

Patient information from the BMJ Group

Meningococcal disease

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Meningococcal disease

Meningitis and septicaemia are very serious. But most people recover if they get treatment quickly. In this article we look at meningitis and septicaemia caused by bacteria called meningococcus. These infections are also called meningococcal disease.

We've brought together the best research about meningococcal disease and weighed up the evidence about how to treat it.

What is meningococcal disease?

Meningitis and septicaemia are serious conditions caused by an infection. Both conditions can lead to life-threatening symptoms in a matter of hours, and early treatment is essential.

Several kinds of infection can cause meningitis. You could be infected by **viruses**, **bacteria**, or **fungi**.

- When one of these germs infects the fluid in your **spinal cord** and around your brain, it's called **meningitis**.^[1] Meningitis means inflammation of the **meninges**. The meninges are the layers of tissue around your brain and spinal cord.
- If the germ gets into your blood, it can cause blood poisoning (**septicaemia**).

Meningitis and septicaemia can be caused by several different bacteria. This information looks at meningitis and septicaemia caused by bacteria called **meningococcus**. These infections are also called **meningococcal disease**. We haven't looked at meningitis caused by a virus, which tends to be a less-serious illness.^[2]

There are lots of different kinds of meningococcal bacteria. Most meningococcal disease is caused by groups called A, B, C, W-135, and Y. Group B is the most common cause of meningococcal disease in the UK.

You can get meningitis or septicaemia on their own. Or you can get both at the same time. Of the two diseases, septicaemia is the most dangerous.

Of the people who get infected with meningococcal bacteria:^[3]

- About 5 in 10 get both meningitis and septicaemia

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- About 3 in 10 just get septicaemia
- About 2 in 10 just get meningitis.

Children under 5 are most likely to be affected by meningococcal disease, followed by young adults between 15 and 24. ^[4] Students in their first year of university who live in halls of residence are also at greater risk. ^[5]

Children whose parents smoke also seem to be at greater risk of meningococcal disease. So do children who live in poor conditions. ^[6]

Since 1999, a vaccine to prevent group C meningococcal meningitis has been part of the usual childhood immunisations in the UK. ^[7] This has reduced the number of people who get diseases caused by group C meningococcus. But other groups of meningococcal bacteria, especially group B, still cause lots of infections every year. ^[7] To read more, see [Who should be vaccinated?](#)

What are the symptoms of meningococcal disease?

If you or your child has any of these symptoms, get treatment straight away. Early treatment is important.



If you have meningococcal meningitis, the rash won't go away when you press a glass against it.

If you have meningococcal meningitis, you may have: ^[1] ^[11]

- A high temperature

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- A headache
- A stiff neck
- Nausea
- Vomiting
- Trouble looking at bright lights
- Confusion
- Sleepiness
- Seizures (fits)
- A rash.

If you have meningococcal **septicaemia**, you may have:^[12]

- A high temperature
- Cold hands and feet
- Shivering
- Very rapid breathing
- Painful joints and muscles
- Sleepiness
- A rash.

People with meningococcal disease often get a particular kind of rash. To test whether a rash is caused by meningococcal **bacteria**, you can press a glass against it. If you can still see the rash through the glass, there's a high chance that it's a meningococcal rash.^[12]

It's important to remember that not everyone who gets meningitis or septicaemia has a rash. It's an important symptom, but you shouldn't delay getting medical help just because someone doesn't have a rash.

Babies and children under 2 may not have these symptoms. Instead they may:^{[12] [7]}

- Be slow, sleepy, or irritable

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- Vomit, or feed poorly
- Cry a lot (moaning or high-pitched crying)
- Have a temperature, but look pale or blotchy
- Have a bulging soft spot (fontanelle) on top of their head
- Be stiff or jerky, or have seizures (fits).

If you or your child has any of these symptoms, get treatment straight away. Do not delay. Go to the nearest emergency department or call an ambulance straight away.

Early treatment, including antibiotics, is very important.

How common is meningococcal disease?

