Winter Sports Update

By Thomas Souza, DC, DACBSP

It is that time of year when your patients take to the snow and ice. Several interesting articles help answer the following questions about injuries in this group of patients:

- What are common injuries with snowboarding and what are the mechanisms?
- What are common injuries with cross-country skiing, and what are the mechanisms?
- Does face shield usage in ice hockey help prevent facial injury but increase head and neck injury?

The Downside of Snowboarding: Common Injuries in Novices and Those Seeking "Hospital Air."
Binder S, Geiger KM.
Postgraduate Medicine 1999;105.

Snowboarding has become so popular that approximately 20-30 percent of slope users are snowboarders (in some resorts it’s as high as 50 percent). The following facts may be helpful in evaluating or interpreting injury patterns:

- Falls are the most common cause of injury, followed by collision.
- Injury rate is four per 1,000 snowboarding days (similar to alpine skiing).
- Novices have the highest injury rate: mainly wrist injuries, fractures, and more serious injuries.
- Expert snowboarders have more ankle injuries.
- Those who use the "regular" position on the board with the left foot forward (2/3 of snowboarders) have injury mainly to the left leg; those who take the "goofy" position of right foot forward have injuries to the right leg and left arm and shoulder.
- The most common snowboard injury is a fall on a hyperextended wrist. Careful evaluation for scaphoid fracture and various forms of dissociation of the carpals should be made with careful attention to a full x-ray wrist series. Sixty-five percent of wrist injuries with snowboarding are fractures. Wrist supports
may help prevent these injuries.

- Shoulder injuries are also common, accounting for 8-16 percent of all snowboarding injuries; high on the list are dislocations and AC separations.

- Younger snowboarders (4-14) are particularly susceptible to elbow fracture and dislocations.

- Snowboarders have a higher proportion of ankle injuries, but a lower proportion of knee injury compared to alpine skiers. This is primarily the result of less ankle support in snowboarding boots. Torsion is decreased because the feet remain in contact with the board when the snowboarder falls.

- Ankle injuries make up 8-23 percent of snowboarding injuries: fractures (44 percent) and sprains (52 percent).

- Fractures of the lateral process off the talus are sometimes called snowboarder’s fracture. It occurs in snowboarders three times as often as the general population. The mechanism is often dorsiflexion of the ankle and inversion of the hindfoot. There is a decreased risk with the use of soft boots.

- Although knee injury is not as common compared to alpine skiing, ACL tears and MCL tears can still occur.

Those snowboarders attempting higher speeds and jumps (i.e., seeking "hospital air") are more prone to serious injuries, such as trauma to the head, neck and abdomen. Interestingly, spleen injuries in snowboarders are more frequent than with alpine skiers.

Snowboard Equipment:

- The snowboard is a single broad ski: a fiberglass body with a plastic base and steel edges. The length is 140-189 cm and the width is 30-40 cm.

- There are three varieties of snowboard boots: soft-shell boots ("freestyle") that allow for more movement of the foot; leather "pack style" boots; and hard-shell boots ("free ride") that are heavier and provide more support. Hard-shell boots cause more knee injuries.

- Snowboard bindings are nonreleasable.
Safety gear includes wrist guards, helmets, and elbow and knee pads; however, they are rarely used.


Cross-country (Nordic) skiing is becoming quite popular. It has high cardiovascular demands minus some of the jarring and pivoting seen in other aerobic endeavors. This smooth, apparently rather safe sport, makes maximum use of large muscle groups of the upper and lower limbs. What has changed is ski design: shorter skis, longer poles, higher boots and more stable binding, allowing more downhill runs that have been clocked at 50 mph! Still, the vast majority of injuries are overuse.

Two techniques are used:

Classical (diagonal stride): The skier points skies straight ahead and pushes off from the "kick zone" in the middle of one ski while the other (lying flat on the ground) glides forward.

Skating (freestyle): The skier alternates pushing each leg outward similar to speed skating. Poor weight transfer may be a cause of overuse injury because it prolongs the time the ankle is pronated.

The most common overuse injuries are medial tibial stress syndrome, Achilles tendon problems, low back pain, and patellofemoral problems. Other common problems are "skier’s toe," which is in essence hallux rigidus (painful arthritic changes in the first MCP joint due to repeated dorsiflexion), and inflammation of the sesamoid bones of the first toe (especially found during the kick phase of classical skiing). A rigid shank (orthotic extension for the great toe) or firm taping with strapping tape may help skier’s toe. An orthotic with a cut-away area for the sesamoids sometimes helps sesamoiditis, as does adduction taping of the great toe.

Acute injury accounts for approximately one-quarter of cross-country injuries, with medical collateral ligament (MCL) sprain as the most common (skier usually catches a ski tip or edge while the leg is fixed).ACL injury is usually the consequence of a fall on a downhill run. Ankle injury is relatively common; usually inversion sprains.

Skier’s thumb (gamekeeper’s thumb) is the most common upper extremity injury. Because the skier passes the hand through the loop of the pole strap and then grasps the pole and strap, when the skier falls, the pole levers the thumb into abduction and extension tearing the ulnar collateral ligament of the thumb.
Radiographs should be taken with a stress radiograph added.
The authors of this paper feel that AC separation is also common; again, more likely from a fall on a downhill run.

Head and Neck Injuries among Ice Hockey Players Wearing Full Face Shields vs Half-Face Shields.
Benson BW, Mohtadi NGH, Rose MS, Meeuwisse WH. *JAMA* 1999;282.

Ice hockey associations in the United States and Canada have attempted to provide head and neck risk-management strategies, including the mandatory use of full facial protection for certain age groups and various levels of play. There has been some speculation that due to the increase in catastrophic hockey-related injuries to the cervical spine, the use of the full-face shield may have inadvertently increased the risk of neck injury. This study evaluated injury in 642 hockey players and compared injury rates between those players using half-shield versus full-shield face protection. This risk of facial laceration and dental injury was about four times less when wearing a full-face shield; there was also more time lost from concussion in players using the half shield. There was no indication that the use of face shields was related to an increase in cervical spine injury.

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