

## INQUIRY INTO PEDESTRIAN SAFETY (MINISTERIAL REFERENCE)

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**Date Received:** 10/07/2009

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## ***Roads and Young Children: Protecting our Future***

Fifteen years ago, I undertook a study which involved interviewing over 100 parents of children who were injured whilst pedestrians. The devastation of such an injury on the family was very evident; the families had to not only deal with the physical injuries (frequently serious head injuries and multiple fractures of the long bones) but they also had to come to terms with the potential social and long-term consequences of such injuries. What these interviews highlighted for me, was the need for a range of effective strategies to protect the most vulnerable of our road users – the young child.

Fifteen years on, child pedestrian injury remains one of the leading causes of death for children aged 5 to 9 years in Australia although the incidence of injury has declined over that time. The decline can be attributed to many factors including innovative education programs, greater enforcement of speed zones around schools and probably the most likely reason, reduced exposure namely, that the number of children walking to and from school and other activities has reduced dramatically over the period of time.

So how does such an injury occur? A number of scenarios account for more than 70% of injuries to child pedestrians. The most typical scenario (43%) is the 'dart out' type of incident whereby, the child appears suddenly from the roadside, frequently from between cars, and is struck by a passing motor vehicle. Also, dashing across an intersection is a particular problem for children accounting for about 11% of incidents. These two scenarios primarily involve children aged 5-9 years and 5-14 years, respectively. By contrast, events in which a car reverses over a child are limited almost completely to very young children (children in the 1-2 year age group) who are small in stature and physically unable to alert the driver. The proportion of these injury events varies between published reports, with recent findings in New South Wales suggesting 18% of fatal pedestrian injuries are driveway incidents predominantly involving 4WD type vehicles.

With 45% of injured children unaccompanied at the time of the injury and a further 45% accompanied by another child at the time of the collision, a number of

preventive strategies have focused on ensuring children under the age of 10 are accompanied by an adult when crossing the road. This strategy makes sense when you consider the developmental timetable of children. There is now considerable evidence that developmental processes have a large impact on a child's ability to make safe decisions when crossing the road. Crossing a road is physically an easy task for the child. However, making a decision about when to cross is a difficult cognitive task if traffic is present. It requires that the child detects motion, ascertains if the motion is toward or away as well as requiring the child to estimate the time of the vehicle's arrival. Execution of these tasks relies on figure-ground discrimination, distance depth cues, and the relative size of the vehicle and its velocity. These various cognitive tasks, which must be completed before crossing takes place, demand considerable abilities particularly for children younger than 10 years.

Importantly, there is not just one reason why a child is hit by a car and it is not sufficient to think that a child's developmental timetable explains the overrepresentation of children among these injuries. The cause of these injuries is a complex combination of factors related not only to characteristics of the child, but also their environment along with features of the motor vehicle and the driver.

Child pedestrian injuries occur in residential areas, and a large proportion of these injuries occur on the same street or in close proximity to the child's home. There is also a complex relationship between the speed and volume of traffic and the likelihood of injury. A child is at a greater risk of injury on roads which have few vehicles but where the vehicles are exceeding the speed limit – this type of road is typically found in residential areas. The other road environment which confers a high risk to children is roads which have many vehicles but they are moving slowly, these roads might include picking up or dropping off children outside a school or near shops.

Besides the volume and speed of traffic, other environmental features such as on-street parking and semi-permanent or permanent objects such as rubbish bins, telephone booths, trees and post boxes can hide a child whilst they are walking to the roadside. It is conceivable that a child's movement from their home to the roadside could be completely obscured by such obstacles and it has been reported that

obstacles along the roadside (or verge) can increase the likelihood of pedestrian injury threefold.

Ironically, in our efforts to create safer roads for our children in some instances we have increased the risk of injury for children. For example, based on the injury statistics, crossing at a protected pedestrian crossing increases the likelihood of pedestrian injury twofold and that the roadway nearby or adjacent to a pedestrian crossing (zebra crossing) has been found to be the most hazardous for young children. Whether this is because children assume these areas are 'safe zones' and approach them with less caution, it is unknown. Fortunately, recent research suggests that when appropriate signs and road markings are provided at greater distances from the pedestrian crossing, thereby alerting drivers to the pedestrian crossing sooner, a reduction in pedestrian motor vehicle conflict occurs.

In the event of an injury, the design of the motor vehicle involved in the collision can have a major effect on the severity of injuries sustained by the child. The exterior shape of the motor vehicle has provided a focus for designers in an effort to reduce the severity of pedestrian injuries. The significance of bumper design (particularly the angle between the bumper and the front of the vehicle), the vehicle's bonnet height along with energy absorbing exteriors are vehicle features considered most important in reducing the severity of child pedestrian injury. Of interest to all consumers is the pedestrian protection rating allocated to new vehicles on the Australian market. The assessment program known as ANCAP (Australian New Car Assessment Program see <http://www.mynrma.com.au/cps/rde/xchg/mynrma/hs.xsl/ancap.htm>) assigns a pedestrian protection rating for vehicles with a 4 star rating (the highest rating) indicating sufficient protection for a pedestrian struck at 40km/hr.

No single intervention to prevent injuries to child pedestrians can be expected to be completely effective. For truly effective interventions, action is needed at National and State as well as local levels. To date, the approach at the local level has consisted of various combinations of pedestrian skills training, parent education, legislation, environmental modifications and changes to vehicle design.

The first of these approaches, pedestrian skills training, has received only a minor focus in the kindergarten to grade 10 (K-10) health education syllabus. Importantly, when it is included in the syllabus, the program shouldn't focus on the teaching of the kerb-drill "...look right, look left, listen, then look right again, and, if the road is clear, cross the road". A recent study found that 97% of the children were able to repeat the standard kerb-drill. However, we know that young children do not understand the kerb-drill or the reasons for such a drill. There are now a number of school-based education programs in Australian schools that have shown that it is possible to improve the pedestrian skills of children, and to modify the abilities of parents to assess accurately the skills of their children in crossing streets. The key features of these programs are that they include cross curricula education, activities that increase practical road crossing skills and importantly, they advocate that children are assisted by an adult when crossing a road until the age of 10 years.

The key environmental approaches have focused on imposing barriers between the motor vehicle and child pedestrian, or to modify the speed and volume of traffic in areas used by pedestrians. The calming of traffic in local areas has been reported as very cost effective for example, road safety education would need to prevent 18 child pedestrian injuries a year to be as cost effective. As well, it is important that street scapes are designed so that permanent structures do not obscure the drivers' view of a young child at the roadside and concomitantly, the child's view of the approaching vehicle.

Ongoing vehicle design including energy absorbing exteriors that reduce the severity of injury is crucial. Importantly, as consumers, the pedestrian protection rating of new vehicles (ANCAP) provides an excellent guide when purchasing a new vehicle. And, if we can influence the sale of new vehicles on the basis that the vehicle integrates pedestrian protection in their design, the message to the manufacturers will be clear.

Finally, our children are the most vulnerable of our road users and it is our role to advocate not only for comprehensive educational programs and safer road environments but also to influence vehicle design in order to protect their future.

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Useful Websites:

Pedestrian Council of Australia (<http://www.walk.com.au/pedestriancouncil>)

Kidsafe Australia (<http://www.kidsafe.com.au>)

Australian New Car Assessment Program

(<http://www.mynrma.com.au/cps/rde/xchg/mynrma/hs.xsl/ancap.htm>)