

## Hypothermia

Hypothermia is a dangerously low body temperature.

Hypothermia results when the body loses more heat than can be replaced by increasing metabolism (through exercise) or by increasing warming from external sources, such as a fire or the sun. Wind increases heat loss, as does sitting or lying on a cold surface or being immersed in water. Sudden immersion in very cold water may cause fatal hypothermia in 5 to 15 minutes; however, a few people, mostly infants, have survived for as long as 1 hour completely submerged in ice water. The shock shuts off all systems, essentially protecting the body. Hypothermia may also occur after prolonged exposure in only moderately cool water.

People at greatest risk are those who are lying immobile in a cold environment—such as those who have had a stroke or who are unconscious from intoxication or injury. Because they are not moving, these people generate less heat and also are unable to leave the cold environment. Such people are at risk of becoming hypothermic even when the surrounding temperature may be only as cold as 55 or 60° F. The very young and the very old are at particular risk. People in these age groups often do not compensate for cold as well as young adults and are dependent on others to anticipate their needs and keep them warm. Very old people quite often become hypothermic from sitting immobile in a cold room for hours. Infants lose body heat rapidly and are particularly susceptible to hypothermia.

### Symptoms

The symptoms of hypothermia usually develop so gradually that neither the person himself nor others realize what is happening. Initial symptoms include intense shivering and teeth chattering. As body temperature falls further, shivering stops and movements become slow and clumsy, reaction time is longer, thinking is blurred, and judgment is impaired. The person may fall, wander off, or simply lie down to rest. If body temperature continues to fall, shivering stops, which is an ominous sign. At that point, the person becomes more sluggish and slips into a coma. The heart and breathing rates become slower and weaker. Eventually the heart stops.

The lower the body temperature, the higher the risk of death. Death may occur at body temperatures below 88° F but is most likely to occur below 83° F.

### Diagnosis and Treatment

Doctors diagnose hypothermia by measuring body temperature, typically with a

rectal thermometer. Conventional thermometers do not record below 94° F, thus special thermometers are needed to measure temperatures in severe hypothermia.

In the early stages, changing into warm dry clothing or drinking hot beverages can bring about recovery. If the person is found unconscious, further heat loss is prevented by wrapping the person in a warm dry blanket and, if possible, moving him to a warm place while arrangements are made for immediate transportation to a hospital. Often, no pulse can be felt and no heartbeat can be heard, although the heart may be beating weakly. The person must be handled gently, because a sudden jolt may cause an irregular heart rhythm (arrhythmia) that could be fatal. For this reason, if the person appears to be breathing, even very shallowly, cardiopulmonary resuscitation (CPR) is not recommended outside of a hospital. Because it is so difficult for untrained people to detect very faint respirations and heartbeats, some doctors do not recommend CPR for any hypothermic person outside a hospital.

In the hospital, doctors warm the person with warmed oxygen and heated fluids given intravenously or passed into the abdominal or chest cavity through plastic tubes inserted into those areas. In addition, the blood may be warmed through the process of hemodialysis (in which the blood is pumped out of the body, through a filter with a heating attachment, and back into the body) or with a heart-lung machine (which pumps blood out of the body, heats the blood, adds oxygen, and then returns the blood to the body).

Because some people with hypothermia who have arrived at the hospital with no signs of life have recovered, doctors usually continue resuscitation efforts until the person is warmed but still shows no signs of life.