



Sporting Injuries

Childhood Injury Presentations:

July to December 2013

- Between July 2013 and December 2013 there were 36,294 presentations to the Princess Margaret Hospital Emergency Department (PMH ED) from children under the age of 16.
- Injury presentations accounted for 26.5% (n=9,612) of the total number of presentations to PMH ED during this time period.

Number of Injury Presentations by Month; July 2013 to December 2013



- The majority of injury presentations were from children under the age of 5 (40.5%, n=3,891). Children aged 1 and 2 years accounted for 10.1% (n=973) and 10.2% (n=977) of presentations respectively, the highest in any age category.
- Males represented 56.4% (n=5,418) of injury presentations.
- The home was the most common location for childhood injuries (23.1%, n=2,221), with the outdoors accounting for the largest portion of injuries within the home (16.8%, n=373).
- Falls were the most common cause of injury, representing 39.3% (n=3,777) of all injury presentations.
- The majority of children were recorded as living within a metropolitan postcode (92.4%; n=8,882).
- Children of Aboriginal and/or Torres Strait Islander ethnicity accounted for 4.0% (n=382) of presentations.
- Unintentional injuries accounted for 97.1% (n=9,332) of injury presentations.

Introduction

- There were a total 296,546 presentations to PMH ED during the 5 year period between July 2008 and June 2013. Of these presentations 30.1% (n=89,349) were due to injury.
- Between July 2008 and June 2013 there were 19,294 injury presentations to the PMH ED due to sporting related activities, accounting for 21.6% of injury presentations.
- Of these presentations, children between 10 and 14 years of age were significantly more at risk, accounting for 58.0% (n=11,185).
- Males were also found to be at greater risk, accounting for 67.6% (n=13,004) of the presentations.



- Australian Rules Football had the highest number of sporting injuries, accounting for 13.0% (n=2,501) of presentations, followed by trampoline injuries (11.1%, n=2,146).
- The home was the most common location for sporting injuries (14.6%, n=2,827).
- Within the home, 80.3% (n=2,269) of sporting injuries occurred in the outdoor areas of the house.
- The majority sport injuries were unintentional (99.8%, n=19,255).
- Falls were the most common cause of injury from a sporting activity (28.7%, n=5,531), closely followed by blunt force (26.3%, n=5,055).
- The majority of sport injury presentations (83.4%, 16,062) were treated and discharged within the PMH Emergency Department. A further 15.5% (n=2,996) of presentations required hospital admission.

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Results

Australian studies estimate that around one million Australians injure themselves while playing sports each year, with children aged between 10 and 14 years of age at the greatest risk of injury¹. An estimated 50% of sporting injuries are considered to be preventable². Common injury risks for children while participating in sports include falls, fractures, head injuries, blunt force injuries and spinal injuries.

Between July 2008 and June 2013 there were 19,294 children between 0 and 15 years of age presenting to the Princess Margaret Hospital Emergency Department (PMH ED) as a result of sporting injuries, accounting for 21.6% of total injury presentations to the PMH ED. The total number of sporting injuries has risen during the five year period from 3,198 presentations between July 2008 and June 2009 to 4,580 presentations between July 2012 and June 2013 (figure 1). This exceeds the annual increase rate of total injury presentations from 15,217 between July 2008 and June 2009 to 19,252 between July 2012 and June 2013.

