Meningococcal Disease Quicksheet

January 2024

Infectious Agent

Neisseria meningitidis is a gram-negative diplococcus bacterium; 5-10% of the population is colonized with *N. meningitidis*.

Clinical Description

Invasive disease manifests most commonly as meningitis and/or meningococcemia and may progress to purpura fulminans, shock, and death within hours of onset. Other manifestations, such as septic arthritis or orbital cellulitis, may be observed. The case fatality rate is 10%-15% and 11-19% of surviving patients have sequelae (e.g., neurologic disability, limb or digit loss, and hearing loss).

Mode of Transmission

Transmission occurs through respiratory secretions or droplets from the nose, throat, and mouth of colonized or infected persons. *N. meningitidis* may be carried in the nasopharynx of otherwise healthy individuals. Invasive meningococcal disease occurs primarily in individuals who are newly colonized with the organism, usually within the first few days.

Incubation Period

From 1-10 days, usually less than 4 days.

Period of Communicability

Persons with meningococcal disease are considered infectious 7 days before onset of disease until 24 hours after initiation of appropriate antibiotic therapy, with the most infectious period shortly before symptom onset until initiation of antibiotic therapy.

CDC/CSTE Case Definition: Invasive Meningococcal Disease

Confirmed:

- Detection of *N. meningitidis*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood or CSF), using a validated polymerase chain reaction (PCR) assay; or
- Isolation of *N. meningitidis*
  - from a normally sterile body site (e.g., blood or cerebrospinal fluid, or less commonly, synovial, pleural, or pericardial fluid), or
  - from purpuric lesions.

Probable:

- 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, isolated from a normally sterile body site (e.g., blood or CSF).

Culture-Negative Suspect Cases

If antibiotics have been given prior to specimen collection, sterile site cultures may be negative. In such cases, specimens may be submitted to the CDPH Microbial Diseases Laboratory (MDL), and PCR testing can be performed concurrently with cultures. In addition, specimens from culture-negative patients for whom there is strong suspicion of meningococcal disease can be submitted regardless of antibiotic history. See Laboratory Testing for Meningococcal Disease Quicksheet.

Serogrouping, Molecular Subtyping, and Antimicrobial Resistance Testing

The MDL performs serogroup identification on all confirmed isolates and some clinical specimens to assist in surveillance of meningococcal disease.

CDPH routinely submits *N. meningitidis* isolates to CDC for molecular subtyping when appropriate. This information is extremely helpful in determining if a cluster or outbreak is occurring. CDC has identified *N. meningitidis* isolates that are resistant to penicillin and ciprofloxacin in the U.S. in recent years. CDPH encourages antimicrobial susceptibility testing (AST) on *N. meningitidis* isolates to inform treatment and post-exposure prophylaxis (PEP) decisions. AST should not delay initiation of PEP. CDC results are not available promptly enough to be used for clinical or public health decision-making for individual cases.

Discontinuation of ciprofloxacin for invasive meningococcal disease (IMD) post-exposure prophylaxis (PEP), Bay Area and Sacramento regions (January 2024)

Due to the detection of ciprofloxacin-resistant strains of *Neisseria meningitidis*, local health jurisdictions (LHJs) in the Bay Area and Sacramento regions are recommended to discontinue use of ciprofloxacin for IMD post-exposure prophylaxis (PEP).

Ciprofloxacin should no longer be used for IMD PEP in: City of Berkeley, Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, San Francisco, Solano, Sonoma, Sacramento, El Dorado, Amador, Placer, San Joaquin, Sutter and Yolo counties. For IMD PEP, prescribe rifampin, ceftriaxone or azithromycin instead of ciprofloxacin. These recommendations (see Appendix) should be followed until updated public health guidance is issued.

