Meningococcal Disease Information and Investigation Guidelines

Note: This version (revised 02/14) contains updates to the Prevention section.

Description

Meningococcal disease usually presents clinically as one of three syndromes: meningitis, meningococcemia (bacteremia), or bacteremic pneumonia. The two most common presentations are meningococcal meningitis accounting for 50.2% of cases, and meningococcemia accounting for 37.5% of cases. Meningococcal meningitis is an inflammation of the meninges (the tissue that covers the brain and spinal cord), while meningococcemia is an extremely severe, invasive infection of the blood stream. These disease presentations may occur independently or at the same time depending on the location of the bacteria in the body.

Infectious Agent

Meningitis can be caused by many different organisms, including bacteria, viruses, parasites, and fungi. Bacterial meningitis is generally more severe than viral meningitis. The term “meningococcal disease” refers only to disease caused by the bacteria Neisseria meningitidis; an aerobic, gram-negative, diplococcus. There are 13 serogroups of N. meningitidis. Serogroups A, B, C, Y, and W-135 account for nearly all cases of invasive disease worldwide. In the United States, serogroups B, C, and Y account for over 90% of cases.

Symptoms

Meningococcal disease signs and symptoms can include: high fever, headache, stiff neck, photophobia, nausea/vomiting, hypotension, weakness, confusion, shock, and coma. A petechial rash and/or purpura fulminans (systemic peripheral gangrene) may be observed in cases of meningococcemia. The rash develops rapidly and usually appears around the armpits, groin, and ankles. The rash may have macules or vesicles and does not fade when direct pressure is applied. Symptoms in infants may be difficult to notice or present differently from older children and adults. Fever, irritability, lethargy, vomiting, and refusing foods can all be symptoms of meningococcal disease in infants. Once clinical disease presents, symptoms may develop rapidly within a few hours, or over the course of 1-2 days.

Incubation Period

The time from exposure to the development of clinical symptoms can range from 2-10 days, usually 3-4 days. The vast majority of individuals who come into contact with the N. meningitidis bacteria will not develop meningococcal disease.
Incidence
The occurrence of meningococcal disease is highest during the winter and spring. Each year, approximately 800-1,200 cases (rate of ~0.3 cases per 100,000 population) of meningococcal disease occur in the United States. The incidence of meningococcal disease is highest among infants and children less than 5 years old, adolescents and young adult aged 16-21 years, and adults 65 years and older. Rates of disease tend to decrease after infancy then increase during adolescence and young adulthood.

Transmission
The bacteria that cause meningococcal disease are contagious and spread from respiratory and nasopharyngeal secretions. Humans are the only reservoir. Fortunately, N. meningitidis bacteria are not as contagious as other respiratory pathogens such as rhinovirus (the common cold) and influenza virus. Most people exposed to N. meningitidis will not develop illness. Transmission of the bacteria on objects is generally not significant, although attention should be paid in daycares and other settings where children may place toys or other objects in their mouths. Casual contact is generally not enough to spread the bacteria to other individuals. Close, prolonged, or direct contact with oral or nasal secretions is necessary for transmission. Types of close contact include: kissing, sharing eating or drinking utensils, sharing cigarettes, performing CPR with breathing techniques, etc.

Communicability
Infection may be spread as long as there are live bacteria in nasal and throat secretions. A person is usually considered infectious 7-10 days prior to illness onset until 24 hours after appropriate antibiotic therapy is started. Bacteria are generally no longer present in the nasopharyngeal tract after 24 hours of appropriate antibiotic therapy. Hospitalized cases should be placed under droplet precautions until 24 hours of appropriate treatment has been completed.

