

Patient information from BMJ

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Hypernatremia

If you have hypernatremia you don't have the right balance of water and sodium in your blood. It is often caused by dehydration.

Hypernatremia can be extremely dangerous if not treated quickly, and many people with hypernatremia don't survive. But hypernatremia is usually the result of other serious health problems.

What is hypernatremia?

Hypernatremia means that your blood doesn't have the right balance of water and a mineral called **sodium**. It's often caused by lack of water (**dehydration**).

This means that the sodium in your blood, which is usually helpful, can now cause serious problems.

Why is sodium important?

Sodium helps to control how water flows through the cells in your body.

- If you have **too little sodium**, too much water can flow into certain parts of your body. For example, too much water flowing into the brain can cause it to swell.
- If you have **too much sodium (hypernatremia)**, it can cause the brain to shrink. Both swelling and shrinking of the brain can be very dangerous in different ways.

Many people with hypernatremia don't survive. But it's often too simple to say that hypernatremia causes death. This is because hypernatremia is often caused by other health problems, which can be life threatening by themselves.

They can include things like:

- Problems that cause severe **diarrhea and vomiting**, which lead to water loss, and which also mean that people are unable to drink enough water, or to drink water without vomiting
- **Kidney problems**
- **Dementia**. People with dementia often don't drink enough fluids

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- Conditions that affect someone's ability to feel thirsty. These can include **brain tumors** and other conditions that physically affect the brain
- A type of diabetes called **diabetes insipidus**, where the body struggles to retain water. This is rare, as most people with diabetes insipidus either have the condition under control, or have a normal thirst
- Things that make you sweat a lot, such as fever, heat exposure, and burns (these things don't usually cause hypernatremia, but they can make it worse).

Hypernatremia can also be caused by what's called **sodium overload**. This means that someone consumes, or is given too much sodium in a short period of time. This can happen in various ways, including:

- Being given too much fluid that contains sodium (usually slightly salty water, called saline) into a vein, while in the hospital
 - Problems with medications that contain a lot of sodium
 - Swallowing a lot of sea water. This can happen to people who are rescued from the sea
 - Deliberately drinking bleach as an act of self harm
 - Eating too much salt by accident. This usually happens when people mistake salt for sugar. This is especially dangerous for children
- Problems during kidney dialysis.

Medications that can be linked to hypernatremia include:

- Lithium, which is used to treat mood disorders such as bipolar disorder
- Diuretics. These drugs are used to treat conditions where too much water can build up in the body. But sometimes they can cause people to lose too much fluid
- Some laxatives, and
- Charcoal, which is used to treat some types of poisoning.

What are the symptoms?

Symptoms of hypernatremia can be hard to spot. They usually depend on what has caused the problem.

For example, in older people, **dehydration** over time can lead to hypernatremia. Symptoms of dehydration in older people can include:

- Dry mouth
- Feeling thirsty, and
- Dark-colored urine.

Hypernatremia that comes on very quickly - for example, because of sodium overload - can cause the brain to shrink. This can cause symptoms including:

- Tiredness
- Weakness, and

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- Mood symptoms such as being irritable.

If brain shrinkage is severe, this can lead to seizures, coma, and death.

If your doctor thinks that you have hypernatremia, they will ask you about your symptoms and your general health. For example, they will ask about:

- Any medical conditions that you have
- Any medications that you are taking, and
- How much fluid you have been drinking recently.

You will also need to have blood and urine tests. These tests can tell whether you have hypernatremia, and might also help to show what has caused it.

What treatments are available?

Treatment for hypernatremia is aimed at treating what is causing the problem. For example, that might mean:

- Stopping or reducing any **medications** that are causing hypernatremia
- Giving medications that can reduce **fluid loss**: for example, this can help for conditions such as diabetes insipidus
- Treating fever, which reduces the water loss caused through sweating
- Treating the cause of any diarrhea and vomiting
- Stopping excessive sodium intake, and
- Increasing water intake when needed.

Your doctor will also monitor your sodium levels throughout treatment.

If you have hypernatremia that is severe, or that comes on suddenly, you should be treated in the hospital.

But if you have hypernatremia that is mild, or that came on over a long period (for example, because of dehydration over time) you might be able to have treatment at home.

Replacing lost fluids

If someone has dehydration, it's best to treat this simply by drinking more fluid. But if someone is unable to do this for any reason, they might need to be given fluids by another method such as:

- Through a **nasogastric tube**. This is a feeding tube inserted into the nose, which leads down into the stomach, or
- Directly into a vein.

Treating sodium overload

If someone has consumed or been given too much sodium in some form, they need to be treated in two ways. These are:

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- Flushing out the excess sodium. Drugs called diuretics can help with this, and
- Replacing the water that the diuretics have helped to flush out, either by drinking fluids, or by one of the methods described above.

What to expect in the future

About half of people with hypernatremia do not survive. But this number doesn't tell the whole story. It's too simple to say that hypernatremia on its own causes people to die.

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