

Meningococcal Disease (Invasive)

24-Hour Reportable Disease

(Including Meningitis, Meningococemia, Pneumonia
and Other Invasive Infections)

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Invasive meningococcal infections are caused by the bacterium *Neisseria meningitidis* (the meningococcus), a gram-negative diplococcus. There are 13 serogroups of *N. meningitidis*. Most invasive disease is caused by five serogroups; A, B, C, Y, and W-135.

B. Clinical Description

Invasive infection with *N. meningitidis* may cause several clinical syndromes, including meningitis, sepsis or pneumonia. Symptoms of **meningitis** (infection of the meninges, the tissue surrounding the brain and spinal cord) typically include the sudden onset of a stiff neck, high fever and headache. A petechial rash may be present. Nausea, vomiting and mental confusion are often also present. **Meningococemia** (meningococcal sepsis or bloodstream infection) typically presents with the abrupt onset of fever, prostration and rash (petechial or purpuric), and is often associated with shock and multi-organ failure. Meningococcal disease may progress rapidly to purpura fulminans (a rash consisting of reddish or purplish spots or patches associated with shock/sepsis), shock, and lead to death within hours despite appropriate therapy. The overall case-fatality rate for invasive meningococcal disease is approximately 10-14%.

C. Reservoirs

Humans are the only natural reservoir of *N. meningitidis* and the nasopharynx is the site from which meningococci are transmitted to other persons. Five to ten percent of adults are asymptomatic nasopharyngeal carriers of strains of *N. meningitidis*, most of which are not pathogenic.

D. Modes of Transmission

The principal mode of transmission of *N. meningitidis* is person-to-person through large respiratory droplets or contact (indirect or direct) with the oral or nasal secretions of a colonized person. In a small number of persons, *N. meningitidis* penetrates the mucosa and gains access to the bloodstream, causing invasive disease.

E. Incubation Period

The incubation period is variable, 1–10 days, usually 3–4 days.

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F. Period of Communicability or Infectious Period

Cases are presumed to have been infectious for up to 7 days before their illness onset. Cases remain infectious as long as meningococci are present in oral secretions or until 24 hours after initiation of effective antibiotic treatment.

G. Epidemiology

N. meningitidis has become a leading cause of bacterial meningitis in the United States after dramatic reductions in the incidence of infections due to *Streptococcus pneumoniae* and *Haemophilus influenzae* type b have been achieved as a result of using conjugate vaccines. Meningococcal disease is reported throughout the year in Colorado, however, incidence is highest in the late fall and winter months. Serogroups B, C, and Y account for almost all of the cases of meningococcal disease reported in Colorado. The incidence of meningococcal disease in Colorado has decreased during the past decade; 1994 - 1996 an average of 45 cases were reported yearly, whereas, 2001 - 2004 an average of 26 cases were reported annually.

Colorado meningococcal disease statistics are available at the CDPHE website:

www.cdphe.state.co.us/dc/CODiseaseStatistics/index.html

2) CASE DEFINITION

Clinical Description

Meningococcal disease manifests most commonly as meningitis and/or meningococcemia that may progress rapidly to purpura fulminans, shock, and death. However, other manifestations might be observed.

Case Classification

Suspect:

- Clinical purpura fulminans in the absence of a positive blood culture
- A clinically compatible case with gram negative diplococci from a normally sterile site (e.g., blood or CSF)

Probable: A clinically compatible case that has either:

- Evidence of *N. meningitidis* DNA using a validated polymerase chain reaction (PCR), obtained from a normally sterile site (e.g., blood or CSF),

OR

- Evidence of *N. meningitidis* antigen by immunohistochemistry (IHC) on formalin-fixed tissue or latex agglutination of CSF.

Note: Positive antigen test results from urine or serum samples are unreliable for diagnosing meningococcal disease.

Confirmed: A clinically compatible case **AND** isolation of *Neisseria meningitidis* from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF]) or, less commonly, synovial, pleural, or pericardial fluid) or skin scrapings of purpuric lesions.

