CONDITION

Heat emergencies

Heat emergencies happen when the body cannot control rising temperature and begins to lose normal function.

WHAT IT IS
Dangerous overheating caused by heat or physical exertion

BODY SYSTEM
Whole body, especially brain, heart, kidneys, and muscles

MAIN SYMPTOMS
Heavy sweating, weakness, confusion, collapse

WHAT CAUSES IT
Heat exposure exceeding the body's cooling ability

HOW IT IS DIAGNOSED
Clinical assessment and core body temperature

MAIN TREATMENT
Rapid cooling, fluids, and emergency supportive care

CAN IT BE CURED?
Sometimes - prompt cooling can allow full recovery

IS IT AN EMERGENCY?
Sometimes - confusion, seizure, or collapse means emergency

LONG-TERM OUTLOOK
Usually good, but heatstroke can cause lasting organ damage

Overview

Heat emergencies happen when your body gains more heat than it can release. They may develop during hot weather, inside a hot building or vehicle, or during intense physical activity. High humidity makes sweating less effective because sweat cannot evaporate as easily.

Heat-related illness covers a range of problems. Heat cramps, fainting from heat, and heat exhaustion are usually less severe. Heatstroke is the most serious form. It affects the brain and may damage the kidneys, liver, muscles, heart, and blood-clotting system.

Heatstroke is not simply a high fever. A fever is a regulated rise in temperature caused by illness. In heatstroke, the body's temperature control is failing. Fever-reducing medicines do not correct this problem.

Heatstroke can occur while someone is still sweating. Hot, dry skin is possible, especially in heatstroke caused by prolonged environmental heat, but it is not required for diagnosis.

Rapid recognition and cooling matter. Confusion, unusual behaviour, seizures, loss of consciousness, or collapse during heat exposure should be treated as an emergency.

Symptoms

Symptoms can progress from mild to severe. They do not always appear in a fixed order.

Heat cramps are painful muscle spasms, often in the legs, arms, or abdomen. They usually occur during or after heavy sweating. The person is generally awake and thinking clearly.

Heat fainting, also called heat syncope, is a brief loss of consciousness or feeling faint in the heat. It may happen after standing for a long time or standing up suddenly. Other causes of fainting still need to be considered, especially if there was an injury, chest pain, or ongoing confusion.

Heat exhaustion can cause:

A person with heat exhaustion should remain awake, able to communicate normally, and able to follow instructions. Confusion suggests heatstroke rather than uncomplicated heat exhaustion.

Heatstroke causes brain dysfunction during severe overheating. Warning signs include:

Exertional heatstroke usually develops during hard physical activity. Classic, or non-exertional, heatstroke often develops more gradually during a heatwave, particularly in older people or people who cannot reach a cooler environment.

- Heavy sweating, thirst, weakness, or marked tiredness
- Headache, dizziness, nausea, or vomiting
- Muscle cramps, fast heartbeat, or cool and clammy skin
- Reduced urine output or difficulty continuing an activity
- Confusion, agitation, unusual behaviour, or poor coordination
- Collapse, seizure, or loss of consciousness
- Very high body temperature
- Rapid breathing or heartbeat, with skin that may be wet or dry

Causes and risk factors

Your body normally releases heat through the skin and through evaporating sweat. Illness develops when these systems cannot keep up with heat production or environmental heat.

Strenuous exercise produces large amounts of internal heat. Hot, humid, windless conditions make cooling harder. Heavy, tight, or protective clothing can trap heat and limit sweat evaporation.

Dehydration reduces the body's ability to sweat and maintain circulation. However, drinking water does not make someone immune to heat illness. Heatstroke can occur even when a person has been drinking.

Risk is higher when your body has not had time to adjust to hot conditions. This adjustment, called heat acclimatisation, usually happens gradually with repeated, controlled heat exposure.

