



Safety Training & Environmental Protection, LLC

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Protecting Workers from Cold Stress Injuries

As the winter season progresses falling temperatures leave many workers across North America exposed to cold stress related injuries.

Illnesses that may develop include trench foot, frostbite and hypothermia. In addition just being in the cold can limit a person's range of motion, creating a possible workplace hazard. This article will examine cold stress illnesses and treatment options.

Limited range of motion

While the pumping of blood away from the limbs to increase the temperature of the torso is not a sign of a cold stress illness, it can create a workplace hazard. This natural response limits the flexibility and agility in the hands and feet. This loss of flexibility/agility can affect a person's ability to grip and carry objects or move away from pinch points. To limit this hazard keep your limbs warm by wearing gloves and socks that are heavy enough to keep you warm, but to also maintain flexibility.

Trench Foot

Trench foot occurs when feet are cold and damp while wearing constricting footwear. Unlike frostbite, trench foot does not require freezing temperatures and can occur in temperatures up to 60° Fahrenheit. The condition can occur with as little as thirteen hours' exposure.

Symptoms of trench foot include tingling, itching, burning pain and swelling of the feet. More advanced cases can also include blisters and infection.

Trench foot is easily prevented by keeping the feet warm and dry. To treat trench foot move the victim to a warm area, soak feet in warm water and wrap with a dry towel.

Frost Bite

At or below 32 °F (0 °C), blood vessels close to the skin start to constrict, and blood is shunted away from the extremities. In extreme cold, or when the body is exposed too cold for long periods, this protective strategy can reduce blood flow in some areas of the body to dangerously low levels. This lack of blood leads to the eventual freezing and death of skin tissue in the affected areas. There are four degrees of frostbite. Each of these degrees has varying degrees of pain.

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The treatment steps for frostbite are as follows:

- Get into a warm room as soon as possible.
- Unless absolutely necessary, do not walk on frostbitten feet or toes-this increases the damage.
- Immerse the affected area in warm-not hot-water (the temperature should be comfortable to the touch for unaffected parts of the body).
- Warm the affected area using body heat; for example, the heat of an armpit can be used to warm frostbitten fingers.
- Do not rub or massage the frostbitten area; doing so may cause more damage.
- Do not use a heating pad, heat lamp, or the heat of a stove, fireplace, or radiator for warming. Affected areas are numb and can be easily burned.

Hypothermia

Hypothermia is a condition in which core temperature drops below the required temperature for normal metabolism and body functions. Symptoms of hypothermia vary depending on the level of hypothermia. The four levels of hypothermia are mild, moderate, severe and critical.

The basic principles of rewarming a hypothermic victim are to conserve the heat they have and replace the body fuel they are burning up to generate that heat. Let's take a look at how to treat mild and moderate to critical hypothermia.

Mild hypothermia

Victims of mild to moderate hypothermia are still conscious and can be treated without medical attention. Follow these guidelines to treat a person with mild hypothermia.

- Handle the victim gently and minimize his or her exertion.
- Remove wet clothing and get the victim into warm, dry clothes and wrap the victim in warm blankets — make sure the victim's head is covered. Place something warm and dry under the victim. Move the victim to a warm environment. Do not make the victim exercise to warm up.
- Do not suppress shivering, even if violent. Shivering is the most effective way to generate body heat.
- Do not massage the extremities (hands, arms, legs, feet, etc.) or the trunk.
- Do not place the victim in a warm bath or shower.

Moderate to critical hypothermia

Victims of moderate to severe hypothermia have an altered level of consciousness and fluctuating changes to their heart and respiratory rate. They may be shivering and their core body

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temperature is usually below 91.4 degrees Fahrenheit or 33°C. If someone is suffering from critical hypothermia dial 911 immediately then follow these steps:

- Handle the victim gently. Rough handling can cause heartbeat irregularities and death.
- Check for airway obstructions and breathing or circulation problems and take appropriate action if there are any abnormalities in these areas. Initiate CPR only if there is no pulse present after a full one-minute assessment.
- If CPR is necessary, assist breathing at 10 to 12 breaths per minute. Do not start cardiac massage unless it can be continued effectively without a break. It is more dangerous to start, stop, and re-start CPR rather than to wait until proper care is available.
- Remove all wet clothing and replace with dry, layered coverings. Wrap the victim in warm blankets or a sleeping bag. If this is not possible, cover the victim with warm dry clothing or blankets. Make sure the victim's head is covered. Place something warm and dry under the victim.
- Move the victim to a warm, dry environment.
- Do not suppress shivering, even if it is violent. Shivering generates body heat.
- Do not give anything by mouth because of the high risk of vomiting.
- Do not massage the trunk or extremities of the victim.
- Do not place the victim in a hot bath or shower.
- If available, heated, humidified air or oxygen should be administered.
- Continue first aid treatment even if the victim appears lifeless. The body can sometimes survive for hours without signs of life at very low body temperatures.
- Know how to assess hypothermia and give help when it is needed, even if the victim resists help. The victim may be confused and unaware of what is happening and may deny assistance when it is needed.
- Arrange rapid transport to the nearest medical facility

Chilblains

Chilblains are caused by the repeated exposure of skin to temperatures just above freezing to as high as 60 degrees F. The cold exposure causes damage to the capillary beds (groups of small blood vessels) in the skin. This damage is permanent and the redness and itching will return with additional exposure. The redness and itching typically occurs on cheeks, ears, fingers, and toes.

Symptoms

Symptoms of chilblains include:

- Redness
- Itching
- Possible blistering
- Inflammation
- Possible ulceration in severe cases

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First Aid

Workers suffering from chilblains should:

- Avoid scratching
- Slowly warm the skin
- Use corticosteroid creams to relieve itching and swelling
- Keep blisters and ulcers clean and covered

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