

# Meningococcal Meningitis

## Traveler Summary

### Key Points

- ⌋ Meningococcal infections are acute, often fatal bacterial infections (caused by one of the bacterial serogroups A, B, C, W, X, and Y) occurring worldwide (primarily in the meningitis belt of sub-Saharan Africa) and acquired through the inhalation of aerosolized respiratory droplets or through direct contact with objects contaminated with respiratory secretions from an infected person or carrier (without symptoms).
- ⌋ Risk is generally low but is highest for travelers going to the meningitis belt and any other destination with a current local epidemic. Risk increases with the level of contact with the local population.
- ⌋ Symptoms are usually severe and include fever, rash, severe headache, vomiting, neck and back pain with rigidity, altered consciousness, and coma.
- ⌋ Consequences of infection include deafness, difficulty concentrating and sleeping, or death (which may occur within 12-24 hours of initial symptoms).
- ⌋ Prevention includes observing good respiratory-hygiene (cough and sneeze etiquette) and hand-hygiene (frequent, thorough handwashing) measures.
- ⌋ Meningococcal vaccines (protecting against different serogroups) are available. Quadrivalent (serogroups A, C, W, Y) meningococcal vaccine is given as a single dose to travelers at risk and given routinely to nontraveling adolescents at age 11 years and then again at age 16 years. At-risk travelers aged 2 months and older should receive 1 to 3 doses depending on age. Meningococcal B vaccines (serogroup B) are not indicated for travel but may be given as a routine vaccine to persons aged 16 to 23 years.
- ⌋ Vaccine side effects are mild and include injection-site reactions, headache, fatigue, muscle aches, weakness, and fever. Persons receiving quadrivalent vaccine may experience a painful swelling of the arm.
- ⌋ Duration of quadrivalent vaccine protection wanes; a booster is recommended every 3 to 5 years if at continued risk.

### Introduction

Meningococcal infections are potentially fatal, acute bacterial infections of the blood or brain occurring worldwide, caused by different serogroups (A, B, C, W, X, Y) of *Neisseria meningitidis* bacteria and are transmitted through inhalation of aerosolized respiratory droplets or contact with objects contaminated with respiratory and nasal secretions from infected persons.

### Risk Areas

Meningococcal disease occurs worldwide but the highest incidence is in developing countries in the meningitis belt of sub-Saharan Africa, where large outbreaks (caused primarily by serogroups C and W) occur semiannually in the hot dry season (December through June), primarily in children aged 5-12 years. In other developing countries, the seasonality is less marked.

In industrialized countries, the disease occurs as single cases or small clusters, with serogroup B being the most common cause of meningococcal disease, especially in children younger than 5 years. In countries with a temperate climate, peak transmission is during winter; highest incidence is in infants younger than 1 year. Outbreaks may occur in crowded settings, childcare centers, schools, colleges, summer camps, and the military. In the U.S., serogroups B, C, and Y are responsible for about two-thirds of cases in persons 11 years and older.

Epidemics are associated with poverty and crowding. This pattern influences vaccination policy and advice to travelers.

### Transmission

Meningococcal bacteria are mainly transmitted person to person via inhalation of aerosolized respiratory or nasal droplets (e.g., from sneezes or coughs) from an infected symptomatic person or symptom-free carrier or through contact with objects contaminated with respiratory or nasal secretions from infected persons. The closer the contact, the greater the risk of transmission.

## Risk Factors

Risk is generally low but is higher for travelers or health care workers (HCWs) going to (or residing in) countries within the African meningitis belt during the epidemic season or going to any country where an epidemic is ongoing or outbreaks are common; for persons participating in an international pilgrimage (Hajj or Umra); or persons having close contact with local residents who may be meningitis carriers. Congregate settings (e.g., military barracks, college dormitories, and similar close-living quarters) facilitate transmission; smoke-filled bars and clubs have been associated with outbreaks. Persons with weakened immune systems are also at increased risk.

## Symptoms

Symptoms commonly appear and progress rapidly about 1 to 10 days following exposure and include fever and rash, followed hours or days later by severe headache, vomiting, neck and back pain with rigidity, altered consciousness, and coma. Half of the persons with meningitis develop shock. In severe infections, a brief influenza-like illness with high fever leads directly to extreme weakness, collapse, and shock within hours.

## Consequences of Infection

Nerve damage following infection is common. Deafness and difficulty concentrating and sleeping are common in persons who have recovered. Death occurs in more than 70% of untreated infected persons and in about 10% of individuals who receive treatment.