Case Investigation

1) Confirm that the suspected case meets the case definition and/or is highly suspected. Identify and locate patient specimens. **Submit bacterial isolates or culture-negative sterile site specimens to CDPH MDL as soon as possible for serogrouping and additional testing.**
2) Empiric therapy for suspected meningococcal disease should include cefotaxime or ceftriaxone. Cases not treated with cefotaxime or ceftriaxone, which clear carriage, should receive chemoprophylaxis before hospital discharge.
3) Effective antibiotic therapy for meningococcal disease should be determined by the medical provider. Options include cefotaxime, ceftriaxone, penicillin G, or ampicillin.
4) Identify all persons who had close contact with case within 7 days of case's onset of symptoms until case has had 24 hours of effective antibiotic therapy (see definition of close contact below). To identify close contacts, interview the case, their household members and close friends as needed (for adolescents and young adults, close friends may be the only reliable source of information about contacts).
5) Regardless of the meningococcal vaccination status of the contact, recommend chemoprophylaxis for close contacts as soon as possible, ideally within 24 hours of identification of the index case and up to 14 days from the last exposure (see next page for information on expanded chemoprophylaxis).

6) For long-term protection, recommend meningococcal vaccines to unvaccinated close contacts and recovered cases with an ACIP recommendation for vaccination.
7) Meningococcal vaccine (MenACWY or MenB vaccines) may also be considered for unvaccinated:
   - persons who are not close contacts but have an ACIP recommendation for vaccination to help reduce anxiety about exposure; and
   - close contacts and recovered cases without an ACIP recommendation for vaccination (the risk of exposure may be longer than the very short period of protection from chemoprophylaxis, and cases may have an undiagnosed risk for meningococcal infection).

   Children vaccinated before the age recommended by ACIP should receive additional dose(s) of vaccine at the recommended age(s).
8) Provide close contacts with information about the signs and symptoms of meningococcal disease and ask them to self-monitor for the onset of febrile illness.
9) Alert clinicians and educate the public, as indicated.
10) Recommend evaluation of previously immunized or recurrent cases for terminal complement or other immune deficiency; some experts recommend evaluation of all recovered cases.

Close Contact Definition

Close contacts are people who may have been exposed to the respiratory secretions or droplets of a case in the 7 days before the onset of symptoms in the case and until the case has had 24 hours of effective antimicrobial therapy. The following persons are considered close contacts:

- Household members.
- Childcare or preschool contacts.
- Persons with unprotected exposure to the case's respiratory secretions or droplets, e.g., via intubation, endotracheal tube management, suctioning, and mouth-to-mouth resuscitation.
- Persons who shared sleeping spaces with the case (e.g., dormitory, barracks).
- Persons with exposure to the index patient's secretions through kissing or other markers of close or intimate contact (e.g., sharing toothbrushes, eating utensils or smoking materials). Although *N. meningitidis* is not commonly detected in saliva, these types of exposures are often used as indicators of close contact and secretion or droplet exposure.
- Other persons who may be considered close contacts include those who are likely to have been exposed to secretions or droplets from the case's nose, throat, or mouth (e.g., close face-to-face contact, especially if prolonged).
- Persons sitting directly next to the index case during airline flights lasting more than 8 hours, or passengers seated within one seat in any direction from an index case on a flight of any duration if the index case was coughing or vomiting during the flight.

When there are a large number of contacts or there is difficulty reaching contacts, priority should be given to persons with the most prolonged or intimate contact with the case or contact with the case shortly before the onset of symptoms when cases are most infectious.

Expanded Chemoprophylaxis

Offering chemoprophylaxis to those with casual or transient contact with the case is generally not recommended. However, in settings involving defined populations where it may be difficult to ascertain the individual degree of contact with the case, offering chemoprophylaxis to others beyond those identified as close contacts (expanded PEP) may be considered.

Examples include childcare/kindergarten classrooms, small primary/secondary schools, jails, residential facilities, or defined social networks such as fraternity/sorority members, sports team members, and party attendees. Expanded PEP is often warranted for those in the social networks of college student cases.

If expanded PEP is undertaken, it should be administered to all targeted persons at the same time, ideally within 24 hours. Contact CDPH for consultation if expanded PEP is being considered.

