

## CHAPTER NINE: OTHER UNINTENTIONAL INJURY

### Highlights

- Each year, an average of 118 individuals are hospitalized for injuries due to dog bites. Hospitalization rates are highest for children ages 1-9.
- Each year, an average of three individuals die and eight are hospitalized for lightning-related injuries. Most lightning-related injuries occur during the summer months.
- Each year, 14 individuals die and 91 are hospitalized for injuries due to hypothermia (excessive cold). Common risk factors include advanced age, substance abuse, altered mental status, and increased contact with substances that promote heat loss, such as water.
- Each year, 86 individuals die and 32 are hospitalized for airway obstruction injuries. Death rates are highest for the very young (infants less than a year old) and the very old (adults ages 85 and older).

### “Other unintentional” defined

After reviewing injuries involving motor vehicles, motorcycles, bicycles, pedestrians, other transportation, falls, unintentional poisoning, burns, and drowning, one might ask what other unintentional injuries there could possibly be. In fact, there are two other major categories of unintentional injury that result in significant numbers of hospitalizations and deaths in Colorado.

The first category, “natural/environmental” injuries, include those resulting from excessive heat or cold, lightning and other environmental conditions, and injuries inflicted by animals or insects such as bites from dogs, cats, snakes, spiders, bees, or wasps.<sup>1</sup> The second category, “other unintentional” injuries, include those resulting from airway obstruction, foreign objects entering the body, falling objects, striking against or by objects or people (including in sports), being caught in or between objects, machinery (including agricultural), cutting instruments (including lawn mowers, knives and other hand tools), unintentional discharge of a firearm, electric current, overexertion, and other or unspecified mechanisms. This chapter provides brief information on several of these mechanisms of injury.

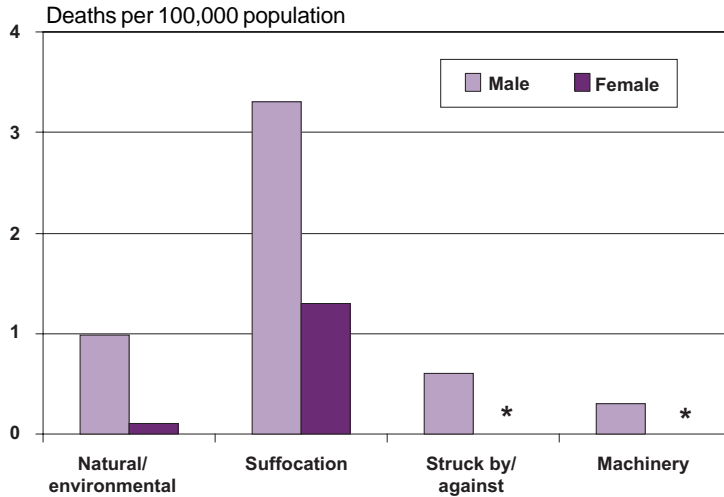


1. Injuries resulting from animals being ridden are discussed in Chapter Four: Other Transportation.

## Deaths

On average, each year 28 Coloradans die from natural/environmental factors, 86 from airway obstruction and 168 from other unintentional or un-

**Figure 87: Age-adjusted death rates due to other unintentional injuries by type of injury and sex Colorado residents, 2001-2003**



\* Fewer than three deaths each year.

specified injury mechanisms (Table D3).<sup>2</sup> Airway obstruction is a major cause of injury death for children ages 0-4 and for adults ages 75 and older (Table D18). An average of 8 deaths are caused each year by unintentional discharge of a firearm (Tables D22). Forty percent of these unintentional firearm-related deaths involve individuals ages 15-24. An average of 15 Coloradans die each year from being unintentionally struck by or against an object and seven die from injuries due to machinery (Table D22).

*“A 6-year-old...boy was target-shooting with his family when his finger slipped and he accidentally shot and killed his mother...”*

*The Gazette, 3/30/01*

<sup>2</sup> Death tables are found in Appendix A. Hospitalization tables are found in Appendix B.

