



Kidsafe WA Childhood Injury Report: Playground Injuries 2015 - 2020

Partner:



Government of **Western Australia**
Department of **Health**

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PLAYGROUND INJURIES AT A GLANCE

5,233

Children were seen in the Perth Children's Hospital Emergency Department (PCH ED) due to a playground-related injury between July 2015 and June 2020.



1,046

Children per year are seen in PCH ED for a playground-related injury



48%

Of playground-related injuries occurred in children between 5 and 9 years

Equipment Type

Most common equipment associated with playground-related injuries seen in PCH ED



49%

Trampoline



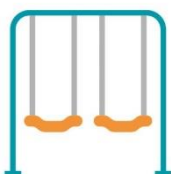
19%

Monkey Bars



14%

Slides



11%

Swings



71%

Of playground-related injuries seen at PCH ED were caused by a fall



51%

Of children injured on a playground were female

Location

Most common known location of playground-related injuries seen in PCH ED



36%

Home

30%

School

INTRODUCTION

Kidsafe WA

Kidsafe WA is the leading independent not-for-profit organisation dedicated to promoting safety and preventing childhood injuries and accidents in Western Australia. Injuries are the leading cause of death in Australian children aged one to fourteen, accounting for nearly half of all deaths in this age group. More children die of injury than die of cancer, asthma and infectious diseases combined. Many of these deaths and injuries can be prevented. Kidsafe WA works in the community to educate and inform parents and children on staying safe at home, at play and on the road.

Perth Children's Hospital Emergency Department

Perth Children's Hospital (PCH) is the only paediatric hospital in Western Australia and is the referral centre for paediatric illness and injury within the state. Each year approximately 70,000 children present to the PCH Emergency Department (ED). The PCH ED Injury Surveillance System is designed to capture data related to all children who present with an injury. This research report provides a summary of the Injury Surveillance System data collected at PCH between July 2015 and June 2020 relating to playground injuries. While this data does not take into account all Emergency Department presentations in Western Australia, it offers a useful snapshot of injury occurrences.

Playground Injuries

Play is an essential part of childhood that promotes physical and cognitive development and contributes to the social and emotional wellbeing of children^{1, 2}. It is a way for children to learn and develop new skills while also reducing the risk of serious health conditions associated with physical inactivity and obesity³. Outdoor playgrounds and play environments are common areas for children to engage in social and interactive play, and can provide important opportunities for children's cognitive and motor development¹. Despite playgrounds providing a safer environment for children when compared to other outdoor areas close to traffic and other hazards, children can still be at risk of injury while using playground equipment¹.

Playground-related injury presentations to PCH ED have consistently represented only a small number of total injury presentation each year. From 2006 to 2014 playground injuries seen at PCH ED accounted for an average of 5.2 percent of total injury presentations each year⁴, with this number increasing slightly to an average of 5.7 percent between 2015 and 2020. From 2006, the first year playground injuries were included in the PCH ED data, to 2020, no deaths attributed to playground equipment have been identified in Western Australia⁴. Despite being a low contributor to the overall child injury burden, 15 percent of playground injuries are serious enough to require admission to hospital for treatment.