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3) REPORTING CRITERIA

What to Report to the Colorado Department of Public Health and Environment (CDPHE) or local health agency

- Any suspect case of invasive meningococcal disease based on the healthcare provider's impression or preliminary laboratory results indicating *N. meningitidis* (e.g. gram stain) from a normally sterile site.
- Confirmed and probable cases of invasive meningococcal disease.
- All meningococcal disease cases should be reported within 24 hours of clinical or laboratory diagnosis.
- Cases should be reported immediately by telephone to CDPHE or the local health agency. In addition, confirmed, probable, and suspect cases should be reported using the Colorado Electronic Disease Reporting System (CEDRS) or faxed to CDPHE.
- Only confirmed and probable meningococcal disease cases are reported to CDC.
- *Note:* Isolates obtained from sputum or throat cultures are not considered isolates from normally sterile sites. Therefore, *N. meningitidis* isolated from these sites does not need to be reported unless the patient has an illness suggestive of invasive meningococcal disease (e.g., pneumonia).
- CDPHE Microbiology Laboratory will confirm and serogroup isolates of *Neisseria meningitidis*.
- **All isolates from invasive meningococcal disease cases should be sent to CDPHE Microbiology Laboratory for serogrouping.** Serogrouping aids in public health surveillance, investigating, and disease control.
- PFGE testing (i.e. molecular typing) is performed when clusters are identified.

Purpose of Surveillance and Reporting

- To identify cases for investigation.
- To promptly identify clusters and potential outbreaks of disease.
- To monitor trends in disease incidence.

Important Phone Numbers and Web Resources

- CDPHE Communicable Disease Epidemiology Program
 - Phone: 303-692-2700 or 800-866-2759
 - Fax: 303-782-0338
 - After hours: 303-370-9395
- CDPHE Microbiology Laboratory: 303-692-3480
- [Communicable Disease Manual \(CD Manual\) website](http://www.cdphe.state.co.us/dc/epidemiology/dc_manual.html)
(http://www.cdphe.state.co.us/dc/epidemiology/dc_manual.html)

4) STATE LABORATORY SERVICES

Laboratory Testing Services Available

- CDPHE Microbiology Laboratory will confirm and serogroup isolates of *Neisseria meningitidis*.
- **All isolates from invasive meningococcal disease cases should be sent to CDPHE Microbiology Laboratory for serogrouping.** Serogrouping aids in public health surveillance, investigating, and disease control.

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- PFGE testing (i.e. molecular typing) is performed when clusters are identified.

5) CASE INVESTIGATION

All reports of invasive meningococcal disease should be investigated, including suspect cases. The first step is to determine whether the case is clinically compatible with meningococcal disease and review the reported positive lab findings. When investigating a suspect case, the "[Suspect Bacterial Meningitis \(Meningococcal\) Information Collection Form](#)," which is available on the CD Manual website, is useful for organizing laboratory and clinical information. Additional laboratory and clinical information may help differentiate between possible viral versus bacterial meningitis (see table on the suspect bacterial meningitis/meningococcal disease form). Cases should be investigated to:

- Identify close contacts of the case and provide recommendations for who should receive antibiotic chemoprophylaxis to prevent secondary cases.
- Provide information about the disease, its transmission, and methods of prevention.
- Promptly identify clusters or outbreaks of disease and initiate appropriate prevention and control measures.

Almost all cases of meningococcal disease are hospitalized and many are unable to be interviewed due to their medical condition. Information may be obtained from the case, hospital infection control practitioner, healthcare provider, parents/relatives, friends and/or others involved with the case.

A. Case Investigation / Form

- Organized local health departments have primary responsibility for interviewing cases in their jurisdictions.
- Public health nursing services should consult with CDPHE Regional Epidemiologists to establish primary responsibility for interviewing cases and implementing disease control measures for cases of meningococcal disease in their jurisdictions.
- For confirmed, probable, and suspect cases complete the "[Active Bacterial Core Surveillance \(ABCs\) Case Report](#)" form, which is available on the CD Manual website, or enter information directly into CEDRS.
- Only the following sections of the ABCs form need to be completed: 1-5, 8-11, 14, 17, 18a, 19, 20, and 25-27.
- All information from completed ABCs report forms should be entered into CEDRS or completed report forms may be faxed or mailed to CDPHE. On the CEDRS extended record screen only the sections in red text need to be completed.

B. Identify and Evaluate Contacts

The main focus of following up cases of invasive meningococcal disease is to prevent additional cases of disease among close contacts of the index case. Chemoprophylaxis should be administered as soon as possible, because the risk of secondary disease among close contacts is highest during the first few days after the onset of disease in the index patient.

