



MENINGITIS

Frequently asked questions for the public

What is meningitis?

Meningitis is the inflammation of the protective membranes covering the brain and spinal cord known as the meninges.

What is septicemia?

Septicemia is a bloodstream infection caused by some bacteria which can cause meningitis as well. These bacteria enter the bloodstream, multiply and release toxins. The toxins cause widespread damage to major organs of the body. A characteristic dark purple rash appears in some cases due to septicemia.

What can cause meningitis?

Meningitis may develop in response to a number of causes, usually bacteria or viruses.

Viral infections are the most common cause of meningitis but rarely fatal. This kind of meningitis is characterized by mild symptoms and antibiotics do not help in the treatment.

Bacterial meningitis occurs less often than viral but is more severe to fatal, in some cases. Several pathogens can cause bacterial meningitis such as *Neisseria meningitidis*, *Streptococcus pneumoniae*, *Haemophilus influenzae* (most often caused by type b, Hib), *Streptococcus*, *Mycobacterium tuberculosis* etc.

How can someone get meningitis?

It depends on the cause. *Neisseria meningitidis* normally colonizes mucosal surfaces of nasopharynx and is transmitted through cough, sneezing and direct, prolonged contact. *Neisseria meningitidis* cannot survive for long outside the human body. Approximately 10% of the population are asymptomatic carriers of *Neisseria meningitidis*.

Enteroviruses, the most common cause of viral meningitis, are spread from person to person through fecal contamination. Enteroviruses can also be spread through respiratory secretions (saliva, sputum, or nasal mucus) of an infected person. Other viruses, such as mumps and varicella-zoster virus, may also be spread through direct or indirect contact with the secretions of an infected person.

Can anyone get meningitis?

Everybody has a small possibility to get meningitis but special risk groups tend to be more susceptible. Risk groups for *Neisseria meningitidis* include household contacts of cases, military staff, college freshmen who live in dormitories, microbiologists who work with isolates of *N. meningitidis*, persons traveling to a country where meningococcal disease is epidemic or highly endemic, and patients without spleens or with terminal complement component deficiencies. Risk groups for the rest types of bacterial meningitis include age, crowding conditions (military staff, students), certain diseases or surgical procedures, region, profession. As far as it concerns viral meningitis risk factors include age (children under 5 years of age tend to be more susceptible) and weakened immune system.

Meningococcal meningitis and meningococemia, is there a difference?

Neisseria meningitidis can cause a wide spectrum of clinical features:

- Meningitis occurs when bacteria enter the bloodstream and the meninges, multiply and cause inflammation.
- Septicemia occurs when bacteria enter the bloodstream, multiply and release toxins.
- More often, bacteria enter the meninges and the bloodstream as well, causing meningitis and septicemia respectively.

Which are the typical signs and symptoms?

It depends on the cause. Not always all signs and symptoms appear. **Bacterial** meningitis may show up in a person by sudden onset of fever, headache and stiff neck. Other symptoms may appear, as well, such as nausea, vomiting, sensitivity to light (photophobia), confusion. Typically, symptoms of bacterial meningitis develop within few hours or few days after exposure (usually within 3-7 days). The infant may appear to be slow or inactive (lack of alertness) and feeding poorly. **Viral** meningitis is characterized usually by mild symptoms. In infants

viral meningitis usually shows up by fever, irritability, poor eating and hard to awaken while in adults we can see also symptoms like high fever, severe headache, stiff neck and sensitivity to light. The symptoms of viral meningitis usually last from 7 to 10 days. As far as it concerns meningococcal disease symptoms appear to be similar. The only difference lies in severity of symptoms. Meningococcal meningitis, when also septicemia occurs, is characterized by a dark purple rash, fatigue, vomiting, diarrhea, cold chills, rapid breathing, severe aches or pain in the muscles, joints.

What about the incubation period for meningococcal meningitis?

The incubation period, as we call the period from the day of contagion to the day of onset, as it concerns meningococcal meningitis, lies between 2 to 10 days.

How meningitis can be treated?

That depends on the cause. As far as it concerns the treatment of bacterial meningitis, (meningococcal, pneumococcal etc), effective antibiotics can be used. **It is important that treatment be started as soon as possible.** Appropriate antibiotic treatment of the most common types of bacterial meningitis reduce the risk of dying from meningitis, although the risk of severe impacts remains high. The prognosis of meningitis varies from patients fully treated within a few days to others which need a prolonged hospitalization.

There is not specific treatment for viral meningitis. Antibiotics cannot be used for the treatment of viral meningitis. Most of the patients make full recovery within 7 to 10 days. Patients need to be hospitalized, especially severe cases and immunocompromised ones.

Are there any complications?

The most frequent after effect of viral and bacterial meningitis, as well, is deafness. Other complications may include:

- Epilepsy
- Learning difficulties
- Difficulties in sight
- Behavior changes
- Headaches
- Fatigue
- Memory loss
- Lack of concentration

Toxins realized in the bloodstream by bacteria cause severe damage through blood cells. This fact causes an obstacle in vital flow of blood and oxygen to the major organs of the body including kidneys, liver etc.

Which are the prevention measures?

Immunization is the most effective and protective measure. There are vaccines only against some types of bacteria which cause meningitis. These effective vaccines include *Neisseria meningitidis* (meningococcus types A,C,Y and W135), *Streptococcus pneumoniae* (pneumococcus), and *Haemophilus influenzae* type b (Hib). Meningococcal bacteria spread through close and prolonged contact with the patient. In this case, household contacts and people who had direct contact with patient's secretions (saliva, nasopharynx), need to take antibiotics as prevention. As for viral meningitis, there are vaccines against polio, measles, mumps, varicella-zoster, influenza, rabies and some arboviruses (Japanese encephalitis virus, tick-borne encephalitis).