Cold Stress Guide

Working in the Cold

Anyone working in a cold environment may be at risk of cold stress. Some workers may be required to work outdoors in cold environments and for extended periods, for example, snow cleanup crews, sanitation workers, police officers and emergency response and recovery personnel, like firefighters, and emergency medical technicians.

How Cold is Too Cold?

What constitutes extreme cold and its effects can vary across different areas of the country. In regions that are not use to winter weather, near freezing temperatures are considered "extreme cold." A cold environment forces the body to work harder to maintain its temperature. Whenever temperatures drop below normal and wind speed increases, heat can leave your body more rapidly. Cold stress occurs by driving down the skin temperature and eventually the internal body temperature (core temperature). This may lead to serious health problems, and may cause tissue damage, and possibly death.

Some of the risk factors that contribute to cold stress are:

- Wetness/dampness, dressing improperly, and exhaustion
- Predisposing health conditions such as hypertension, hypothyroidism, and diabetes
- Poor physical conditioning

Most of the body's energy is used to keep the internal core temperature warm, however, over time the body will begin to shift blood flow from the hands, feet, arms, and legs (extremities)and outer skin to the chest and abdomen (core). This change in blood flow can cause the extremities to be prone to frostbite and hypothermia.

Common cold induced Iilnesses/ Injuries include: Hypothermia, Frostbite, and Immersion/Trench Foot.

Hypothermia

Hypothermia 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 is most likely at very cold temperatures, but it can occur even at cool temperatures (above 40°F), if a person becomes chilled from rain, sweat, or submersion in cold water.

Take Action

Call 911 immediately in an emergency; otherwise seek medical assistance as soon as possible.

- Move the person to a warm, dry area.
- Remove wet clothes and replace with dry clothes, cover the body (including the head and neck) with layers of blankets; and with a vapor barrier (e.g. tarp, garbage bag). Do not cover the face.
- If medical help is more than 30 minutes away:
  - Give warm sweetened drinks if alert (no alcohol), to help increase the body temperature. Never try to give a drink to an unconscious person.
  - Place warm bottles or hot packs in armpits, sides of chest, and groin. Call 911 for additional rewarming instructions.

Reddened skin, numbness, skin burning, and blisters are indications of frostbite. Longer exposure to the extreme cold may cause the skin to turn gray or black.

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Frostbite

Frostbite is an injury to the body that is caused by freezing of the skin and underlying tissues. The lower the temperature, the more quickly frostbite will occur. Frostbite typically affects the extremities, particularly the feet and hands. Amputation may be required in severe cases.

Frostbite Symptoms

- Reddened skin develops gray/white patches.
- Numbness in the affected part, skin burning sensation, pins and needles.
- Feels firm or hard.
- Blisters may occur in the affected part, in severe cases.

Take Action

- Follow the recommendations described above for hypothermia.
- Do not rub the affected area to warm it because this action can cause more damage.
- Do not apply snow/water. Do not break blisters.
- Loosely cover and protect the area from contact.
- Do not try to rewarm the frostbitten area before getting medical help; for example, do not place in warm water. If a frostbitten area is rewarmed and gets frozen again, more tissue damage will occur. It is safer for the frostbitten area to be rewarmed by medical professionals.
- Give warm sweetened drinks, if the person is alert. Avoid drinks with alcohol.

Immersion/Trench Foot

Trench Foot or immersion foot is caused by prolonged exposure to wet and cold temperatures. It can occur at temperatures as high as 60°F if the feet are constantly wet. Non-freezing injury occurs because wet feet lose heat 25-times faster than dry feet. To prevent heat loss, the body constricts the blood vessels to shut down circulation in the feet. The skin tissue begins to die because of a lack of oxygen and nutrients and due to the buildup of toxic products.

Immersion/Trench foot syndrome is a medical condition caused by prolonged exposure of the feet to damp, unsanitary, and cold conditions.

Trench Foot Symptons

- blisters
- redness , blotchy skin
- skin tissue that dies and falls off
- coldness, heaviness, numbness
- pain when exposed to heat
- persistent itching
- prickliness
- tingling

Take Action

- Call 911 immediately in an emergency; otherwise seek medical assistance as soon as possible.
- Remove the shoes, or boots, and wet socks.
- Dry the feet.

Safety Tips for Workers

- Your employer should ensure that you know the symptoms of cold stress.
- Monitor your physical condition and that of your coworkers.
- Dress properly for the cold.
- Stay dry in the cold because moisture or dampness, e.g., from sweating, can increase the rate of heat loss from the body.
- Keep extra clothing (including underwear) handy in case you get wet and need to change.
- Drink warm sweetened fluids (no alcohol).
- Use proper engineering controls, safe work practices, and personal protective equipment (PPE) provided by your employer.

SAFETY TRAINING SIGN-IN

Company Name: _____ Date: _____

Subject: Cold Stress Guide

The following employees participated in this training.

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