

## Bicycle Safety Introduction

Bicycling is a common means of transportation as well as an increasingly popular source of recreation, exercise, and sport. With more than 100 million bicycle owners, the popularity of bicycling has reached an all-time high.

- Along with increased use of bicycles comes the risk of significant injuries. According to national statistics, more than 1.8 billion bicycle outings occur each year, resulting in nearly 580,000 visits to Emergency Departments. Injuries attributable to bicycling range from common abrasions, cuts, and bruises to broken bones, internal injuries, head trauma, and even death.
- Almost 800 bicyclists die annually, and 20,000 are admitted to hospitals. From a statistical standpoint, bicycle riding has a higher death rate per trip or per mile of travel than being a passenger in an automobile.
- The most common cause of bicycle crashes is due to falls or collisions with stationary objects. Collisions involving motor vehicles account for 90% of all bicycle-related deaths and 10% of nonfatal injuries. The majority of these bicycle deaths are caused by head injuries.

## Principles of Bicycle Safety

- Bicycling training: The best preparation for safe bicycle riding is proper training.
  - Common resources include an experienced rider, parent, or community program.
  - Often, however, initial training involves simple instruction from parents on balance and pedaling.
  - Proper supervision of younger riders is a prerequisite. In fact, it is recommended that younger children ride only in enclosed areas.
- Bicycle safety equipment: Early investment in safety equipment such as protective clothing and a [helmet](#) can prevent a significant number of injuries.
  - Helmets - Extremely important
  - Reflective clothing for nighttime or low-visibility conditions
  - Bicycle safety equipment (reflectors on frame and wheels)
  - Proper bicycle selection
  - Bicycle maintenance
- Bicycling safety guidelines: Consideration of these ideas can further reduce the risk of a bicycle accident.
  - Use a bicycle only in a way that is appropriate for the age of the rider.

- Be aware of the need for experience and skill before bicycling on public roads.
- Less experienced bicyclists should be educated about the rules of the road.
- Be aware of the understanding among bicyclists and motorists about sharing the road.
- Promote and ensure safe motorist and bicyclist practices (proper speed, yielding right-of-way, not driving while drinking).
- Teach increased awareness of surroundings. (Beware of opening car doors, sewer grating, debris on roads, uneven surfaces, poorly lit areas.)
- Obey traffic rules.
  - Cyclists must follow the same rules as motorists. Use correct hand signals before turning.
  - Because we are all sharing the same road, obeying the rules of the road will allow for an enjoyable and safe ride for both bicyclists and motorists.
- Ride in single file with traffic, not against it.
- Avoid major roads and sidewalks.
- Announce your presence ("On your left") on bike and walking trails as you come up behind and pass pedestrians and other riders.
- Enforcement and legislation can increase bicycle safety.
  - Mandating use of protective devices (helmets, reflectors)
  - Bicycle-friendly community and community planning, for example establishing bicycle lanes and bike trails or rails-to-trails

## Reasons for Bicycle Crashes

- Most bicycle accidents occur when a cyclist falls or crashes into a stationary object. Crashes are more likely to occur when adverse conditions occur related to:
  - Weather
  - Road conditions
  - Mechanical failure
  - Poor rider judgment

- Excessive speed
  - Lack of attention
  - Breach of traffic regulations
  - Coordination problems
- Inexperience
- Although the rules of the road and right of way are the same for both cyclists and motorists, other factors contribute to the disharmony that can occur between the 2 groups.
  - Many motor vehicle drivers are often simply not aware of the presence of a cyclist on the road.
  - In low-visibility conditions or at night bicyclists are difficult to see. The use of reflectors and a bicycle headlight gives you greater visibility to vehicle drivers.
- Problems with alcohol can contribute to accidents.
  - Inappropriate alcohol use is not limited to motorists.
  - Almost 25% of traffic crashes that resulted in deaths of bicycle riders involved alcohol intoxication by the motorist or the bicyclist.
  - In 17-30% of all bicycle-related fatalities, it is the bicyclist who was intoxicated, not the motorist.
- Nearly one-third of bicycle crashes occur when a bicyclist is riding against oncoming traffic.
- Many people assume bicycle riding on sidewalks is safer than on roads. However, the risk of injury increases significantly if you ride on sidewalks.
  - This may be due to the presence of pedestrians and stationary objects (parking meters, for example) lining sidewalks as well as a preference by inexperienced bicyclists to use sidewalks for bicycle travel.
  - Another common scenario involves children who generally are experienced riders. They tend to crash while riding a bicycle for the first time or while riding a bike they are unfamiliar with.

