



The definitions and use of the injury record within the Athlete Management System

Data Dictionary

Version 2.1

Approved 30 June 2020



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Version 2.1 – Notice of variation

The definitions and use of the injury record within the Athlete Management System: Data Dictionary Version 2.1 provides an updated version to the preceding *Version 2* of this document, which was approved and published by the Australian Institute of Sport on 1 October 2019. *The definitions and use of the injury record within the Athlete Management System: Data Dictionary Version 2.1*, includes minor amendments that have been subsequently made to the *AMS injury record* form and a small number of minor modifications made to the definitions and recommendations outlined in the preceding *Data Dictionary Version 2*.

The minor amendments included within the *Data Dictionary Version 2.1* were made to ensure that this document and its recommendations are aligned to the *International Olympic Committee consensus statement: methods for recording and reporting of epidemiological data on injury and illness in sport 2020 (including STROBE Extension for Sport Injury and Illness Surveillance (STROBE-SIIS))*¹ that was first published on 18 February 2020. The International Olympic Committee (IOC) consensus statement, involving 27 world-leading experts, was commissioned by the IOC to provide systematic and methodologically appropriate recommendations for conducting injury and illness surveillance in sport.

Following the publication of the IOC consensus statement, the *AMS injury record* form and *The definitions and use of the injury record within the Athlete Management System: Data Dictionary Version 2* document were critiqued to ensure that they were consistent with the IOC consensus statement's recommendations. A small number of minor differences in either terminology used or data captured between these resources were identified. A number of small amendments to the *AMS injury record* form and the *Data Dictionary Version 2* document were consequently made. These minor amendments are individually detailed in **Appendix 3** (p.49). The content within this document incorporate these changes.

In addition, there were a small number of recommendations made in the IOC consensus statement that were consistent with the **Future directions** section of the *Data Dictionary Version 2* document. A number of these recommendations have now been actioned and are included within this document. It is acknowledged that the small number of remaining recommendations are important and work is underway to incorporate these within the AMS. Further detail on these recommendations are included below in the **Future directions** section of this report (p.43).



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Please contact ams@ausport.gov.au if errors or omissions are found.
These will be corrected and included in the later editions.



Background

On 16 October 2014, the *Data Dictionary for the National Injury and Illness Database, Version 1* was released as a component of the Australian Institute of Sport (AIS) Best Practice Protocol. The purpose of the 10-page document was to describe the variables contained within the Athlete Management System (AMS) that pertained to injury and illness. This inaugural version of the AIS Data Dictionary provided an update for the use of injury definitions and surveillance within Australian National Sporting Organisations (NSOs). The minimum dataset collection criteria for sports injury developed by the Australian Sports Injury Data Working Party and published as the Australian Sports Injury Data Dictionary (ASIDD) in 1998^{2,3} was used as a basis for the AIS Data Dictionary document, which was adapted to be applicable to the high performance setting. Version 1 of the Data Dictionary provided Australian NSOs and clinical staff across the National Institute Network (NIN) with a resource to provide improved clarity surrounding definitional issues related to sports injury for elite sport in Australia.

Since the release of Version 1, five years ago, there has been a substantial amount of research undertaken within both Australia and internationally that provides new information and further clarity related to sports injury definitions and surveillance methods. There has also been a substantial increase in the uptake and use of the AMS to conduct injury surveillance across NSOs and the NIN. The increasing awareness of the importance of achieving high quality and consistent longitudinal surveillance as the first stage of evidence-based injury prevention,^{4,5} has also led to an increasing interest in using the collected epidemiological data to help review seasonal trends and direct injury prevention strategies. Concurrently with this increased use of collected injury data, an update of the AIS Data Dictionary has been requested by many NSOs and NIN service providers to clarify new issues that have arisen regarding injury definition issues and to determine a revised benchmark for the minimum requirement of data entry regarding injury records.

Overview

Professional record keeping and the AMS

The recording and documentation of the details relating to each athlete consultation is a requirement for physiotherapists and medical doctors practicing within Australia under the guidelines provided by the Physiotherapy Board of Australia⁶ and the Medical Board of Australia,⁷ in conjunction with the Australian Health Practitioner Regulation Agency (AHPRA), under section 39 of the Health Practitioner Regulation National Law Act 2009.⁸ The AMS provides a platform that fulfils the medico-legal requirements relating to the collection and storage of medical records and is the platform where all injury and illness records should be recorded for athletes aligned with an NSO or NIN. Completion of the injury records by clinicians (doctors and physiotherapists) as a component of their routine workflow after consultation with injured or unwell athletes, contributes clinical data that are organised into a structured format and stored within the AMS that allow it to be used for epidemiological purposes too. The nationalised system allows for the health records of an athlete to be captured and stored within the one system, which assists in providing transparency in the transition of care if an athlete moves between clinical providers during their career. While satisfying the medico-legal requirements of medical record taking is an objective of the AMS, this objective is only one facet that the AMS aims to achieve relating to athlete health.

National injury surveillance system

A major objective within the healthcare of athletes is to minimise risk of ill health, while optimising health in contributing to performance outcomes. It has been well established that injuries impair both individual and team performance.⁹ The availability of an athlete to train and compete is necessary to achieve performance goal success and reduce the probability of failing to accomplish the benchmarks set to measure seasonal performance.¹⁰ For team sports, athlete availability for training and competition has been consistently demonstrated to correlate with the performance metrics of increased scoring,^{11,12} higher ladder position,^{11,12} and winning.¹¹⁻¹⁵ Injury and reduced performance are inherently linked, as injury is usually associated with a reduction in physical capacity, opportunities for skill acquisition, general conditioning, and psychological state.¹⁵⁻¹⁸

The AIS prioritises prevention of injury to improve athlete availability within NSOs and the NIN, as a means to facilitate the achievement of sustained high performance outcomes. A key objective of the AMS is to deliver high quality



longitudinal injury surveillance to satisfy the first stage of the Translating Research into Injury Prevention Practice (TRIPP)⁴ framework for the prevention of sports related injury. The AMS is a repository of all athletic information including but not limited to training, competition, anthropometric, physiological, epidemiological and medical data. The AMS has been constructed to facilitate the collection and storage of these data in structured formats to enable consistent injury recording methods and to allow the data to be systematically reviewed, trends to be monitored and accurate reporting to occur. Consistent longitudinal injury surveillance provides data to identify areas of concern and direct prevention resources to areas of the greatest burden.

Intended purpose of this document

The intent of this document is to deliver an update to Version 1 of the AIS Data Dictionary provided in 2014, in response to the requests made by staff of many NSOs and across the NIN. This document aims to combine a 'gold standard' of surveillance procedures and principles with operational efficiency for the clinician who is required to enter the data and maintain record accuracy. As a result of improving the reporting processes across Australian sports, the sporting system will be in a greater position to progress through the prevention process to optimise athlete health and improve the probability of achieving success.

Objectives of this document

1. Define the definitions of the variables collected within the AMS injury record form
2. To outline the minimum requirement for data collection pertaining to health records with the AMS
3. Provide solutions for challenges commonly raised by NSO and NIN staff relating to injury surveillance and best practice methods
4. Outline suggested methods for analysing and reporting AMS injury data
5. Inform the direction for prevention programs and research supporting high performance sport in Australia



SECTION 1: DEFINITIONS



Executive summary: definitions

Medical attention injury

“Tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy that results in an athlete receiving medical attention.”

Sports-incapacity (time-loss) injury

“Tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy that results in an athlete being unable to complete the current or future training session or competition.”

Athlete self-report injury

“A sensation of pain, discomfort, or loss of functioning associated, by an athlete, related to exposure to sports training or competition having an intensity and quality that leads to the sensation being interpreted by the athlete as discordant with normal body functioning.”

Subsequent injury

“An injury that occurs following the occurrence of a previous (index) injury, irrespective of the type of injury.”

Recurrent injury

“An injury that occurs after an index injury that is of the same type and to the same body site, following a player’s return to full participation from the index injury.”

Full training and competition

“Unrestricted participation in the primary mode of training or competition at an equivalent level to pre-injury/illness when at full capacity, as planned by coaching staff if the athlete was uninjured/healthy.”

Modified training or competition

“Any reduction from pre-injury/illness full capacity or restriction to an athlete’s participation in training or competition, as planned by coaching staff, that is based on medical restriction and relates only to the primary mode of training.”

No training or competition

“The athlete is completely unable to participate in the primary mode of training or competition based on medical advice.”



Sports injury definitions

Background

Understanding and defining 'what is a sports injury' is critical in sports injury surveillance, as different definitions and terminology are commonly applied and used interchangeably.^{19 20} The injury definition used has implications for the analysis and the outcomes drawn from the data collected within sports injury surveillance.^{21 22} Over the past 13 years, a number of individual sports have attempted to provide clarity for clinicians working within the sport and guidance for researchers conducting sport-specific injury investigations through the publication of consensus statements for injury definitions and surveillance methods.²³⁻²⁷ These consensus guidelines provide a good foundation for injury surveillance, however there remains inconsistencies in the definitions and terminology used between sports, which can lead to further ambiguity and difficulties when comparing injury findings between sports.²⁰ The clinical staff of various NSOs and NIN sites have adopted various injury definitions over previous years, which has created discrepancies in the methods for reporting injuries. The selection of the injury definition used within a surveillance system is one critical factor that affects the outcome of the reported events.²⁸ The most appropriate definition of a sports injury has been well debated over recent years, with a trade-off existing between the ability to capture a broad range of injuries with reduced reliability versus the ability to capture a narrow range of injuries that have a high degree of reliability. The *International Olympic Committee consensus statement: methods for recording and reporting of epidemiological data on injury and illness in sport 2020 (including STROBE Extension for Sport Injury and Illness Surveillance (STROBE-SIIS))*,¹ defines an injury as "tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy" (p.3).

In 2014, Timpka et al., (2014), proposed three definitions to encompass the mixed use of terms relating to the broader concept of *sports impairment*. Sports impairment is defined by the World Health Organisation's (WHO) classification of the International Classification of Functioning, Disability, and Health (ICF), as a loss of body functions or deviation of structure caused by the transfer of energy during participation in sport.²⁹ The concept of sports impairment acted as a foundation for further classification of sports injury relating to the wider perspectives of health services, the athlete and sport institutions. The conceptualised sports injury definitions provided by Timpka et al., (2014) according to these three different perspectives are: (i) **time-loss** (sports incapacity) injuries, (ii) **medical attention** (clinical examination) injuries, and (iii) **athlete self-report** injuries. The three injury definitions are not mutually exclusive to each other, with the interrelation between these injury definitions having been previously represented visually within the literature (Figure 1).²⁸ When comparing injury data across other squads or sports, it is critical to clarify what injury definition has been used as different injury definitions are often used in parallel, which warrants additional precaution in the interpretation of study findings and when comparison between studies is undertaken.²⁰ The use of these three injury definitions is recommended by the IOC consensus statement.¹ An outline of each of these injury definitions as defined by the IOC consensus statement is provided in the sections below.

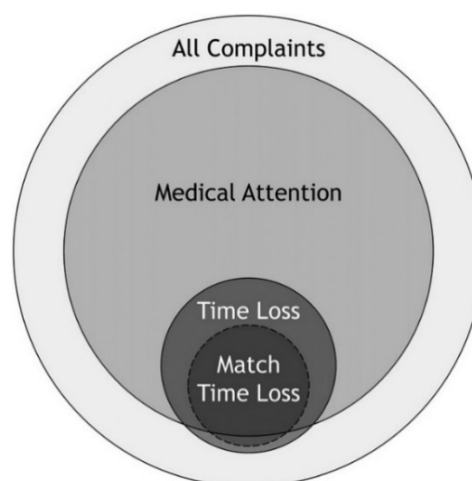


Figure 1. The interaction between different injury definitions. (Clarsen, B., & Bahr, R. (2014). Matching the choice of injury/illness definition to study setting, purpose and design: one size does not fit all! *British Journal of Sports Medicine*, 48(7), 510-512. With permission of British Journal of Sports Medicine. Figure 1 Interactions between various definitions of injury and illness. Circle-size represents the relative number of incidents likely to be registered (not to scale)).

Medical attention injury

Any injury record entered into the AMS is, by definition, a medical attention injury irrespective of the injury status that is selected because the entry is made by a clinician.

Definition:

“Tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy that results in an athlete receiving medical attention.”

