California Department of Public Health – February 2018

Meningococcal Disease Quicksheet

Infectious Agent
Neisseria meningitidis, a gram-negative diplococcus bacterium carried by 5-10% of the population.

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% and 11-19% of surviving patients have sequelae (e.g., neurologic disability, limb loss, and hearing loss).

Mode of Transmission
Transmission occurs through contact with aerosols 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.

2015 CDC/CSTE Case Definition

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 *Neisseria 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. Culture-negative sterile site specimens should be submitted to the CDPH Microbial Diseases Laboratory (MDL) for PCR testing, which can confirm the diagnosis. See "Laboratory Testing for Meningococcal Disease" at: https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Immunization/IMM-MeningLabTesting.pdf

A **primary case** of meningococcal disease is one that occurs in the absence of previous known close contact with another case. A **secondary cas**e is one that occurs in a close contact of a primary case ≥24 hours after the onset of illness in the primary case. **Co-primary cases** are two or more cases that occur among a group of close contacts with onset of illness separated by <24 hours.

Case Investigation
1) Confirm that the suspected case meets the case definition and/or is highly suspected.
2) 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.** See "Laboratory Testing for Meningococcal Disease" at link above for more information.
3) Confirm that appropriate antibiotics have been provided to the case. Cases treated only with penicillin need an additional antibiotic to eradicate pharyngeal carriage (see page 3 for more information).
4) Identify all persons who had close contact with case within 7 days of onset of disease in case until case has had 24 hours of effective antibiotic therapy (see definition of close contact below). Interview the case, their household members and close friends (for adolescents and young adults, close friends may be the only reliable source of information about contacts).
5) Recommend antibiotic postexposure prophylaxis 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) Postexposure prophylaxis should be offered regardless of the meningococcal vaccination status of the contact.
7) For long-term protection, recommend meningococcal vaccines to unvaccinated close contacts who qualify for vaccine under ACIP recommendations and to unvaccinated recovered cases.
8) Meningococcal vaccine (quadrivalent ACWY or MenB vaccines) may also be considered for unvaccinated:
   - persons who are not close contacts who qualify for vaccine under ACIP recommendations to help reduce anxiety about exposure; and
   - close contacts who do not qualify for vaccine under ACIP recommendations (the risk of exposure may be longer than the very short period of protection from chemoprophylaxis). Children vaccinated before the age recommended by ACIP should receive additional dose(s) of vaccine at the recommended age(s).
9) 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.
10) Alert clinicians and educate the public, as indicated.
11) Recommend evaluation of previously immunized or recurrent cases for terminal complement or other immune deficiency; some experts recommend evaluation of all recovered cases.
12) Report vaccine failures to the CDPH Immunization Branch.

Close Contact Definition

Close contacts are people who may have been exposed to the respiratory aerosols 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 aerosols, 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 respiratory 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.
- Other persons who may be considered close contacts include people who are likely to have been exposed to aerosols or secretions from the case's nose, throat, or mouth (e.g., close face-to-face contact, especially if prolonged).
  - Per CDC, persons sitting directly next to the index case during airline flights lasting more than 8 hours.

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

In general, offering chemoprophylaxis to those with casual or transient contact to the patient is not recommended. However, in certain settings involving defined populations where it may be difficult to ascertain the degree of contact with the patient (e.g., child care/kindergarten classrooms, small primary/secondary schools, jails, residential facilities, or defined social networks such as fraternity/sorority, sports team members, party attendees), offering chemoprophylaxis to others beyond those identified as close contacts may be considered. Expanded chemoprophylaxis is often warranted for those in the social networks of college student cases.

If expanded chemoprophylaxis is undertaken, it should be administered to all targeted persons at the same time, ideally within 24 hours. Contact CDPH for consultation if expanded chemoprophylaxis 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
MenB-FHbp§	Trumenba®	10-25y	B
MenB-4C	Bexsero®	10-25y	B

* ACIP recommends the use of MenACWY vaccines in persons ≥56 years of age and MenB vaccines in persons ≥10 years of age who are at increased risk during an outbreak.

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

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

Approximately 2 weeks are required following 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 potential protection from vaccination can be achieved (see section above 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.

Information communicated should include:

- Notification about the case (obtain consent if the name of the case is to be released).
- Reassurance that chance 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.

Molecular subtyping of isolates

Molecular subtyping can be performed on isolates of the same serogroup to determine if they have similar genetic fingerprints. This information can be extremely helpful in determining if a cluster or outbreak is occurring.

***N. meningitidis* infection in a non-sterile site**

Although not recommended by CDC, CDPH considers it reasonable to manage close contacts of meningococcal conjunctivitis or pneumonia cases in the same manner as close contacts of invasive disease cases. Invasive disease has developed among close contacts of meningococcal conjunctivitis or pneumonia cases.

Reporting

Report all suspected, probable and confirmed cases of meningococcal disease on CDPH form 8469, available on the Communicable Disease Control Forms web page at: https://www.cdph.ca.gov/Programs/PSB/Pages/CommunicableDiseaseControl.aspx

Contact the CDPH Immunization Branch at (510) 620-3737 if there is 1 suspected or confirmed case in a high school or college student or ≥2 cases in the same institution or social network, or for guidance about other unusual situations.

Recommended chemoprophylaxis regimens*

Age	Dose	Duration	Efficacy	Cautions
Rifampin[a]				
<1 month	5 mg/kg, every 12 h, po	2 days		
≥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.
Ceftriaxone				
<15 years	125 mg, intramuscularly	Single dose	90–95%	To decrease pain at injection site, dilute with 1% lidocaine.
≥15 years	250 mg, intramuscularly	Single dose	90–95%	To decrease pain at injection site, dilute with 1% lidocaine.
Ciprofloxacin[a,b]				
≥1 month	20 mg/kg (maximum 500 mg), po	Single dose	90–95%	Per the 2015 AAP Red Book recommendations, ciprofloxacin is recommended as chemoprophylaxis for nonpregnant persons ≥1 month of age. Reports of adverse events in children have been rare after widespread ciprofloxacin use in children.
Azithromycin	10 mg/kg (maximum 500 mg), po	Single dose	90%	Not recommended routinely; equivalent to rifampin for eradication of *N. meningitidis* from nasopharynx in one study.

***Penicillin** is often appropriate as treatment, but is not appropriate for prophylaxis.

[a] Not recommended for use in pregnant women.

[b] Use only if fluoroquinolone-resistant strains of *N meningitidis* have not been identified in the community. See: CDC. Emergence of fluoroquinolone-resistant *Neisseria meningitidis*—Minnesota and North Dakota, 2007–2008. *MMWR.* 2008;57(7):173–175 at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5707a2.htm. In limited testing to date, ciprofloxacin-resistant *N. meningitidis* isolates have been detected in one case in California and three cases in the Midwest.