- Close contacts are defined as household contacts (anyone who slept overnight in the case's house during the 7 days prior to illness onset in the case), child care contacts

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(children and staff), and anyone who may have had contact with the case's oral secretions (i.e. saliva) during the 7 days before illness onset in the case.

- Obtain information about the case's close contacts (household, relatives, significant other, friends, etc.) and activities (school, work, child care, sports, social gatherings, etc.) during the 7 days prior to the illness onset in the case.
 - Specifically ask if anyone may have had contact with the case's saliva (kissing, sharing food, beverages, toothbrushes, cigarettes, or eating utensils) in the 7 days prior to illness onset in the case.
 - For each activity, record the facility's name, phone number, and a contact person.
 - Record the names, county (city or address) and phone numbers of all close contacts.
 - Information about contacts and activities occurring outside the investigator's area should be given to the appropriate county health department or nursing service or CDPHE. CDPHE should be notified of all out-of-state close contacts.
 - If multiple attempts to obtain case information are unsuccessful (e.g. the case, case's relative or healthcare provider does not return your calls, or the person refuses to divulge information), contact your CDPHE Regional Epidemiologist.
- 1. Symptomatic Contacts** (Exposure within 7 days prior to illness onset in the case.)
Symptoms of invasive meningococcal disease include some of the following: severe headache, stiff neck, fever, chills, sleepiness, rash, nausea, vomiting, and being disoriented or confused.
- Meningococcal disease symptoms may progress very rapidly.
 - Contacts having symptoms, which may represent invasive meningococcal disease (especially fever), should seek medical care immediately and inform their healthcare provider of recent exposure to meningococcal disease.
 - Symptomatic close contacts should receive antimicrobial prophylaxis (see section 6.B.) once meningococcal disease has been ruled out by a healthcare provider.
- 2. Asymptomatic Contacts** (Exposure within 7 days prior to illness onset in the case.)
- Close contacts should receive antimicrobial prophylaxis. (See section 6.B.)
 - Provide asymptomatic contacts information about meningococcal disease symptoms.
 - Counsel asymptomatic contacts to seek medical care if symptoms develop.

C. Reported Incidence is Higher than Usual/Outbreak Suspected

Call the CDPHE Communicable Disease Program if there are a higher number of cases in your area than usual for the time of the year or an outbreak is suspected.

- Serogroup information (and molecular typing) will be important in determining whether an outbreak exists and appropriate disease control measures.
- Mass vaccination might be indicated in community-based or organization-based (e.g. university) outbreaks when certain criteria recommended by the CDC are met.
- For further outbreak information see Morbidity and Mortality Weekly Report Recommendations and Reports, May 27, 2005, "Prevention and Control of Meningococcal Disease, Recommendations of the Advisory Committee on Immunization Practices (ACIP)," www.cdc.gov/mmwr/PDF/rr/rr5407.pdf, and Morbidity and Mortality Weekly Report Recommendations and Reports, February 14, 1997, "Control and Prevention of

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Serogroup C Meningococcal Disease: Evaluation and Management of Suspected Outbreaks," www.cdc.gov/mmwr/PDF/rr/rr4605.pdf .

- Mass chemoprophylaxis is not routinely recommended for community-based or organization-based outbreaks.
- Chemoprophylaxis of all persons may be considered if an outbreak involves a small, defined population (e.g. a single school or child care center).
- The decision to provide mass vaccination or mass chemoprophylaxis should be made with input from the CDPHE Communicable Disease Program.

6) DISEASE CONTROL MEASURES

A. Treatment

- Treatment of meningococcal disease should begin immediately when the presumptive clinical diagnosis is made, even before obtaining confirmatory lab results.
- Invasive meningococcal disease cases should receive Penicillin G intravenously.
- Acceptable alternatives to penicillin are cefotaxime, ceftriaxone, or ampicillin.
- Antibiotic therapy for five to seven days is adequate for most cases.
- Cases not treated with ceftriaxone or cefotaxime should receive chemoprophylactic antibiotics prior to hospital discharge to ensure elimination of *N. meningitidis* carriage from the nasopharynx.

