The Irish Rugby Injury Surveillance Project

All-Ireland League Amateur Club Rugby

2022 - 2023 Season Report

UNIVERSITY OF LIMERICK
OLLSCOIL LUIMNIGH

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Irish Rugby Football Union Foreword

The Irish Rugby Football Union (IRFU) continues their commitment to player welfare across all areas of the game in Ireland. We are proud to be part of the planned expansion and further development of the Irish Rugby Injury Surveillance (IRIS) Project, to try enhance player welfare and performance.

The injury data provided by the IRIS Project informed IRFU discussions around tackle behaviours. These data were a vital component in the IRFU decision to address the tackle behaviour in the domestic game and subsequently to opt into the World Rugby Global Tackle Height Trial. As we look towards the upcoming 2023/24 season, we will be able to accurately compare injury rates before and after the law change. These data allow us to better understand the impact of lowering the tackle height and improving tackle technique on injury rates, injury severity and injury mechanisms.

The IRFU ENGAGE Readiness and Robustness programme continues to be rolled out across the country, and components of this programme feature in the new IRFU Graduated Return to Play (GRTP) Protocol following a concussion. The GRTP Protocol aims to return players to Rugby following a suspected or confirmed concussion safely and efficiently, while also aiming to reduce the risk of further injury.

We are encouraged to see the ongoing support from our clubs working with the IRIS Project. Thank you to each and every club, data collector, volunteer, player and researcher that is part of this project. Your continued support is a fundamental component of how we protect player health and wellbeing.

Medical Director, IRFU
Dr. Rod McLoughlin

Irish Rugby Injury Surveillance Foreword

Comprehensive injury surveillance systems in amateur Rugby Union are needed to enhance player welfare and this innovative project to date has provided essential accurate data for all those involved in the game to help inform training, recovery, and game policy. The IRIS project has involved the research, design and implementation of an online injury recording platform. Collection has now been completed of a fifth season's data and this 2022-2023 season report documents our collaborative work with the IRFU, and with 26 men's and women's All-Ireland League clubs.

This season represents 577 matches, over 1,000 players, and support from dedicated data injury recorders, coaches, doctors, physiotherapists, managers, and ancillary staff within clubs: thank you. The IRIS project includes the addition of schools surveillance for senior cup (reported separately).

IRIS involves research stemming from ongoing injury reduction and sports performance work by University of Limerick academics across a range of sports, as well as our specific expertise in Rugby Union. It has effectively brought together academics with expert practitioner experience from the fields of biomechanics, medicine, biomedical engineering, mathematics and statistics, physiotherapy, sport psychology, and strength and conditioning as well as post-doctoral and doctoral researchers. The holistic approach to injury surveillance and prevention is central to the project.

IRIS Principal Investigators
Assoc. Prof. Tom Comyns, PhD
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1.0 Executive Summary

1.1 Match Injury

Starting in September 2022, the Irish Rugby Injury Surveillance (IRIS) project collected injury data across 577 matches from 26 men's and women's amateur Rugby clubs.

Men's AIL

- There were 22 men's clubs involved in the IRIS project (10 Division One, 12 Division Two clubs).
- There were a total of 878 male players registered in the IRIS project (400 Division One, 478 Division Two players).
- The overall match time-loss injury incidence rate for males was 43.3/1,000 player hours
  - This is lower than the overall match time-loss injury incidence rate for males during the 2021-2022 season (55.0/1,000 player hours).
  - The match time-loss injury incidence rate for Division One males was 41.2/1,000 player hours.
  - The match time-loss injury incidence rate for Division Two males was 45.0/1,000 player hours.
- A single male player would have to play, on average, 17 matches to sustain one injury.

Women's AIL

- There were 4 women's clubs involved in the IRIS project.
- There were a total of 139 female players registered in the IRIS project.
- The overall match time-loss injury incidence rate for women was 30.3/1,000 player hours.
  - This is similar to the overall match time-loss injury incidence rate for females during the 2021-2022 season (29.8/1,000 player hours).
- A single female player would have to play, on average, 25 matches to sustain one injury.

1.2 Training Injury

There were a total of 116 training injuries reported in the men's clubs.

- This is higher than the total number of training injuries reported in the 2021-2022 and 2019-2020 seasons (93 and 48 injuries respectively) but lower than the 2018-2019 season (121 injuries).
- There was a total of 64 training injuries in Division One men's clubs.
- There was a total of 52 training injuries in Division Two men's clubs.

There was a total of 16 training injuries reported in the women's clubs.

- This is higher than the number of training injuries in 2021-2022 (9 injuries), 2019-2020 (7 injuries) and 2018-2019 (11 injuries).

1.3 Injury Occurrence

The most commonly reported match injuries for the men's clubs were concussion (20%), followed by ankle ligament sprains (11%). Concussion injuries resulted in an average of 30 days' absence from Rugby match or training activities, while ankle ligament sprains resulted in an average of 34 days' absence.

The most commonly reported match injuries for the women's clubs were ankle ligament sprains (14%), and knee ligament sprains (12%). Concussion injuries (8%) resulted in an average of 31 days' absence from Rugby match or training activities, while ankle ligament sprains resulted in an average of 12 days' absence, and knee sprains an average of 199 days' absence.

Note: *Reported concussion incidence includes suspected concussions as per IRFU recognise and remove protocol. The Graduated Return to Play (GRTP) protocol requires a minimum of 21 days absence from play for adults and 23 days for players under 20 years of age.*

1.4 Injury Event

The tackle event accounted for the majority of match injuries, with 64% of all injuries happening during the tackle in the men's clubs, and 71% in the women's clubs. Within the tackle event, in line with previous reports for the women's clubs, the ball carrier (66%) sustained more injuries compared to the tackler (34%). In the men's clubs however, the tackler (55%) sustained more injuries than the ball carrier (45%).

1.5 Playing Position

Of all match injuries recorded in the men's clubs, 60% were to the 'forwards' (position no. 1-8), while 40% were to the 'backs' (position no. 9-15). By position, the blindside flanker (no. 6) accounted for the most injuries at 10%, while the second row (no. 4) and the hooker (no. 2) had the second highest proportion of injuries with 9% each.

Of all match injuries recorded in the women's clubs, 55% were to the forwards (position no. 1-8), while 45% were to the backs (position no. 9-15). The loosehead prop (no. 1), openside flanker (no. 7) and inside centre (no. 12) had the highest proportion of match injuries with 10% each.

1.6 Injury Burden

The burden of an injury assesses the incidence rate of an injury in relation to the average severity of the injury (measured as the number of days absent).[1]

Concussions carried the greatest burden of all match injuries for the men's clubs (with 273 days absence/1,000 player hours) with an average severity of 30 days per concussion, while for women's clubs knee sprains carried the greatest injury burden (739 days/1,000 player hours) with an average severity of 199 days per sprain. In the 2021-2022 season knee sprain injury burden was the greatest at 250 days/1,000 player hours for men's clubs, with toe fractures at 232 days/1,000 player hours producing the highest injury burden for women's clubs.

1.7 New & Recurrent Injury

The majority of all injuries were ‘New’ compared to ‘Recurring’. For time-loss injuries reported in the men’s clubs, new injuries accounted for 95% of all injuries, with 86% in the women’s clubs recorded as new. For all medical attention injuries across the men’s and women’s clubs, 100% were new injuries, with no recurrent injuries reported.

2.0 Introduction

2.1 The IRIS Project

The Irish Rugby Injury Surveillance (IRIS) project has developed and implemented the first long-term Rugby Union specific injury surveillance system within amateur Rugby Union in Ireland. This system monitors the incidence, nature and severity of both match and training injuries occurring across the amateur game in Ireland. By monitoring this information, injury trends may emerge which will aid in the continued development and implementation of evidence-based injury reduction strategies in order to minimise injury risk and enhance player welfare.

IRIS Aims:

- To develop and implement an injury surveillance system for amateur Rugby Union in Ireland.
- To monitor the incidence and type of injuries occurring and identify any possible injury risk factors.
- To enhance the health and welfare of Rugby Union players by using this information to assist the IRFU policy regarding injury reduction strategies.

2.2 Injury Definitions

The IRIS project follows the guidelines from the World Rugby 'Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union'[2] and the International Olympic Committee (IOC) consensus statement: methods for recording and reporting of epidemiological data on illness and injury in sport 2020 (including STROBE Extension for Sport Injury and Illness Surveillance (STROBE-SIIS)).[3]

An injury is defined as "*Any physical complaint, which was caused by a transfer of energy that exceeded the body's ability to maintain its structural and/or functional integrity that was sustained by a player during a Rugby match or Rugby training, irrespective of the need for medical attention or time-loss from Rugby activities.*"

A recurrent injury is one of the same site and same type as the original injury and occurs after the player has made a full return to match play following the original injury.

A dual injury is one of multiple diagnoses resulting from one injury event. Dual injuries were analysed as one injury event for the purposes of calculating overall incidence and overall injury severity. However, when analysing injury location and nature dual injuries were separated as per international best practice.[2,3]
Both time-loss and medical attention injuries have been monitored and analysed separately. Medical attention injuries are any injury that resulted in 0-1 days absent from Rugby match or training activities (i.e. slight injuries). Any injury that results in greater than 1 days' absence from match or training activities is classed as a time-loss injury and categorised according to injury severity. Only time-loss injuries were included in injury incidence rate calculations.[2,3]

Injury severity is calculated as the number of days that elapsed from the date of injury to the date of the player's return to full participation in training and availability for match selection.

