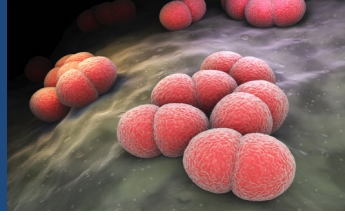
Invasive Meningococcal Disease Management Protocol and Risk Assessment



WHAT IS MENINGOCOCCAL DISEASE?

- Caused by the bacterium ***Neisseria meningitidis***, a gram-negative diplococcus.
- Six serogroups (A, B, C, W, X, and Y) cause the majority of invasive disease worldwide.
- *N. meningitidis* can lead to infections of the lining of the brain and spinal cord (meninges), as well as blood infections (bacteremia or sepsis), which are often severe or can be fatal.

SIGNS AND SYMPTOMS may include:

- Fever
- Petechial or purpuric rash
- Altered mental status
- Stiff/immobile neck
- Nausea/vomiting
- Seizures
- Severe headache
- Photophobia (aversion to light)

TRANSMISSION is through direct contact with oral secretions

- Kissing
- Sharing eating utensils or drinking containers (e.g. glasses, water bottles)
- Sharing cigarettes (or other smoking materials)
- Performing CPR or endotracheal intubation

CASE DEFINITION:

Confirmed

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

Probable

- Detection of *N. meningitidis* antigen
  - ⇒ In formulin-fixed tissue by immunohistochemistry (IHC); **or**
  - ⇒ In CSF by latex agglutination.

! Urine, sputum, throat, and bronchoalveolar lavage (BAL), specimens are not considered sterile sites.

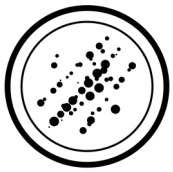
Suspected

- 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.

CSF analysis *can be used to distinguish between bacterial and viral meningitis. The detection of increased white blood cells (predominantly neutrophils), high protein levels and low levels of glucose in the CSF suggest a bacterial cause instead of viral.*

INCUBATION PERIOD: It takes about 1–10 days from exposure, generally 3–4 days, until a person will get sick.

INFECTIOUS PERIOD: A patient is considered contagious for a period of 7 days prior to onset of illness until 24 hours after the initiation of appropriate antibiotic therapy.



Asymptomatic carriage is relatively common; it is estimated that up to 5–10% of the population has *N. meningitidis* in their nose and throat at any given time, without illness.

Meningococcal pneumonia:

Pneumonia, with the sole cause being *N. meningitidis,* without concurrent sepsis or meningitis is uncommon. Sputum samples may contain *N. meningitidis* flora picked up from the nasopharynx. Typically these are non-typeable strains. A true meningococcal pneumonia case is characterized as a chest x-ray confirmed pneumonia with *N. meningitidis* being the predominant organism.

Although communicability is a theoretic possibility, the Centers for Disease Control and Prevention (CDC) does not recommend treatment of direct contacts of case patients with meningococcal pneumonia. Local and tribal health departments (LTHDs) can collect laboratory and radiography results and consult with the Communicable Diseases Epidemiology Section (CDES) at the Wisconsin Department of Health Services to determine whether chemoprophylaxis or follow up with contacts are needed.

PUBLIC HEALTH RESPONSE

It is the responsibility of the clinician, infection control practitioner (IP), ***and*** *the laboratory to ensure the reporting of a suspect case of meningococcal disease* ***by telephone*** *to their LTHD and/or state public health staff as soon as possible. Entering the case into the Wisconsin Electronic Disease Surveillance System (WEDSS) is* ***not*** *sufficient notification.*

1) Gather clinical history of the patient to identify and confirm:

- Clinical signs and symptoms.
- Date of illness onset.
- Laboratory test results including specimen source, Gram stain and culture results, and CSF analysis if applicable.

(Continued)

- Dates and time of antibiotic treatment:
  ⇒ If antibiotics were given prior to blood or CSF collection, culture results may be negative.
  ⇒ Determine if the patient was on antibiotics before illness onset. PCR testing is still an option.
- Meningococcal vaccination history including the date, name of vaccine, and manufacturer.

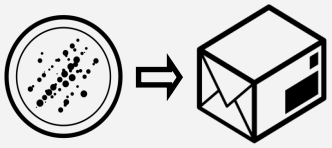
The "Search WIR" button in WEDSS will upload vaccine data into the record.

2) Report immediately (per Wis. Admin Code ch. DHS 145) all suspect cases of meningococcal disease to the CDES.

- The general number for CDES staff should be used during weekdays: **608-267-9003**
- The emergency number for on-call CDES staff should be used after business hours and on weekends: **608-258-0099**. This phone number is for local health departments and clinical practitioners only. Please **do not distribute** to the public.

