schools, found 18.1% of male pupils participated in rugby union, with no data being offered for girls. For boys, rugby union was the sixth most popular activity, behind soccer (72%), badminton (40%), basketball (33%), athletics (26%), and tennis (21%).

Data from 288 secondary schools in England, representing 8.43% of the number of secondary schools in the country and based on pupil numbers (293,414) is 9.1% of the national

population, show that rugby union is the 10th most popular sport delivered as part of the PE curriculum (n=234/288, 81.25%). When split by gender, rugby union is the eighth most delivered activity for boys (n=229/275, 83.3%) and the 18th most delivered for girls (n=151, 53.55%) (White, 2018).

Given that there is limited epidemiological data within the physical education and school sport terrain, the best indicator currently available is the perception of risk from those in the context. Data from 233 Subject Leaders for physical education and school sport in England rated rugby union the highest risk activity that they deliver, with 57% of schools that deliver rugby union rating it the highest risk. Second to this was trampolining, which 32% rated as the highest risk activity delivered (White, 2018). Of course, trampolining does have ongoing training requirements for school teachers, unlike rugby.

At present there are no requirements for teachers (or coaches) to have any formal training in order to deliver contact rugby. The Association for Physical Education (AfPE), as the professional body for physical educators in England, offers expert guidance on the provisions that should be implemented to deliver an activity safely (AfPE, 2016). For rugby union, there is no recommendation on the levels of training expected or necessary to deliver contact rugby union or league. In contrast, the AfPE suggests:

Staff teaching trampolining are strongly advised to show up-to-date and appropriate qualifications and expertise that demonstrate knowledge of the basic skills, techniques, and mechanics of the moves they are helping students to learn.

(AfPE, 2016, p. 416)

Likewise, for swimming there is a requirement for those responsible for water safety to hold a current qualification or to have a lifeguard present (AfPE, 2016). The Rugby Football Union's own Code of Practice⁵ also shows no training requirements to deliver contact rugby.

A training audit conducted in October 2015 in 24 Oxfordshire Rugby Football Schools Union-affiliated schools found that only 39% of current PE teachers had any rugby coaching qualifications and only 32% had completed a concussion education module; for state schools this was 14%, with nine state schools having no teacher with concussion training. Similarly, even in targeted schools for the RFU as part of the All Schools initiative, 31% of schools had received no coaching development training (Pollock, White & Kirkwood, 2018). To this end, rugby union is currently commonly delivered in schools for boys but teachers are often lacking in and not required to have formal education in its delivery.

Reducing risk

Rugby union is a high-risk activity (Roberts *et al.*, 2013; White, 2018) and there are a number of strategies that have been tested to attempt to reduce the risk of injury and concussion in the sport. For instance, protective equipment in the form of scrum caps have been tested and shown to have no effect on reducing concussion (Benson *et al.*, 2009). Similarly, education programmes have been introduced; for instance, the Rugby Football Union's 'Headcase' programme. Yet, these initiatives are often tertiary-care focused and lack rigorous evaluation (Batten *et al.*, 2016). Most recently, attention has been focused upon the tackle technique (Tucker *et al.*, 2017), which is yet to garner any positive protective effect (Pollock, White & Kirkwood, 2018). Additionally, while

⁵ The Rugby Football Union Code of Practice can be accessed at <https://www.englandrugby.com/participation/coaching/age-grade-rugby/codes-of-practice>

Hislop and colleagues (2017) have suggested a pre-activity movement control programme⁶ is beneficial for the reduction of injury and concussion, this has been critiqued for being statistically non-significant and lacking feasibility in the PE context, and there may have been other variables that could explain the reduction in concussions beyond this initiative (White *et al.*, 2018).

The options now available for reducing the risk of concussions are limited. At present, the only successful strategy for the reduction of concussion in sport has been observed in ice hockey with the removal of the body check (Black *et al.*, 2016). It is, therefore, logical that the substitution of the tackle with a touch/tag should be the next viable step in the attempt to improve athlete welfare in rugby.