B. Prophylaxis

1. Antimicrobial prophylaxis

Antimicrobial prophylaxis (see table below) is recommended for all persons who had close contact (see section 5.B.) with a case of invasive meningococcal disease during the 7-day period prior to illness onset in the case. Close contacts include:

- household contacts (anyone who slept overnight in the case's house during the 7 days prior to illness onset in the case),
- child care contacts (children and staff), and
- anyone who may have had contact with the case's oral secretions (e.g., through kissing; sharing food, eating utensils, beverages, toothbrushes, or cigarettes).

Meningococcal Prophylaxis			
DRUG	AGE GROUP	DOSAGE	DURATION
Rifampin* [§]	Children <1 Month	5mg/kg orally every 12 hours	2 days
	Children ≥ 1 Month	10mg/kg (maximum, 600 mg) orally every 12 hours	2 days
	Adults	600mg orally every 12 hours	2 days
Ciprofloxacin* [◆]	Adults (≥ 18 years)	500mg orally	Single dose
Ceftriaxone	< 15 Years of Age	125 mg IM	Single dose
	≥15 Years of Age	250 mg IM	Single dose

* Not recommended for use in pregnant women.

[§] Rifampin therapy might affect the reliability of oral contraceptives.

[◆] Can be used in children when no acceptable alternative therapy is available, and risks and benefits are explained.

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Antimicrobial prophylaxis should be administered as soon as possible (ideally within 24 hours after the case is identified), because the risk of secondary disease for close contacts is highest during the first few days after onset of disease in the index case.

- Prophylaxis administered >14 days after onset of illness in the index case is not recommended.
- Testing of contacts (e.g. throat culture) is not recommended.
- Contacts needing prophylaxis should be referred to their healthcare provider.
- On rare occasions, a local health department or CDPHE physician may call in a prescription to a pharmacy for close contacts needing prophylaxis.

Health care workers do not routinely need prophylaxis unless they possibly had direct exposure to the case's oral secretions (e.g. mouth-to-mouth resuscitation, endotracheal intubation or suctioning).

2. Vaccination

Antibiotic prophylaxis of close contacts of sporadic meningococcal disease cases is the primary means for prevention of spread. Vaccine may be recommended for use in control of meningococcal disease outbreaks due to serogroups contained in the vaccine (A, C, Y, and W-135). There is no vaccine currently available for prevention of serogroup B disease.

- There are two tetravalent meningococcal vaccines, which cover serogroups A, C, Y, and W-135, available in the United States.
- The meningococcal polysaccharide vaccine (MPSV4 or Menomune®) was licensed in 1981 for persons ≥ 2 years of age with increased risk of meningococcal disease.
- In January 2005, a tetravalent meningococcal conjugate vaccine (MCV4 or Menactra™) was initially licensed for persons aged 11 – 55 years. As of October 2007, the vaccine licensure was expanded to persons aged 2 – 55 years.
- Routine immunization with the conjugate meningococcal vaccine is recommended for all persons 11 – 18 years of age.
- Routine vaccination also is recommended for certain persons with increased risk for meningococcal disease, such as:
 - College freshman living in dormitories
 - Microbiologists routinely exposed to isolates of *N. meningitidis*
 - Military recruits
 - Persons traveling to or residing in countries in which *N. meningitidis* is hyperendemic or epidemic
 - Persons having terminal complement component deficiencies
 - Persons having anatomic or functional asplenia
- Use of conjugate vaccine is preferred among persons aged 2 – 55 years; however, polysaccharide vaccine is recommended among persons > 55 years of age.
- Persons with a history of Guillain-Barré syndrome should discuss the decision to receive meningococcal vaccine with their health-care provider. Meningococcal polysaccharide vaccine is an acceptable alternative for short-term protection (i.e., 3 – 5 years) against meningococcal disease for persons with a history of Guillain-Barré syndrome.

