

# ***TOP 5 ENVIRONMENTAL INJURIES***

- **ALTITUDE**
- **UV RADIATION**
- **HYPOTHERMIA**
- **FROSTBITE**
- **AVALANCHE**



## Top 5 Environmental Injuries

- 1) Altitude
- 2) UV Radiation
- 3) Hypothermia
- 4) Frostbite
- 5) Avalanche



## ABOUT THE AUTHOR



### **Dr. Stephen Burkert, PT, DPT, CSCS**

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Dr. Stephen Burkert is the founder and owner of Snow Beast Performance located in Burlington, VT.

After spending 15 years helping clients attain their goals of outdoor adventure and returning to activity with their family and friends, he transitioned his work to focus on snow sport athletes looking to return to the mountain so they can enjoy nature and sport year round. His goal is to help snow sport enthusiasts get back in their boots, and stay on the mountain. He doesn't want you missing out on a great powder day with your family, a whitewater adventure with your friends, or a challenging hike with your dog.

If you have pain, stiffness, weakness, or anything else limiting your ability to be out on the mountain, then you will excel with a program designed to address your unique deficits, and attain your individual goals. Dr. Stephen Burkert helps outdoor enthusiasts overcome their limitations without needing detrimental medications, expensive and inconclusive imaging, temporary injections, or multiple trips to the physicians office.

**We help active adults and athletes return to outdoor adventure, while saving them time and money.**

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## Altitude

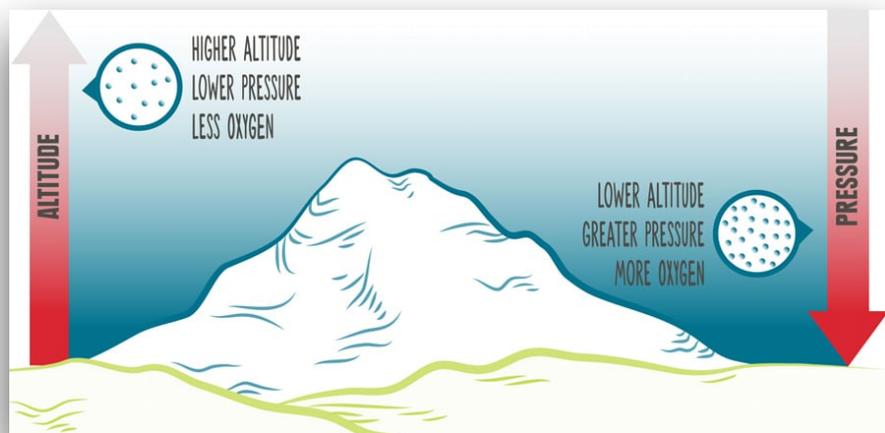
If you don't already live at a higher altitude, and are not accustomed to the lower oxygen levels in the air, you may experience altitude sickness when traveling to a mountain destination. This is most common when traveling from lower levels of elevation to higher levels. The most common type of altitude sickness is Acute Mountain Sickness, but other rarer, more severe types may include high-altitude pulmonary edema and high-altitude cerebral edema.



Altitude sickness is common when traveling to above 8000 feet of elevation, which is where many mountain resorts are located and peaks exceed. Oxygen levels gradually decrease as elevation increases, and some people may experience an onset of symptoms below 8000 feet. As elevation increases, you receive less oxygen molecules per breath, and the first symptom may be a headache.

Symptoms may progress to include

weakness, exhaustion, dizziness, sleepiness, shortness of breath, malaise, lack of appetite, nausea, vomiting, and possibly swelling of the hands, feet, and face. Altitude sickness is frequently caused by increasing elevation too quickly, or by staying at an increased elevation for too long. Someone experiencing altitude sickness should slowly descend to a lower elevation.



More severe cases can cause fluid build up in the lungs resulting in dry coughing often with pinkish sputum, fever, and panting. Fluid buildup around the brain can also occur, and this results in headaches that don't respond to medication, unsteady walking, clumsiness, increased vomiting, gradual loss of consciousness, and numbness.



Those with symptoms should rest, drink water, and slowly descend elevation. Medical evaluation may be indicated for those with more severe conditions.

Altitude sickness can be avoided by allowing the body to adapt to elevation over time in a process called acclimatization. This may take 1-3 days depending on the person, and can be completed with a slow ascent of elevation if symptoms remain in control. If symptoms worsen, it is recommended to descend elevation, increase fluid intake, and give the body increased time to acclimatize.

Altitude sickness can be severe if symptoms are unrecognized, and it is important to report and identify symptoms, along with taking appropriate action to prevent significant consequences.

## UV Radiation

Although winter sports are primarily completed in cold weather, ultraviolet radiation levels can be higher than on warmer days. If



you've ever had tan lines from your goggles, even though you never felt hot, then you have experienced increased UV radiation. Skin damage is not caused by the heat of the sun, but instead by the radiation it provides.

UV radiation increases as elevation is gained due to closer proximity to the source, the sun. However, reflection from snow is the real culprit as this can increase UV radiation up to 40-80%, more than reflection off of water.



While a sunburn is uncomfortable in the short term, the real risk is repeated exposure over time. Repeated exposure potentially increases risk of skin cancer and cataracts.

It is recommended to utilize sunscreen with sun-protection factor (SPF) 30 or more, especially on areas with the highest exposure such as the lips and nose. During spring conditions in which you may have more skin exposure, be sure to spread sunscreen on all affected areas.

