

WA Consumer Product Advocacy Network

Product-related Burn Injuries Research Report



Partner:



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

This report was produced by Kidsafe Western Australia in collaboration with members of the WA Consumer Product Advocacy Network.



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



Department of **Energy, Mines,
Industry Regulation and Safety**



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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 among Australian children aged zero to fourteen, accounting for nearly half of all deaths in this age group. More children die of injury than of cancer, asthma and infectious diseases combined. However, many of these deaths and injuries can be prevented. Kidsafe WA works to educate and inform parents and children on staying safe at home, at play and on the road.

WA Consumer Product Advocacy Network

The WA Consumer Product Advocacy Network (WA CPAN) was established in October 2014 by Kidsafe WA in partnership with the Department of Health Western Australia. WA CPAN provides leadership to ensure ongoing and emerging injury issues associated with unsafe products are identified and minimised, with a focus on products used by children. The network consists of representatives from organisations who are involved in the regulation, safe use, injury prevention, treatment and sale of products for use by consumers.

Organisations include:

- Australian Competition and Consumer Commission
- Burn Injury Research Unit - School of Surgery, University of Western Australia
- Department of Health Western Australia, Public and Aboriginal Health Division
- Department of Energy, Mines, Industry Regulation and Safety – Consumer Protection
- Goodstart Early Learning
- Kidsafe Western Australia
- Perth Children's Hospital Emergency Department
- WA Poisons Information Centre

Products identified through the network are prioritised according to the level of risk posed or safety concerns raised by WA CPAN members. A documented action plan then supports the ability to advocate for change. The network aims to explore solutions for identified unsafe products and ultimately reduce the number and severity of childhood injuries related to consumer products. WA CPAN members meet every two months, with approximately six meetings per year. The members are also in regular email contact between meetings so that emerging issues can be dealt with in a timely manner. Once a product safety issue is identified appropriate actions are taken and typically led by the member with the biggest potential impact or reach. Actions can include:

- Advocating for changes
- Delivering workshops to provide injury prevention information
- Monitoring products through injury surveillance and safety checks
- Providing safety messages in media releases and newsletters
- Providing resources such as brochures, fact sheets, tools and videos which are made available through websites and social media channels
- Enforcement of appropriate regulations or consumer law

Perth Children's Hospital Injury Surveillance System

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. Injury data is collected by triage nurses who initially assess the child presenting to ED. All clinical information and basic demographic details are recorded. This data is then coded and validated by a dedicated Injury Surveillance Officer daily. This report provides a summary of all product-related burn injuries between July 2018 and June 2023 to the PCH ED. While this data does not consider all Emergency Department presentations in Western Australia, it offers a useful snapshot of injury occurrences.

Introduction

Burn injuries are a major cause of preventable morbidity and mortality rates worldwide^{1,2}. Globally burn injuries remain a significant public health issue that affects young children yearly³. Burn injuries have been described as one of the most painful and traumatic injuries a child can experience⁴. Due to children having a curious nature, slower reaction rates and lower risk calculation skills they are predisposed to higher incidence rates of sustaining a burn injury¹.

The Australian and New Zealand Burns Association (ANZBA) defines adequate first aid for burns as 20 minutes of cool running water within the first three hours of a burn injury⁵. Any clothing or jewellery should be removed unless stuck to the skin, with the burn area being submersed under running water and seek medical attention⁶. Burns are classified by the depth and total body surface area, severity and onset of the burn depending on temperature and duration of contact². Many burn injuries in children are managed medically at home before attending a hospital for further treatment⁷. First aid when applied correctly can be associated with a decrease in mortality, pain reduction and improved wound healing⁸.

