
Meningococcal: Questions and Answers

Information about the disease and vaccines

What causes meningococcal disease?

Meningococcal disease is caused by the bacterium *Neisseria meningitidis*. This bacterium has at least 13 different subtypes (serogroups). Five of these serogroups, A, B, C, Y, and W-135, cause almost all invasive disease. The relative importance of these five serogroups depends on geographic location and other factors.

How does meningococcal disease spread?

The disease is spread person-to-person through the exchange of respiratory and throat secretions (e.g., by coughing, kissing, or sharing eating utensils). Meningococcal bacteria can't live for more than a few minutes outside the body, so the disease is not spread as easily as the common cold or influenza.

How long does it take to show signs of meningococcal disease after being exposed?

The incubation period of meningococcal disease is 3 to 4 days, with a range of 2 to 10 days. Meningococcal bacteria can make a person extremely ill by infecting the blood (septicemia) or by infecting the fluid of the spinal cord and around the brain (meningitis). Because this disease progresses quickly, it is important to be diagnosed and start treatment as soon as possible.

What are the symptoms of meningococcal disease?

The most common symptoms are high fever, chills, lethargy, and a rash. If meningitis is present, the symptoms will also include headache and neck stiffness (which may not be present in infants); seizures may also occur. In overwhelming meningococcal infections, shock, coma, and death can follow within several hours, even with appropriate medical treatment.

How serious is meningococcal disease?

Meningococcal disease is very serious. About 10 to 15% of people with meningococcal disease die even with appropriate antibiotic treatment. Of those who recover, up to 20% suffer from some serious after-effects, such as permanent hearing loss, limb loss, or brain damage.

How is meningococcal disease diagnosed?

The diagnosis is made by taking samples of blood and spinal fluid from a person who is sick. The spinal fluid is obtained by performing a spinal tap, where a needle is inserted into the lower back. Any bacteria

found in the blood or spinal fluid is grown in a medical laboratory and identified.

Meningococcal disease is uncommon in the United States, and the symptoms can be mistaken for other illnesses, which unfortunately can lead to delayed diagnosis and treatment.

Can't meningitis be caused by a virus too?

Yes, the word "meningitis" refers to inflammation of the tissues covering the brain and spinal cord. This inflammation can be caused by viruses and fungi, as well as bacteria. Viral meningitis is the most common type; it has no specific treatment but is usually not as serious as meningitis caused by bacteria.

Is there a treatment for meningococcal disease?

Meningococcal disease can be treated with antibiotics. It is critical to start treatment early.

How common is meningococcal disease in the United States?

Fewer than 1000 cases of meningococcal disease are reported each year in the United States. An estimated 100 deaths from meningococcal disease occurred in the United States in 2011.

The disease is most common in children younger than 5 years (particularly children younger than age 1 year), people age 16–21 years, and people age 65 years and older.

What people are at special risk for meningococcal disease?

In addition to certain age groups, people at increased risk include travelers to places where meningococcal disease is common (e.g., certain countries in Africa, and in Saudi Arabia), people with damaged or missing spleens, and people with persistent complement component deficiency (an immune system disorder). Other factors make it more likely an individual will develop meningococcal disease, including having a previous viral infection, living in a crowded household, having an underlying chronic illness, and being exposed to cigarette smoke (either directly or second-hand).

Studies have also shown that college freshmen who live in a dormitory are at an increased risk of meningococcal disease compared with others their age.

How common is meningococcal disease in the world?

Meningococcal disease occurs throughout the world, but is more common in the area of Africa known as the "meningitis belt." Serogroup A is responsible for most of the meningococcal disease in sub-Saharan Africa. This serogroup is uncommon in the United States.

Can you get meningitis more than once?

Yes. Meningitis can be caused by different serogroups of the meningococcal bacterium, by other bacteria such as Streptococcus and Haemophilus, as well as by viruses and fungi. Being vaccinated against *Neisseria meningitidis* or having had the disease will not protect you against meningitis from other bacteria or viruses.

If a child is diagnosed with meningococcal disease, can anything be done to protect the other children with whom he has contact?

Individuals who have been exposed to a person with bacterial meningitis can be protected by being started on a course of antibiotics immediately (ideally within 24 hours of the patient being diagnosed). This is usually recommended for household contacts and children attending the same day care or nursery school. Older children and adults (e.g., who are in the same school or church) aren't usually considered exposed unless they have had very close contact with the infected person (e.g., kissing or sharing a glass).

In addition to the antibiotic treatment, vaccination may be recommended for people 2 months of age and older if the person's infection is caused by meningococcus serogroup A, C, Y, or W-135, which are contained in 3 of the 4 meningococcal vaccines available in the United States.

What meningococcal vaccines are available in the United States?

Four meningococcal vaccines are currently available in the United States. A quadrivalent meningococcal polysaccharide vaccine or "MPSV4" (Menomune by sanofi pasteur) was licensed in 1981 for people ages 2 years and older. It protects against four serogroups of meningococcus—A, C, Y, and W-135. The first quadrivalent meningococcal conjugate vaccine (MCV4, Menactra by sanofi pasteur), was licensed in 2005 and is approved for persons age 9 months through 55 years. A second quadrivalent conjugate vaccine (MCV4, Menveo by Novartis) was licensed in 2010 and is approved for persons age 2 months through 55 years. A bivalent conjugate meningococcal vaccine containing serogroups C and Y combined with *Haemophilus influenzae* type b vaccine (MenHi-

brix by GlaxoSmithKline) was licensed in 2012 for children age 6 weeks through 18 months.

