

## Working In the Cold – Preventing Cold Stress

Workers who are exposed to extreme cold or work in cold environments, such as snow cleanup crews and sanitation workers, may be at risk of cold stress. Cold stress is the body’s response to cold temperatures resulting from heat loss from a portion of the body. A cold environment forces the body to work harder to maintain its temperature, and when temperatures drop below normal and wind speed increases, heat will leave the body more quickly. Prolonged exposure to cold or freezing temperatures may cause serious health problems and, in extreme cases, death.

## Health Effects from Exposure to Cold Environments

**HYPOTHERMIA** – This occurs when body heat is lost faster than it can be replaced, and the normal body temperature (98.6°F) drops to less than 95°F. Hypothermia can be fatal without immediate medical attention.

### Early Symptoms

- Shivering
- Fatigue
- Loss of coordination
- Dizziness
- Confusion or disorientation

### Late Symptoms

- Shivering stops
- Blue skin
- Slowed pulse and breathing
- Reduced alertness
- Loss of consciousness

### Treatment

- Seek medical attention.
- Move worker into a warm room.
- Remove wet clothing and replace with dry clothing.
- Cover the worker with layers of blankets.
- If alert, have the worker drink warm beverages.
- Call 911 if there is no pulse and begin CPR.

**FROSTBITE** – This is an injury to the body that is caused by freezing. Frostbite typically affects the extremities, particularly the feet and hands.

### Symptoms

- Reduced blood flow to hands and feet
- Numbness
- Tingling or stinging
- Aching
- White or waxy looking skin
- Swelling or blisters

### Treatment

- Seek medical attention.
- Move worker into a warm room.
- **Do not** rub area or apply dry heat.
- **Do not** use a heating pad, heating lamp, or radiator for warming.
- Immerse affected area in warm, not hot, water.
- If alert, have the worker drink warm beverages.

**TRENCH FOOT (IMMERSION FOOT)** – A nonfreezing injury caused by prolonged exposure to wet and cold temperatures. Trench foot can occur at temperatures as high as 60°F if the feet are constantly wet. This injury occurs because wet feet lose heat 25 times faster than dry feet. To prevent heat loss, the body constricts blood vessels to shut down circulation in the feet. Lack of oxygen and nutrients causes skin tissue to die and nerve damage to occur.

### Symptoms

- Reddening of the skin
- Numbness
- Leg cramps
- Swelling
- Tingling pain
- Blisters or ulcers
- Gangrene

### Treatment

- Seek medical attention.
- Remove shoes/boots and wet socks.
- Avoid walking.



## Cold Stress Prevention

**Employers** should take the following steps to protect their workers:

- Train workers on how to prevent and recognize cold stress illnesses and injuries and how to apply first aid treatment.
- Provide training on the importance of monitoring yourself and co-workers for cold stress symptoms and the use of Personal Protective Equipment (PPE).
- Allow for appropriate rest periods.
- Provide warm areas for use during breaks.
- Provide warm beverages to workers.
- Provide engineering controls (example: radiant heaters to warm workers or shielding work areas from wind to reduce wind chill).
- Monitor workers who are at risk of cold stress.

**Workers** should take the following steps to protect themselves:

- Wear several layers of loose clothing.
- Make sure the ears, face, hands, and feet are protected.
- Wear boots that are waterproof and insulated.
- Dress properly for the cold, including wearing a hat.
- Move to warm locations during breaks.
- Carry cold weather gear (e.g., extra socks, gloves, hats, blankets).
- Avoid touching cold metal surfaces with bare skin.
- Monitor your physical condition as well as the physical condition of co-workers.

## Resources

- Wind Chill Chart: <http://www.nws.noaa.gov/om/winter/windchill.shtml>

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## Training

Workers have been trained to recognize the signs of frostbite.

Workers know how to administer first aid for frostbite.

Workers have been trained to recognize the signs of hypothermia.

Workers have been trained on precautions to take when working in the cold and on the proper use of protective clothing and equipment.

Workers understand the effect alcohol and drugs have on the risk of hypothermia. *(These substances affect the body's ability to retain heat – blood vessels stay widened allowing heat to escape. Being under the influence can impair an individual's judgment toward the cold.)*

## Work Practices

Temperature and wind are controlled as much as possible. Heaters, wind shields, and windbreaks are used when feasible.

Workers in cold jobs are rotated when possible.

**Machine controls modified to accommodate mittens or gloves (if applicable).**

There are plenty of warm liquids readily available on site. Workers are drinking plenty of fluids, as dehydration occurs readily in the cold.

A warm shed, trailer, or van is provided so workers can take breaks and warm up. Workers are taking frequent breaks.

Skin contact with cold metal is prohibited.

Workers periodically touch their extremities (fingers, toes, ears, nose, and cheeks) to detect numb or hard areas (frostbite).

Workers use the "buddy system" to recognize signs of frostbite and hypothermia in each other.

In extreme cold or high wind chill conditions, all skin is kept covered.

First aid supplies and equipment are available.

## Protective Clothing

Workers wear layers of loose clothing.

Clothing is kept dry.

Workers wear full head coverings.

Workers wear mittens or gloves.

In cold and wet conditions (e.g., snow, sleet, hail) workers wear waterproof boots.

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