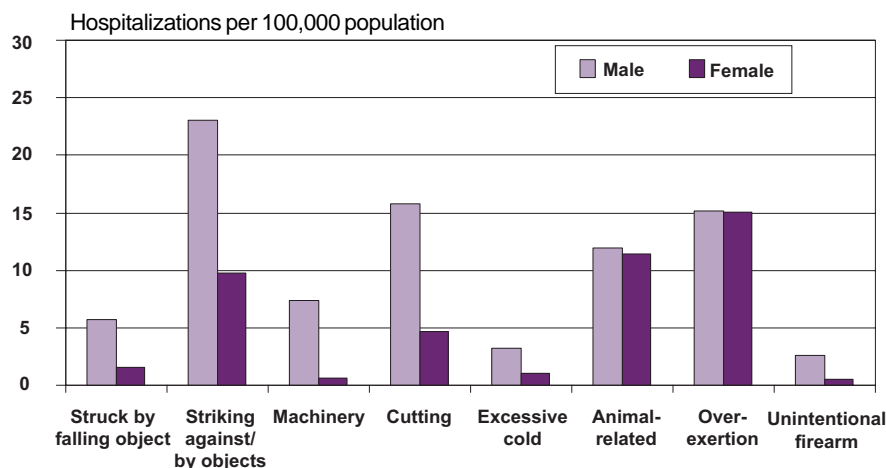
## Hospitalizations

On average, 720 Coloradans are hospitalized each year for injuries due to natural/environmental causes (Table H16). Of these hospitalizations, 118 are due to dog bites, 108 are due to cat or rodent (not rat) bites, 95 are due to bites from snakes, spiders or insects, and 91 are due to excessive cold (Table H16).

In addition, each year an average of 889 individuals are hospitalized for injuries resulting from being struck by or against a person or object (including in sports), 653 for overexertion, 470 for injuries resulting from the use of cutting instruments, 187 for injuries from machinery, 82 for injuries from being caught in or between objects and 73 for unintentional injury from use of a firearm (Table H16).

The distribution of some of these types of injury hospitalizations varies by age (Table H17). Hospitalizations for injuries due to machinery are most common in those age groups most likely to work around hazardous machines (ages 20-64). Hospitalizations for injuries due to cutting instruments are most likely to involve people ages 15-54 and ages 85 and older. Hospitalizations for unintentional injury from use of a firearm are most common among teens and young adults ages 15-24.

**Figure 88: Age-adjusted hospitalization rates due to other unintentional injuries by type of injury and sex Colorado residents, 2001-2003**



## Dog bites

On average, 118 Coloradans are hospitalized each year for injuries due to dog bites. The hospitalization rate for dog bite injuries is slightly higher for males (2.8 per 100,000) than for females (2.5 per 100,000) (Table H16).

Each year in Colorado, approximately 40 children ages 0-14 are hospitalized for injuries due to dog bites (Table H17). These hospitalizations account for 2 percent of all unintentional injury hospitalizations in this age group (Table H17). The hospitalization rate for injuries due to dog bites is highest among children ages 1-4 (7.1 per 100,000) with higher rates also seen among children ages 5-9 (4.6 per 100,000).

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*“A new family pet attacked and fatally injured a 7-year-old girl in Fruita... The dog had bit her on both sides of the neck...and she bled to death.”*

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*The Denver Post, 5/9/05*

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More people are hospitalized for injuries due to dog bites in the spring and summer. Almost half (42 percent) of the hospitalizations for dog bite injuries occur in the months of April to July.

Nationally, an estimated 4.7 million people sustain injuries due to dog bites each year. Approximately 800,000 seek medical care for the bite. Of those injured, 360,000 require treatment in an emergency department and 10 to 12 result in death. The rate of dog bite injuries is highest for young children ages 5-9, and decreases with age. Almost two-thirds of the injuries to children ages 0-4 are to the head and neck region.<sup>3</sup>

## Lightning

On average, there are three deaths and eight hospitalizations due to lightning-related injuries in Colorado each year (Tables D22, H16). Most of the lightning-related hospitalizations (75 percent) involve males. The hospitalization rate for lightning-related injuries is highest for Coloradans ages 25-34 (Table H17).