Groups with Increased Risk for Meningococcal Disease
- Household contacts of case patients and people with direct contact to case patient’s oral and nasal secretions
- Infants
- People with concurrent or recent viral respiratory infections
- Individuals in crowded living situations such as multiple families living in a single unit, homeless shelters, or refugee camps
- Individuals with chronic illness
- People in group living situations, such as a college dormitory or military barracks
- People with immune deficiencies, those on medications that suppress immune function, or patients without spleens
- Individuals with active or passive exposure to smoking
- Travelers to areas with high levels of endemic or epidemic meningococcal disease
- Microbiologists or laboratorians who work with the N. meningitidis bacteria
Severity
Nearly all untreated cases of meningococcal disease result in death. Despite the susceptibility of the *N. meningitidis* bacteria to many common antibiotics, even with treatment 10-15% of cases are fatal. Among those who survive infection, 11-19% will have long-term adverse effects (e.g., brain damage, hearing loss, loss of limb use, etc.)

Diagnosis
CSF from a lumbar puncture (LP or spinal tap) in conjunction with a blood isolate are the primary specimens used to diagnose meningococcal disease. Unless contraindicated, a lumbar puncture and blood sample should be taken immediately prior, or concurrently to starting antibiotic therapy. CSF and blood cultures should be started as soon as possible to attempt to identify the infectious agent, as results may take up to 48 hours. Gram stains should immediately be done in effort to visualize the diplococci bacteria.

In the event a lumbar puncture is delayed, a blood specimen should be drawn followed by the initiation of antibiotic therapy before a CT scan is performed. The administration of antibiotics prior to collecting samples may result in no culture growth. In this case, other clinical and laboratory evidence can still be used to determine the likely cause of disease. CSF from a bacterial meningitis case may appear cloudy or milky; have increased protein, decreased glucose, and a high number of white blood cells (neutrophils usually predominate). PCR and latex agglutination may also be of use in cases suspected to be culture-negative due to the prior administration of antibiotics. Blood, CSF, or other sterile site isolates must be submitted to the Michigan Department of Community Health (MDCH) Laboratory for serogrouping from every case of meningococcal disease.

Case Definition
MDCH uses the case definition for meningococcal disease developed by the Centers for Disease Control and Prevention (CDC). Normally sterile sites include: CSF, blood, joint fluid, pleural fluid, and pericardial fluid. Isolation from non-sterile sites such as urine, sputum, or nasopharyngeal samples does not meet the case definition. Approximately 5-10% of the population asymptotically carries *N. meningitidis* in their noses and throats; nasopharyngeal colonization is not considered invasive disease. Carriage is generally transient and usually resolves within several weeks.

**Confirmed:** Isolation of *Neisseria meningitidis*:
- from a normally sterile body site OR
- from purpuric lesions

**Probable:**
- detection of *N. meningitidis*-specific nucleic acid in a specimen obtained from a normally sterile body site, using a validated polymerase chain reaction (PCR) assay OR
- detection of *N. meningitidis* antigen
  ▪ in formalin-fixed tissue by immunohistochemistry (IHC); or
  ▪ in CSF by latex agglutination

**Suspect:**
- Clinical purpura fulminans in the absence of a positive blood culture, OR
- Gram-negative diplococci, not yet identified, from a normally sterile body site
Treatment

Appropriate antibiotic therapy should be started as soon as possible, at most within 24 hours of diagnosis. A table of appropriate therapy based on the clinical and laboratory findings available at the time of therapy initiation can be found below for bacterial meningitis. The normal duration of therapy for bacterial meningitis caused by *N. meningitidis* is at least 7 days, depending on the patient’s clinical response.

<table>
<thead>
<tr>
<th>Clinical / laboratory findings</th>
<th>Recommended therapy</th>
<th>Alternative therapies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial meningitis suspected, no lumbar puncture (LP) or LP delayed</td>
<td>Vancomycin plus a 3rd generation cephalosporin (ceftriaxone or cefotaxime)</td>
<td>In those &gt; 50 years: vancomycin plus ampicillin plus 3rd generation cephalosporin</td>
</tr>
<tr>
<td>Presumptive identification of <em>N. meningitidis</em> from gram stain</td>
<td>Ceftriaxone or cefotaxime</td>
<td>Penicillin G, ampicillin, chloramphenicol, fluoroquinolone, or aztreonam</td>
</tr>
<tr>
<td><em>N. meningitidis</em> isolated and susceptibility testing completed</td>
<td>If penicillin MIC &lt;0.1µg/mL: penicillin G or ampicillin</td>
<td>Ceftriaxone, cefotaxime, or chloramphenicol</td>
</tr>
<tr>
<td></td>
<td>If penicillin MIC 0.1-1.0 µg/mL: ceftriaxone or cefotaxime</td>
<td>Chloramphenicol, fluoroquinolone, or meropenem</td>
</tr>
</tbody>
</table>

