

Cold Environment Participation Guidelines

Cold weather is defined as any temperature which negatively affects the body's regulatory system. These do not have to be freezing temperatures. Prolonged exposure to the cold can be uncomfortable, impair performance and even become life threatening. The National Athletic Trainers' Association Environmental Cold Injuries Position Statement (2008) states that injuries from cold exposure are due to a combination of low air or water temperatures and the influence of wind on the body's ability to maintain a normothermic core temperature, due to localized exposure of extremities to cold air or surface. In addition to environmental factors, cold stress may result from previous cold weather injury (CWI), race, geographical origin, ambient temperature, use of medications, clothing attire, fatigue, hydration, age, activity, body size/composition, aerobic fitness level, acclimatization and low caloric intake. Conditions created by cold exposure include chilblain, frostnip, frostbite and hypothermia. The Wind Chill Temperature (WCT) can make activity uncomfortable and can impair performance when muscle temperature declines.

Chilblain can occur with exposure to 40-50 degrees F temperatures under wet and windy conditions which can be equivalent to sub-zero temperatures with no wind or moisture. It presents as itching, red patches, swelling and blistering on the toes, fingers, ears and nose. There have been cases resulting in permanent nerve damage. Frostnip can occur with WCT of 39-30 degrees F. It is a mild form of frostbite causing redness, a cold feeling and numbness in the extremities. Frostbite is the freezing of superficial tissues, usually of the toes, fingers, ears and face. This may occur with WCT of 29-20 degrees F. Hypothermia happens when a significant drop in body temperature occurs with rapid cooling, exhaustion and energy depletion. The resulting failure of the temperature-regulating mechanisms constitutes a medical emergency. Hypothermia frequently occurs at temperatures above freezing. A wet and windy 30-50 degrees F exposure can be as serious as a subzero exposure.

Important factors to decrease the possibility of cold exposure injury or illness:

- **Planning activities and workouts depends on wind chill temperatures, not ambient temperatures**
- **Wear appropriate clothing. Protective clothing (gloves, hats, etc.) should be emphasized during participation.** (dress in layers and try to stay dry)
- **Maintain energy levels** (via the use of meals, energy snacks and carbohydrate/electrolyte drinks)
- **Stay hydrated:** avoid alcohol, caffeine, nicotine and other drugs that cause water loss, vasodilatation or vasoconstriction of skin vessels
- **Minimize fatigue and exhaustion as these deplete energy levels**
- **Warm-up properly prior to activity**
- **Use a partner during cold weather workouts**

Wind speed interacts with ambient temperature to significantly increase body cooling. When the body and clothing are wet (whether from sweat, rain, snow, or immersion), the cooling is even more pronounced due to the evaporation of the water held close to the skin by the wet clothing.

Temp	Risk	Guide
WCT < 50 F	Hypothermia / Chilblain Risk	- Appropriate clothing - No break in activity
WCT 39 to 33 F	Hypothermia / Frostnip Risk	- Appropriate clothing including pants, headgear, and gloves - Layers, wicking clothing - No break in activity
WCT 32 to 31 F	Mild Frostbite Risk	- Appropriate clothing including pants, headgear, and gloves (especially bench players) Extremities covered. - 45 minutes exposure / 15 minutes indoors
WCT 30 to 25 F	Frostbite Risk	- Appropriate clothing including pants, headgear, and gloves (especially bench players) Extremities covered. - 30 minutes exposure / 20 minutes indoors
WCT 25 F and <	Severe Frostbite Risk	- No outside practices - All activity must be indoors
For Games / Events		*For WCT's below 31 ^o F, game officials / facilities staff / and medical staff will discuss need to modify game procedures and re-warming procedures as needed for safety of student-athletes.

Signs and Symptoms of Cold-Related Injuries (NATA)

Condition	Sign or Symptom
<u>Hypothermia</u>	
Mild	Core temperature 98.6 F to 95F (37C–35C) Amnesia, lethargy Vigorous shivering Impaired fine motor control Cold extremities Polyuria Pallor Rhinorrhea Typically conscious Blood pressure within normal limits
Moderate	Core temperature 94F to 90F (34C–32C) Depressed respiration and pulse Cardiac arrhythmias Cyanosis Cessation of shivering Impaired mental function Slurred speech Impaired gross motor control Loss of consciousness Muscle rigidity Dilated pupils Blood pressure decreased or difficult to measure
Severe	Core temperature below 90F (32C) Rigidity Bradycardia Severely depressed respiration Hypotension, pulmonary edema Spontaneous ventric fibrillation or cardiac arrest Usually comatose
<u>Frostbite</u>	
Mild / superficial	Dry, waxy skin Erythema Edema Transient 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

Skin is hard and cold
Skin may be waxy and immobile
Skin color is white, gray, black, or purple
Vesicles present
Burning aching, throbbing, or shooting pain
Poor circulation in affected area
Progressive tissue necrosis
Neurapraxia
Hemorrhagic blistering occurs w/in 36 to 72 hrs
Muscle, peripheral nerve, joint damage likely

Chilblain / pernio

Red or cyanotic lesions
Swelling
Increased temperature
Tenderness
Itching, numbness, burning, or tingling
Skin necrosis
Skin sloughing

Immersion (trench) foot

Burning, tingling, or itching
Loss of sensation
Cyanotic or blotchy skin
Swelling
Pain/sensitivity
Blisters
Skin fissures or maceration