

# Patient information from BMJ

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## Heat stroke

Heat stroke is a medical emergency that happens when someone's body temperature becomes dangerously high. This can cause organ damage and sometimes death.

Heat stroke often affects older people during the summer months. If you think that someone is suffering from heat stroke, call an ambulance right away.

### What is heat stroke?

Heat stroke is when someone's body temperature becomes dangerously high. It is a **medical emergency that needs immediate treatment**.

Doctors say that a dangerously high temperature is above **40°C (104°F)**.

Most of us suffer from the effects of extreme heat at some time, either in hot weather or if we exercise hard in a warm environment. If we get so hot that it causes physical symptoms, this is called **heat illness**.

Mild heat illness can cause symptoms such as swelling and muscle cramps. But it's not always dangerous, and we usually just need to take simple steps to cool down.

But if someone becomes overheated and doesn't manage to cool down, their condition can get worse. It can then become what doctors call **heat stroke**. This is the most dangerous type of heat illness.

Without treatment, heat stroke can stop the body's main organs, including the lungs, kidneys, and liver from working properly. It can even cause them to fail completely, which can cause death.

### Causes of heat stroke

A common cause of heat stroke is long spells of hot weather, or **heat waves**, during the summer months. Hot weather can be especially dangerous for **older people**, whose bodies are not able to cool themselves as well as younger people's.

People living in **urban areas** seem to be more at risk during hot weather, as densely built-up towns and cities can trap heat so that it can't disperse.

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As well as being older, other things that make someone more likely to suffer from heat stroke include:

- high-intensity **exercise** in hot or humid conditions
- being in poor physical condition. This makes it harder for your body's systems to cool down
- having what doctors call **impaired cognition**. This could mean being affected by certain mental health conditions or by dementia. Or it could just mean mentally slowing down a little as we get older. These things can stop people from spotting the signs of overheating
- needing help taking care of yourself
- certain medicines. These include diuretics, antidepressants, and antihistamines among others
- having certain medical conditions, including diabetes and heart disease
- not being used to local weather conditions (called being **acclimatised**). For example, if you travel to a hot and humid country and you're not used to that kind of climate, you might need to take things easy for a few days
- being dehydrated
- being unable to take a break when working in hot conditions, and
- being unable to find shelter or shade in hot conditions.

## What are the symptoms?

The symptoms of heat stroke can include:

- an altered mental state. This can vary from being confused to losing consciousness (blacking out)
- being agitated and irritable
- being slow and lethargic
- seizures
- problems with balance, speech, and coordination
- headache
- anxiety
- dizziness
- weakness, and
- nausea and vomiting.

## What treatments work?

As you would expect, the main treatment for someone suffering from heat stroke is to reduce their body temperature to a safe level as quickly as possible.

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But the medical staff will be careful not to reduce someone's temperature by too much, because being too cold can be dangerous.

Doctors also need to check that someone's organs are working properly, and to do what they can to get them working normally if they're not. This will probably mean doing some tests, such as blood tests.

**Reducing body temperature quickly** is ideally done by placing the person into **cold water**. If someone is being treated in a place where it's not possible to do this, doctors can use **ice packs**.

Doctors will probably also use ice packs when it's not safe or wise to immerse someone in cold water. For example, ice would be used if someone:

- is not conscious
- is not cooperating with treatment - perhaps because they are panicking
- has heart problems, or
- is dehydrated and needs immediate fluids into a vein before any other treatments.

As well as treatments to reduce body temperature, someone with heat stroke might also be given:

- oxygen to breathe, and
- intravenous fluids - this means being given fluids directly into a vein. This gets a mixture of water, salt, and sugar into the body as quickly as possible.

If someone needs emergency treatment for heat stroke before they can be taken to hospital, there are things that can help to cool them down quickly, such as:

- taking them to a cooler place
- removing excess clothing
- fanning the skin, and
- wetting and cooling the skin with cool-water towels and ice packs, if possible.

But these things should only be done if it's clear that their symptoms are being caused by heat and not something else.

## Preventing problems with heat

We can't do anything about the weather, and heat waves are becoming more common in many parts of the world.

But there are things we can do to help prevent problems, especially when we know warm weather is coming. For example, people who are more likely to have problems in the heat, such as older people, can:

- make sure they stay hydrated by drinking plenty of fluids. But **avoid alcohol**. Alcohol causes dehydration

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- stay in a cool place, if possible, and
- wear loose, light clothing.

### What to expect in the future?

Heat stroke can continue to cause dangerous inflammation (swelling) in the body's tissues for some time after the initial problem. So you should avoid warm conditions for a couple of days after even a mild bout of heat illness.

Having heat stroke once means that you have an increased chance of having it again. So you might want to be careful when in warm conditions in the future.

If you have had medical treatment for heat stroke, you should:

- avoid exercise for at least seven days
- exercise in a cool environment when you start exercising again
- exercise gently at first, and gradually increase exercise to your normal level over about two weeks.

Most people recover well from heat stroke, but it can cause death. This is more likely in older people, whose organs are not able to withstand the damage from heat stroke as well as younger people's.

About 5 in 100 young healthy people with severe heat stroke will die from it. But about half of older people with severe heat stroke will not survive.

Some people have long-term complications because of organ damage caused by heat stroke. For example, heat stroke can cause problems with the liver, kidneys, or lungs.

You are more likely to make a good recovery if you get treatment quickly and are in fairly good general health.

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