Note: The AMS is used as a platform to record any injury that an athlete may present to a clinician with. Sports injury analysis that aims to quantify the risk associated with sport specific participation should exclude recorded injuries that are not related to sport specific exposure (e.g. car crash). Injuries that have occurred due to a non-sports related activity are now captured within the **Injury activity** (p.27) section in the injury record form.

Background:

The medical attention (also interchangeably referred to as clinical examination) injury definition has a broad scope that is likely to capture a large range of sustained injuries as they are recorded irrespective of whether or not the injury resulted in time-loss from training or competition. The use of the medical attention injury definition is recommended by a majority of the consensus statements across sports, compared to the time-loss definition, as the larger capture of injuries using this definition is likely to provide a greater representation of the true burden of injury occurrence.²⁸ The medical attention injury definition has been demonstrated to record up to a 3- to 5-fold increase in the number of injuries sustained compared to reporting only time-loss injuries.³⁰⁻³¹ Injury surveillance systems that involve team clinicians who have an invested interest in the quality of the injury surveillance and interest in the outcome of surveillance data for research or practical use, report a greater number of non-time loss and minimal injuries than clinicians who do not have such interest.³²

The requirement of a registered physiotherapist or medical doctor to enter injury records into AMS provides a level of quality control surrounding the accuracy of the injury characteristics that are recorded, which has been commonly cited as a limitation in the literature when other non-clinical staff are eligible to enter these records. Medical attention injuries are commonly reported for short competition periods such as the Olympic Games,³³⁻³⁵ or major competitions such as World Cups or Championships.³⁶⁻³⁸ However, the main limitation that has been linked with medical attention injuries is the difficulty in recording these injuries longitudinally as the athletes under surveillance need to have ready access to clinicians in order for these injuries to be recorded. The wide accessibility of the AMS to clinicians across Australia and its availability for clinicians travelling internationally is a strength of this system. The main limitation of the medical attention injury definition (and the time-loss injury definition) is the difficulty in capturing these injuries when the athletes do not have regular access to clinicians. For example, if an athlete sustains an injury whilst travelling internationally and there is no clinician travelling with them, this injury is likely to go unreported unless that athlete reports it to a clinician when they next have access to one. Aside from this limitation, the use of the medical attention definition is strongly recommended for all sports as a more complete picture of the burden of injury that can be captured, which can then be used to allocate medical resourcing and provide direction for prevention priority areas.

Maintenance treatments

It is acknowledged that treatment and servicing may be offered and applied to athletes in the absence of injury by any definition for multiple valid reasons. A ‘maintenance treatment’ is defined as *“any servicing provided to an athlete, who is in full training, in the absence of any diagnosable injury and/or illness.”*

Any treatment that relates to an athlete presenting with physical complaint that is recognised to be associated with an injury should be recorded within an injury record as this fulfils the medical attention definition of an injury. Injuries that are entered into maintenance records are unable to be used in reporting or analysis and causes an athlete’s injury data to be disrupted and unable to be used in injury surveillance or linked with other metrics such as training load data. Maintenance treatments are designed for provision of service such as a pre- or post-competition soft tissue massage that **do not relate to an injury**.



Key concepts surrounding medical attention injuries

- Medical attention injuries are reported irrespective of time-loss occurring from training or competition (e.g. Achilles tendinopathy, low back pain).
- Any complaint that is recognised to be associated with an injury, and for which the athlete seeks an examination, is a medical attention injury.
- Every injury record entered into the AMS is defined as a medical attention injury, irrespective of the injury status (full training and competition, modified training or competition, or no training and competition).
- Maintenance treatments should only be entered for provision of service **not** related to an injury.

Sports-incapacity (time-loss) injury

Any injury entered into the AMS that involves the *injury status* being selected as either *modified training or competition* (orange) or *no training or competition* (red) is by definition a sports-incapacity injury.

Definition:

“Tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy that results in an athlete being unable to complete the current or future training session or competition.”

Note: The primary mode of training/competition is discussed in depth in the **Injury status definitions** section (p.16).

Note: The AMS is used as a platform to record any injury that an athlete may present to a clinician with. Sports injury analysis that aims to quantify the risk associated with sport specific participation should exclude recorded injuries that are not related to sport specific exposure (e.g. car accident). Injuries that have occurred due to a non-sports related activity are now captured within the **Injury activity** (p.27) section in the injury record form.

Background:

The sports incapacity injury (also interchangeably referred to as time-loss) definition has commonly been used in sports injury literature, particularly over extended surveillance periods in team sports.²⁰⁻²⁸ The sports incapacity injury definition has been implemented in many surveillance systems due to the assumption that the identification of an athlete's inability to participate in full training or competition is easy to delineate from reduced participation due to injury. This definition is the narrowest of the three sports injury definitions, meaning it is likely to have a smaller reach to capture the occurrence of injury, as it is reliant on an athlete missing time from competition or injury.²⁸ The fact that many athletes train and compete while injured, which this definition is unable to capture and quantify, is likely to under-report the true burden of injury in sport.³⁹ In many sports, management strategies that involve the use of analgesic medications, modification of training or delaying more intensive injury management until the end of the competition season (e.g. surgery) results in these being missed under this definition.⁴⁰⁻⁴² Many overuse injuries are not captured using the time-loss definition despite them being very common in various sporting populations.⁴³⁻⁴⁴

A further subset of the time-loss injury definition is the match time-loss definition that some surveillance systems use to only record an injury if it results in a competition match or event being missed due to injury. This definition is even more restrictive and results in a smaller number of injuries being recorded. This definition has typically been used in team sports where there is regular (e.g. weekly) competition games. A major limitation of this injury definition relates to the non-reporting of less severe injuries that typically recover within a week (e.g. concussion) which results in them not being captured unless they have not recovered within the 7-day period. In sports where competition is less frequent, this definition would potentially fail to capture a range of injuries that occur outside of infrequent competition.²⁸

The main limitation of using only the time-loss injury definition is that a large number of injuries are not captured. Further, there can be difficulties in defining what constitutes participation in training or competition being modified. For example if a basketball player who would typically play 80% of the total game time, only plays 30% game time because of an Achilles complaint – this would commonly not be recorded as a time-loss injury as the competition game time has been modified but the player is still participating in some competition, despite the competition being impacted.



All injuries that are recorded within the AMS injury record form (medical attention injuries) can be sub-categorised as either time-loss or non-time-loss injuries, dependent on the **injury status** selected by the clinician. Suggestions surrounding the selection of appropriate AMS injury statuses are provided in the section below titled **Injury status definitions** (p.16).

Injury Status Definitions	
Full training and competition	Unrestricted participation in the primary mode of training or competition at an equivalent level to pre-injury/illness when at full capacity, as planned by coaching staff if the athlete was uninjured/healthy.
Modified training or competition	Any reduction from pre-injury/illness full capacity or restriction to an athlete's participation in training or competition, as planned by coaching staff, that is based on medical restriction and relates only to the primary mode of training.
No training or competition	The athlete is completely unable to participate in the primary mode of training or competition based on medical advice.

Key concepts surrounding sports incapacity injuries

- Any injury entered into the AMS that involved the injury status being selected as either *modified training or competition* (orange) or *no training or competition* (red) is by definition a sports incapacity injury.
- When interpreting published research or injury reports, it is important to distinguish if sports incapacity (time-loss) is defined by a study to relate to both training and competition time, or competition only.

Athlete self-report injury

Academic definition:

"An immediate sensation of pain, discomfort, or loss of functioning associated, by an athlete, with an isolated exposure to physical energy during sports training or competition having an intensity and quality making the sensation being interpreted by the athlete as discordant with normal body functioning" (Timpka et al., 2014, p. 425).

Modification of this definition for the Australian sporting setting is:

"A sensation of pain, discomfort, or loss of functioning associated, by an athlete, related to exposure to sports training or competition having an intensity and quality that leads to the sensation being interpreted by the athlete as discordant with normal body functioning."

Background:

The capture of injuries as reported by the athletes themselves provides the opportunity to document a broad range of injuries that may otherwise not be reported using either the time-loss or medical attention injury definitions.⁴³ Surveillance systems that utilise athlete self-report methods to report injuries are highly likely to detect a larger number of overuse injuries and capture the burden that these injuries have within various athlete groups.^{45 46}

The advantage of the extended reach of this definition to identify injuries from the athletes is counter-balanced by a reduction in the reliability and accuracy of the data that are reported compared to the other injury definitions. There is likely to be a bias in what the individual athlete interprets as the necessary threshold of symptoms to be present in order to interpret and report them as an injury.

Self-reported injury surveillance may also offer a viable method of injury capture if a group of athletes do not have regular contact with medical staff who would otherwise capture the occurrence of the medical attention injuries that occur. Within the AMS an athlete can report an injury in the sessional monitoring form; however, there are also validated questionnaires that have been built into the AMS that can also be used to capture these data, such as the Health Problems Questionnaire.⁴⁶

Key concepts surrounding athlete self-report injuries

- The athlete self-report method of injury collection offers the broadest scope to identify the occurrence of injuries.
- The validated and reliable Health Problems Questionnaire⁴⁶ is a tool that some NSOs have adopted to collect athlete self-reported health outcomes. The AMS is used as the platform to collect, monitor and act relating to these data.

Subsequent injury

An injury that occurs following the occurrence of a previous (index) injury, irrespective of the type of injury, is defined as a subsequent injury.^{19 47} A large proportion of all injuries sustained in sport are subsequent to a previous injury.^{19 47-49} The most commonly defined sub-category of subsequent injury in sports injury research is a recurrent injury.

Recurrent injury

A recurrent injury is defined as an injury that occurs after an index injury that is of the same type and to the same body site, following a player's return to full participation from the index injury.^{23 24} This definition of recurrence is typically used in sports injury epidemiological studies that focus on one specific type of injury, such as hamstring^{50 51} or anterior cruciate ligament (ACL)^{52 53} injuries.

Previous injury of the same type is a strongly established risk factor for future injury of the same type.⁵⁴⁻⁵⁶ A large body of research has investigated the risk factors for recurrent injury. It should be recognised, however, that when all injuries are considered within an athlete's previous history, recurrent injuries tend to only account for a very small percentage (<5%) of all injuries.^{19 47-49}

Within the AMS injury record form, a section captures whether or not an injury is recurrent to a previous injury – this notion is explained further in the **AMS injury record data fields** section (p.22).

Subsequent injury categorisation

Since the publication of the Data Dictionary Version 1 in 2014, there has been a body of work that been completed regarding subsequent injury categorisation methods in sport.^{17 47-49 57-60} The recently revised subsequent injury categorisation (SIC-2.0) model⁴⁷ provides advanced usability and offers solutions to some of the challenges and limitations of the original SIC-1.0 model¹⁹ that was suggested for use in the Data Dictionary Version 1.

The SIC-2.0 model offers two levels of subsequent injury categorisation – a data-driven level (8 categories) (Table 1) and a sub-categorisation clinical level (16 categories). In addition to the table provided below, a user friendly flowchart is available to help perform the categorisation process (Appendix 1).⁴⁷

Table 1. The categories of the revised subsequent injury categorisation (SIC-2.0) model⁴⁷

SIC-2.0 data-driven category	Category description
I	No subsequent injury; only one injury was sustained by the athlete throughout the surveillance period
II	Re-injury after recovery, to the same site, same nature, same side, and same structure
III	Acute exacerbation before recovery, to the same site, same nature, same side, and same structure Continual/sporadic exacerbation before recovery, to the same site, same nature, same side, and same structure
IV	Injury to the same site, same nature, same side, but of a different structure
V	Injury to the same site, same nature, but different side
VI	Injury to the same site, but of a different nature
VII	Injury to a different site, but of the same nature
VIII	Injury to a different site, and of a different nature



Key considerations surrounding subsequent injury recording

Multiple injuries in the one event

It is possible for an athlete to sustain multiple injuries to different sites during a single injury event. For example, a rugby sevens player could sustain both a fractured wrist and a concussion during a tackle. These are clearly two separate injuries in this singular injury event and should be recognised as such within the injury record. It is important that each of these injuries are entered within their own injury record to ensure that each injury is accounted for and can be closed off independent of the other injury. This allows for an accurate injury duration to be recorded and future injuries to be linked to both injuries to determine injury risk profiles. From the rugby sevens example above, if the concussion was entered as a second Orchard Sports Injury Classification System (OSICS) code within the injury record of the fractured wrist, there is no method for collecting the relevant data related to the concussion as it is assumed that the injury status and days spent injured are the same of that of the fractured wrist. This could mean that that concussion is recorded as lasting for 6-weeks (the same as the fractured wrist) when it actually was only a 6-day injury. This has implications when constructing injury reports, as it inflates the total severity of an injury and may result in inappropriate conclusions being drawn from the data (see the section **Injury: OSICS diagnostic code** (p.23) for further details).