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For additional information regarding meningococcal vaccine refer to May 27, 2005, Morbidity and Mortality Weekly Report, "Prevention and Control of Meningococcal Disease: Recommendations of the Advisory Committee on Immunization Practices (ACIP)", www.cdc.gov/mmwr/PDF/rr/rr5407.pdf, the August 10, 2007 Morbidity and Mortality Weekly Report, "Notice to Readers: Revised Recommendations of the Advisory Committee on Immunization Practices to Vaccinate All Persons Aged 11-18 Years with Meningococcal Conjugate Vaccine", www.cdc.gov/mmwr/preview/mmwrhtml/mm5631a3.htm, and the December 7, 2007, Morbidity and Mortality Weekly Report, "Notice to Readers: Recommendation from the Advisory Committee on Immunization Practices (ACIP) for Use of Quadrivalent Meningococcal Vaccine (MCV4) in Children Aged 2 – 10 Years at Increased Risk of Invasive Meningococcal Disease", <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5648a4.htm>.

C. Education

- Advise contacts of signs and symptoms of meningococcal disease and the importance of seeking medical care should they experience any compatible symptoms.
- The CDPHE sample letters, "Meningococcal Disease Alert", located on the Communicable Disease Manual website include the signs and symptoms of meningococcal disease, the importance of seeking medical care if symptoms develop, and vaccine recommendations for specific age groups.
- Two handouts, "Meningococcal Disease: Frequently Asked Questions" (which covers bacterial meningitis), and "Meningococcal Disease In-Short," are available on the CDC website at www.cdc.gov/vaccines/vpd-vac/mening/default.htm.
- See sections D.2. School and D.3. College, regarding educating students about meningococcal disease and vaccination.

D. Managing Special Situations

1. Child Care / Preschool

A case of invasive meningococcal disease in a child care facility often causes concern among parents, although the risk of secondary cases occurring in this setting is relatively low. Chemoprophylaxis for all the children in the classroom is recommended because the physical interactions between young children are often very close, therefore, the opportunity for direct or indirect contact with the index case's oral secretions is appreciable. Refer child care providers to the [Infectious Disease in Child Care Settings: Guidelines for Child Care Providers](#) for additional invasive meningococcal disease information. General recommendations include:

- Determine who needs antibiotic prophylaxis.
- In a large child care facility, prophylaxis should be recommended for children and staff in the case's classroom. If the case joined other classrooms or children from other classrooms for activities in the 7 days prior to illness onset, antibiotic prophylaxis of these individuals may be considered, depending on the type and duration of the activity.
- In a small child care facility, prophylaxis should be recommended for the child care provider(s) and all the attendees.

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- In a home child care setting, the child care attendees, the provider, and members of the provider's household who interact with the attendees should receive prophylaxis.
- Recommend chemoprophylaxis for all exposed children and staff. Parents of children in child care may be notified using the "[Meningococcal Disease Alert, Important Notice to Parents of Children Needing Antibiotics](#)" and "[Meningococcal Alert, Important Notice to Parents of Children in Childcare](#)" letters, which are available on the Communicable Disease Manual website.
- Routine meningococcal vaccination of preschool age children is not recommended.
- Educate parents and staff about the signs and symptoms of invasive meningococcal disease and the importance of seeking medical care if symptoms develop. This information is included in the "Meningococcal Disease Alert" letters, which are located on the Communicable Disease Manual website.
- Reinforce basic hygiene practices, including hand washing and disinfection of contaminated toys and surfaces daily.

2. School

A case of invasive meningococcal illness in a school often causes concern among parents, although, the risk of secondary cases occurring in a school is very low. Refer school personnel to the CDPHE [Infectious Disease Guidelines for School Personnel \(www.cdphe.state.co.us/dc/epidmeiology/dc_guide.asp\)](http://www.cdphe.state.co.us/dc/epidmeiology/dc_guide.asp) for additional invasive meningococcal disease information. General recommendations include:

- Chemoprophylaxis is not routinely recommended for school/classroom contacts, unless certain individuals meet the criteria for "close contacts" (see section 6.B.).
- Educate parents, students, and staff about the signs and symptoms of invasive meningococcal disease, the importance of seeking medical care if symptoms develop, and vaccine recommendations for students 11 – 18 years of age. This information is included in the "[Meningococcal Disease Alert, Important Notice to Parents of School Children](#)" letters that are located on the CD Manual website.
- Determine whether notification letters should be sent to the case's classroom or the entire school. Typically, school administrators prefer to notify the entire facility.
- Antibiotic prophylaxis of school contacts may be recommended on rare occasions when more than one meningococcal disease case is reported from a school in a relatively short time period.
- Contact CDPHE Communicable Disease Program if more than one case is reported from a school within the same school year.