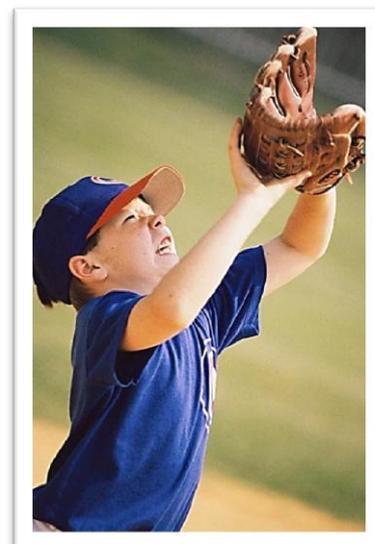
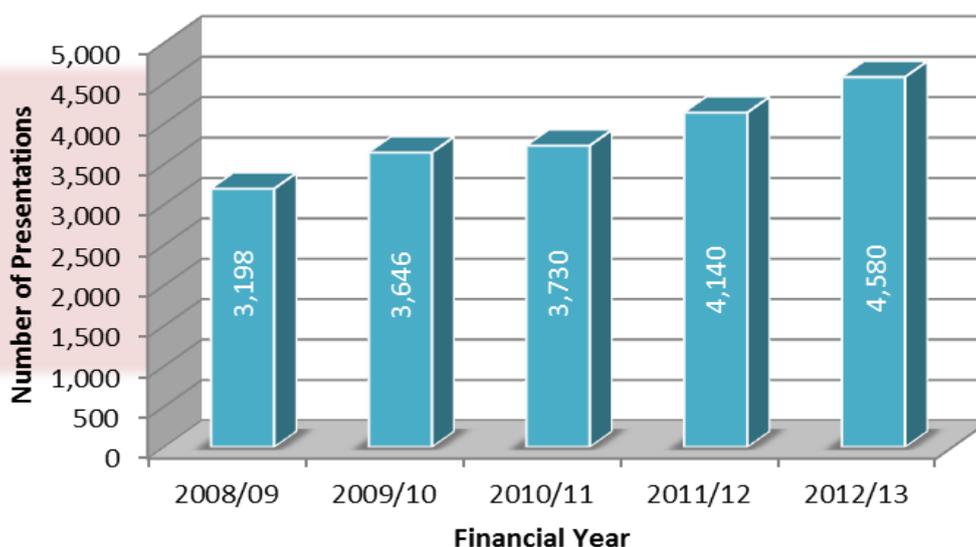
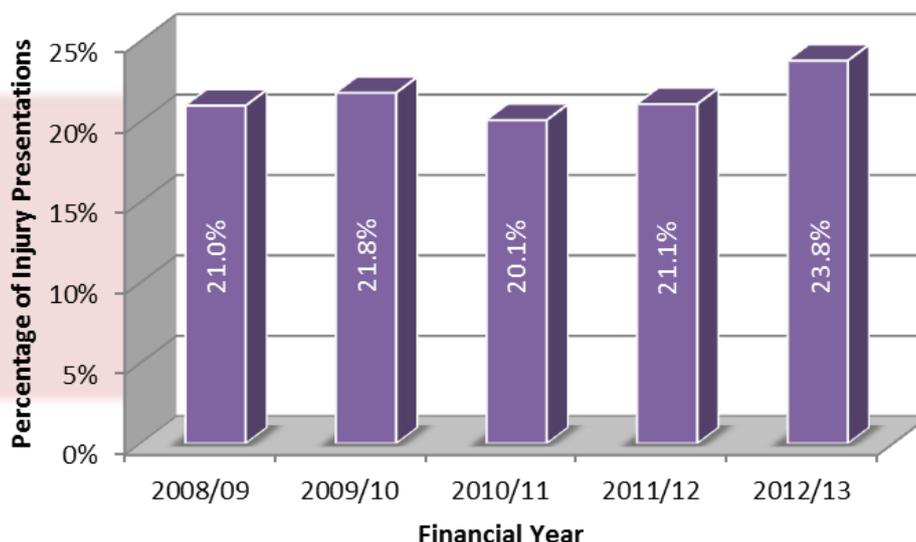


Figure 1: Total Sporting Injury Presentations by Financial Year; July 2008 to June 2013



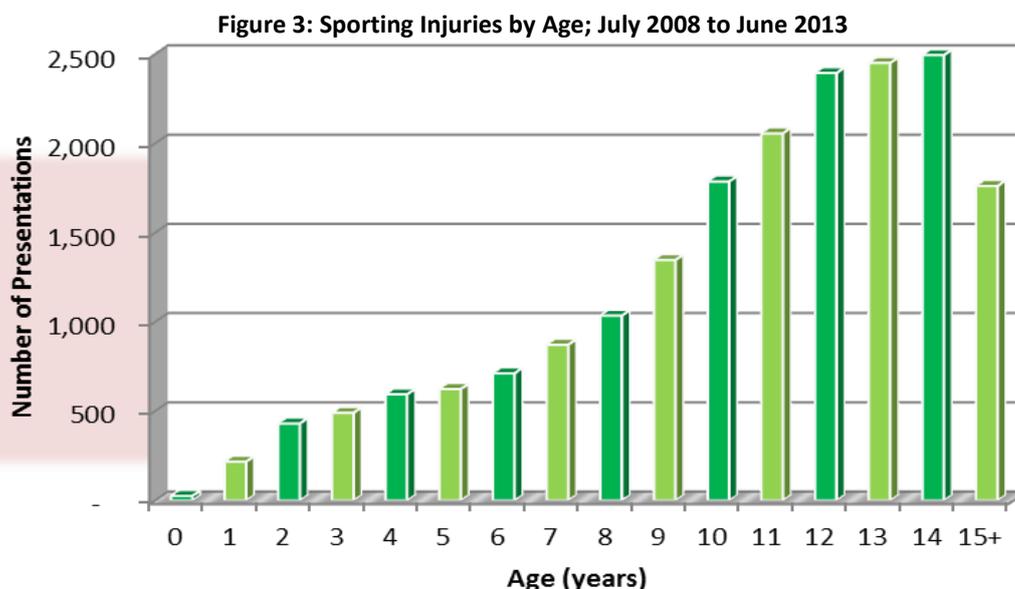
Sporting injuries as a percentage of the total number of injury presentations to the PMH ED have also increased from 21.0% between July 2008 and June 2009 to 23.8% between July 2012 and June 2013 (figure 2).