3) Identify direct contacts of the case. Advise them that they should receive preventive antibiotic prophylaxis (see *Contact investigation* on following page).

4) Ensure the diagnosing laboratory will send the bacterial isolate to the Wisconsin State Laboratory of Hygiene (WSLH) for serogroup identification.



5) Determine if the case is a high school, college, or vocational student.

- What year in school is the student?
- Did the student live in a residence hall, an apartment or a house with roommates?
- Have the roommates received the meningococcal vaccine?
- What activities/travel did the student participate in during the 7 days prior to onset?

6) Determine if there are other risk factors for meningococcal disease.

- Does the case take a complement inhibitor drug (e.g., Soliris)?
- Is the case experiencing homelessness or are they housing insecure?
- Is the case a male who has sex with men (MSM)?
- Is the case HIV-positive?

This information is requested by and reported to the CDC for national MeningNet surveillance.

7) Enhance surveillance for additional cases:

- Rapidly investigate additional suspect cases.
- Consider alerting clinicians, health, and school officials in your area of the case, especially if the case had a lot of contacts in a group or school environment.

8) If there are multiple cases, investigate potential links between them.

CONTACT INVESTIGATION — Who needs prophylactic treatment?

Post-exposure chemoprophylaxis:

Ideally, chemoprophylaxis should be provided to direct and household contacts within 24 hours of diagnosis of the index case. Chemoprophylaxis is only necessary for people exposed **directly** to the case patient's oral secretions while they were infectious. A patient is considered infectious for 7 days prior to their onset date of illness through 24 hours after the start of appropriate antibiotic therapy. Prophylaxis is not indicated more than 14 days after exposure to patient (Red Book, 2018 -21. p. 554-554). **Chemoprophylaxis should be offered even if a contact has been vaccinated, as vaccines are not 100% effective.**

To identify direct contacts during the 7 days before illness onset, interview the patient. If this is not possible, interview family, friends and others such as work and activity acquaintances. It is important to talk directly to non-adult patients and/or interview their friends **alone**. Parents may not be aware of intimate partners and other exposures, such as shared cigarettes, drugs, and drinking activities. A young person may not be willing to share important details in front of a parent.

Chemoprophylaxis is recommended for the following high risk contacts:

- Any person who had direct exposure to index patient's oral secretions through kissing, drinking from the same glass or bottle, sharing eating utensils, a toothbrush, or smoking material
- Household contacts, especially children younger than 2 years of age
- Intimate partners
- Child care or pre-school contacts (both attendees and staff)
- Ambulance, EMS, and other health care personnel exposed **directly** to respiratory secretions (e.g., during mouth-to-mouth resuscitation, endotracheal intubation, suctioning)
- Any persons who had direct saliva contact at events or activities such as those occurring during the school or work day, sporting events and practices, after-school programs, church programs, or social events

Chemoprophylaxis is generally not recommended for the following low-risk contacts:

- Casual contacts (e.g., school, work) with no direct exposure to the patient's oral secretions
- People in the same room after patient was there but had no contact
- Contact of a contact (secondary contact), with no direct exposure to the patient
- Health care professionals without direct exposure to patient's oral secretions

Note: There is no length of distance (e.g."3-foot rule") that can determine a person's risk. The risk is determined by direct contact with saliva, not distance.

Chemoprophylaxis of contacts after exposure to a case on an aircraft

The risk of infection is related to the length of the flight and one's seating proximity to the case. For flights > 8 hours, including ground time, passengers seated in the same row directly adjacent to the case should be considered for chemoprophylaxis. For flights ≤ 8 hours, no prophylaxis of nearby passengers is advised.

Personnel from the airline, CDC quarantine station, LTHD, and CDES will collaborate to determine the risk, and identify the aircraft passengers seated around the case and any crew members that may have had close interactions.

Mass vaccination or chemoprophylaxis is only recommended during outbreak situations. The Wisconsin CDES will work with LTHDs to determine if this is necessary.

Ensure terminal prophylaxis of the patient.

- Ceftriaxone clears nasopharyngeal carriage effectively after 1 dose.
- Treatment of meningococcal disease with agents other than a third-generation cephalosporin or ciprofloxacin may not reliably eliminate nasopharyngeal carriage of *N. meningitidis*.
- If the patient was not treated therapeutically with a third-generation cephalosporin or ciprofloxacin, ensure that the patient receives one of the three antibiotics in the table on page 6 to clear nasopharyngeal carriage (terminal prophylaxis) before leaving the hospital.

Chemoprophylaxis should be provided even if the close contact has been immunized. Currently licensed vaccines do not provide 100% protection.

CHEMOPROPHYLAXIS REGIMENS

The following regimens are appropriate for chemoprophylaxis, and elimination of nasal carriage, in high-risk contacts (Red Book, 2018-21, p.555).