Multiple injuries sustained across different injury events

It is also common for an athlete to report for medical assessment after a competition or a training week with multiple health problems that have occurred throughout different injury events/incidents (e.g. different matches on the same day or sustained on different training days). Each of these injuries should be reported in separate injury records, to allow for these injuries to be distinguished from one another over time and used within injury analysis and reports. Failure to do so results in inaccurate data being recorded within the athlete's records and reduces the usability of the data.

Multiple diagnoses at the same injury site

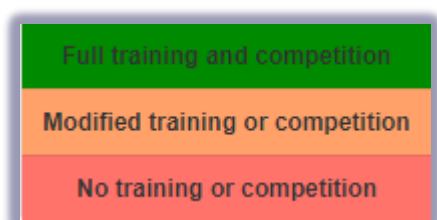
It can be common for an injury to involve more than one diagnosable pathology at the same anatomical site. For example, an acute knee injury sustained by a netballer while changing direction may consist of an ACL rupture, MCL sprain and medial meniscal injury. In such injury cases, it is appropriate for this injury to be reported as just one knee injury (one injury record), where the multiple injured tissues are captured as second and third OSICS diagnoses. It is important in such cases that the most severe component of the injury is recorded as the primary or first OSICS diagnostic code, as this is the point of reference for the injury (see the section **Injury: OSICS diagnostic code** (p.23) below for further details). In certain cases, but not uniformly, there are specific OSICS codes to represent common multiple diagnosis injuries. For instance, an OSICS code exists for ACL, MCL and meniscus injuries combined and this can be used instead of three separate diagnoses in the record.



Injury status definitions

Background

The entering of a new injury record or a subsequent treatment to an existing injury requires the clinician to select the current health status of an athlete relating to their primary mode of training. There are three options that can be selected within the AMS:



Historically there has been confusion reported by clinical staff surrounding the criteria to correctly select the status of an injury. This is commonly linked to ambiguity and different interpretations of the definition provided for each of the three injury status options. Each of these status' are defined in the section below. It is important to note that the injury status is related to the primary mode of an athlete's training/competition. For example:

Example 1. In relation to a water-based sports such as rowing or kayaking, the primary mode of training is considered as on-water training and competition. While athletes in these sports are likely to undertake various forms of cross training and gym sessions, these training modalities are not the primary mode of the sport and modification of other equipment such as a bike would not constitute modified training for a rower.

Example 2. In sports such as rugby sevens or football, the primary mode on training is considered as on-field training.

Example 3. For sports such as diving or swimming, the primary mode of training is considered as water-based sessions.

Example 4. Other sports, such as triathlon, require athletes to perform across multiple disciplines (swim, cycle, run) which are all essential components to fulfil the requirements of competing in the sport. In sports such as these, the primary mode of training involves each of these aspects, which means the athlete must be unrestricted to participate in all training or competition to pre-injury/illness capacity, as planned by the coaching staff. Some sports with multiple disciplines have opted to capture an athlete's ability to undertake full training within each of the disciplines separately. This is a sport specific option that can be added as an additional component within the injury record form as directed and agreed upon by each NSO.



Full training and competition

Definition:

“Unrestricted participation in the primary mode of training or competition at an equivalent level to pre-injury/illness when at full capacity, as planned by coaching staff if the athlete was uninjured/healthy...”

Full training and competition

Unrestricted participation in the primary mode of training or competition at an equivalent level to pre-injury/illness when at full capacity, as planned by coaching staff if the athlete was uninjured/healthy.

Examples:

Example 1. A cyclist is completing all aspects of their prescribed training without any modifications being made and is fully available for competition selection.

Example 2. A diving athlete is completing all of their water-based training without restriction or modification according to the plans of the coach, but is restricted in the gym with medical imposed restrictions limiting the performing of squats.

Example 3. A rugby sevens player is training and competing full on-field training despite being treated for ongoing lower back pain over the past 3 weeks, which has caused them to only complete 50% of their originally prescribed gym program for this time period.

Modified training or competition

Definition:

“Any reduction from pre-injury/illness full capacity or restriction to an athlete’s participation in training or competition, as planned by coaching staff, that is based on medical restriction and relates only to the primary mode of training.”

Modified training or competition

Any reduction from pre-injury/illness full capacity or restriction to an athlete’s participation in training or competition, as planned by coaching staff, that is based on medical restriction and relates only to the primary mode of training.

Examples:

Example 1. Following the onset of knee pain, a cyclist has had their training volume reduced to 50% of what was planned for the following 3 days, before returning to a full training routine (3 days of modified training time).

Example 2. A diving athlete is restricted from completing backward dives following an injury but can complete the other dive groups of their training for 10 days before returning to full training (10 days of modified training).

Example 3. A rugby sevens player completed the full training volume and non-contact drills as planned by the coaching staff for the training group but was medically restricted to avoid receiving contact during the training drills for a 6 day period following a shoulder injury (6 days of modified training).



No training or competition

Definition:

“The athlete is completely unable to participate in the primary mode of training or competition based on medical advice.”

No training or competition

The athlete is completely unable to participate in the primary mode of training or competition based on medical advice.

Examples:

Example 1. Following a crash, a cyclist is unable to complete any cycling-based training for 20 days following hip injury (20 days of no training).

Example 2. A diving athlete is unable to perform any water-based training for 7 days following a surgical suture of a leg laceration (7 days of no training).

Example 3. A rugby sevens player sustains a concussion and the doctor prescribes a 3 day rest period due to ongoing symptoms, before clearing the player to commence light on-field jogging after 3 days of rest. (3 days of no training).



Definition of recovery

Background

The definition of injury recovery has been debated within the sports medicine research. Determining injury recovery is dependent on the injury definitions used within an injury surveillance system,⁵⁷ with the definition of recovery often ambiguous throughout the literature.^{58 61 62} Return-to-play is often considered as the resolution of a 'sports incapacity' injury that is defined by time-loss from competition or training.²⁰ This definition of injury recovery has been previously recommended by a number of consensus statements for injury definitions across multiple sports.^{23-27 63} However, as has been discussed earlier within this document, many injuries do not involve time-loss from training or competition and it is also common for an injury's symptoms to persist following return to play with treatment continuing.^{41 61} Injuries defined in relation to the 'medical attention' definition, that are independent of time-loss, are commonly considered to have recovered when the cessation of clinical intervention occurs.^{43 63}

Recommended definition for injury recovery

A strength of the AMS injury record form is that it offers the ability to capture the accumulated time lost to injury (days in no training and modified training), while also capturing the total length of time an injury continues to require ongoing treatment for after return to full training and competition (the days an injury is open) and the number of treatments associated with an injury.

Recovery from time-loss injury:

The time-loss component of an injury (if present) is ended when the clinician changes the injury status from either no training or competition (red) or modified training or competition (orange) to full training and competition (green).

In the circumstance where an athlete recovers from an injury during a period where there is no planned training or competition (e.g. during the off-season), the date of return to full training and competition should be entered as the date the athlete would have resumed full training and competition participation if it were planned.

Recovery from medical attention injury:

As all injuries that are reported within AMS are by definition a medical attention injury, these injuries will not be considered as fully recovered until the clinician closes off the injury record, which indicates that the injury does not require current ongoing medical attention.

Permanent long-term change resulting from an injury:

In the circumstance where the occurrence of an injury has resulted in the permanent change in an athlete's full training or competition capacity, this should be captured within the **Significant past medical history** section as detailed below (p.26). This identifies that an athlete's new full capacity or their 'new normal' has been established, which allows the injury record to be closed without the need to have them open long-term and remaining as an 'active injury' that is accumulating days spent as injured.

Closing of injury records

The AMS captures the date when the treating clinician closes off an injury record, which signifies that the injury has recovered from a medical perspective and **no longer requires active clinical intervention**. Formally closing off injury records has historically been an aspect of injury reporting that has been either dismissed or overlooked by many clinicians. While it is recognised that in some scenarios, such as when the clinician is not embedded within the sport, that contact with the injured athlete could be lost if an athlete does not return for a follow-up appointment for example. However, **it remains the duty of the clinician to maintain accurate records for the NSO or NIN provider that the athlete is affiliated with, so following up the athlete in these cases is important**. Best practice management is to maintain up to date injury records, which involves the clinician regularly reviewing the athlete cohort within AMS that they are responsible for providing medical servicing to. Many NSOs have taken the approach that all open injury records should be reviewed weekly to ensure that the records are accurate, and if an athlete has recovered from an injury and is



no longer receiving servicing, that record should then be closed if there are no further treatments planned. This effectively ends the accumulation of the number of days an athlete spends as currently injured (further details are presented regarding this process in the **AMS injury record data fields** section (p.31)).

What constitutes the reporting of a new injury occurrence during the recovery of a current injury?

The ability to recognise and capture data relating to injuries that occurred prior to the full recovery of a previous injury has been identified in the literature as an important feature within a surveillance system.⁶⁴ As highlighted in the subsequent injury section of this document, a subsequent injury can occur either before or after the full recovery of a previous injury. Subsequent injuries that occur following the full recovery of a previous injury are easy to record within the AMS, as the previous injury record should have already been closed, so creation of a new injury record is required. When a subsequent injury occurs during the rehabilitation period of a previous injury, it is critical that this new injury is recognised as a separate injury event (a new injury record). There are two main possibilities in this scenario.

1. An athlete is recovering from one injury (e.g. ACL reconstruction) and sustains a different type of subsequent injury (e.g. hamstring strain). In this scenario the hamstring injury should be recorded as a new injury as it is clearly separate from the original ACL injury, rather than the treatment notes for the hamstring injury being entered under the ACL injury notes.
2. An athlete recovering from one injury (e.g. ACL reconstruction) and re-injures the same ACL during rehabilitation. Again, this subsequent injury should be recorded as a new injury event (this is under the recurrent option under the **Injury Classification** section – detailed further in the section below) as a second distinct injury has clearly been sustained. By not recording the second ACL injury, the overall incidence of ACL injuries would be underreported and the length of duration of the first injury would be exaggerated. These types of recurrent injuries are more easily defined when the second injury is acute in nature. In cases involving overuse type injuries, substantial exacerbations should also be recorded – although often they are not. For example a netballer with Achilles tendinopathy resumed court based training as she progressed to the next stage of her rehabilitation, after which she developed a substantial increase in symptoms which prompted her management plan to go **back a phase** in her rehabilitation. This exacerbation in her Achilles tendinopathy should be recognised as a worsening in the state of the non-recovered injury that resulted in the progress of the initial injury's recovery from being achieved as expected, and such this should also be recorded as a new injury record.⁶⁴ Future iterations of the AMS injury record (**Future directions** p.43) aim to allow exacerbations to be captured in the exiting injury record.

The ability to identify injury exacerbations is important to ensure that the severity of the index injury is accurately recognised. Recording exacerbation occurrence allows the additional days spent injured, resulting from the exacerbation, to be distinguished from those associated with the index injury. This ensures that the severity of the initial index injury is not overstated. Furthermore, the number of index injuries recorded remains unchanged when this method is used; instead, an additional metric – the number of exacerbations – is collected and reported. Consideration of an exacerbation is important in return to play decisions made after an athlete is fully recovered, as the risk associated to the previous injury can be accurately quantified with adjustments for the exacerbation occurrence.⁶⁴ Furthermore, the decisions relating to the progression of an injury within the rehabilitation phase can be assessed to identify if management was ideal, allowing future replication and refinement of rehabilitation programs and return to play protocols.



SECTION 2: AMS INJURY RECORD DATA FIELDS



Parent data (compulsory) fields

Date of injury

This item provides the date when the injury occurred. It is important that the date of injury is differentiated from the date of the first clinical examination, as these two dates are often different as an athlete may not receive medical attention until after the injury occurred. The date of injury is recorded in the following format:



Date of Injury

Wed, 01-05-2019

Details

The full name, date of birth and sport of the athlete are all pre-populated fields from the athlete's AMS account. These fields should be reviewed to ensure the details are correct. If any changes are required, please contact ams@ausport.gov.au.

