
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 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 3–4 days, with a range of 2–10 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 9–12% of people with meningococcal disease die even with appropriate antibiotic treatment. Of those who recover, up to 20% suffer from some serious after-effect, 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 possibly infected. 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 relatively rare 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?

Bacterial meningitis can be treated with antibiotics. It is critical to start treatment early.

How common is meningococcal disease in the United States?

There are approximately 2,000–3,000 cases of meningococcal disease each year in the United States. An estimated 110 deaths from meningococcal disease occurred in the United States in 2009.

The disease is most common in children younger than age one year and in people with certain medical conditions. The proportion of cases in adolescents and young adults has increased in recent years; the rate of invasive disease among people age 17–20 years is about twice that of the general U.S. population.

What people are at special risk for meningococcal disease?

People at risk include infants, travelers to places where meningococcal disease is common (e.g., certain countries in Africa and Saudi Arabia), people with damaged or missing spleens, and people with certain blood diseases. 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 dormitories are at an increased risk of meningococcal disease compared with others their age.

How common is meningococcal disease in the world?

Meningococcal disease is common in certain parts of the world, especially the area of Africa which is known as the "meningitis belt." Serogroup A is responsible for most of the meningococcal disease in sub-Saharan Africa, but this serogroup is uncommon in the United States.

Can you get meningitis more than once?

Yes. Meningitis can be caused by different subtypes of the meningococcal bacterium, by other bacteria such as Streptococcus and Haemophilus, as well as by viruses and fungi. Even being vaccinated against Neisseria meningitidis or having had the disease will not protect you against these other sources of infection.

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 two years of age and older if the person's infection is caused by meningococcus type A, C, Y, or W-135, all of which are contained in the meningococcal vaccine.

When did the meningococcal vaccine become available?

The first meningococcal vaccine in the United States was licensed in 1974 and was effective against only one of the five major subtypes (i.e., strains) of meningococcus. A bivalent vaccine, effective against two strains, was licensed in 1978.

In 1981, a meningococcal polysaccharide quadrivalent vaccine or "MPSV4" (Menomune by sanofi pasteur) was licensed for people ages 2 years and older. It protects against four subtypes of meningococcus—A, C, Y, and W-135. The first quadrivalent meningococcal conjugate vaccine (MCV4), Menactra by sanofi pasteur, was licensed in 2005. A second conjugate vaccine, Menveo by Novartis, was licensed in 2010. They both also protect against the A, C, Y and W-135 subtypes. Meningococcal conjugate vaccines are expected to give better, longer-lasting protection than the polysaccharide vaccine. Unfortunately, no vaccine protects against subtype B which causes about one third of all the meningococcus cases in

the United States. In 2001, 65% of cases in infants age one year or younger were caused by subtype 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 conjugating the capsular polysaccharide antigens individually to diphtheria toxoid protein. Both the polysaccharide and conjugate vaccines protect against serotypes A, C, Y and W-135 and do not contain live bacteria.

How is this vaccine given?

The MPSV4 vaccine is given as an injection into the fat of the arm. The MCV4 vaccines are given in the muscle.

Who should get the meningococcal vaccine?

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

- People 19–21 years if they are or will be a first-year college student living in a residential hall.
- People age 9 months and older who have persistent complement component deficiency (an immune system disorder), reside in or travel to a country with hyperendemic or epidemic disease, or are present during outbreaks caused by a vaccine serogroup.
- People age 2 years and older who have a damaged or missing spleen.
- People working with meningococcus bacteria in laboratories.
- Travelers to certain countries in sub-Saharan Africa as well to other countries for which meningococcal vaccine is recommended (e.g., travel to Mecca, Saudi Arabia, for the annual Hajj).
- U.S. military recruits.

MCV4 should be used in people ages 2 through 55 years in these risk groups and one of the two vaccines (Menactra; sanofi) can be used in children ages 9 through 23 months who have specific risk factors. MPSV4 can be used in people ages 2 years and older if someone has a permanent contraindication or precaution to the use of MCV4. MPSV4 is the only licensed meningococcal vaccine product that can be used in adults 56 years or older.

Can vaccine be given to children younger than age two years?

Younger children, ages 9 through 23 months, who are at increased risk of disease can be vaccinated with Menactra (by sanofi pasteur). This vaccine was

licensed for the expanded age indication in 2011 and is recommended specifically for children who meet any of the following risk indicators: 1) persistent complement component deficiency (an immune system disorder), 2) reside in or travel to a country with hyperendemic or epidemic disease, or 3) are present during outbreaks caused by a vaccine serogroup.

Should college students be vaccinated against meningococcal disease?

College freshmen, especially those living in residence halls, are at an increased risk of meningococcal disease relative to other people their age. The MCV4 vaccine is therefore recommended for first-year college students, age 19–21 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 is similar to that of the general population of the same age, there is no medical reason that other students who wish to decrease their risk of meningococcal disease cannot receive the vaccine.

How many doses of meningococcal vaccine are needed?

Some people need 2 doses spaced 2–3 months apart when first vaccinated; this includes children and adults who are without a spleen or with a damaged spleen, with persistent complement component deficiency (an immune system disorder), or infected with HIV.

Are booster doses needed following initial vaccination?

Yes, all adolescents who were first vaccinated at ages 11 through 12 years 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. In addition, vaccinated people who remain at risk, such as people without a spleen or those who travel repeatedly to parts of Africa, should receive an additional vaccination at least 5 years after their previous dose of either MCV4 or MPSV4. First-year college students ages 19 through 21 years who are living in a residential hall should get a booster dose if their previous dose was given before age 16 years.

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

The interval between the primary (initial) doses(s)

and the first booster depends varies. Children who received their primary dose(s) before their seventh birthday should get their first booster with a minimum interval of 3 years. Children who received their primary dose(s) at or after age 7 years and all adults should get boosters with a minimum interval of 5 years between doses.

How safe is this vaccine?

Both meningococcal vaccines are very safe. Polysaccharide (sugar) meningococcal vaccines have been used extensively in mass vaccination programs, such as those conducted by the military.

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 meningococcus. Based on results of laboratory studies, MCV4 is believed to be as effective as MPSV4 and to have a longer duration of immunity.

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 is fractional and contains only a part of the microbe.