Other factors that may increase risk include:

Some medicines can affect sweating, fluid balance, alertness, or the body's response to heat. Examples include diuretics like furosemide or hydrochlorothiazide , some antihistamines like cetirizine or loratadine , anticholinergic medicines, stimulants like methylphenidate or lisdexamfetamine , and certain psychiatric or heart medicines. Do not stop prescribed medicine because of hot weather without medical advice. A pharmacist or prescriber can help you make a heat plan.

- Very young or older age
- Heart, lung, kidney, or neurological conditions
- Diabetes, limited mobility, or an illness causing fever or diarrhoea
- Previous heat illness or poor physical conditioning for the activity
- Alcohol or recreational stimulant use
- Social isolation, homelessness, or lack of access to cooling

Diagnosis

Heat emergencies are diagnosed from the circumstances, symptoms, examination, and body temperature. Treatment should not be delayed while waiting for tests when heatstroke is suspected.

For possible heatstroke, a rectal temperature gives the most reliable measure of core body temperature in an emergency setting. Mouth, forehead, ear, or underarm readings may underestimate the temperature, especially after exercise or cooling has started.

A temperature above 40°C is strongly concerning when brain symptoms are present. However, heatstroke may still be diagnosed at a lower reading if cooling has already begun or the measurement is inaccurate. The key feature is brain dysfunction linked to overheating.

In hospital, blood and urine tests may check electrolytes, kidney and liver function, blood clotting, and muscle injury. An electrocardiogram may assess the heart. Further tests may be needed to rule out infection, low blood sugar, poisoning, stroke, or other causes of collapse.

Treatment and management

Suspected heatstroke needs immediate emergency help and active cooling.

While waiting for emergency care:

Do not give drinks to someone who is confused, having a seizure, vomiting repeatedly, or not fully awake. They could choke. Do not use fever-reducing medicines such as paracetamol or ibuprofen to treat heatstroke. They do not lower temperature in the necessary way and may add risk when organs are under stress.

Cold-water immersion can cool exertional heatstroke quickly. Emergency services should still be contacted. Cooling and arranging transport can happen at the same time when enough help is available.

For heat exhaustion, stop activity and move to a cool or air-conditioned place. Loosen clothing and cool the skin with water, wet cloths, a fan, or a cool shower. If the person is fully alert and not vomiting, they can take frequent sips of cool water. A drink containing electrolytes may be useful after prolonged heavy sweating.

Symptoms should begin to improve with rest and cooling. If they are worsening, do not clearly improve within about 30 minutes, or include confusion or collapse, seek emergency help.

Hospital treatment for heatstroke may include continued cooling, intravenous fluids, oxygen, and close monitoring. Clinicians treat complications such as abnormal electrolytes, kidney injury, muscle breakdown, low blood pressure, seizures, or clotting problems.

- Move the person out of the heat and remove unnecessary outer clothing
- Begin rapid cooling with cool or cold water
- Use cold-water immersion when practical, especially after exertion
- If immersion is not possible, soak the skin, fan continuously, and apply cold packs
- Place an unconscious but breathing person on their side and monitor breathing

Complications

Heat exhaustion usually improves without lasting harm when cooling and fluids are started promptly. Vomiting and ongoing sweating can still lead to dehydration or abnormal levels of sodium and other electrolytes.

Heatstroke can injure several organs. Possible complications include muscle breakdown, known as rhabdomyolysis, and acute kidney injury. Liver damage may appear or worsen over the following days.

Severe overheating can also affect blood clotting, heart rhythm, blood pressure, lungs, and brain. Some people develop ongoing problems with memory, coordination, concentration, or mood. The likelihood of complications rises when effective cooling is delayed.

Falls, head injuries, and other trauma may occur if someone faints or collapses.

Prevention

Many heat emergencies can be prevented, although risk cannot be removed completely during extreme heat, strenuous work, or unexpected exposure.

Check weather and heat alerts before exercise, travel, or outdoor work. Move demanding activity to a cooler time, reduce its intensity, and take planned breaks in shade or air conditioning. Increase heat exposure gradually rather than beginning with a full workload on the first hot day.