Details

Full Name AAP Test Athlete

Date of Birth 07-12-1997

Sport Triathlon

Injury classification

This field determines if the injury is a new type of injury (new diagnosis) or a recurrent injury (same diagnosis as a previous injury). A recurrent injury should only be selected if the injuries have exactly the same diagnosis and are on the same side (left/right) as the previous injury. In the scenario where an exacerbation of an injury has occurred, a recurrent injury can be selected (this streamlines the entry of the injury record form).

Injury Classification *



New Injury



Recurrent Injury

Injury onset

This field captures the mode in which the injury commenced. One of the four options listed must be selected:

Injury Onset *



Acute



Repetitive - Sudden Onset



Repetitive - Gradual Onset



Other

These four options are defined as:

- **Acute:** an injury following an instantaneous transfer of energy to the body (e.g. hamstring strain with immediate commencement of pain and/or dysfunction).
- **Repetitive – Sudden Onset:** an injury caused by an accumulated energy transfer that occurs with an identifiable single event (e.g. a tibial fracture sustained from a gymnastics dismount, that medical imaging demonstrates occurred with a pre-existing bone stress reaction).
- **Repetitive – Gradual Onset:** an injury caused by an accumulated energy transfer without an identifiable single event (e.g. a gradual increase in Achilles pain over a month, diagnosed as Achilles tendinopathy).
- **Other:** This option may be selected for cases that do not relate to acute or repetitive onsets (e.g. symptoms related to ankylosing spondylitis).



Injury: OSICS-10.1 diagnostic code

Background:

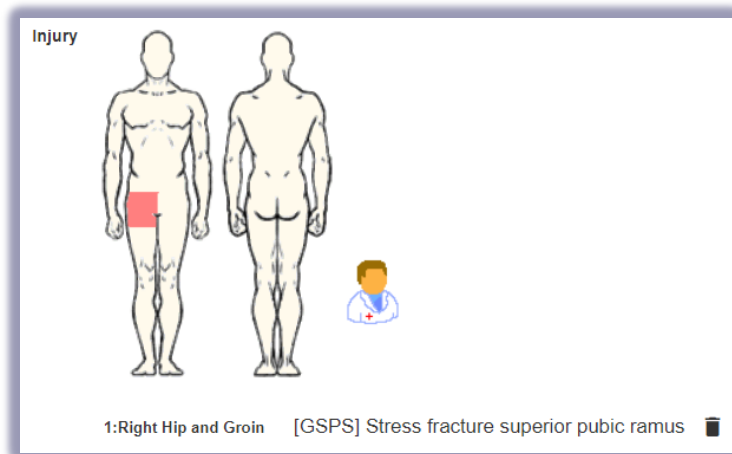
The diagnostic code given to a sports injury is an important component of any injury surveillance coding scheme. Injury codes enable their identification according to specific characteristics, such as body site or tissue type, which expedites the retrieval of injury records for analysis, collation and analysis.^{65 66} The original iteration of the Orchard Sports Injury Coding System (OSICS) was developed in 1992, designed specifically for sports medicine diagnoses in Australian Football, with the tenth version (OSICS-10.1)⁶⁵⁻⁶⁷ currently embedded within the AMS injury record form.

The OSICS-10.1 involves the assigning of a four letter diagnostic code to each injury within a progressive four tier diagnostic framework.⁶⁶ The first letter codes the injury according to the anatomical site injured (e.g. knee, thigh, shoulder, etc.); the second letter codes the nature or pathology type of the injury (e.g. muscle, tendon, cartilage, etc.); and the third and fourth letters provide further diagnostic specificity according to the type of the injury (e.g. biceps femoris strain grade 1-2).⁶⁶ The OSICS has been widely adopted across sports injury research and its use is recommended by the consensus statements for injury definitions and data reporting procedures of a number of different sports.^{23 25 27 63}

On 24 March 2020 the Orchard Sports Injury and Illness Classification System (OSIICS-13.1)⁶⁸ was published as the successive iteration of the OSICS-10.1. The OSIICS-13.1 will be incorporated into the AMS injury form in the coming months. This will not change the data entry processes listed below, but will provide updated injury and illness diagnostic codes and terminology. Further information is detailed below in the **Future directions** section (p.43).

AMS OSICS-10.1 code selection

The clinician is directed through a series of steps to select the appropriate OSICS-10.1 code by firstly clicking on the displayed body chart to indicate the body site where the injury has occurred. Following this step, a selection of broad injury types is displayed, prompting the clinician to again select the most relevant option in reference to the current injury. Depending on the injury type, options may be presented to the clinician that enables a more specific diagnosis to be selected. On the selection of the final injury diagnosis, AMS will automatically assign the OSICS-10.1 code that best represents the selected injury diagnosis.



It is strongly recommended that the clinician enters the most accurate and precise diagnosis that they are able to assign. It is acknowledged that accurate initial diagnoses are not always possible, for example, the findings from imaging may be required to specifically diagnose the injury with confidence.

However, in cases where the OSICS-10.1 code that was initially entered by the clinician does not accurately reflect the later diagnosis of an injury, the injury record **should be retrospectively updated** with an accurate OSICS-10.1 code (e.g. GZZX – Hip/groin pain undiagnosed – should be changed to a more specific diagnostic code GSPS – Stress fracture superior pubic ramus – when an updated diagnosis is made).

The failure to perform this update, restricts the precise characteristics of the injury from being captured. This limits the quality of the data, reducing the quality of any subsequent reporting and analyses for the sport, while also failing to provide an accurate injury history that can be referred to in the future management of an athlete's health.

A link to the complete list of the 1736 different OSICS-10.1 codes is provided for reference in Appendix 2.

Injury side

Selection of the OSICS-10.1 code also requires the clinician to select the side of the body where the injury has occurred. This is a straightforward requirement, however, historically there have been errors in the selection of the correct side. Injuries to the lumbar spine can be specified as left or right or as to the middle region. Injuries that occur bilaterally should be recorded as two separate injuries, to allow for the recovery of each to be distinguished. E.g. bilateral Achilles tendinopathy – OSICS-10.1 ATAT – where the left side resolves within 7 days, but the right side persists for 60 days. In this example it is important to note that two injuries have occurred, but they were of differing severities.

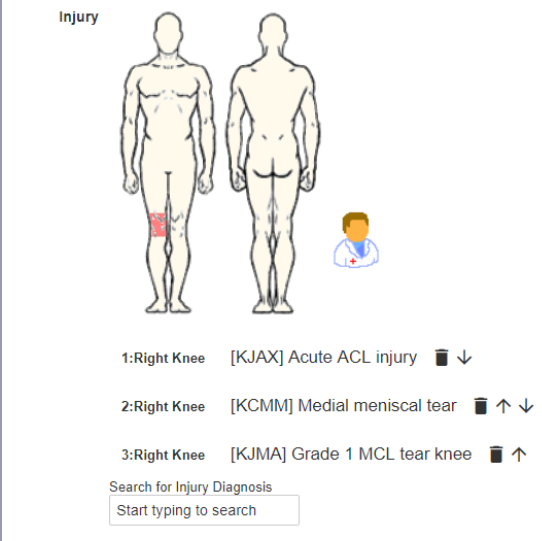
Diagnosis

The diagnosis field is automatically filled using the description provided from the first OSICS-10.1 code that has been entered.

Diagnosis Stress fracture superior pubic ramus

Multiple diagnoses at the same injury site

An injury can involve more than one diagnosable pathology at the same anatomical site. For example, an acute knee injury sustained by a netballer while changing direction may result in an ACL rupture, medial meniscal injury, and a MCL sprain. In such injury cases, it is appropriate for this injury to be acknowledge as just one knee injury (one injury record – not three separate knee injuries), with the multiple injured tissues to be captured as second and third OSICS-10.1 diagnoses. It is important in such cases that the most severe component (anticipated longest recovery time) of the injury is recorded as the primary or first OSICS-10.1 diagnostic code, as this is the point of reference for the injury (listed under **Diagnosis**).



Injury

1:Right Knee [KJAX] Acute ACL injury

2:Right Knee [KCMM] Medial meniscal tear

3:Right Knee [KJMA] Grade 1 MCL tear knee

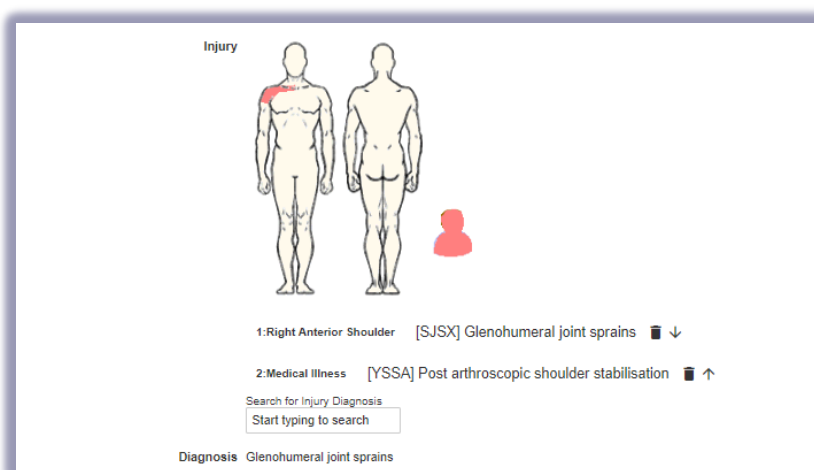
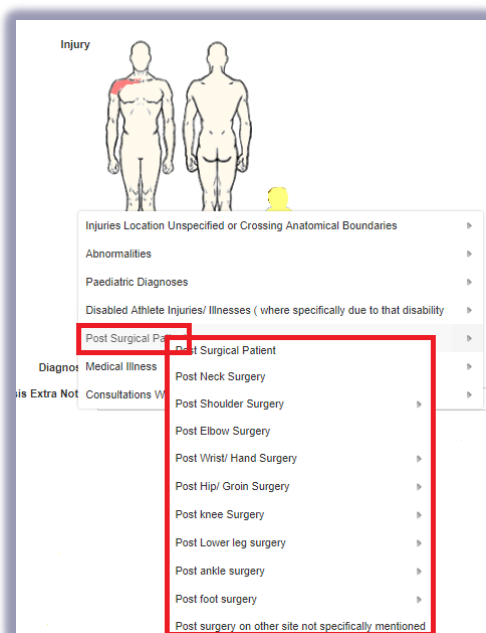
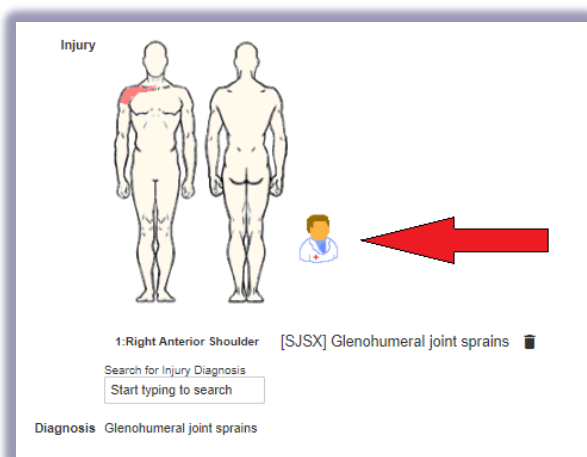
Search for Injury Diagnosis
Start typing to search

Diagnosis Acute ACL injury

Injuries requiring surgery

Any surgery performed for injury management should be recorded within the AMS injury record. A surgical OSICS-10.1 diagnostic code can be allocated to the surgery performed. It is important that the injury is entered first prior to entering the surgical code as a second diagnosis code (see example below).

After an injury OSICS-code has been selected (e.g. SJSX – Glenohumeral joint sprain), a surgical code can be then entered. A surgical injury code is entered by clicking on the doctor icon next to the body chart and following the drop-down boxes until the most appropriate surgical option is selected. The surgical code should then appear as the secondary OSICS-10.1 code (e.g. YSSA – Post arthroscopic shoulder stabilisation), that follows the primary OSICS code that details the characteristics of the injury.



After selecting a surgical OSICS-10.1 code, a brief section titled **Surgery details** will appear. This section collects the date that the surgery was performed under **Surgery date**, and allows for free-text related to the surgery to be entered under **Surgery details**. The date of the surgery is important to capture as it allows the duration of the injury to be separated according to time prior to surgery and time post-surgery to be distinguished.