**Note:** According to the Infectious Diseases Society of America (IDSA) these guidelines are intended to assist practitioners in making decisions about appropriate health care and are not intended to replace the physician’s judgment with respect to certain patients or special clinical situations.


Prophylaxis

Antibiotic prophylaxis is recommended for close contacts who have had direct contact with the case patient during the 7-10 days prior to illness and up to 24 hours after appropriate antibiotic therapy was started. Prophylaxis for contacts should be started within 24 hours of the case patient’s diagnosis. Prophylaxis administered greater than 14 days after last exposure to the case while infectious is not considered beneficial. Generally, prophylaxis is not necessary for casual contacts in classrooms or work environments, or for emergency response professionals who have used standard precautions. Due to the rate of asymptomatic carriage of *N. meningitidis*, nasal swab screening is not considered useful in determining the need for prophylaxis or treatment. All contacts should be advised to monitor for the development of symptoms consistent with meningococcal disease, particularly fevers, rashes, and severe headache. Signs and symptoms will generally present within 2 weeks, but a small risk of disease may persist for up to 2 months.
Prophylaxis Cont.

Close contacts may include:
- Household members or anyone who has slept in the same household as the case patient
- Daycare or childcare contacts, includes staff and attendees
- People who have had direct contact with oral or nasal secretions from the case patient
- People who have shared food, beverage, toothbrush, eating utensils, or cigarettes with the case patient
- Individuals who have provided direct patient care for 4 or more hours during the infectious period
- Medical personnel who have had direct, unprotected contact with oral or nasal secretions such as performing CPR with airway support or intubation
- Anyone seated directly next to a case on a prolonged airline flight (≥ 8 hours)

Persons / settings to consider and evaluate for contact follow-up and prophylaxis:
- Family
- Friends
- Roommates
- Boyfriend/ girlfriend/ intimate partners
- Place of employment
- School (close friends of older children, generally not the entire classroom)
- Daycare
- Before or after school care programs
- Social gatherings (particularly parties where drinking games and sharing of cigarettes or other drugs may have occurred)
- Extracurricular and sports events
- Church groups
- Hospital and emergency medical personnel
- Seat mates with extended contact on transportation (plane, bus, etc.)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Age Group</th>
<th>Dosage</th>
<th>Duration and Route of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rifampin*</td>
<td>Children &lt; 1 month old</td>
<td>5 mg/kg body weight every 12 hrs</td>
<td>2 days, oral administration</td>
</tr>
<tr>
<td></td>
<td>Children ≥ 1 month old</td>
<td>10 mg/kg body weight every 12 hrs</td>
<td>2 days, oral administration</td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>600 mg every 12 hrs</td>
<td>2 days, oral administration</td>
</tr>
<tr>
<td>Ciprofloxacin**</td>
<td>Adults</td>
<td>500 mg</td>
<td>Single dose, oral administration</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>Children &lt; 15 years old</td>
<td>125 mg</td>
<td>Single intramuscular dose</td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>250 mg</td>
<td>Single intramuscular dose</td>
</tr>
</tbody>
</table>

*Rifampin is not recommended for pregnant women. It may also decrease the reliability of oral contraceptives.

**Ciprofloxacin is not recommended for pregnant / lactating women and is generally not recommended for persons <18 years old. May be considered for use in children when no alternative therapy is available.