Figure 2: Sporting Injuries as a Percentage of Total Injury Presentations by Financial Year; July 2008 to June 2013



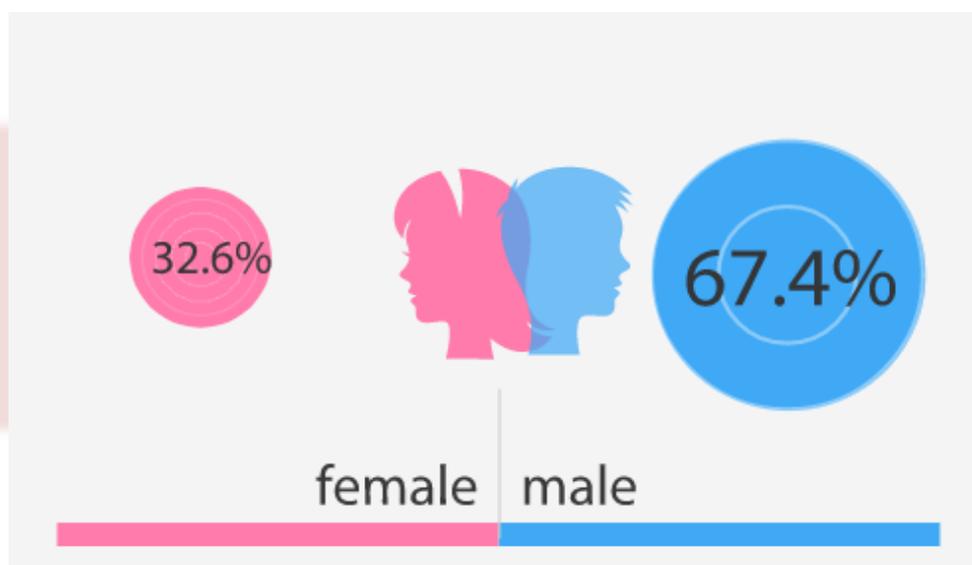
Demographic Data

Children aged between 10 and 14 years of age are at greater risk of sustaining a sporting injury, accounting for 58.0% (n=11,185) of total sport injury presentations to the PMH ED. This is in contrast to overall injury presentations, where children under the age of 5 years are at greater risk. For sporting injuries, children under the age of 5 accounted for only 9.1% (n=1,757). Children at these young ages are less likely to participate in sporting activities as they are still developing fine and gross motor skills. Children aged 12, 13 and 14 years of age represented 12.4% (n=2,395), 12.7% (n=2,451) and 12.9% (n=2,495) of sporting injuries respectively (figure 3). The drop off in the number of sporting injuries for children aged 15+ (9.1%, n=1,762) is due to a general tendency for adolescents to present to non-paediatric facilities.



During the 5 year time period, males accounted for 67.4% (n=13,004) of sporting injury presentations to the PMH ED, while females accounted for only 32.6% (n=6,290) (figure 4). This is slightly above the male: female gender ratio of 3:2 traditionally seen across child injury statistics. Peaks of male presentations are seen in the 14 and 15+ age categories where males account for 78.0% (n=1,945) and 79.3% (n=1,397) of sporting injury presentations respectively.

Figure 4: Sporting Injuries by Gender; July 2008 to June 2013



Within the PMH Injury Surveillance System, children presenting to the PMH ED are recorded as either Aboriginal and/or Torres Strait Islander descent or other. During the 5 year data period a small number of children who presented to the PMH ED with a sporting injury were recorded as being either Aboriginal and/or Torres Strait