Either MPSV4 or MCV4 can be given to a person age 56 years or older, according to the recommendations of CDC's Advisory Committee on Immunization Practices. The clinician will decide which vaccine is appropriate depending on individual circumstances.

Meningococcal conjugate vaccines are believed to give better protection and are more effective in young children than the polysaccharide vaccine. Unfortunately, no U.S. licensed vaccine protects against meningococcal serogroup B which causes about one third of all meningococcal disease in the United States. About 60% of meningococcal disease in infants age one year or younger are caused by serogroup B.

What kind of vaccines are they?

The MPSV4 vaccine is made from the outer polysaccharide capsule (sugar coat) of the meningococcal bacteria. The meningococcal conjugate vaccines are made by chemically linking the capsular polysaccharide antigens individually to a protein. The vaccines do not contain live bacteria.

How is this vaccine given?

The MPSV4 vaccine is given as an injection into the fatty tissue of the upper arm. The MCV4 vaccines are given in a leg muscle of a young child or the deltoid (arm) muscle of an older child or adult.

Who should get the meningococcal vaccine?

MCV4 is recommended for all children and teens, ages 11 through 18 years. Vaccination is also recommended for other people at increased risk of meningococcal disease; this includes:

- People younger than 22 years of age if they are or will be a first-year college student living in a residential hall.
- People age 2 months and older who have persistent complement component deficiency (an immune system disorder), or are at risk during an outbreak caused by a vaccine serogroup (MenHibrix may be used for children age 6 weeks through 18 months in this group).
- People age 2 months and older who have a damaged or missing spleen (MenHibrix may be used for children age 6 weeks through 18 months in this group).
- People working with meningococcus bacteria in laboratories.
- People age 2 months and older who reside in or travel to certain countries in sub-Saharan Africa as

well as to other countries for which meningococcal vaccine is recommended (e.g., travel to Mecca, Saudi Arabia, for the annual Hajj).

- U.S. military recruits.

Should college students be vaccinated against meningococcal disease?

College freshmen living in residence halls, are at an increased risk of meningococcal disease relative to other people their age. The MCV4 vaccine is recommended for previously unvaccinated first-year college students, age younger than 22 years, who are or will be living in a residence hall. Some colleges and universities require incoming freshmen and others to be vaccinated; some may also require that a meningococcal vaccination have been given since the age of 16 years. The vaccine may be available from the college health service. Although the risk for meningococcal disease among other college students (such as those 22 years or older, or not living in a residence hall) is similar to that of the general population of the same age, students who wish to decrease their risk of meningococcal disease can be vaccinated.

How many doses of meningococcal vaccine are needed?

The number of doses recommended depends on the age when the vaccine is given and the presence of certain medical conditions or risk factors. All adolescents should be vaccinated at ages 11 through 12 years and need a booster dose at age 16 years. All teens who were vaccinated at ages 13 through 15 years need a booster dose at age 16 through 18 years (at least 8 weeks after the first dose). First-year college students younger than 22 years who are living in a residential hall should get a booster dose if their previous dose was given before age 16 years. People ages 2 months and older who have certain risk factors such as no spleen or a damaged spleen, or persistent complement component deficiency (an immune system disorder), may need more than one dose. In addition, vaccinated people who remain at risk, such as people without a spleen, microbiologists who work with meningococcus, or those who travel repeatedly to parts of Africa, should receive a booster dose of MCV4 every 5 years.

How soon after their first dose should people who remain at risk for meningococcal disease be vaccinated again?

The time between the primary (initial) doses(s) and the first booster varies. Children who received their primary dose(s) before their seventh birthday

should get their first booster 3 years after their primary dose(s). Children who received their primary dose(s) at or after age 7 years and all adults should get boosters 5 years after their primary dose(s).

How safe is this vaccine?

Both types of meningococcal vaccines are very safe. Polysaccharide (sugar) meningococcal vaccine has been used extensively since 1981, and millions of doses of meningococcal conjugate vaccine have been given since they were first licensed in 2005.

What are the side effects of this vaccine?

Up to about half of people who get meningococcal vaccines have mild side effects, such as redness or pain where the shot was given. These symptoms usually last for one or two days and are more common after MCV4 than after MPSV4. A small percentage of people who receive the vaccine develop a fever. Severe reactions, such as a serious allergic reaction, are very rare.

How effective is this vaccine?

The MPSV4 vaccine is 85 percent to 100 percent effective at preventing infection from the subtypes of meningococcus found in the vaccine (A, C, Y, and W-135). However, the vaccine does not protect against serogroup B disease. Based on results of laboratory studies, MCV4 is believed to be as effective as MPSV4.

Who should not receive meningococcal vaccine?

- People who have had a serious allergic reaction to a previous dose of either meningococcal vaccine or to one of the vaccine components.
- People who are moderately or severely ill.

Can a pregnant woman get meningococcal vaccine?

Studies of vaccination with MPSV4 during pregnancy have not documented adverse effects among either pregnant women or newborns. Post-licensure safety data suggest no concerns with the safety of MCV4 during pregnancy. Pregnancy is not considered to be a contraindication to either MPSV4 or MCV4.

Can the vaccine cause meningococcal disease?

No. Only the *Neisseria meningitidis* bacterium can cause meningococcal disease. The vaccine contains only the sugar capsule of the microbe.