Table adapted from: Prevention and Control of Meningococcal Disease. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2013: 62; No. 2
Prophylaxis Cont.

**Meningococcal pneumonia**

Currently, in the United States, there are no definitive guidelines regarding prophylaxis for close contacts exposed to a meningococcal pneumonia case. Most public health agencies advise that prophylaxis should be given to close contacts of a meningococcal pneumonia case with invasive disease, where *N. meningitidis* is isolated from a sterile site (blood, CSF, joint, etc.). The recommendations are less clear when a case has clinically compatible disease, but *N. meningitidis* is isolated from only a sputum specimen. High rates of asymptomatic carriage in the nasopharyngeal tract make it difficult to determine whether the illness, in the absence of sterile site cultures, is truly due to *N. meningitidis*. Transmission of *N. meningitidis* due to meningococcal pneumonia appears to be rare and generally prophylaxis is not recommended. However, with the absence of CDC or clinical practice standard guidelines, in cases of suspected meningococcal pneumonia without clear evidence of invasive disease, physicians and public health professionals should use their best judgment when deciding whether prophylaxis of close contacts is appropriate.

**Prevention**

There are several ways to reduce the risk of meningococcal disease including: the use of meningococcal vaccine for appropriate groups; not sharing drinking glasses, water bottles, eating utensils, cigarettes, cosmetics or balms for the lips; stop smoking/avoid exposing children to second-hand smoke; and avoiding contact with oral and nasal secretions of ill individuals. Frequent hand washing should be encouraged. Staying up-to-date on recommended vaccinations for other respiratory diseases such as influenza and pneumococcal disease may also provide some degree of protection.

**Vaccination**

Four types of meningococcal vaccines are available in the U.S. against *N. meningitidis*. Three are quadrivalent vaccines effective against serogroups A, C, Y, and W-135. The fourth is a bivalent meningococcal combination vaccine effective against *Haemophilus influenzae* type b (Hib) and meningococcal serogroups C and Y. These four vaccines are not effective against *N. meningitidis* serogroup B, which accounts for approximately 30% of meningococcal cases in the U.S.

The combination Hib/meningococcal conjugate vaccine, MenHibrix® is used in children aged 2-18 months who are at increased risk of meningococcal disease. The meningococcal conjugate vaccines, Menveo® or Menactra®, are the preferred vaccines for ages 2-55 years old, with Menactra also approved for use in children ages 9-23 months who are at increased risk for meningococcal disease. The polysaccharide vaccine, Menomune®, is preferred for those ≥ 56 years old.

- Meningococcal and Haemophilus b Tetanus Toxoid Conjugate Vaccine- MenHibrix® (Hib-MenCY-TT)
  - licensed for use in 2012 as a four dose series
  - approved for use in children aged 6 weeks-18 months who are at increased risk of meningococcal disease
Prevention Cont.

- Meningococcal conjugate vaccine- Menveo® (MenACWY-CRM)
  - licensed for use in 2010
  - approved for use in people ages 2-55 years old
- Meningococcal conjugate vaccine- Menactra® (MenACWY-D)
  - licensed for use in 2005
  - approved for use in people ages 2-55 years old as a single dose
  - licensed as a 2 dose series for ages 9-23 months old who are at increased risk of meningococcal disease
- Meningococcal polysaccharide vaccine- Menomune® (MPSV4)
  - Licensed for use in 1981
  - only vaccine approved for use in people ≥ 56 years old
  - may be given to pregnant women if deemed necessary by a physician
  - may be given to individuals aged 2-55 years if both Menveo® and Menactra® are contraindicated or unavailable and the need is urgent

Individuals recommended to be vaccinated for meningococcal disease:

- All adolescents aged 11-18 years old
- Children aged 2 months-10 years old with certain high-risk conditions
- Persons aged 19 - 55 years old who meet one of the following conditions: live in a college dormitory, are military recruits, have a damaged or removed spleen, have terminal complement component deficiency, are microbiologists working with *N. meningitidis*, or are traveling/reside in an area with hyperendemic or epidemic meningococcal disease
- Individuals in a defined risk group exposed to a meningococcal disease outbreak

