

Everything you need to know about hypothermia

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Hypothermia happens when the body temperature falls below a safe level, and it can be fatal. Infants and older people are especially at risk.

Under healthy conditions, the body maintains a relatively stable temperature of around 98.6°F or 37°C.

If the environment gets too cold or the body is unable to produce sufficient heat, the core temperature can drop, and hypothermia can develop.

Between 2003 and 2013, more than 13,400 people died from hypothermia in the United States, according to the [Centers for Disease Control and Prevention \(CDC\)](#).

What is hypothermia?



Hypothermia happens when the body cannot produce enough energy to keep warm. Older people and children are especially susceptible.

Hypothermia is a severe condition in which the body temperature drops to an abnormally low level. It occurs when the body is unable to produce enough heat to counter the heat that it is losing.

The part of the brain that controls body temperature is called the hypothalamus. When the hypothalamus recognizes changes in body temperature, it initiates body responses to bring the temperature back in line.

The body produces heat during routine metabolic processes in cells that support vital bodily functions. Most heat leaves the body through the skin's surface by the processes of convection, conduction, radiation, and evaporation.

If the environment becomes colder, the body shivers. This increase in muscle activity generates more heat. However, if the body loses heat more quickly than it can make it, the core temperature will fall.

As the temperature falls, the body shunts blood away from the skin to reduce the amount of heat that escapes.

Instead, it directs blood flow to the vital organs of the body, such as the heart, lungs, kidney, and brain. The heart and brain are most sensitive to lower temperatures, and electrical activity in these organs slows down when they become cold.

If the body temperature keeps falling, the organs begin to fail, ultimately leading to death.

Hypothermia is the opposite of hyperthermia, which involves an elevated body temperature and can present as heat exhaustion or heat [stroke](#).

Symptoms



A person can become disoriented and may not take action to get warm.

As hypothermia sets in, it becomes more challenging to think, move, and take preventive action. This is dangerous because it means that people who have hypothermia will not seek to keep themselves warm and safe.

The body starts to slow down as the temperature drops. If the person stops shivering, it can be a sign that their condition is getting worse.

The individual is at risk of lying down, falling asleep, and dying. In some cases, people will paradoxically remove their clothes just before this occurs.

Treatment

Treatment depends on the degree of hypothermia, but the aim will be to make the person warm.

Treatments include the following:

First aid treatment

Anyone with symptoms of hypothermia will need immediate medical assistance.

Until medical assistance arrives, taking the following action can help:

- moving the person to a warm, dry place, if possible, or sheltering them from the elements
- removing wet clothing, cutting items away if necessary
- covering their whole body and head with blankets, leaving only the face clear
- putting the individual on a blanket to insulate them from the ground
- monitoring breathing and carrying out CPR if breathing stops
- providing skin-to-skin contact, if possible, by removing clothing and wrapping yourself and the individual in the blanket together to transfer heat
- providing warm drinks, if the individual is conscious, but no alcohol or caffeine

It is vital not to use direct heat, such as heat lamps or hot water, as this can damage the skin. It can also trigger irregular heartbeats and, potentially, lead to cardiac arrest.

Do not rub or massage the person either, as these potentially jarring movements could also cause cardiac arrest.

Clinical treatment

According to [an article](#) published in the American Family Physician (AFP), the journal of the American Academy of Family Physicians (AAFP), the following techniques can help treat hypothermia.

Passive external rewarming: This uses the individual's heat-generating ability. It involves removing their cold, wet clothing, ideally replacing it with adequately insulated, dry clothing, and moving them to a warm environment.

Active external rewarming: This involves applying warming devices, such as hot-water bottles or warmed forced air, externally to truncal areas of the body. For example, the individual could hold a hot-water bottle under each arm.

Active core rewarming: This uses warmed, intravenous fluids to irrigate body cavities, including the thorax, peritoneum, stomach, and bladder. Other options include getting the individual to inhale warm, humidified air, or applying extracorporeal rewarming by using a heart-lung machine.

Do [not give a person alcohol](#) if they have signs of hypothermia, and avoid giving any drinks to an unconscious person.

A person with severe hypothermia may not seem to have a [pulse](#) or be breathing. If they appear to be dead, the [CDC advise](#) bystanders to give CPR while keeping the person warm and waiting for emergency help. It is possible that this may resuscitate them.

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Stages

Hypothermia generally progresses in three stages from mild to moderate and then severe.