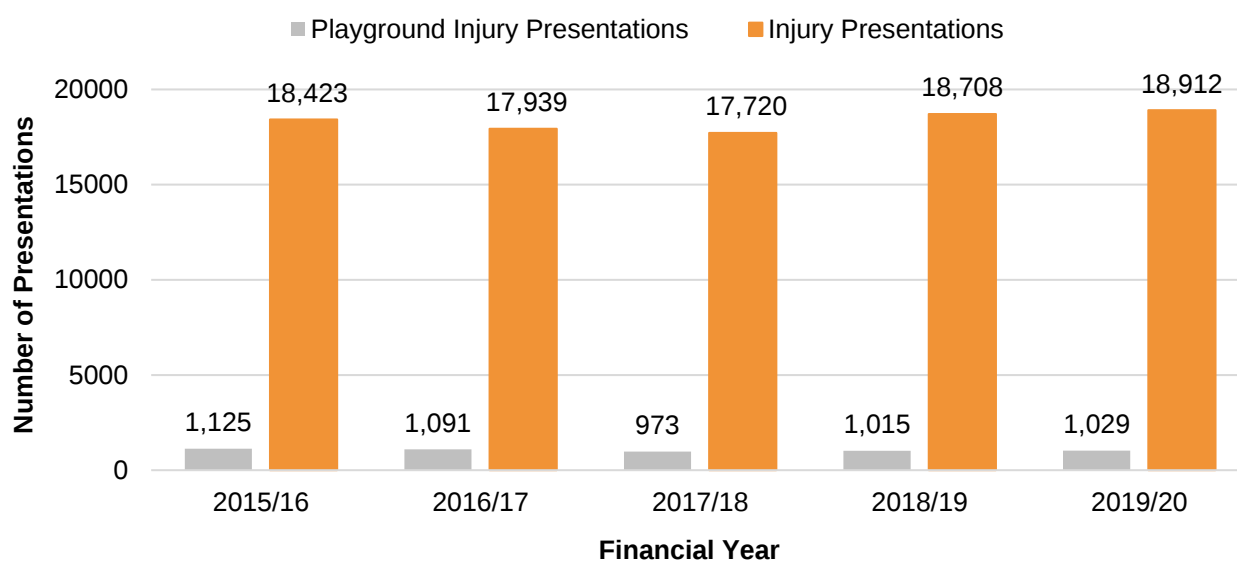
There are a number of risk factors that can be associated with playground injuries¹. Behavioural risk factors can include lack of adult supervision, misuse of equipment and the use of equipment not suitable for a child's age or stage of development⁵. Environmental risk factors can include poor design, overcrowding of equipment and a lack of regular maintenance⁶. To reduce the risk of serious playground injuries, playgrounds should be designed, installed and maintained to Australian Standards for Playgrounds. Although there are no mandatory regulatory requirements to comply with these standards in Western Australia, they are regarded as the minimum standard of safety that all playgrounds should meet. Considering the benefits of outdoor play and the opportunities that are provided for children's development, it is essential that children have access to safe playgrounds and steps are taken to reduce injury risk factors where possible⁷.

DEMOGRAPHIC DATA

EMERGENCY DEPARTMENT PLAYGROUND INJURY PRESENTATIONS

Over the five-year period from July 2015 to June 2020, there was a total of 91,702 presentations for injury at PCH ED. During the same time period, 5,233 of those presentations were related to playground equipment, accounting for 5.7 percent of total injury presentations. The proportion of playground related injuries to total injuries over the five year period has remained fairly consistent peaking at 6.1 percent in 2015/16 and dropping to 5.4 percent in 2018/19 (Figure 1).

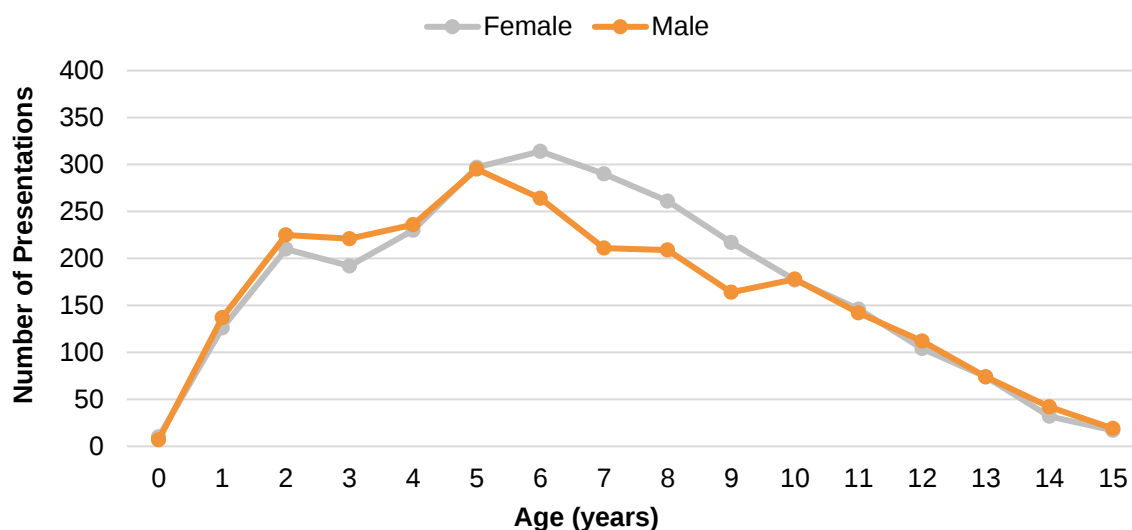
Figure 1: Total Injury and Playground-related Injury by Financial Year; July 2015 to June 2020



Age and Gender

Children between the age of five and nine years accounted for the highest number of playground-related injuries (48.2%, n=2,522), with peaks seen at five and six years of age (Figure 2). This may be attributed to the frequency of use of playground equipment within this age group and development of independent play. As children reach adolescence there tends to be a drop off in playground injury rates. Minimal variation in males and females was seen for playground-related injuries with females accounting for 51.5 percent (n=2,697) and males the remaining 48.5 percent (n= 2,536).

