AAOS American Academy of Orthopaedic Surgeons
American Association of Orthopaedic Surgeons

Position Statement

Winter Sports Safety and Helmet Use

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.

Every year, thousands of youths and adults are injured by winter downhill slope activities such as snow skiing, snowboarding, sledding, and tobogganing. According to the National Electronic Injury Surveillance System of the U.S. Consumer Product Safety Commission (CPSC), more than 241,700 winter sports-related injuries were treated in hospital emergency departments, doctors' offices, and clinics in 2014. The medical, legal, work loss, and pain and suffering costs associated with these injuries totaled more than $6.65 billion.[1]

Common injuries caused by winter sports include sprains, strains, dislocations and bone fractures to the arms and legs, as well as facial injuries and trauma to both the head and spine. Estimates from numerous countries indicate that head injuries account for 9 percent to 19 percent of all injuries reported by ski patrols and emergency departments.[2]

According to a CPSC study, more than 40 percent of snow skiing and snowboarding-related head injuries reported each year could have been prevented or minimized with helmet use.[4]

The purpose of a helmet is to partially absorb the force and dissipate the energy of blunt trauma to the head. Although helmets do not decrease the risk of injury, they can decrease the severity. A national study in Sweden found that the use of helmets has reduced head injuries by approximately 50 percent.[5]

Skiing helmets are graded on their ability to withstand frontal blunt and sharp impacts, retention strength, and resistance to roll-off. American standards indicate that those helmets with a rating of RS-98 from the Snell Memorial Foundation of the American National Standards Institute (ANSI) have the highest level of protection in all tested areas of impact. This is approximately 15 percent stronger than the standards used in European helmet testing.

Helmet use is mandated for ice hockey, alpine ski racing, and other competitive winter sports, but, to date, few state laws mandate the use of helmets for recreational skiing. Evidence suggests that routine use of helmets during recreational downhill slope sports should be encouraged. Little potential risk is associated with wearing a helmet, but if an accident occurs, protective head gear could significantly decrease risk of serious injury.

The American Academy of Orthopaedic Surgeons (AAOS) recommends the following safety guidelines to improve winter sports safety:

General

- Parents or adults should supervise young children during all winter downhill slope sports activities at all times.
- Ski, snowboard, and sled enthusiasts should avoid slopes that end in a street, gravel road, drop off, parking lot, river, or pond.
- Evening activities should only be conducted in well-lighted areas.
- Protective gear such as helmets, gloves, and layers of clothing should be worn.

Sledding

- All participants should sit in a forward-facing position, steering with their feet or a rope tied to the steering handles of the sled. No one should sled headfirst down a slope.
- Make sure people at the bottom of the slope have cleared the slope path prior to allowing another sled to go down the slope.
- Participants should not sit/slide on plastic sheets or other materials that can be pierced by objects on the ground.
- Sleds with runners and steering mechanisms are safer than toboggans or snow disks.

Snowboarding and Skiing

- Participants should warm-up the muscles that will be used in skiing with exercises such as knee lifts, heel raises, abdominal twists, and squats. After a warm-up, a few minutes of muscle-stretching (hamstrings, arms, and calves) are recommended.
- Proper ski and snowboard equipment such as properly fitting boots and adjusted bindings that attach the boots to the skis/snowboard should be used. To help prevent injuries during a fall, bindings should be set to skier classification, height, and weight and only by a certified technician.
- Participants should ski on trails within their skill level.
- Participants should stay on trails and obey trail closure and other warning signs.

Individuals with pre-existing neurological problems may be at higher risk for injury. Participants who have a pre-existing condition should talk to their doctors before taking part in these activities.

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