According to the [AAFP](#), the signs and symptoms of these stages are as follows:

Stage	Body temperature	Signs and symptoms
Mild	90°F to 95°F (32.2°C to 35°C)	High blood pressure, shivering, rapid breathing and heart rate, constricted blood vessels, apathy and fatigue , impaired judgment, and lack of coordination.
Moderate	82.4°F to 90°F (28°C to 32.2°C)	Irregular heartbeat, a slower heart rate and breathing, lower level of consciousness, dilated pupils, low blood pressure , and a decrease in reflexes.
Severe	Less than 82.4°F (28°C)	Labored breathing, nonreactive pupils, heart failure , pulmonary edema , and cardiac arrest.

Additional symptoms of hypothermia may include:

Mild:

- dizziness
- hunger and nausea
- difficulty speaking

Moderate to severe:

- shivering may stop
- slurred speech
- significant confusion
- drowsiness
- apathy or lack of concern

- weak pulse

When a person has severe hypothermia, they may no longer know what they are doing, due to a [change in mental consciousness](#).

Paradoxical undressing

Back in 1979, [researchers](#) described a phenomenon known as paradoxical undressing.

In paradoxical undressing, people remove their clothes despite the cold. As a result of doing this, they lose more body heat, which can be fatal. This can happen during the later stages of hypothermia as the person becomes disoriented, confused, and possibly combative.

Although there is a lack of research on this situation, anecdotal evidence suggests that [20–50 percent](#) of deaths from hypothermia are due to paradoxical undressing.

In infants

Infants lose body heat more easily than adults, and they cannot shiver to keep warm.

Infants with hypothermia may have:

- bright red skin
- cold skin
- very low energy
- a weak cry

Infants should not sleep in a cold room. Using extra blankets is not a solution as there is a risk that these can smother the infant.

The [CDC suggest](#) making alternative arrangements if it is not possible to maintain a warm space where an infant can sleep.

Prevention

Understanding and being prepared for hypothermia is integral to its prevention.

People are at higher risk if they:

- work outdoors in cold weather
- practice snowsports, watersports, or other outdoor activities
- are at home during winter weather, especially older people
- are stranded in a vehicle in severe winter conditions
- are sleeping rough
- have other medical conditions
- use alcohol or illicit drugs

At home

To prevent hypothermia indoors, the [National Institute on Aging \(NIA\)](#) recommend the following:

- heating the room you are using to 68–70°F and closing off other rooms to save on heating bills
- insulating your home, by either making building improvements or laying down rolled-up towels to stop drafts
- arranging for someone to check on you regularly if you live alone

Stranded in a motor vehicle

Anyone who becomes stranded in a motor vehicle should move everything they need from the trunk into the vehicle.

They should run the car for 10 minutes every hour, making sure that snow is not covering the exhaust pipe and keeping the window open a crack to prevent a buildup of fumes.

People should also consider creating a winter survival kit to keep in the car. The kit should contain nonperishable food, blankets, a first aid kit, water, and necessary medications.

Outdoor activities



Check the weather conditions before going out and dress appropriately.

Tips for avoiding hypothermia when outdoors include:

- checking the weather conditions in advance and preparing accordingly
 - wearing multiple layers of clothing with the innermost layers made of wool, silk, or polypropylene because these materials retain heat better than cotton
 - layering clothing to trap multiple layers of air
- Overexertion will not help, as this can lead to exhaustion and result in sweat-drenched clothing, both of which contribute to heat loss.

A person who begins to experience or show signs of mild hypothermia should retreat to a warmer place immediately to prevent progression to a life-threatening condition.

Other tips

Other tips for a cold environment include:

- wearing a hat or thick scarf on the head, even indoors
- avoiding alcohol
- eating a sufficient number of [calories](#), as additional fat under the skin can protect against cold during a winter weather spell

Hypothermia in summer

Hypothermia can happen in summer too. Excessively cool air-conditioning or water-based activities pose a risk, especially for infants and older people who may not be able to express how they are feeling.

The [National Institutes of Health \(NIH\)](#) recommend keeping room temperatures at 68°F (20°C) or above and closing off rooms that are not in use.

Diagnosis

Observing symptoms and taking a person's temperature with a thermometer can show whether or not they are experiencing hypothermia.

The [BMJ define](#) hypothermia as when a person's body temperature below 95°F (35°C).

An oral thermometer may not show a temperature this low. In either case, it is vital to seek urgent medical attention.