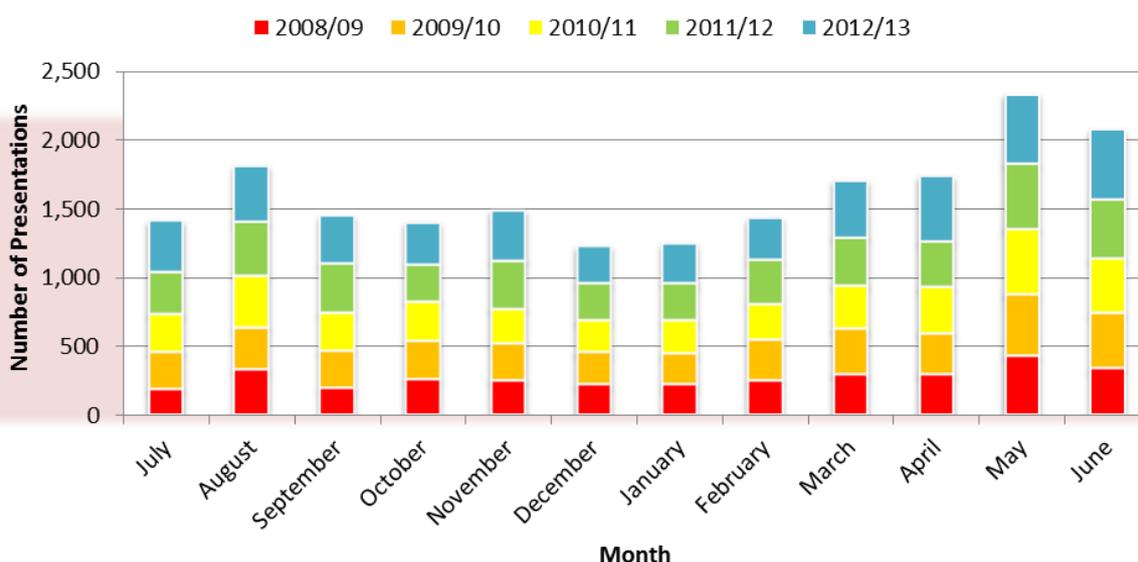
Islander Descent (3.0%, n=578). Sporting injury data demonstrates an under-representation of children from these ethnicities, since their overall injury presentation is slightly higher at 4.6% (n=4,062).

The majority of children presenting to the PMH ED for a sporting injury, lived within the metropolitan area (93.6%, n=18,053). The remaining 6.4% (n=1,241) lived in a rural area of Western Australia (5.4%, n=1,046) or were unknown/other area (1.0%, n=195).

Month, Day and Time of Injury

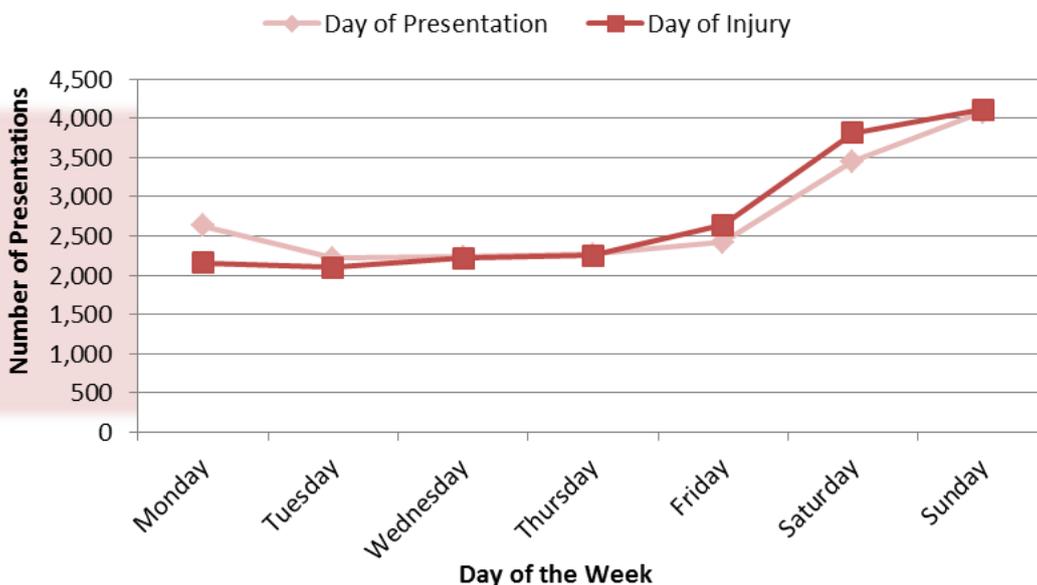
Across the year, sporting injuries most commonly occurred in the cooler winter months with May and June showing the highest number of presentations, accounting for 12.1% (n=2,333) and 10.7% (n=2,074) respectively (figure 5). This coincides with the winter organised sporting season with many children developing new or refreshing old skills. December and January recorded the lowest number of presentations accounting for 6.3% (n=1,222) and 6.4% (n=1,246) of sporting injuries respectively. This is perhaps due to the summer school holidays and consequent break in organised sports over this time.