Method

Using a completed data set from PCH ED injury surveillance database from July 2018 to June 2023 a custom search query was set up to identify potential burn injuries resulting from products. The following inclusion criteria were used:

- Injury cause: Must include: *Contact with fire or flame; contact with hot liquid or steam; contact with hot liquid, steam, gas, object or solid; contact with hot object or solid; contact with machinery; exposure to chemicals; other exposure to chemical; other mechanical force; other thermal mechanism*
- Intent: *All*
- Location: *All*
- Injury factor: *All*

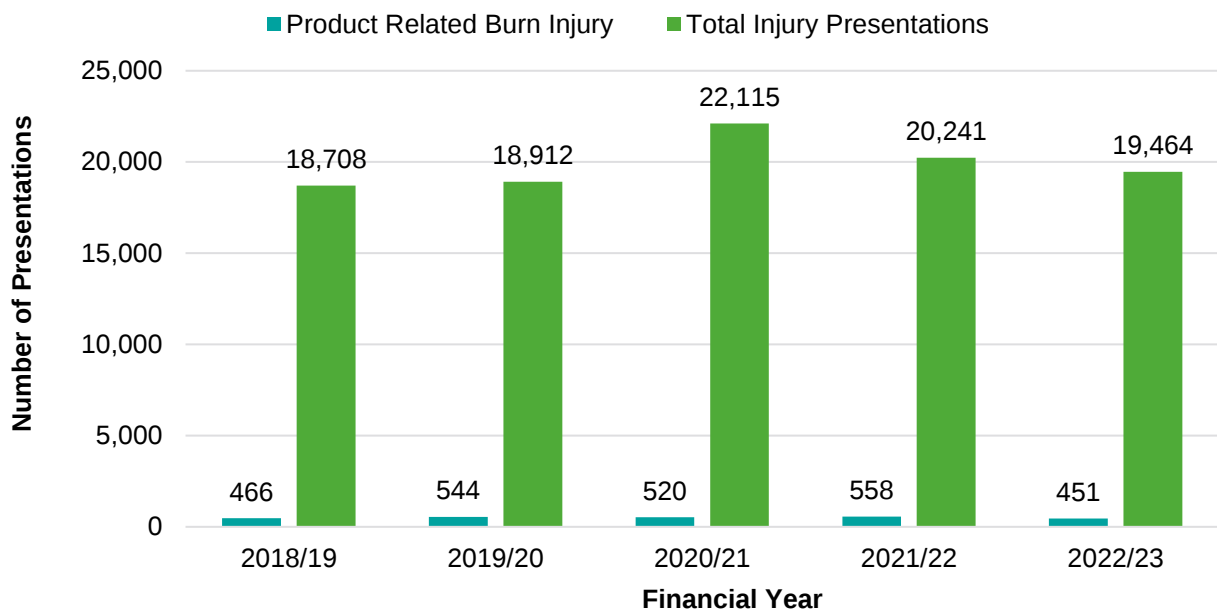
These cases were then manually reviewed to remove any injuries that were not burns. For the purpose of this report only burn injuries associated with products were included. Cases that did not have a product causing the injury and injuries that were identified as 'sunburns' were removed.

Results

Demographics

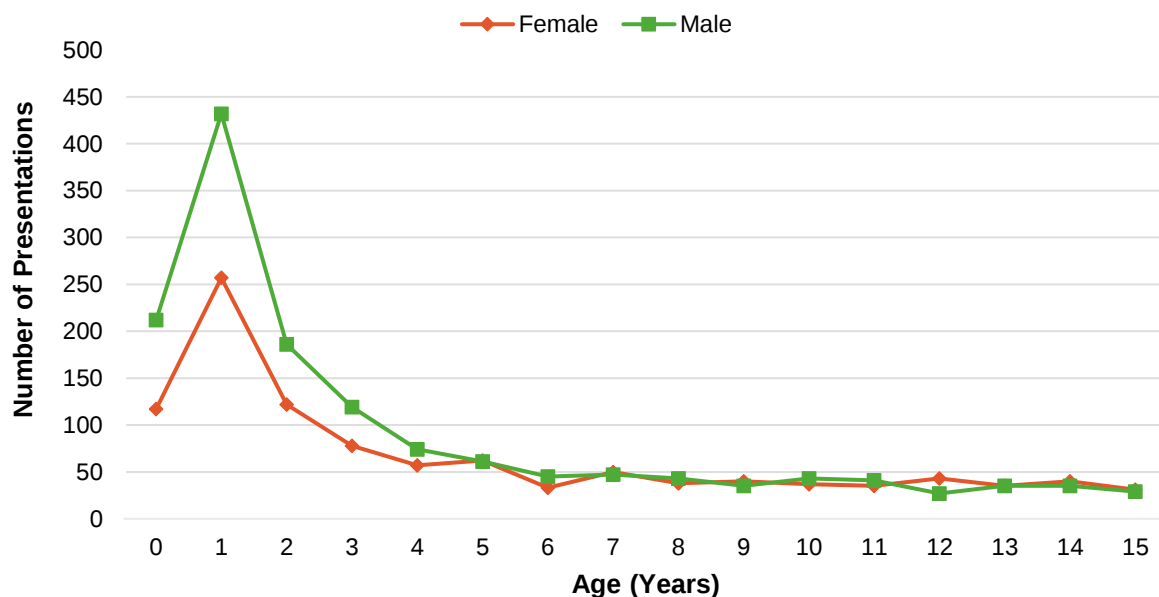
Between July 2018 and June 2023, there were 2,539 product-related burn injury presentations to PCH ED, accounting for 2.6 percent of total injury presentations. While the highest number of presentations was seen in 2021/22 (2.7%, n=558), the highest proportion in comparison to total injuries occurred in 2019/20 (2.9%, n=544). Product-related burn injuries have remained fairly consistent over the five year period, with a slight decrease seen in 2022/23 (2.3%, n=451) (Figure 1).

