



# Meningitis

[Meningitis Home](#)

## Bacterial Meningitis

Bacterial [meningitis](#) is serious. Some people with the infection die and death can occur in as little as a few hours. However, most people recover from bacterial meningitis. Those who do recover can have permanent disabilities, such as brain damage, hearing loss, and learning disabilities.

## Causes

Several types of bacteria can cause meningitis. Leading causes in the United States include

- *Streptococcus pneumoniae*
- Group B *Streptococcus*
- *Neisseria meningitidis*
- *Haemophilus influenzae*
- *Listeria monocytogenes*
- *Escherichia coli*

*Mycobacterium tuberculosis*, which causes [tuberculosis or TB](#), is a less common cause of bacterial meningitis (called TB meningitis).

Many of these bacteria can also be associated with another serious illness, [sepsis](#). Sepsis is the body's extreme response to infection. It is a life-threatening medical emergency. Sepsis happens when an infection triggers a chain reaction throughout your body. Without timely treatment, sepsis can quickly lead to tissue damage, organ failure, and death.

Some causes of bacterial meningitis are more likely to affect certain age groups:

- **Newborns:** Group B *Streptococcus*, *S. pneumoniae*, *L. monocytogenes*, *E. coli*
- **Babies and young children:** *S. pneumoniae*, *N. meningitidis*, *H. influenzae*, group B *Streptococcus*, *M. tuberculosis*
- **Teens and young adults:** *N. meningitidis*, *S. pneumoniae*
- **Older adults:** *S. pneumoniae*, *N. meningitidis*, *H. influenzae*, group B *Streptococcus*, *L. monocytogenes*

## Risk Factors

Certain factors increase a person's risk for getting bacterial meningitis. These risk factors include:

- **Age:** Babies are at increased risk for bacterial meningitis compared to people in other age groups. However, people of any age can develop bacterial meningitis. See section above for which bacteria more commonly affect which age groups.
- **Group setting:** Infectious diseases tend to spread where large groups of people gather. For example, college campuses have reported outbreaks of meningococcal disease, caused by *N. meningitidis*.
- **Certain medical conditions:** Certain medical conditions, medications, and surgical procedures put people at increased risk for meningitis. For example, having an HIV infection or a cerebrospinal fluid leak, or not having a spleen can increase a person's risk for several types of bacterial meningitis.
- **Working with meningitis-causing pathogens:** Microbiologists routinely exposed to meningitis-causing bacteria are at increased risk for meningitis.
- **Travel:** Travelers may be at increased risk for meningococcal disease, caused by *N. meningitidis*, if they travel to certain places such as:

places, such as:

- The meningitis belt in sub-Saharan Africa, particularly during the dry season
- Mecca during the annual Hajj and Umrah pilgrimage

In many countries, TB is much more common than in the United States. Travelers should avoid close contact or prolonged time with known TB patients in crowded, enclosed environments (for example, clinics, hospitals, prisons, or homeless shelters).

## How It Spreads

Certain germs that cause bacterial meningitis, such as *L. monocytogenes*, can spread through food. But most of these germs spread from one person to another.

How people spread the germs often depends on the type of bacteria. It is also important to know that people can have these bacteria in or on their bodies without being sick. These people are “carriers.” Most carriers never become sick, but can still spread the bacteria to others.

Here are some of the most common examples of how people spread each type of bacteria to each other:

- **Group B *Streptococcus* and *E. coli*:** Mothers can pass these bacteria to their babies during birth.
- ***H. influenzae*, *M. tuberculosis*, and *S. pneumoniae*:** People spread these bacteria by coughing or sneezing while in close contact with others, who breathe in the bacteria.
- ***N. meningitidis*:** People spread these bacteria by sharing respiratory or throat secretions (saliva or spit). This typically occurs during close (coughing or kissing) or lengthy (living together) contact.
- ***E. coli*:** People can get these bacteria by eating food prepared by people who did not wash their hands well after using the toilet.

People usually get sick from *E. coli* and *L. monocytogenes* by eating contaminated food.

## Signs and Symptoms

### Pregnancy

Being pregnant increases a person's risk of getting a [Listeria infection](#) (*L. monocytogenes*). Pregnant people with a *Listeria* infection may not have any symptoms or may only have a fever and other flu-like symptoms, such as fatigue and muscle aches. However, infection during pregnancy can lead to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn, including meningitis. [Find out which foods are more likely to contain \*Listeria\* and steps you can take to protect your and your baby's health.](#)

Pregnant women can pass group B *Streptococcus* (group B strep) to their baby during delivery. Newborns infected with group B strep can develop meningitis or other serious infections soon after birth. Talk with your doctor or midwife about getting a group B test when you are 36 through 37 weeks pregnant. Doctors give antibiotics (during labor) to women who test positive in order to [prevent infections in newborns](#).