Figure 2 : Playground-related Injury by Age and Gender



Area of Residence and Ethnicity

Most children presenting to PCH ED for playground-related injuries reside within the Perth Metropolitan Area (93.8%, n=4,910). The remainder reside either within regional Western Australia (3.9%, n=209), interstate (0.5%, n=25) or the location was unknown (1.7%, n=89). The Wheatbelt and Southwest had the highest number of presentations of regional WA accounting for 1.2 percent (n=62) and 0.8 percent (n=42) respectively. Several factors can influence the number of injury presentations from regional locations. This can include proximity to the metropolitan area and PCH and access to suitable local medical facilities. Often more severe injuries are transferred from rural hospitals to PCH for treatment.

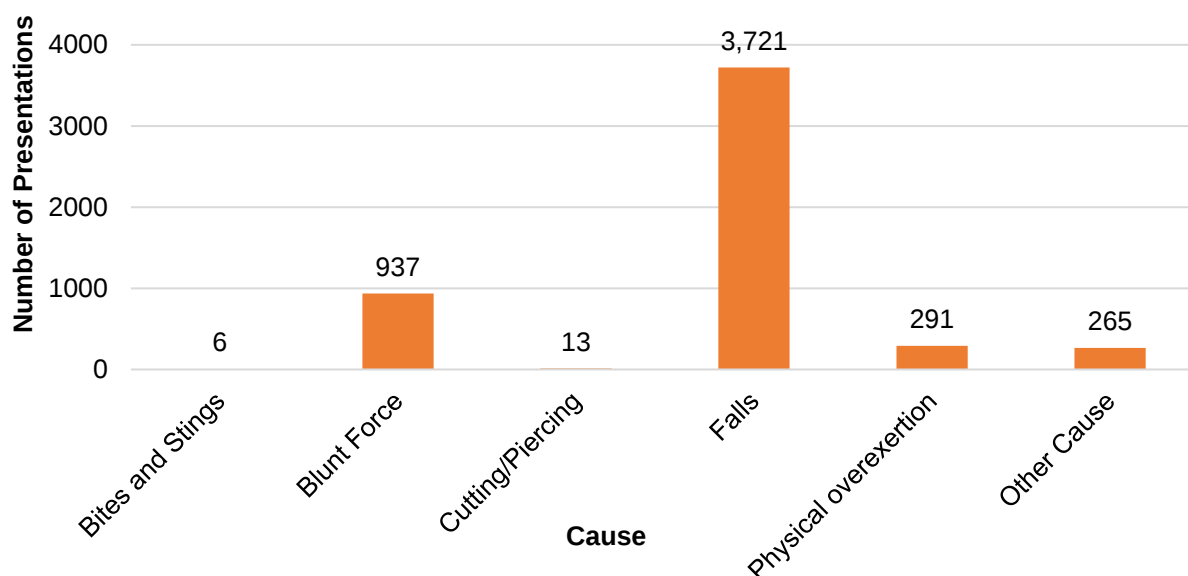
Children who identified as Aboriginal and/or Torres Strait Islander descent accounted for 2.3 percent (n=121) playground-related injury presentations. Of the Aboriginal and/or Torres Strait Islander presentations, 24.8 percent (n=30) resided in regional WA while 75.2 percent (n=91) resided in the Perth Metropolitan Area.

INJURY DATA

Cause of Injury

Overwhelmingly Falls are the leading causes of playground-related injury accounting for 71.1 percent (n=3,721). Falls are categorised by height of fall, with the majority of the injuries caused by falls from less than one metre (44.4%, n= 1,652), followed by falls from greater than one metre (33.6%, n=1,249), and finally falls from the same level (22.0%, n=820). Other causes of playground-related injury include Blunt Force accounting for 17.9 percent (n=937) of injuries and physical overexertion (5.6%, n=291) (Figure 3). Blunt force refers to an injury caused by a collision with a person or object.