Advisory Committee on Immunization Practices (ACIP) Meningococcal Vaccine Guidelines

Routine Vaccination of Adolescents (Table 3)

Current meningococcal ACIP guidelines recommend routine vaccination with one of the meningococcal conjugate vaccines, Menactra or Menveo, at age 11 or 12 years with a booster dose at age 16 years. Adolescents who receive their first dose of meningococcal vaccine at age 13-15 years should receive a single booster dose between the ages of 16-18 years. Individuals who receive their first dose of vaccine on or after age 16 do not need a booster dose, unless they become at increased risk for meningococcal disease. Individuals aged 19-21 years are generally not recommended to routinely receive vaccination, but may be vaccinated with Menactra or Menveo up to age 21 years as a catch-up vaccination for those who have not received a dose after their 16th birthday. Routine vaccination of healthy individuals who are not at increased risk for meningococcal disease is not recommended for children aged 2 months-10 years or after age 21 years.
Prevention Cont.

Table 3: Summary of ACIP Meningococcal Vaccine Recommendations

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Risk Group</th>
<th>Primary Vaccination</th>
<th>Booster Dose</th>
</tr>
</thead>
</table>
| 11 - 21 years old | Normal health | Menactra or Menveo:  
11-12 years: 1 dose  
13-18 years: 1 dose, if not vaccinated previously  
19-21 years: not routinely recommended, but 1 dose may be administered as a catch-up vaccination for those who have not received a dose after their 16th birthday | One booster dose recommended if first dose administered before 16th birthday  
No booster if primary dose given on or after age 16 years |

Note: For those aged 2 months-10 years, 22-55 years, or ≥ 56 years; vaccination is not routinely recommended. See Table 4 below for individuals with increased risk of disease.

Table adapted from: Prevention and Control of Meningococcal Disease. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2013: 62; No. 2

Vaccination Recommendations for Special Populations and Persons at Increased Risk (Table 4)

Age-based recommendations

- Infants aged 2-18 months at increased risk for meningococcal disease should receive a 4-dose primary series of MenHibrix. The first dose may be administered as early as 6 weeks old and the fourth dose may be given as late as 18 months. If the first dose is given on or after 12 months of age, doses should be given at least 8 weeks apart. MenHibrix can be administered with any other routine infant vaccinations, except other Hib-containing vaccines.

- Persons aged 9 months-55 years with increased risk for meningococcal disease should receive Menactra or Menveo depending on their age. Infants aged 9-23 months should be vaccinated with a 2-dose primary series of Menactra, spaced 12 weeks apart. Infants who have received the MenHibrix do not need to receive Menactra unless they are traveling to an area with a high endemic rate of meningococcal disease. Persons 2-55 years old are recommended to receive either a single dose or a 2-dose primary series depending upon the reason for vaccination.

- Persons aged ≥ 56 years old who have not previously been vaccinated for meningococcal disease should receive a single dose of Menomune. For persons now aged ≥ 56 years old who were previously vaccinated with Menactra or Menveo and are recommended for vaccination where multiple doses are anticipated, they should continue to receive Menactra or Menveo.
Prevention Cont.

**Condition-based recommendations**

- **Persons with persistent complement component deficiencies (C3, C5-9, Properdin, Factor D, and Factor H):** For ages 9 months-55 years a 2-dose series of Menactra or Menveo administered 8-12 weeks apart is recommended. A 4-dose series of MenHibrix can be administered to infants aged 2-18 months. A booster dose should be administered every 5 years. Children who receive the primary series before their 7th birthday should receive the first booster dose in 3 years and subsequent boosters every 5 years.