Figure 1: Total Injury Presentations and Product-related Burn Injuries to PCH ED by Financial Year; 2018 - 2023



Two thirds of the children presenting with a product-related burn injury were under the age of five (65.1%, n=1,654). One year olds presented most frequently (27.1%, n=689), followed by children aged under one (13%, n=329) and two year olds (12.1%, n=308) (Figure 2). Males accounted for a higher proportion of product related-burn injuries (57.7%, n=1,464) in comparison to females.

Figure 2: Product-related Burn Injuries by Sex and Age; 2018 - 2023



Most of the children presenting with product-related burn injuries reside in Western Australia (Perth metropolitan area 86.3%, n=2,191; regional WA 10.9%, n=278). A small proportion of presentations were children who reside interstate or were recorded as unknown (2.8%, n=70). It is interesting to note that while children from regional WA account for 4.2% of total injury presentations, they account for nearly 11 percent of product related burn injuries.

Aboriginal and/or Torres Strait Islander children account for 8.9 percent (n=225) of product-related burn injury presentations to PCH ED. Again, this is considerably higher in comparison to total injury presentations where Aboriginal children account for 3.7 percent of injuries. Almost half (49.8%, n=112) of all children who identify as Aboriginal and/or Torres Strait Islander reside in regional Western Australia.

Injury

Almost all product-related burn injuries were due to unintentional circumstances (99.3%, n=2,520). A small proportion were due to intentional self-harm (0.3%, n=8), all of which were children over 12 years of age. The remainder of presentations were undetermined or other.

For many of the presentations, the location of where the injury occurred was recorded as unknown (81.0%, n=2,056). Of the known locations (19.0%, n=483), 77.0 percent (n=372) occurred at home. This was followed by at school (9.9%, n=48), commercial, industrial or medical area (4.6%, n=22) and open nature area (4.3%, n=21) (Figure 3a). Within the home, just under half (49.5%, n=184) of injuries occurred in an unspecified location. The kitchen was the most specified area of the house (25.0%, n=93), followed by outdoors (10.2%, n=38), living and dining (8.9%, n=33) and bathroom (4.6%, n=17) (Figure 3b).