Figure 5: Sporting Injuries by Month and Year; July 2008 to June 2013



Sport injury incidence was greatest over the weekend, with Saturday and Sunday recording the highest number of injuries occurring, accounting for 19.8% (3,813) and 21.1% (n=4,075). Saturday and Sunday also accounted for 17.9% (n=3,448) and 21.3% (n=4,112) of injury presentations (figure 6). Tuesday recorded both the lowest number of injuries (10.9%, n=2,100) and presentations (11.5%, n=2,220).

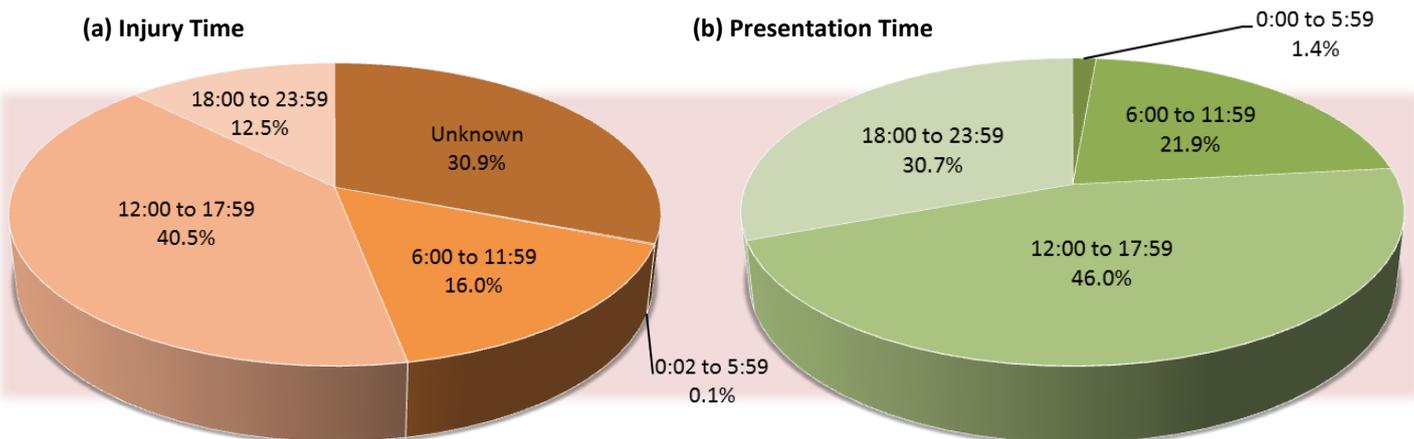
Figure 6: Sporting Injuries by Day of Presentation and Day of Injury; July 2008 to June 2013



For a large number of injury presentations the exact injury time is unknown. The time period of 0:00-0:01am is used to denote unknown injury times and accounts for 30.9% (n=5,956) of total injury presentations. The majority of injuries occur between 12:00-17:59 (12:00pm to 5:59pm), accounting for 40.5% (n=7,822) of presentations (figure 7a).

The time of presentation is also recorded for each injury case presenting to the PMH ED, with presentation times broken down into four 6 hour time intervals over the 24-hour day. The most common time for presentation of sporting injuries is between 12:00-17:59 (12:00pm to 5:59pm) accounting for 46.0% (n=8,874) of presentations (figure 7b).