Most lightning injuries take place during the summer months. The majority of hospitalizations for lightning-related injuries (75 percent) occur in June through August. During this time of year, weather patterns create frequent afternoon thunderstorms, and people are more likely to be engaged in outdoor activities.

3. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2004). *Spotlight on Dog-bite Prevention*. Retrieved April 1, 2005, from <http://www.cdc.gov/ncipc/duip/biteprevention.htm>.

Nationally from 1980 to 1995, 1,318 deaths were attributed to lightning. Of these, 85 percent involved males, and 68 percent involved individuals ages 15-44. Studies have identified patterns associated with lightning injuries. For example, approximately 30 percent of people struck by lightning die, and 74 percent of lightning strike survivors have permanent disabilities. Most deaths due to lightning (92 percent) occur during May to September, and 73 percent occur during the afternoon and early evening. Of the people who died from lightning, 52 percent were engaged in outdoor recreational activities and 25 percent were engaged in work activities.<sup>4</sup>

## Hypothermia

From 2001 to 2003, an average of 14 individuals in Colorado died and 91 were hospitalized for hypothermia. Hypothermia results from prolonged exposure to excessive cold such that the body's core temperature drops below 95°F. The majority of hypothermia deaths (84 percent) and hospitalizations (76 percent) in Colorado involve males. Most deaths (51 percent) and hospitalizations (47 percent) involve individuals ages 35-54, although the highest hospitalization rates involve individuals ages 75 and older.

Nationally, an average of 689 hypothermia deaths occur each year, with the majority involving individuals ages 65 and older. Studies indicate that common risk factors include advanced age, substance abuse, altered mental status, and increased contact with substances that promote heat loss, such as water. Older individuals are at particular risk because their lower metabolic rate may prevent them from maintaining normal body temperatures when indoor or outdoor temperatures fall below 64.4°F. Older people also might not perceive cold as well as younger people and might be slow to compensate for the cold.<sup>5</sup>

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*“Lightning struck a crowded beach at Boyd Lake near Loveland, injuring nine people. The force of the bolt knocked beachgoers to the ground, sent swimmers running for cover and set off car alarms at a nearby parking lot.”*

*The Denver Post, 7/4/05*

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4. Centers for Disease Control and Prevention. (1998). *Lightning Associated Deaths - United States, 1980 - 1995. (MMWR 47)*. Retrieved June 27, 2005, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/00052833.htm>.

5. Centers for Disease Control and Prevention. (2005). *Hypothermia-Related Deaths -- United States, 2003-2004. (MMWR 54(07): 173-175)*. Retrieved June 27, 2005, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5407a4.htm>.

## Airway obstruction

Airway obstruction injury includes suffocation (blockage of the external airway), aspiration or choking (blockage of the internal airway) and strangulation (when an external object around the neck constricts the internal airway).

On average, each year 86 Coloradans die and 32 are hospitalized for airway obstruction injuries. Death rates are highest for the very young (10.3 per 100,000 for infants less than a year old) and the very old (41.7 per 100,000 for adults ages 85 and older).

Children ages 4 and younger are at increased risk for airway obstruction due to their small upper airways, natural curiosity, and for infants, their limited ability to lift their head. Airway obstruction is the leading cause of injury death among children less than a year old in Colorado and is the fifth leading cause of injury death for children ages 1-4 and 10-14. The mechanism of injury varies with the developmental stage of the child. For infants less than a year old, 93 percent of the airway obstruction deaths occur from suffocation or strangulation in a bed or crib. For children ages 1-4, 43 percent of the deaths result from choking, 14 percent from strangulation and 43 percent from other or unspecified causes. For children ages 5-14, 43 percent of the deaths result from strangulation and 43 percent from choking (Table D18).