Surgery Details

Surgery Date

19-07-2019

Surgery Details

Arthroscopic Bankart repair performed by Dr. Details Here....

Add to significant past medical history (PMHx) list

In the circumstance where the occurrence of an injury has resulted in the permanent change in an athlete's full training or competition capacity, this should be captured within the **Significant past medical history** section. This identifies that an athlete's new full capacity or their 'new normal' has been established, which allows the injury record to be closed without the need to have them open long-term and remaining as an 'active injury' that is accumulating days spent as injured.

Additionally, this field should be selected for any major injury that is likely to have treatment relevance in the future, e.g. ankylosing spondylitis.

This is a dichotomous (yes/no) selection field. The **'No'** option is automatically selected in each new injury record form, so if the injury is adjudicated to likely have a permanent change in the athlete's capacity to participate in the full training and competition capacity that existed pre-injury or there is likely to be future related treatment to this injury/illness, then the user should change this to **'Yes'**. An injury can be marked as being added to the significant PMHx list at any stage during the assessment or treatment/rehabilitation process of the injury.

Add to Significant PMHx List

☒ Yes
 ☐ No

Select Yes if this injury will effect maximal training capacity for the career of this athlete. This is NOT for minor injuries.

Expected return to full training date

This field requires the clinician to enter the date that they anticipate that the athlete will to return to full training participation and competition. This field is provided within the shared notes page for coaches and non-medical professionals to assist in training and competition planning. It is intended as a reviewable estimate not a definitive point.

Expected Return to Full Training Date *

Expected Return to Full Training Days

Expected return to full training days

This field is automatically calculated from the difference in days from the dates entered within 'expected return to full training date' – 'date of injury'.

Expected Return to Full Training Date

22-05-2019

Expected Return to Full Training Days

21 Days

Injury activity

This field captures the activity that was being undertaken by the athlete at the time the injury occurred. The options that can be selected from are Warm-up, General training, Game/race/event, Weight training, X-training, Not related to sports participation and Other. These data provide valuable information that contributes to understanding the context of injury occurrences across the population, and can be used to direct prevention strategies and resources to target the activities associated with the greatest injury risk. Sports injury analysis that aims to quantify the risk associated with sport specific participation should exclude recorded injuries that are not related to sport specific exposure (e.g. car crash).

Injury Activity *

- ☐ Warmup
- ☐ General training
- ☐ Game/Race/Event
- ☐ Weight training
- ☐ X-training
- ☐ Not related to sports participation
- ☐ Other

General location

It is important to capture geographical location of injury occurrence in order to analyse where injuries are commonly occurring. The generic options for this field for most NSOs are DTE – Domestic, DTE – International, Competition – Domestic, Competition – International, Camp, and Other. This data provides valuable information to contribute to understanding the context of injury occurrences across the population, and can direct prevention strategies and resources to target the locations that are associated with the greatest injury risk.

General Location *

- ☐ DTE - Domestic
- ☐ DTE - International
- ☐ Competition - Domestic
- ☐ Competition - International
- ☐ Camp
- ☐ Other

DTE = Daily Training Environment

Child data (non-compulsory) fields

Diagnosis extra notes

This open text box allows any further diagnostic details to be entered by the clinician. This is helpful where the OSICS codes do not allow the complexity or the uncertainty to be recorded, or if an appropriate OSICS code does not exist.

Diagnosis Extra Notes

Use this field when the above Orchard system does not have the correct label or extra notes are required to help explain

Sport specific fields

A number of NSOs have specified additional injury data that they want to capture in order to understand the aetiological characteristics of the injuries that are being sustained. These fields are sport specific and only appear for athletes who are identified within these NSOs. Almost every sport that regularly reports its injury data at a population level makes these fields mandatory. Any irrelevant data fields that are not used should be removed to improve the efficiency of completing the injury record form by a clinician. These fields should be reviewed alongside any individual sport specific consensus statement recommendations that follow the IOC consensus statement publication.¹



Examples include:

- Time-loss injury (yes/no)
- Sport activity
- Time of game/training
- Location
- Menstrual cycle stage
- Limitations to off-water training
- Current altitude training?
- Event type

For example:

Water Polo Specific Details

Water Polo Activity

Water Polo Time of injury

Water Polo Mechanism

Triathlon Specific Details

Triathlon Activity Type

Running off-road

Triathlon Training Implications

☒ Yes ☐ No

If Yes, remember to update the Restrictions table below

Triathlon Swim Implications

☐ None ☐ Modify Training ☒ Stop Training

Triathlon Bike Implications

☐ None ☒ Modify Training ☐ Stop Training

Triathlon Run Implications

☒ None ☐ Modify Training ☐ Stop Training

Netball Specific Details

Netball Time Loss Injury

☒ Yes ☐ No

Answer Yes if the expected time-loss is greater than 24 hours.

Netball Surface

Netball Mechanism *

Netball Position *

Was this different to their normal position?

☐ Yes ☐ No

Netball Location on Court *

☐ Attacking circle ☐ Attacking third (not circle) ☐ Middle third ☐ Defensive circle ☐ Defensive third (not circle) ☐ Not Applicable

Netball Period *

☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ Warmup ☐ Not Applicable

Was the player able to continue?

☐ Yes ☐ No

Netball Competition

☐ Suncorp Super Netball ☐ Australian Netball League ☐ 19/U Nationals ☐ 17/U Nationals ☐ Fast5 ☐ Other ☐ Not a tournament

Menstrual Cycle

☐ Taking contraceptives ☐ Regular cycle ☐ Irregular cycle ☐ Amenorrhoeic ☐ Unknown/Didn't ask

Please select the options that apply to the athlete

What stage of the menstrual cycle did the injury occur

☐ Menstruation (Approx Day 1-7) ☐ Follicular (Approx Day 8-11) ☐ Ovulation (Approx Day 12-17) ☐ Luteal (Approx Day 18-28)

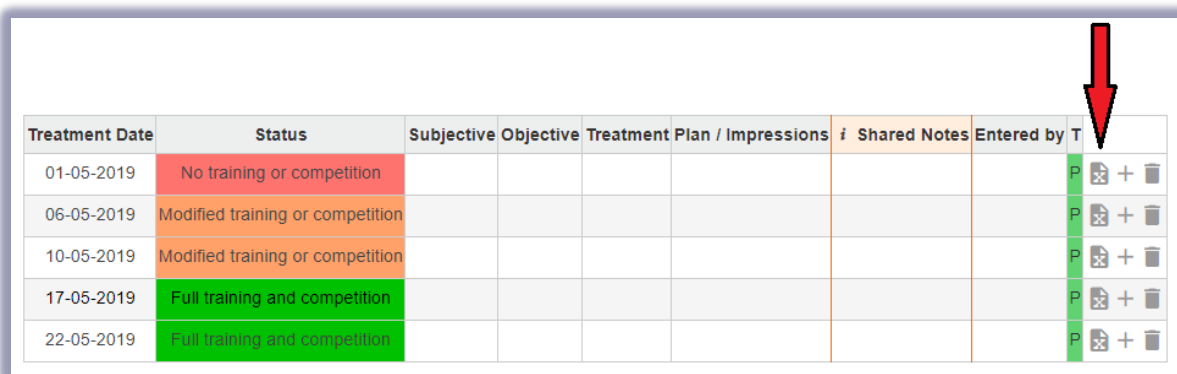
Netball Any Other Comments











Treatment fields

A current registration with AHPRA, or the international equivalent, is required to enter information into this record section. Injury records are confidential and are made accessible to doctors, physiotherapists and approved medical administrators only, unless communicated via the Shared Notes section.

Users accessing AMS are required to note and comply with all applicable Australian Sports Commission (ASC) policies and Australian legislation to retain the security and privacy of the personal information contained within the system. Non-compliance will be considered a breach of the ASC Code of Conduct and may constitute a civil and/or criminal offence. Users are reminded that all activity on AMS is recorded and retained.

The AMS treatment notes satisfy the health record requirements of AHPRA. If a clinician wishes to duplicate the treatment notes to also store these within their own clinical record system, this can be achieved by clicking on the sheet logo as indicated in the picture below.



Treatment Date	Status	Subjective	Objective	Treatment	Plan / Impressions	Shared Notes	Entered by	T
01-05-2019	No training or competition						P	 + 
06-05-2019	Modified training or competition						P	 + 
10-05-2019	Modified training or competition						P	 + 
17-05-2019	Full training and competition						P	 + 
22-05-2019	Full training and competition						P	 + 

Treatment date

The date the treatment was undertaken. If a treatment note is entered retrospectively, the treatment date should still reflect the date the treatment was provided.

Status

The current training and competition status that reflects the current capacity of the athlete due to the specified injury at the date of the treatment should be accurately provided here. For further details about the selection of the appropriate injury status please refer to the earlier **Injury status definitions** section (p.16).

Injury Status Definitions	
Full training and competition	Unrestricted participating in all training or competition to pre-injury/illness full capacity, as planned by coaching staff, only relating to the primary mode of training
Modified training or competition	Any reduction from pre-injury/illness full capacity or restriction to an athlete's participation in training or competition, as planned by coaching staff, that is based on medical restriction and relates only to the primary mode of training
No training or competition	Athlete unable to participate in primary mode of training or competition based on medical advice

Subjective

Subjective assessment findings entered in this field.

Objective

Objective assessment findings entered in this field.

Treatment

Record of treatment provided entered in this field.

Plan/Impressions

The injury plan for the athlete entered in this field. This section is only visible to the treating clinicians, which could also be thought of as a “note to self” for the next treatment session regarding the immediate plan or clinical impressions.

Shared notes

This box of the treatment section is visible to selected and approved members of the high performance team, which may include coaches, performance directors and other performance support staff. This section is intended to be used as a platform to communicate information regarding an athlete’s rehabilitation status to the key members of the high performance team, the injury status of an athlete to the other members of the high performance team, without sharing the confidential components of the treatment record.

Examples of information shared in these notes could be an update of prognosis or return to sport planning, current activity restrictions or training guidelines, recommendations made for athletes to connect with other performance support practitioners.

Confidential information should not be included in this section.

Entered by

The name of the clinician entering the treatment record is captured here automatically which is transferred from the AMS account of the clinician.

Status prior to first treatment

Please choose the injury status of the athlete for the time between the date of the injury and the first treatment/assessment. This drop down box allows the clinician to select one of the three status options: Full training and competition, Modified training or competition, or No training or competition (for further details about the selection of the appropriate injury status please refer to the earlier **Injury status definitions** section (p.15)).

Treatment status

When the treatment status of an injury is selected as ‘*Full training and competition*’ an additional section under the heading **Treatment status** is made visible. Under this new section there are two additional components:

Is the OSICS Correct?

This question provides a prompt to review the initial OSICS diagnostic code that was entered. Please review the initial OSICS code entered and update this section if it is not the most accurate diagnosis that can be provided (see **Injury: OSICS diagnostic code** section (p.23) for more details). The last record is the record which is analysed and it is therefore imperative this is updated to avoid errors in the reporting of injuries and therefore prevention programs.

Is OSICS Correct? * ☐ Yes ☐ No

Please confirm you are happy with the OSICS code that has been given (often at initial diagnosis) prior to closing the record

Treatment Status

This field provides a dichotomous option to identify if the injury remains ongoing and requiring further treatment (open), or if the injury has been adjudicated to be recovered and does not currently require any further treatment (closed). An injury should be closed once clinical intervention for that injury is no longer required.

The AMS captures the date when the treating clinician closes off an injury record, which signifies that the injury has recovered from a medical perspective and no longer receiving active treatment.



It is the duty of the clinician to maintain accurate records for the NSO or NIN provider that the athlete is affiliated with, so following up the athlete in these cases is important. Best practice management is to maintain up to date injury records, which involves the clinician regularly reviewing the athlete cohort within AMS that they are responsible for providing medical servicing to.

Many NSOs have taken the approach that all open injury records should be reviewed weekly to ensure that the records are accurate, and if an athlete has recovered from an injury and is no longer receiving servicing, that record should then be closed if there are no further treatments planned. This effectively ends the accumulation of the number of days an athlete spends as currently injured.

