

## **All-Terrain Vehicles**

*This Position Statement was developed as an educational tool based on the opinion of the authors. It is not a product of a systematic review. Readers are encouraged to consider the information presented and reach their own conclusions.*

All-terrain vehicles (ATVs) are three- or four-wheeled motorized vehicles with large, soft tires and a relatively high center of gravity. Used primarily for off-road activities, ATVs have handlebars like a motorcycle and are designed for a single operator to straddle the body of the vehicle. Some can reach speeds of 50 mph and weigh up to 600 lbs.

Very few states require a license to operate an ATV, most of which are used for recreational purposes. There are no mandatory national safety standards for their construction, and only some states have issued regulations for their use. ATVs are often operated by children, some as young as age five.

ATVs have been involved in an alarming number of injuries and deaths, particularly among young people. Because of this, in 1998 the Consumer Public Safety Commission (CPSC) replaced its initial consent decree with ATV manufacturers with an updated ATV Action Plan agreement. The agreement included not marketing or selling adult-sized ATVs for use by children younger than 16, not marketing or selling three-wheeled ATVs, and providing information and safety education.<sup>1</sup>

***The American Academy of Orthopaedic Surgeons (AAOS), the Orthopaedic Trauma Association (OTA), and the Pediatric Orthopaedic Society of North America (POSNA) support the Consumer Product Safety Commission consent agreement placing restrictions on the sale of four-wheeled ATVs to children. In addition, we support efforts to pass state laws mandating licensing for operation on public roadways, and we strongly urge governmental agencies to educate the public about the dangers of these vehicles, including requiring ATV retailers to provide purchasers with educational safety materials.***

The three-wheeled ATV is inherently unstable. When the operator executes a sharp turn at even moderate rates of speed, the high center of gravity of the vehicle, short wheel base and short turning radius, can cause the vehicle to turn over. The rider may also be thrown from the vehicle or crushed beneath it as it rolls.

Four-wheeled ATVs have some of the same design features as the three-wheeled models, including a high center of gravity, short wheel-base, short turning radius and high-powered engine. They are difficult machines to operate, even if somewhat less likely to roll over than the

three-wheeled versions. Moreover, as off-road vehicles, they are generally used on rough or uneven ground. Uneven surfaces can cause them to turn over, largely due to the high center of gravity. When used on hills, they are capable of flipping over from front to back, as the rear wheels can lift the front wheels off the ground when excessive power is applied. Studies have shown that almost 60 percent of accidents involving four-wheeled ATVs result from tipping and overturning. Drivers can be thrown from these ATVs or can be crushed beneath them, just as with three-wheeled models.

Many other risk factors, such as the use of alcohol and the lack of safety equipment, can contribute to accidents on ATVs. However, the basic design of the three- and four-wheeled models makes them hazardous to anyone who rides them.

Although perceived as recreational toys, ATVs can be extremely unsafe. According to the US Consumer Product Safety Commission, more than 368,000 ATV-related injuries were treated in hospitals, doctors' offices and clinics in 2009. Of those injuries, over 117,000 were to riders under the age of eighteen.

In 2007, at least 107 children younger than 16 were killed on ATVs. This accounts for 20 percent of fatalities.<sup>4</sup> The most common mechanisms of injury include striking the ground, hitting fixed objects such as trees, and rolling backwards. The majority of injuries are cranial or spinal. Although the relative incidence of these injuries is declining, the consequences remain severe.

***In light of statistics that show an inordinate number of injuries and deaths resulting from the use of ATVs, the AAOS, OTA and POSNA consider ATVs to be a significant public risk.***

The three orthopaedic societies provide the following recommendations and safety tips for those choosing to ride ATVs:

- **ATV operators should be licensed on the basis of demonstrated competence in handling the vehicle and knowledge of the safety hazards.** With few existing laws governing the use of these vehicles, almost anyone of any age or level of skill or training can legally operate an ATV. No person should operate such a machine without some demonstration of training, knowledge and maturity.
- **ATVs should never be driven by a child younger than age of 12.** Children younger than the age of 12 generally possess neither the body size and strength, nor the motor skills and coordination necessary for the safe handling of an ATV.
- **Children between the age of 12 and 16 should have limitations on their use of ATVs.** Children under age 16 generally have not yet developed the perceptual abilities or the judgment required for the safe use of highly powered vehicles. ATVs with a 90 cc or greater engine size should not be used by children under the age of 16. The child should be of a size appropriate to operate the particular ATV. Children should be supervised by a responsible adult. Children, in particular, should receive hands on safety training and certification.

- **Operators should wear safety equipment.** The key piece of safety equipment is a safety helmet that meets standards set for helmets used by motorcycle riders. As with motorcycle riders, the helmet provides the best protection available against death or serious disabling injury. In 80 percent of the deaths from accidents involving ATVs, the driver was not wearing a helmet. Proper clothing includes eye protection, gloves with padded knuckles, work boots or motorcycle racing boots, long pants and a long sleeved shirt or jacket. The minimum can help to prevent or mitigate injuries associated with falls from the vehicle. Even better is to use specific riding gear that includes padding over shoulders, elbows and knees.
- **ATVs should be used only during daylight hours.** Most ATVs are marketed and used as off-road recreational vehicles. In the varied terrain in which they are most commonly used, good visibility is required. Riding after dark is especially dangerous because lights attached to a vehicle cannot provide enough properly directed illumination when the vehicle is bouncing or turning.
- **Only one person at a time should ride an ATV which is intended for single person use.** Adding a passenger to the ATV increases the propensity of the vehicle to tip or turn over. In almost a third of ATV accidents (31 percent), more than one person was riding the vehicle. The safety of two person or multirider ATVs is not well known. Recent research has shown that there is a much greater likelihood of primary limb amputation or open fracture on multirider ATVs versus single rider ATVs.
- **ATVs should not be operated if you are under the influence of drugs or alcohol.** According to the CPSC, approximately 30 percent of all fatal ATV accidents involved alcohol use.<sup>5</sup>

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