

**Hypothermia** is reduced body temperature that happens when a body dissipates more heat than it absorbs. In humans, it is defined as a body core temperature below 95.0 °F. Symptoms depend on the temperature. In mild hypothermia there is shivering and mental confusion. In moderate hypothermia shivering stops and confusion increases. In severe hypothermia there may be paradoxical undressing, in which a person removes his or her clothing, as well as an increased risk of the heart stopping.

- **Mild**

Symptoms of mild hypothermia may be vague, with shivering, high blood pressure, fast heart rate, fast respiratory rate, and contraction of blood vessels. These are all physiological responses to preserve heat. Increased urine production due to cold, and mental confusion may also be present.

- **Moderate**

Low body temperature results in shivering becoming more violent. Muscle mis-coordination becomes apparent. Movements are slow and labored, accompanied by a stumbling pace and mild confusion, although the person may appear alert. Signs to watch out for, and a good and easy catchphrase to remember, are the mumbles, fumbles, stumbles and grumbles: They might start mumbling while trying to communicate, their coordination will start to suffer. Simple tasks that require basic coordination will be hard to complete. They may start to stumble a bit and lumber as they walk. They may start grumbling and complaining. The key thing about the mumbles, fumbles, stumbles and grumbles is that the person themselves may well be oblivious to them and they may still even seem outwardly alert to an observer. Surface blood vessels contract further as the body focuses its remaining resources on keeping the vital organs warm. The subject becomes pale. Lips, ears, fingers, and toes may become blue.

- **Severe**

As the temperature decreases, heart rate, respiratory rate, and blood pressure all decrease. Difficulty speaking, sluggish thinking, and amnesia start to appear; inability to use hands and stumbling are also usually present. Below (86 °F, the exposed skin becomes blue and puffy, muscle coordination very poor, and walking almost impossible, and the person exhibits incoherent/irrational behavior, including terminal burrowing or even stupor. Pulse and respiration rates decrease significantly, but fast heart rates (ventricular tachycardia, atrial fibrillation) can also occur. Major organs fail. Clinical death occurs.

- **Paradoxical undressing**

Twenty to fifty percent of hypothermia deaths are associated with paradoxical undressing. This typically occurs during moderate to severe hypothermia, as the person becomes disoriented, confused, and combative. They may begin discarding their clothing, which, in turn, increases the rate of heat loss.

- **Terminal burrowing**

An apparent self-protective behavior known as terminal burrowing, or hide-and-die syndrome, occurs in the final stages of hypothermia. The afflicted will enter small, enclosed spaces, such as underneath beds or behind wardrobes. It is often associated with paradoxical undressing. This happens mostly in cases where temperature drops slowly.

**Prevention**

Appropriate clothing helps to prevent hypothermia. Synthetic and wool fabrics are superior to cotton as they provide better insulation when wet and dry. Some synthetic fabrics, such as polypropylene and polyester, are used in clothing designed to wick perspiration away from the body, such as liner socks and moisture-wicking undergarments. Clothing should be loose fitting, as tight clothing reduces the circulation of warm blood. Covering the head is effective, but no more effective than covering any other part of the body. While common folklore says that people lose most of their heat through their heads, heat loss from the head is no more significant than that from other uncovered parts of the body.

**Treatment**

Aggressiveness of treatment is matched to the degree of hypothermia. Treatment ranges from noninvasive, passive external warming to active external rewarming, to active core rewarming. Moving the person as little and as gently as possible is recommended as aggressive handling may increase risks of a dysrhythmia.

**Rewarming**

Rewarming can be done with a number of methods including passive external rewarming, active external rewarming, and active internal rewarming. Passive external rewarming involves the use of a person's own ability to generate heat by removing any wet clothing and providing properly insulated dry clothing, placing the person in a dry sleeping bag or extra jacket, and moving to a warm environment. It is recommended for those with mild hypothermia. Active external rewarming involves applying warming devices externally, such as a heating blanket. In wilderness environments, hypothermia may be helped by placing a hot water bottle wrapped in a dry towel or t-shirt in both armpits and groin. Use your own body heat if nothing else is available. These methods are recommended for moderate hypothermia. Warm sweetened liquids can be given provided the person is alert and can swallow (avoid caffeinated beverages like coffee or tea, which can worsen hypothermia). Active core rewarming involves the use of intravenous warmed fluids and similar methods by medical professionals.