- **Persons with anatomic or functional asplenia:** For individuals 2-55 years old, a 2-dose primary series of Menactra or Menveo administered 8-12 weeks apart is recommended. For infants aged 2-18 months old, a 4-dose primary series of MenHibrix should be administered. Infants aged 19-23 months who have not received MenHibrix should defer vaccination with Menactra or Menveo until age 2 years, and after the completion of the pneumococcal vaccination series. For all, a booster dose should be administered every 5 years. Children who receive the primary series before their 7th birthday should receive the first booster dose in 3 years and subsequent boosters every 5 years.

- **Microbiologists routinely exposed to isolates of *N. meningitidis*** should receive a single dose of Menactra or Menveo. A booster dose should be given every 5 years if the exposure is ongoing.

- **Persons who travel or reside in countries where meningococcal disease is hyperendemic or epidemic (sub-Saharan Africa during December-June; Mecca, Saudi Arabia during Hajj; other countries with epidemic travel advisories):** International travelers should receive a booster dose of Menactra or Menveo if the last dose was 5 years or more previously (note: travelers to Mecca during the Hajj are required by the government of Saudi Arabia to have a vaccination within the 3 years before the date of travel). Children aged 9-23 months can receive their second dose of the primary series as early as 8 weeks after the first dose before travel. Infants and children who received MenHibrix and are traveling to hyperendemic/epidemic areas should receive 1 or 2 doses of Menactra or Menveo (dependent upon age and vaccination product) before travel to protect against serogroups A and W-135, which are not covered by MenHibrix. Travel information and advisories can be found at [www.cdc.gov/travel](http://www.cdc.gov/travel).

- **Persons with Human Immunodeficiency Virus:** HIV infection alone is not an indication for routine meningococcal vaccination. HIV-infected individuals aged ≥ 9 months old at increased risk for meningococcal disease and all HIV-infected persons aged 11-18 years, should receive a 2-dose primary series, administered 8-12 weeks apart. HIV-infected individuals do not respond as well to a single primary dose.

- **First-year college students living in residence halls:** should receive at least one dose of Menactra or Menveo before college entry, preferably on or after their 16th birthday. If only one dose of vaccine was administered before the 16th birthday, a booster dose should be administered before enrollment. Because many colleges and universities now require meningococcal vaccination, persons aged ≤ 21 years old should have documentation of receipt of Menactra or Menveo not more than 5 years before enrollment.
Table 4: Summary of ACIP Meningococcal Vaccine Recommendations

Vaccination of Individuals at Increased Risk of Meningococcal Disease

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Risk Group</th>
<th>Primary Vaccination</th>
<th>Booster Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 18 months old*</td>
<td>Child with high risk conditions: persistent complement deficiencies; have functional or anatomic asplenia, or are at risk during a community outbreak attributable to a vaccine serogroup</td>
<td>MenHibrix: 4 doses given at 2, 4, 6, and 12-15 months</td>
<td>If the person remains at increased risk for meningococcal disease, and completed the primary dose or series at age:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 months - 6 years: Individual should receive an additional dose of Menactra or Menveo 3 years after primary vaccination; additional boosters should be repeated every 5 years thereafter, if increased risk persists.</td>
</tr>
<tr>
<td>9 - 23 months old**</td>
<td>Child with high risk conditions: persistent complement deficiencies; traveling to or are residents of countries where meningococcal disease is hyperendemic/epidemic; or are at risk during a community outbreak attributable to a vaccine serogroup</td>
<td>Menactra: 2 doses, 12 weeks apart</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: If child is receiving vaccine prior to travel, the 2 doses may be administered as early as 8 weeks apart</td>
</tr>
<tr>
<td>2 - 55 years old, not previously vaccinated</td>
<td>Individuals with high risk conditions: persistent complement deficiencies; have functional or anatomic asplenia; or have HIV and another indication for vaccination exists</td>
<td>Menactra or Menveo: 2 doses, 8 - 12 weeks apart</td>
<td>≥7 years: Individual should receive an additional dose of Menactra or Menveo 5 years after primary vaccination; additional boosters should be repeated every 5 years after that, if increased risk persists</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: If Menactra is used it should be administered at least 4 weeks after completion of all pneumococcal conjugate vaccine doses.</td>
</tr>
<tr>
<td></td>
<td>Individuals who are: first year college students aged ≤ 21 years living in residential housing; traveling to or are residents of countries where meningococcal disease is hyperendemic/epidemic; at risk during a community outbreak attributable to a vaccine serogroup; or microbiologists routinely exposed to isolates of N. meningitidis</td>
<td>Menactra or Menveo: 1 dose</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: If Menactra is used it should be administered at least 4 weeks after completion of all pneumococcal conjugate vaccine doses.</td>
</tr>
</tbody>
</table>