Injury severity is classified as; slight (0-1 days), minimal (2-3 days), mild (4-7 days), moderate (8-28 days) and severe (>28 days).

Match injury data are presented as the number of injuries per 1,000 player hours of match exposure. In order to calculate match injury incidence rates, the following calculation was used:

Team match injury incidence rate (IR):

$$IR = \frac{\text{number of injuries}}{\text{number of matches x number of players (15) x match duration (1.33)}} \times 1{,}000$$

Injury definitions are listed in Section 6.0 Glossary of Terms, page 37.

2.3 Recruitment

At the beginning of the 2022-2023 season, the IRIS team successfully recruited 28 clubs from the men's and women's All-Ireland League (AIL). The Men's AIL is split into two divisions; Division One (Men's AIL 1) and Division Two (Men's AIL 2).

The IRIS project had an 93% compliance rate (26/28 teams recruited) for the 2022-2023 season in comparison to 84% in the 2021-2022 season. These clubs are shown in Table 1.

Table 1: The IRIS club recruitment 2022-2023

	Men's AIL	Women's AIL
Number of clubs	22 *(Division 1 = 10; Division 2 = 12)*	4
Number of players	878 *(Division 1 =400; Division 2 = 478)*	139

Each club nominated an 'injury recorder', who was trained on use of the IRIS system during the pre-season training of the 2022-2023 season. In the majority of clubs (85%), the physiotherapist or physical therapist to the Senior 1XV acted as the injury recorder. Each injury recorder was given a secure and confidential login to their own club's home-page on the IRIS system. Each club registered all players involved with the Senior 1XV on the IRIS system. Beginning with the start of the Rugby season in Autumn 2022, the injury recorder documented all injuries occurring to the Senior 1VX men's or women's team. The injury recorders also reported when a player returned to play so that injury severity data could be calculated.

3.0 Match Injury

3.1 Overall Time-loss Match Injury

For the 2022-2023 season, injury data from 26 clubs across 577 matches were collected.

A total of 477 match time-loss injuries (any injury resulting in more than 1 days' absence from Rugby match or training activities) were recorded. Any injuries resulting in 0-1 days' absence from Rugby match or training activities (slight injuries) were classified as 'medical attention injuries' and were not included in the analysis of time-loss injuries, as per international best practice.[1]

The overall team match time-loss injury incidence rates:

- Men's teams – 43.3/1,000 player hours.
- Women's teams – 30.3/1,000 player hours.
- This is approximately one time-loss injury every match for the men's teams and one every second match for the women's teams.
- A male player would have to play approximately 17 matches in order to suffer one time-loss injury.
- A female player would have to play approximately 25 matches in order to suffer one time-loss injury.

Table 2 shows the overall team match time-loss injury incidence rate for the Division One men's clubs (Men's AIL 1), the Division Two men's clubs (Men's AIL 2) and the women's clubs (Women's AIL).

Table 2: Match time-loss injuries (excluding 'slight' injuries).

Division	No. Clubs	No. Players	No. Matches	Exposure Hours	No. Injuries	IR*
Men's AIL 1	10	400	231	4608	190	41.2
Men's AIL 2	12	478	265	5287	238	45.0
Overall men's clubs	**22**	**878**	**496**	**9895**	**428**	**43.3**
Women's AIL	4	139	81	1616	49	30.3
Overall women's clubs	**4**	**139**	**81**	**1616**	**49**	**30.3**

*IR – Incidence rate per 1,000 player hours

- 22% of match time-loss injuries required medical imaging (X-Ray, MRI, Ultrasound etc).

3.2 Match Injury Classification

The injury diagnosis refers to the specific body location and nature of the injury.

The most common injury diagnoses for the men's clubs were concussion, followed by ankle sprains, accounting for 20% and 11% of all time-loss match injuries respectively.

For the women's clubs, the most common time-loss match injury diagnoses were ankle sprains (14%) and knee sprains (12%).

Tables 3 and 4 show the three most common match time-loss injury diagnoses for all the men's and women's clubs for the current season (2022-2023), and the four prior seasons (2021-2022, 2019-2020, 2018-2019, 2017-2018).**

Table 3: Overall most common injury diagnoses for the men's clubs (IR/1,000 player hours, % of injuries)*

Men's Clubs				
2022-23	**2021-22**	**2019-20**	**2018-19**	**2017-18**
Concussions 9.1 (20%)	Concussions 7.6 (13%)	Concussions 7.1 (14%)	Concussion 5.3 (11%)	Concussion 6.1 (12%)
Ankle sprains 5.0 (11%)	Ankle sprains 5.3 (9%)	Ankle sprains 4.5 (9%)	ATFL sprains 4.1 (9%)	ATFL sprains 5.7 (11%)
Hamstring strains 4.7 (10%)	Hamstring strains 4.6 (8%)	Hamstring strains 2.9 (6%)	Hamstring strains 3.9 (8%)	Hamstring strains 4.1 (8%)

* accounts for separation of dual injuries and mathematical rounding
** IRIS did not collect full season data during 2020-2021 due to training and match curtailment as a result of the COVID-19 pandemic

Table 4: Overall most common injury diagnoses for the women's clubs (IR/1,000 player hours, % of injuries)*

Women's Clubs				
2022-23	**2021-22**	**2019-20**	**2018-19**	**2017-18**
Ankle sprains 4.3 (14%)	Concussions 3.6 (10%)	Concussions 5.6 (16%)	Concussions 5.3 (19%)	Concussions 5.1 (11%)
Knee sprains 3.7 (12%)	Ankle sprains 2.9 (8%)	Ankle sprains 4.8 (14%)	ATFL sprains 3.4 (12%)	ATFL sprains 5.1 (11%)
Concussions 2.5 (8%)	Finger sprains 2.9 (8%)	Knee sprains 4.0 (11%)	Knee MCL sprains 2.9 (11%)	Rotator Cuff strains 3.2 (7%)

*accounts for separation of dual injuries and mathematical rounding

Table 5 shows the three most common match time-loss injury diagnoses for each of the men's divisions (Division One and Division Two) during the 2022-2023 season.

Table 5: Most common injury diagnoses for each men's Division One and Division Two (IR/1,000 player hours, % of injuries)*

Men's AIL 1	Men's AIL 2
Concussion 8.9 (21%)	Concussion 9.8 (18%)
Ankle sprains 5.4 (13%)	Ankle sprains 5.2 (9%)
Hamstring strains 3.5 (8%)	Hamstring strains 6.7 (12%)

*accounts for separation of dual injuries and mathematical rounding

The head was the most commonly injured body location in the men's clubs, accounting for 23% of all injuries in 2022-2023. This is similar to the 2021-22 season when the head was also the most injured location with 16% of all injuries.

For the women's clubs in 2022-2023, the most commonly injured body locations were the ankle and knee, each accounting for 22% of all injuries. Comparatively, in the 2021-2022 season the ankle and face were the most commonly injured sites with 17% of injuries each.

Tables 6 and 7 show the most common diagnoses for each commonly injured body location.

Table 6: Men's Clubs: Most common injury diagnoses with regards bodily location (IR/1,000 player hours, % of injuries)

Location	Diagnosis
Head 10.3 (23%)	Concussion 9.0 Laceration 1.0 Fracture 0.1
Shoulder 6.3 (14%)	Ligament sprain 2.3 Rotator cuff strain 2.3 Dislocation/subluxation 0.8
Ankle 5.4 (12%)	Ligament sprain 5.0 Fracture 0.2

Table 7: Women's Clubs: Most common injury diagnoses with regards bodily location (IR/1,000 player hours, % of injuries)

Location	Diagnosis
Ankle 6.8 (22%)	Ligament sprain 4.3 Fracture 1.9 Haematoma/contusion 0.6
Knee 6.8 (22%)	Ligament sprain 3.7 Haematoma/contusion 1.9 Turf burn 0.6
Head 2.5 (8%)	Concussion 2.5

3.3 Timing of Match Injury

The majority of injuries occurred in the 2nd half in both the men's (63%) and women's clubs (78%).

The men's clubs again saw a rise in injuries from 1st quarter to 4th quarter this season, similar to the previous three seasons (2018-2019, 2019-2020, 2021-2022 seasons). In the 2017-2018 season however, the men's clubs saw a decline from 3rd quarter to 4th quarter. Figure 1(a) shows the timing of match injury for the men's clubs comparing this season (2022-2023) to the previous four seasons (2021-2022, 2019-2020, 2018-2019, 2017-2018).

