AAOS American Academy of Orthopaedic Surgeons
American Association of Orthopaedic Surgeons

Position Statement

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 to 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.

Although perceived as recreational "toys," ATVs can be extremely unsafe. According to the U.S. Consumer Product Safety Commission, an estimated 99,600 ATV-related injuries were treated in emergency departments in 2013. Between 1982 and 2013, approximately 23 percent of all reported ATV-related fatalities involved children younger than 16 years of age; 10 percent of all reported ATV-related fatalities were children younger than 12 years of age.[1]

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.

Few states have issued regulations on ATV use or 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.

In 1988, major ATV manufacturers agreed in Consent Decrees to limit the engine size, to provide speed limiting devices for ATVs intended for children younger than age 16, and to offer driver-training programs.[2] The 2008 Consumer Product Safety Improvement Act (CPSIA) banned the importation and sale of new three-wheel ATVs; those remaining in use are older models.

The American Academy of Orthopaedic Surgeons (AAOS), the Orthopaedic Trauma Association (OTA), and the Pediatric Orthopaedic Society of North America (POSNA) support the 2008 Consumer Product Safety Act placing restrictions on the sale of four-wheeled ATVs to individuals younger than age 16. In addition, we support efforts to pass state laws mandating licensing for ATV operation on public roadways, and we strongly urge governmental agencies and ATV retailers to educate the public about the dangers of these vehicles.

The three-wheeled ATV is inherently unstable. When the operator executes a sharp turn at even moderate rates of speed, the vehicle's high center of gravity, short wheel base, and short turning radius, can cause it to overturn. The rider may 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. When used on hills, they are capable of flipping over from front to back, because the rear wheels can lift the front wheels off the ground when excessive power is applied.

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 who choose to ride ATVs.[3]

- **ATV operators should be licensed, based on their demonstrated competence in handling the vehicle and their 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 12.** Children younger than age 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 ages of 12 years and 16 years 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 younger than age 16. The child should be of a size appropriate to operate the particular ATV. Children should be supervised by a responsible adult and should receive hands-on safety training and certification.
- **Operators should wear safety gear.** Helmets are especially important in reducing the risk of head injury. Protective gloves and heavy boots can also help reduce injuries.
- **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 that is intended for single-person use; no more than two people should ride tandem ATVs.** Adding a passenger to the ATV increases the propensity of the vehicle to tip or turn over.
- **ATVs should not be operated by anyone under the influence of drugs or alcohol.**

References:

1. All-Terrain Vehicle Safety. U.S. Consumer Product Safety Commission. Washington, DC. Available at: http://www.cpsc.gov//Global/Research-and-Statistics/Injury-Statistics/Sports-and-Recreation/ATVs/2013-ATV-Annual-Rpt-of-ATV-Related-Deaths--Injuries.pdf
2. All-Terrain Vehicle Safety. U.S. Consumer Product Safety Commission. Washington, DC. Retrieved from: http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/ATV-Safety-Information-Center/
3. All-Terrain Vehicle Safety. OrthoInfo.org. Retrieved from http://orthoinfo.aaos.org/topic.cfm?topic=A00265
   Warda L, Klassen TP, Buchan N, Zierler A: All-terrain vehicle ownership, use and self reported safety behaviors in rural children. *Inj Prev* 1998;4:44-9.
4. Rodgers GB, Adler P: Risk factors for all-terrain vehicle injuries: A national case-control study. *Am J Epidemiol* 2001;153:1112-8.
5. US Consumer Product Safety Commission: Annual Report of ATV Deaths and Injuries (2000). Washington, DC: CPSC, 2001.
6. Upperman JS, Shultz B, Gaines BA, et al: All-terrain vehicle rules and regulations: Impact on pediatric mortality. *J Pediatr Surg* 2003;38:1284-6.

Position Statement 1101

For additional information, contact the Public Relations Department at 847-384-4036.