

Kids Can't Fly: Preventing Fall Injuries in Children

Jeffrey W. Britton, MD, FAAP

ABSTRACT

Falls are the leading cause of unintentional injury in children. Pediatric fall injuries can be grouped into roughly 4 categories: (1) falls while walking or running, (2) falls from heights, (3) falls while participating in recreational activities, and (4) falls during competitive sports activities. Because injury statistics collected by the US Consumer Product Safety Commission are product-related, there is little data on falls from walking or running. Falling down stairs is the most common height-related fall injury, followed by playground-related falls. Bicycle-related injury leads the third category in frequency. Over 30% of parents report that their child has been injured while playing a team sport; although not all sports-related injuries are caused by falling, most result in a fall. Strategies for preventing fall injuries are based on finding risk factors that can be modified; these modifications can be pre-event, event-specific, or post-event. Office-based injury prevention counseling plays an important role in preventing pediatric fall injury.

INTRODUCTION

Falls are the leading cause of unintentional injury for children, accounting for more than 2.3 million emergency department visits for children age 14 years and under in the United States in 2002.¹ Fortunately, falls in children do not carry the high mortality rate that they do in the elderly, and only 177 fall-related deaths (specifically related to falls from heights) occurred among 0-18 year olds in the United States in 2001.² Although falling down is a natural part of childhood activities such as learning to walk, learning to ride a bike, and

playing sports, many fall injuries can be prevented, considerably reducing morbidity and associated health care costs. This article explores the epidemiology of pediatric fall injuries and reviews recommended prevention strategies for pediatricians and other child health professionals.

PEDIATRIC INJURY FROM FALLING: THE SCOPE OF THE PROBLEM

Pediatric fall injuries can be grouped into roughly 4 categories: (1) falls while walking or running, (2) falls from heights, (3) falls while participating in recreational activities such as bicycling, skating, or jumping on a trampoline, and (4) falls during competitive sports activities. Researching statistics on pediatric fall injury is limited because statistics are compiled through the National Electronic Injury Surveillance System (NEISS) of the United States Consumer Product Safety Commission (CPSC). Because the CPSC is concerned with consumer products, the NEISS data is product-specific and injury rates for non-product related falls (such as category 1 above) are difficult to track. In the remaining 3 categories, however, NEISS provides product-specific estimates of the number of emergency department visits, with 2002 data being the most current.³ This data reflects non-fall as well as fall-related injuries, but in the case of the product-related statistics presented in Tables 1, 2, and 3, the scope of the injuries due to falls can be reasonably extrapolated.

Injury statistics for pediatric falls from heights are presented in Table 1. Falling down stairs is the most common fall injury. Playground-related falls, including falls from swings, slides, monkey bars, and see saws, come in second. Bed-related falls are third, with 16.5% of the injuries resulting from falls off of bunk beds. Finally, in addition to the products listed, an estimated 4700 children age 15 and under are treated annually in emergency departments for injuries sustained from falling out of windows.¹

Table 2 lists injury statistics for some selected recreational activities. Bicycle riding leads the list, both

Doctor Britton is a general pediatrician in the department of Pediatrics and Adolescent Medicine, Aurora Sheboygan Clinic, Sheboygan, Wis and co-chair of the Wisconsin Chapter of the American Academy of Pediatrics Committee on Injury and Poison Prevention. Please address correspondence to Jeffrey W. Britton, MD, Aurora Sheboygan Clinic, 2414 Kohler Memorial Dr, Sheboygan, WI, 53081; phone 920.457.4461; fax 920.459.1170; e-mail Jeffrey.W.Britton@aurora.org.