Treatment Status * ☐ Open ☐ Closed

Date Injury Closed

This item specifies the date that the clinician elects to signify that an athlete's injury no longer requires clinical intervention, essentially identifying that the injury has recovered. It is recommended that the date for this field aligns with the date of the last clinical treatment related to the injury.

If the injury record has been left open for an additional time period following the last treatment date to observe if further treatment related to the injuries recovery is required (e.g. two weeks), but no further treatment is provided within this time, then the date the injury is closed can be retrospectively entered as the date of the last treatment. This essentially results in the length of the injury being ended at this date, rather than being increased by an additional two-week period.

Date Injury Closed 24-05-2019

Catastrophic Injury or Fatality

In the circumstance where an injury leads to permanent disability or death, this should be captured within the Catastrophic Injury or Fatality section. Catastrophic injury and fatality are individually defined below:

Catastrophic injury: *a confirmed spinal cord or traumatic brain injury resulting in permanent functional disability and assessed at 12 months. This does not include injuries resulting in transient neurological deficits such as burners/stingers, paraesthesias, transient quadriplegia or cases of concussion where there is full recovery.*¹

Fatality: *any athlete fatality related to training or competition.*¹

This is a trichotomous (No/Catastrophic Injury/Fatality) selection field. The 'No' option is automatically pre-selected in each injury record form. If the injury has a catastrophic outcome or causes fatality, then the user should change this selection to either the 'Catastrophic Injury' or 'Fatality' option respectively. The Catastrophic Injury or Fatality section only appears when the Treatment Status field is moved from 'Open' to 'Closed'.

Was this a catastrophic injury or a fatality? ☒ No ☐ Catastrophic Injury ☐ Fatality

Catastrophic injury refers to a confirmed spinal cord or traumatic brain injury resulting in permanent functional disability

Status Summary

A summary of the injury is provided at the bottom of the page within this section of the injury record. The following is an example case of what is provided after the injury sustained on 1-05-2019 was closed on 24-05-2019 (2 days after the last treatment date):

Status Summary

Summary
This provides a summary of the last entered notes in the treatments table.
 Injury Date:
 Last Treatment Date: 22-05-2019

Body Area: Thigh
 Diagnosis: Adductor longus strain
 Current Status: Full training and competition

Subjective Summary: Enter subjective notes here...

Objective Summary: Enter objective notes here...

Treatment Summary: Enter treatment notes here...

Plan Summary: Enter plan / impression notes here...

Treatments
 5

Total days in No Training
 No. of days when in a No Training or Competition Status
 5

Total days in Modified Training
 No. of days when in a Modified Training or Competition Status
 11

Total days in Full Training
 No. of days when in a Full Training or Competition Status
 5

Total days injured
 23

The data presented in the figure above is derived from the set of treatment notes that relate to the initial injury:

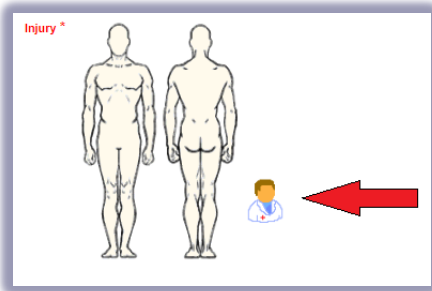
Treatment Date	Status	Subjective	Objective	Treatment	Plan / Impressions	i Shared Notes	Entered by	T	
01-05-2019	No training or competition							P	+ -
06-05-2019	Modified training or competition							P	+ -
10-05-2019	Modified training or competition							P	+ -
17-05-2019	Full training and competition							P	+ -
22-05-2019	Full training and competition	Enter subjective notes here...	Enter objective notes here...	Enter treatment notes here...	Enter plan / impression notes here...	Enter shared notes here...		P	+ -

Note: As the injury was closed on the 24-05-2019, 2 days after the last treatment date (22-05-2019), the total duration of the injury length is calculated as 23 days, as opposed to 21 days. This example highlights the possible discrepancies that can arise if an injury is left open for extended periods of time in the absence of treatment.

Other considerations

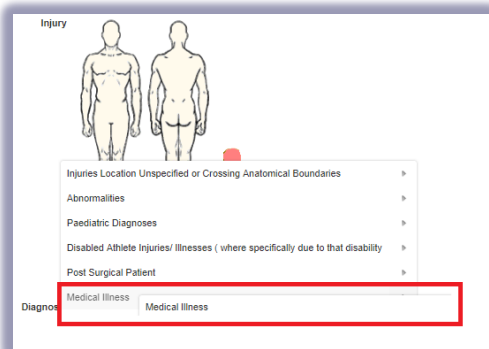
Reporting illness in the absence of a medical doctor

In the circumstance where an athlete does not have access to a medical doctor and reports to a physiotherapist with a medical illness, the physiotherapist should record this as a **medical illness** that can be accessed under the **Injury** section by clicking on the doctor icon (as indicated below). In cases where an athlete does have access to consult with a medical doctor (including video consultation), it is the doctors responsibility, not the physiotherapists, to enter this into a medical illness record.



After clicking on the doctor icon, the **medical illness** row should be selected. A specific diagnosis is **not** required as it is beyond the scope of a physiotherapist to diagnose a medical illness.

Any actions taken as a result should be recorded within this record.



SECTION 3: SURVEILLANCE MEASURES & REPORTING



Surveillance measures

A key objective of any health system database is to facilitate the calculation of epidemiological metrics to monitor the health of an athlete or an athletic population longitudinally. Ascertainment of population health provides a valuable resource to measure health trends over time and enables the effect of various factors to be analysed with respect to the impact on injury and illness rates. While the AMS provides a great opportunity for such insight, there are key fundamental components that need to be considered and understood when planning and interpreting such analyses.

Defining the surveillance period

A clear starting date of surveillance enables the time that an athlete is being monitored to be definitely recorded. This enables basic exposure measures to be recorded and allows the time an athlete is at risk to be established. It is common in injury surveillance research for the surveillance period to be a singular competition season.⁶⁹ It is important to recognise however, that many athletes sustain injuries during the pre-season that can increase their risk of sustaining injuries within the playing season and that pre-season injuries can also carry over into the in-season stage. In sports that have a defined competition season, it can be common practice for an athlete's injury management plan to involve supporting them through an injury to enable them to continue to participate in competition whilst being injured, with the plan for post-season surgery to facilitate the full recovery of an injury.^{40 41} In such cases, by not capturing post-season (off-season) injury surveillance, the severity of such injuries are not captured which underestimates the true incidence of injury for the sport.⁴⁰

Ideally injury surveillance should continue longitudinally beyond just one competition season or one calendar year. A limitation of a majority of sports injury literature is that it does not report on multiple seasons or years of injury surveillance.⁶⁹ Surveillance over multiple seasons is important to monitor seasonal fluctuations and allows for injury metrics to be compared against previous seasons to determine if there are changes that are beyond what is expected within normal fluctuations. Furthermore, having consistent surveillance over multiple seasons, allows the effectiveness of introducing prevention programs or the effect of rule changes to be measured.

Exposure

Determining the level of injury risk is a major interest for a range of stakeholders in sport, from the level of the participating athlete through to the administrative level of sport.⁷⁰ While determining the frequency (number of occurrences) of injuries that have occurred in a team is useful information, it does not provide any accurate insight into the risk of injury occurrence. Quantifying a measure of athlete participation that is segregated into training and/or competition, is typically referred to as *exposure* data. Exposure provides the opportunity for the risk of injury to be calculated as well as allowing a more accurate comparison of injury occurrence between different squads or sporting populations.^{21 22 70} A challenge in quantifying and interpreting sports injury data, relates to the definition and collection of meaningful athlete participation data in relation to their training and competition.^{22 71 72}

There are various methods to capture exposure data in sport.^{23-27 63} The gold standard method for collecting exposure data requires the exposure of each individual athlete to be recorded for all training and competition sessions. This may include using tools such as GPS devices to capture the running distances or total time participated in for each session, or may involve a sport related metric such as the number of throws completed in baseball or the number of balls bowled in cricket.²⁶

It is widely recognised for many Australian NSOs that this highly detailed level of data is not currently feasible to collect within current surveillance parameters. As such, a more pragmatic method is proposed within this document that is applicable to a large range of sports. The '*per athlete days*' metric is proposed as it is not reliant on highly specific capture of participation data and is easily interpreted by athletes, coaches and administrators. The IOC consensus statement recommends that exposure be reported '*per 365 athlete days*'.¹ If the capture of high quality exposure data is readily available, it is recommended that these data be utilised within the sport to perform more precise calculations as discussed in the following sections of this document.



Data cleaning

Injury data is not always accurately entered into the AMS and in some cases contains erroneous data that could lead to inappropriate inferences being made if the errors are not corrected or appropriately acknowledged. Before injury data are reported, they should be reviewed and checked for errors and missing data points. This process should be performed systematically that involves a process with both appropriate data handling methods and specific sports injury knowledge to ensure confidence in the accuracy of the reported data is strong.

Key data points to review for each record include:

- Date of injury occurrence
- Injury status is up to date (open vs closed)
- Date of injury closure
- Number of time loss days (no training and modified training)
- Number of total days spent injured
- Accurate OSICS code allocation
- Side of injury is selected
- Each record only contains data for one body site injury (injuries at different sites should be entered in different injury records)

It is always important to check for duplicate records to ensure that a single injury is not represented more than once.

Reporting and analysis of injury data

Frequency

The frequency (the number of occurrences) is the most commonly used metric for measuring injury occurrence across NSOs. The frequency count can be used to rank the most commonly occurring injuries in order of their occurrence. This can be used to report the most frequently occurring OSICS codes, body site injured, injury mechanism, etc.

Proportion

A proportion is the part that represents a group when compared to the whole. For example, hamstring injuries accounted for 30 of the 200 injuries sustained. Proportions are often expressed as percentages, e.g. 15% of all injuries sustained were hamstring injuries.

Prevalence

Prevalence is defined as the proportion of a specific population that are affected by a health problem at a particular period of time.⁷³ Prevalence is calculated by dividing the number of affected athletes at a particular time by the total number of athletes within the specified population.⁷⁰ In sports research, prevalence is usually presented as a percentage or as a fraction. Prevalence measures within sports injury analysis should be presented with an accompanying confidence interval (CI).⁷⁰ Explanation and formulae for calculating CIs are beyond the scope of this document, but there are numerous statistical resources available to provide further detail.

Point prevalence

Point prevalence is defined as the prevalence of a health problem at a certain point in time. For example, a point prevalence shoulder pain was reported in 36% of elite handball players at the beginning of the competition season.⁷⁴

$$\text{Point prevalence (\%)} = \frac{\text{number of cases on a specific date}}{\text{number of athletes in the population on this date}} \times 100$$



Period prevalence

Period prevalence is the prevalence of a health problem over a specific period of time. For example, 21.5% of elite Australian Football players reported Achilles tendon symptoms during the 2016 Australian Football season.⁴⁴

$$\text{Period prevalence (\%)} = \frac{\text{number of cases that existed in a given period}}{\text{number of athletes in the population during this period}} \times 100$$

Lifetime prevalence

Lifetime prevalence is the proportion of athletes within a population that have been affected by a health problem at some point in their life until the time of assessment. For example, 93.8% of elite adolescent male rowers reported experiencing low back pain at some stage during their lives.⁷⁵

$$\text{Lifetime prevalence (\%)} = \frac{\text{number of cases experienced at some point throughout life}}{\text{number of athletes in the population}} \times 100$$

Incidence

The incidence of a health problem is defined as the number of *new* cases (e.g. injuries) that occur within a defined population over a specified period of time.⁷³ It is important to note that only *new* injury records are considered in the calculation of incidence. This excludes pre-existing injuries, such as an ACL injury currently undergoing rehabilitation that was sustained in a previous time period not considered in the injury incidence calculation (e.g. the previous season). Incidence provides information regarding the *risk* of sustaining a health problem, which is different to prevalence which describes how widespread a health problem is. Incidence measures within sports injury analysis should always be presented with an accompanying confidence interval (CI).⁷⁰ Explanation and formulae for calculating CIs are beyond the scope of this document, but there are numerous statistical resources available to provide further detail.

