

## What You Should Know About:

### ► *Bicycle Injury*

#### *National Statistics*

Soon after a blacksmith by the name of Kirkpatrick MacMillan invented the bicycle, it became apparent that a bicyclist needed something to protect his or her head during a crash. Head injury is the primary cause of death and serious disability among victims of bicycle crashes.<sup>1,2</sup> Additionally, one-half to two-thirds of persons hospitalized following a bicycle crash have injuries to the head, accounting for 12,000 hospitalizations per year;<sup>1,3,4</sup> approximately 181,000 persons are treated in emergency departments for bicycle-related head injuries each year,<sup>3</sup> or, one emergency department-treated head injury occurs every 3 minutes. Approximately 85% of bicycle-related deaths are caused by head injury,<sup>1</sup> accounting for 600 bicycle-related head injury deaths each year.<sup>3</sup> This translates to one head injury death every 15 hours.



Bicycle-related deaths rise rapidly at 5 years of age and are highest among children 12 years of age.<sup>5</sup> Almost one-fourth (22%) of bicyclists killed in traffic crashes in 2002 were between 5 and 15 years of age.<sup>6</sup> Deaths of older bicyclists are an increasing problem. Seventy-six percent of bicycle deaths in 2002 were to riders 16 years and older. This compares with 32% in 1975.<sup>7</sup> Sixty-eight percent of bicyclists were killed in urban areas as compared to 32% in rural areas in 2002.<sup>7</sup> Eighty-five percent of bicyclists killed in 2002 were not wearing helmets.<sup>7</sup>

#### *Oklahoma Statistics*

In Oklahoma, bicycle-related brain injuries occur most commonly among children 5-12 years of age, accounting for 56% of injuries from 1992-2002. During that time, bicycle-related injuries were the third leading cause of brain injuries among children 5-9 years of age and the leading cause among children 10-12 years. Among the 5-12 age group, males (rate 13.3 per 100,000 population) were more than twice as likely than females (rate 6.1 per 100,000



population) to suffer a bicycle-related brain injury. Whites had the highest rates followed by African Americans and Native Americans (rates 9.6, 9.4, and 7.0 per 100,000 population, respectively). Thirty-three percent of injuries were known to be the result of the bicyclist being hit by a motor vehicle or the bicyclist hitting a parked vehicle. Seventy-nine percent of injuries occurred from March through September. Sixty-three percent of the injuries were known to have occurred from 3 p.m. to 8 p.m.

Reported bicycle helmet use among children continues to increase in Oklahoma. In 2001, helmet use among children was reported to be 28% compared to 6% in 1992.

## ► What Works

### ***Bicycle Helmet Campaigns***



Bicycle helmets have been found to be 85% to 88% effective in reducing or preventing brain injuries.<sup>8</sup> If every person wore a helmet while riding, one life would be saved every day, and one brain injury would be prevented every 4 minutes.<sup>3</sup> Organized, community-wide bicycle injury prevention programs focusing on increasing bicycle helmet use have shown promise. In 1987, a community-wide bicycle helmet program was implemented in Seattle. Helmet use among children was 5% at the time and increased to 62% in 1993.<sup>9</sup>

In Oklahoma, community-based bicycle helmet programs have been implemented since 1993. Reported bicycle helmet use between 1992 and 2000 more than quadrupled among children statewide. There was a 32% decrease in bicycle-related traumatic brain injuries among children 5-12 years of age from 1992-2000. While all of the factors that contributed to this decline are not known, increasing education and helmet use in program communities across the state likely contributed to the decline in injuries.

### ***Bicycle Safety Education***

Interventions based on increasing helmet use through education have been successful when done properly.<sup>10</sup> Often, children are taught how to ride a bicycle, but not taught basic traffic safety rules.