Figure 3a: Product-related Burn Injuries by Location; 2018 - 2023

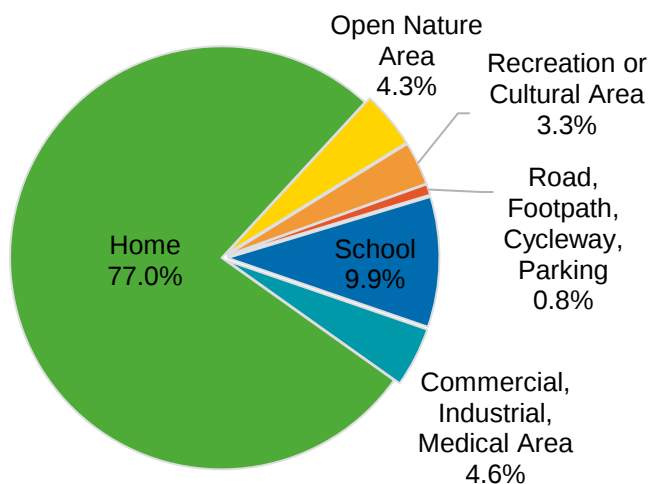
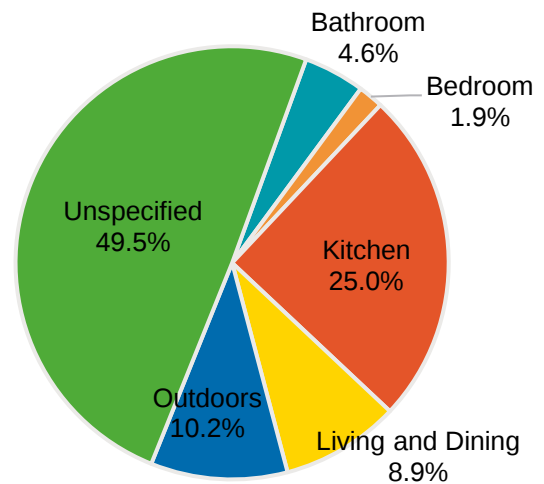


Figure 3b: Product-related Burn Injuries by Home Location; 2018 - 2023



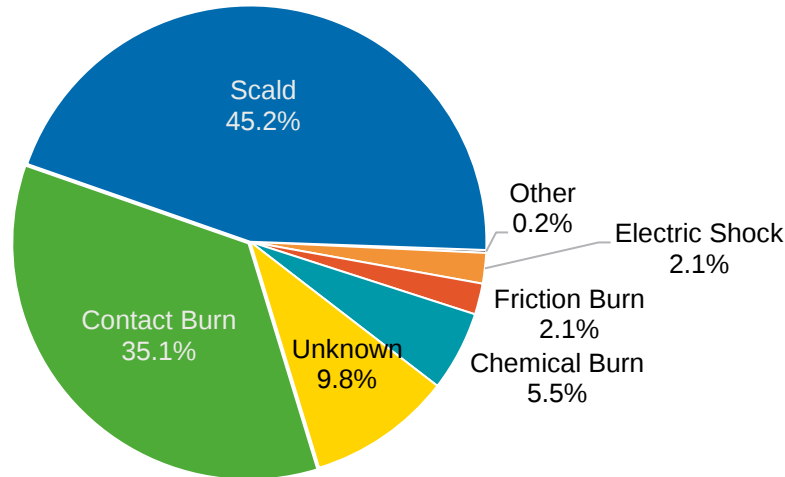
The most common cause of product-related burn injuries were drinks such as hot tea and coffee (16.2%, n=412), water from the bath, shower or tap (14.3%, n=363) and food such as noodles and soup (10.4%, n=264). Table 1 outlines products related to burn injuries as manually reviewed in the PCH Injury Surveillance System free text.

Table 1: Product-related Burn Injuries by Product; 2018 - 2023

Product	Example	Number of Presentations	%
Drink	Tea, coffee, milk	412	16.2
Tap water	Bath, shower, tap	363	14.3
Food	Noodles, soup, oil, porridge	264	10.4
Unknown		232	9.1
Cooking appliance	BBQ, oven, toaster, stove	200	7.9
Chemical	Bleach, sanitiser, petrol, detergent	130	5.1
Heater	Fireplace, gas, electric	130	5.1
Fire	Camp fire, coals	126	5.0
Other		103	4.1
Cookware	Tray, pot, pan & utensils	66	2.6
Kettle	Surface of kettle, water, steam	55	2.2
Treadmill		47	1.9
Hair appliance	Curling iron, straightener	42	1.7
Motorbike	Motorbike surface, exhaust	39	1.5
Ground surfacing	Pavement, artificial grass	34	1.3
Iron		32	1.3
Oil		30	1.2
Candle, lighter or matches		28	1.1
Hot water bottle or heat pack		26	1.0
Lighting	Lamp, globe or switch	25	1.0
Aerosol can		22	0.9
Humidifier or vapouriser		22	0.9
Hot glue or glue gun		21	0.8
Electrical charger	Charger, power cord	16	0.6
Tool or machinery		15	0.6
Sparkler		13	0.5
Lawn mower		10	0.4
Car		10	0.4
Power point or socket		9	0.4
Engine or exhaust		9	0.4
Play equipment	Slide, metal components	8	0.3
Total		2,539	100