Informed consent

A central cornerstone of the Sport Collision Injury Collective's campaign to remove tackling from school physical education and school sport was the premise that contact rugby was most often compulsory. In a study of independent schools, Nyiri (2016) found that 77% of these schools made contact rugby a compulsory element of the curriculum. In state schools, 91% (n=208/229) of schools that deliver boys rugby make the activity compulsory within the PE curriculum (White, 2018).

Of course, there are not just structural forces at play; indeed, there is also the cultural pressure to participate in contact codes of rugby too. Pringle and Markula (2005, p. 480), in their study of school rugby players, found that "rugby was a compulsory aspect of their youthful education". Yet importantly, children were not only pressured by the school's curriculum structures but also by the culture to fit in, which included playing rugby. The children did not want to

⁶ Simply put, this is a set of exercises and activities that are done before activity that prepare the muscles for physical activity.

withdraw from activities due to the fear of looking inferior and un-masculine to their peers (Pringle & Markula, 2005).

The AfPE (2016, p. 143) states, “When consent is required for participation in organised activities ... the information provided to parents needs to be as comprehensive as possible in order for them to make informed decisions”. Unfortunately, on two occasions in recent years the rugby authorities have been found to promote inaccurate and misleading information to stakeholders (including players and parents) about the levels of injury risk associated with rugby. For instance, Piggan and Pollock (2016) found that World Rugby disseminated inaccurate injury statistics in an infographic. Following this, Piggan and Bairner (2017) also found that England Rugby were using a quote that was misleading around the level of injury risk in rugby.

When certain activities have a higher risk of injury than other sport, such as rugby (Roberts *et al.*, 2013), informed consent is one mechanism for increasing the threshold of socially acceptable risk (Fuller, 2007). Fuller (2007, p. 185) comments:

... a high level of risk does not make a risk unacceptable per se; people will accept risks that are taken on a voluntary basis that are up to 1,000 times higher than risks taken on a non-voluntary basis (Trimpop & Zimolong, 2006).

As such, informed consent becomes a central feature of this debate (White & Robinson, 2018). Unfortunately, little information is shared with parents on the levels of injury and risk associated with youth contact rugby union. The latest studies to be published by the Rugby Football Union or their partners in the youth game are from the 2008-2009 season (Haseler, Carmont & England, 2010), which is somewhat dated given the rate of change within injury, and particularly brain injury, research.

In Australia, Boufous, Finch and Bauman (2004) found that over one-quarter of parents were concerned about sporting activities that had a high risk of injury. Furthermore, a parent's subjective perception of injury risk was correlated to injury data, showing that their risk assessments were legitimate. It is thus unsurprising that the sports that parents withdrew their children from the most were rugby league and rugby union (Boufous, Finch & Bauman, 2004). As such, questions should be asked about why parents are currently not given the choice to remove their children from risky activities, such as contact rugby, from physical education and school sport in the UK.

What makes a risk acceptable or not is somewhat contextually subjective (Quarrie *et al.*, 2017). Molcho and Pickett, however, have attempted to define some boundaries of unacceptable risk for children. Specifically, they suggest that:

... the following are deemed non-acceptable: 1) intentional injuries, 2) severe or disabling injuries, 3) injuries while involved in unhealthy, unnecessary, or abnormally risky behaviours, and 4) injuries that occurred while ignoring known preventative measures.

(Molcho & Pickett, 2011, p. 147)

I and others have argued that rugby union meets all four of Molcho and Pickett's criteria for an unacceptable risk for children (White *et al.*, 2018). In rugby, tackling is a structural element of play, while also being the primary cause of injuries, making them an inevitable outcome of rugby participation (White *et al.*, 2018a). Rugby can also lead to debilitating injuries, as a product of long-term neurodegenerative disease linked to concussion. Given that rugby is not a mandatory element of the National Curriculum for physical education, it is not essential or necessary in a

child's education. Finally, given the low adherence and uptake of rugby training courses and safety initiatives by those who deliver rugby both inside and outside of the schools' system, it is clear preventative strategies are being ignored.