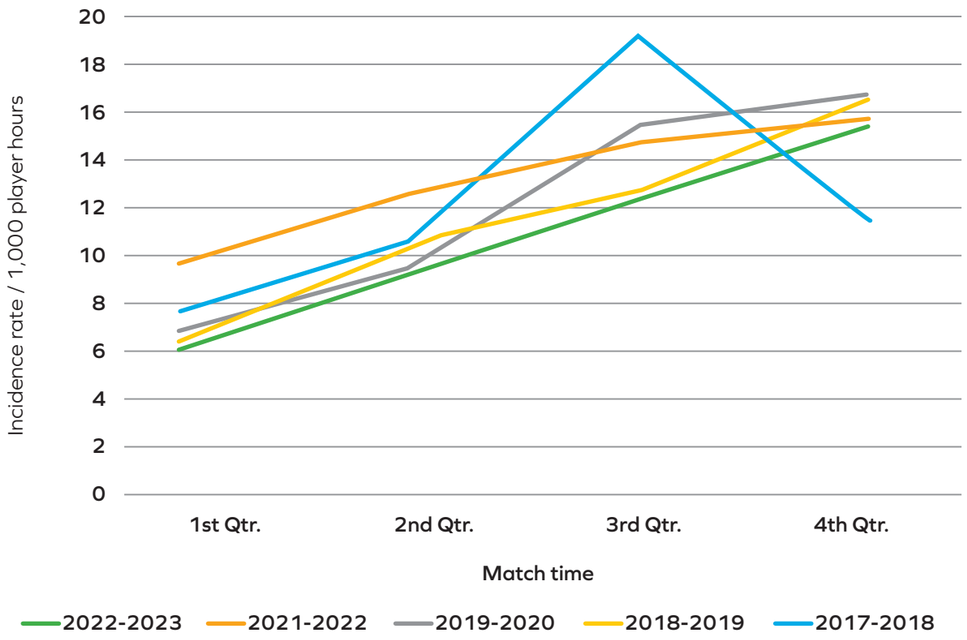

Figure 1(a): Timing of injury during match play for the men's clubs (IR/1,000 player hours)

The timing of women's match injuries mirrored that of the men in the 2022-2023 season, steadily rising from 1st quarter to 4th quarter. During the 2021-2022 season, the women's clubs saw a spike in the 3rd quarter, very similar to that of the 2019-2020 season. During the first two seasons, the women's injury incidence plateaued after the 2nd quarter, with a slight increase towards the 4th quarter observed in the 2018-2019 season. Figure 1(b) shows the timing of match injury for the women's clubs comparing this season (2022-2023) to the previous four seasons (2021-2022, 2019-2020, 2018-2019, 2017-2018).

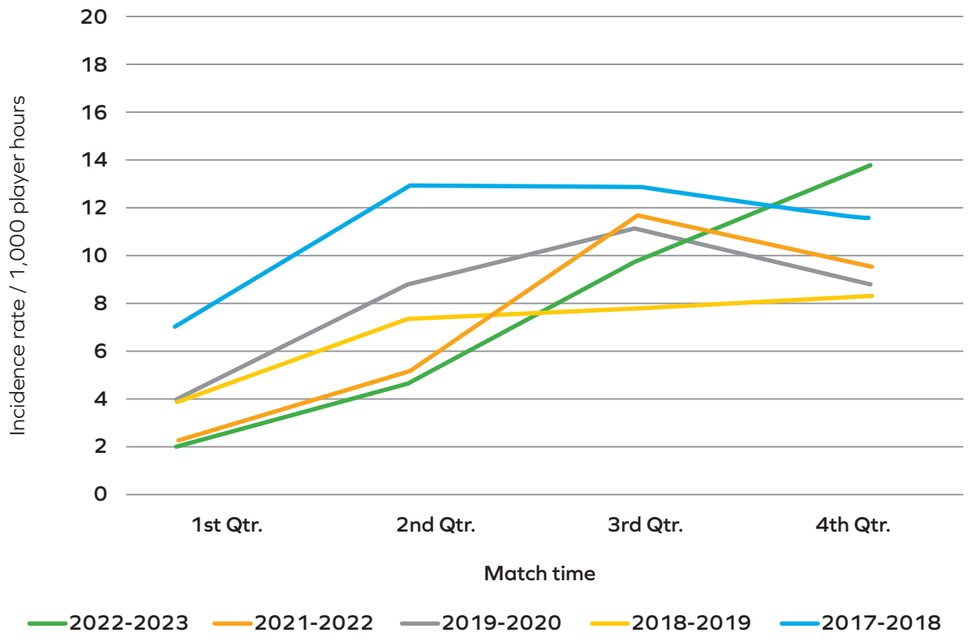

Figure 1(b): Timing of injury during match play for the women's clubs (IR/1,000 player hours)

3.4 Match Injury Event

Figure 2 shows the event surrounding the occurrence of an injury (i.e. mechanism).

The tackle event has accounted for the majority of injuries across both the men's and women's clubs for five seasons in a row. For the women's clubs specifically, the ball carrier (i.e. being tackled) has reported higher injuries than the tackler every season including in 2022-2023.

The tackler (55%) had higher injury rates than the ball carrier (45%) this season in the men's clubs, similar to the 2019-2020 and 2018-2019 seasons. In 2021-2022 injury rates between the two were similar and in the 2017-2018 season the ball carrier had a higher rate of injuries during the tackle event. Non-contact injuries were responsible for 11% and 6% of all injuries for men's and women's clubs respectively.

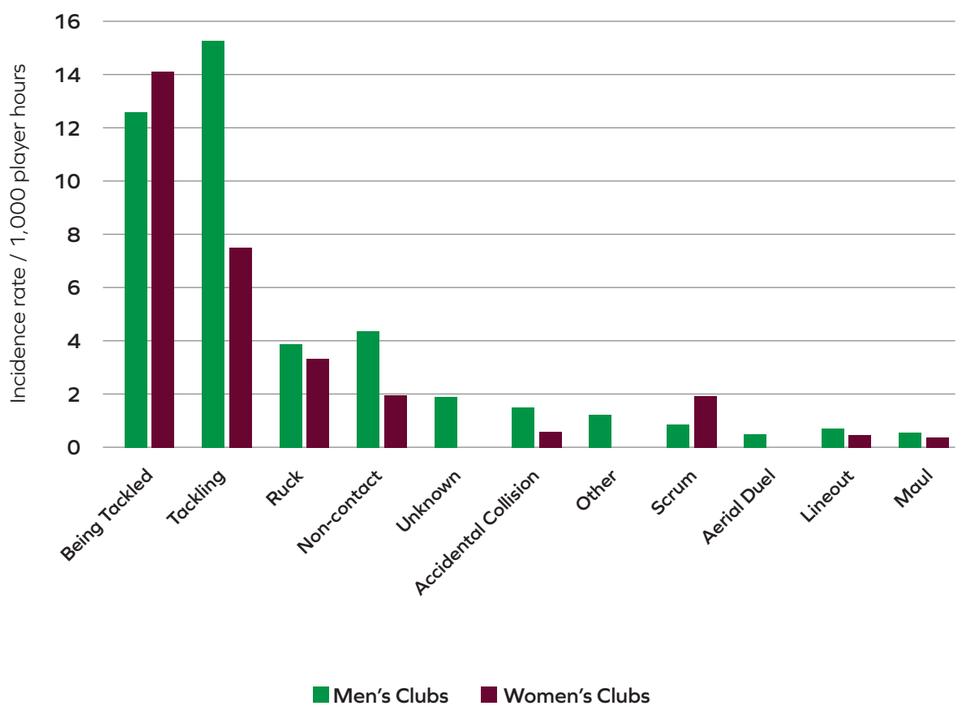

Figure 2: Injury event (IR/1,000 player hours)

3.5 Nature of Match Injury

The nature of injury refers to the type of injury occurring.

Strains (referring to muscle or tendon tears) were the most common injury type for the men's clubs, followed by sprains (referring to ligament tears). While strains and sprains have been the two most common types of injury in every season for the men's clubs, only the 2021-2022 season reported the men's clubs having sustained more sprains than strains. The women's clubs have reported more sprains in every season since 2017-2018.

The column labelled 'Other' refers to a small proportion of reported injuries including; joint fluid, hernia, or vascular injuries. Other injuries accounted for 2% of all men's injuries.

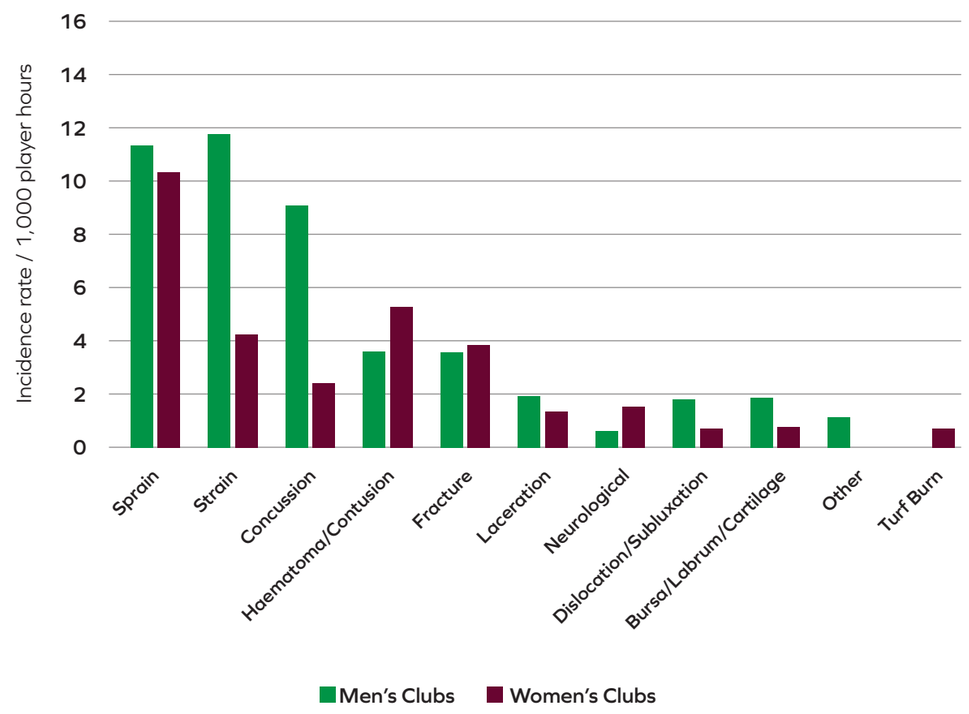

Figure 3: Nature of injury (IR/1,000 player hours)

3.6 Body Location of Match Injury

The head was the most commonly injured body area in the men's clubs again this year (2022-2023) accounting for 23% of injuries. The shoulder was ranked second this season at 12% of all injuries. The head and shoulder have both been within the three most common injury sites in each season to date (2017-2018, 2018-2019, 2019-2020, 2021-2022).