Table 1. Falls From Heights: Selected Products³

	2002 Estimate
Stairs or Steps	250,930
Playground Equipment	218,625
Beds	212,195
Grocery or Shopping Carts	23,208
Bleachers	15,262
High Chairs, Baby Seats, Baby Carriers	14,638
Baby Strollers/Carriages	11,666
Baby Walkers/Jumpers	4767
Tree Houses/Play Houses	4130
Baby Changing Tables	2746

Source: (2002 Estimated US Emergency Department Visits; data includes non-fall injuries)

Table 2. Injuries During Selected Recreational Activities³

	2002 Estimate
Biking	350,538
Skateboard Riding	93,159
Roller Skating	89,423
Trampoline Use	80,272
Scooter Riding	53,953
Horseback Riding	20,664
Sledding	17,664
Ice Skating	16,765
Water Skiing	1991

Source: (2002 Estimated US Emergency Department Visits; data includes non-fall injuries)

because it is a very popular activity and because it involves interacting with traffic on the roadway. Biking leads in fatalities as well, with 185 deaths in children 18 and under in the United States in 2001.² Skateboards, scooters, and roller skates also pose fall risks, and their danger is amplified if the activities occur in the roadway. Trampolines are particularly risky toys. Most trampoline injuries are the result of colliding with other jumpers, falling from or onto the trampoline, or doing stunts.⁴ Given that relatively few children ride horses, compared to the other listed activities, the estimated 20,664 injuries are significant.

Injuries during competitive sports are common. In fact, 30% of parents report that their child has been injured while playing a team sport, and half of these parents say the child has been injured more than once.⁵ As the number of children participating in sports has grown over the past several years there has been an associated increase in sports-related injuries. The sports selected in Table 3 are sports in which falling is common (football, ice hockey, soccer), the playing surface is hard (basketball, hockey), or the equipment is high off the ground (gymnastics).

The estimates presented include injury from falls and other mechanisms.

STRATEGIES FOR PREVENTING FALL INJURIES

It is unlikely that we will keep children from falling down, no matter how vigorous our prevention efforts are. That being said, injuries are understandable, predictable, and preventable. They are not random accidents that just happen. Strategies for preventing fall injuries, therefore, are based on finding risk factors that can be modified. Such modifications can be pre-event (designing a playground with a soft, cushioned ground surface), event (wearing a bike helmet), or post-event (appropriate pediatric life support training for Emergency Medical Services personnel).⁶ In some instances, the risk of using a particular piece of equipment may be so great that complete avoidance is the safest option; examples would include infant walkers⁷ and trampolines.⁸

Recommendations for preventing falls from walking or running primarily focus on making sure that the home environment is free from clutter to prevent tripping. Area rugs should be secured with double-sided tape or a rubber pad. Homes with young children may also need to use protective padding for coffee tables, countertops, and other furniture with sharp edges. Liquid spills must be cleaned up immediately, and bathtubs should have a non-skid surface.

Falls from heights may be prevented by a number of different mechanisms. Homes with young children should have hardware-mounted safety gates (or doors) at the top and bottom of every stairway. Stairs should be kept clear of clutter. Infant walkers should not be used. Window guards should be used to prevent falls from windows. Children should be prohibited from playing on balconies, roofs, and fire escapes. Horseplay on beds should be curtailed, and young children (less than 6 years old) should not sleep in the top bunk.⁶ Children should be properly supervised on playground equipment, and playgrounds should be installed with appropriate protective surfacing.⁹ Children should not ride in the basket of a shopping cart, nor should they ride on the sides or front. They should wear a seat belt if sitting in the cart's seat.

Protective equipment can prevent serious injury during recreational activity. The use of a bike helmet can save lives. The fatality rate for non-helmeted riders is 14 times greater than that for helmeted riders, and it is estimated that 75% of fatal bicycle-related head injuries could be prevented by using a helmet.¹⁰ Use of a helmet is recommended for skating, skateboarding, and scooter

riding as well, although the data supporting this is largely extrapolated from the bicycle injury data. Use of a specific equestrian helmet is recommended for horse-back riding, and riding activities should be supervised at a level appropriate for the skill level of the rider.⁶ As noted above, there is essentially no way to make a home trampoline safe enough to allow use.⁸

Falling causes only some of the injuries from the competitive sports listed in Table 3, but many, if not most, serious sports injuries that are not caused by falling at least result in a fall to the ground. Improvements in equipment design, appropriate use of protective equipment, appropriate supervision of participants, maintenance of safe playing surfaces, and appropriate training and conditioning can all play a role in reducing the frequency and severity of sports injuries.