Cumulative incidence

Cumulative incidence is a measure of the proportion of athletes who experience a *new* injury during a specified period of time, where all athletes are considered to be at risk during the entire time period.

$$\text{Cumulative incidence (\%)} = \frac{\text{number of new injuries sustained during a specified period of time}}{\text{total number of athletes during the specified period of time}} \times 100$$

It is important to recognise the length of the time period for which the cumulative incidence has been calculated from. Cumulative incidences over longer time periods (e.g. 2-years compared to 1-year) would expect to result in higher findings due to a longer exposure time and hence greater time to be exposed to sustaining a health problem.

It is also important to understand an assumption that is made in the calculation of cumulative incidence. As the calculation of cumulative incidence typically considers all athletes to be exposed to the same length of time, those athletes who leave the squad (e.g. retire, change sports, dropped from the squad) are not exposed to the same risk for sustaining an injury as the athletes who are involved in the program for the entire surveillance period. This can result in the true incidence being underestimated as a smaller number of athletes (the actual number remaining after drop-out) are less likely to sustain as many injuries as a larger group consisting of more athletes.⁷⁶ Cumulative incidence also assumes that the rate is constant over the specified period.⁷⁷

Incidence rate

The incidence rate (also referred to as incidence density) can overcome the issues with assuming that all of the athletes have a uniform time under surveillance. The term '*censoring*' refers to the process of identifying the true time periods that an athlete was under surveillance for, discarding the time within the whole surveillance period where the athlete was not under surveillance (e.g. following a retirement mid-season).⁷⁶ An incidence rate calculation considers the total amount of time *each athlete* was under surveillance, rather than using the total population risk that is considered in cumulative incidence calculations.



$$\text{Injury incidence rate} = \frac{\text{number of new injuries sustained during a specified period of time}}{\text{total athletes} \times \text{time under surveillance}} \times 1000$$

In the incidence rate formula above, the rate has been multiplied by 1000 so that the incidence rate can be expressed per 1000 training/competition days. The multiplier number is arbitrary – it can be another figure such as 100 or 10,000. The per 1000 days metric is the proposed metric for use, due to its pragmatic interpretation. For example, a coach with 10 athletes and an incidence rate of 0.05 ankle injuries per 1000 days, can expect to observe 5 ankle injuries per 1000 days of training.

In the circumstance where accurate exposure data has been collected (i.e. GPS data to confirm the duration of exposure), the per 1000 hours metric can be used. This metric is the recommended measure for many sports made by their consensus statements for the methodology of injury and illness surveillance.^{23-25 27 63} While this metric is considered the gold standard, it has been unachievable to consistently capture accurate exposure for most NSOs previously, which is a requisite for using this method.

Pre-existing injuries

It is common for a small number of athletes to enter a surveillance period with a pre-existing injury. Recognition of pre-existing injuries is important, as they will have contributed to the number of days spent injured within the surveillance period. For example, if an athlete sustains an ACL injury 6 weeks prior to the commencement of the surveillance period, the consequences of this injury should be accounted for, as a substantial period of training will be spent in modified training (time-loss) and unavailable for competition. These injuries are then reflected in the overall availability rate of a squad and of an athlete throughout the surveillance period.

Given that these injuries are sustained prior to the surveillance period, they are not recorded as 'new' injuries and as such are not included within injury incidence calculations. However, given they can persist into the surveillance period they can be included within prevalence calculations.

Severity

The recommended definition for the severity of a health problem is consistent with a number of consensus statements for injury surveillance, which is defined as *"the number of days that have elapsed from the day after the onset of the incident to the day of the athlete's return to full participation in training and is fully available for competition"*.^{23-25 27 63}

It is important to recognise that this definition of severity is only applicable to time loss injuries. To consider the severity of non-time loss injuries, it is recommended that severity be defined as *the number of days that have elapsed from the day after the onset of the incident to the day of full injury recovery*.

Injury severity should be reported in either parametric or non-parametric values based on the data. Injury severity data are typically non-parametric, meaning that the distribution is skewed, in which case the median value offers the more appropriate measure.

Severity can be ordered into categories according to the length of injury time. The sub-categories of severity that are recommended are in accordance with those of Timpka et al., (2014):

Category	Time period
Minor	1-7 days (slight=1 day, minimal 2-3 days, mild 4-7 days)
Moderately serious	8-28 days
Serious	>28 days – 6 months
Long term	>6 months



Burden

The burden of a sports injury is a metric that has rarely been reported in sport despite its use in public health.⁷⁸ Injury burden considers two dimensions – how frequently an injury occurs (incidence) and how severe the injury is (severity).

$$\text{Injury burden} = \text{injury incidence} \times \text{mean injury severity}$$

Sports injury burden is commonly reported as the number days of absence per 1000 hours.⁷⁸ Injury burden can also be illustrated by a risk matrix, a tool used for risk assessment. There are numerous methods to construct risk matrices,⁷⁹ but the example provided below provides a simple output that can be used to assess injury burden, where the injury severity (time-loss days) is plotted against the injury incidence (Figure 2).⁸⁰ Those injuries that appear in the darker aspects of the shading (top right) demonstrate a greater injury burden, than the injuries in the lighter shading (bottom left) that demonstrate a smaller burden. Those injuries with the highest burden should be given higher priority to prevention resourcing and strategy.⁷⁸

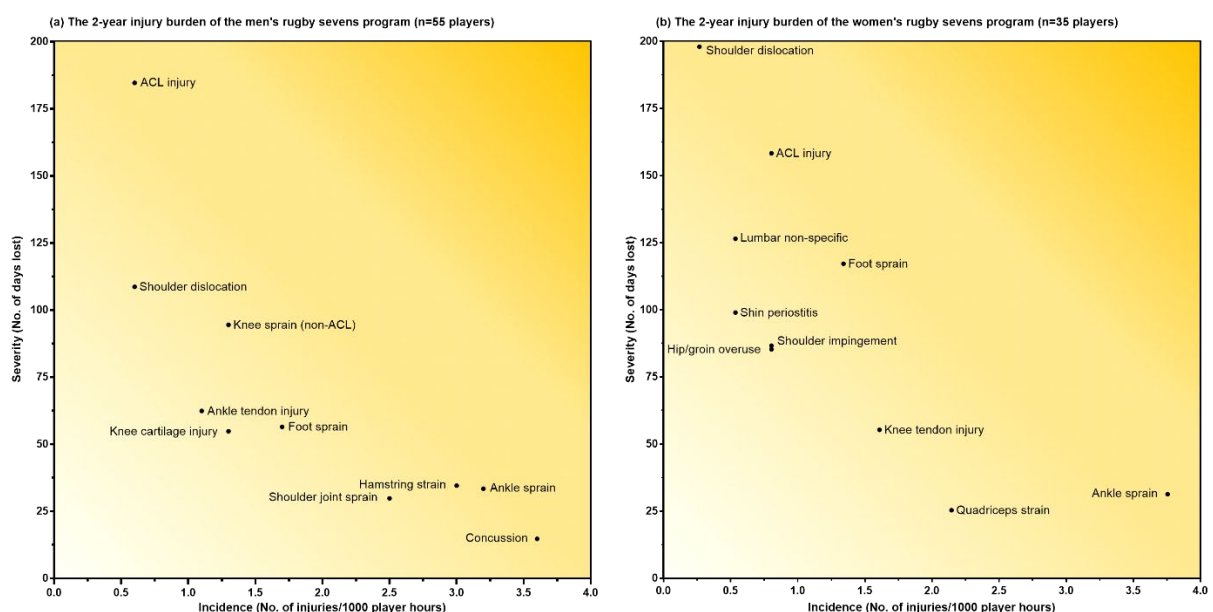


Figure 2. An injury risk matrix for male and female rugby sevens players highlights the injury burden of the top 10 injury types (adapted from Toohey et al, 2019)⁸⁰

Frequently asked questions

1. Why was this document created?

Creation of this document was in response to the requests made by staff of NSOs and across the NIN to deliver an update to Version 1 of the AIS Data Dictionary provided in 2014. This document aims to combine a 'gold standard' of surveillance procedures and principles with operational efficiency for the clinician who is required to enter the data and maintain record accuracy. Through improving the injury reporting processes across Australian sports, the sporting system will be in a greater position to progress through the prevention process to optimise athlete health.

2. How severe does an injury need to be for it to be entered into the AMS as an injury record?

In any circumstance where an athlete seeks or requires medical attention for the loss or abnormality of bodily structure or functioning which when following clinical examination can be associated as a recognised medical injury it should be recorded within an injury record, irrespective of whether or not training or competition time is lost.

3. Why should non-time loss injuries be recorded?

Health professionals are required to document any injury as a component of best practice.

Non-time loss injuries can progress into time loss injuries and there is also evidence that demonstrates non-time loss injuries increase the risk for future time-loss injuries. Failing to record these injuries prevents such associations being made and limits the management of an athlete that takes into consideration their full injury history.

Evidence shows that performance may be reduced even though they are participating in their sport. It is important for discussions relating to performance outcomes.

4. What defines an athlete to be in full training?

To be considered to be in full training, an athlete should be able to fully participate in the primary mode of training or competition at an equivalent level to pre-injury when at full capacity, as planned by coaching staff if the athlete was uninjured/healthy. In sports with multiple primary modes (e.g. triathlon), the athlete should be able to fully participate in all modes of the sport to be considered in full training.

5. When should I use 'maintenance' notes?

Any servicing provided to an athlete, who is in full training, in the absence of any diagnosable injury and/or illness. Any treatment that relates to an athlete presenting with physical complaint that is recognised to be associated with an injury should be recorded within an injury record as this fulfils the medical attention definition of an injury. Examples include a post-competition massage that does not relate to an injury or providing stretching and range of motion programs that are aimed to improve an athlete's ability to achieve sport specific positions for performance reasons.

6. What is the difference between a new and recurrent injury in the AMS?

A new injury identifies an injury diagnosis that has not previously been entered into the AMS for that athlete.

A recurrent injury links the occurrence of an injury an athlete presents with, to a previous injury that they have sustained that is of the same diagnosis (e.g. 2nd left lateral ankle sprain following a previous left ankle sprain).

7. Why are recurrent injuries and exacerbations recorded as separate injury records?

The ability to identify recurrent injuries and exacerbations is important to ensure that the severity of the index injury is accurately recognised. Recording exacerbation occurrence allows the additional days spent injured, resulting from the exacerbation, to be distinguished from those associated with the index injury. This ensures



that the severity of the initial index injury is not overstated. Currently the AMS cannot capture this information in an existing injury record.

8. How do I update an OSICS code in the injury record form?

The OSICS code that has previously been selected can be updated as further diagnostic information becomes available (e.g. following an MRI) by removing the previous OSICS code - by clicking on the 'trash can' icon - and then selecting a new OSICS code that reflects the revised injury diagnosis.

9. When should an injury record be closed?

An injury record should be closed when there is no further clinical intervention required at that time relating to an injury. The date of the last clinical treatment should be used at the date of injury closure.

10. What date should I list when closing an old injury record?

When closing an injury record, the date of the last treatment related to the specified injury should be entered.

11. How often should the AMS injury records for a group be reviewed?

It is encouraged that AMS injury records for a group (e.g. water polo squad) are reviewed weekly to ensure that up to date injury records are maintained. It is recognised that in some circumstances this is not feasible and fortnightly or monthly reviews may be more appropriate. A full audit should be completed annually to be included in annual reports.

12. Can physiotherapists view and enter medical illness records?

Physiotherapists cannot view medical illness records. Viewing of illness records is currently restricted to medical doctors only.

13. How do I access data for research?

The use of the AMS data for research purposes requires three approvals to be granted. These include the AIS Ethics Committee, the National Sporting Organisation and approval from the ASC for use of the data for research purposes. Please direct enquiries to ethics@ausport.gov.au or contact the secretary of the AIS Ethics Committee on 02 6214 1577.

14. Can athletes see their medical records/notes?

Athletes cannot see their medical records/notes through their AMS athlete profile. However, athletes can request access to their medical records/notes through the ASC in accordance with Australian Privacy Principles (AAP 12).

In the first instance an athlete can request access to their personal information by contacting the ASC.

By post:

Privacy Officer
Australian Sports Commission
PO Box 176 Belconnen ACT 2616

By email: privacy@ausport.gov.au

The AIS Privacy Policy (available at https://www.sportaus.gov.au/legal_information/privacy_policy) outlines our personal information handling practices, including details on how athletes can seek access or correction of the personal information that is held about them.

15. Why are administrators (such as performance directors) not authorised to see medical notes?



Information contained in injury and illness notes contains confidential medical information that has been provided as medical-in-confidence to a health professional. This information is unable to be shared without consent from the athlete.