The OSDH Injury Prevention Service has developed *Breaking Away* and the *Oklahoma PTA Guide to Bicycle Safety* to assist teachers and school personnel in teaching bicycle safety. Additionally, the Injury Prevention Service has developed the



*Oklahoma Elementary School Injury Prevention Education: The Subject-Integrated Safety Curriculum for Teachers* that contains lessons on bicycle safety for grades K-5. The Oklahoma SAFE KIDS Coalition has information available about how to conduct bicycle rodeos.

### ***Bicycle Paths and Lanes***

Because the majority of bicycle-related deaths occur on roadways, many communities have constructed bicycle paths and lanes in an attempt to separate motor vehicle and bicycle traffic and to provide bicyclists with a road surface free from obstruction and potholes. Establishing clearly designated bicycle facilities may provide safer travel for cyclists. Studies reveal that the presence of a striped bike lane or paved shoulder dramatically increases the feeling of comfort and safety of riders, as well as increasing the number of riders. The Department of Transportation has funding available to communities to assist in constructing bicycle and pedestrian lanes/paths.

### ***Bicycle Safety Counseling Through Health Care Providers***

Physicians and other health care providers are often viewed as the most credible source of health information. Pediatricians and public health nurses are likely to have several opportunities to provide bicycle safety counseling. During counseling, parents should be informed about the need for bicycle helmets when riding and the risks associated with children riding bicycles which are inappropriately equipped or too large. The child should be able to place the balls of both feet on the ground when sitting on the seat with the hands on the handlebars. Additionally, young children's bicycles should be equipped with coaster brakes because young children do not have the strength and coordination to use hand brakes.

### ***Bikeability Checklist***

Sponsored by NHTSA, the Bikeability Checklist is a tool utilizing seven simple questions to help in rating how friendly communities are for bicycling, identify problem areas, and find short- and long-term solutions to improve bikeability scores. The checklist is available for download at <http://www.bicyclinginfo.org/cps/checklist.htm>.

## **► What You Can Do**

### ***Make Bicycle Helmets Available Free or at Reduced Cost***

Helmets can be distributed at county health departments, Indian Health Service clinics, schools, community events, etc. Potential funding sources to purchase helmets may include grant funds (Oklahoma Highway Safety

Office), injury prevention programs (Oklahoma SAFE KIDS Coalition), local civic groups (Lions, Kiwanis, etc.), local professional organizations (American Academy of Pediatrics, business leaders' associations), and local businesses or foundations. The helmets can be given away or sold at substantially reduced cost; monies collected can be used to purchase more helmets. Communities can also encourage local retailers to distribute coupons offering a discount on helmets.



### ***Implement Bicycle Safety Education Programs in Schools***

Work with schools and Parent Teacher Associations to implement an injury prevention curriculum that includes lessons on bicycle safety, as well as information about bicycle helmets, bicycle selection, and traffic safety rules.

### ***Encourage Bicycle Safety Education by Health Care Providers***

Local health departments, Indian Health Service clinics, physicians, and other health care providers should utilize opportunities during existing clinics/visits (e.g., WIC, well-child, immunization, guidance, etc.) to educate clients about the risk of bicycle-related brain injuries and bicycle safety. Clients should be provided information about where helmets are available in the community.

### ***Promote Bicycle Paths and Lanes***

Communities should work with city and residential planners in developing plans for constructing and maintaining bicycle paths and lanes.

### ***Promote Local Bicycle Helmet Legislation***

Local school boards should consider requiring helmet use for all children riding bicycles to school. Communities should consider enacting local ordinances requiring bicycle helmet use.

### ***Increase Awareness of Bicycle Traffic Rules***

Communities should work with local law enforcement to educate residents about bicycle traffic rules.

## ***Sponsor Local Events & Campaigns***

Sponsor events/campaigns such as "Bike With Your Child to School Day." Use the opportunity to make note of hazards (e.g., sidewalks cracked, unsafe neighborhoods, etc.) and present to the city leaders with recommendations for improvements.

## **► Where You Can Go**

The following organizations can provide information about reducing bicycle-related crashes as well as links to other organizations and web sites.