## Characteristics of Accident Victims

- Most bicycle injuries occur to boys aged 10-14 years.
- Although safety education often focuses on children, older bicyclists must remember that almost 70% of bicycle deaths involve adults.
  - Men account for almost 90% of all bicycle deaths, 7 times higher than rates for women.

- Officials attribute this to males riding more than females.
- In analyzing who is at fault for a collision, officials found the bicyclist responsible in half the cases and the motorist responsible in about one third. The remaining were attributed to both parties.
- Younger cyclists who are not familiar with rules of the road are far more likely to cause and be involved in a serious accident. Some advocate that children younger than 8 years should not be allowed on public roads.
- Statistics from the Insurance Institute for Highway Safety reveal that most bicycle deaths occur during the summer months, and almost half the deaths occur between 3-9 pm.
  - The risk of sustaining an injury in non daylight conditions is 4 times greater than during daytime.
  - Almost 40% of bicycle-motor vehicle crashes occurred during low-light conditions when motorists had trouble seeing cyclists.
  - Bicycle deaths are almost equal throughout the weekdays or weekends.
  - More bicyclists are killed in urban areas than rural areas.
  - More than half of bicycle deaths occur on major roads; one third of deaths occur at an intersection.
  - One third of bicyclist fatalities occur on roads with speed limits of 55 mph or higher.
  - Typically, bicycle-motorist crashes occur within 1 mile of the bicyclist's home.

## Overuse Injuries

Physical overuse can also causes bicycle injuries. These injuries can be prevented by proper selection, adjustment of the bicycle to the individual rider, maintenance, and common sense in how the bicycle is used.

- Appropriately-sized frames, handlebar and seat heights as well as understanding of gear systems help reduce injuries.
- Drinking enough fluids, stretching, and routine scheduled activity can help avoid potential injuries related to overuse.

## Legislation Promoting Safety

Perhaps the easiest step a rider can take to prevent bicycle related injury and death is to wear a helmet. Unfortunately, many riders disregard this, placing themselves at great risk.

- Mandatory helmet laws have been shown to increase helmet use, which reduces significantly the incidence and severity of head injuries.
  - Mandatory use of helmets has proven to reduce severe injuries by almost 85% in addition to cutting the number of bicycle-related fatalities.
  - Children wear a protective helmet almost twice as much as adults. This is probably due to parental insistence. Nevertheless, younger children have a higher proportion of head injuries than older children.
  - The majority of bicyclists (98%) report wearing a helmet for safety reasons—70% because of insistence of a parent or spouse and 44% because of laws.
  - Simply owning a helmet will not necessarily insure safety. It must be used! Children should be monitored to be certain that they not avoiding helmet use because of peer pressure.
  - It is important that your helmet fits properly and is worn correctly. A proper fit helps a bicyclist realize the full benefit of helmet use. A poorly fitting helmet will provide significantly less protection.
- Currently, only 17 states have laws requiring helmet use by young bicyclists.
  - Local communities have enacted ordinances mandating use of helmets while bicycling.
  - It is estimated that 13 million bicycles and 14-15 million helmets are sold annually in the US. There is added benefit for all helmet owners: Use your helmet during other activities with a potential for head injury such as scooters and water sports.
- Nevertheless, 98% of bicyclists killed in 1998 were reportedly not wearing a protective helmet.
- It is estimated that two-thirds of bicycle-related deaths could be prevented by the use of a protective helmet.

## Safety in Off-Road Conditions

- Bicycle riding has evolved from a mode of transportation to a widely enjoyed hobby and recreational sport. Off-road riding and racing has certainly increased in popularity over the past decade.
- The majority of off-road injuries involve cuts and scrapes to the arms and legs. However, off-road or all-terrain cyclists sustain more severe injuries—such as fractures and dislocations—than road cyclists.
- In 1998 bicycling accounted for the largest number of sport-related injuries in Emergency Departments among middle-aged people.
- Off-road cyclists are more likely to wear a protective helmet and therefore

less likely to have face and head injuries.