16. How long are injury records kept?

Athlete health records are retained for up to a maximum of 100 years (in accordance with Commonwealth and medical recordkeeping requirements), after which time they will be securely disposed.

17. Who can view injury records?

Authorised staff who are involved with an athlete's care can view their injury records. This includes medical doctors, physiotherapists and nurses. All employees of the ASC are made aware of good privacy practices and are bound by the ASC Code of Conduct to not misuse personal information. Those who perform services on the ASC's behalf are also bound by contractual agreements that include privacy clauses.

18. What are the consequences for staff not complying with the ASC Code of Conduct?

Users accessing AMS are required to note and comply with all applicable Australian Sports Commission (ASC) policies and Australian legislation to retain the security and privacy of the personal information contained within the system. Non-compliance will be considered a breach of the ASC Code of Conduct and may constitute a civil and/or criminal offence. Users are reminded that all activity on AMS is recorded and retained.

19. Where do I report a breach of Code of Conduct?

A breach of the Code of Conduct should be reported to the ASC Privacy Officer. The contact details for the ASC Privacy Officer are as follows:

By post:

Privacy Officer
Australian Sports Commission
PO Box 176 Belconnen ACT 2616

By email: privacy@ausport.gov.au

20. Who do I report a privacy complaint to?

Any privacy complaints received by the ASC must be in writing and will be initially investigated by the ASC Privacy Officer, and will be escalated as required.

By post:

Privacy Officer
Australian Sports Commission
PO Box 176 Belconnen ACT 2616

By email: privacy@ausport.gov.au

The ASC will respond to all complaints within a reasonable time period appropriate to the specific complaint. The ASC complies with the Guidelines published by the Office of the Australian Information Commissioner in relation to complaints management. The Privacy Policy also contains information on how you can make a complaint if you think the ASC has breached its obligations under the Privacy Act 1988.



Limitations

While this document provides an update from the first iteration of the Data Dictionary, Version 1 created in 2014, there remains several limitations. The intent of this document is to provide a basis to inform best practice to systematically collect population level epidemiological data that also concurrently fulfils the medico-legal requirement of record keeping for Australia clinicians under the AHPRA guidelines. The scope of this document is intended to be applicable to all NSOs and NIN sites, rather than specifically applicable to one individual sport as has been the objective of previously published consensus statements of injury definitions for individual sports.^{23-27 63}

The AMS injury record form allows the clinician to record other data related to the onset of the injury including the mechanism, activity and geographical location at the time of the injury. These data fields are sport specific. Not all sports require clinicians to complete these compulsory fields. It is strongly recommended that each NSO reviews the content of these additional fields, to firstly remove any unnecessary components, and then to make the remaining fields mandatory within the injury record form to avoid important data not being captured. It is acknowledged that to develop successful injury prevention programs additional data are required beyond what can be routinely captured in a clinical health record. Accurate capture of workload data, for example, would allow for participation injury risk to be measured for both injured and non-injured athletes.

Future directions

There are a number of projects that are either currently in progress or that are planned that aim to improve both the quality of the injury data that is being collected, whilst also reducing the time burden on entering the data through improving the workflow of clinicians that use the injury record form on a daily basis. As advances in the injury record form are made available, this will be communicated widely to the system by the AMS team. It is anticipated that future iterations of this document will be required as new research and advancements in IT infrastructure that improve the facilitation and knowledge of injury surveillance and injury recording emerge.

On 24 March 2020 the Orchard Sports Injury and Illness Classification System (OSIICS-13.1) was published as the successive iteration of the OSICS-10.1. The OSIICS-13.1 provides updated injury diagnostic codes and terminology, while also including an increased number of illness specific diagnostic codes. All of the OSIICS-13.1 diagnostic codes have been mapped to the International Classification of Diseases 11th Revision (ICD-11) diagnostic coding system.⁶⁸ The OSIICS-13.1 will be incorporated into the AMS injury form in the coming months and further detail will be provided at this time. The update to the OSIICS-13.1 from the OSICS-10.1 will have little impact on the current clinical workflow for entering injury diagnoses.

Additional future developments include advancements in the injury record form to capture multiple injuries and accurately record exacerbations within the one record form.

Please direct suggestion of future enhancements to ams@ausport.gov.au. All suggestions will be considered.



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Appendices

Appendix 1. SIC-2.0 model flowchart



SIC-2.0
flowchart.pdf

Appendix 2. OSICS-10.1 codes



OSICS10version1.p
df



Appendix 3. Detailed changes made from Version 2

The table below details all of the changes in Data Dictionary Version 2.1 made from Data Dictionary Version 2, with a page reference number for each version and reference to the relevant page number(s) of the IOC consensus statement.

Section	Sub-heading	Data Dictionary: Version 2.1 page	Data Dictionary: Version 2 page	IOC consensus statement ¹ page
Definitions	Executive summary: definitions	9	8	373-374
	<i>The wording of the medical attention injury and sports-incapacity injury definitions has been slightly amended to align with the IOC consensus statement. Specified changes are detailed within the Medical attention injury and Sports-incapacity (time-loss) injury statements below.</i>			
Definitions	Sports injury definitions	10	9	373-374
	<p><i>The following sentences have been added to this section:</i></p> <p><i>“The International Olympic Committee consensus statement: methods for recording and reporting of epidemiological data on injury and illness in sport 2020 (including STROBE Extension for Sport Injury and Illness Surveillance (STROBE-SIIS)),¹ defines an injury as “tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy” (p.3).”</i></p> <p><i>“The use of these three injury definitions is recommended by the IOC consensus statement.¹ An outline of each of these injury definitions as defined by the IOC consensus statement is provided in the sections below.”</i></p>			
Definitions	Medical attention injury	11	10	373-374
	<p><i>Medical attention injury definition in Version 2.1:</i></p> <p><i>“Tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy that results in an athlete receiving medical attention.”</i></p> <p><i>Medical attention injury definition in Version 2:</i></p> <p><i>“The loss or abnormality of bodily structure or functioning resulting from exposure to sports training or competition that following examination is diagnosed by a clinical professional as a medically recognised injury.”</i></p>			
Definitions	Sports-incapacity (time-loss) injury	12-13	11-12	373-374
	<p><i>Sports incapacity injury definition in Version 2.1:</i></p> <p><i>“Tissue damage or other derangement of normal physical function due to participation in sports, resulting from rapid or repetitive transfer of kinetic energy that results in an athlete being unable to complete the current or future training session or competition.”</i></p> <p><i>Sports incapacity injury definition in Version 2:</i></p> <p><i>“The removal from or reduction in participation of an athlete related to the primary mode of training/competition by a sports authority (the athlete her/himself, coach, manager, sports committee, sports medicine practitioner) due to a reduced ability to perform a planned sports activity that follows exposure to sports training or competition.”</i></p> <p><i>Note: The Injury Status Definitions image has also been updated to reflect the current image displayed in the AMS injury record (p.14).</i></p>			



Definitions	Injury status definitions	17-18	16-17	N/A
	<i>The Injury Status Definition images have been updated to reflect the current image displayed in the AMS injury record.</i>			
Definitions	Recovery from time-loss injury	19	18	379
	<p><i>The following sentence has been added to this sub-heading section:</i></p> <p><i>“In the circumstance where an athlete recovers from an injury during a period where there is no planned training or competition (e.g. during the off-season), the date of return to full training and competition should be entered as when the athlete would normally have been ready for full training and competition participation.”</i></p>			
AMS injury record data fields	Injury onset	22	21	374-375
	<p><i>A change in terminology was required for the selection options within the Injury onset data field. The three previous options in Version 2 were changed from “Trauma, Overuse, Other” to the recommended options “Acute, Repetitive – sudden onset, Repetitive – gradual onset, and Other”. The “Other” option was retained from Version 2 despite not being specifically stated within the IOC consensus statement to account for a small number of cases where the three options are not appropriate. The four options in Version 2.1 are:</i></p> <p><i>Acute: an injury following an instantaneous transfer of energy to the body (e.g. hamstring strain with immediate commencement of pain and/or dysfunction).</i></p> <p><i>Repetitive – Sudden Onset: an injury caused by an accumulated energy transfer that occurs with an indefinable single event (e.g. a tibial fracture sustained from a gymnastic dismount, that medical imaging demonstrates occurred with a pre-existing bone stress reaction).</i></p> <p><i>Repetitive – Gradual Onset: an injury caused by an accumulated energy transfer without an identifiable single event (e.g. a gradual increase in Achilles pain over a month, diagnosed as Achilles tendinopathy).</i></p> <p><i>Other: This option may be selected for cases that do not relate to acute or repetitive onsets (e.g. symptoms related to ankylosing spondylitis).</i></p>			
AMS injury record data fields	Injury: OSICS-10.1 diagnostic code	23	22	377
	<p><i>The following four sentences were added to this section:</i></p> <p><i>On 24 March 2020 the Orchard Sports Injury and Illness Classification System (OSIICS-13.1)⁶⁸ was published as the successive iteration of the OSICS-10.1. The OSIICS-13.1 will be incorporated into the AMS injury form in the coming months. This will not change the data entry processes listed below, but will provide updated injury and illness diagnostic codes and terminology. Further information is detailed below in the Future directions section (p.43).</i></p>			
AMS injury record data fields	Injury activity	27	26	374
	<i>An additional selection box “Not related to sports participation” was added to the selection options with the Injury activity section. This allows for sports injury analysis that aims to quantify the risk associated with sport specific participation to exclude recorded injuries that are not related to sport specific exposure (e.g. car crash).</i>			
AMS injury record data fields	Sport specific fields	27	26	375
	<p><i>The following two sentences have been amended following the publication of the IOC consensus statement:</i></p> <p><i>Any irrelevant data fields that are not used should be removed to improve the efficiency of completing the injury record form by a clinician. These fields should be reviewed alongside</i></p>			



	any individual sport specific consensus statement recommendations that follow the IOC consensus statement publication. ¹			
AMS injury record data fields	Catastrophic Injury or Fatality	31	N/A	381-382
<p>The following new data field, Catastrophic injury or fatality, has been added to the AMS injury record to include capture of catastrophic injuries and fatalities.</p> <p>Catastrophic injury or fatality</p> <p>In the circumstance where an injury leads to permanent disability or death, this should be captured within the Catastrophic injury or fatality section. Catastrophic injury and fatality are individually defined below:</p> <p>Catastrophic injury: a confirmed spinal cord or traumatic brain injury resulting in permanent functional disability and assessed at 12 months. This does not include injuries resulting in transient neurological deficits such as burners/stingers, paraesthesias, transient quadriplegia or cases of concussion where there is full recovery.¹</p> <p>Fatality: any athlete fatality related to training or competition.¹</p> <p>This is a trichotomous (No/Catastrophic Injury/Fatality) selection field. The 'No' option is automatically pre-selected in each injury record form. If the injury has a catastrophic outcome or causes fatality, then the user should change this selection to either the 'Catastrophic Injury' or 'Fatality' option respectively. The Catastrophic injury or fatality section only appears when the Treatment Status field is moved from 'Open' to 'Closed'.</p>				
Surveillance measures & reporting	Exposure	35	34	383
<p>The metric for reporting of exposure in athlete days has been amended from 'reporting per 1000 athlete days' to 'per 365 athlete days'. This is reflected in the following sentence:</p> <p>The IOC consensus statement recommends that exposure be reported 'per 365 athlete days'.¹</p>				
Future directions		43	42	N/A
<p>The following paragraphs were added in the Future directions section of Version 2.1:</p> <p>On 24 March 2020 the Orchard Sports Injury and Illness Classification System (OSIICS-13.1) was published as the successive iteration of the OSICS-10.1. The OSIICS-13.1 provides updated injury diagnostic codes and terminology, while also including an increased number of illness specific diagnostic codes. All of the OSIICS-13.1 diagnostic codes have been mapped to the International Classification of Diseases 11th Revision (ICD-11) diagnostic coding system.⁶⁸ The OSIICS-13.1 will be incorporated into the AMS injury form in the coming months and further detail will be provided at this time. The update to the OSIICS-13.1 from the OSICS-10.1 will have little impact on the current clinical workflow for entering injury diagnoses.</p> <p>Additional future developments include advancements in the injury record form to capture multiple injuries and accurately record exacerbations within the one record form.</p>				

