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Golden Hills

Orthopedic and Sports Physical Therapy

j o u r n a l

January-February 2008



Seasonal Activity Spotlight: Alpine Snow Sports

Our Mission...

To further the prevention, diagnosis and treatment of movement dysfunction in order to enhance the physical health and functional abilities of our patients.

To maximize the patient's potential for regaining full physical health by providing rehabilitation through the use of advancements in physical therapy techniques and state-of-the-art equipment.

To establish a self-management program for the patient through education and a personalized home exercise program for each individual to enable the patient to maintain their physical health at home and at work.

In the November and December 2007 issues of *Golden Hills Journal*, we announced an exciting new direction for our monthly physical therapy publication. For the past two years, the articles we publish in *Golden Hills Journal* have focused on a single area of the body or on general exercise and treatment programs. Beginning with the current issue on alpine snow sports, we will focus on a specific seasonal sport, recreation and exercise (SRE) activity in each issue. Our goal is to help you and your patients understand the risks inherent in certain activities as well as the wide range of physical therapy services available to patients for whom SRE activities are an important part of their active lifestyle.

We welcome referrals of patients who have suffered an alpine snow sport-related injury or who are simply looking to enhance their performance through effective training and safety practices. Just contact us at (408) (408) 274-0888, or therapy@goldenhillspt.com. We're here to help!

Alpine Snow Sport Injuries: A General Overview

Alpine snow sports remain very popular winter pastimes—there are an estimated 200 million skiers and 70 million snowboarders in the world today.

Unfortunately, as with every other outdoor sport, snow sports are associated with a risk of injury. But that risk is lower than one might suspect: the reported rate of “medically significant” injury is estimated to be less than 0.5%. (For the purposes of this article, we will discuss injury rates by the measurement of Injuries per Thousand Skier Days (IPTSD). It is derived by dividing the number of injuries seen by the total number of skier/boarder days and then multiplying by 1,000.) Alpine skiing carries an injury risk of less than 3 injuries per 1000 skier days. In other words, for every 1,000 people skiing on any particular day, less than 3 will sustain an injury that requires medical attention. For snowboarding and other sports like skiboarding (snowblading), the rate is slightly higher, just over 4 injuries per 1,000 boarder days.

Deaths due to participating in alpine snow sports are very rare. From the 1991-92 to the 2003-04 seasons, a total of 469 traumatic deaths were recorded within the boundaries of U.S. ski resorts. 58 of these deaths were snowboarders and 401 were skiers. A total of 650.7 million skier days took place during these 13 seasons giving a death rate of 0.71 deaths per million skier days (or one death every 1.4 million skier days). Collisions of all sorts account

for 90% of all fatalities; trees are the most commonly struck object accounting for some 60% of all fatalities. Collisions with other persons account for about 10% of all fatalities.

A more unusual mode of death is “Non-Avalanche Related Snow Immersion Death” (NARSID). Also called “tree-well deaths,” these result from a fall into the pitted area under a snow-laden tree; as the victim tries to extricate himself or herself, more snow caves and he or she dies from either asphyxiation or hypothermia. Snowboarders and off-piste skiers are obviously the most at risk.

The number of skiers and snowboarders suffering head and spinal cord injuries is on the rise internationally, probably the result of greater risk-taking on the slopes. In a review of data on such injuries from 10 countries, Canadian researchers found increasing rates of brain and spinal cord injuries among skiers and snowboarders between 1990 and 2004. These injuries account for a relatively small proportion of all injuries on the slopes; head trauma constitutes anywhere from 3% to 15% of all injuries, depending on the study, while spinal cord trauma accounts for 2% to 4% of injuries. Still, they can be devastating or even fatal and should be taken seriously.

In general, men are at higher risk for life- or limb-threatening injuries, especially those in their 20s or early 30s. This is likely due to faster and higher-risk performance on the slopes.