Each year, about 2,000 people in the UK and Ireland get meningitis or septicaemia caused by meningococcal bacteria.

Children under 5 and young adults between 15 and 24 are most likely to be affected, especially those aged up to 18 and those in their first year of university who live in a hall of residence.^[4]

It's possible to have meningococcal bacteria in your body without being ill. About 1 in 10 people carry meningococcal bacteria in their throats.^[4] But they usually don't have any symptoms.

The bacteria can spread through fluid from people's mouths. The bacteria could be spread by kissing or by coughs and sneezes. Most people who carry the bacteria or who are exposed to carriers don't get ill. But a few people do. We're not sure why.

What treatments work for meningococcal disease?

If you or your child has symptoms of meningococcal disease, it's important to get medical care immediately. Go to the emergency department or call an ambulance straight away.

This information is about treating meningitis or septicaemia caused by a particular kind of bacteria (meningococcal bacteria). It doesn't apply to meningitis caused by a virus.

Key points about treating meningococcal disease

- If doctors think you might have meningococcal disease, you'll get antibiotics as soon as possible. You'll probably be given antibiotics on the way to hospital.
- If you've been in very close contact with someone who has meningococcal disease, you'll usually be given antibiotics too. This is to try to stop you getting the disease.

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- Having steroid injections alongside antibiotics may reduce the risk that a child will lose their hearing because of their illness. (Note that these steroids are called corticosteroids, which are different from the ones you may have heard about some athletes using. Those are called anabolic steroids.)
- Steroid injections may also improve an adult's chance of surviving meningitis.
- We don't know whether adding steroids to antibiotics helps children or adults with meningococcal septicaemia. There isn't enough good research to tell us.
- Vaccines can prevent some types of meningitis, but not all of them. It's recommended that all babies in the UK have a vaccine against meningitis C. To read more, see [Who should be vaccinated?](#)

Which treatments work best? We've looked at the best research and given a rating for each treatment according to how well it works.

Treatment Group 1

Treatments for meningococcal disease

Treatments that are likely to work

- [Antibiotics](#)
- [Adding steroids to antibiotics for meningococcal meningitis](#)

Treatments that need further study

- [Adding steroids to antibiotics for meningococcal septicaemia](#)

What will happen to me?

Most people who get meningococcal disease get better. However, it can be a dangerous illness, and some people do die from the infection. Others are left with a serious disability.

This information talks about what happens to someone who has meningitis or blood poisoning ([septicaemia](#)) caused by a meningococcus bacteria. If someone is ill because of these bacteria, doctors say they have meningococcal disease.

It's also possible to get meningitis caused by a virus. Meningitis caused by a virus tends to be much less serious than meningitis caused by bacteria. ^[2] It's an unpleasant illness, but serious health problems are less likely than with meningococcal disease.

If doctors think that you might have meningococcal disease (meningitis, septicaemia, or both), you'll be treated quickly. You'll be given [antibiotics](#) , possibly on the way to hospital. Once you arrive, doctors will usually need to do tests, such as a spinal tap (also called

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a lumbar puncture). This is when a needle is put into your lower back to take out some fluid and test it for **bacteria**. You may be treated in an intensive care unit.

About 9 in 10 people who get meningococcal disease will recover.^[13] Sadly, of the people who get better, about 1 or 2 in 10 will be left with some lasting disability.^[13]

Disabilities can happen because of the damage the bacterial infection can do to someone's body.

- Meningococcal meningitis causes swelling around the brain. This can cause damage to nerves in the brain.
- If someone has meningococcal septicaemia, large numbers of the bacteria grow in their blood. The bacteria release poisonous chemicals that can damage blood vessels and organs.

If the damage is severe, it can cause long-term problems. For example, someone with meningococcal disease may lose their hearing, have some brain damage, or need to have a limb or finger amputated.

Meningococcal disease is a dangerous illness, and not everyone who has it recovers. About 1 in 10 people who get meningococcal disease will die.^[13]

What if I've come into contact with meningococcal disease?