Scalds and contact burns were the most common type of burn accounting for 45.2 percent (n=1,148) and 35.1 percent (n=890) of injuries respectively. Other types of burns included chemical burn (5.5%, n=139), friction burn (2.1%, n=54) and electric shock (2.1%, n=53) (Figure 4).

Figure 4: Product Related Burn Injuries by Type; 2018 - 2023

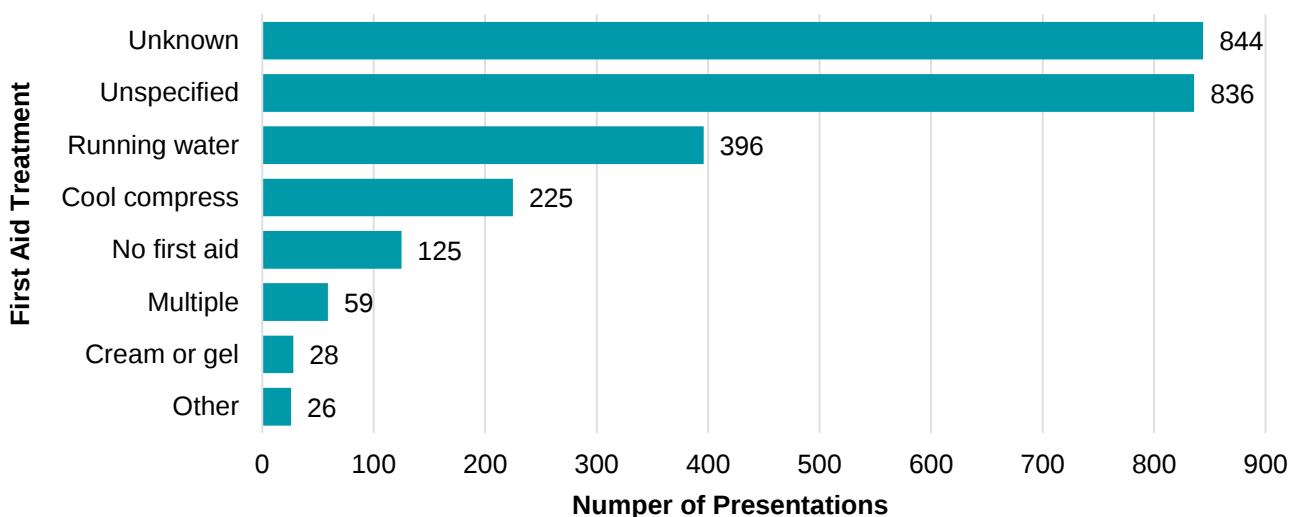


In many cases, the burn was caused by a child touching a product (25.0%, n=634) or a product spilling on them (19.4%, n=493). Other commonly recorded mechanisms include when a child pulled a product onto themselves (7.1%, n=180), they fell or stepped on a product (2.2%, n=102) or it was squirted, splashed or sprayed on them (3.3%, n=84).

Treatment

Best practice first aid treatment for burns is recognised as the burn area being placed under cool running water for 20 minutes to assist with minimizing the injury, reducing pain and improving recovery time^{5,6}. First aid given prior to presentation to PCH ED for a large proportion was recorded as unknown in 33.2 percent of cases (n=844) or unspecified in a further 32.9 percent of cases (n=836). Running water had been used in 15.6 percent of cases (n=396), of which 60.1 percent (n=238) of cases had received running water for 20 minutes or more. A cool compress, such as a cold pack, damp cloth or frozen product had been applied in 8.9 percent (n=225) of cases. And burn creams or gels had been applied to 1.1 percent of cases (n=28). In 2.3 percent (n=59) of cases, multiple first aid treatments had been applied to the burn area. Some cases (4.9%, n=125) were recorded as using no first aid prior to their arrival at the emergency department (Figure 5). Data on the treatment provided once a patient arrives at the emergency department is not available in this data set.

