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QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals represent three distinct areas of Queensland.

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## Injuries in the Home - Children

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### Summary

- Q 57% of injuries to children occur in the home
- Q More than half of the injuries were to pre-school children
- Q Children encountered different hazards in the home depending on their developmental stage
- Q For children under one year the most common injury causes were falls, poisoning and burns. The most common presentation was with head injury and the admission rate from all presentations was 20%
- Q Children in the 1 to 4 year age group were most commonly injured by falls, poisoning and by striking or collision with objects. The head was still the commonest body area harmed but the all presentation admission rate was lower, at 17%, than the youngest group.
- Q Older children (5-14) presented most commonly with falls, collisions and cuts. They were most likely to be hurt in the garden with the forearm or hand the most common site of injury. Trampolines and bicycles were often involved in their injuries. The all presentation admission rate for older children was lower than for younger children.

### Introduction

This is the second of two bulletins examining injuries to adults and children occurring in or around the home. The home is where children, particularly young children spend much of their time and where the majority of injuries to children occur.

These injuries range from inconsequential knocks and bumps to tragic loss of life. More than half of all child presentations to emergency departments (EDs) for injury in Queensland are the result of an incident in the home. This analysis describes such unintentional injuries for the different developmental ages and highlights home safety issues.

### Results

For the three years from January 1998 to December 2000 there were 31 389 child (aged less than 15 years old) presentations to participating EDs in Queensland as a result of an unintentional injury in the home. This comprised 57% of all unintentional child injury presentations, although for children aged under one year this figure was almost 90%.

#### **Age and sex**

More than half of child home injuries involved preschool children (aged less than 5 years). Child injuries were the most numerous at age one with

the number decreasing steadily with age (Figure 1). At all ages injuries to males outnumbered females with this differential gradually increasing with age from 10% more males at age 0 to almost 80% more at fourteen.

Due to the quite different pattern of child injury at different developmental ages the results are presented for four age groups, less than one, one to four, five to nine and ten to fourteen years of age.

## Less than 1 year

### External cause

The external cause of a half of injuries to children aged <1 in the home was falls (low and high), followed by poisoning (9%) and hot liquids or objects (8%). Other significant external cause categories were struck by or collision with object (7%), cutting piercing object (4%), other threat to breathing (4%) and animal related (excluding dog or horse) (3%).

### Location

The most common locations for injuries to children aged under 1 year in the home were living/family room (28%), bedroom (23%), kitchen (18%), stairs (7%), and garden (5%).

### Nature and body location of injury

More than a quarter of the injuries at this age were suspected intracranial injuries followed by superficial (13%), open wounds (10%), poisoning (9%), burns (8%), foreign bodies in the respiratory or alimentary tract (8%) and fractures (5%) (Table 2).

The most common body part injured was the head or face comprising almost one half of all home injuries at this age. Other common body parts injured were the hand (8%), elbow (3%) and neck (3%).

Main injury factor		<1
1	Bed	130
2	Floor	116
3	Baby walker	85
4	Other chemical	69
5	Other natural object/animal	67
6	Change table	64
7	Table	57
8	Other drug	48
9	Pram/stroller	48
10	Hot beverage	44

Table 1. QISU Emergency Department presentations, unintentional injuries in the home to children aged less than 1 year, ranked by major injury factor 1998-2000

### Main injury factor

The ten most reported injury factors for this age were listed in Table 1. The most common consumer items mentioned were beds (7%), baby walkers (4%), change tables (3%), tables (3%) and prams/strollers (2%). Injuries involving hot beverages (2%), chemicals (3%) and medicines (2%) also featured. Amongst the top 20 injury factors, other nursery items included high chairs (ranked 14<sup>th</sup>), cots (15<sup>th</sup>) and bouncers (19<sup>th</sup>). Other food or drink, which is often associated with choking, also featured amongst the top 20 injury factors (13<sup>th</sup>).

### Severity

Almost 20% of injuries resulted in admission to hospital and 45% were categorised as urgent or higher priority at triage.