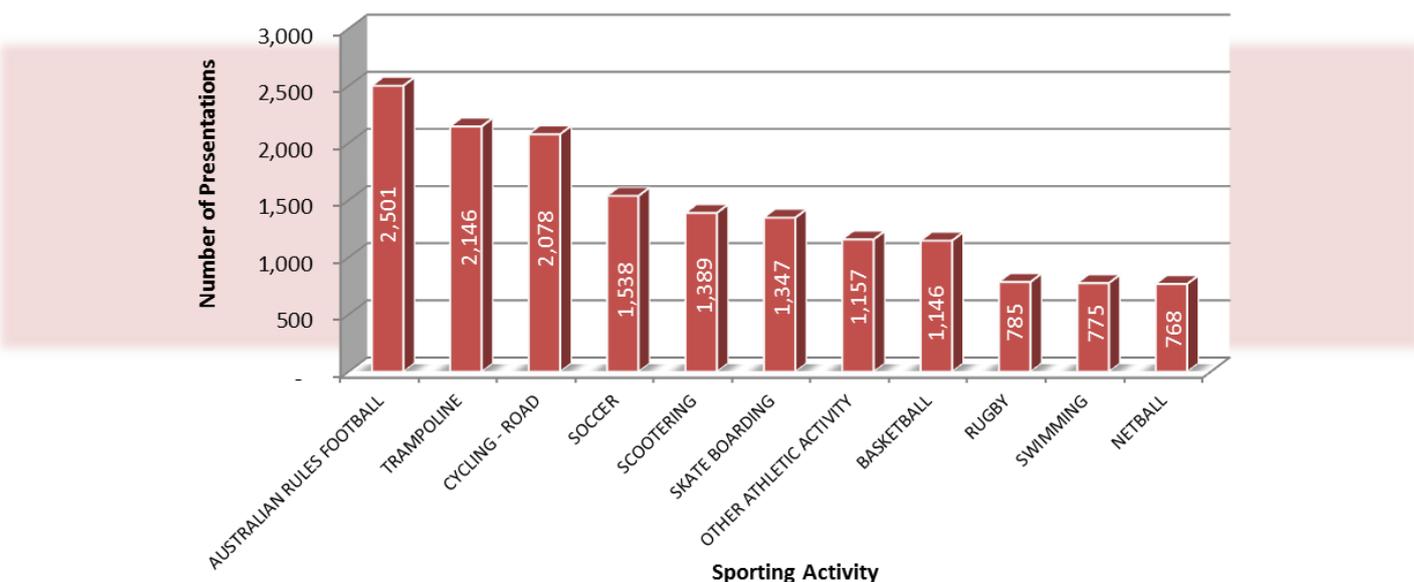
Figure 7: Sporting Injuries by Time of Injury (a) and Time of Presentation (b); July 2008 to June 2013



Injury Data

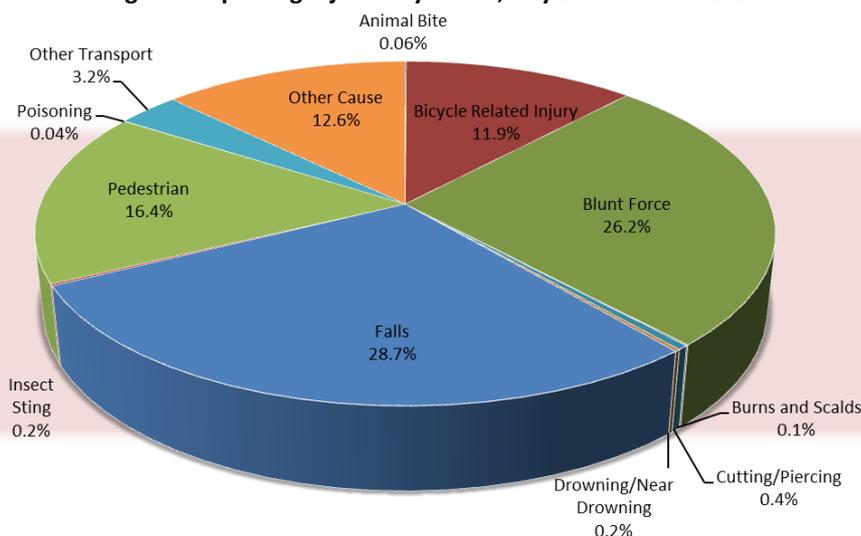
Australian Rules Football was the most commonly recorded sporting activity accounting for 13.0% (n=2,501) of all sporting injuries. This was followed by trampolining (11.1%, n=2,146), cycling - road (10.8%, n=2,078) and soccer (8.0%, n=1,538) (figure 8). The figures demonstrate the top 10 sports injury presentations and an overall breakdown of injury cause at the PMH ED.

Figure 8: Sporting Injuries by Sporting Activity; July 2008 to June 2013



The most common cause of a sporting injury was due to a falls, which accounted for 28.7% (n=5,531) of all sporting injuries between July 2008 and June 2013 (figure 9). Falls from the same level, falls from less than one metre and falls from greater than one metre accounted for 70.5% (n=3,900), 23.6% (n=1,307) and 5.9% (n=324) of falls respectively. The second most common cause was blunt force (26.2%, n=5,055), followed by pedestrian injury (16.4%, 3,162) and bicycle related injury (11.9%, n=2,297). Of note, is physical over-exertion which accounts for 5.3% (n=1,018) of sporting injuries. Physical over-exertion is grouped into other cause.

