



Tips to Prevent Cold Weather Injuries

Prepared by Karl Parmer, Certified Athletic Trainer and Dr. Michael W. Gish, Orthopedic Surgeon and Medical Director for PA Classics

Cold Injury Prevention

Winter is here. As we know, soccer does not stop for winter. Low temperatures combined with wind and dampness can leave athletes prone to cold injuries. The two most common cold injuries are hypothermia and frostnip/frostbite.

HYPOTHERMIA

Hypothermia is defined as a decrease in core body temperature below 95.6 F. As certified athletic trainers, we most commonly treat mild to moderate hypothermia.

Prevention of hypothermia is most important and starts with:

- Dressing in thin layers of clothing that are able to be added or removed.
- Ensuring that the lower layers of fabric permit the passage of heat so sweat can evaporate. Synthetic base layers are recommended so that they do not absorb and trap moisture from sweating.
- If possible, finding a waterproof and windproof fabric to wear as the top layer. (This may be more feasible in training situations than in game situations.)

Signs and Symptoms

- Mild Hypothermia – Core Temperature 95 F to 98.6 F.
 - Vigorous shivering, amnesia, lethargy, impaired fine motor control, cold extremities, excessive urination, pale appearance, runny nose, typically conscious, blood pressure within normal limits
- Moderate Hypothermia – Core Temperature 90 F to 95 F
 - Depressed respiration and pulse, cardiac arrhythmias, skin appears blue or purple, athlete stops shivering, impaired mental function, slurred speech, impaired gross motor control, possible loss of consciousness, muscle rigidity, dilated pupils, and blood pressure decreased or difficult to measure.

Treatment of Hypothermia

- Remove wet or damp clothing. Insulate the athlete with warm dry clothing or a blanket, ensuring the athlete's head is covered. Move the athlete to a warm sheltered environment, protected from wind and rain.
- Apply heat only to the trunk and to areas of heat transfer. This includes the armpits, chest wall, and groin.
- Provide warm foods and fluids that contain carbohydrates. This will help to sustain shivering and improve metabolic heat production.
- **Avoid** applying friction massage to tissues; if frostbite is present this could damage the tissues.



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FROSTNIP/FROSTBITE

Frostbite is the freezing of body tissues. This is a localized response and usually occurs when there is a high wind, severe cold, or both. Frostbite most commonly affects the extremities and happens because the body is redirecting blood flow towards the core to maintain temperature. The severity of frostbite is determined by the depth of the tissue that is freezing. Mild frostbite involves freezing of the skin and adjacent tissues. Deep frostbite is the freezing of the tissues below the skin and adjacent tissues, which could include muscle, tendon, and bone. Deep frostbite is a serious injury and requires immediate hospitalization. Fortunately deep frostbite is rarely seen except with prolonged exposure in extreme cold weather conditions.

Frostnip is the precursor to frostbite, where only the superficial skin is frozen. There is no permanent tissue damage.

Signs and Symptoms

- **Mild Frostbite/Frostnip** – dry, waxy skin, redness of skin, swelling, temporary tingling or burning sensation, skin contains white or blue-gray colored patches, affected area feels cold and firm to the touch, limited movement of affected area
- **Deep Frostbite** – skin is hard and cold, skin may be waxy and immobile, skin color is white, gray, black, or purple; burning, aching, throbbing, or shooting pain, poor circulation in affected area, progressive tissue death, loss of motor and sensory function, hemorrhagic blistering usually develops within 36-72 hours; muscle, nerve, and joint damage is likely

Treatment of Frostbite - Being prepared is the best way to prevent frostbite. Wear extra layers, winter gloves, and hats to stay warm and preserve core temperature.

- **Mild (superficial)**
 - Rewarming can occur at room temperature or by placing the affected tissue against another person's warm skin. One can also use their armpits for the rewarming of frostnip of the hands. Rewarming should be a slow procedure. The use of warm water immersion is appropriate. **Do not** use water with a temperature greater than 98 F to 104 F.
 - If the athlete is being rewarmed, then it is imperative that affected tissue is not allowed to refreeze. Refreezing could result in tissue death.
 - **Avoid** the application friction massage to prevent tissue damage.
- **Deep**
 - Rewarming of affected tissues with deep frostbite is best done with warm water immersion. Clothing over the affected area should be removed. Water temperature should be 98 F to 104 F with gentle circulation. The affected area should be immersed for 15 – 30 minutes.
 - As the tissue is rewarmed, it should at first feel numb and then produce a burning and stinging sensation. If the athlete is being rewarmed, then it is **imperative** that affected tissue is not allowed to refreeze. **Refreezing could result in tissue death.** Weight bearing



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- should be avoided when feet are affected. If refreezing is possible, delay rewarming until advanced medical care can be obtained.
- **Do not** use friction massage so as to prevent tissue damage.
 - **Do not** use dry heat or steam to rewarm affected tissue.
 - If not rewarming the tissue, protect the affected area from additional damage and transport the athlete to a medical facility.

References

National Athletic Trainers' Association Position Statement: Environmental Cold Injuries
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