



WEATHERING THE WINTER: KEEPING WORKERS SAFE IN THE COLD





Weathering the Winter: Keeping Workers Safe in the Cold

by Langdon Dement

During the winter and in extreme weather events like the Polar Vortex, workers are at risk for health emergencies. Cold weather can lead to danger for workers outside or in poorly insulated or unheated areas, particularly in fields such as sanitation, construction, emergency response, delivery, or transportation. Weather-related conditions can also pose a risk for drivers on slippery roads and for those responsible for snow removal. What happens in the cold, and how can workers stay safe?

What is cold stress?

According to the Occupational Safety and Health Administration (OSHA), cold stress occurs by driving down the skin temperature and eventually, the internal body temperature. As the body is unable to warm itself, serious illness and injuries, permanent tissue damage, and death could result. Types of cold stress include hypothermia, cold water immersion, trench foot, frostbite, and chilblains.

The temperature threshold for cold stress and its associated effects are different across the country. For regions that are not used to winter weather, temperatures close to freezing are considered risk factors for cold stress. In other areas, risk factors for cold stress can be:

- wetness/dampness, improper dress, and exhaustion;
- predisposing health conditions such as hypertension, hypothyroidism, and diabetes; and
- poor physical conditioning.

Hypothermia

Hypothermia—abnormally low core body temperature—occurs when cold temperatures cause the body to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. Hypothermia begins to occur at a body temperature of 95° or about three degrees lower than a typical body temperature around 98.6°. A body temperature that is too low affects the brain, making the victim unable to think clearly or move well.





Early symptoms of hypothermia include:

- Shivering
- Fatigue
- Loss of coordination
- Confusion and disorientation

Late symptoms include:

- No shivering
- Blue skin
- Dilated pupils
- Slowed pulse and breathing
- Loss of consciousness

Anyone suffering from hypothermia should be evaluated by a health professional. In most cases, early symptoms of hypothermia can be treated by moving the person to a warmer environment, removing wet clothing, and providing warm, non-alcoholic and non-caffeinated beverages. Moderate or severe hypothermia requires immediate emergency assistance.

Cold Water Immersion/ Trench Foot

Cold water immersion creates a specific condition known as immersion hypothermia. Cold water immersion develops much more quickly than standard hypothermia because water conducts heat away from the body 25 times faster than air. For example, hypothermia can occur in any water temperature below 70°F. Anyone who has been immersed in cold water for any period of time should be dried, warmed, and evaluated for hypothermia.

Trench foot, also known as immersion foot, is an injury of the feet resulting from prolonged exposure to wet and cold conditions. Trench foot can occur at air temperatures as high as 60°F and in as little as 13 hours if the feet are constantly wet. To prevent heat loss, the body constricts blood vessels to shut down circulation in the feet. As a result, skin tissues begin to die because of the lack of oxygen and nutrients and due to the buildup of toxic products. Workers at risk of trench foot should wear water-resistant footwear and take care to keep feet warm, clean, and dry. A medical professional should evaluate any potential instance of trench foot.

Symptoms of trench foot include:

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



Frostbite

Frostbite results from skin tissue freezing. It can cause permanent damage to the body, infection, and nerve damage, and in severe cases lead to amputation. Exposed skin in cold, windy conditions is at the highest risk, but even covered skin can suffer frostbite in extreme temperatures. Those with reduced blood circulation and those not wearing proper clothing (including personal protective equipment) have an increased risk of frostbite. Before frostbite develops, cold skin can be rewarmed. Once frostbite is established, the patient requires professional medical care.

Symptoms of frostbite include:

- Reduced blood flow to hands and feet
- Numbness
- Tingling or stinging
- Aching
- Bluish or pail, waxy skin

Chilblains

Chilblains are the painful, itchy inflammation of capillaries in the skin due to sudden warming from cold temperatures just above freezing to as high as 60°F. The repeated cold exposure causes damage to the capillary beds in the skin. This damage is permanent and the redness and itching may return for years with additional exposure. Chilblains most often develop on the extremities, such as ears, nose, fingers, and toes. In general, chilblains will resolve on their own within a few weeks, although they can lead to infection and severe skin damage if the skin blisters. Treatment may include corticosteroid creams to help relieve itching, prescription medication to increase blood flow, and infection prevention or antibiotics if necessary.

Symptoms of chilblains include:

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

Prevention of Cold Stress

Although there is no specific OSHA standard for cold stress, under section 5(a)(1) of the OSH Act of 1970 (the general duty clause) each employer:

- “Shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.”

This portion of the standard covers workers and employers’ duties to keep those workers safe. Employers should train workers on working safely, provide engineering controls, and use safe work practices when dealing with cold, dangerous conditions. Employers should provide cold stress training that includes:



- How to recognize the environmental and workplace conditions that can lead to cold stress.
- The symptoms of cold stress, how to prevent cold stress, and what to do to help those who are affected.
- How to select proper clothing for cold, wet, and/or windy conditions.

Employers should also:

- Monitor workers' physical condition.
- Schedule frequent short breaks in warm, dry areas to allow the body to warm up.
- Schedule cold jobs for the warmest part of the day.
- Provide warm, sweet beverages that do not include alcohol.
- Provide engineering controls such as radiant heaters.

Other Cold-weather Hazards

Cold stress is not the only hazard that workers face during the winter months. Carbon monoxide (CO) poisoning, winter driving, shoveling snow, working at heights while clearing snow, and walking safely on snow and ice are all additional concerns during this time of year.

Carbon Monoxide Poisoning

According to the Centers for Disease Control and Prevention (CDC), more than 400 people per year die in the United States from accidental carbon monoxide poisoning. After winter storms or other major natural disasters cause power outages, alternative sources of fuel or electricity for heating, cooling, cooking, or working can cause CO to build up in living/working quarters and create a hazardous environment. Vehicles idling in garages can also cause dangerous levels of CO to build up, as can portable heaters that use fuels such as kerosene. Tools which produce combustion fumes such as small gasoline engines, stoves, generators, and lanterns all generate CO. As a result, it is vital to ensure these sources are ventilated out and are not enclosed in spaces.

It is imperative to be able to recognize the symptoms of CO poisoning and understand how to prevent it. CO is an odorless and colorless gas that can cause sudden illness and death if inhaled, creating a dangerous, unsuspected hazard that is easy to overlook. The most common symptoms of CO poisoning are headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion. Carbon monoxide poisoning requires immediate evacuation from the area and emergency medical attention.

Winter Driving

Driving in the winter can mean dealing with wet, slippery roads, limited visibility, and fewer daylight hours. Black ice, snow squalls, and whiteout conditions can pop up with very little warning, causing increased danger for vehicles and pedestrians alike. Drivers should be trained on defensive driving techniques and learn how to contend with winter driving hazards like skids and fishtails. Those travelling long distances or in lightly-populated zones should consider using reliable communication channels such as CB radio, and keep extra blankets and provisions on hand in case of accident or stranding.



Snow Hazards

Clearing away a fresh coat of snow can be a dangerous endeavor. Falls are likely in slippery conditions, as are lower back and other musculoskeletal injuries while shoveling heavy snow. Clearing roofs and other overhangs can be dangerous for those at heights and for those who might be struck by falling ice and snow. Some workers might even face the risk of a cardiac event due to exertion. Workers should be careful to use proper techniques and protective equipment, and take frequent breaks as necessary.

Stay Safe

Understanding the hazards that are associated with the winter months and implementing precautions can help prevent injury and save lives. Awareness, preparation, and proper training are essential when combating not only cold stress and other winter conditions, but any workplace hazard that organizations face.

AUTHOR

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