### Colorado Child Fatality Review Committee

From review of airway obstruction deaths in children, the Colorado Child Fatality Review Committee notes that positional asphyxia during sleep is the primary cause of suffocation deaths in infants. These types of deaths can be prevented by using safe sleep practices, such as those promoted in the national “Reduce the Risk of SIDS (Sudden Infant Death Syndrome)” campaign (specifically, placing babies on a firm mattress in a safety-approved crib and removing all fluffy and loose bedding, including pillows and stuffed toys, from the sleep area). In the past decade, the use of safe sleep practices nationally has not only reduced SIDS-related deaths, but also has led to a 30 percent reduction in infant deaths due to accidental suffocation.

Airway obstruction is a significant problem for older adults as well. Airway obstruction is the fourth leading cause of injury death for Colorado adults ages 65-84 and the second leading cause of injury death for adults ages 85 and older. For older adults, choking on food or other objects accounts for the majority of airway obstruction deaths (Table D18).

For more information on safe sleep practices, see [www.coloradosids.org](http://www.coloradosids.org) and the American Academy of Pediatrics at [aappolicy.aappublications.org/cgi/reprint/pediatrics;105/3/650.pdf](http://aappolicy.aappublications.org/cgi/reprint/pediatrics;105/3/650.pdf).

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## Injuries due to machinery

The injuries described in this section result from use of equipment such as agricultural machines (tractors, mowers, combines, reapers, and other farm machinery), lifting machines (cranes and forklifts), and woodworking/forming machines (saws, sanders and planes), as well as machines used in mining and earth drilling, metalworking, earth moving and excavation, manufacturing and various gas turbine, internal combustion, and transmission machinery. The use of machinery as a transport vehicle is not included in this category.

Each year, approximately seven Coloradans die and 187 are hospitalized for injuries due to machinery (Tables D22, H16). Males account for 93 percent of the machine-related hospitalizations and 95 percent of the deaths (Tables D22, H16). The age-adjusted hospitalization rate for males (7.4 per 100,000) is twelve times the rate for females (0.6 per 100,000) (Table H16). The hospitalization rates for machine-related injuries are highest for individuals ages 20-24 (8.1 per 100,000) (Table H17).

## Injuries due to cutting instruments

Each year, an average of 470 individuals are hospitalized for unintentional injuries due to cutting instruments, such as powered lawn mowers, powered hand tools, other hand tools or implements, and knives, swords or daggers. Hospitalization rates are highest for individuals ages 20-24 (17.4 per 100,000) and 85 and older (15.6 per 100,000) (Table H17). The age-adjusted hospitalization rate for males (15.8 per 100,000) is more than three times higher than the rate for females (4.7 per 100,00). For hospitalizations due to injuries from powered hand tools, the age-adjusted rate is more than 29 times higher for males than females (Table H16).

## Injuries due to sports

Although there is a great interest in learning more about sports-related injuries, analysis of existing data is limited due to:

- Various definitions of “sports” and “recreation.” Often the activities categorized as sports or recreation also can be considered transportation, work-related or involves a fall.
- Inadequate identification. The *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)*<sup>6</sup> used to code hospital discharge records does not specifically identify most sports. In this coding system, activities such as basketball, soccer, baseball and football are classified under broader mechanisms of injury such as falls or striking against a person or object. It is estimated that only about one-third of sports injuries can be identified by the *ICD-9-CM* coding system.<sup>7,8</sup>

Despite these limitations, some information on recreational injuries in Colorado is available. From a study that involved manual review of death certificates, 211 recreation-related deaths were identified during the three-year period of 1996 to 1998. Of these deaths, 44 (21 percent) involved individuals who were not Colorado residents. Among the nine recreational categories examined (see Figure 89), the greatest number of deaths involved climbing/hiking (37 deaths), followed by snow skiing (36 deaths) and bicycling (30 deaths).<sup>9</sup>

The majority of these recreation-related deaths (82 percent) involved males, 42 percent involved individuals ages 20-39 and 93 percent involved whites. The activities resulting in recreation-related deaths differed by age group. Four of the 13 deaths among children ages 0-9 involved swimming in a pool. For youth ages 10-19, snow skiing resulted in the largest number of recreation-related deaths (23 percent), while climbing/hiking resulted in the most deaths for adults ages 20-29 (29 percent of recreation-related deaths). For individuals ages 60 and older, bicycling accounted for the greatest proportion of deaths due to recreation (25 percent).<sup>10</sup>

According to the Colorado Traumatic Brain Injury Surveillance data system, nearly 1,000 Colorado residents were hospitalized with a traumatic brain injury resulting from a sports or recreational activity in 2001 and 2002. In

6. World Health Organization. (1979). *International Statistical Classification of Disease and Related Health Problems, Ninth Revision*. Geneva, Switzerland: World Health Organization.