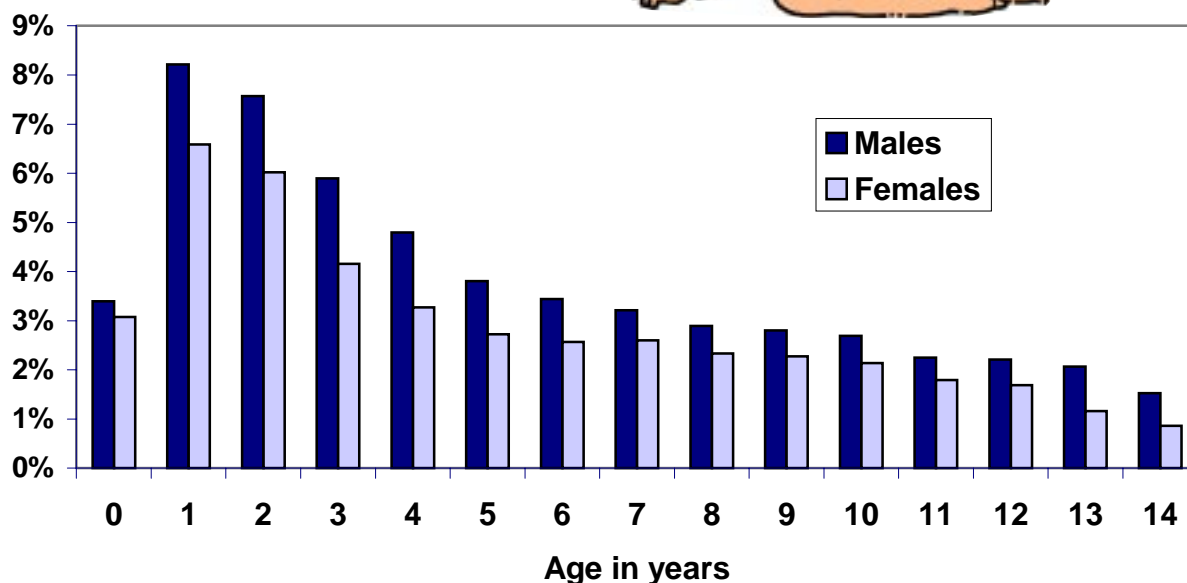


Figure 1 QISU Emergency Department presentations, unintentional injuries to children in the home by age and gender, 1998-2000

Nature	<1	1-4	5-9	10-14	Total
Open wound	10%	25%	27%	22%	24%
Fracture	5%	10%	21%	22%	15%
Sprain strain	3%	6%	13%	20%	10%
Superficial	13%	9%	9%	9%	9%
Intracranial	26%	11%	6%	4%	9%
Poisoning	9%	12%	1%	1%	7%
Burn	8%	4%	2%	3%	4%
Bite - venomous/non venomous	3%	3%	3%	4%	3%
FB in alimentary tract	3%	3%	2%	1%	2%
Eye injury	2%	2%	3%	2%	2%
Dislocation	2%	2%	1%	1%	2%
Crushing injury	1%	2%	2%	1%	1%
FB in soft tissue	0%	1%	2%	2%	1%
FB in nose	0%	3%	0%	0%	1%
FB in eye	0%	1%	1%	1%	1%
FB in ear	0%	1%	1%	1%	1%
FB in respiratory tract	3%	0%	0%	0%	0%

Table 2 QISU Emergency Department presentations, unintentional injuries to children in the home by percentage of nature of injury for age group, 1998-2000

## 1 to 4 years

### External cause

The external cause of 40% of injuries to children aged 1 to 4 years in the home was falls (low and high), followed by poisoning (12%) and struck by or collision with object (11%). Other significant external cause categories were cutting piercing object (7%), hot liquids or objects (5%), animal related (excluding dog or horse) (4%) and dog related (2%).

### Location

The most common locations for injuries to children aged 1 to 4 years in the home were living/family room (21%), bedroom (17%), garden (17%) and kitchen (13%). Two per cent of injuries specified balcony or verandah as the place of injury.

### Nature and body location of injury

A quarter of the injuries at this age were open wounds followed by poisoning (12%), intracranial injury (11%), fracture (10%), superficial (9%), sprain or strain (6%) and burns (4%). Of interest was the number of cases of foreign bodies in the nose at this age (3%) (Table 2).

The most common body part injured for this age group was the head or face (39%) followed by the hand (8%), elbow (6%), foot (5%) and forearm (5%).