Wear lightweight, loose clothing when protective equipment is not required. Drink regularly and replace fluids lost through sweating. Avoid forcing very large amounts of plain water because this can dangerously lower blood sodium. Thirst, activity length, sweating, and medical conditions all affect fluid needs.

Never leave anyone in a parked vehicle, even with a window open. Indoor temperatures can also become unsafe. During hot weather, check on people who live alone, have limited mobility, or may not recognise thirst and overheating.

People who work or train in heat benefit from a clear emergency plan. This includes access to cooling, a way to call for help, and someone who can recognise confusion or declining coordination.

Living with it and what to expect

Mild heat cramps or heat exhaustion often settle over hours after cooling, rest, and fluid replacement. Tiredness, headache, or reduced exercise tolerance may continue into the next day. Returning immediately to strenuous heat exposure can bring symptoms back.

After significant heat exhaustion, it is sensible to avoid hard activity in the heat until you feel fully recovered. Medical review is appropriate if symptoms persist, urine output remains low, or you have a condition that affects fluid balance.

Recovery from heatstroke is less predictable. Some people recover fully, while others need days or weeks of hospital care and follow-up. Kidney, liver, muscle, or neurological problems may become apparent after the body temperature has returned to normal.

Follow-up may include blood tests and a gradual return to work, sport, or heat exposure. A previous heat illness does not always cause permanent heat intolerance. However, returning too soon, remaining on a contributing medicine, or having lasting organ effects may increase future risk.

Emotional reactions are also possible after a collapse or emergency admission. Concerns about exercising or being outdoors often improve with a planned, gradual return and advice suited to your health and activity.

When to get medical help

Call emergency services now if someone exposed to heat has confusion, unusual behaviour, a seizure, severe loss of coordination, collapse, or loss of consciousness. Start cooling immediately while help is being arranged.

Emergency assessment is also needed if the person has difficulty breathing, chest pain, repeated vomiting, signs of shock, or symptoms that are rapidly worsening.

Seek urgent medical advice for suspected heat exhaustion that does not clearly improve after about 30 minutes of rest and active cooling. Get advice sooner if the person is pregnant, medically vulnerable, unable to drink safely, or has very little urine.

Routine follow-up is appropriate after heatstroke, a hospital-treated heat illness, repeated episodes, or symptoms that continue after the heat exposure has ended. This review can check recovery, medicines, organ function, and plans for returning to heat or exercise.

Common questions

What is the difference between heat exhaustion and heatstroke?

Heat exhaustion causes symptoms such as heavy sweating, weakness, headache, nausea, and dizziness, but normal thinking is preserved. Heatstroke affects brain function. Confusion, unusual behaviour, seizures, or unconsciousness make it an emergency.

Can you have heatstroke if you are still sweating?

Yes. Sweating does not rule out heatstroke. People with exertional heatstroke are often sweating heavily. Focus on brain symptoms, severe overheating, and the circumstances rather than whether the skin is dry.

Should I give someone with heatstroke cold water to drink?

Only give fluids if the person is fully awake, thinking clearly, able to swallow, and not vomiting. Do not give anything by mouth to a confused, drowsy, seizing, or unconscious person.

Does paracetamol help heatstroke?

No. Paracetamol and similar fever medicines do not treat the uncontrolled overheating that causes heatstroke. Rapid physical cooling and emergency medical care are needed.

How long does heat exhaustion last?

Symptoms should start improving after cooling, rest, and safe fluid replacement. Tiredness may last into the next day. Symptoms that worsen, include confusion, or fail to improve within about 30 minutes need urgent assessment.

Can heatstroke cause permanent damage?

It can. Some people recover fully, especially with rapid cooling. Others develop lasting kidney, liver, muscle, or brain problems. The outcome is influenced by the severity of overheating, other health conditions, and how quickly cooling begins.

Sources

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