

PUBLIC HEALTH

Accidental falls from heights

Epidemiology: Guitarist Eric Clapton wrote the song "Tears in Heaven" in memory of his 4-year-old son Conor, who died in 1991 after an accidental fall from the window of 53rd-floor apartment in a Manhattan high-rise. The ballad¹ resonates with the unspeakable grief of a father as he struggles to release his earthly hold on his son. The song was awarded a Grammy Award in 1993 and has since become an anthem for tragedies involving children and the premature loss of life.

This summer there have been several incidents in which children accidentally fell from windows and balconies in Canada. Data on the epidemiology of such events are sketchy, since there is no specific code for these injuries in the International Classification of Diseases. Accidental falls from buildings tend to be rare events; when they do occur they usually

involve children or youths, occur in the summer and result in severe injuries and sometimes death.²

The extent of these injuries depend in part on impact velocity, the surface landed upon, the orientation of the body on impact and the age of the person who fell.³ Head (depressed skull fracture, cerebral contusion, intracranial hemorrhage), thoracic (pulmonary contusion, ruptured bronchus or aorta, sternal fracture resulting from hyperflexion of the chin), spinal (burst vertebral bodies) and abdominal (shearing of the bowel at the junction of fixed and mobile portions) injuries are common, although skeletal injuries predominate.

Their frequency and patterns vary by age. A review of 110 falls from heights of 3 m or more revealed 19 fractures among 25 toddlers, 55 fractures among 55 children age 3 to 10, and 36 fractures in 30 youths aged 11 to 21, giving fracture rates of 0.76, 1.00 and 1.9 respectively. There were no vertebral fractures among the 25 toddlers, 4 among the 55 children aged 3 to 10 and 27 among the 30 adolescents and young adults; long-bone fractures occurred in 7 of the 25 toddlers, 33 of the 55 children aged 3 to 10 and only 8 of the 30 adolescents/young adults.⁴ These patterns reflect the greater plasticity of the younger skeletal frame and are consistent with the suspected most common body positions assumed by falling infants (head first), children (prone) and adolescents (feet first).

Clinical management: Victims of falls from heights may require advanced trauma life support. About 15% of these patients present in shock, due often to hemorrhage from vascular rupture, a tension pneumothorax or a spinal cord injury with loss of sympathetic vascular tone. An unstable bony pelvis is the presence of shock points to a possible retroperitoneal hemorrhage, a not uncommon consequence of abrupt vertical deceleration. The height the patient has fallen, the surface landed upon, the position at landing and consideration of secondary impact injuries

(for example, as the legs buckle in feet-first landings) can help to direct the primary and secondary surveys.⁵

Prevention: Windows and balconies represent both potential hazards, from which people fall, and potential fire exits, through which they escape. Fire regulations restrict the installation of permanent grilles on residential windows.⁵

Canada's National Building Code stipulates that residential window sills located 50 cm or less from the floor must be protected by a guard or a mechanism that stops a window from opening more than 10 cm. The code also requires that guards be installed on balconies and accessible rooftops.⁵

Windows and balconies represent only a tiny proportion of the diverse locations and sites from which children fall. In Canada, as in other parts of the world, falls are the leading-cause of injury-related hospitalization among children and youth.⁵

A number of Web sites, such as the Safe Kids Canada site (www.safekidscanada.com) maintained by the National Injury Prevention Program at the Toronto Hospital for Sick Children, have been developed to provide parents with safety tips, such as positioning cribs and beds away from windows. If adopted, such simple remedies could mean that "Tears in Heaven" will be heard at fewer memorial services for children. — *Erica Weir, CMAJ*

References

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Dylan Pashe is comforted by his parents after he fell from the third-storey window of a Winnipeg apartment in July 2000. Unlike most people who fall from heights, he was not seriously injured.