

Cold Stress – Hypothermia

Safety Training Handout

Introduction

People who work outside or enjoy outdoor recreational activities face certain risks. Hypothermia is one of these risks that is often overlooked or not recognized. Because hypothermia can affect reasoning and judgment, you can quickly find yourself in a life-or-death situation without realizing that you are in danger.

Definition

Hypothermia is defined as, “a decrease in core body temperature to a level at which normal muscular and cerebral functions are impaired.” The most common cause of this loss of body temperature is exposure to cold and/or wet conditions. When exposed to cold conditions, the body can lose heat through a variety of routes, including conduction (contact with cold or wet objects, such as snow or wet clothing), convection (heat being carried away from the body by wind, i.e. wind chill) and evaporation (sweating and respiration). Once the body’s core temperature begins to drop, the symptoms of hypothermia will start to appear.

Recognition

The symptoms of hypothermia are varied and depend on the body’s core temperature. A person suffering from a mild case may exhibit shivering and a lack of coordination, while a person suffering from severe hypothermia may be incoherent, exhibit muscular rigidity and can potentially succumb to cardiac arrest. The chart below shows the correlation between core body temperature and hypothermia symptoms.

Severity of Hypothermia	Body Temperature (°F)	Symptoms
Mild	98.6-97	Shivering begins.
	97-95	Cold sensation, skin numbness, goose bumps, lack of hand coordination.
Moderate	95-93	Intense shivering, general lack of muscular coordination, slow or stumbling pace, mild confusion, pale skin.
	93-90	Violent shivering, gross lack of muscular coordination, mental sluggishness, amnesia, difficulty speaking.
Severe	90-86	Shivering stops, muscular stiffness, extreme confusion or incoherence, irrational behavior, inability to stand, skin appears blue and/or puffy.
	86-82	Muscular rigidity, semiconscious, pulse and respiration decrease, dilation of pupils, skin ice-cold to touch.
	82-78	Unconsciousness, pulmonary edema, pulse and heart-beat erratic, cardiac and respiratory failure, death.

Treatment

Once it is determined that someone is suffering from hypothermia, it is critical to begin treatment immediately, even in cases of mild hypothermia. In hypothermia cases, the first, and most important, step is to eliminate the victim's exposure to cold or wet conditions (i.e. seeking shelter if outdoors). Treatment methods, which vary depending on the severity hypothermia, are as follows:

- **Mild Hypothermia**—Remove all wet clothing and replace it with warm, dry clothes. Encourage the victim to stay active and to drink a warm (not hot), sugary liquid. Avoid offering liquids containing alcohol and/or caffeine, as alcohol can increase heat loss and caffeine tends to cause dehydration.
- **Moderate Hypothermia**—Again, replace all wet clothing with warm, dry clothes. Be sure to cover the victim's head, as this is a major source of heat loss. If the victim is able to swallow without danger, give them warm, sugary liquids to drink. Place warm objects, such as hot water bottles, next to the victim's head, neck, chest and groin to help increase core body temperature; body-to-body contact is also an effective means of warming the victim. Finally, take the victim to a medical facility as soon as possible.
- **Severe Hypothermia**—A person suffering from severe hypothermia may easily be mistaken for dead. Even if the victim is cold, rigid and has no detectable pulse, continue treatment! (There are numerous cases where a seemingly lifeless victim was brought back to full consciousness and good health.) It is vital that a person suffering from severe hypothermia get to a medical facility as quickly as possible, even before treatment is attempted. While waiting for professional assistance, replace the victim's wet clothing with warm, dry clothing. Always handle the victim gently; when the heart reaches temperatures below 90°F, it is very susceptible to cardiac arrest. If the victim does suffer a cardiac arrest, administer CPR until professional help arrives.

Prevention

There are several steps you can take to reduce your risk of hypothermia before you head out into cold, wet conditions. These steps include:

- Wear proper clothing. The ideal clothing for extended periods in a cold and/or wet environment consists of a breathable layer next to the skin (such as cotton or polypropylene), an insulating middle layer (wool, which continues to insulate even when wet, is a good choice) and a waterproof, but breathable, outer layer (such as nylon or Gore-Tex).
- Stay hydrated when outdoors.
- Use the buddy system when spending time out-doors, if possible.
- Be familiar with the signs of hypothermia. Early recognition of hypothermia can help prevent you from facing a life or death situation.
- Remember, workers face increased risks when they take certain medications, are in poor physical condition or suffer from illnesses such as diabetes, hypertension or cardiovascular disease.