Alpine Skiing Injuries

Downhill, or alpine, skiing is among the most popular winter sports worldwide. The simplest form of downhill skiing is sliding down a slope on skis while avoiding obstacles and moving in a controlled fashion. Competitive downhill skiing is characterized by four disciplines: downhill, super g, giant slalom and slalom.

While the overall incidence of lower extremity injuries has decreased in recent years, the frequency of severe knee injuries continues to rise. In fact, about one third of all alpine ski injuries affect the knee joint; these usually involve the medial collateral ligament, anterior cruciate ligament (ACL), the meniscus (cartilage) or any combination of the three. There is increasing evidence that current ISO binding settings, while certainly protecting against tibia fractures, could perhaps be lowered slightly especially for some groups (such as women and children) in order to better protect the knee (particularly injuries to the collateral ligaments and the meniscus).

Beginners have an injury rate four times greater than intermediate skiers. That being said, skill alone is not enough to protect the skier and the talented athlete is not necessarily immune to injury. The majority of severe or fatal ski injuries result from high speed accidents of predominantly experienced male skiers who lose control.

Cross-Country Skiing Injuries

Cross-country skiing is one of the most physically demanding sports because it involves a majority of the muscles in the body and stresses the cardiovascular system for a sustained period of time. It typically involves skiing in prepared tracks, but can also include skiing on mountainous and rough terrain.

The rate of injury for cross-country skiing is estimated to be 1.5 to 2.0 IPTSD, and is considered to be less than for downhill skiing due to lower speeds and limitations imposed by “in-track” skiing. Strain and sprain injuries are the most common in cross-country skiing. The second most common is fracture. The injuries in cross-country skiing have been located to the upper body in a higher percentage than in downhill skiing. Knee injuries have the same proportion in both types of skiing and cross-country skiing has a higher percentage of shoulder, hand, wrist, arm, elbow, ankle, foot and toe injuries than downhill skiing.

Overuse injuries are also common, including medial tibial stress syndrome (shin splint), Achilles tendon problems and low back pain.

Surprisingly, there is evidence to suggest that cross-country skiing instruction does not have an effect on the likelihood of injury. Instruction focuses on technique but not safety or proper equipment. Also, few ski schools teach students how to fall in a “controlled” manner.

Snowboarding Injuries

Boarding was the fastest growing snow-sport during the 1990s but its

popularity has leveled out in recent years at about 25% of all slope users.

Snowboarding has a different injury profile to skiing. Upper limb injuries predominate, usually as a result of falls onto an outstretched hand. The incidence of wrist fractures is particularly high, especially amongst beginners. Whilst they are available, the majority of snowboarders still do not wear wrist guards despite very strong evidence to support their use. Most boarders take no professional instruction and prefer to either learn from friends or are self taught. Bad habits learned early on can be difficult to eradicate later and inhibit the development of new skills.

As the overall skill levels of boarders increases, so more and more boarders are pushing the limits of their ability on half pipes and jumps. Although still relatively rare, the incidence of serious spinal injuries is on the increase. An injury all snowboarders should be aware of is “snowboarder's ankle,” a fracture of the lateral process of the talus bone in the ankle. This injury can be easily overlooked and lead to long term problems.

Patient Strategies to Avoid Injury and Enhance Performance

There are several very general safety rules for patients to follow that apply to all three above-mentioned alpine snow sports:

- Establish and follow an athletic training and conditioning

program in advance of the winter season.

- Know and follow mountain safety rules.
- Adapt to terrain and weather conditions.
- Use reliable equipment.
- Do not overestimate your ability.

These apply to all activity-goers of all skill levels and all ages. In addition, there are a number of more specific guidelines for patients to follow:

Training

- Begin your intensive training program in early fall at the absolute latest. For help establishing an effective program, see a qualified physical therapist.
- Engage in training activities specific to skiing, such as the indoor ski machine and upper and lower body muscular fitness exercises. This will strengthen the connective tissue (muscle, bones, ligaments and tendons) and will provide a good aerobic foundation.
- Running, cycling or any aerobic exercise can also increase your aerobic capacity and cardiovascular health and conditioning.
- Strengthen the legs through weight resistance training or a repetition of simple leg lunges. A series of squats, leg presses, calve lifts, leg curls, and adduction and abduction exercises is suggested.
- Increase your flexibility by stretching.



