

## **BICYCLE INJURY**

Bicycles are associated with more childhood injuries than any other consumer product except the automobile. More than 70 percent of children ages 5 to 14 (27.7 million) ride bicycles. This age group rides 50 percent more than the average bicyclist and accounts for approximately 21 percent of all bicycle-related deaths and nearly half of all bicycle-related injuries.

Head injury is the leading cause of death in bicycle crashes and is the most important determinant of bicycle-related death and permanent disability. Head injuries account for more than 60 percent of bicycle-related deaths, more than two-thirds of bicycle-related hospital admissions and about one-third of hospital emergency room visits for bicycling injuries. The single most effective safety device available to reduce head injury and death from bicycle crashes is a helmet. Helmet use reduces the risk of bicycle-related death and injury and the severity of head injury when a crash occurs. Unfortunately, national estimates report that bicycle helmet use among child bicyclists ranges only from 15 to 25 percent.

### ***BICYCLE-RELATED DEATHS AND INJURIES***

- In 2001, 134 children ages 14 and under died in bicycle-related crashes.
- In 2002, nearly 288,900 children ages 14 and under were treated in hospital emergency rooms for bicycle-related injuries. Nearly half (47 percent) of children ages 14 and under hospitalized for bicycle-related injuries are diagnosed with a traumatic brain injury.
- In 2002, children ages 14 and under accounted for 36 percent of bicyclists injured in motor vehicle crashes. It is estimated that collisions with motor vehicles account for nearly 90 percent of all bicycle-related deaths and 10 percent of all nonfatal bicycle-related injuries.
- More than 40 percent of all bicycle-related deaths due to head injuries and approximately three-fourths of all bicycle-related head injuries occur among children ages 14 and under.
- Children can be seriously hurt from colliding with handlebars during a fall, even in low-speed bike crashes. One national study of seriously injured bicyclists found that handlebar impacts accounted for 22 percent of injuries among non-head-injured children. Improper bicycle sizing may predispose a child to falling and expose more of his trunk to the handlebar.

### ***WHEN AND WHERE BICYCLE-RELATED DEATHS AND INJURIES OCCUR***

- Children are more likely to die from motor vehicle-related bicycle crashes at non-intersection locations (59 percent), during the months of April through October (80 percent) and between 2 p.m. and 8 p.m. (65 percent).
- Nearly 60 percent of all childhood bicycle-related deaths occur on secondary roads. The typical bicycle crash with a motor vehicle occurs within one mile of the bicyclist's home.
- Children ages 4 and under are more likely to be injured in non-street locations around the home (e.g., driveway, garage, yard) than are children ages 5 to 14.
- Children ages 14 and under are nearly four times more likely to be injured riding in non-daylight hours (e.g., at dawn, dusk or night) than during the daytime.
- Among children ages 14 and under, more than 80 percent of bicycle-related fatalities are associated with the bicyclist's behavior, including riding into a street without stopping, turning left or swerving into traffic that is coming from behind, running a stop sign and riding against the flow of traffic.

### ***WHO IS AT RISK***

- Riding without a bicycle helmet significantly increases the risk of sustaining a head injury in the event of a crash. Non-helmeted riders are 14 times more likely to be involved in a fatal crash than helmeted riders.
- Children ages 10 to 14 are at greater risk for traumatic brain injury from a bicycle-related crash compared with younger children, most likely because helmet use declines as children age. Helmet use by children of all ages is lowest among children ages 11 to 14 (11 percent).

- Children ages 14 and under are five times more likely to be injured in a bicycle-related crash than older riders.
- Males account for 83 percent of bicycle-related deaths and 71 percent of nonfatal injuries among children ages 14 and under. Children ages 10 to 14, especially males, have the highest death rate of all ages from bicycle-related head injury.
- More children ages 5 to 14 are seen in hospital emergency rooms for injuries related to biking than any other sport.

### ***BICYCLE HELMET EFFECTIVENESS***

- Bicycle helmets have been shown to reduce the risk of head injury by as much as 85 percent and the risk of brain injury by as much as 88 percent. Bicycle helmets have also been shown to offer substantial protection to the forehead and midface.
- Correct fit and proper positioning are essential to the effectiveness of bike helmets at reducing injury. One study found that children whose helmets fit poorly are at twice the risk of head injury in a crash compared with children whose helmet fit is excellent. In addition, children who wear their helmets tipped back on their heads have a 52 percent greater risk of head injury than those who wear their helmets centered on their heads.
- It is estimated that 75 percent of fatal head injuries among child bicyclists could be prevented with a bicycle helmet.
- Universal use of bicycle helmets by children ages 4 to 15 could prevent between 135 and 155 deaths, between 39,000 and 45,000 head injuries, and between 18,000 and 55,000 scalp and face injuries annually.
- Child helmet ownership and use increases with parent income and education levels, yet decreases with the child's age. Children are more likely to wear a bicycle helmet if riding with others (peers or adults) who are also wearing one. In a national survey of children ages 8 to 12, 53 percent reported that a parental rule for helmet use would persuade them to wear a helmet, and 49 percent would wear a helmet if a state or community law required it.

### ***BICYCLE HELMET LAWS AND REGULATIONS***

- Nineteen states, the District of Columbia and numerous localities have enacted some form of bicycle helmet legislation. Thirteen of these twenty laws cover children ages 15 and under. At least six states now require children to wear a helmet while participating in other wheeled sports (e.g., scooters, inline skates, skateboards).
- Various studies have shown bicycle helmet legislation to be effective at increasing bicycle helmet use and reducing bicycle-related death and injury among children covered under the law. One example shows that in the five years following the passage of a state mandatory bicycle helmet law for children ages 13 and under, bicycle-related fatalities decreased by 60 percent. Police enforcement increases the effectiveness of these laws.
- One recent study reported that the rate of bicycle helmet use by children ages 14 and under was 58 percent greater in a county with a fully comprehensive bike helmet law than in a similar county with a less comprehensive law.

### ***HEALTH CARE COSTS AND SAVINGS***

- The total annual cost of traffic-related bicyclist death and injury among children ages 14 and under is more than \$2.2 billion.
- Every dollar spent on a bike helmet saves society \$30 in direct medical costs and other costs to society.
- If 85 percent of all child cyclists wore helmets in one year, the lifetime medical cost savings could total between \$109 million and \$142 million.
- A review of hospital discharge data in Washington state found that treatment for nonfatal bicycle injuries among children ages 14 and under costs more than \$113 million each year, an average of \$218,000 per injured child.

### ***PREVENTION TIPS***

- Every time you ride, wear a bicycle helmet that meets or exceeds the safety standards developed by the U.S. Consumer Product Safety Commission. A helmet should sit on top of your head in a level position, and it should not rock forward and backward or side to side. The helmet straps must always be buckled but not too tightly. Ensure proper bike fit by bringing the child along when shopping for a bike. Buy a bicycle that is the right size for the child, not one he will grow into. When sitting on the seat, the child's feet should touch the ground.
- Learn the rules of the road and obey all traffic laws. Ride on the right side of the road, with traffic, not against; use appropriate hand signals; respect traffic signals; stop at all stop signs and stop lights; and stop and look both ways before entering a street. Cycling should be restricted to sidewalks and paths until a child is age 10 and able to show how well he or she rides and observes the basic rules of the road. Adult supervision is essential until the traffic skills and judgment thresholds are reached by each child.

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