UV protective clothing can and should be utilized, as well as appropriate UV protective eye wear.

## Hypothermia

With prolonged exposure to cold weather, there is a risk of an unintentional drop in core body temperature below 95° F, or 35° C, called hypothermia.

The two signs that guide assessment and treatment of hypothermia are shivering and change in mental status.

Hypothermia can



be a medical emergency, and proper treatment to rewarm the body are necessary.

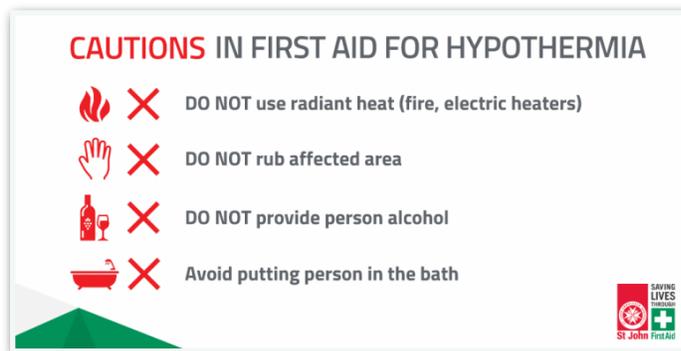


Treatment includes prevention from further decrease in body temperature, calorie replacement to support shivering, and active warming.

Protection from further decrease in body temperature includes removing wet clothes if present, and sheltering from cold temperatures.

Shivering is the body's attempt to create warmth by increased muscle activity, and this uses increased calories which need to be replaced. If hypothermia is not addressed, shivering may stop, which is a worsened sign of progression.

Active warming can include using warmed water bottles, receiving warmed intravenous fluids, or breathing warmed air. Heat lamps or hot water are not recommended as they can cause skin damage.



Hypothermia is not common at resort locations, but is of greater concern in backcountry areas, especially following trauma

in which mobility is restricted, therefore limiting the ability to create internal body warmth.

Layering of clothing that preserves body heat, use of hats, insulated helmets, and gloves, sufficient calorie intake, and avoidance of alcohol can all help prevent hypothermia.

## Frostbite

Frostbite is a localized cold-induced freezing injury of the skin and underlying tissues that primarily affects peripheral body parts, such as toes, fingers, nose, ears, cheeks, and chin. Frostbite may be a risk on resorts and in the backcountry.



The initial onset of frostbite will include very cold and reddened skin, followed by the skin becoming numb, hard, and pale. Skin that is exposed to cold, windy weather is most vulnerable, and frostbite occurs both on resorts, and in the backcountry.

Rapid rewarming, air drying and dressing of damaged tissue, and hydration are treatments for frostbite, and these are best completed at a medical facility. Severe cases can result in tissue death, and these tissues will need surgical removal to prevent decay and infection.

## Avalanche

An avalanche occurs when a slab of snow fractures from an underlying layer and slides down a steep slope, or when loose snow starts to slide and accumulates more snow and speed as it continues to travel down the slope.

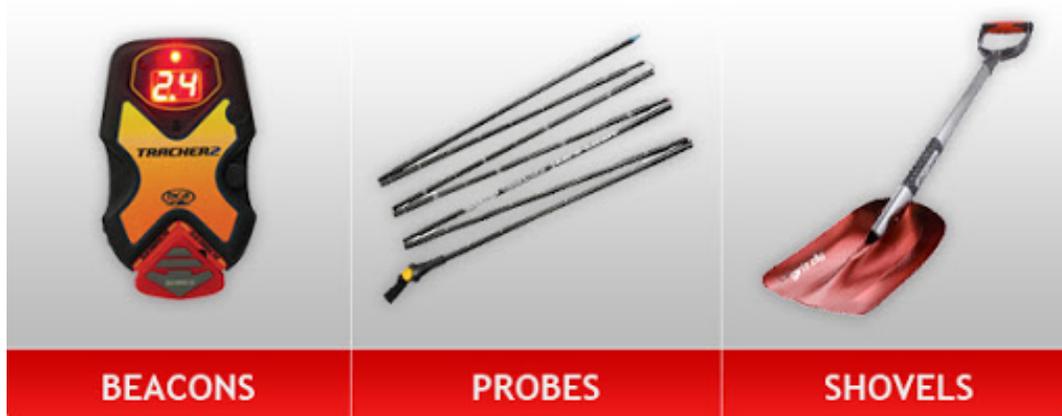
An avalanche can move at speeds up to 120 mph, and can lead to impact with rocks or trees, being pushed over a cliff, or being buried under the snow. As the snow descends, friction causes a

slight melting, which then refreezes after the snow stops moving. This refreezing results in heavy crud, and the weight can squeeze air out of the lungs of a buried survivor resulting in oxygen deprivation. This oxygen depreciation commonly has fatal results.



An avalanche has four main factors: a steep slope, snow cover, a weak layer in the snow cover, and a trigger. The best defense for avalanche safety is to read and understand conditions to avoid dangerous situations.

If you are traveling in the backcountry, it is important to have the appropriate gear, receive training, gather the forecast, create a picture, and stay out of harms way.



Avalanche safety courses are recommended, and many resources are available. [www.backcountryaccess.com](http://www.backcountryaccess.com) has a comprehensive list of information to start gathering more information.