In 2022-2023, at 4.9/1,000 player hours, the posterior thigh saw its' highest rate of injury incidence reported in the men's clubs to date (2021-2022: 4.6; 2019-2020: 3.1; 2018-2019: 3.8; 2017-2018: 4.6/1,000 player hours).

Figure 4(a) shows the incidence of injury according to body location for the men's clubs.

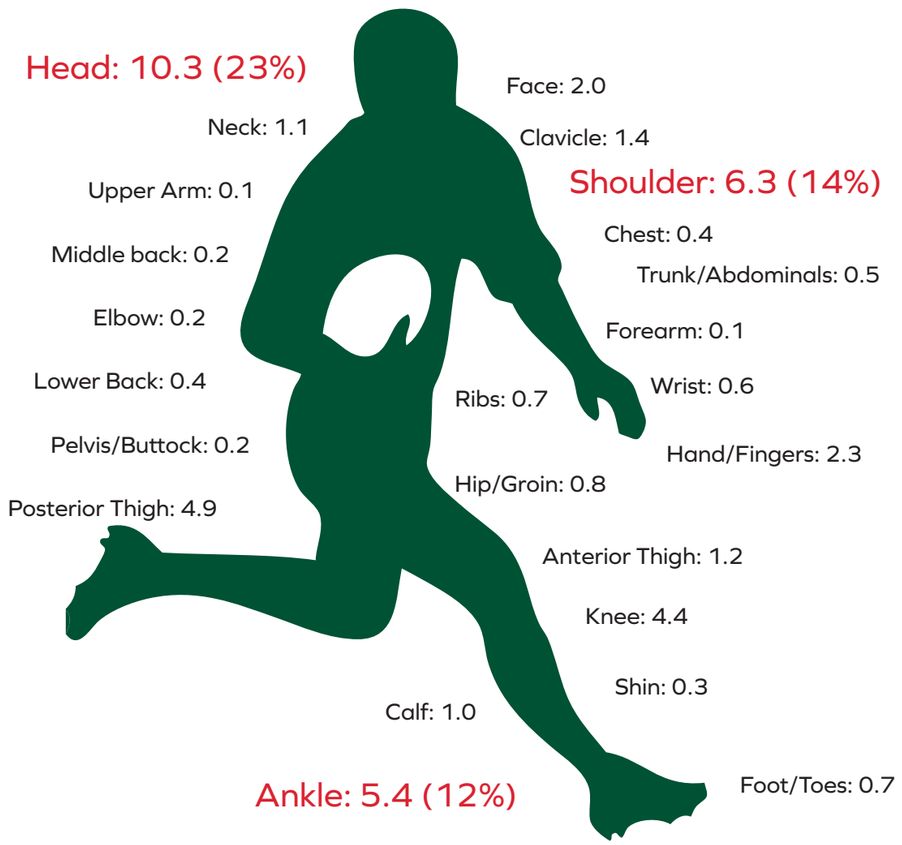

Figure 4(a): Location of injury for the men's clubs (IR/1,000 player hours)*

*accounts for separation of dual injuries and mathematical rounding

The ankle and knee were the most commonly injured areas in the women's clubs this season, each receiving 22% of injuries. This is followed by the head (8%) and neck (6%).

The ankle has been in the three most common injured locations in each season, with the highest rate reported this 2022-2023 season (2022-2023: 6.8; 2021-2022: 5.1; 2019-2020: 4.8; 2018-2019: 3.9; 2017-2018: 6.4/1,000 player hours).

Figure 4(b) shows the incidence of injury according to body location for the women's clubs.

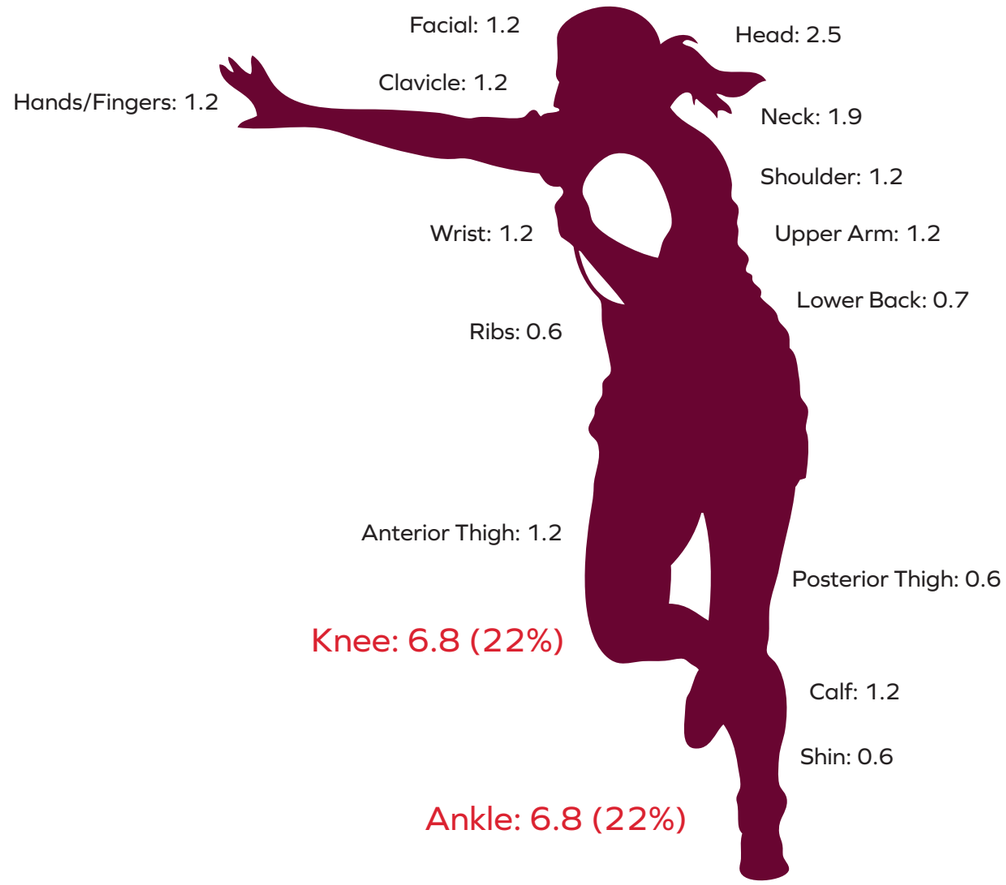

Figure 4(b): Location of injury for the women's clubs (IR/1,000 player hours)

*accounts for separation of dual injuries and mathematical rounding

3.7 Playing Position of Match Injury

Rugby player positions are split into 'forwards' (position no. 1-8) and 'backs' (position no. 9-15). In men's clubs, forwards sustained more reported injuries (60%) than the backs (40%) in the 2022-2023 season, in-line with the prior four seasons.

By position, the blindside flanker (no. 6) reported the most injuries, accounting for 10% of all match time-loss injuries for the men's clubs. The second row (no. 4) and hooker (no. 2) accounted for 9% of injuries each as seen in Figure 5(a).

