Meningitis

What is meningitis?

Meningitis is an infection of the tissue (called the "meninges") that surrounds the brain and spinal cord.

What are the symptoms of meningitis?

Symptoms of meningitis may appear suddenly. Fever, severe and constant headache, stiff neck or neck pain, nausea and vomiting, sensitivity to light, and rash can all be signs of meningitis. Changes in behavior such as confusion, sleepiness, and trouble waking up can also be important symptoms. In some infants, the only signs of meningitis may be crankiness or tiredness and poor feeding. Babies with meningitis usually run a fever, but not always. Anyone who has or observes these symptoms should contact a health care provider right away. Some cases of meningitis are very serious, leading to permanent neurologic problems, amputation of limbs, loss of hearing, seizures or strokes, and even death.

What causes meningitis?

Many different kinds of viruses and bacteria (germs) can cause meningitis. A sample of spinal fluid, usually collected by a spinal tap, is needed to find out if someone has meningitis and to see what caused it.

What kinds of bacteria can cause meningitis?

Neisseria meningitidis are bacteria that can cause illness in people of any age. At any time, about 5-15% of people have these bacteria in their throats or noses without getting sick. The bacteria are spread through saliva (spit) during kissing, sharing of food, drinks or cigarettes (including e-cigarettes), and by close contact with infected people who are sneezing or coughing. People who have come in close contact with the saliva of a person with meningitis from this type of bacteria may have to get antibiotics (medicine) for protection. Meningitis caused by these bacteria is called "meningococcal." There are vaccines, which can be used to help prevent this kind of meningitis.

Haemophilus influenzae type b bacteria, called Hib, can also cause meningitis. There is a vaccine called "Hib vaccine" that prevents infants and young children from getting Hib disease. Most adults are resistant to this type of meningitis, and thanks to the vaccine, most children under 5 years of age are protected. Certain people who have come in close contact with the saliva of a person with meningitis from this type of bacteria may have to get an antibiotic to protect unimmunized, under-immunized or immunocompromised children in their household.

Streptococcus pneumoniae are bacteria that cause lung and ear infections but can also cause "pneumococcal" meningitis. These bacteria are usually found in the throat. Most people who have these bacteria in their throats stay healthy. However, people with chronic medical problems or with weakened immune systems, and those who are very young or very old, are at higher risk for getting pneumococcal meningitis. Meningitis caused by *Streptococcus pneumoniae* is not spread from person-to-person. People in close contact with someone who has pneumococcal meningitis do not need to get antibiotics.

Other bacteria can also cause meningitis, but meningitis from these other bacteria is much less common and usually not contagious.

What about viruses?

Viral meningitis, also called **aseptic meningitis**, is much more common than bacterial meningitis. A group of viruses called *enteroviruses* is the most common cause of viral meningitis. These viruses are found in the throat and feces (stool) of infected people. The virus is most likely to be spread when people do not wash their hands after using the toilet or changing a diaper or soiled sheets, then touch their own mouths, prepare food for others, or touch others with their contaminated hands. These viruses can also be spread by the kind of close face-to-face contact that is common in families.

Many enteroviruses don't cause people to feel very sick. Others may cause only mild diarrhea or vomiting. People with viral meningitis are usually less sick than people with bacterial meningitis. They usually get better on their own. People who are close contacts of viral meningitis patients do not need to be treated with antibiotics. However, they should wash their hands often with soap and warm water or use alcohol-based hand rubs or gels to stop the spread of these viruses. There are usually more cases of viral meningitis in the late summer and early fall.

How is meningitis spread?

Many of the viruses that cause meningitis are spread through saliva (spit) or feces (stool). The bacteria that can cause meningitis are usually spread from person-to-person through contact with infected saliva. Most people may already have immunity (natural protection) against many of these germs.

How can meningitis be prevented?

If a person is exposed to the saliva of someone with meningitis caused by certain types of bacteria, public health officials or your health care provider may recommend an antibiotic to prevent disease. Frequent handwashing with soap and water or use of alcohol-based hand rubs or gels can help stop the spread of many viruses and bacteria. Not sharing food, drinks, or eating utensils with other people can also help stop the spread of germs.