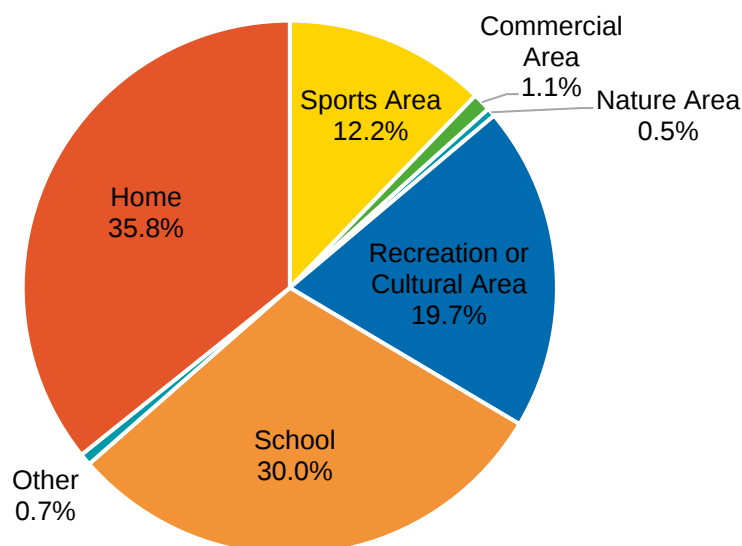
Figure 3: Playground-related Injury by Cause



Location of Injury

A large proportion of playground-related injuries were recorded as occurring in an unknown location (70.8%, n=3,703). Of known locations (29.2%, n=1,530), the majority occurred either at Home (35.8%, n=547), School (30.0%, n=459), a Recreation or Cultural Area (19.7%, n=301) or a Sports Area (12.2%, n=187) (Figure 4). Of note, the majority of playground related injuries that occurred at home, occurred outdoors (83.0%, n=454).

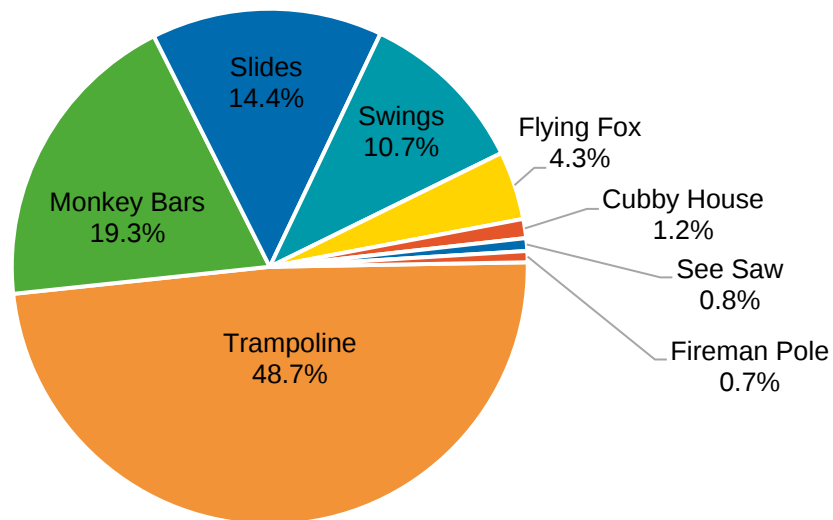
Figure 4: Playground-related Injury by Location



Type of Equipment

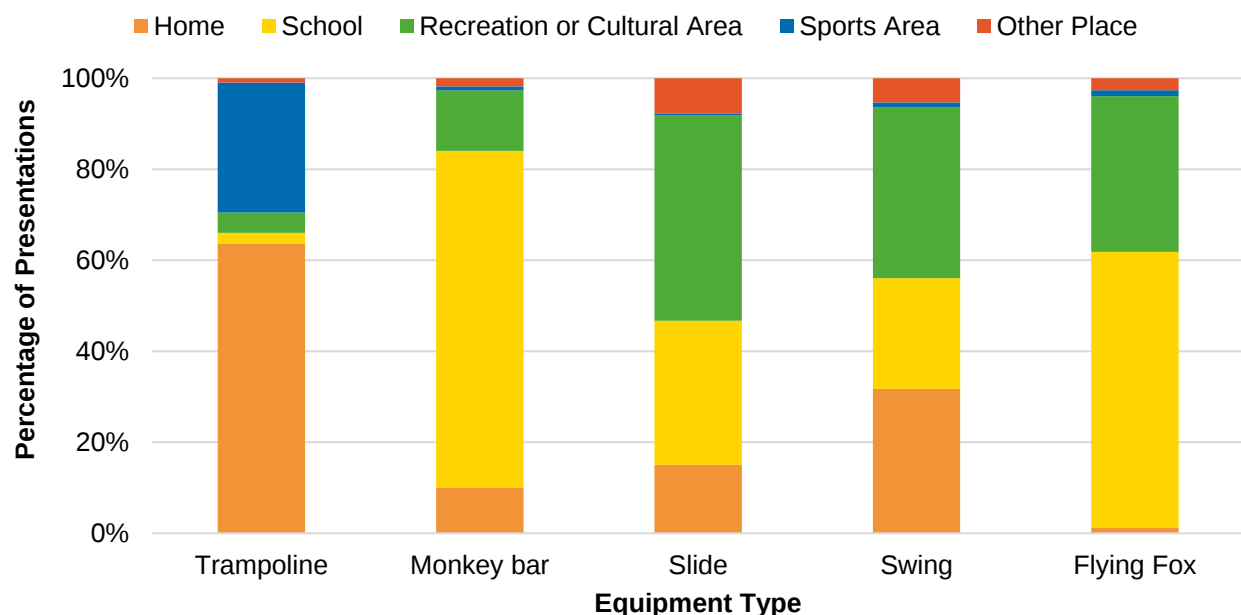
Trampolines were the most common piece of equipment associated with playground-related injuries accounting for 48.7 percent (n=2,547) of presentations. This was followed by monkey bars (19.3%, n=1,008), slides (14.4%, n=751) and swings (10.7%, n=561) (Figure 5).