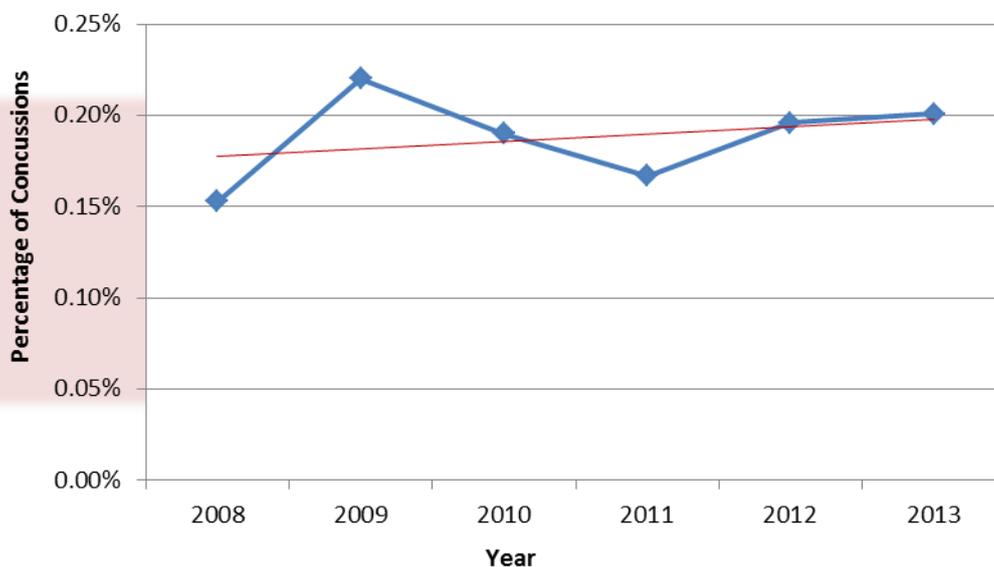
Figure 9: Sporting Injuries by Cause; July 2008 to June 2013



The majority of sporting injuries were sustained to the upper limb (46.1%, n=8,888) and lower limb areas (25.0%, n=4,828), followed by facial (11.2%, n=2,156), head (8.7%, n=1,682) and neck/torso injuries (4.4%, n=852). Fractures accounted for the majority of sport injuries (42.1%, n=8,125), followed by sprain and strain injuries (20.7%, n=3,986). The remaining injuries were due to contusion, lacerations, dislocations and internal injuries.

A slight increase in concussion injuries can be seen across the five year span (figure 10). Although numbers are small, it does depict a rise in concussions from 0.15% (n=21) of total injury presentations between January and December of 2008 to 0.20% (n=39) between January and December of 2013. Australian Rules Football and cycling, including BMX and road cycling recorded the highest numbers of concussions during the five years, accounting for 26.8% (n=53) and 17.2% (n=34) of concussions respectively.

Figure 10: Concussions as a Percentage of Total Injuries by Year; January 2008 to December 2013

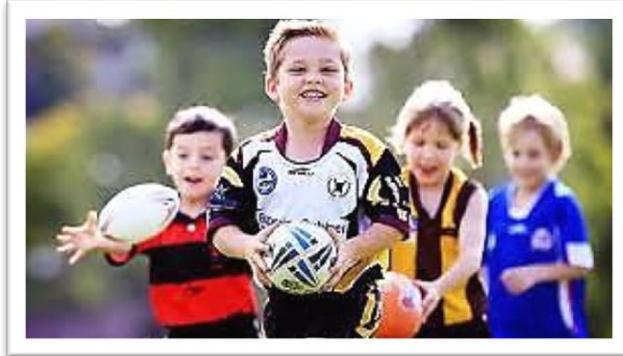


Between July 2008 and June 2013 the most commonly recorded location for a sporting injury was other place (48.6%, n=9,368), referring to an unknown or unspecified place not elsewhere classified. The home location was the second most common location representing 14.7% (n=2,827) of sporting injuries. Of sporting injuries that occurred within the home, 80.3% (n=2,269) occurred in an outdoor area of the home. Other recorded locations for sporting injuries include school or residential institution (9.8%, n=1,890), sports and athletics areas (8.9%, n=1,717), public building, recreational or cultural area (8.3%, n=1,592) and public roadway, footpath or cycleway (6.6%, n=1,268).

Almost all of the presentations for sporting injuries between July 2008 and June 2013 were deemed to be due to unintentional circumstances (99.8%, n=19,255). The remainder were either undetermined (0.2%, n=32), or classified as other (0.04%, n=7).