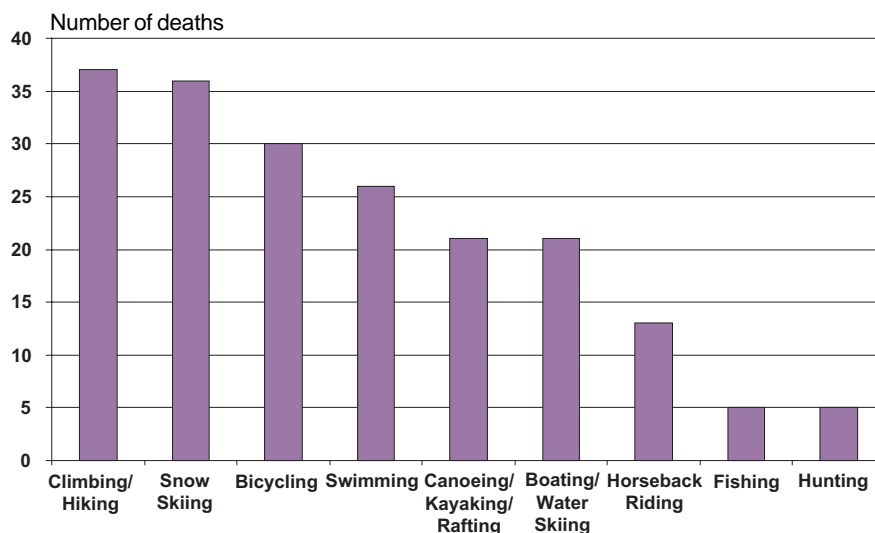
7. Molliconi, S. and Strauman-Raymond, K. (1995). *Childhood Injury in Hennepin County*. Minneapolis, MN: Hennepin County Community Health Department.

8. Christofell, J. D. and Gallagher, S. S. (1999). *Injury Prevention and Public Health*. Gaithersburg, MD: Aspen Publishers, Inc.

9. Colorado Department of Public Health and Environment, Health Statistics Section. (2000). *Recreational fatalities in Colorado, 1996-1998 (Brief No. 35)*.

10. Ibid.

**Figure 89: Recreational fatalities by type  
Colorado total occurrences, 1996-1998**



general, sports or recreation was the mechanism of injury for 14 percent of all hospitalized traumatic brain injuries. More than one-third of the sports/recreation hospitalizations (35 percent) resulted from injuries due to bicycling, while another 18 percent resulted from horseback riding, 13 percent from skiing/snowboarding, 5 percent from using skates, skateboards or non-motorized scooters, and 5 percent from football, baseball or softball. Males accounted for 71 percent of the sports/recreation hospitalizations and the majority of the hospitalizations involved young people (27 percent of those hospitalized were ages 5-14 and 29 percent were ages 15-24).

Appropriate use of helmets has been shown to be effective in preventing traumatic brain injuries in sports and recreation.<sup>11</sup> According to the Colorado Traumatic Brain Injury Surveillance data, only 14 percent of the horseback riders, 18 percent of the skiers/snowboarders and 28 percent of the bicyclists who sustained a traumatic brain injury in 2001 and 2002 were known to be wearing a helmet at the time of their injury.

11. Levy, A.S. (2000). *Helmets for Sports and Recreation: An Injury Prevention Battle Far from Over*. Retrieved July 7, 2005, from <http://www.thecni.org/reviews/11-1-p27-levy.htm>.