Meningitis symptoms include sudden onset of

- Fever
- Headache
- Stiff neck

There are often other symptoms, such as

- Nausea
- Vomiting

- vomiting
- Photophobia (eyes being more sensitive to light)
- Altered mental status (confusion)

Newborns and babies may not have, or it may be difficult to notice the classic symptoms listed above. Instead, babies may

- Be slow or inactive
- Be irritable
- Vomit
- Feed poorly
- Have a bulging fontanelle (the “soft spot” on a baby’s head)
- Have abnormal reflexes

If you think your baby or child has any of these symptoms, call the doctor right away.

Typically, symptoms of bacterial meningitis develop within 3 to 7 days after exposure; note, this is not true for TB meningitis, which can develop much later after exposure to the bacteria.

People with bacterial meningitis can have seizures, go into a coma, and even die. For this reason, **anyone who thinks they may have meningitis should see a doctor as soon as possible.**

## Diagnosis

If a doctor suspects meningitis, they will collect samples of blood or cerebrospinal fluid (fluid near the spinal cord). A laboratory will test the samples to see what is causing the infection. Knowing the specific cause of meningitis helps doctors treat it.

## Treatment

Doctors treat bacterial meningitis with a number of antibiotics. **It is important to start treatment as soon as possible.**

## Prevention

### Vaccination

Vaccines are the most effective way to protect against certain types of bacterial meningitis. There are vaccines for 4 types of bacteria that can cause meningitis:

- Meningococcal vaccines help protect against *N. meningitidis*
- Pneumococcal vaccines help protect against *S. pneumoniae*
- *Haemophilus influenzae* serotype b (Hib) vaccines help protect against Hib
- [Bacille Calmette-Guérin vaccine](#) helps protect against tuberculosis disease, but is not widely used in the United States

Make sure you and your child are vaccinated [on schedule](#).

Like with any vaccine, these vaccines do not work 100% of the time. The vaccines also do not protect against infections from all the types (strains) of each of these bacteria. For these reasons, there is still a chance vaccinated people can develop bacterial meningitis.

## Prophylaxis

When someone has bacterial meningitis, a doctor may recommend antibiotics to help prevent people around the patient from getting sick. Doctors call this prophylaxis. CDC recommends prophylaxis for:

- Close contacts of someone with meningitis caused by *N. meningitidis*
- Household members of someone with a serious Hib infection when the household includes one or more people at increased risk of Hib based on age, vaccination status, and/or immunocompromising conditions

Doctors or local health departments recommend who should get prophylaxis.

## Healthy Pregnancy Practices

Pregnant women should talk to their doctor or midwife about getting tested for group B *Streptococcus*. Women receive the test when they are 36 through 37 weeks pregnant. Doctors give antibiotics (during labor) to women who test positive in order to [prevent passing group B strep to their newborns](#).

Pregnant women can also reduce their risk of meningitis caused by *L. monocytogenes*. Women should [avoid certain foods during pregnancy and safely prepare others](#).

## Healthy Habits

You can also help protect yourself and others from bacterial meningitis and other health problems by maintaining healthy habits:

- Don't smoke and avoid cigarette smoke as much as possible
- Get plenty of rest
- Avoid close contact with people who are sick
- Wash your hands often with soap and water (use hand sanitizer if soap and water aren't available)
- Cover your mouth and nose with a tissue when you cough or sneeze (use your upper sleeve or elbow if a tissue isn't available)

These healthy habits are especially important for people at increased risk for disease, including:

- Young babies
- Older adults
- People with weak immune systems
- People without a spleen or a spleen that doesn't work the way it should

Related Pages	
<a href="#">Preventing Infections in Pregnancy</a>	<a href="#">Hib Vaccine</a>
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<a href="#">Pneumococcal Disease</a>	<a href="#">Listeriosis</a>
<a href="#">Pneumococcal Vaccine</a>	<a href="#">Escherichia coli</a>
<a href="#">Haemophilus influenzae Disease, including Hib</a>	<a href="#">When and How to Wash Your Hands</a>