### Main injury factor

The ten most reported injury factors for the one to four age group are listed in Table 3. The most common items mentioned were drugs or chemicals (11%) followed by beds (4%), floors (3%), doors (3%), tables (3%), other natural object or animal (5%) trampolines (2%) and dogs (2%). Injuries involving hot beverages also featured amongst the top 20 injury factors as did bicycles ranked 17<sup>th</sup> and swings 18<sup>th</sup>.

Main injury factor	1-4
1 Other drug	703
2 Other chemical	598
3 Bed	550
4 Floor	457
5 Door	452
6 Table	446
7 Other natural object/animal	406
8 Trampoline	318
9 Dog	262
10 Paracetamol	253

Table 3. QISU Emergency Department presentations, unintentional injuries in the home to children aged 1 to 4 years, ranked by major injury factor 1998-2000

### Severity

Thirty nine percent of presentations aged 1 to 4 years were categorised as urgent or higher priority at triage while 17% resulted in admission to hospital.

## 5 to 9 years

### External cause

As with the younger age groups the most common external cause of injuries to children aged 5 to 9 years in the home was falls (low and high) (43%), followed by struck by or collision with object (14%) and cutting piercing object (11%). Other significant external cause categories were animal related (excluding dog or horse) (5%), pedal cycle (5%) and struck by or collision with person (4%).

### Location

The most common locations for injuries to children

Main injury factor		5-9
1	Trampoline	553
2	Bicycle	487
3	Tree	402
4	Person	316
5	Sporting equipment	287
6	Other natural object/animal	255
7	Natural surface	240
8	Dog	212
9	Floor	207
10	Door	196

Table 4. QISU Emergency Department presentations, unintentional injuries in the home to children 5 to 9 years old, ranked by major injury factor 1998-2000

aged 5 to 9 years in the home were garden (34%), living/family room (12%), bedroom (11%), garage/carport (7%) and kitchen (6%).

### **Nature and body location of injury**

More than a quarter of the injuries at this age were open wounds followed by fractures (21%), sprain or strain (13%), superficial (9%) and intracranial (6%) (Table 2).

A quarter of the injuries involved the head or face followed by the forearm (13%), hand (10%), foot (10%), elbow (6%) and knee (4%).

### **Main injury factor**

The ten most reported injury factors for this age are listed in Table 4. The most common item mentioned was the trampoline (6%) followed by bicycle (6%), tree (5%), person (4%) and sporting equipment (3%).

### **Severity**

Sixteen per cent of home injuries to children aged 5 to 9 years resulted in admission to hospital and 32% were categorised as urgent or higher priority at triage.

## **10 to 14 years**

### **External cause**

The most common external cause of injuries to children aged 10 to 14 years in the home was again falls (low and high) (37%) followed by struck by or collision with object (15%), cutting piercing object (12%), struck by or collision with person (6%), animal related (excluding dog or horse) (6%) and pedal cycle (5%).

### **Location**

The most common locations for injuries to children aged 10 to 14 years in the home were the garden (32%), living/family room (17%), bedroom (8%), garage/carport (8%) and kitchen (7%).

### **Nature and body location of injury**

The pattern of injury at this age was similar to the previous age group with the most common injuries

Main injury factor		10-14
1	Bicycle	360
2	Person	317
3	Natural surface	231
4	Sporting equipment	222
5	Trampoline	185
6	Tree	174
7	Other natural object/animal	163
8	Dog	144
9	Skateboard	134
10	Roller skates/blades	118

Table 5. QISU Emergency Department presentations, unintentional injuries in the home to children 10 to 14 years old, ranked by major injury factor 1998-2000

being open wounds (22%), fractures (22%), sprains or strains (20%) and superficial injuries (9%) (Table 2). Also of note was the number of venomous and non-venomous bites (4%) and burns (3%).

Contrary to the other age groups the most common body part injured was not the head or face but the hand (16%) followed by the foot (14%), forearm (13%) and then the head and face (12%).

