

COLD STRESS

The information in this SOP is a compilation of information and recommendations offered by the National Institute of Occupational Safety and Health (NIOSH) and the United States Occupational Safety and Health Administration (OSHA) on the topic of cold stress. Additional information on this topic is available on these agency's web sites.

Cold stress is a term used to describe the range of personal injuries/illnesses that can result upon exposure to cold environments, and range from mild to severe. The severity of injury/illness depends on a number of factors including harshness of the environment and a person's susceptibility to such conditions, among others. Effects may include hypothermia, frostbite, chilblains, and even death. Risks are greater when the skin is wet or damp. Certain physical conditions can also put a person at greater risk, including poor physical condition, hypertension, hypothyroidism, and diabetes.

Cold Stress Injuries/Illnesses

Hypothermia. In cold weather the body may lose heat faster than it is produced. Prolonged exposure will eventually use up all the body's stored energy, resulting in an abnormally low body temperature. If low body temperature affects the brain, a person may not be able to think clearly or realize they are in trouble. Early warning signs include shivering, fatigue, and loss of coordination. As the condition worsens, pupils may dilate, pulse and breathing will slow, and loss of consciousness can occur. Death may result.

Frostbite. Frostbite is an injury caused by freezing of the skin and underlying tissues, characterized by reduced blood flow, leading to lack of feeling and color in the affected body parts. Most often the body parts affected are nose, fingers, toes, ears, cheeks or chin. Warning signs include: numbness, aching, tingling or stinging, bluish or pale skin, and skin that feels unusually firm or waxy. Blistering may occur in severe cases.

Chilblains. Repeatedly exposing skin to cold temperatures can cause permanent damage to groups of small blood vessels in the skin, characterized by redness and itching that returns with subsequent exposures. Body parts most often affected are cheeks, ears, fingers and toes. Warning signs include: redness, itching, blistering/ulcers, and inflammation.

Prevention

Prevention is always the best policy to avoid cold stress. Following are some precautions workers should take to avoid cold stress.

- **Wear appropriate clothing.** Layered clothing, loose and not too tight, provides insulation yet allows good blood circulation. An inner layer of wool, silk or synthetic keeps moisture away from the body. A middle layer of wool or synthetic provides insulation even when wet. The outer layer should resist penetration by wind and moisture, but also allow for some ventilation to protect from overheating.
- **Protect your feet.** Wear insulated and waterproof footwear that provides good traction.
- **Cover your head, face, and ears** to reduce body heat loss and protect sensitive skin.
- **Protect your hands** by wearing insulated and moisture resistant gloves.
- **Try to schedule work** for the warmest/driest/least windy part of the day. Take regular breaks in a warm, dry, and protected area. Limit the total amount of time outside during extremely cold weather.
- **Stay hydrated** by drinking plenty of fluids, especially warm fluids.
- **Avoid exhaustion or fatigue**, because energy is necessary to keep muscles warm.
- **Be aware of any medical conditions or medications that might make you more susceptible** to cold stress.
- **Monitor your physical condition** and that of your co-workers. You may not be aware of warning signs that a co-worker would be able to observe.
- **Inform yourself** of anticipated weather conditions, including the wind chill factors.

First Aid

When experiencing symptoms of cold stress:

- Seek shelter in a warm, dry area.
- Remove wet clothing, and replace with dry clothing.
- Cover the body with blankets. As necessary and available, use warmer packets/bottles in groin, armpits and on torso.
- If conscious, sip warm, sweet, non-alcoholic drinks.
- Summon emergency help for severe cases of hypothermia, labored breathing, or weak pulse.
- Seek medical attention for moderate or severe cases of frostbite. Let the medical professionals implement skin-warming techniques (other than loosely covering affected area with blankets or cloth). Do not rub frostbitten skin.
- Remain alert to and monitor for changing physical conditions.