Figure 5: Playground-related Injury by Equipment Type



Certain types of equipment were more commonly recorded as occurring in specific locations. For example, where the location was known a large proportion of trampoline injuries (n=630) occurred at Home (63.7%, n=401) or a Sports Area (28.6%, n=180). Where the location was known for monkey bar injuries (n=338) they occurred more commonly at school (74.0%, n=250) (Figure 6). Where as slide and swing injuries occurred at a variety of locations.

Figure 6: Playground-related Injury by Equipment Type and Location



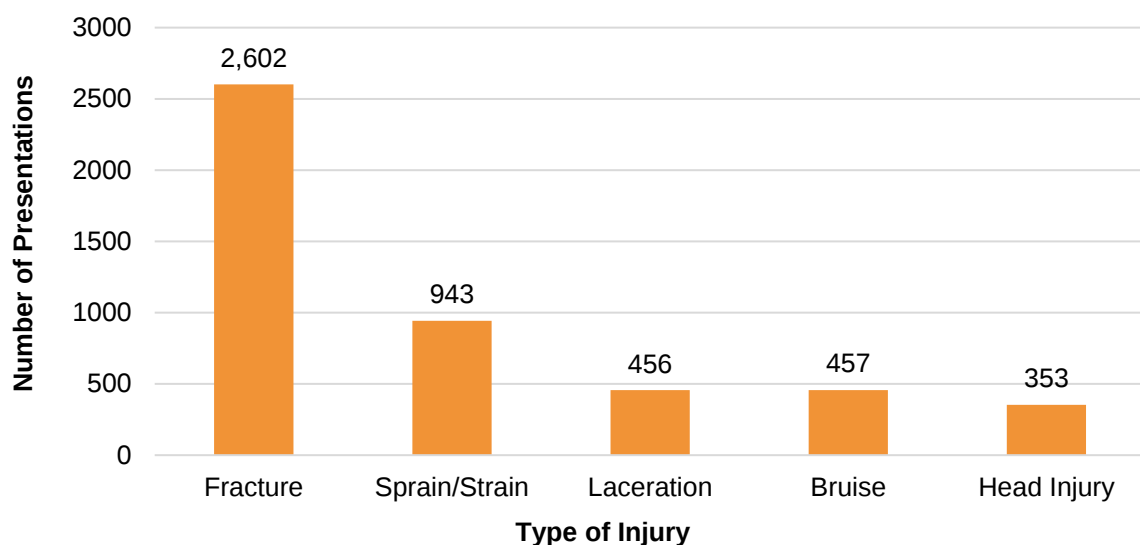
Intent

Almost all playground-related injuries were due to unintentional circumstances (99.9%, n=5,230). The very few remaining were due to either alleged assault or were of undetermined intent.

Type of Injury

Fractures were the most common type of injury associated with playground-related injury accounting for almost half of presentations (49.7%, n=2,602). Following fractures were sprain and strain injuries (18.0%, n=943), bruises (8.7%, n=457), lacerations (8.7%, n=456) and head injuries (6.7%, n=353) (Figure 7).