Age	Dose	Duration	Cautions
Rifampin			
Children < 1 month	5 mg/kg, orally, every 12 hours	2 days	Discuss use with an infectious diseases expert
Adults and children ≥1 month	15–20 mg/kg, p.o., (max. 600 mg), orally every 12 hours	2 days	Not recommended for use during pregnancy; can interfere with the efficacy of oral contraceptives and some seizure and anticoagulant medications; can stain soft contact lenses
Ceftriaxone			
<15 years	125 mg, intramuscularly	1 dose	To decrease pain at injection site, dilute with 1% lidocaine.
≥15 years	250 mg, intramuscularly	1 dose	To decrease pain at injection site, dilute with 1% lidocaine.
Ciprofloxacin*			
≥ 1 month	20 mg/kg (max. 500 mg), orally	1 dose	Not recommended for use during pregnancy
Azithromycin			
	10 mg mg/kg (max. 500 mg)	1 dose	Not recommended routinely; equivalent to rifampin for the eradication of *N. meningitidis* from nasopharynx in one study of adults

*Use only if fluoroquinolone-resistant strains of *N. meningitidis* have not been identified in the community.

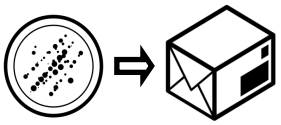
ROLES AND RESPONSIBILITIES DURING A CASE INVESTIGATION

Local or Tribal Health Department (LTHD)

See *Priority for local public health response* on page 2.

Hospital Infection Preventionist (IP)

- Notify the LTHD of any suspect cases by phone as soon as possible. Entering a case into the WEDSS system does not count as notification. Provide details about the case's clinical history, diagnosis, and laboratory results.
- Identify medical personnel and/or EMTs that were directly exposed to the saliva of the patient (e.g., resuscitation or endotracheal tube placement). Arrange for chemoprophylactic treatment. Being in the same room as the patient is **not** considered direct contact.
- Ensure the patient receives terminal prophylaxis before leaving the hospital.
- Ensure the laboratory will send the bacterial isolate to the WSLH for serogroup testing as mentioned on page 3.



Wisconsin State Laboratory of Hygiene (WSLH)

- Perform confirmation, serogrouping, and antibiotic susceptibility testing of the isolate.
- Forward isolates to CDC, for whole genome sequence (WGS) testing during outbreaks, and other national surveillance activities.
- Report results to the submitting laboratory and CDES.

Communicable Disease Epidemiology Section (CDES)

- Review the case's clinical and laboratory data to confirm case status.
- Assist the LTHD in determining which persons need chemoprophylaxis.
- Coordinate investigations that are multi-jurisdictional and conduct enhanced surveillance to look for potential links between cases.
- Provide template letters to the LTHD for clinicians, schools, daycares, and workplaces, etc.
- Confirm that the bacterial isolate is received at the WSLH for serogroup determination.
- Request PCR testing from WSLH on culture-negative isolates when appropriate.

The general number for CDES should be used during weekdays: **608-267-9003.** The emergency number for on-call CDES staff can be used after business hours and on weekends: **608-258-0099**. The on-call phone number is for LTHDs and clinicians only. Please **do not distribute** to the public.

VACCINATION

Currently in the U.S., there are two types of licensed meningococcal vaccines.

Meningococcal Conjugate Vaccines (MenACWY)

The following vaccines protect against 4 strains (A, C, W, Y) of meningococcal disease:

- Menactra® (Sanofi Pasteur),
- Menveo® (Novartis), and
- MenQuadfi® (Sanofi Pasteur)

  Note: *Sanofi Pasteur has announced that future resources will be focused on MenQuadfi and that Menactra will be discontinued in 2021.*

CDC recommends routine MenACWY for all preteens and teens 11 to 12 years old with a booster dose at 16 years old.

Meningococcal serogroup B vaccines (MenB)

The following vaccines only protect against strain B, which is not contained in the MenACWY vaccines:

- Trumenba® (Wyeth)
- Bexero® (Novartis)

  Note: *The two MenB vaccines are not interchangeable; the same vaccine must be used for all doses.*

MenB recommendations:

- The Advisory Committee on Immunization Practices (ACIP) recommends the vaccine be administered to persons aged 16–23 years, with a preferred age range of 16–18 years, to increase the likelihood that protection will last during the years when they are at greatest risk of meningococcal disease.
- MenB vaccines are routinely recommended only for persons aged 10 years and older who are identified as being at increased risk for meningococcal disease because of medical conditions, such as those with comple-ment component deficiencies and functional or anatomic asplenia.

For recommendations of who and when to vaccinate please see the CDC website: https://www.cdc.gov/vaccines/vpd/mening/index.html

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