If you've been in close contact with someone who gets meningococcal meningitis or septicaemia, your doctor may give you antibiotics. This is to try to stop you getting the disease.

Close contact means that in the seven days before the person you knew got meningococcal disease:^[10]

- You lived in the same house as that person
- You were a pupil sharing a dormitory with that person
- You were a boyfriend or girlfriend of that person
- You were a university student and shared a kitchen in a hall of residence with that person.

It's important to get treatment if you've come into contact with someone who has meningococcal disease. But your risk of catching the disease from someone living in the same house as you is fairly low. Without treatment, there's a 1 in 300 chance of getting meningococcal disease after coming into contact with someone who has it.^[10]

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Doctors sometimes give a vaccine to close contacts of people who get meningococcal disease.^[10] To read more about vaccines, see [Who should be vaccinated?](#)

Treatments:

Antibiotics

In this section

If doctors think you have meningococcal disease, you'll be given antibiotics. You might be given them on the way to hospital. You'll be given penicillin or another antibiotic.

We didn't find any studies comparing people who were given antibiotics on the way to hospital with people who weren't.^[14] It wouldn't be fair to do these studies, because doctors think that it's very important to give antibiotics as soon as possible to anyone who might have meningococcal disease.

There have been other, poorer-quality, kinds of studies, called **observational studies**. Some of these found that being given antibiotics on the way to hospital reduced the risk of dying from meningococcal disease, although the results were mixed.^{[15] [16] [17] [18] [19] [20] [21] [22] [23]}

It is generally safe to give someone antibiotics on the way to hospital. But it can be difficult to know for certain if someone has meningococcal disease. Doctors usually give antibiotics just in case. But this means that some people get antibiotics who don't need them.^{[24] [25] [26] [27]} For example, some people have meningitis caused by a virus. Antibiotics don't work against viruses. But viral meningitis is a less severe illness anyway, and will often go away without treatment.

If you've come into very close contact with someone who has meningococcal disease, your doctor will also recommend antibiotics. This is done as soon as possible, preferably within a day of finding out that the person you know is ill. To read more, see [What will happen to me?](#)

There hasn't been much good research about whether giving antibiotics to close contacts stops them getting meningococcal disease.^{[28] [29] [30]} It wouldn't be fair to do these studies. This is because antibiotics are generally safe, and meningococcal disease is very serious. So doctors think you should take antibiotics if you've been in close contact with a person who has meningococcal disease.

Doctors may also treat carriers. Carriers are people who carry the meningococcal bacteria around in their throat, but who aren't ill. Studies have found that antibiotics help to get rid of meningococcal bacteria in the throat of carriers.^{[31] [32] [33] [34] [35]} But we don't know if this stops other people getting ill.

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Antibiotics can cause side effects in some people.^[14] For example, some people feel sick or get diarrhoea.^[36] If you wear contact lenses, the drug rifampicin can make your lenses turn orange.

Some antibiotics of a kind called fluoroquinolones can increase your chance of getting damage to your **tendons** (tendonitis) or rupturing a tendon.^[37]

However, meningococcal disease can be very dangerous, so the benefits of antibiotics are much more important than the risk of side effects.

Adding steroids to antibiotics for meningococcal meningitis

In this section

One big **review** of 18 studies found that giving steroid injections as well as antibiotics reduced the chance of severe deafness caused by bacterial meningitis.^[38] But steroid injections didn't increase children's chances of surviving meningitis.

A second review of four studies found that steroids reduced the risk of death and brain damage in teenagers and adults.^[39]

Doctors may give you an injection of steroids alongside antibiotics if they think you might have meningococcal meningitis. These aren't the anabolic steroids that some bodybuilders use. They're similar to the steroids made naturally by your body to fight stress and inflammation. Their full name is **corticosteroids**.

The corticosteroids used in studies included dexamethasone and hydrocortisone (brand name Solu-Cortef).