*Infants and children who received MenHibrix and are traveling to areas with hyperendemic/epidemic rates of meningococcal disease are not protected against serogroups A and W-135 and should receive a meningococcal vaccination licensed for children aged ≥ 9 months prior to travel.

**Because of the high-risk for invasive pneumococcal disease, children with functional or anatomic asplenia should not be immunized with Menactra before age 2 years to avoid interference with the immune response to the pneumococcal conjugate vaccine (PCV).

Table adapted from: Prevention and Control of Meningococcal Disease. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2013: 62; No. 2
Prevention Cont.

Vaccination contraindications and adverse events

Meningococcal vaccine is contraindicated in individuals who have had a severe (life-threatening) allergic reaction to previously administered meningococcal vaccine or any other vaccine component. People who have ever had Guillain-Barré Syndrome should consult with their doctor prior to getting vaccinated, but it is no longer considered a contraindication or precaution to vaccination. Individuals who are moderately or severely ill should wait until they are recovered to receive meningococcal vaccine; those with mild illness can usually be vaccinated.

Most people will have no adverse effects from meningococcal vaccine. Some individuals will develop mild redness or pain at the injection site or a low grade fever. These side effects generally resolve after 1-2 days. Serious allergic reactions to the meningococcal vaccines are rare.

Vaccination standing orders

Standing orders for the administration of meningococcal vaccine can be found on the Immunization Action Coalition’s website at [www.immunize.org](http://www.immunize.org). Specific links to the standing orders documents can be found below.

Standing Orders for Administering Meningococcal Vaccine to Children & Teens

Standing Orders for Administering Meningococcal Vaccine to Adults

Proper vaccine storage and handling guidance for meningococcal vaccines can be found at: [http://www.immunize.org/packageinserts/pi_meningococcal.asp](http://www.immunize.org/packageinserts/pi_meningococcal.asp)

Surveillance for Outbreaks

In the U.S., >98% of meningococcal disease cases are sporadic. In order to ascertain whether an outbreak is occurring, clinical samples must first be collected to determine the serogroup of *N. meningitidis* causing disease and, if warranted, to conduct pulsed field gel electrophoresis (PFGE). Outbreaks will be caused by a single serogroup and are generally very closely related strains.

Guidelines to assist in determining whether an outbreak is occurring include: at least 3 or more confirmed or probable primary cases (no known exposure to another case of meningococcal disease), a time period of less than 3 months, and a primary attack rate of greater that 10 cases per 100,000 population. Please contact the MDCH Communicable Disease Division immediately at 517-335-8165 or after business hours at 517-335-9030, if you suspect an outbreak of meningococcal disease. The use of vaccine for prophylaxis may be considered in outbreak situations. A defined population must be determined and consultation with the local and state health departments should occur prior to undertaking any vaccination efforts.

Because up to 5-10% of people carry *N. meningitidis* asymptptomatically in their nasopharynx, screening with nasopharyngeal swabs of asymptomatic individuals is not recommended in routine case contact investigations or outbreak settings. Only a small percentage (<1%) of asymptomatic carriers will go on to develop invasive disease.
Physician and Infection Control Responsibilities

