

# All Terrain Vehicle Injuries

*Stephanie Malchak, AEMT-P*



# What are two-wheeled vehicles?

- Miniature motorcycles intended for off-road use by children and adolescents have enjoyed wide popularity since the 1960s.
- However, manufacture of these vehicles is not regulated by federal motor vehicle safety standards.
- Neither the rider nor the vehicle is required to be licensed.
- Some of these cycles are small enough to be operated by children as young as 4 years, and many have been sold for use by school-aged children.

# Cont'd...

- *Minibikes*, the smallest and most primitive of the 2-wheelers, are motorized bicycle-style frames that weigh <45 kg and are powered by engines operating at <4 horsepower. The more sophisticated and higher-powered *minicycles* are constructed with suspension systems and transmissions that resemble miniature motorcycles.
- *Trailbikes* or *trailcycles* are larger than minicycles and have power and design characteristics that make them suitable for rough terrain. They are generally only approved for off-road use.

# Cont'd...

- *Mopeds* are bicycles with small, unenclosed assist motors and top speeds of about 30 mph. They are intended for street use but, in many states, neither the mopeds nor their drivers must be licensed. Two-wheeled vehicles generally have a short and relatively unstable wheelbase, small tires, slow acceleration, borderline brakes, and poor visibility in traffic (both of the cycle and by the cycle operator).
- *Motorcycles* are also 2-wheeled cycles, but require licenses in all states; these vehicles are not specifically discussed in this statement.

# Stats on two-wheeled...

- About 40 000 injuries related to 2-wheeled motorized off-road cycles were treated in emergency departments each year, 1994 through 1996.
- Of the injuries, 26% were sustained by children younger than 15 years.
- From 1990 through the first quarter of 1995, the US Consumer Product Safety Commission (CPSC) collected at least 50 reports of deaths related to minibike and trailcycle use.
- All but 1 of the victims were male, and 42% were 16 years of age or younger.

# Stats Cont'd...

- Injury typically results from loss of control of the cycle after striking rocks, bumps, or holes, or from illegal on-road use.
- Mopeds are more often involved in collisions with other vehicles, presumably because they are legally used on-road, and frequently in urban areas.
- Shoulder, knee, and leg injuries account for more than one third of emergency department visits for moped-related injuries.
- Head injuries account for about half of the deaths.
- Laryngotracheal trauma may result from driving across open fields into poorly visible wire fences.
- Thermal burns occur when engines are not enclosed, which is usual for mopeds.
- Deaths are more likely to be associated with racing or jumping.

# Three- and Four-Wheeled Vehicles

- All-terrain vehicles (ATVs) are motorized cycles, with 3 or 4 balloon-style tires, designed for off-road use on a variety of terrains.
- Although ATVs give the appearance of stability, the 3-wheeled design is especially unstable on hard surfaces.
- The ATV stability is further compromised by a high center of gravity, a poor or absent suspension system, and no rear-wheel differential.
- The danger is magnified because these vehicles can attain substantial speeds (30-50 mph).
- The industry agreed to cease production and sale of new 3-wheeled ATVs (but not to recall old ones), to implement a rider-safety training program nationally, and to develop a voluntary standard to make ATVs safer.

# Stats

- All-terrain vehicles, commonly known by the acronym ATV, have been on the market for over 30 years.
- Use of ATVs has rapidly increased in rural America and so has the number of ATV-related injuries and deaths
- U.S. Consumer Product Safety Commission reports up to 111,700 ATV-related injuries per year and 120 deaths
- 50% of the injuries and fatalities involve children under 16 years old
- The average hospital cost per injury is estimated at \$6,899.

# Stats Cont'd...

- Poor judgment and risk-taking behaviors are often factors related to accidents
- Helmets were worn by only 30% of patients
- Skin and orthopedic injuries are the most frequent injuries reported
- Head and facial injuries are second most common
- 61% of fractures are classified as open or comminuted

# Youths under 16 years of age.....

- Factors associated for injuries:
  - ◆ No helmet use
  - ◆ Immature judgment, risk taking and/or motor skills
  - ◆ Male gender
  - ◆ Having a passenger
  - ◆ Recreational Use
  - ◆ Driving an ATV larger than that recommended for their age
  - ◆ Alcohol is generally not a factor among youth injuries

# Cont'd...

- Developmental factors that put them at risk for injuries:
  - ◆ Do not possess the physical strength, coordination, and motor skills to operate an ATV
  - ◆ The cognitive capacity to look for and react to potential hazards
  - ◆ Good judgment to not act impulsively or take excessive risks

## ATV Injuries Rising

The number of emergency room visits from ATV-related injuries has more than doubled in the past four years.

Injuries	1997	2001	Increase
Total	54,700	111,700	<b>104%</b>
Under 16 yrs.	21,132	33,071	<b>57%</b>
Per 1,000 ATVs	13.7	20.0	<b>46%</b>

Source: U.S.  
Consumer Product  
Safety Commission

# Mechanism of Injury

- Loss of control of vehicle and fall from vehicle (most common mechanisms)
- Collision with stationary or moving objects
- Rollover
- Fall from vehicle

# Landscape features that influence ATV accidents and injuries...

- Fences
- Cliffs or steep drop-offs
- Rocks and ditches
- Frozen lakes, rivers, or streams
- Wooded areas

# Prehospital Treatment

## *All-Terrain Vehicle Injuries*

# New York State DOH

## *Basic Life Support Protocols*

# Which Protocols?

- Amputation
- Suspected Head or Spinal Injuries
- Bleeding (External)
- Eye Injuries
- Burns (Thermal)
- Adult Major Trauma
- Musculoskeletal Trauma
- Pediatric Major Trauma

# Susquehanna Regional EMS

*Advanced Life Support Protocols*

# Which Protocols?

- Routine Medical Care
- Amputation
- Burns
- Adult Major Trauma (including traumatic cardiac arrest)
- Pediatric Major Trauma (including traumatic cardiac arrest)