Steroids can have side effects, which can sometimes be serious. But problems are less likely when steroids are given only for a short time, as they are in treating meningococcal disease.^[40]

Adding steroids to antibiotics for meningococcal septicaemia

In this section

We didn't find any good studies about adding steroids to antibiotics to treat people with septicaemia caused by meningococcal bacteria.

One review looked at people with septicaemia caused by bacteria (but not necessarily meningococcal bacteria).^[41] It found that giving steroids for more than five days might increase people's chances of surviving septicaemia. But we don't know whether adding steroids to antibiotics will help people with septicaemia caused by meningococcal bacteria.

The steroids used in studies included dexamethasone and hydrocortisone (Solu-Cortef). These aren't the anabolic steroids that some bodybuilders use. They're similar to the

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steroids made naturally by your body to fight stress and inflammation. Their full name is **corticosteroids**.

Steroids can have side effects, which can sometimes be serious. But problems are less likely when steroids are given only for a short time, as they are in treating meningococcal disease. ^[40]

Further informations:

Who should be vaccinated?

A vaccine for meningitis C (Men C) is part of the immunisations all children get in the UK. Babies are given two injections of the vaccine, usually at 3 months and 4 months. ^[8] There's then a booster dose at 12 months. The booster vaccine is called Hib/Men C. That's because it also protects against illnesses caused by bacteria called *Haemophilus influenzae* type B.

If your baby has missed their early doses of the Men C vaccine and is between 5 months and 12 months old, he or she only needs two doses to be fully protected. ^[9] But if your child is also catching up on other vaccines they've missed, they may get three doses as normal.

All children and young adults under 25 should also be immunised. ^[9] Anyone between 1 and 24 needs only one dose. If you're about to start university and haven't had the Men C vaccine, talk to your doctor about getting it.

You may also be given the vaccine if you've been in close contact with someone who has meningococcal meningitis. ^[10]

Because of the Men C vaccine, far fewer people get group C meningococcal disease in the UK. But people still get meningitis and **septicaemia** caused by other groups of meningococcal bacteria. ^[10]

Glossary:

viruses

Viruses are microbes (tiny organisms) that need the cells of humans or other animals to exist. They use the machinery of cells to reproduce. Then they spread to other cells in the body.

bacteria

Bacteria are tiny organisms. There are lots of different types. Some are harmful and can cause disease. But some bacteria live in your body without causing any harm.

fungus

A fungus is an organism that is sometimes considered to be a type of plant. A fungus lives by feeding on other organisms. The mushrooms we eat in salads are fungi, but so are candida and cryptococcus, which can cause infections in people's bodies.

spinal cord

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Your spinal cord is a thick bundle of nerves that runs down your backbone (spine). These nerves carry messages between your brain and the rest of your body. The bones (vertebrae) in your neck and back protect your spinal cord. If your spinal cord gets damaged, you may lose feeling in your legs or arms.

septic shock

Septic shock is a serious condition caused by a large number of bacteria getting into your blood. It's also called septicaemia, sepsis or blood poisoning. Usually, when bacteria get into your blood, your immune system kills them. But if your immune system isn't working well, it can get overwhelmed. Then, the bacteria multiply and start to release poisonous chemicals (called toxins) into your blood. These chemicals cause your blood pressure to drop massively. When this happens, organs such as your brain, heart, kidneys and liver may not be able to work properly because they aren't getting enough blood. Septic shock needs to be treated urgently, usually with antibiotics, to stop these vital organs failing and to prevent death.

antibiotics

These medicines are used to help your immune system fight infection. There are a number of different types of antibiotics that work in different ways to get rid of bacteria, parasites, and other infectious agents. Antibiotics do not work against viruses.

observational studies

Observational studies examine how common a disease is or how risk factors affect the chances of getting a disease. There are three types of observational studies: cross-sectional studies, cohort studies and case-control studies.

tendons

Tendons are the tough, rope-like connections between muscles and bones.

systematic reviews

A systematic review is a thorough look through published research on a particular topic. Only studies that have been carried out to a high standard are included. A systematic review may or may not include a meta-analysis, which is when the results from individual studies are put together.

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