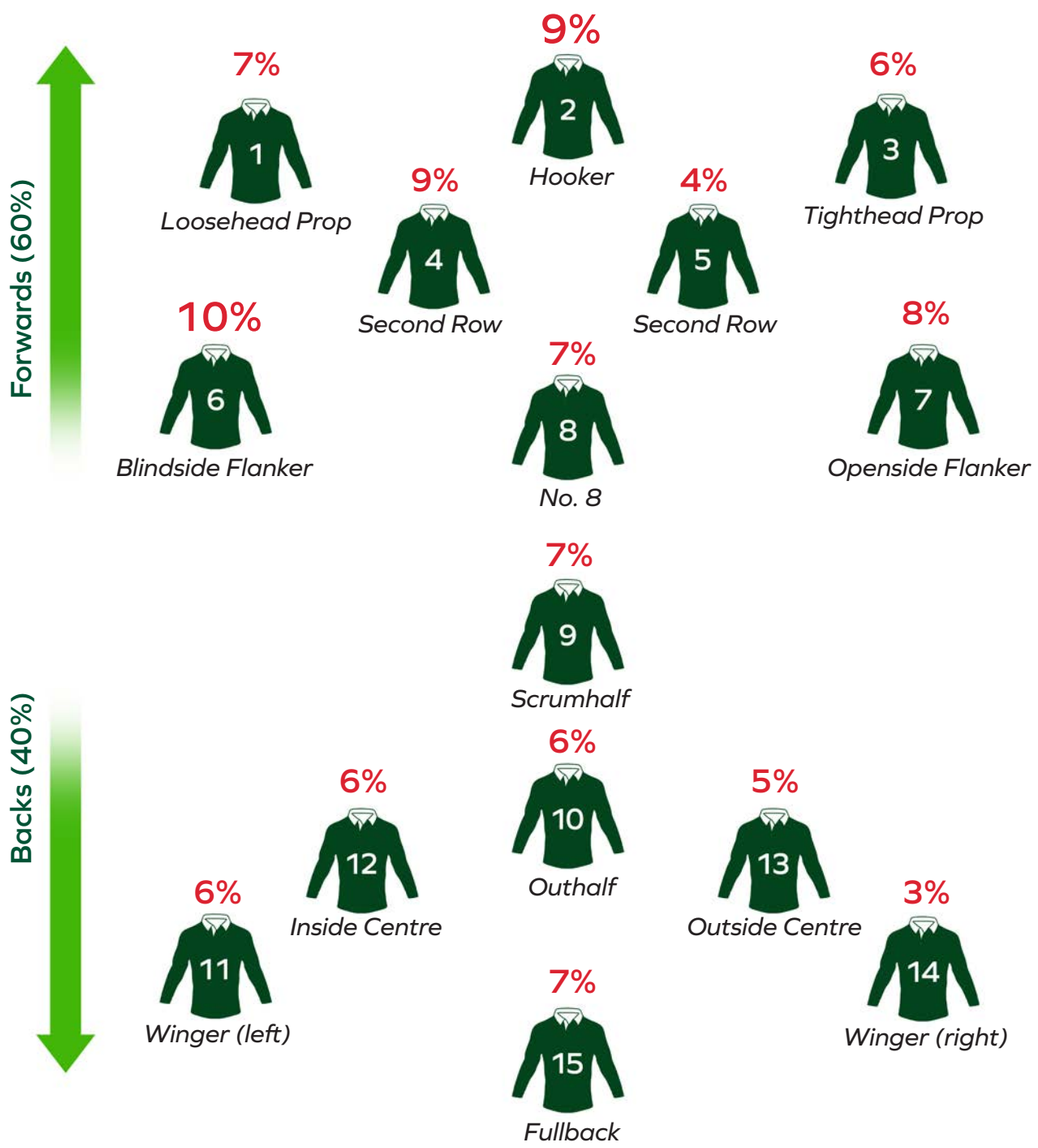

Figure 5(a): Percentage of injuries occurring per playing position in the men's clubs

Overall for the women's clubs, forwards sustained 55% of the injuries during the 2022-2023 season. The three positions that sustained the most injuries were the loosehead prop (no. 1) openside flanker (no. 7) and inside centre (no. 12) with 10% of all reported injuries each. In the 2021-2022 season, the blindside flanker (no. 6) and wing (no. 11) sustained the most injuries in the women's clubs with 17% of all injuries.

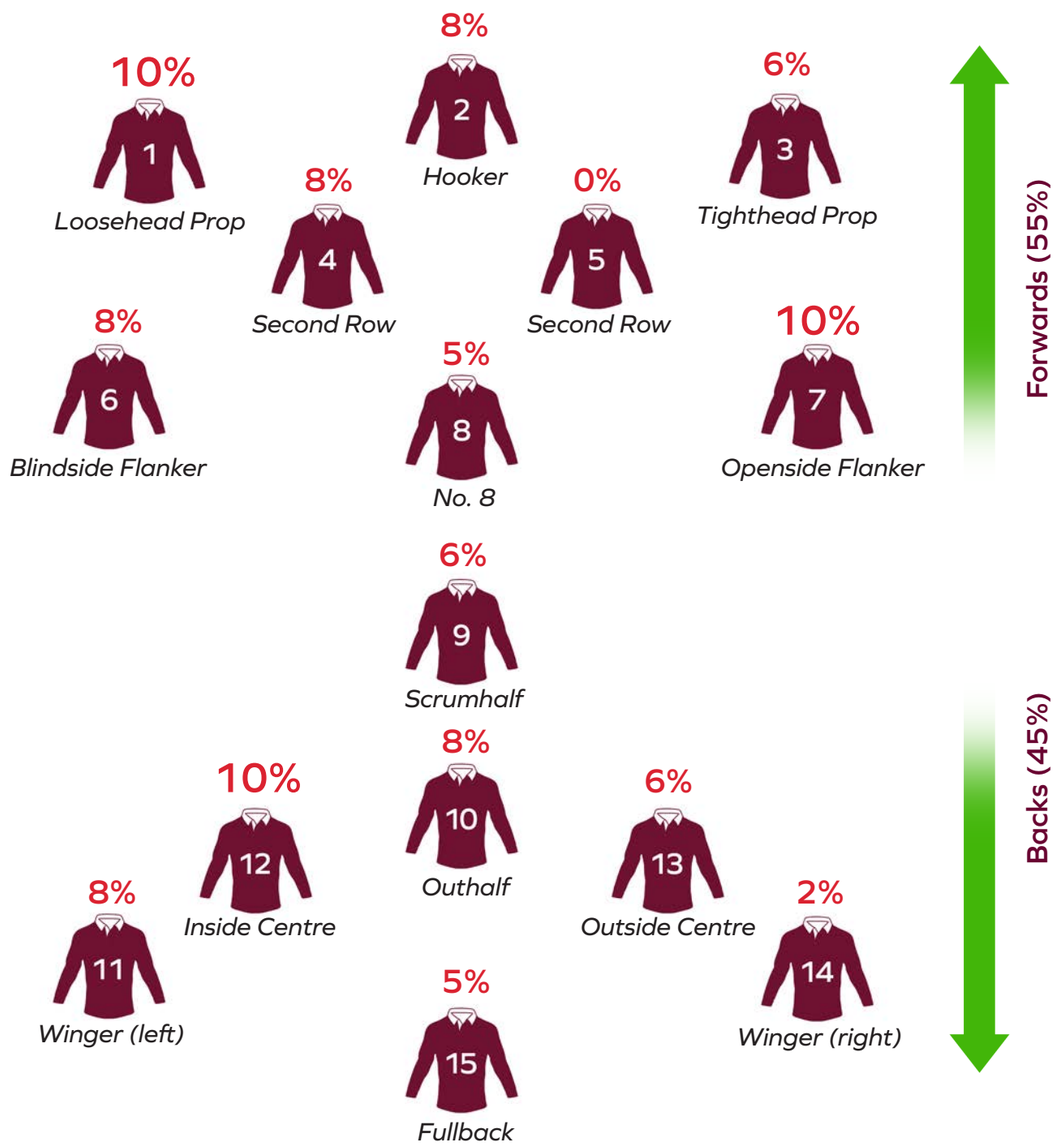

Figure 5(b): Percentage of injuries occurring per playing position in the women's clubs

3.8 Match Injury Severity

Injury severity was calculated as total number of days absent from Rugby match or training and classified according to the World Rugby Consensus guidelines.[2] In line with the 2019-2020 and 2021-2022 seasons, most injuries had 'moderate' or 'severe' time-loss for both men's and women's clubs, as shown in Figure 6.

Slight injuries (0-1 days absence) were considered as 'medical attention' injuries and were not included in analysis of time-loss injuries.[2] Slight injuries are discussed in more detail in sub-section 3.10.

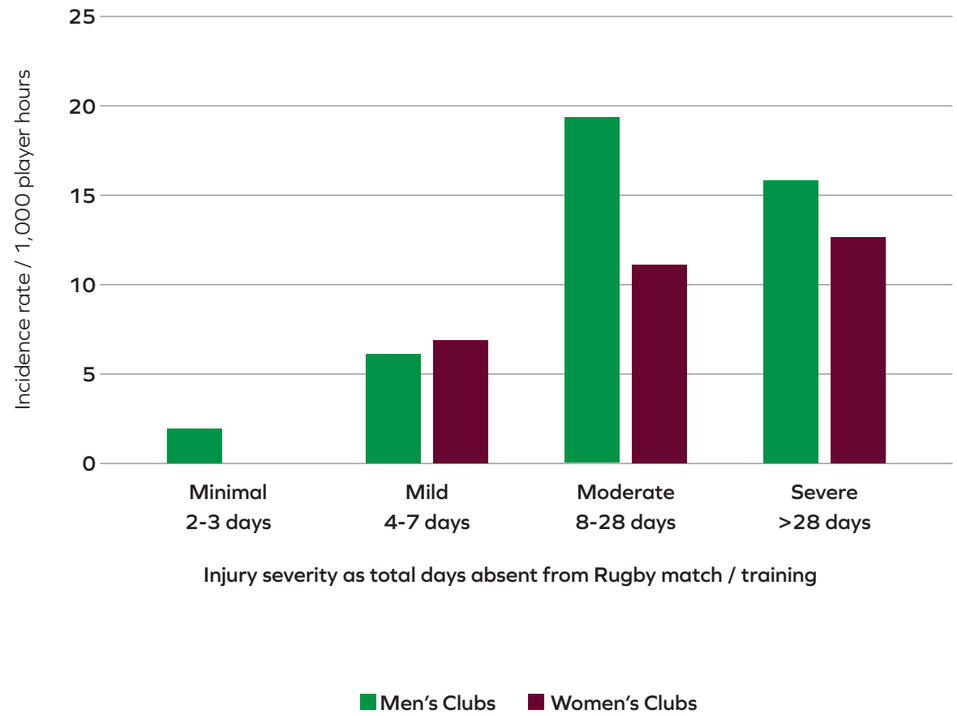

Figure 6: Injury severity of time-loss injuries (IR/1,000 player hours)

3.9 Match Injury Burden

The burden of an injury assesses the incidence rate of an injury in relation to the average severity of the injury ([IR] x [average number of days' absence]).