## Unintentional injuries can be prevented

### Dog bites

Health agencies and safety advocates can participate in a community approach to dog bite prevention that includes:



- Development of community partnerships with local animal control and enforcement agencies.
- Providing data and information to groups promoting dog control ordinances and other legislation.
- Education of public officials, health professionals, and the public.

### Lightning

Health agencies and safety advocates can participate in seasonal public awareness campaigns addressing the dangers of lightning and provide prevention tips, such as those recommended by the National Weather Service (see [www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov)).

### Hypothermia

During cold weather, high risk groups (infants, the elderly, and homeless populations) should be monitored frequently. Additional resources, such as temporary shelters, heating assistance and programs to check on the elderly, should be made available.

Education campaigns should encourage the use of emergency kits in automobiles and appropriate preparation for wilderness skiing, hiking and climbing.

### Airway obstruction

Health agencies and safety advocates can promote the prevention of airway obstruction injuries through public awareness campaigns highlighting the risk factors for suffocation, aspiration and strangulation, and providing prevention tips, such as those recommended by the National SAFE KIDS Campaign (see [www.preventinjury.org/PDFs/AIRWAY\\_OBSTRUCTION\\_INJURY.pdf](http://www.preventinjury.org/PDFs/AIRWAY_OBSTRUCTION_INJURY.pdf)).

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## Injuries due to machinery

Health agencies and safety advocates can participate with other organizations to promote safety in the workplace and the safe use of machines and tools in the home environment.

## Injuries due to sports

Each sport and recreational activity has specific safety requirements and recommendations. Health agencies and safety advocates can participate in the following prevention strategies:

- Participate in community coalitions to promote helmet use and safety behavior for bikes, scooters, skateboards, in-line skates, skiing/snowboarding and other sports activities.
- Encourage children and adults to wear all the recommended safety gear for each sport.
- Encourage parents and other adults to be involved in the safety aspects of the sports in which their children participate. Parents should make sure that sports programs include proper physical and psychological conditioning, use of appropriate safety equipment, a safe playing environment, adequate adult supervision, and safety rules that are enforced.
- Encourage safe participation in sports activities. Participants should warm up before and after any athletic activity and drink an adequate amount of liquid while engaged in athletic activities.

The American Academy of Pediatrics ([www.aap.org](http://www.aap.org)) has a number of policy statements and recommendations regarding children's participation in organized sports and many specific sports and recreation activities.

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*"A 12-year-old Texas snowboarder died from injuries he suffered while riding in Winter Park ... The boy lost control, fell and slid head-first into a tree, suffering massive head injuries... The boy was not wearing a helmet."*

*The Rocky Mountain News, 12/31/04*

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### For more information

- The Injury and Suicide Prevention Program at the Colorado Department of Public Health and Environment at [www.cdphe.state.co.us/pp/injuryprevention/](http://www.cdphe.state.co.us/pp/injuryprevention/)
- Centers for Disease Control and Prevention, National Center for Injury Prevention and Control at [www.cdc.gov/ncipc/](http://www.cdc.gov/ncipc/)
- National SAFE KIDS Campaign at [www.safekids.org](http://www.safekids.org)
- Brain Injury Association of America at [www.biausa.org](http://www.biausa.org)
- The National Program for Playground Safety at [www.uni.edu/playground](http://www.uni.edu/playground)
- Consumer Product Safety Commission at [www.cpsc.gov](http://www.cpsc.gov)
- The American Academy of Pediatrics at [www.aap.org](http://www.aap.org)
- The National Children's Center for Rural and Agricultural Health at [www.research.marshfieldclinic.org/children](http://www.research.marshfieldclinic.org/children)
- National Institute for Occupational Safety and Health at [www.cdc.gov/niosh](http://www.cdc.gov/niosh)
- American Veterinary Medical Association at [www.avma.org](http://www.avma.org)
- Colorado Lightning Resource Center at [www.crh.noaa.gov/pub/ltg.html](http://www.crh.noaa.gov/pub/ltg.html)
- National Oceanic and Atmospheric Center at [www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov)