

Learning Series - #27



Understanding Snow Sports

Snow sports have been increasing in popularity worldwide over the last several decades and it can be either recreational or a competitive sport. More hazardous snow sports require specialized training and safety equipment to prevent serious injury. Approximately 75% of all fatalities are attributed to avalanches while 25% are attributed to tree wells, non-avalanche snow immersions, crevasses and collisions with stationary objects (out-of-bounds glade skiing).

Statistically it is difficult to segment a substantial difference between the risk for guests and guides. However, tree wells and non-avalanche snow immersions do not contribute to the death of guides likely as they have more experience to avoid these hazards, which is not the case for guests.

Types of Snow Skiing

Inbound skiing is considered a low-risk activity. The ski terrain is inside the boundaries of a ski resort. People use the skills of professionals to ensure the safety and enjoyment of those using the resort facilities and do not use mechanized transportation to bring them to remote locations.

Types of low-risk skiing	Descriptions
Cross country skiing	People use cross-country skis to ski in groomed trails specifically designed for the sport. This sport is usually practiced in-bounds close to a resort where risk is minimal as trails are maintained.
Alpine (downhill) skiing	People slide down snow-covered slopes in a ski resort. Ski lifts are used to reach the top of the mountain. Slopes are well-maintained.
Glade skiing	Alpine skiing through trees off-trail or on a defined woods trail practiced at low altitudes near a resort.



Out of bound skiing is considered a high-risk activity. Skiing is done outside maintained boundaries of a resort, tourist complex or park. It involves various dangers and hazards which include avalanches and unmarked and not inspected terrains. The greatest risk comes from avalanche and blunt force trauma from high-speed collisions.

Backcountry skiing, commonly known as off-piste skiing, is a type of out of bound skiing. The two methods for backcountry skiing are as follows:

Types of high-risk skiing	Descriptions
Non-mechanized backcountry skiing	Non-mechanized backcountry skiing, also known as ski touring, combines the elements of both Nordic and alpine skiing. Touring is typically done off-piste and outside of ski resorts in unmarked terrain, without the use of a ski lift or transport. These locations tend to be less remote and at lower altitudes.
Mechanized backcountry skiing	Mechanized skiing is a type of skiing that uses either a helicopter, snowcat or snowmobile to take skiers and snowboarders up remote slopes in the backcountry.

The differences in risk between helicopter skiing and snowcat skiing are likely related to differences in terrain use. Whereas helicopter skiing predominantly takes place in large, open alpine and glaciated terrain, snowcat skiing usually takes place at the tree line and below. This explains the higher risk of death from avalanches and crevasses in helicopter skiing vs the higher risk of death from other non-avalanche related snow immersions in snowcat skiing. This difference may be due to increased snowcat operations during heavy snowfall when helicopter skiing operations are shut down because of unsuitable flying conditions.

Learning Series - #27



Understanding Snow Sports (cont'd)

Competitive snow sports

Like many backcountry activities, some of the extreme winter competitive sports can be quite dangerous. Competitive snow sports require intense training and practice because of the nature of the rocky terrains, harsh weather or high speeds involved. Traditional competitive snow sports include downhill ski racing and jumping, snowboarding, snowmobiling, snow biking, ice climbing, bobsleigh and skeleton.

Types of high-risk competitive snow sports	Descriptions
Snowkiting (kite skiing)	The use of kite power to glide on snow or ice on skis or a snowboard. The kite gives the skier speed and lift.
Ski mountaineering	A timed racing event. Racers climb and descend under their own power using backcountry skiing equipment and techniques.
Snocross (snowcross)	A racing sport involving racing specialized high performance snowmobiles on natural or artificially made tracks consisting of tight turns, banked corners, steep jumps, and obstacles.
Hillcross	A mix between an uphill drag and a snocross. Racing side by side up the hill with numerous jumps that propel the racers high into the air while going at high speeds.



Extreme adventure skiers typically ski above the level of the tree line in high-risk areas. The locations and mountains that are most likely to experience avalanches of snow or to results in fatalities are listed below.

High risk locations	Descriptions
North America	Rocky Mountains, Pacific Coast Range, Alaska Range and Yukon Range
Europe	The Alps
Asia	The Himalayas and Karakoram
South America	The Andes Mountains
Low risk locations	
Typically, altitudes on the eastern mountain ranges of the United States and Canada	Are considerably lower and pose negligible avalanche risk (i.e. Appalachians)



Learning Series - #27



Understanding Snow Sports (cont'd)

Numerous risk factors for skiing injuries have been identified and include:

Risk Factors	Descriptions
Age	Younger age groups, particularly adolescents, have a greater risk of injury.
Sex	Male skiers are at a 2.2 times higher risk than females for head injury. Male sex is associated with greater risk-taking behavior, which may lead to a greater number of injuries with greater severity.
Level of Experience	Beginners are more likely to sustain an injury compared to more skilled skiers.
Terrain Condition	High snow avalanche risk, inappropriate trail design and/or grooming can cause an increased risk of injury and death.
Alcohol/Drugs	Consuming alcohol or drugs affects judgment and decreases reaction time.
Pre-existing medical conditions	People with pre-existing medical conditions such as CAD, pulmonary insufficiency, pre-existing hypoxemia or OSA are at risk of altitude illness or sudden cardiac death at higher elevations.
Performing sport alone	It is recommended to conduct ski tours with one or more partners to reduce fatalities connected with avalanche burial. Partner rescue is crucial for survival since the highest survival rates of avalanche victims were found within the first 15 minutes after burial.
Frequency	Skiing frequency might provide a useful estimation for individuals at risk.
Occupation	Professional guide or tour operator are in a high-risk environment which makes them more susceptible to numerous natural winter hazards that can result in injury or death.
Participation in several extreme sports	Increases the risk of injury or death.

Underwriting considerations

Avocation questionnaire is a helpful tool to assess the level of risk. The important factors in assessing these risks are:

1. Level of experience and activity i.e. recreational or competitive.
2. Frequency of participation as well as the level of danger involved.
3. Participation in high-risk locations which consist of serious mountain terrain and avalanche hazard.
4. Performing sport alone or with a partner.
5. The use of safety/protective gear to reduce the risk of injury.
6. Participation in multiple hazardous sports requires special consideration.
7. Medical history and lifestyle must also be considered which may require additional premium or cause the risk to be uninsurable.



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