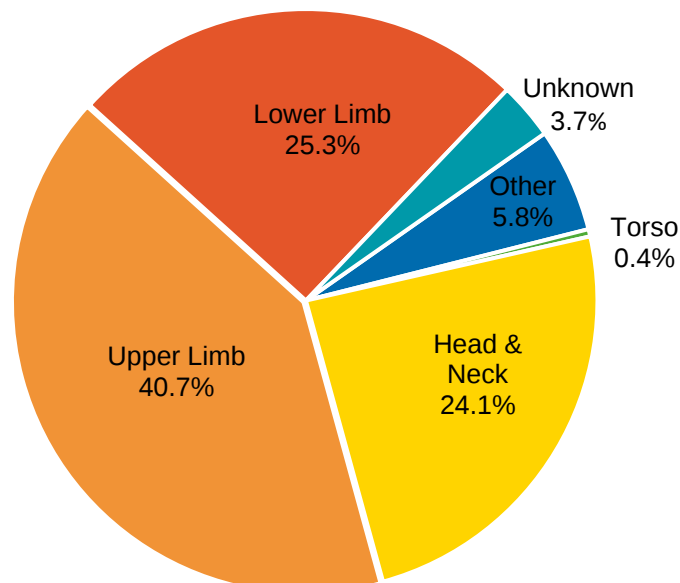
Figure 7: Playground-related Injury by Type of Injury



Body Region

The majority of the playground injuries were associated with the upper limbs (40.7%, n=2,131), followed by lower limb injuries (25.3%, n=1,323) and injuries involving the head and neck region (24.1%, n=1,263) (Figure 8).

Figure 8: Playground-related Injury by Body Region

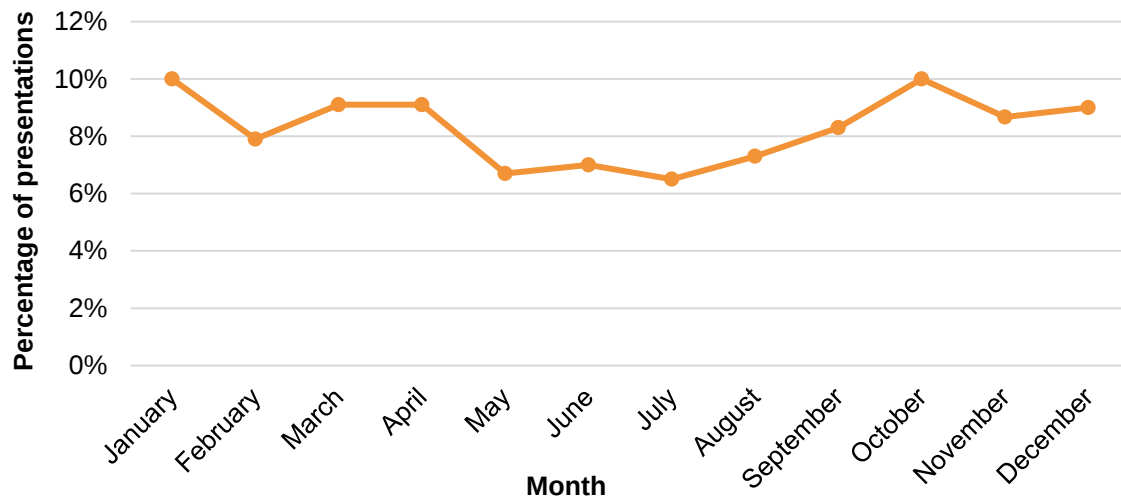


TREATMENT DATA

Month, Day and Time of Injury

There is a seasonal pattern to injuries in the playground, with peaks seen in Spring and Summer months from October (10.1%, n= 527) to January (10.1%, n=527), and again in March (9.2%, n=481) and April (9.2%, n=479) (Figure 9). These times of year correlate with dry warmer weather in Perth and holiday periods including Christmas and Easter.