Outbreak Management and Mass Vaccination

An outbreak threshold is determined on a case-by-case basis but is generally defined as 1) 2-3 outbreak-associated cases within an organization during a 3-month period or 2) multiple outbreak-associated cases resulting in increased meningococcal disease incidence in a community during a 3-month period. If an outbreak is suspected, efforts should be made to ensure that isolates are submitted to public health laboratories for whole genome sequencing (WGS). Additional epidemiologic data should be collected from suspected cases to identify a possible risk group/network.

Vaccination is the preferred control measure for outbreaks of all serogroups commonly seen in the U.S., however mass vaccination decisions should be made on a case-by-case basis in consultation with CDPH, taking in account all circumstances and epidemiology specific to the outbreak. The vaccine used should reflect the outbreak serogroup.

Licensed Meningococcal Vaccines

Formulation¶	Trade name	Licensed ages*	Serogroups
MenACWY-D	Menactra®	9m-55y	A, C, W, Y
MenACWY-CRM	Menveo®	2m-55y	A, C, W, Y
MenACWY-TT	MenQuadfi®	≥2y	A, C, W, Y
MenB-FHbp§	Trumenba®	10-25y	B
MenB-4C	Bexsero®	10-25y	B

¶There is no brand preference, however for MenB vaccines, the same brand must be used for all doses in a series.

*ACIP recommends the use of MenACWY vaccines in persons ≥2 months of age and MenB vaccines in persons ≥10 years of age who are at increased risk including during an outbreak.

§If Trumenba® is used for a MenB outbreak response, ACIP recommends that the 3-dose series (0, 1-2, 6m) be used to provide earlier protection and maximize the immune response.

It takes ~2 weeks after vaccination for the development of protective antibody levels. Expanded chemoprophylaxis can be used as an interim measure to temporarily reduce meningococcal carriage and transmission before protection from vaccination can be achieved (see section on expanded chemoprophylaxis).

Efforts should be made to educate communities, physicians, and other health-care personnel about meningococcal disease to promote early care-seeking behaviors and recognition of cases. In general, restricting travel, closing schools, or cancelling sporting or social events are not recommended.

Risk Communication

Immediately contact administrators of schools or other institutions where a case of meningococcal

disease has occurred. Recommend that affected schools and institutions rapidly communicate (phone trees, e-mail) with their populations and help guide messaging. CDPH can provide assistance with messaging and letters.

Information communicated should include:

- Notification about the case (obtain consent if the name of the case is to be released).
- Reassurance that the risk of another case is remote.
- Signs and symptoms of meningococcal disease and instructions to seek care promptly if they occur.
- Persons recommended to receive chemoprophylaxis will be notified by public health authorities.
- Serogroup-specific vaccination recommendations.

Reporting

Situations of heightened concern such as one suspected, probable, or confirmed case in a daycare, school, or college setting, or two or more cases in the same institution or social network, or if other unusual situations are identified should be reported immediately CDPH via email VPDReport@cdph.ca.gov or phone (510) 620-3737 during business hours; if after hours, report the next day. All other cases should be reported within 1 working day to CDPH via CalREDIE or submission of CDPH form 8469.

***N. meningitidis* Infection in a Non-sterile Site**

In all situations, if the person with a positive *N. meningitidis* result from a non-sterile site is a close contact to an IMD case, manage as an IMD contact. Only *N. meningitidis* results from sterile sites are reportable in California. However, health departments may receive questions or reports regarding *N. meningitidis* in nonsterile sites.

Nonsterile Site (condition)	Treatment	Close contact management/PEP
Eye (conjunctivitis)	No public health treatment recommendation; manage clinically.	No public health recommendation for contact management/PEP.
Nasopharyngeal/throat/ oropharynx (pharyngitis, sinusitis)	No public health recommendation for treatment; manage clinically	No public health recommendation for contact management/PEP
Urine (urethritis)	*N. meningitidis* can cause urethritis. CDC recommends the same treatment for *N. meningitidis* and *N. gonorrhoeae* urethritis.	CDC recommends that sex partners of patients with *N. meningitidis* urethritis be treated as they would be treated for *N. gonorrhoeae* exposure.
Sputum/respiratory/endotracheal (pneumonia)	No public health recommendation for treatment; manage clinically.	No public health recommendation for contact management/PEP.