3. College

a. Disease Investigation and Control

- Notices may be distributed in the case's classes to educate classmates and staff about the symptoms of invasive meningococcal disease, the importance of seeking medical care if symptoms develop, and the vaccine recommendations. The "[Meningococcal Disease Alert, Important Notice to College Students](#)" letter, which is available on the Communicable Disease Manual website, may be used for this purpose.
- Campus publications, such as newspapers, may be used to more broadly notify the campus of a case and heighten awareness of meningococcal disease.

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- Notices may be posted in the dormitory and/or cafeteria if the case lives in a dormitory.
- Many college student health centers routinely offer meningococcal vaccine to college students, since routine vaccination is recommended for college freshmen living in dormitories.
- Some college student health centers target meningococcal vaccination to all freshmen students, instead of reviewing the student's housing situation.
- Meningococcal vaccine may be offered to all college students wanting to reduce their risk for meningococcal disease.
- Colleges may promote meningococcal vaccination and/or provide a meningococcal vaccination clinic in response to a single college student having meningococcal disease.
- Vaccination does not replace chemoprophylaxis of close contacts of a case of meningococcal disease, however, it is an effective way to increase meningococcal immunization coverage among students, especially those at increased risk.
- Multiple cases of meningococcal disease on a college campus within a relatively short time period might meet the criteria for recommending mass vaccination (see section 5.C.).
- Contact CDPHE Communicable Disease Program if more than one meningococcal disease case is reported from a college within three months.
- For further information about college students and meningococcal disease refer to the June 30, 2000, Morbidity and Mortality Weekly Report, "Prevention and Control of Meningococcal Disease and Meningococcal Disease and College Students: Recommendations of Advisory Committee on Immunization Practices (ACIP)," www.cdc.gov/mmwr/PDF/rr/rr4907.pdf and the May 27, 2005, Morbidity and Mortality Weekly Report, "Prevention and Control of Meningococcal Disease: Recommendations of the Advisory Committee on Immunization Practices (ACIP)," www.cdc.gov/mmwr/PDF/rr/rr5407.pdf.

b. College Requirement

College freshman residing in dormitories are at a modestly increased risk for meningococcal disease compared to other persons their age and other college students.

- Beginning July 1, 2005, Colorado law will require all public and nonpublic postsecondary education institutions in Colorado to provide new students, who have not received meningococcal vaccine and are residing in student housing, information about meningococcal disease and the benefit and availability of meningococcal vaccine. The information must be provided to the student's parent or guardian if the new student is < 18 years of age.
- Students (or parents of students < 18 years of age) deciding not to receive meningococcal vaccine must sign a form indicating they reviewed information about meningococcal disease and vaccine and decided not to be vaccinated.

The Colorado Revised Statute regarding this requirement is available at www.cdphe.state.co.us/dc/Immunization/Forms/meningact.pdf.

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4. Patients and Staff in Health Care Facilities (Hospitals and Long Term Care Facilities)

Hospitals and long term care facilities generally have written infection control policies and procedures for handling cases of communicable disease among patients and staff members. If a facility does not have such policies in place, provide the following recommendations:

- Standard and droplet precautions (respiratory isolation) are recommended during the first 24 hours of antimicrobial therapy of the case.
- Health care workers do not routinely need prophylaxis unless they possibly had direct exposure to the case's oral secretions (e.g., mouth-to-mouth resuscitation, endotracheal intubation or suctioning).
- Infection control staff and Employee Health typically assess the need for, and administration of, prophylaxis of exposed staff.

5. Airline Passengers

- Antimicrobial prophylaxis should be considered for airline passengers seated directly next to a person subsequently confirmed to have meningococcal disease during the 7 days after a prolonged (≥ 8 hours) flight.
- Prophylaxis should also be considered for other passengers who had direct contact with respiratory secretions from the index patient.
- Obtain flight information and contact CDPHE Communicable Disease Program if the case was on a long airline flight in the 7 days prior to illness onset. CDPHE will contact CDC to identify and notify out-of-state passengers who should receive prophylaxis.
- See CDC's "Guidelines for the Management of Airline Passengers Exposed to Meningococcal Disease," www.cdc.gov/travel/menin-guidelines.htm, for additional information.

E. Environmental Measures

- No specific environmental measures are recommended.

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