Concussions carried the greatest burden of all match injuries for the men's clubs (273 days/1,000 player hours) in 2022-2023, compared to knee sprains carrying the greatest burden in 2021-2022 (250 days/1,000 player hours). For women's clubs in 2022-2023, knee sprains carried the greatest injury burden (739 days/1,000 player hours). In the 2021-2022 season, toe fractures contributed to the greatest burden among women's clubs at 232 days/1,000 player hours.

Knee sprains had the second greatest injury burden this year for men's clubs, with a rate of 253 days/1,000 player hours. This included two ACL tears which themselves had an average 486 total days off. For women's clubs, ankle fractures had the second greatest injury burden with a rate of 299 days/1,000 player hours.

For the men's clubs, concussions resulted in an average of 30 days' (compared to 38 days in the 2019-2020 season and 27 days in 2021-2022) absence from Rugby match or training, and 31 days' (compared to 53 days in the 2019-2020 season and 51 days in 2021-2022) average absence for the women's players.

Table 8 shows the highest injury burden and average total days off (severity) for all the men's and women's clubs.

Table 8: Diagnosis, Injury Burden (days absence/1,000 player hours), average TDO (total days off)

	Diagnosis	Injury Burden	Average TDO
Men's Clubs	Concussion	273	30
	Knee sprains	253	119
	Ankle sprains	168	34
Women's Clubs	Knee sprains	739	199
	Ankle fractures	299	161
	Concussion	77	31

3.10 Medical Attention Match Injury (slight injury)

Any injuries resulting in 0-1 days' absence from Rugby match or training are considered as slight or 'medical attention' injuries, therefore were excluded from the analysis of time-loss injuries as per international best practice.[2]

During the 2022-2023 season, 11 medical attention injuries were recorded in the men's clubs, with an additional 3 recorded for the women's clubs.

The overall team match medical attention injury incidence rates:

- Men's AIL clubs – 1.1/1,000 player hours
- Women's AIL clubs – 1.9/1,000 player hours

Table 9: Match medical attention injuries (slight injuries) per division

Division	No. Clubs	No. Players	No. Matches	Exposure Hours	No. Injuries	IR*
Men's AIL 1	10	400	231	4608	5	1.1
Men's AIL 2	12	478	265	5287	6	1.1
Overall men's clubs	**22**	**878**	**496**	**9895**	**11**	**1.1**
Women's AIL	4	139	81	1616	3	1.9
Overall women's clubs	**4**	**139**	**81**	**1616**	**3**	**1.9**

*Incidence rate per 1,000 player hours

Lacerations had the highest incidence rate (0.3/1,000 player hours) for all types of medical attention injuries for the men's clubs.

All women's medical attention injuries were haematoma/contusions (1.9/1,000 player hours).

For the men's clubs, 55% of medical attention injuries were to the head and face. Whereas, for the women's clubs, the three haematoma/contusions were to the head, knee and other.

The tackle event accounted for the majority of medical attention injuries in the men's clubs (1.0/1,000 player hours) and women's clubs (1.2/1,000 player hours), majority of which occurred to the tackler.

3.11 New & Recurrent Injury

The majority of all injuries were 'New' compared to 'Recurring'. For all medical attention injuries across the men's and women's clubs, 100% were new injuries. For time-loss injuries reported in the men's clubs, new injuries accounted for 95%, with 86% in the women's clubs recorded as new.

3.12 Other Match-day Related Injury

A small proportion of injuries occurred during the match warm-up and these were not included in the analysis of the match injury incidence, as only injuries occurring during the match play counted as match injuries.

In the men's clubs, 13 warm-up injuries were reported, all were time-loss. For the women's clubs, there were 2 warm-up injuries reported, both of which were time-loss. Of these, 2 were non-contact, 1 from tackling, 1 accidental collision, and 3 were unknown mechanisms. Non-contact mechanisms were most responsible for warm-up injuries in the men's clubs (46%) and women's clubs (100%).

4.0 Training Injury

4.1 Overall Time-loss Training Injury

For the 2022-2023 season, training injury data from the 26 clubs (22 men's and 4 women's) were also collected. For operational reasons, as the frequency and duration of training sessions were not recorded, training injury incidence rates are not available. Therefore, the total number of training injuries that occurred are reported.

Any injuries resulting in 0-1 days absence from Rugby match or training activities were considered to be medical attention injuries and are not included in the analysis of time-loss injuries, as per international best practice.[2]

The overall number of training injuries for the men's clubs was 116, while the overall number of training injuries for the women's clubs was 16.

Table 10 shows the overall number of training injuries for the Division One men's clubs (Men's AIL 1), the Division Two men's clubs (Men's AIL 2) and the women's clubs (Women's AIL).

Table 10: Training time-loss injuries (excluding slight injuries)

Division	No. Clubs	No. Players	No. Injuries
Men's AIL 1	10	400	64
Men's AIL 2	12	478	52
Overall men's clubs	**22**	**878**	**116**
Women's AIL	4	139	16
Overall women's clubs	**4**	**139**	**16**

4.2 Training Injury Classification

The injury diagnosis refers to the specific body location and nature of the injury.

The most common injury diagnosis for the men's clubs was posterior thigh strains, accounting for 18% of all training time-loss injuries. This was followed by ankle sprains, accounting for 11%, and concussions which accounted for 6% of training injuries. Calf strains, shoulder sprains, knee sprains, and hand/finger fractures accounted for 5% of training injuries each.

Shoulder strains accounted for the most common training time-loss injury for the women's clubs.

Table 11 and 12 show the top three most common specific training time-loss injury diagnoses for both the men's and women's clubs over the past five seasons.

Table 11: Overall most common training injury diagnoses for the men's clubs (% of injuries)

Men's Clubs				
2022-23	**2021-22**	**2019-20**	**2018-19**	**2017-18**
Hamstring strains (18%)	Ankle sprains (20%)	Hamstring strains (23%)	Hamstring strains (13%)	Hamstring strains (12%)
Ankle sprains (11%)	Hamstring strains (16%)	Ankle sprains (13%)	Ankle sprains (12%)	Ankle sprains (11%)
Concussion (6%)	Groin strains (7%)	Calf strains (6%)	Calf/Achilles strains (10%)	Groin strains (11%)
-	-	Knee tendon strains (6%)	-	-
-	-	Quadriceps contusions (6%)	-	-

Table 12: Overall most common training injury diagnoses for the women's clubs (% of injuries)

Women's Clubs				
2023-23	**2021-22**	**2019-20**	**2018-19**	**2017-18**
Shoulder strain (18%)	Ankle sprains (22%)	Finger fractures (29%)	Hamstring strains (18%)	Ankle sprains (19%)
Ankle sprain (12%)	Hamstring strains (22%)	Sternoclavicular sprains (14%)	Concussions (18%)	Hamstring strains (13%)
Foot/Toe sprain (12%)	-	Neck strains (14%)	-	Lumbar spine strains (13%)
	-	Wrist strains (14%)	-	-
	-	Lumbar herniation (14%)	-	-
	-	Finger nerve damage (14%)	-	-

Table 13 shows the top three most common specific training time-loss injury diagnoses for each of the men's divisions (Division 1 and Division 2).

Table 13: Most common training injury diagnoses for each men's Division 1 and Division 2 (% of injuries)

Men's AIL 1	Men's AIL 2
Hamstring strain (15%)	Hamstring strain (21%)
Ankle sprain (9%)	Ankle sprain (13%)
Concussion (7%)	Calf strain (8%)
Hand/finger fracture (7%)	-
Shoulder sprain (7%)	-

4.3 Body Location of Training Injury

Overall, the posterior thigh (18%) was the most common injury site in the men's clubs, followed by the ankle (13%) and knee (13%). The 2021-2022 season's report showed similar rankings, with the ankle (20%) and posterior thigh (17%) most common.

Figure 7(a) shows the incidences of training injury according to body location for the men's clubs

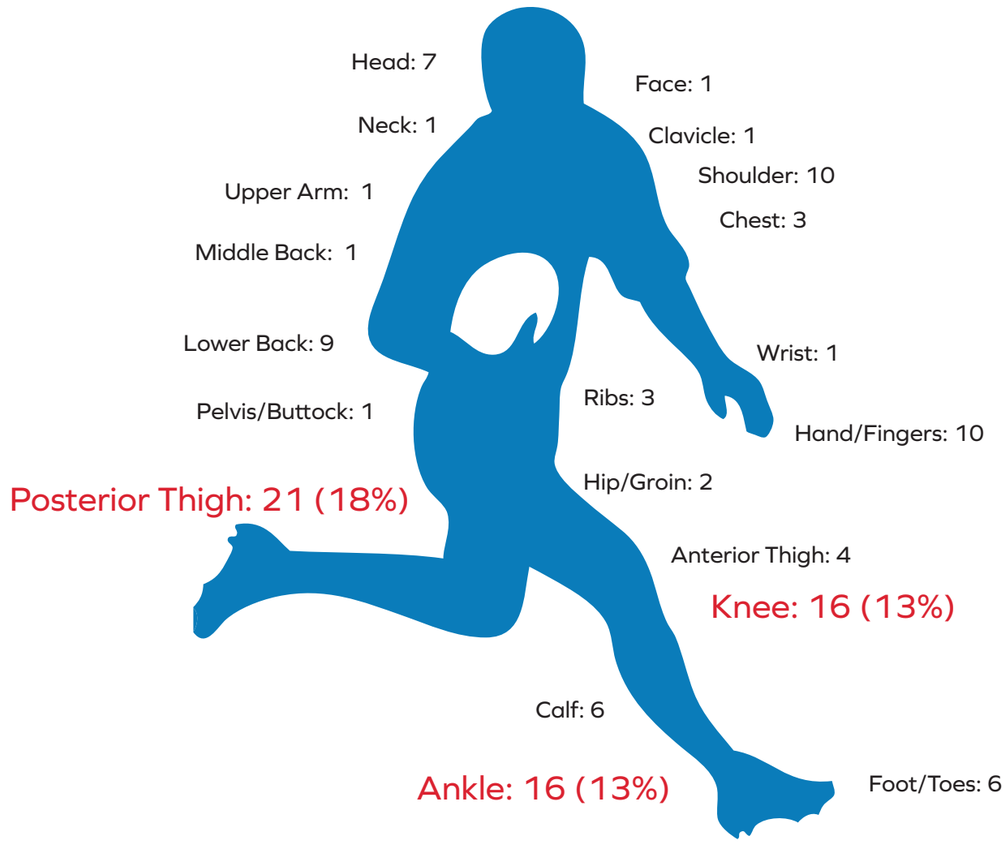

Figure 7(a): Location of training injury for the men's clubs (number of injuries)

In contrast to the men's clubs in 2022-2023, the women's clubs saw the majority of training injuries occur at the shoulder (29%). These data are different than the 2021-2022 season where the posterior thigh (22%) and ankle (22%) were the most common locations of injury in the women's clubs.

