Low speed run-over of young children in QLD

Summary

- 28 children younger than five years died as a result of a low-speed, non-traffic pedestrian impact in Queensland in the seven year period, 1994-2000.
- Low-speed run-over is the third most frequent cause of injury death for toddlers (1-4 years) in Queensland.
- 60% of the vehicles involved in the deaths were reversing at the time.
- 41% of the vehicles involved in the deaths were 4WDs.
- 2/3 of the deaths occurred at the victim's home and the driver was most frequently a relative or family friend (54%).
- In the four years to 2001 QISU recorded 68 emergency department (ED) presentations by children younger than five years for low speed runover.
- 80% of the injury presentations to ED occurred at home and 60% required hospital admission.

Introduction

In Australia pedestrian crashes are responsible for half of all transport related deaths of children aged under five years. Of these fatalities half are the result of a low speed driveway run-over1. For the years 1994 to 2000 there were 53 pedestrian fatalities of children aged less than five years in Queensland of these 28 (53%) were the result of a low speed impact2. A recent study examining driveway run-over deaths of young children in Australia found that most fatalities involved toddlers being reversed over by a large 4WD vehicle in the driveway of their own home by a member of their immediate family3. After drowning and motor vehicle passenger deaths low speed runovers are the most frequent cause of death due to injury amongst toddlers (aged 1 to 4 years).

This bulletin examines the circumstances of low speed (non-traffic) pedestrian injury deaths and Emergency Department presentations of children younger than five years to participating QISU hospitals*.

*Listed far right column

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Results

Deaths
During the period 1994 to 2000 there were 28 deaths of children aged less than five years as the result of a low speed pedestrian impact. These deaths represent 10% of all injury deaths of children aged 1 to 4 years and is the third leading cause of death due to injury at this age. Almost a third of the fatalities were aged one year (12 to 23 months) and the male female ratio was 1.5:1 (Figure 1). The median age was 22 months.

An examination of the circumstances of the fatalities show that in 15 (54%) of the cases either a direct relative or friend of the family was driving the vehicle, most frequently a parent. Where the direction of travel was known 60% of vehicles were reversing at the time of the incident. Where the type of vehicle involved was known the majority were large (19 out of 22) with the biggest single group being 4WD vehicles (41%) (Figure 3).

The largest number of fatalities occurred on a Sunday (6). Twice as many fatalities occurred in the afternoon (mostly late afternoon) compared to before noon. Almost 60% of the incidents occurred in the driveway or garage of the deceased’s own home.

ED presentations
For the period 1998 to 2001 there were 68 presentations of children aged under 5 years to participating EDs in Queensland as result of a low speed pedestrian related injury. These cases represent two thirds of all pedestrian related injuries at this age.

Almost 50% of the ED presentations for a low speed pedestrian injury were aged one year with males outnumbering females 1.7:1 (Figure 2) with a median age of 23 months, a similar pattern to that observed in the fatalities.

Nearly 80% of the cases were described as occurring at home with 60% taking place in the driveway or garage/carport. Forty per cent of runovers occurred on a Saturday or Sunday while 40% took place between 3pm and 6pm in the afternoon and 32% between 8am and 12pm in the morning.

The most frequent injury was superficial injuries (24%) followed by fracture (22%), intracranial (16%), crushing injury (9%) and internal injury (7%). Four cases (6%) suffered no physical injury. The head, face or neck was the most frequently injured body part (26%) followed by the lower limbs (25%), multiple sites (13%) and thorax and upper back (12%). Almost half of the fractures involved the major bones of the lower body (pelvis, thigh or lower leg) (Table 1).

Almost 60% of low speed pedestrian injury presentations resulted in admission to hospital while one case died in ED. Fifty five (81%) presentations were assigned a triage category of Urgent or higher while 1 in 10 had the highest category, Resuscitation.

Discussion
The findings of this bulletin are similar to other studies of low speed run over fatalities amongst young children. These deaths most often involve children aged between 12 and 23 months, an age when independent mobility becomes established but when the concept of personal safety is absent. Not unex-
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The over representation of 4WD vehicles is somewhat paradoxical in that studies of rearward visibility have found their high driving position means that they have rearward visibility no worse than some smaller vehicles. However this visibility is compromised on many 4WDs by the fitting of spare wheels and other accessories on the rear door.

Prevention

Low-speed run-overs are often the predictable consequence of a child following a parent into the driveway area without their knowledge. These circumstances are similar to those surrounding the most common cause of death due to injury at this age, drowning in domestic swimming pools. Strategies for the prevention of driveway run-overs may require a similar approach. In the case of domestic pools passive changes to the environment have been found to be the most effective measure to reduce toddler drownings while behaviour modification and education campaigns are only effective if used in combination with passive measures.

Figure 3 Queensland non-traffic slow speed run-over deaths, children aged 0 - 4, by type of vehicle, 1994 -2000

![Figure 3](image)

Table 1 QISU Emergency Department presentations, non-traffic, slow speed pedestrian injuries, aged 0 - 4, nature of injury by body part, 1998 -2001

<table>
<thead>
<tr>
<th>NATURE</th>
<th>Abdo, lower back, pelvis</th>
<th>Upper limbs</th>
<th>Thorax, upper back</th>
<th>Multiple sites</th>
<th>Lower limbs</th>
<th>Head, face, neck</th>
<th>Unspecified, other</th>
<th>TOTAL</th>
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<td>-</td>
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<td>-</td>
<td>3</td>
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<td>9</td>
<td>17</td>
<td>18</td>
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</tbody>
</table>

Table 1 QISU Emergency Department presentations, non-traffic, slow speed pedestrian injuries, aged 0 - 4, nature of injury by body part, 1998 -2001

Smart
Holden provide as standard or as an option proximity sensors on their most popular models, but they stress that these devices are only to be used for assistance in parking and cannot be relied upon to detect small children behind a vehicle.

Supervision and education remain important components of a preventive strategy to reduce driveway run-over deaths however longer term structural changes are more likely to provide more effective outcomes. As in the case of toddler pool drownings it took many years of campaigning and research to convince regulators that proven passive interventions were the most likely strategies to succeed in reducing deaths. However given the success of pool fencing legislation in reducing toddler drowning we would expect similar measures to reduce driveway run-over deaths. In the meantime the issue of low speed runovers needs to be highlighted amongst the injury prevention community as well as government and non-government agencies involved in housing and motor vehicle design. Those agencies providing services to young children should ensure that all parents and caregivers are provided with suitable educational material highlighting the dangers to young children around motor vehicles in all settings.

**References**


Further information