Meningococcal: Questions and Answers

Q&A

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, cause almost all invasive disease. The relative importance of these five serogroups depends on geographic location and other factors. In the United States almost all meningococcal disease is caused by serogroups B, C, W and Y. Serogroups C, W, and Y account for more than half of reported cases.

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 caused by any serogroup is very serious. About 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 lumbar puncture, 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 500 cases of meningococcal disease were reported each year since 2010 in the United States. In 2018, a total of 329 cases were reported and 39 died.

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?

Risk factors for meningococcal disease include having a recent viral infection, household crowding, and cigarette smoke exposure (direct or second-hand smoke). In addition, certain people are at higher risk than other people

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their age for meningococcal disease caused by any serogroup. These include people with a damaged or missing spleen, those with persistent complement component deficiency (an immune system disorder) or who take a complement inhibitor (Soliris [eculizumab] or Ultomiris [ravulizumab]), as well as microbiologists who routinely handle meningococcal isolates.

Certain people are at increased risk for meningococcal serogroups A, C, W, and Y but not serogroup B. These include travelers to regions where meningococcal disease is more common (such as sub-Saharan Africa) and people living with HIV.

Does meningococcal disease occur in other parts of the world?

Meningococcal disease occurs throughout the world, but is more common in the area of Africa known as the "meningitis belt." Serogroup A was common in sub-Saharan Africa but is now rare thanks to a major vaccination campaign. Serogroups C and W now dominate in the "meningitis belt."

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, which are contained in 3 of the 5 meningococcal vaccines available in the United States.

What meningococcal vaccines are available in the United States?

There are 2 types of meningococcal vaccine available in the United States. One type of vaccine (MenACWY) contains the surface polysaccharides of meningococcal serogroups A, C, W and Y chemically bonded (conjugated) to a protein. This vaccine is recommended for all adolescents at 11–12 years and a second dose at 16 years. A second type are vaccines for meningococcal serogroup B (MenB), which are composed of proteins also found in the surface of the bacteria. No type of vaccine contains live or intact meningococcal bacteria.

MenACWY vaccines provide no protection against serogroup B disease and MenB vaccines provide no protection against serogroup A, C, W or Y disease. For protection against all 5 serogroups of meningococcus it is necessary to receive a MenACWY and a MenB vaccine.

Meningococcal Vaccines Licensed in U.S.

TRADE NAME	TYPE OF VACCINE	SEROGROUPS INCLUDED	YEAR LICENSED	APPROVED AGES
Menactra	Conjugate	A, C, W, Y	2005	9 months–55 years*
Menveo	Conjugate	A, C, W, Y	2010	2 months–55 years*
MenQuadfi	Conjugate	A, C, W, Y	2020	2 years and older
Trumenba	Protein	B	2014	10–25 years†
Bexsero	Protein	B	2015	10–25 years†

*may be given to people age 56 years or older
†may be given to people age 26 years or older

How is this vaccine given?

MenACWY vaccines are given in a leg muscle of a young child or the deltoid (arm) muscle of an older child or adult. MenB vaccines are given in the deltoid muscle.

Who should get the meningococcal vaccine?

Certain groups should receive both MenACWY and MenB vaccines. Others are recommended to receive MenACWY only.

MenACWY is recommended for these groups:

- All children and teens, ages 11 through 18 years
- People age 2 months and older who have a damaged or missing spleen.

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- People age 2 months and older who have persistent complement component deficiency (an immune system disorder) or who take a complement inhibitor (Soliris [eculizumab] or Ultomiris [ravulizumab]).
- People who are at risk during an outbreak caused by a vaccine serogroup.
- People with HIV infection.
- People who are or will be a first-year college student living in a residential facility.
- 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).
- People working with meningococcus bacteria in laboratories.

MenB is recommended for these groups:

- People age 10 years and older who have a damaged or missing spleen.
- People age 10 years and older who have persistent complement component deficiency (an immune system disorder) or who take a complement inhibitor (Soliris [eculizumab] or Ultomiris [ravulizumab]).
- People who are at risk during an outbreak caused by a vaccine serogroup.
- People working with meningococcus bacteria in laboratories.

MenB vaccines are not routinely recommended for all adolescents or college students. However, the Centers for Disease Control and Prevention (CDC) recommends that a MenB vaccine series may be administered to persons 16 through 23 years of age with a preferred age of vaccination of 16 through 18 years. This shared clinical decision-making recommendation allows the clinician and patient to decide on MenB vaccination based on the risk and benefit for the individual patient.

What information should healthy people age 16 through 23 years and their healthcare provider consider when deciding on the use of MenB vaccine?