Figure 5: Product-related Burn Injuries by First Aid Treatment; 2018 - 2023



A triage category reflects the level of medical urgency required. Every child that presents to PCH ED with an injury is allocated a triage category (Table 2). While a large proportion (54.5%, n=1,383) of product-related burn injuries were recorded as semi-urgent, the triage categories resus, emergency and urgent accounted for 45.3 percent (n=1,151) combined. When compared to 23.3 percent for total injury presentations, burns injuries are more likely to require high levels of urgent medical attention. Very few product-related burn injuries are coded as non-urgent (0.2%, n=5).

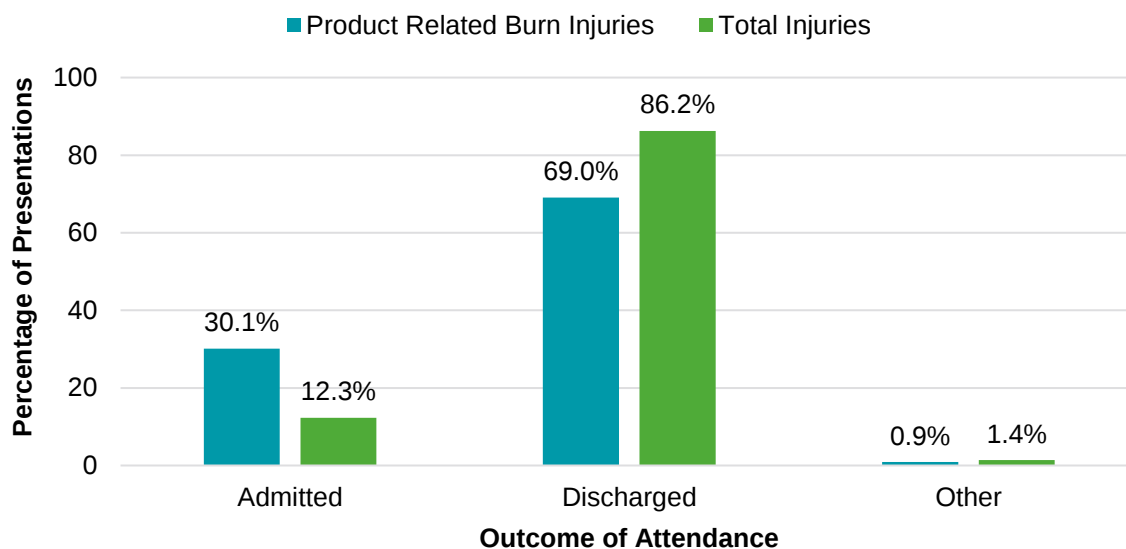
Table 2: Triage Category

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

Many children attended the PCH ED based on concerns of themselves or a relative (80.5%, n=2043). A further 14.5 percent (n=369) were referred to PCH by another hospital, which when compared to total injuries (3.7%) is substantial. Of children referred by another hospital, 42.0% (n=155) reside within regional Western Australia.

Most children (69.0%, n=1,753) who presented with a product-related burn injury were discharged from PCH ED with treatment complete. Almost a third (30.1%, n=764) of product-related burn presentations required admission to the hospital for further treatment. When compared to the admission rate for total injuries (12.3%), product-related burn injuries are more than double (Figure 6).

Figure 6: Product-related Burn Injuries and Total Injuries by Outcome of Attendance; 2018 - 2023



Discussion

This report provides a summary of all product-related burn injuries between July 2018 and June 2023 to the PCH ED. Product-related burn injuries accounted for 88.3 percent of all burn injury presentations to the PCH ED during the five year time period.