## Need for Medical Assistance

Persons who have been exposed to or develop symptoms of meningococcal disease should seek immediate medical attention for evaluation of the need for postexposure treatment. Sudden onset of fever while in a risk situation, especially if accompanied by rash or headache, requires immediate medical attention. Antibiotic therapy, if given as soon as possible, may reduce the duration and severity of meningococcal meningitis.

## Prevention

### Nonvaccine

Observe good respiratory-hygiene (cough and sneeze etiquette) and hand-hygiene (frequent, thorough handwashing) measures.

### Vaccine

#### Routine

Quadrivalent meningococcal vaccines (Menactra, Menveo), providing protection against serogroups A, C, W, and Y, are given routinely as an adolescent vaccination, to certain persons at risk, or to persons during a community outbreak caused by meningococcal serogroups A, C, W, or Y.

Meningococcal B vaccine (Bexsero, Trumenba), providing protection against serogroup B, is recommended for certain at-risk persons 10 years and older. These vaccines may also be given as a routine vaccination to healthy persons aged 16-23 years (preferred age, 16-18 years) to provide short-term protection.

Meningococcal C vaccine, providing protection against serogroup C (associated with school and community outbreaks in certain countries), is available outside the U.S. and may be given following local guidance in the destination country.

#### Travel

Vaccination with quadrivalent (serogroups A, C, W, and Y) meningococcal vaccine is recommended for:

- | Travelers going to (or residing in) certain countries where meningococcal disease is constantly or highly present or epidemic-prone at certain times of the year; especially if prolonged close contact with local residents is anticipated.
- | Travelers going to any country experiencing a current epidemic or localized outbreak.
- | HCWs traveling to any of the above countries at any time of year for health care work or research.
- | Expatriates and long-stay child travelers in countries where meningococcal vaccine is given routinely to children and infants.

- | University students who will be living in dormitories or residence halls who had not previously received quadrivalent vaccine at 16 years and older.
- | Persons aged 11-18 years who have not previously received quadrivalent vaccine

Vaccination with quadrivalent meningococcal vaccine is required for:

- | All persons 2 years and older who are traveling to Saudi Arabia for the pilgrimage to Mecca (Hajj or Umra). Vaccination must have been received not more than 3 to 5 years (depending on vaccine) and not less than 10 days before arrival in Saudi Arabia.

Vaccination with meningococcal B (MenB) vaccine is recommended for expatriates and long-stay child travelers in a few countries (outside the U.S.) where high risk exists for serogroup B; MenB vaccine is routinely given to infants/children in these countries. Vaccination is recommended for persons or HCWs going to areas with a serogroup B disease outbreak.

Vaccination with meningococcal C vaccine (MenC; not available in the U.S.) is recommended for expatriates and long-stay child travelers in countries where this vaccine is given routinely to infants/children.

### Side Effects

The most common side effects of meningococcal vaccines are mild and can include injection-site reactions, headache, fatigue, muscle aches, weakness, and fever. Persons receiving quadrivalent vaccine may experience a painful swelling of the arm.

Persons with underlying medical conditions or who have concerns about the vaccines should speak to their health care provider before vaccine administration.

### Timing

Quadrivalent vaccines (Menveo or Menactra) are given as follows:

- | Routine, regardless of travel for:
  - | Adolescents aged 11-12 years: 1 dose followed by a booster at age 16 years
  - | Military recruits (regardless of any previous doses); persons at risk from a meningococcal disease outbreak due to serotypes A, C, W, or Y; and laboratory workers exposed to samples containing meningitis-causing bacteria: 1 dose followed by a booster every 5 years if risk remains
  - | First-year college students (aged 21 years or younger) living in residence halls: 1 booster dose (within 5 years of enrollment) if the most recent dose was given when younger than 16 years
- | Travelers or other at-risk groups:
  - | Children aged 2-23 months: 2 to 3 doses (depending on age and vaccine brand), given 8 to 12 weeks apart. For imminent departures, doses may be given 4 weeks apart
  - | Healthy persons 2 years and older: 1 dose
  - | Boost 5 years after a previous dose if at new or continued exposure; for travelers going to Africa, consider a booster dose 3 years after a previous dose (due to waning immunity)

MenB vaccines (Bexsero or Trumenba) for at-risk persons 10 years and older are given as follows:

- | Bexsero: 2 doses, given 1 month apart
- | Trumenba: 2 doses, given at 0 and 6 months or 3 doses at 0, 1-2, and 6 months
- | No booster dose is indicated.

MenC vaccine: Will be given following local guidance in destination country if indicated.

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