

QUICK LINKS

Cold-Related Injury—TRAVELER INFORMATION

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Traveler Information

COLD-RELATED INJURY

INTRODUCTION

When travel plans include outdoor activities in a chilly environment, especially at altitude or if rain is expected, travelers should take extra precautions to avoid hypothermia and other cold-related conditions.

COLD ADAPTATION

Humans are poorly adapted to cold. The body gains radiant heat from a warm or hot environment (sunlight or indoors) and generates heat through metabolism (digestion, exercise, or shivering). Heat is lost when exposed to a cold environment (exposure, wet, and evaporation); it is retained by insulation (shelter and suitable clothing).

COLD-RELATED INJURY

Hypothermia is a dangerous drop in the body's core temperature and is defined as a body core temperature < 35°C (95°F). When exposed to cold temperatures, the body begins to lose heat faster than it can be produced. Hypothermia can occur even on days that seem mild, especially if the weather is wet and windy. Many hypothermia deaths have occurred in weather that is -1 to 10°C (30-50°F).

- Even mild hypothermia 32-35°C (90-95°F) affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it.
 - Initial symptoms include shivering, fatigue, loss of coordination, stumbling, loss of awareness, and confusion.
- Below 32°C (90°F), symptoms include loss of shivering, blue skin, dilated pupils, weak pulse, abnormal heart rhythms and breathing, and loss of consciousness.

Treatment of hypothermia:

- In the event of hypothermia, move the victim into a warm room or shelter. Remove wet clothing. In mild cases, administering warm drinks and wrapping the victim in blankets may suffice. Severe cases need more vigorous management. Warm the center of the body first (chest, neck, head, and groin) using an electric blanket, if available, or skin-to-skin contact in a sleeping bag or under layers of dry blankets, clothing, towels, etc. Warm drinks may help if the patient is conscious and able to swallow.
- Intensive treatment of hypothermia often has life-threatening complications and should be attempted only in a medical center. The low metabolic rate associated with hypothermia is protective, and, therefore, when treated properly, individuals may be successfully resuscitated after prolonged hypothermia. Conventional wisdom is that *"no patient is dead until they are warm and dead."*

Immersion hypothermia occurs when skin temperature is kept below 12°C (54°F) for prolonged periods, usually in cold water. This may paralyze nerves and muscles, as well as causing hypothermia, and leads to drowning.

To treat, extract the victim from the water and dry him or her; dress the victim in warm clothes, wrap in blankets, or warm up gradually as described above.

Frostbite is an actual freezing of body tissues, most commonly of the fingers, toes, and nose. Symptoms include pain, numbness, swelling, itching, and white, hard skin.

Treatment of frostbite: Thaw the frozen body part(s) in water at 40-42°C (104-108°F) for 15-30 minutes 3-4 times per day; however, do not thaw unless the area can be kept thawed. For example, if a hiker must be able to walk to obtain help, do not start the warming

process. Refreezing the injured area causes damage that is worse than the original frostbite. Freezing and thawing are very painful, and strong analgesics may be needed. Do not manipulate blisters.

RISK FACTORS

- Wet skin or clothing
- Wind: A still air temperature of 5°C (41°F) equates to -50°C (-58°F) if the wind speed is 40 kph (25 mph).
- Complete immersion in cold water
- Persons who are small and/or thin
- Old age, especially when coupled with immobility, malnutrition, or illness
- Drugs that impair consciousness or cause vasodilatation, especially alcohol

PREVENTION

- Dress appropriately.
 - Wear layers of loose, soft clothing; pockets of air between the layers create additional insulation. Two or three thin woolen pullovers are more efficient than a single thick pullover.
 - Add or remove layers if the weather changes or the level of activity changes.
 - Carry an outer jacket of windbreaker-type material.
 - If there is any chance of precipitation, wear a moisture-resistant all-covering jacket and trousers as the outermost layer. The material should be able to “breathe” (be permeable to water vapor).
 - Take along water-resistant shoes or boots, a hat, and mittens or gloves.
- Seek shelter if becoming cold or wet.
- Think twice about a long swim in water below 21°C (70°F) unless wearing a wet suit.
- Watch for symptoms of hypothermia in others.

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