### **Main injury factor**

The ten most reported injury factors for this age are listed in Table 5. The most frequent items mentioned were bicycle (6%), person (6%), natural surface (4%), other sporting equipment (4%), trampoline (3%), tree (3%) and dog (3%). Skateboards, roller skates and roller blades also appear amongst the top ten items for the first time. Knives, the most frequent consumer item involved in adult injuries in the home, appear in the top 20 injury factors for the first time at this age (ranked 13<sup>th</sup>).

### **Severity**

In contrast with the youngest age group only 12% of injuries at this age resulted in admission to hospital while 30% were categorised as urgent or higher priority at triage.

## **Discussion**

### **Falls**

By far the most common reason for presentation to a hospital ED for injury amongst children at all ages is some type of fall. The reason for these falls which is illustrated by the results above varies markedly at different ages.

For infants (under 1 year) a major proportion (15%) of these injuries is associated with nursery items which in many cases result in a potentially serious head injury. One nursery item in particular which stands out at this age is the baby walker which was the 3<sup>rd</sup> most frequent injury factor mentioned. Injuries resulting from this item and other nursery products were covered in more detail in a previous Injury Bulletin but in summary baby walkers have been



shown to have no benefit, pose an unacceptable risk and should not be used under any circumstances<sup>1</sup>.

Falls as a result of rolling from beds, sofas, tables, and change tables also make up a significant proportion (14%) of injuries at this age and illustrates the need for parents /carers to not underestimate the physical abilities of their infant. A number (55) of fall injuries amongst infants were also described as resulting from being dropped.

Falls from balconies or verandahs were responsible for 80 cases of injury to children aged less than five. Many resulted in head injuries (55%) and almost half required admission to hospital (42%). Current building standards do not specify balustrades be vertical nor do they require them to be more than one metre high regardless of the size of the drop to ground level. This is clearly an area where more stringent building requirements have the potential to reduce the incidence of often severe falls.

At older ages fall injuries increasingly become associated with play and play equipment. In the one to four years age group there is already a surprisingly large number of trampoline injuries and even bicycle injuries while for the next age group these two items dominate the injuries.

The oldest age group, 10 to 14 years, sees the appearance of skateboards, roller blades, and roller skates as a significant cause of fall related injury.

### **Poisoning**

Amongst children aged under 5 years poisoning is the second most frequent reason for presentation for injury at a hospital emergency department comprising more than 10% of all injury presentations at this age. Two thirds of the ingestions were associated with medicines a quarter of which were paracetamol. This major cause of injury to young children was examined in greater depth in a previous injury bulletin, however its dominance at this age indicates there is still some way to go in implementing prevention strategies in this area<sup>2</sup>.

### **Burns**

After falls and poisoning the other significant injury amongst preschool children was burns, from either hot liquids or objects. These injuries are commonly associated with hot drinks and food or with children coming into contact with hot irons, stoves or lawn mower exhausts. The increase in burns amongst older boys mainly due to fire and flames is of concern and requires further investigation into risk taking behaviour at this age.

### **Doors**

Injuries associated with doors are also a significant reason for attendance at a hospital ED amongst younger children ranking 5<sup>th</sup> for those aged 1 to 4 years. These finger jam injuries which in many cases result in a permanent injury including ampu-

tation could often have been avoided by using simple low cost prevention measures.

### **Dogs, Animal –related**

Although dog bites make up only around 2% of injuries to children they often involve injuries to the face and head and admission to hospital. In an effort to reduce dog bites amongst children the Brisbane City Council has recently produced an information leaflet for dog owners, a copy of which has been included with this bulletin.

Bites from spiders, ticks, and insects also make up around 2% of child home injury presentations and were covered in detail in a recent bulletin<sup>3</sup>.

### **Other**

Injuries to young children resulting from falling furniture or similar items, such as bird baths, contribute only a relatively small number (71 cases in 2000) but they have the potential to be more serious with four deaths from falling furniture being reported in Queensland since 1993<sup>4</sup>.

The television, often mentioned amongst these injuries topples easily because its centre of gravity is high and near the front. Most manufacturers of larger TVs now recommend that they be tethered to the wall to prevent toppling. Another item which is not obviously a hazard but tips over easily and has caused a number of injuries and one death in Queensland is the bird bath<sup>4</sup>.

### **Deaths**

Deaths due to injury amongst children in the home represents around half of the 65 injury deaths to children per year in this State. The most common cause of injury death in the home is drowning, mainly in swimming pools, followed by asphyxia, driveway runovers and poisoning.

