Injuries in the Home – Children

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Summary
- 57% of injuries to children occur in the home
- More than half of the injuries were to pre-school children
- Children encountered different hazards in the home depending on their developmental stage
- 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%
- 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.
- 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%).

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

Table 1. QISU Emergency Department presentations, unintentional injuries 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 14th), cots (15th) and bouncers (19th). Other food or drink, which is often associated with choking, also featured amongst the top 20 injury factors (13th).

**Severity**
Almost 20% of injuries resulted in admission to hospital and 45% were categorised as urgent or higher priority at triage.
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 17th and swings 18th.

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...
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 men-
tioned was the trampoline (6%) followed by bicycle
(6%), tree (5%), person (4%) and sporting equip-
ment (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
being open wounds (22%), fractures (22%), sprains
or strains (20%) and superficial injuries (9%) (Table
2). Also of note was the number of venemous and
non-venemous 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 men-
tioned were bicycle (6%), person (6%), natural sur-
fave (4%), other sporting equipment (4%), trampo-
line (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 13th ).

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 pri-
iority 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 3rd most frequent injury factor mentioned. Inj-
uries resulting from this item and other nursery pro-
ducts 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. 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/caregivers 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. By four years age group there is already a surprisingly large number of trampoline injuries and even bicycle injuries. This is clearly an area where more stringent building requirements have the potential to reduce the incidence of often severe falls.

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.

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 6th for those aged 1 to 4 years. These finger jam injuries which in many cases result in a permanent injury including amputation 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.

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.

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.

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

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/ skateboard/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
First Aid courses – www.ambulance.qld.gov.au
New home/renovations – www.smarthouse.qld.gov.au
Queensland Health – www.health.qld.gov.au

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

Information on the Safety in Residential Dwellings Task-force can be found at www.qisu.qld.gov.au