

## What is Meningitis?

Meningitis is inflammation of the thin tissue that surrounds the brain and spinal cord, called the meninges. There are several types of meningitis. The most common is viral meningitis, which you get when a virus enters the body through the nose or mouth and travels to the brain. Bacterial meningitis is rare, but can be deadly. It usually starts with bacteria that cause a cold-like infection. It can block blood vessels in the brain and lead to stroke and brain damage. It can also harm other organs. Pneumococcal infections and meningococcal infections can cause bacterial meningitis.

Anyone can get meningitis, but it is more common in people whose bodies have trouble fighting infections. Meningitis can progress rapidly. You should seek medical care quickly if you have

- A sudden fever
- A severe headache
- A stiff neck

Early treatment can help prevent serious problems, including death. Vaccines can prevent some of the bacterial infections that cause meningitis. Parents of adolescents and students living in college dorms should talk to a doctor about the vaccination.

## Causes

The most common causes of meningitis are viral infections that usually get better without treatment. However, bacterial meningitis infections are extremely serious, and may result in death or brain damage, even if treated.

Meningitis may also be caused by:

- Chemical irritation
- Drug allergies
- Fungi
- Parasites
- Tumors

Most viral meningitis is due to enteroviruses, which are viruses that also can cause intestinal illness.

Many other types of viruses can cause meningitis.

- Viral meningitis can be caused by herpes viruses, the same virus that can cause cold sores and genital herpes . However, people with cold sores or genital herpes are not at a greater risk of developing herpes meningitis.
- Viruses that cause mumps and HIV can cause aseptic meningitis.

- Recently, West Nile virus, spread by mosquito bites, has become a cause of viral meningitis in most of the United States.

### Symptoms

Viral meningitis occurs more often than bacterial meningitis, and is milder. It usually occurs in the late summer and early fall. It most often affects children and adults under age 30.

Bacteria meningitis is an emergency. You will need immediate treatment in a hospital. Symptoms usually come on quickly, and may include:

- Fever and chills
- Mental status changes
- Nausea and vomiting
- Sensitivity to light (photophobia)
- Severe headache
- Stiff neck (meningismus)

Other symptoms that can occur with this disease:

- Agitation
- Bulging fontanelles in babies
- Decreased alertness
- Poor feeding or irritability in children
- Rapid breathing
- Unusual posture, with the head and neck arched backwards (opisthotonos)

Meningitis is an important cause of fever in children and newborns.

You cannot tell if you have bacterial or viral meningitis by how they feel. Your health care provider must do this. Seek prompt attention if you have symptoms of meningitis.

### Exams and Tests

The doctor or nurse will examine you. This may show:

- Fast heart rate
- Fever
- Mental status changes
- Stiff neck

If the health care provider thinks you have meningitis, a lumbar puncture (spinal tap) should be done to remove a sample of spinal fluid (cerebrospinal fluid, or CSF) for testing.

Other tests that may be done include:

- Blood culture
- Chest x-ray
- CT scan of the head

### Treatment

Antibiotics are used to treat bacterial meningitis. The specific type depends on which bacteria is causing the infection. Antibiotics do not treat viral meningitis.

Antiviral medicine may be given to those with herpes meningitis.

Other treatments will include:

- Fluids through a vein (IV)
- Medicines to treat symptoms such as brain swelling, shock, and seizures

### Outlook (Prognosis)

Early diagnosis and treatment of bacterial meningitis is essential to prevent permanent neurological damage. Viral meningitis is usually not serious, and symptoms should disappear within 2 weeks with no lasting complications.

### Possible Complications

- Brain damage
- Buildup of fluid between the skull and brain (subdural effusion)
- Hearing loss
- Hydrocephalus
- Seizures

### When to Contact a Medical Professional

If you think that you or your child has symptoms of meningitis, get emergency medical help immediately. Early treatment is key to a good outcome.

### Prevention

Certain vaccines can help prevent some types of meningitis.

- Haemophilus vaccine (HiB vaccine) in children helps prevent one type of bacterial meningitis.
- The pneumococcal conjugate vaccine is now a routine childhood immunization. It is very effective at preventing pneumococcal meningitis.

Household members and others in close contact with people who have meningococcal meningitis should receive antibiotics to prevent becoming infected.

The meningococcal vaccination is recommended for:

- Adolescents ages 11 - 12 and adolescents entering high school (about age 15) who have not already received the vaccination. A booster shot is given between age 16-18.
- All college freshmen who have not been vaccinated and are living in dorms.
- Children age 2 and older who do not have their spleen or who have other problems with their immune system.
- Those traveling to countries where diseases caused by meningococcus are very common (ask your doctor).

Some communities hold vaccination campaigns after an outbreak of meningococcal meningitis.