Considerations for shared clinical decision-making for vaccination against meningococcal B disease include:

- MenB disease is serious, with high rates of death and disability.
- MenB disease is rare (about 34 cases per year in people age 16 through 23 years in the U.S.).
- Risk of MenB disease is higher among college students, especially those who are freshmen, attend a 4-year university, live on campus, or participate in fraternities or sororities.
- MenB vaccines protect against most serogroup B strains.
- MenB vaccines provide short-term protection, with protective antibody levels declining within 1–2 years.
- MenB vaccines may prevent illness but a vaccinated person may still carry the serogroup B bacteria in their nose.

Should college students be vaccinated against meningococcal disease?

The MenACWY vaccine is recommended for previously unvaccinated first-year college students who are or will be living in a residence facility. Some colleges and universities require incoming freshmen and others to be vaccinated with MenACWY.

With widespread use of MenACWY vaccines, the risk for meningococcal disease among college students is greatest for serogroup B, although serogroup B disease in this group is still rare. College students age 16 through 23 may choose to receive MenB vaccine to reduce their risk of MenB disease. Some colleges require MenB vaccination in addition to MenACWY.

How many doses of meningococcal vaccine are needed?

For MenACWY vaccines 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 with one dose of MenACWY at age 11 or 12 years and with a booster dose at age 16 years. All teens who were vaccinated with MenACWY at age 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 who are or will be living in a residential facility should get a MenACWY booster dose if their previous dose was given before age 16 years. Young adults age 19 through 21 who did not receive a dose after their 16th birthday may be given a catch-up dose of MenACWY.

More than 1 dose may be needed for people with a damaged or missing spleen, people with HIV infection, and those with complement component deficiency (an immune system disorder) or who take a complement

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inhibitor (Soliris [eculizumab] or Ultomiris [ravulizumab]). In addition, vaccinated people who remain at risk should receive a booster dose of MenACWY every 5 years.

The CDC recommends that people not at increased risk of meningococcal B disease (healthy people age 16 through 23 years) may receive a 2-dose series of Bexsero or Trumenba, preferably at age 16 through 18 years.

People ages 10 years and older with risk factors (i.e., anatomic/functional asplenia, persistent complement component deficiency, complement inhibitor use, or who work with meningococcus bacteria in laboratories) should receive either the 2-dose Bexsero series or the 3-dose Trumenba series. They should receive a MenB booster 1 year following the completion of a MenB primary series, and then boosters every 2–3 years thereafter, for as long as increased risk remains. For people age 10 years and older who are determined by public health officials to be at increased risk during an outbreak, CDC recommends a one-time booster dose if it has been 1 or more years since completion of a MenB primary series. Depending upon the outbreak conditions, public health officials may recommend a booster dose as soon as 6 months after completing the primary series. Because the two brands of MenB vaccine work differently, it is important that all booster doses be the same brand as the primary series.

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

The time between the primary (initial) doses(s) of MenACWY and the first booster varies. Children who received their primary MenACWY dose(s) before their seventh birthday should get their first booster 3 years after their primary dose(s) and every 5 years thereafter, as long as they remain at risk.

How soon after their 2-dose or 3-dose series of MenB vaccine should people who remain at increased risk of meningococcal B disease be vaccinated again?

The protection of MenB vaccine does not last as long as MenACWY vaccine. Those people at increased risk for meningococcal serogroup B disease (see last paragraph in answer to question at the top of this column) need their first booster dose 1 year after completing their primary series, then every 2–3 years thereafter, as long as they remain at risk.

What are the side effects of these vaccines?

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

More than 60,000 persons have received MenB vaccines during clinical trials or for outbreak control on college campuses. The most common side effect was pain at the injection site, which was reported by about 80% of recipients. The Vaccine Adverse Event Reporting System (VAERS) and other vaccine safety systems carefully monitor MenACWY and MenB vaccine safety as they do for other U.S.-licensed vaccines.

How effective is this vaccine?

Based on antibody studies and comparison with an older meningococcal vaccine, MenACWY is believed to be at least 85% effective.

Because serogroup B meningococcal disease is rare, MenB vaccine efficacy estimates were based on demonstration of an immune response after vaccination. From 63% to 88% of recipients of a full series of MenB vaccine develop a protective level of antibody against representative strains of serogroup B meningococcus.

Who should not receive meningococcal vaccine?

These groups should not receive either type of 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. The packaging of some meningococcal vaccines may contain latex. Information on the contents of each vaccine is included with each vaccine.
- People who are moderately or severely ill.

Can a pregnant woman get meningococcal vaccine?

Post-licensure safety data suggest no concerns with the safety of MenACWY during pregnancy. Pregnancy is not a contraindication nor a precaution to MenACWY vaccination. Healthcare personnel should administer this vaccine to high-risk pregnant women. Although experience with MenB vaccines is limited, they have not been shown to be detrimental to a pregnant woman or fetus. Pregnancy is a precaution to MenB vaccine. Healthcare personnel can administer this vaccine to high-risk pregnant women.