Diagnosis and Treatment Data

The majority of children who presented to PMH ED with a sporting injury did so based on the concerns of themselves or a relative (85.8%, n=16,561). A further 6.5% (n=1,245) of children arrived at PMH ED with a referral from a general practitioner and 5.1% (n=980) by referral from another hospital; this includes metropolitan and regional hospitals of Western Australia that do not have dedicated facilities to cater for the treatment of paediatric injuries.

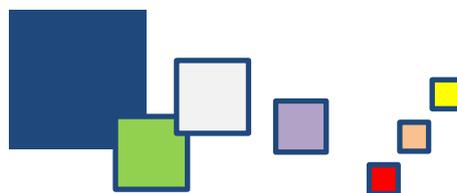


All children who present to PMH ED are initially assessed by a triage nurse who assigns them a triage code based on the perceived severity of their injury/condition. The majority of children presenting with a sporting injury are assigned a triage code of 4; semi-urgent (75.5%, n=14,560), followed by 3; urgent (21.4%, n=4,124) and 2; emergency (2.7%, n=519). Very few children presented with injuries that required a triage code of 1; resus (0.4%, n=72) or 5; non-urgent (0.1%, n=19).

Table 1: Triage Categories

Category	Seen Within (mins)
(1) Resus	0
(2) Emergency	10
(3) Urgent	30
(4) Semi-Urgent	60
(5) Non-Urgent	120

Most children presenting with a sporting injury were treated and discharged within the PMH ED (83.2%, n=16,062). A significant amount however were admitted to the hospital (15.5%, n=2,996). A small number did not wait for treatment (0.8%, n=145) or were referred to another PMH department (0.2%, n=48). No children presenting to the PMH ED over the five year period were recorded as having died as a result of a sporting injury.



Discussion

Sport and physical activity are a vital part of childhood development, allowing children to improve physical, social and cognitive skills amongst others, however injury risks are often perceived as a barrier to participation.

Sporting injuries presenting to the PMH ED have continued to rise over the last five years, with an average of approximately 4,000 individual cases presenting each year, accounting for a fifth of total injury presentations. Older children aged between 10 and 14 years are at greater risk of sustaining a sporting injury, potentially due to a decrease in rule modification as children get older and higher numbers of older children participating in competitive sports in comparison to younger children.

Concussion is a brain injury commonly seen in sporting injuries caused by collisions, falls or anything resulting in excessive force to head. Concussions in adults are often characterized by altered consciousness, a dazed appearance, headache, unsteady feet, dizziness, confusion and/or memory loss. Children under 13 years often report varied signs and symptoms due to physiological differences in their brains³. If you suspect a child has sustained a concussion, ensure they do not return to play and seek immediate medical assessment.



Parents, carers and participants need to be made aware of common sporting injuries and ways to prevent these from occurring. To minimise the risk of sporting injuries, the following preventative measures can be followed:

- Ensure your child wears the appropriate protective equipment for their chosen sport. This may include mouthguards, eyewear, helmets, protective padding, footwear and gloves.
- Stay well hydrated while participating in sporting activities, particularly during warmer months.
- Provide adequate shade and sunscreen to children and participants and encourage the use of appropriate clothing and hats.

- Always warm up and cool down before and after exercise.
- Young children should participate in sports that have modified rules and equipment appropriate to their development. Coaches need to ensure modifications are adhered to. Modified sports include AusKick, Minkey, Netta, Kanga Cricket and Modcross.
- Do not play sport while tired, ill or injured. Ensure the appropriate recovery time is allocated.
- Sporting grounds and facilities should be checked regularly by the appropriate person. Damaged playing surfaces, fencing, lights, posts, padding and rubbish should all be reported.
- Ensure your coach or manager is aware of any existing medical conditions that may affect a child during sporting activities prior to the start of the season.
- Ensure your team is entered in the right level of competition appropriate to the children's age, size and skill level.
- Children should participate in training sessions to learn and develop new skills before participating in competitive games.
- Improved fitness and skill level will reduce your chance of injury.
- A trained and well equip first aider should be present at games and competition.
- Schools should outline suitable rules and guidelines for children playing sport at recess and lunch.

References

1. Routley, V., & Ozanne-Smith, J. (1991). Sports Related Injury – An Overview. Hazard, (Ed. 8). Victorian Injury Surveillance System: Monash University Accident Research Centre.
2. Sports Medicine Australia (n.d.). Safety Guidelines for Children and Young People in Sport and Recreation. Retrieved March 2014 from: <http://sma.org.au/wpcontent/uploads/2009/05/childrensafetyguidelines-fulldoc.pdf>.
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For further information please contact Kidsafe WA