- Pace yourself; don't do too much too soon when conditioning for the winter sport season.

Technique

- Remember to warm-up and stretch at least 5 to 10 minutes before skiing.
- Avoid participation in high risk behaviors (e.g., skiing for speed, jumps, tricks, etc.)
- For beginner and intermediate skiers and boarders, always stay on groomed runs.
- Always ski or board under control; follow all mountain safety rules.
- Be aware of your personal fatigue level. Snow sport injury rates peak in mid-afternoon to late afternoon; fatigue is a significant risk factor in skiing injuries. Once you are on the slope and you feel fatigue coming on, ski slower or stop to allow more blood flow to the muscle.

Equipment

- Use equipment conducive to injury prevention.
- Most snowboard injuries are to the wrists. Wear wrist guards made for snowboarding. Don't break your fall with your open hands. Hold your hands in closed fists while you snowboard so you won't be tempted to break your fall with an open hand.
- Wear a helmet when learning, racing and skiing or snowboarding on unmarked trails.
- Many skiers and boarders now wear a helmet whenever they are on the mountain.

Environment

- Be aware of the potential for avalanche and other environmental hazards such as trees, bushes, other skiers, etc.
- Dress for the sport to prevent hypothermia and frostbite.

- Alcohol consumption should be discouraged as it promotes heat loss and may impair judgment.
- Liquid and nutrition replenishment is recommended to decrease exposure-related illness.
- Take lessons from a trained instructor in good weather (when there is good visibility and it's not too cold). Avoid icy slopes.

Physical Therapy Treatment

When an injury does occur, Golden Hills' skilled physical therapists are prepared to help your patients heal from the injury and recover their pre-injury levels of performance, including strength, flexibility, balance and endurance.

In past issues of *Golden Hills Journal*, we have discussed in depth our treatment approach for injuries to specific joints or biomechanical

systems. The following table shows which areas are discussed in which issues. Please contact us if you would like another copy of any of the issues!

| Biomechanical System | Discussed in Issue |
|----------------------|--------------------|
| Shoulder | Aug-Sep 2006 |
| Elbow | Oct-Nov 2006 |
| Hand/Wrist | Jan-Feb 2007 |
| Knee | Jun-Jul 2006 |
| Foot/Ankle | Mar-Apr 2007 |

By following the above guidelines, your patients can significantly increase their enjoyment of their sport and avoid many of the injury conditions discussed earlier in the article. For more information on how Golden Hills can help your patients achieve their alpine sport-related training or injury recovery goals, contact us at **(408) 274-0888**, or therapy@goldenhillspt.com.

Golden Hills: Your Partner in Patient Care



Golden Hills is unique among physical therapy clinics because we understand how important your patients are and we share your commitment to providing them with superior care. Each one of our knowledgeable and friendly office staff, as well as our skilled physical therapists, is focused on giving you

and your patients nothing less than their absolute best.

Since we founded the clinic in 1992, our approach to physical therapy has proven exceptionally effective. The vast majority of our patients show significant improvement in their conditions and, through patient education, we are able to keep them healthy long after they leave our care.

About Golden Hills

Golden Hills is owned and operated by Saad E. Shaban, PT. Golden Hills' physical therapy staff must be

licensed in California and undergo extensive continuing education to keep abreast of advancements in physical therapy techniques and technologies. In addition, we always strive to provide the best physical therapy care possible while keeping patient healthcare costs to a minimum.

We want you to feel confident referring your patients to our care. If there are any questions we can answer for you, or any other services we can provide, please don't hesitate to contact us at the phone or email address listed above.