

# REFERENCE GUIDE

A Loss Control Service from Donegal Insurance Group



## Cold Stress

### Introduction

Cold stress? Is this a hazard I should be concerned about? Section 5(a)(1) of the Occupational Safety and Health Act, also known as the General Duty Clause, states that “employers must provide their employees with a workplace free from recognized hazard(s) likely to cause death or serious physical harm”. According to the Centers for Disease Control and Prevention (CDC), on average, 689 Americans died each year after exposure to extreme cold. Men are particularly at risk, with 66% of hypothermia-related deaths occurring in men. The numbers can be considerably higher in certain states.

When temperatures drop below normal and wind speeds increase, heat leaves the body more rapidly and can cause a cold stress condition. Cold stress can occur both from outside jobs as well as jobs within facilities without adequate sources of heat. The definition of extreme cold can vary across different areas of the country. For example, near freezing temperatures could be considered “extreme cold” for regions of the country that typically do not experience winter weather.

Major industries impacted by cold stress include construction, home building, trucking, sanitation, landscaping services, emergency response, police and firefighting to name a few.

### Risk Factors and Types of Cold Stress Conditions

Risk factors that contribute to cold stress include wet/damp environments, dressing improperly, exhaustion, poor physical condition and other health concerns. Consider the individual’s medical history if they are working in exposed environments, since those with a history of diabetes, hypothyroidism, hypertension or cardiovascular disease are more likely to experience cold stress. Unfit and older workers also are more vulnerable to extremes in temperature.

Hypothermia, frostbite, trench foot, and Chilblains are the most common cold-induced conditions. Hypothermia occurs when the body’s heat is lost faster than it can be replaced; body temperature may fall to less than 95-degrees Fahrenheit (F). Although most cases are caused by winter temperatures, temperatures above 40 degrees can also cause hypothermia, if the body becomes chilled from rain, wind, and submersion into cold water. Symptoms of hypothermia include:

- Body shivering will not stop.
- Worker will begin to lose coordination, become confused and disoriented.
- Pupils become dilated, pulse and breathing become slowed.
- Loss of consciousness.

A person who presents these symptoms should be treated by professional medical personnel immediately. Call 911 if the person is very confused or unconscious. If you can, move the person inside to a warm and dry room. If an inside room is not available, OSHA (Occupational Safety & Health Administration) recommends removing wet clothes and replace with dry clothes or wrap the person in blankets with a vapor barrier, such as a tarp or garbage bags (not over the head or face). If conscious, give the person warm, sweet drinks to increase body temperature. If available, place warm (not hot) bottles of water or warming packs under the person’s armpits, along the sides of chest and in the groin area.

Frostbite is the freezing of the skin and underlying tissue and typically affects the body extremities. Symptoms include reddened skin developing into gray/white patches; numbness; skin feels firm or hard; and blisters may occur and permanent damage to body parts is possible, severe cases can result in amputations. To provide assistance to the victim, follow the same OSHA recommended procedure for hypothermia. Do not rub the affected area since this will cause more damage. Do not put affected area in cool, warm or hot water. Get the person to a medical professional as soon as possible.

Trench foot is caused by the prolonged exposure to wet and cold temperatures. Reportedly, this condition can occur at temperatures as high as 60 degrees F if the feet are constantly wet. Symptoms include redness of the skin, swelling, numbness, and blisters. To treat, OSHA suggests immediately removing wet shoes, boots and socks, and drying the feet, and then seeking medical attention.

Chilblain's condition is caused by the repeat exposure of skin to temperature from freezing to 60 degrees F. This exposure causes damage to the capillary beds in the skin and the damage is permanent. This condition causes redness and itching (and in severe cases blistering and ulcerations) in the cheeks, ears, fingers and toes. According to NIOSH (National Institute for Occupational Safety & Health), treatment consists of slowly warming the skin and using corticosteroid creams to relieve itching. If blister and ulcerations occur, seek medical attention.

### **How to Reduce Cold Stress Exposure**

The effects of cold stress can be mitigated by employers through training employees on prevention, recognition, and first aid treatment for this condition and by providing engineering controls such as radiant heaters or other safe methods of generating heat for those working in cold quarters. For outdoor construction projects, build wind blocks to work behind to reduce the effects of cold wind on the body. Construct or identify warming locations and schedule periodic breaks so workers can warm up and hydrate. Hydration and food help keep the body fueled and generating heat. Dehydration can occur in cold conditions as well as warmer conditions.

Most importantly, wearing proper clothing for conditions and dressing in layers can significantly reduce the risk. In general, proper layering should consist of the following:

- Inner layer of wool, silk or synthetic fiber undergarment to wick moisture away from the body.
- A mid-layer of wool or synthetic garment to provide insulation even when wet.
- An outer layer that stops wind and rain but allows ventilation to prevent overheating.
- A hat or snug fitting hood to keep most of the body heat from escaping from the head.
- In extreme cold conditions, a ventilated face mask should be worn to protect the nose and mouth areas.
- Insulated gloves and boots that provide protection from wet environments.

### **References & Additional Information**

[OSHA Emergency Preparedness and Response](#)

[CDC Working in the Cold](#)

[CDC Winter Weather Preventing Hypothermia](#)

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