Recommended chemoprophylaxis regimens

Age	Dose	Duration	Efficacy	Cautions
Rifampin[a]				
<1 month	5 mg/kg, every 12 h, po	2 days		Discussion with an expert for infants <1 month of age.
≥1 month	10 mg/kg (maximum 600 mg), every 12 h, po	2 days	90–95%	Can interfere with efficacy of oral contraceptives and some seizure and anticoagulant medications; can stain soft contact lenses.
Adult	600mg every 12 h, po	2 days	90–95%	
Ceftriaxone				
<15 years	125 mg, intramuscularly	Single dose	90–95%	To decrease pain at injection site, dilute with 1% lidocaine.
≥15 years – Adult	250 mg, intramuscularly	Single dose	90–95%	
Ciprofloxacin[a]				
≥1 month	20 mg/kg (maximum 500 mg), po	Single dose	90–95%	
Adult	500mg, po	Single dose	90–95%	
Azithromycin				
Pediatric	10 mg/kg (maximum 500 mg), po	Single dose	90%	Not recommended routinely; may be recommended in jurisdictions with ciprofloxacin-resistant *N.meningitidis* strains. Equivalent to rifampin for eradication of *N. meningitidis* from nasopharynx in one study of young adults.
Adult	500mg, po	Single dose	90%	

Note: Penicillin is often appropriate as treatment but is not appropriate for chemoprophylaxis.
[a] Not recommended for use in pregnant women.

Adapted from AAP 2021-2024 Red Book.

Appendix

Discontinuation of ciprofloxacin for invasive meningococcal disease (IMD) post-exposure prophylaxis (PEP), Bay Area and Sacramento regions

Due to the detection of ciprofloxacin-resistant strains of *Neisseria meningitidis*, California Department of Public Health (CDPH) has recommended local health jurisdictions (LHJs) in the Bay Area and Sacramento regions discontinue use of ciprofloxacin for invasive meningococcal disease (IMD) post-exposure prophylaxis (PEP). Rifampin, ceftriaxone or azithromycin are recommended options for PEP in these LHJs.

Ciprofloxacin should no longer be used for IMD PEP in: City of Berkeley, Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, San Francisco, Solano, Sonoma, Sacramento, El Dorado, Amador, Placer, San Joaquin, Sutter and Yolo counties.

Recommended chemoprophylaxis ciprofloxacin-resistant regimens

Age	Dose	Duration	Efficacy	Cautions/Notes
Rifampin[a]				
<1 month	5 mg/kg, every 12 h, po	2 days		Discussion with an expert for infants <1 month of age.
≥1 month	10 mg/kg (maximum 600 mg), every 12 h, po	2 days	90–95%	Can interfere with efficacy of oral contraceptives and some seizure and anticoagulant medications; can stain soft contact lenses.
Adult	600 mg every 12 h, po	2 days	90–95%	
Ceftriaxone				
<15 years	125 mg, intramuscularly	Single dose	90–95%	To decrease pain at injection site, dilute with 1% lidocaine.
≥15 years – Adult	250 mg, intramuscularly	Single dose	90–95%	
Azithromycin				
Pediatric	10 mg/kg (maximum 500 mg), po	Single dose	90%	Not recommended routinely; may be recommended in jurisdictions with ciprofloxacin-resistant *N.meningitidis* strains. Equivalent to rifampin for eradication of *N. meningitidis* from nasopharynx in one study of young adults.
Adult	500 mg, po	Single dose	90%	

Note: Penicillin is often appropriate as treatment but is not appropriate for chemoprophylaxis.

[a] Not recommended for use in pregnant women.

Resources

CDC Meningococcal Disease: https://www.cdc.gov/meningococcal/index.html

CDC Meningococcal Vaccines: https://www.cdc.gov/vaccines/vpd/mening/index.html

CDC Threshold for Changing Meningococcal Disease Prophylaxis Antibiotics in Areas with Ciprofloxacin Resistance: https://www.cdc.gov/meningococcal/outbreaks/changing-prophylaxis-antibiotics.html

CDPH Meningococcal Disease: https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/meningococcal.aspx