FALL INJURY PREVENTION IN THE OFFICE SETTING

Pediatricians and other health care professionals caring for children have the opportunity to counsel families on topics of injury prevention, including fall prevention. Such counseling ideally takes place before the injury occurs, in a health maintenance visit or other similar setting. Community education programs, letters to the editor, and posters or signs in the waiting rooms are other ways to get the safety message out. Acute injury visits, either to the physician's office or to the emergency department, also provide opportunities for education on injury prevention.

Injury prevention handouts and fact sheets on many topics are available from many good sources, including those listed in Table 4. Included at the end of this article is an appendix on the prevention of fall injuries in children. Photocopying and widespread distribution of this page is permitted.

In conclusion, falling is the most common cause of unintentional injury in children. Many pediatric fall injuries are preventable by use of simple safety measures, use of protective equipment, or avoidance of specific devices. It is hoped that physicians will recognize the importance of counseling families about these important injury prevention strategies.

ACKNOWLEDGMENTS

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REFERENCES

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Table 3. Injuries During Selected Competitive Sports³

	2002 Estimate
Basketball	381,933
Football	314,155
Soccer	173,519
Ice Hockey	38,238
Gymnastics	27,108

Source: (2002 Estimated US Emergency Department Visits; data includes non-fall injuries)

Table 4. Internet Resources for Injury Prevention Handouts and Information

- American Academy of Pediatrics: The Injury Prevention Program (TIPP)
www.aap.org/family/tippintr.htm
- Wisconsin Chapter, American Academy of Pediatrics: Injury Prevention Handout Series
www.wisaap.org/safetyhandouts.htm
- The National Safe Kids Campaign
www.safekids.org
- US Consumer Products Safety Commission
www.cpsc.gov
- National Center for Injury Prevention and Control
www.cdc.gov/ncipc

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Appendix.

Kids Can't Fly! Preventing Injuries from Falling

Falls are the leading cause of injury for children of all ages, and they lead to over 2 million emergency room visits in the United States every year. Although falling down is a natural part of childhood activities such as learning to walk, skating, learning to ride a bike, and playing sports, many fall injuries can be prevented. Here are some tips for keeping your child safe from a fall injury:

Preventing falls while walking or running

- Keep floors clear of toys and other clutter
- Secure area rugs with double-sided tape or a rubber pad
- Clean up liquid spills immediately
- Consider protective padding for coffee tables and countertops

Preventing falls down stairs

- Keep stairs clear of clutter
- Homes with young children should have hardware-mounted safety gates at the top and bottom of every stairway
- Do not use infant walkers

Preventing falls from beds

- Do not allow horseplay on beds
- Do not allow children under age 6 to sleep in the top bunk of a bunk bed

Preventing falls from shopping carts

- Use seatbelts to restrain your child in the cart seat
- Don't allow your child to ride in the cart basket
- Don't allow your child to ride or climb on the sides or front of the cart

Preventing playground injuries

- Closely supervise children on playground equipment
- Make sure your playground is installed with an appropriate protective surface, such as sand or wood chips

Preventing falls from windows and balconies

- Use window guards to prevent falls out of windows
- Do not put cribs or other furniture in front of windows
- Do not let children play on balconies, roofs, or fire escapes

Preventing fall injuries from recreational activities

- Wear a helmet approved by the Consumer Product Safety Commission for all biking, skating, scooter riding, and skateboard riding activities
- Do not use scooter, skateboards, or roller skates in the street
- Never "surf" on a bike, skateboard, or skates behind a vehicle or car
- Wear other protective equipment (knee and elbow pads, wrist guards) for skating and skateboarding
- Do not use home trampolines
- Wear an approved equestrian helmet for all horseback riding activities

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