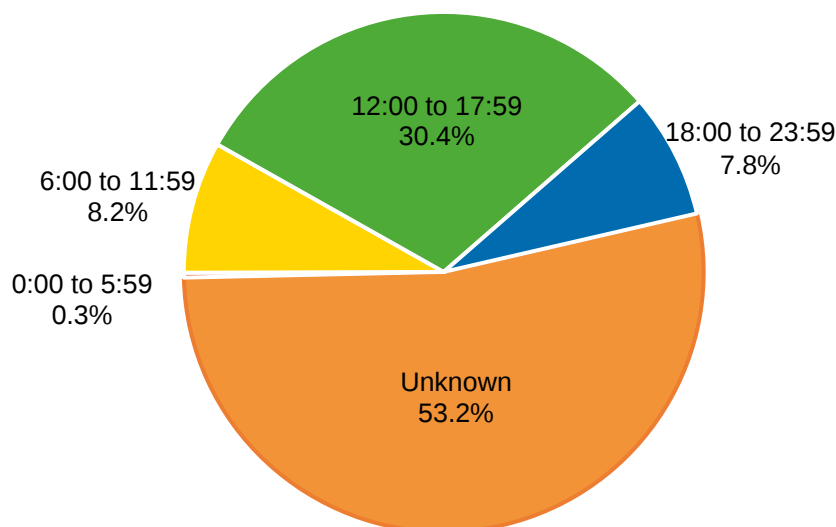
Figure 9: Playground-related Injuries by Month



A higher number of injuries in the playground occur on the weekend with Saturday and Sunday accounting for 17.1 percent (n=896) and 18.1 percent (n=947) of injuries, respectively. The least number of injuries occurred on Wednesday (12.0%, n=629) and Tuesday (12.2%, n=638).

For over half of playground-related injuries, the time of occurrence was unknown (53.2%, n=2,786). A large proportion of injuries (30.4%, n=1,593) occurred in the afternoon between 12:00 and 17:59 (Figure 10).

Figure 10: Playground Injuries by Time of Occurance



Triage Category

Each child that attends PCH ED is allocated a triage category based on the urgency of medical attention required (Table 1). The majority of injuries that occur in the playground were triaged as Semi-urgent (77.8%, n=4,073), Urgent (19.8%, n=1,038) or Emergency (2.1%, n=112). The small remainder were triaged as either Resuscitation or Non-urgent.

Table 1: Triage Category

Category	Seen within (minutes)
(1) Resuscitation	0
(2) Emergency	10
(3) Urgent	30
(4) Semi-urgent	60
(5) Non-urgent	120

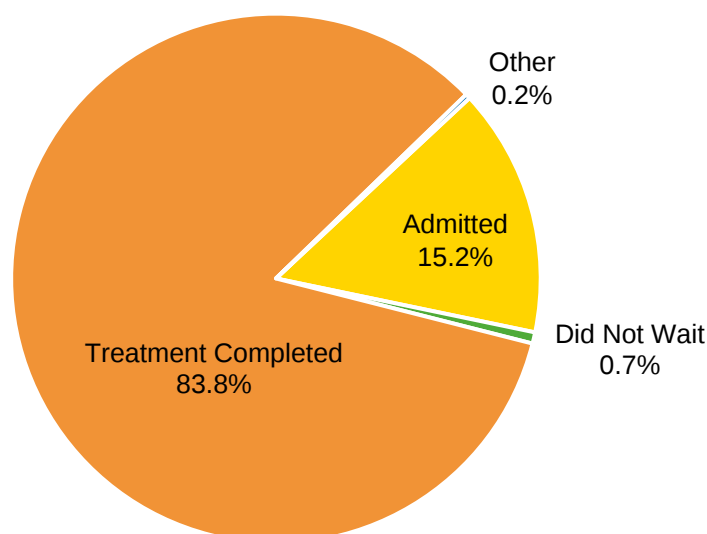
Referral Source

Most children who attended PCH ED for an injury that occurred in the playground, did so based on a referral from themselves or a relative (88.0%, n=4,603). The majority of the remaining children were referred by a general practitioner (6.0%, n=315) or another hospital (4.6%, n=243).

Outcome of Attendance

The majority of children who presented with playground injury were able to depart the ED with treatment complete (83.8% n=4,386). A further 15.2% (n=796) were admitted to hospital for further treatment (Figure 11). The remaining either did not wait for treatment or their outcome was recorded as Other.

Figure 11: Outcome of Attendance



DISCUSSION

Playgrounds provide important opportunities for children's physical and cognitive development, encourage social and interactive play, and contribute to reducing the risk of obesity and other health conditions related to physical inactivity^{1, 3}. While playgrounds provide safer environments for children when compared to other outdoor areas, they are still associated with a risk of injury⁸.

Between July 2015 and June 2020, 5,233 children presented to PCH ED with an injury related to playground equipment, accounting for just 5.7 percent of all injury presentations seen at PCH ED during the same time period. This rate has remained steady with playground related injuries accounting for 5.2 percent of all injury presentations at PCH ED between 2006 and 2014⁴.