The precautionary principle

Barnett and O'Hagan (1997) developed the precautionary principle in the environmental setting, where there is often weak scientific understanding on a given topic. On occasions where the science is lacking, the burden of proof is placed upon the proponents of an activity to justify its safety (Barnett & O'Hagan, 1997). In practice, this means a more stringent standard is necessary, on precautionary grounds, and only when proven safe are the standards relaxed. Martuzzi (2007, p. 569) comments:

... [the precautionary principle] is usually taken to state that lack of scientific certainty must not be used as a reason to ignore or postpone preventive or remedial action when there are other good reasons to do so.

In this debate, given the extensive scientific research literature available for the risks and harms associated with contact rugby, the onus is on the rugby authorities to show why contact rugby is beneficial and safe for young people to participate in during physical education and school sport.

Children are held to a higher safety standard than that held for adults in the UK as they are deemed to be a particularly vulnerable group (HSE, 2015). As such, a cautionary approach is required when managing the safety and welfare of children and young people, particularly in non-optional contexts like schooling. In the case of contact rugby, Bullingham, White and Batten (2017, p. 1450) suggest, "participation in tag or touch rugby acts in accordance with the cautionary

approach when it relates to the risk of injuries for children”, and thus they suggest tag/touch forms should be implemented as an alternative to contact codes of rugby.

Conclusion

Tackling in rugby in physical education and school sport has been a topic for wide debate in recent years (Pollock, White & Kirkwood, 2017; Quarrie *et al.*, 2017). Throughout this chapter, I have explored the injury profile for contact rugby (Freitag *et al.*, 2015; Roberts *et al.*, 2013), showing it has a higher risk of injury comparative to other team sports (Roberts *et al.*, 2013), including in the youth and school game (Archbold *et al.*, 2017). Concussion accounts for a significant proportion of injuries in rugby union (Kirkwood *et al.*, 2015), with the outcomes being debilitating and long-term (Fralick *et al.*, 2018; Li *et al.*, 2017; Sariaslan *et al.*, 2016; Stewart *et al.*, 2015). Current attempts to curtail concussion rates – whether that be through scrum caps, educational initiatives, or training regimes (such as the Activate programme) – have thus far been ineffective (Pollock, White & Kirkwood, 2018; White *et al.*, 2018b) and have often been focused on tertiary care rather than primary prevention of concussion (Batten *et al.*, 2016).

The National Curriculum for Physical education and school sport does not mandate the delivery of rugby, thus making it a choice for schools. Yet most often schools make contact rugby a compulsory activity for boys (White, 2018). This is the same context whereby teachers are often not required to take, and most often have not undertaken, specialist training for teaching/coaching contact rugby (Pollock, White & Kirkwood, 2018). Furthermore, Subject Leaders for physical education and school sport also rate rugby union as the highest risk activity delivered as part of the curriculum (White, 2018). In other countries, when parents are given the opportunity to remove their children from risky activities, such as contact rugby, they do so (Boufous, Finch & Bauman, 2004). Of course, informed consent would need for accurate and reliable risk information to be

shared with those offering their consent (White & Robinson, 2018), something both England Rugby and World Rugby have failed to do (Piggin & Pollock, 2017). Given that tackling in rugby meets some if not all four of Molcho and Pickett's (2011) criteria for an unacceptable risk for children, tackling in rugby is unnecessary and unacceptable in the physical education and school sport curriculum (White *et al.*, 2018a).

Given what we already know about injury and concussion risk, the lack of informed consent, and the abysmal training requirements (and record), immediate precautionary action should be taken in order to maintain the welfare of young people in physical education and school sport. While I accept that the removal of the tackle may be detrimental to the identity of rugby, the removal of tackling is likely to be the most effective injury-prevention strategy in this particular instance. Indeed, Cross and colleagues (2017, p. 4) state, "The most effective, although extreme, method for preventing concussion would be to eliminate exposure by removing the tackle from the game". The sporting fraternity should be bold in removing the tackle from physical education and school sport to evidence that the health of our children is more important than a game.

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