Extreme or prolonged cold exposure (usually combined with strenuous physical activity) can induce hypothermia, the most dangerous cold disorder. Hypothermia occurs when the body's core temperature begins to drop. Early signs that this is happening are: uncontrolled shivering, slow, slurred speech and a weak pulse. As the condition progresses we may become confused and drowsy. Once our core temperature reaches 32 ° C (89.6°F). Shivering stops and consciousness becomes clouded; pulse rate, blood pressure and respiration will be dropping significantly. At 24 °C (75.2F) the lungs fill with fluid (this is called pulmonary edema). The heart stops completely at 20 °C (68F).

Fatal cases of hypothermia usually occur because a worker could not escape the cold or escape from immersion in the icy water. When wet-either from exposure or sweating-body heat is lost very quickly. Most hypothermia cases have occurred at air temperatures between –1°C (30°F) and 10°C (50°F). (The danger of hypothermia is increased by using alcohol and prescription drugs like sedatives.) People have been revived from hypothermia. Workers in cold environments should be trained to recognize signs of hypothermia and how to manage an emergency.

PREVENTING COLD INJURIES

To prevent injuries and cold-disorders we need to keep dry and keep warm. Here are some suggestions:

- *Provide heated trailers, shelters or other warm areas.*
- *Schedule outdoor work during the warmest part of the day and plan a work/rest schedule to avoid prolonged exposure to the cold. (Factor in wind chill when deciding to do outdoor work and setting up work schedules.) The lower the temperature or the higher the wind speed, the more breaks should be taken.*
- *Shield work area from wind and drafts.*
- *If working in a cold environment, eat well balanced meals.*
- *Provide general and spot heating when tasks require long periods of exposure.*
- *Workers should be allowed to get acclimated to the cold before working full time in a cold environment.*
- *Wear insulated layer clothing. Use gloves when handling metal objects.*
- *Use a buddy system. Keep workers under observation when temperature is 10.4 ° or below (especially when they are working near water).*
- *Workers who must travel for extended periods in the cold weather should have an extra supply of clothing in the vehicle.*
- *Working in cold dry air can cause more water loss than usual. Regular fluid replacement is a must. Warm fluids are commended but caffeine and alcoholic beverages should be avoided.*
- *Workers should be made aware of the signs of any cold disorders and be trained in appropriate first aid techniques.*

This brochure is not a complete summary of your obligations, nor is the information provided intended to determine full compliance with any state or federal law concerning this health and safety issue, or as a substitute for medical or legal advice.

For more information contact:

Workers' Compensation Education Unit
RI Department of Labor and Training
462-8100 choose option #1
www.dlt.state.ri.us

RI Department of Health/OSHA Consultation Service
(401) 222-2438
www.health.state.ri.us/

US Department of Labor/OSHA
(401) 528-4669
www.osha.gov

RI Committee on Occupational Safety and Health
(401) 751-2015
www.coshnetwork.org/RICOSH.htm

Equal opportunity employer/program. Auxiliary aids and services are available upon request to individuals with disabilities.

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Hazards of Hot and Cold Conditions

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Hazards of Hot and Cold Conditions

Weather can be dangerous. It is important for those who work outdoors to be aware of the dangers, the signs of injury and the way weather hazards can be controlled.

According to the Occupational Safety & Health Administration:

High Temperature + High Humidity + Physical Work = Heat Illness

Operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for inducing heat stress in employees
When the body is unable to cool itself through sweating, ***serious heat illnesses*** *may occur. The most severe heat-induced illness are:* **heat exhaustion and heat stroke**

The signs/symptoms of **heat exhaustion** *include:*
headache - nausea - vertigo - weakness - thirst

Heat exhaustion *should not be dismissed lightly. Fainting from heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended.*

When the body temperature rises to critical levels, **heat stroke** *is a medical emergency. If the body temperature is too high, death can occur.*

Symptoms of **heat stroke** *include:*

Dry pale skin with no sweating - hot red skin that appears sunburned - mood changes such as irritability - confusion

The person should be placed in a shady area and outer clothing removed. Replace fluids and wet the person's skin. Do not allow the person to leave the site or be left unattended unless authorized by a medical professional .
The medical outcome of an episode of ***heat stroke*** *depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.*

Other heat induced illnesses include:

Heat Collapse *("Fainting") - may lose consciousness as the brain does not receive enough oxygen because blood pools in the extremities, onset of heat collapse is rapid and unpredictable.*

Heat Cramps *- are painful cramps in the legs, arms or stomach muscles. It is important to understand that cramps can be caused by both too much and too little salt. Recent studies have shown that drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.*

Heat Rashes *- the most common problem in hot work environments. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.*

Heat Fatigue *- The use of a program of acclimatization and training for work in hot environments is advisable. The signs and symptoms of heat fatigue include impaired performance of skilled sensorimotor, mental, or vigilance jobs. There is no treatment for heat fatigue except to remove the heat stress before a more serious heat-related condition develops.*

Controlling Heat On The Job

- *Ventilation, air cooling, fans, shielding, and insulation are the five major types of engineering controls used to reduce heat stress in hot work environments.*
- *The worker should be allowed to take frequent rest breaks in a cooler environment.*
- *Cool (50°-60°F) water or liquid (except alcoholic beverages) should be available. Drink small amounts frequently e.g. one cup every twenty minutes.*

Additionally, there are a number of things that can be done to control the threat of heat injury:

- *Additional heat breaks should be provided to anyone showing signs of heat related strain or fatigue. This is especially important for new employees or workers just back from vacation, an illness, or layoff who are not yet used to the heat environment.*
- *Heavy work should be done during the coolest part of the day.*
- *Workers should have time to acclimate themselves to heavy, hot work.*
- *Dedicated first aid training on heat disorders should be a priority in every hot work area or for every work crew.*
- *Workers in chemical protective clothing should work a buddy system and be observed for any medical problem.*

COLD WEATHER HAZARDS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. Prolonged exposure to freezing or cold temperatures may cause serious health problems such as **trench foot**, **frostbite** *and* **hypothermia**.

Hypothermia *can occur when land temperatures are above freezing or water temperatures are below 98.6° F/37°C. Normal body temperature (98.6°F/37°C) drops to or below 95°F/35°C.*
In extreme cases, including cold water immersion, exposure can lead to death. If any of the following signs are observed, call for emergency help.

- *Uncontrolled shivering*
- *Slurred speech*
- *Clumsy movements*
- *Fatigue*
- *Confused behavior*

Frostbite - Seek Medical Attention Quickly

Freezing in deep layers of skin and tissue: pale, waxy-white skin color; skin becomes hard and numb; usually affects the fingers, hands, toes, feet, ears, and nose are all symptoms of frostbite.

Trenchfoot

Similar to frostbite, the feet become swollen and itchy, and then very painful. The skin may blister and die. Trenchfoot is caused by long periods of exposure to cold and dampness. It may involved the tip of the nose and ear as well as to the feet.

Workers Are at Increased Risk When ...

- *They have predisposing health conditions like cardiovascular disease, diabetes and hypertension*
- *They take certain medications*
- *They are in poor physical condition, or are older*

Suggestions on How To Protect Workers

- *Recognize dangerous conditions*
- *Lean the signs of cold-induced injuries and illnesses and what to do*
- *Encourage workers to wear proper clothing*
- *Train workers about cold-induced injuries and illnesses*
- *Frequent short breaks in warm dry shelters*
- *Avoid exhaustion or fatigue - energy is needed to keep muscles warm*
- *Use the buddy system - to recognize danger signs*
- *Drink warm beverages and avoid caffeine or alcohol*
- *Eat warm, high calorie foods*