- Report suspect or confirmed case as soon as possible, and within 24 hours, to the local health department jurisdiction where the case patient resides.
- Administer prophylaxis to exposed on-site health care workers and emergency personnel (e.g. EMTs or paramedics), as appropriate.
- Confirm your laboratory will submit the mandatory isolates, if available, from blood or CSF to the Michigan Department of Community Health Laboratory for *N. meningitidis* serogroup typing. Instructions for sample submission can be found at: http://www.michigan.gov/documents/LSGNeisseria_Referred_Cultures_8258_7.doc
- Ensure terminal prophylaxis to eliminate nasopharyngeal carriage of *N. meningitidis* in case patient prior to discharge. Third-generation cephalosporins (ceftriaxone or cefotaxime) or ciprofloxacin are effective.
- From 2007-2008, 3 cases of infection with ciprofloxacin resistant *N. meningitidis* were reported in the U.S. While widespread resistance does not appear to be a concern at this time, physicians should report any suspected chemoprophylaxis failures as soon as possible to the local health department.

Local Health Department Responsibilities

- Begin follow-up investigation as soon as possible and within 24 hours of case notification.
- Enter the meningococcal disease case into MDSS as soon as possible and within 24 hours of first report from the physician or laboratory. Use the Meningococcal Disease case report form.
- Conduct case investigation and interview of case patient, parents, or others able to provide information. For adolescent and young adults, friends may be a good source of information as parents may not be aware of all direct contacts.
- Identify close contacts and recommend prophylaxis, the goal should be to identify all close contacts within 24 hours of case report.
- Advise close contacts to visit their health care provider to receive prophylaxis. Help arrange prophylaxis, as needed, for those without health care.
- Communicate with providers to ensure appropriate prophylaxis of on-site health care contacts and any other emergency personnel (e.g. EMTs or paramedics) involved in the case was completed.
- Confirm that a sterile-site isolate from the hospital lab, if available, has been sent to the MDCH laboratory for serogroup typing.
- Provide education on signs and symptoms of meningococcal disease for potentially exposed individuals. Symptoms generally develop within 14 days.
- As needed, provide templates of informational letters for parents of school or daycare contacts, or letters for college or workplace settings.
- Update the MDSS record at least daily with the investigation status and details.

Michigan Department of Community Health Responsibilities

- Provide consultation and recommendations on case investigation and prophylaxis, as needed, to healthcare providers and the local health departments.
- Review all cases of meningococcal disease submitted to the MDSS.
- Verify cases meet appropriate case definition guidelines.
- Maintain and enhance statewide surveillance data.
- Maintain serogroup surveillance data from specimens tested at the MDCH Lab.
MDCH Responsibilities Cont.

- Assist in multi-county investigations as requested by the local health departments.
- Route out-of-state cases to appropriate jurisdictions.
- Coordinate investigation for out-of-state cases.
- Assist in the determination of sporadic vs. outbreak situations.
- Consult with the MDCH laboratory and request PFGE, when appropriate, for suspected outbreaks.
- Consult on the role of vaccination for control measures in an outbreak.

Resources


Centers for Disease Control and Prevention. Licensure of a Meningococcal Conjugate Vaccine for Children Aged 2 Through 10 Years and Updated Booster Dose Guidance for Adolescents and Other Persons at Increased Risk for meningococcal Disease --- Advisory Committee on Immunization Practices (ACIP). MMWR 2011; 60(30): 1018-1019.

Centers for Disease Control and Prevention. Licensure of a Meningococcal Conjugate Vaccine (Menveo) and Guidance for Use --- Advisory Committee on Immunization Practices (ACIP). MMWR 2010; 59(09): 273.


Centers for Disease Control and Prevention. Revised Recommendations of the Advisory Committee on Immunization Practices (ACIP) for Use of Quadrivalent Meningococcal Conjugate Vaccine (MenACWY-D) Among Children Aged 9-23 Months at Increased Risk for Invasive Meningococcal Disease. MMWR 20011; 60(40): 1391-1392.

Centers for Disease Control and Prevention. Updated Recommendation from the Advisory Committee on Immunization Practices (ACIP) for Revaccination of Persons at Prolonged Increased Risk for Meningococcal Disease. MMWR 2009; 58:1042-3.