There are 5 vaccines that can help prevent meningitis:

- ***Haemophilus influenzae* (Hib) vaccine** is usually given at 2, 4, 6 and between 12 and 15 months of age. The total number of doses depends on the age at which the series was begun. Children over 5 years of age usually do not need this vaccine. But, some older children or adults with special health conditions should get it.
- **Pneumococcal conjugate vaccine 13-valent (PCV13)** is recommended for all children less than 24 months old. It is usually given at 2, 4, 6, and between 12 and 15 months of age. The total number of doses depends on the age at which the series was begun. It is also used in high-risk people 2 years of age and older. This vaccine is recommended to be given as a first dose in a series with PPSV23 vaccine, for everyone 65 years of age and older.
- **Pneumococcal polysaccharide vaccine 23-valent (PPSV23)** is used in high-risk individuals 2 years of age or older. (High-risk children less than 5 years of age should also receive PCV13.) This vaccine is also recommended to be given as the second dose in a series with PCV13 for everyone 65 years of age and older.

- **Quadrivalent meningococcal conjugate vaccine** (Menactra and Menveo) is recommended for children 11-12 years of age and for some younger children with certain health conditions like asplenia (including sickle cell disease), or prior to travel to certain parts of the world where meningococcal disease is common. A second dose of quadrivalent meningococcal conjugate vaccine is routinely recommended at 16 years of age. Adolescents and young adults who have not been vaccinated according to routine recommendations should talk to their healthcare provider about vaccination according to the "catch up" schedule.

  College freshmen, military recruits and other newly enrolled college students living in dormitories who are not yet vaccinated are also recommended to receive meningococcal conjugate vaccine.

- **Meningococcal serogroup B vaccine** (Bexsero and Trumenba) is recommended for people with certain relatively rare high-risk health conditions age 10 or older (examples: persons with a damaged spleen or whose spleen has been removed, those with persistent complement component deficiency (an inherited disorder), microbiologists working with *N. meningitidis*, and people who may have been exposed during an outbreak). Adolescents and young adults (16 through 23 years of age) who are not at high risk **may** also be vaccinated with a serogroup B meningococcal vaccine, preferably at 16 through 18 years of age, to provide short term protection for most strains of serogroup B meningococcal disease.

Talk with your doctor about which vaccines you or your child should receive.

Are students required to get meningococcal vaccine?

Yes. Massachusetts law requires the following students receive quadrivalent meningococcal conjugate vaccine (unless they qualify for one of the exemptions allowed by the law):

- Secondary school (those schools with grade 9-12): newly enrolled full-time students who will be living in a dormitory or other congregate housing licensed or approved by the secondary school must provide documentation of having received a dose of quadrivalent meningococcal conjugate vaccine at any time in the past.

- Postsecondary institutions (e.g., colleges): newly enrolled full-time students 21 years of age and younger must provide documentation of having received a dose of quadrivalent meningococcal conjugate vaccine on or after their 16th birthday, regardless of housing status.

More information may be found in the MDPH documents *"Meningococcal Disease and College Students"* and "*Information about Meningococcal Disease, Meningococcal Vaccines, Vaccination Requirements and the Waiver for Students at Colleges and Residential Schools.*"

Shouldn't meningococcal B vaccine be required?

CDC's Advisory Committee on Immunization Practices has reviewed the available data regarding serogroup B meningococcal disease and the vaccines. At the current time, there is no routine recommendation and no statewide requirement for meningococcal B vaccination before going to college (although some colleges might decide to have such a requirement). As noted previously,

adolescents and young adults (16 through 23 years of age) may be vaccinated with a serogroup B meningococcal vaccine, preferably at 16 through 18 years of age, to provide short term protection against most strains of serogroup B meningococcal disease. This would be a decision between a healthcare provider and a patient. These policies may change as new information becomes available.

Where can I get more information about meningitis?

- Your health care provider
- The Massachusetts Department of Public Health, Division of Epidemiology and Immunization at (617) 983-6800 or on the MDPH website at http://www.mass.gov/dph/
- Your local health department (listed in the phone book under government)