# Meningitis

**What is meningitis?**
Meningitis is an inflammation of the tissues that cover the brain and spinal cord. Bacteria, viruses, or fungi and other parasites can cause meningitis.

- Bacterial: Bacterial meningitis is a serious condition that can cause death in as little as a few hours. It is possible to recover, but those who do can have life-long disabilities like hearing loss or brain damage. It is caused by several different bacterium like *Streptococcus pneumoniae*, Group B Streptococcus, *Neisseria meningitidis*, *Haemophilus influenzae*, *Listeria monocytogenes* and *Escherichia coli*. Anyone can get meningitis, but some are more at risk like those who are living in large groups, those who work with the pathogen, babies and young children and travelers.
- Viral: Viral meningitis is a serious illness caused by viruses including non-polio enteroviruses, mumps virus, measles virus, influenza virus and West Nile virus. Each virus spreads in different ways, but only a small number of people who get a virus will develop meningitis. Anyone can get viral meningitis but those who are most at risk are children younger than 5.
- Fungal: Fungal meningitis happens when a fungus on part of the body travels to the spinal cord. Fungi that can cause fungal meningitis Cryptococcus, Histoplasma, Blastomyces, Coccidioides, and Candida. Anyone can get fungal meningitis but those who are most at risk are people who have weakened immune systems or take medications that weaken the immune system.
- Parasitic: Parasitic meningitis is less common than other types, but some parasites can cause eosinophilic meningitis, eosinophilic meningoencephalitis, or EM. The parasites that cause EM are *Angiostrongylus cantonensis, Baylisascaris procyonis* and *Baylisascaris procyonis*. People can get sick with one of these parasites from raw or poorly cooked food and sometimes the feces of racoons who carry the parasite. These exposures usually happen while traveling.
- Amebic: Amebic meningitis is a rare brain infection that is caused by *Naegleria fowleri* and is usually fatal. *Naegleria fowleri* lives in warm fresh water and soil around the world and infects people when the ameba enters the body through the nose. It can survive in water like rivers, lakes, swimming pools, splash pads, tap water and water heaters.
- Non-infectious: Non-infectious meningitis is when the tissues that cover the brain and spinal cord become inflamed without a disease. Causes of non-infectious meningitis are cancer, lupus, certain medications and brain or spine injury

**What are the symptoms of meningitis?**
Symptoms of meningitis may include fever, headache, stiff neck, nausea, vomiting, confusion and fatigue. These symptoms are often difficult to identify in infants, who, when suffering from viral meningitis may become irritable, lethargic, inconsolable, or refuse to eat. Since viral and bacterial meningitis often have similar symptoms, it is important to see a health care provider immediately if you or your child has these symptoms.

**What causes meningitis and how is it spread?**
Approximately 90% of viral meningitis cases are due to a group of common intestinal viruses called enteroviruses. These viruses are typically spread from person-to-person through direct or indirect contact with fecal material, usually on unclean hands or contaminated environmental items. Viruses can be passed on to others beginning about three days after someone is infected until about 10 days after symptoms occur, although very few exposed persons develop meningitis. Bacterial meningitis can be caused by bacteria such as Haemophilus, Streptococcus, or Neisseria meningitidis, which are spread by direct contact with saliva or respiratory droplets from the nose and throat of an infected person.

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**How is meningitis diagnosed and treated?**
The type of meningitis can be confirmed through laboratory tests performed on spinal fluid if needed. There is no specific treatment for viral meningitis, most patients will completely recover on their own with bed rest and plenty of fluids. However, health care providers often will recommend medicine to relieve fever and headache. For bacterial meningitis, antibiotics are needed that treat the specific bacterial cause.

**Should people who have been around a person infected with meningitis receive any treatment?**
Antibiotics are only recommended as a preventative measure for those persons exposed to a person with meningitis caused by the bacteria. When a single instance of Neisseria meningitidis occurs, the state and county health departments work together to ensure that appropriate contacts obtain antibiotics. Only people who have been in close contact with saliva or respiratory secretions such as household members, intimate contacts, health care personnel performing mouth-to-mouth resuscitation, and day care center playmates are recommended to obtain a prescription for a specific antibiotic from their physician or through the health department. Casual contacts including classmates, co-workers, or those in a workplace setting are not usually at increased risk of disease and do not need treatment with the antibiotic. When clusters or outbreaks occur, the health department may expand the recommendations for which groups need to receive antibiotics to prevent possible spread. Antibiotics do not protect people from future exposure to Neisseria meningitidis. For persons exposed to a person with viral meningitis or meningitis caused by most bacteria, antibiotics are not a necessary preventative measure.

**How do you prevent the spread of meningitis?**
Hand hygiene is the single most important action to prevent the spread of infection to others and you. Wash visibly soiled hands with soap and water after using the toilet, after changing diapers, and before preparing and eating food. Use alcohol-based hand gels when hands are not visibly soiled. Routine cleaning is recommended, with focus on items that have been soiled with saliva or nose/throat secretions. In institutions such as childcare centers, washing objects and surfaces with a diluted bleach solution is recommended. For hard surfaces such as diaper-changing areas and bathrooms, use a 1:10 dilution of bleach (mix one cup of bleach with 1 gallon of water). For other objects such as toys and eating utensils, use a weaker form of bleach solution (mix one tablespoon of bleach with one gallon of water).

**What are the vaccines recommended to prevent meningitis?**
The routine recommended childhood vaccines protect children from some of the common causes of meningitis such as Haemophilus influenzae type b (Hib) and Streptococcus pneumonia. These and other vaccines are also recommended for certain people at increased risk of complications from a bacterial infection such as elderly or immunocompromised persons or people living in certain group settings. Three types of meningococcal vaccines are available in the US. Consult with your primary care physician or the local health department about receiving the vaccine. Because the vaccine is not protective against all types of meningococcal infections, people who have been exposed to a person with meningococcal disease are still recommended to receive antibiotics to prevent infection. The vaccine is not used to prevent illness in persons who have been exposed but does protect from future exposures.

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OKLAHOMA
State Department
of Health

| Vaccine Type | Vaccine Name | Recommended For |
|---|---|---|
| MenACWY vaccines | Menactra®<br>Menveo®<br>MenQuadfi® | All preteens and teens 11 to 12 years with a booster at 16 years.<br>Children and adults with weakened immune systems |
| MenB vaccines | Bexsero®<br>Trumenba® | People 10 years or older at increased risk for meningococcal disease |