## **Conclusion**

Almost 60% of child injury occurs in the home setting. Of these 40% can be attributed to falls with poisonings and burns other significant causes of non-fatal injury. These three issues along with drowning, the most common cause of injury death in the home, have been identified as priority areas at a national and state level.

Significant childhood injury prevention is possible in the home environment. Injury surveillance uniquely identifies and describes the spectrum of injuries children encounter as they develop. With the application of specific environmental modifications particular patterns of predictable injury can be reduced.

### **References**

1. Hockey, R., Miles, E., Thomson, F. *Nursery Products*. QISU Injury Bulletin 61 September 2000
2. Hockey, R., Reith, D., Miles, E. *Childhood Poisoning and Ingestion*. QISU Injury Bulletin 60 July 2000.
3. Hockey, R., Miles, E. *Bites and Stings*. QISU Injury Bulletin 64 February 2001.
4. Queensland Council on Perinatal and Paediatric Mortality. Personal Communication 2001

## Prevention

*Space does not permit detailed prevention information for all child injuries in the home.*

*Here we have attempted to provide some global safety advice in response to the injury scenarios found in this analysis.*

*Those topics which have been dealt with in other Injury Bulletins or fact sheets and provide more comprehensive prevention advice are marked\* and can be accessed on the QISU web site or by contacting us.*

### Falls

#### Safe Nursery Furniture\*

- use of safe products which conform to applicable Standards
- appropriate use eg use of harnesses on high chairs
- avoid use of baby walkers

*Babies rolling* - maintain hand contact with young babies on change tables, beds, benches etc

*Furniture* - age appropriate beds

*Prevention of high falls* - use of gates on stairs – top and bottom

- measures to secure windows
- vertical balustrades and railings

#### Maximise trampoline safety\*

- safe positioning, including soft fall
  - use of safety pads, equipment maintenance
  - supervision and guidelines for use
- Roller skates/roller blades/ skateboards/ scooters\** - use of safety gear
- off-road use

### Poisons\*

*Storage* - Secure storage of medicines and chemicals including household products and personal use items in original containers

*Disposal* - Appropriate disposal of unwanted chemicals and medications

*Visitors* - Caution when visiting/being visited where inappropriate storage is more likely (eg tablets in handbags)

### Burns\*

*Smoke alarms* - installed, maintained

*Kitchen* – precautions with hot beverages, hot food, stoves, ovens

Care with hot irons, lawn mowers

*Bathroom* – use of hot water temperature control (eg tempering devices)

- cold water first in bath

### Asphyxia\*

*Food* – do not provide food such as peanuts, to children < 5 years also -

*Small objects* – including parts of toys, coins, beads, batteries

*Strings/cords* – eliminate strings and cords from young child's environment. eg cords on blinds, clothing, toys

*Safe sleeping environment* – snug fitting cot mattress etc



### Drowning\*

*Bath* – continuous bathtime supervision by an adult

*Pools and spas* – compliant fence and gate - supervision

### Bicycle Safety\*

Use of helmets, shoes when riding

### Driveways\*

Children's play area fenced off from driveway

### Other

*Secure heavy objects* – eg TVs, bird baths

*Finger jams* - use of door protection devices

Provide covers for sharp corners on furniture

*Dogs\** – Supervision/separation

### Further Information

Information is available from the following agencies:

*Consumer safety* – [www.fairtrading.qld.gov.au](http://www.fairtrading.qld.gov.au)

*Electrical safety* – [www.energex.com.au](http://www.energex.com.au)

*First Aid courses* – [www.ambulance.qld.gov.au](http://www.ambulance.qld.gov.au)

*New home/renovations* –

[www.smarthousing.qld.gov.au](http://www.smarthousing.qld.gov.au)

*Queensland Health* – [www.health.qld.gov.au](http://www.health.qld.gov.au) .

*Kidsafe* – [www.kidsafe.com.au](http://www.kidsafe.com.au)

Contact the *Poisons Information Centre* on 131126 in case of poisoning or suspected poisoning.

Information on the *Safety in Residential Dwellings Taskforce* can be found at [www.qisu.qld.gov.au](http://www.qisu.qld.gov.au)