Figure 7(b) shows the incidences of injury according to bodily location for the women's clubs.

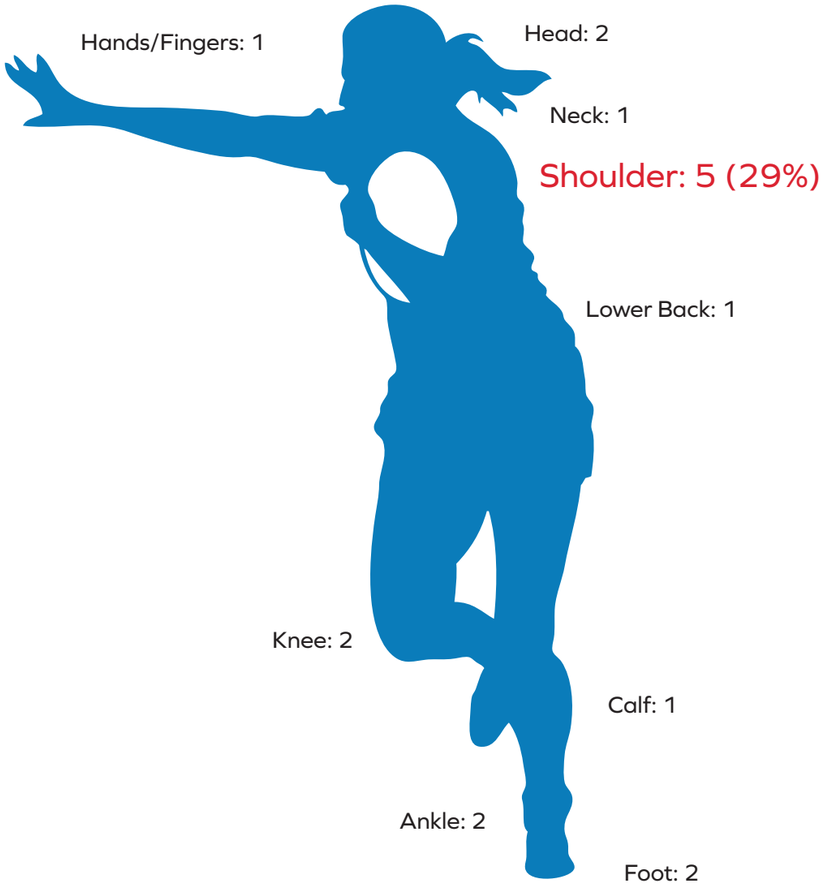

Figure 7(b): Location of training injury for the women's clubs (number of injuries)

4.4 Nature of Training Injury

The nature of injuries refers to the type of injury occurring.

In all five seasons to date, sprains (referring to ligament injuries) and strains (referring to muscle or tendon injuries) have been responsible for the majority of training injuries in the men's clubs. In 2022-2023, women's clubs also experienced most injuries as sprains and strains, with other seasons more evenly distributed across natures. Figure 8 represents data from this season.

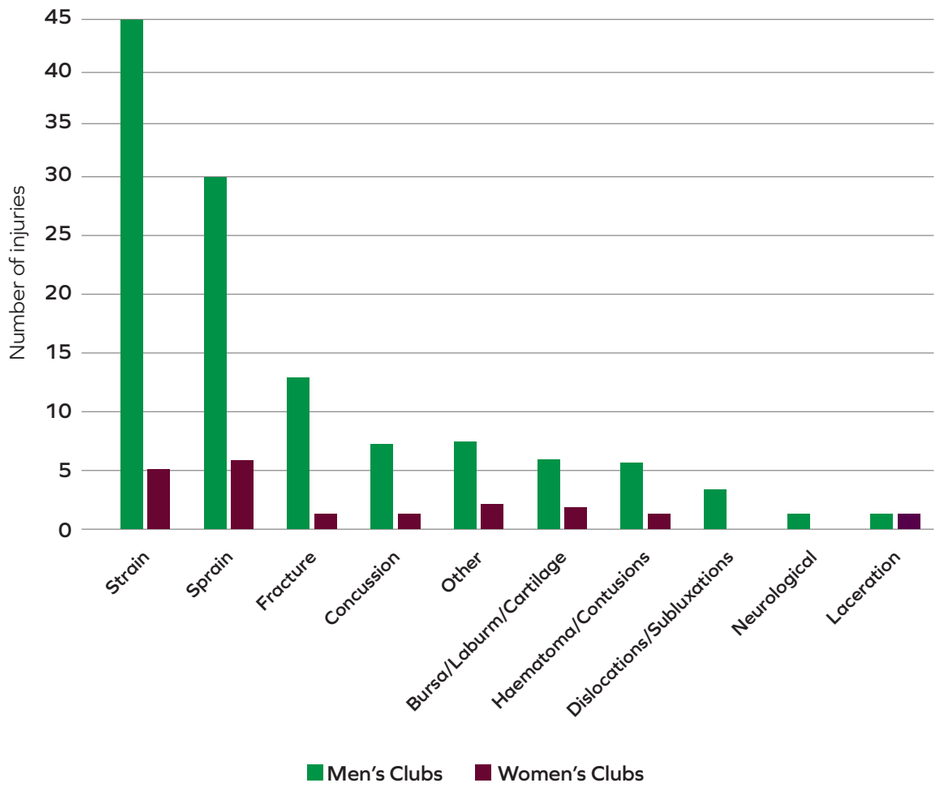

Figure 8: Nature of training injury (number of injuries)

4.5 Training Injury Event

Figure 9 shows the events surrounding the occurrence of an injury.

The training event responsible for the most men's injuries this season was non-contact mechanisms, accounting for 34%. The tackle event was second most common, with the tackler sustaining (17%) more than the ball-carrier (14%). For women's clubs, non-contact mechanisms were responsible for 38% of training injuries. As shown in Figure 9, the tackle event also contributed to a large proportion of training injuries. The tackler sustained more injuries than the ball-carrier which is in contrast to match data.

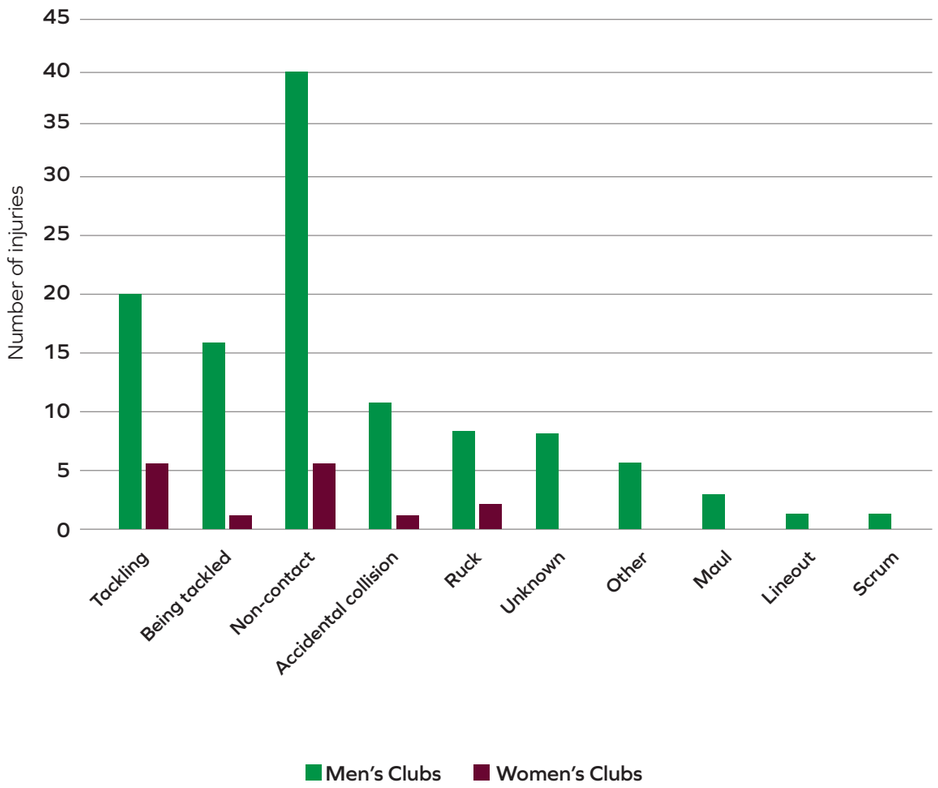

Figure 9: Training injury event (number of injuries)

4.6 Training Injury Severity

Injury severity was calculated as total number of days absent from Rugby match or training and classified according to the World Rugby Consensus guidelines.[1] The majority of training injuries were moderate or severe, as shown in Figure 10. This is a similar distribution to the data from 2021-2022.