Young children under the age of five, particularly toddlers, are most at risk of product-related burns, accounting for almost two-thirds of all presentations. Children of this age are becoming mobile and starting to explore their surroundings however they may lack the necessary skills to navigate their environment safely. They often have a curious nature, slower reaction rate and lower risk calculation skills and are therefore predisposed to a higher chance of sustaining a product-related burn injury¹. Like other injuries, males are known to have a higher rate of injury, with evidence showing that males are more likely to sustain a burn injury from ages two to four⁷.

Children who identify as Aboriginal and/or Torres Strait Islander represent 5.4 percent of children under 15 years in WA⁹ yet accounted for 8.9 percent of product-related burn injury presentations to PCH ED. This highlights the strong over-representation of Aboriginal children presenting to Perth Children's Hospital with a burn injury. When compared to WA hospitalisation data, Aboriginal children and young people were hospitalised at over four times the rate for fires, burns and scalds, than non-Aboriginal¹⁰. Of note within this data set, almost half of all children who identify as Aboriginal and/or Torres Strait Islander reside in regional Western Australia.

In comparison to total injuries, a large proportion of children who sustained a product-related burn resided in regional Western Australia (10.9%). Similarly, a large proportion of children were referred to PCH by another hospital, many of which were by children who reside in regional Western Australia. Often due to the complex nature of burn and scald injuries, regional medical services do not always have the facilities to adequately treat the burn injury, and the child is then transferred to PCH for further treatment.

Children residing in regional and remote areas are also considerably more likely to be hospitalised for injury in comparison to children residing in metropolitan areas¹⁰. Of particular concern are the incidence of burns and scalds where children are 3.1 times more likely¹⁰. Regional and remote areas of Western Australia are diverse both in terms of geography and demography, and as a result provide a range of challenges for both injury prevention and treatment¹¹. The prevalence of certain occupations in regional areas such as farming and mining have been known to significantly increase the risk of death and serious injury¹¹. Small populations spread across large areas can add difficulty to injury prevention initiatives. And similarly distance to adequate medical facilities can lead to considerable time to retrieve injured people and provide them with the appropriate care¹¹.

Many product-related burn injuries occur at home, which is consistent with many childhood injuries. The kitchen is the most specified area in the home for product-related burn injuries to occur. This is where some of the key products related to burn injuries are located and used including hot food and drink as well as cooking appliances. The kitchen is often a communal hub for families, that can get very busy at peak periods such as mealtimes and adult supervision can be divided between multiple tasks. In Australia, hot beverage scalds account for one in five burn injuries in pediatric admissions and globally are the leading cause of injury in young children¹³. Scald injuries typically happen within the home setting and are primarily accidental in cause¹⁴. Zou, Wynn, Miller et al., identified that home safety interventions have only been effective in promoting hot tap water temperatures. There is little evidence supporting interventions when it came to food preparation and handling of hot drinks and reducing scald burn injuries¹⁴. A lack of supervision is considered as a contributing factor to all types of burns¹².

Many product-related burn injuries are triaged as urgent, emergency or resus, requiring critical medical attention. Severe presentations can require hospitalisation and surgery. Burn injuries can be very painful and have a number of associated risks, such as infection, with initial treatment often followed by years of ongoing treatment to reduce scarring and improve mobility and can lead to poorer mental health wellbeing^{6,15}. Children have thinner skin in comparison to adults, resulting in burn injuries developing into deeper burns much quicker making treatment urgent¹². To assist with reducing the severity of the burn injury, first aid of cool running water for at least 20 minutes must be applied within the first three hours of the injury occurring⁵.

Burns are a commonly occurring injury that presents to paediatric emergency departments that range in severity¹⁶. Through research, burn injuries have been understood to be traumatic, and complex and can lead to life-long challenges^{15,16}. These injuries can affect children physiologically and psychologically after the initial burn and in some cases years after the incident¹⁶. Due to the traumatic nature of ongoing medical visits, visible signs of the burn injury and other medical issues, children who have a burn injury have been correlated to have a higher percentage of mental health conditions compared to those who have no injury^{15,16}. Mental health conditions post-burn injury can include psychotic disorders, mood disorders, anxiety disorders and eating disorders¹⁶. These conditions can be assumed to have been caused by surgical and rehabilitation interventions and medical trauma stress, which can lead to self-esteem and body image issues¹⁶. Whilst definitive causes are still unknown, a common outcome was the need for early detection and support following admission for paediatric unintentional burns to reduce the progression of mental health conditions^{15,16}.