### ***State***

- State Injury Prevention Service  
Oklahoma State Department of Health  
405/271-3430  
[www.health.state.ok.us/PROGRAM/injury](http://www.health.state.ok.us/PROGRAM/injury)
- Oklahoma SAFE KIDS Coalition  
405/271-5695  
[www.oksafekids.org](http://www.oksafekids.org)
- Oklahoma Highway Safety Office  
405/523-1570  
[www.dps.state.ok.us/ohso](http://www.dps.state.ok.us/ohso)
- Indian Health Service, Oklahoma City Area  
405/951-3800  
[www.ihs.gov/FacilitiesServices/AreaOffices/oklahoma/index.asp](http://www.ihs.gov/FacilitiesServices/AreaOffices/oklahoma/index.asp)
- Oklahoma Bicycle Coalition  
[www.oklahomabicyclecoalition.com](http://www.oklahomabicyclecoalition.com)

### ***National***

- National SAFE KIDS Campaign  
[www.safekids.org](http://www.safekids.org)
- National Highway Traffic Safety Administration  
[www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)
- National Center for Injury Prevention and Control  
[www.cdc.gov/ncipc](http://www.cdc.gov/ncipc)

- Safe USA  
[www.safeusa.org](http://www.safeusa.org)
- Pedestrian and Bicycle Information Center  
[www.bicyclinginfo.org](http://www.bicyclinginfo.org)
- National Center for Bicycling and Walking  
[www.bikewalk.org](http://www.bikewalk.org)
- Safe Ride News  
[www.saferidenews.com](http://www.saferidenews.com)
- Children's Safety Network  
[www.childrenssafetynetwork.org](http://www.childrenssafetynetwork.org)
- Insurance Institute for Highway Safety  
[www.iihs.org](http://www.iihs.org)
- Indian Health Service  
[www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm](http://www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm)

### ***Local***

Police Department  
County Health Department  
Bike Dealers  
Civic Organizations

## References

1. Fife D, Davis J, Tate L, Wells JK, Mohan D, Williams A. Fatal injuries to bicyclists: the experience of Dade County, Florida. *J Trauma*. 1983;23(8):745-755.
2. Thompson RS, Thompson DC, Rivara FP, Salazar AA. Cost-effectiveness analysis of bicycle helmet subsidies in a defined population. *Pediatrics*. 1993;91(5):902-907.
3. Sacks JJ, Holmgren P, Smith SM, Sosin DM. Bicycle-associated head injuries and deaths in the United States from 1984 through 1988. How many are preventable? *JAMA*. 1991;266(21):3016-3018.
4. Guichon DM, Myles ST. Bicycle injuries: one-year sample in Calgary. *J Trauma*. 1975;15(6):504-506.
5. Baker S, O'Neill B, Ginsberg M, Li G. *The Injury Fact Book*. 2nd ed. New York: Oxford University Press; 1992.
6. US Department of Transportation, National Highway Traffic Safety Administration. *Traffic Safety Facts 2002: Pedalcyclists*. 2002. Available from: <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2002/2002pcyfacts.pdf>. Accessed October 6, 2004.
7. Insurance Institute for Highway Safety. *Fatality Facts: Bicycles, 2002*. June 2004. Available from: [http://www.iihs.org/safety\\_facts/fatality\\_facts/bikes.htm](http://www.iihs.org/safety_facts/fatality_facts/bikes.htm). Accessed October 4, 2004.
8. Thompson RS, Rivara FP, Thompson DC. A case-control study of the effectiveness of bicycle safety helmets. *N Engl J Med*. 1989;320(21):1361-1367.
9. Mock CN, Maier RV, Boyle E, Pilcher S, Rivara FP. Injury prevention strategies to promote helmet use decrease severe head injuries at a level I trauma center. *J Trauma*. 1995;39(1):29-33.
10. Harborview Injury Prevention and Research Center. *Best Practices: Bicycle Injury Interventions*. July 2001. Available from: <http://depts.washington.edu/hiprc/practices/topic/bicycles/helmeted uc.html>. Accessed November 3, 2004.