Slight injuries (0-1 days' absence) were considered as 'medical attention' injuries and were not included in analysis of time-loss injuries, as per international best practice.[2] Slight injuries are discussed in more detail in sub-section 4.8.

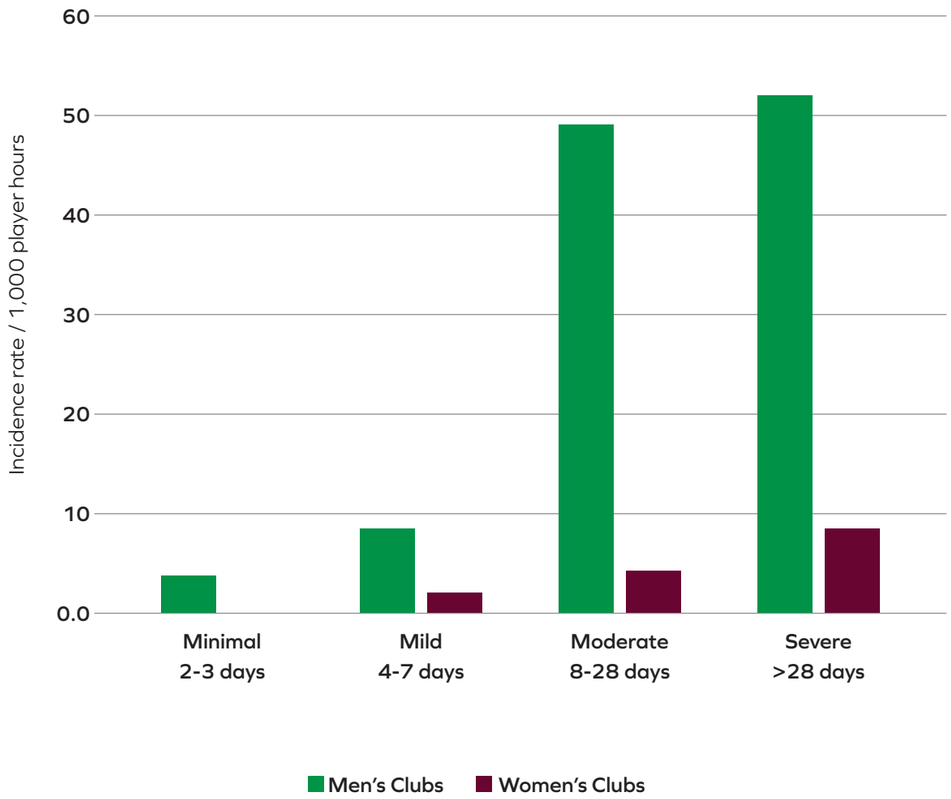

Figure 10: Training injury severity (number of injuries)

4.7 Training Injury Burden

The burden of an injury assesses the incidence rate of an injury in relation to the average severity of the injury ([IR] x [average number of days' absence]). However, because exposure rates were not collected for training, incidence rates were not able to be calculated.

For training injuries reported in the men's clubs, hamstring strains represented the highest frequency of diagnosis (18%), and had an average days' absence of 32 days. For the women's clubs, shoulder strains accounted for the most frequent diagnosis (18%) and had an average days' absence of 17 days.

Table 14 represents the number of injury occurrences and average number of total days off per diagnosis.

Table 14: Diagnosis, number of training injuries, average TDO (average total days off)

	Diagnosis	Number of Injuries	Average TDO
Men's Clubs	Concussion	7	98
	Hamstring strain	21	32
	Ankle sprain	13	28
Women's Clubs	Foot/toe sprain	2	125
	Ankle sprain	2	34
	Shoulder sprain	3	17

4.8 Medical Attention Training Injury (slight injury)

Any injury resulting in 0-1 days absent from Rugby match or training is considered a slight, or 'medical attention' injury and therefore were excluded from the analysis of time-loss injuries, as per best international practice.[2]

During the 2022-2023 season, three medical attention injuries were reported from training activities from the men's clubs, but none were reported in the women's clubs. Slight injuries reported from training continue to be low similar to previous seasons, 2021-2022 reporting only 1 from men's clubs, 2019-2020 season reporting 1 injury each for both men and women, and the 2018-2019 season reporting 4 injuries for the men's clubs and 0 for the women's clubs.

Table 15: Training medical attention injuries

Division	No. Clubs	No. Players	No. Injuries
Men's Clubs	22	878	3
Women's Clubs	4	139	0

5.0 Future Directions of the IRIS Project

Following four successful seasons of the IRISweb system, the IRIS project continued and completed its fifth season of data collection during the 2022-2023 campaign. Recruitment continued in the men's AIL across both Division One and Division Two, expanding a greater reach across Ulster and Connacht. Recruitment in the women's clubs will continue to expand across the women's AIL. The Irish Rugby Football Union has opted in to the World Rugby Tackle Height Law Trial that will run for two years across adult amateur and also age-grade (schools) Rugby. IRIS will provide season comparison data at the end of year one and year two, comparing pre-trial injury rates with post-trial injury rates.

The IRIS Project began a study in the senior amateur club 2021-2022 season measuring injury epidemiology and programme adherence for an intervention programme called ENGAGE. ENGAGE is a bespoke Rugby readiness and robustness programme which aims to improve overall player performance and reduce injury risk. Through a structured and progressive 3-phase programme, ENGAGE prepares players for the immediate training ahead and duration of the competitive matches across the season. IRIS plan to explore this programme in the underage schools game in future seasons, with a heightened focus on coach support for programme delivery.

The IRIS project has also commenced a survey into impact-related breast injuries in adult female players in Ireland and internationally. This information will help inform all involved in the women's game regarding the prevalence of breast pain and injury and raise knowledge and awareness.

6.0 Glossary of Terms

Ankle sprains are inclusive of lateral, medial and high ankle sprains. ATFL sprain (anterior talo-fibular ligament sprain) refers to a tear of the ligament located on the outside of the ankle joint. It is also called an inversion sprain or lateral ligament sprain.

Calf/Achilles strain refers to a tear of one or more of the muscle groups located on the back (posterior aspect) of the lower leg.

Finger nerve damage refers to an injury to any nerve(s) located in the fingers.

Finger sprain refers to a tear or overstretch of the ligaments that connect the bones of the finger joints.

Foot/toe sprain refers to a tear or overstretch of the ligaments that connect the bones of the foot joints.

Fracture refers to a partial or complete break in the continuity of bone.

Groin strain refers to a tear of primarily the iliopsoas or adductor muscle group.

Haematoma/contusion refers to a bruise located anywhere in the body.

Hamstring strain refers to a tear of the muscle group located on the back (posterior aspect) of the thigh.

Knee sprains are inclusive of all ligaments of the knee (anterior cruciate ligament or ACL, posterior cruciate ligament or PCL, medial collateral ligament or MCL, and lateral collateral ligament or LCL).

Knee tendon strain is a tear or overstretch to one of the two tendons in the knee joint (patellofemoral or quadriceps tendon).

Laceration refers to a cut or tear in the skin.

Lumbar herniation refers to damage to the discs that are located between each of bones in the lower back. The most common type of injury to the lumbar discs are tearing or bulging.

Lumbar spine strain refers to a tear or overstretch to one of the muscles or tendons in the lower back region.

Neck strain is a tear or overstretch to one of the muscles or tendons in the neck region.

Quadriceps contusion is a deep bruise in the muscle group at the front of the thigh.

Rotator cuff strain refers to a tear of any of the four tendons that surround the shoulder joint.

Shoulder dislocation/subluxation refers to either partial or complete separation of the upper arm bone (humerus) from the shoulder socket (glenoid fossa).

Shoulder sprain refers to a tear in one of the ligaments in the shoulder (glenohumeral) joint.

Sternoclavicular joint sprain is a tear of the ligament that connects the breastbone (sternum) to the collar bone (clavicle).

Turf burn refers to an abrasion or skin injury resulting from friction or pressure from the playing surface.

Wrist strain refers to a tear or overstretch to one of the muscles or tendons surrounding the wrist joint.

7.0 Publications and Conferences

7.1 Journal Publications

Guilfoyle L., Kenny I.C., O'Sullivan K. and Comyns T.M. (20xx) Coaches of youth field-sports as delivery agents of injury prevention programmes: how are we training the trainers? A systematic scoping review. British Journal of Sports Medicine. Xx(x), xxx-xxx [under amendments review]

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7.2 Conference Communications

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Kenny, I.C., Billingham, T., Dolan, P., Cahalan, R., Warrington, G.D., Yeomans, C., Glynn, L., Campbell, M.J., Lyons, M., Harrison, A.J., Purtill, H., Mulvihill. J.J.E. and Comyns, T.M. (2023) Four Year Analysis of Playing Surface Relationship to Injuries in Adult Amateur Rugby Union. Proceedings of the National Sport & Human Performance Conference 2023, 29 September 2023, Limerick, Ireland.

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