The data in this report provides a snapshot of product-related burn injuries in Western Australian children. Burns continue to be a prevalent injury issue that can require long term treatment and lifelong impacts. Education in prevention and first aid remains crucial in reducing the number and severity of burn injuries.

Prevention

To reduce the risk of product-related burn injuries to children the following safety steps should be taken:

- Identify products in your home that could cause burns and restrict access to children.
- Always supervise children when using products that could cause a burn.
- Follow the manufacturer's recommendations when using products – keeping in mind the safety information provided.
- Have a licenced plumber install a hot water tempering valve to control the delivery temperature of your tap water to a maximum of 50°C.
- Install smoke alarms, test their batteries regularly and replace them on the 1st of April every year.
- Install electrical safety switches to protect against faulty wiring or products. Check electrical appliances for frayed cords and that electrical power boards are not overloaded.
- Keep children out of the kitchen while preparing meals. Use rear hot plates first, turn pot handles to the back of the stove or bench
- Never hold a child while consuming hot food and drink and / or use a commuter mug with a lid when consuming hot drinks.
- Keep matches and lighters out of reach of children.
- Ensure campfires are properly extinguished with water.
- Always run the cold water first and last when filling up a bath and never leave a running bath unattended. Always test the temperature before bathing your child.
- Your microwave should be at a suitable height so that you don't have to take items out from above you

First Aid

Learn the correct first aid treatment for burns:

- Immediately apply cool running water for at least 20 minutes to the burn area.
- Remove nappies, clothing and jewellery unless stuck to the burn area.
- Keep the child warm, to prevent them from going into shock.
- Do not use ice, butter or creams.
- Cover the injury with a clean non-stick dressing
- Seek medical attention if the burn or scald is on the face, hands, feet or groin, if it is larger than a 20 cent coin or blistered.
- In an emergency, phone 000 for an ambulance.

WA Consumer Product Advocacy Network's Role

It is important WA CPAN raise community awareness around product safety and how to reduce the risk of these injuries. This includes promoting safety messages and recommendations within the WA community through education, data dissemination, advocacy, digital media and regulation. Members of the network may also have influence on relevant Australian Standards Committees.

WA CPAN will continue to identify unsafe products and advocate for change in order to reduce the number and severity of child injuries associated with consumer products. WA CPAN will use its network to:

- Identify emerging child product safety issues through data collection and research;
- Continue to monitor existing child product safety issues;
- Advocate for appropriate product safety measures in children's products;
- Raise public awareness of child product safety concerns; and
- Collaborate to achieve the best outcome for Western Australian children.

National Burns Awareness Month

National Burns Awareness Month is an initiative of Kidsafe, Australia's leading community organisation dedicated to child injury prevention in collaboration with the Australian & New Zealand Burn Association. It is held each year in June as there is a significantly increased risk of burns during winter. Throughout the month of June, a social media campaign is used to raise awareness of burns prevention and correct first aid.

We can educate and reach a wider population through the collaboration of multiple organisations that attend the WA CPAN group. National Burns Awareness Month working with WA CPAN group members has encouraged the partnership with daycare centres to inform educators on current burn injuries we see, and to promote policy change to reduce the impact burn injuries can have on children. It has also allowed our group members to re-share social media posts and engage with the campaign to expand and reach more of the wider community. Further, WA CPAN has allowed for establishing collaboration opportunities with policymakers to ensure burns prevention is a key priority.

Limitations

There are some limitations that present with utilising the data from this report. Many injuries that occur to children go unreported. Children that do not attend the PCH ED may go to a closer facility or seek medical assistance from a general practitioner and are therefore not represented in the data in the report.

The accuracy of this report's data is also heavily dependent on patient or parental recall of the injury. This may not always be an accurate relay of what happened, and information can be lost between triage staff and the family affected.

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