Children aged between five and nine years are at a greater risk of sustaining an injury on a playground, accounting for 48.3 percent of all playground injuries. This may be attributed to the frequency of use of playground equipment within this age group and their ability to identify and assess risk in playground environments⁵. These findings support previous research that shows children between five and nine are most at risk of sustaining a fall injury from playground equipment^{6, 9}. Despite males being at an increased risk of most childhood injuries, male and female representation in playground related injuries is fairly even.

Falls are the leading cause of all child injury hospitalisation for children under 15¹⁰, and falls from playground equipment is the most common cause of playground injury^{3, 6}. Similarly to PCH ED playground injury data from 2006 to 2014, falls accounted for just over 70 percent of all playground related injuries from 2015 to 2020. This high rate of fall injuries may be attributed to a lack of correct playground surfacing provided underneath equipment. Despite Australian Standards outlining requirements for playground surfacing, many playgrounds may not meet these requirements, resulting in a higher rate of fall related injuries. Poor surfacing condition and low depth of surfacing material have been identified as major risk factors for playground related fall injuries in previous research^{5, 11}.

Children have access to playgrounds in multiple settings including the home, schools and public outdoor play areas. Injuries associated with certain types of equipment can vary depending on the location of the injury. Trampoline-related injuries are more common within the home environment (63.7%), while injuries associated with monkey bars are more common within schools (74%). This may be attributed to different styles of play, the number of children using the equipment at the same time, and varying levels of supervision between settings¹². Despite the introduction of an Australian Standard for Trampolines in 2003, injuries associated with domestic trampolines have consistently remained high due to a lack of compliance with the standard and the availability of poor quality trampolines¹³.

There are regular spikes in playground injury presentations to PCH ED that coincide with the warmer months in the Perth region and with school holiday periods including Christmas and Easter. Playground injuries are also more likely to occur on weekends and in the afternoon, reflecting times when children are most likely to be using playground equipment.

Despite the number of injuries occurring in playgrounds, this is relatively small in comparison to other child injury factors. The risk of injury on playgrounds can be reduced without the need to lower the value of play or level of challenge they provide. It is essential that children have access to safe playgrounds and that steps are taken to reduce the risk of injury where possible.

PREVENTION

To reduce the risk of serious injury, playgrounds should be designed, installed and maintained to meet the minimum requirements outlined in Australian Standards. While some playground injuries can be associated with behavioural risk factors, many playground injuries can be prevented or their severity reduced by good planning, design and maintenance. Playgrounds should provide opportunities for children to experience risk and challenge while also minimising hazards that could cause serious injury.

Although there is no regulatory requirement in Western Australia to comply with the Australian Standards, they are regarded as the minimum standard of safety that all playgrounds should meet. The standards below should be consulted by anyone planning, designing, building, or maintaining a playground.

Australian Standards for Playgrounds

- Australian Standard AS 4685: Playground Equipment (Parts 0-6, 11)
- Australian Standard AS- 4422: Playground Surfacing

In order to reduce the risk and severity of playground injuries, playgrounds should meet the following recommendations;

- The maximum free height of fall for equipment in supervised early childhood settings should be 1800mm, and 3000mm in all other public or education setting.
- All equipment over 600mm in height should have a certified impact absorbing surface beneath and around it to help minimise serious head or other injuries.
- All equipment that creates movement such as swings or slides must also have a certified impact absorbing surface beneath and around it.
- Measures to protect users from falling should be provided depending on the height of the equipment. This can include handrails, guardrails and barriers.
- Equipment should not present any entrapment hazard that could trap a user by the body, part of the body, hair or clothing.

The following general guidelines can also help to reduce the burden of playground injuries:

- Always provide active and focussed adult supervision that is appropriate for the age of the children and the equipment they are using.
- Children should be encouraged to follow playground safety rules.
- Avoid clothing or hats with cords to prevent the risk of entrapment or strangulation.
- Adequate shade should be provided in areas where children play outdoors to minimise unnecessary exposure to UV radiation.
- Ensure regular maintenance checks of the playground and equipment including lubrication of bearings, tightening of bolts and checks for broken or damaged parts.
- Keep paths and walkways even and clear of tree roots, stumps, or rocks.
- Maintain a regime of visual, operational and annual comprehensive playground inspections.

For further information: Kidsafe WA's Playground Advisory Service provides a range of services to help create and maintain play spaces that support children's development, learning, health, and wellbeing while reducing the risk of serious injury. Kidsafe WA provides advice, consultation, comprehensive audit services and professional development workshops and is not affiliated with any playground equipment manufacturer, retailer, or ancillary business.

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