

## **NEISSERIA MENINGITIDIS (MENINGOCOCCAL DISEASE)**

### I. DEFINITION:

*Neisseria meningitidis* is a gram-negative diplococci (spheres clumped in pairs) bacteria. Meningitis and septicemia constitute the majority of cases of meningococcal disease. Other illnesses include septic arthritis, pneumonia, and rarely pericarditis. Only cases of invasive meningococcal disease (sterile site) are reportable and require a contact investigation.

### II. ETIOLOGY AND EPIDEMIOLOGY:

See Epi Manual

### III. CLINICAL FEATURES

See Epi Manual

### IV. MANAGEMENT PLAN:

#### A. Post-Exposure Prophylaxis (PEP):

1. An Acute Disease Service (ADS) epidemiologist will consult with the Communicable Disease Nurse (CDN) during the case investigation to discuss identification of contacts and recommendations for prophylaxis.
2. Person-to-person transmission of meningococcal disease can be interrupted by chemoprophylaxis, which eradicates the asymptomatic nasopharyngeal carrier state. Because the disease can be fulminant, chemoprophylaxis should be instituted as rapidly as possible following the onset of disease in the index case.
3. Only persons defined as exposed contacts may be recommended to receive PEP.
4. An exposed **contact is defined** as any member of the case's household or other individuals who had direct contact with the case's saliva or oral/nasal secretions, or anyone who had household-like contact during the 7 days prior to onset of symptoms and until 24 hours after the initiation of appropriate antibiotic therapy. If the last exposure has been more than 14 days, prophylaxis is not recommended.
5. Refer to the *Neisseria meningitidis* & *Haemophilus influenzae* Invasive Disease chapter of The Epi Manual for PEP recommendations.
6. Recommendations for chemoprophylaxis are based on the fact that persons of any age may be susceptible to meningococcal infections.
7. Routine throat or nasopharyngeal culture of contacts is not helpful in determining who warrants chemoprophylaxis.

#### B. Clients who are identified as exposed contacts and recommended to receive post-exposure prophylaxis should be directed to an appropriate resource to receive their PEP prescription. The following two options describe where contacts should be referred for their PEP prescription.

1. PEP option #1 (use of external resources):
  - a. Refer client to his/her private physician, or
  - b. Urgent care center or other "a.m./p.m." clinic, or
  - c. The hospital physician treating the source case.

2. PEP option #2: Personnel at the local county health department (CHD) who are legally authorized to prescribe (i.e., medical director, contract physician, physician assistant, family nurse practitioner, pediatric nurse practitioner) may provide prescriptions within the scope of their licensed specialty area **if none of the listed resources in option #1 are available**. The CDN can coordinate providing a prescription to a meningococcal disease contact with the Regional Director or District Nurse Manager (DNM) and the person with prescriptive authority using the following steps:
  - a. Contact the CHD Regional Director and/or DNM to discuss circumstances involving unavailability of external resources as defined above in option #1.
  - b. If decision is made to provide a prescription for PEP via the CHD, request client(s) to come to the CHD.
  - c. Open a limited service record on each person, unless current record is open.
  - d. Perform an assessment of each individual's allergies, age, and body weight and refer to the dosage for PEP. Obtain name of pharmacy where client will fill prescription.
  - e. The person with prescriptive authority will complete an order that includes the contact's name, date of birth, weight, and calculated PEP information (antibiotic name and dose) (ODH 303M).
  - f. They will then contact the pharmacy designated by the client to inform the pharmacist of the circumstances.
  - g. For clients who are unable to afford costs for antibiotic prophylaxis, the CDN will discuss with the CHD Regional Director or DNM to determine if the course of antibiotics recommended for PEP is available through the CHD.

C. Medication

1. Rifampin, ceftriaxone, and ciprofloxacin are the three recommended drugs for chemoprophylaxis in adults. Rifampin is the drug of choice for most children. All three antibiotics are 90 percent to 95 percent effective in reducing nasopharyngeal carriage of *N. meningitidis*.
2. Rifampin dosage and route decisions:
  - a. Orders for rifampin should be rounded up to the next available dosage calculated on the client's age and weight using the dosage for chemoprophylaxis regimen table.
  - b. Appropriate suspending vehicle or syrup vehicle can be used for liquid suspension rifampin orders.
3. Ceftriaxone given in a single intramuscular dose is effective in eradicating carriage.
4. Ciprofloxacin, administered to adults in a single oral dose is effective in eradicating meningococcal carriage; however, in areas of the United States where ciprofloxacin-resistant strains have been detected, it should not be used for chemoprophylaxis.
5. Contraindications:
  - Rifampin is contraindicated in pregnant women.
  - Ciprofloxacin not recommended for people under 18 years of age, pregnant women, or lactating women.

**Dosages for Contacts to a Case of Invasive Meningococcal Disease**

<b>Drug</b>	<b>Age of Contacts</b>	<b>Dosage</b>	<b>Cautions</b>
Rifampin <sup>1</sup>	< 1 month	5 mg/kg, orally, every 12 hours x 2 days	Can interfere with efficacy of oral contraceptives and some seizure and anticoagulant medications; can stain soft contact lenses.
	≥1 month	10 mg/kg (maximum dose 600 mg), orally, every 12 hours x 2 days	
Ceftriaxone	< 15 years	125 mg, intramuscularly (single dose)	To decrease pain at injection site, dilute with 1% lidocaine.
	≥ 15 years	250 mg, intramuscularly (single dose)	
Ciprofloxacin <sup>1,2</sup>	≥1 month	20 mg/kg (maximum 500 mg), orally single dose	Not recommended routinely for people younger than 18 years of age; use may be justified after assessment of risks and benefits for the individual patient.
Azithromycin	All ages	10 mg/kg (maximum 500 mg), single dose	Not recommended routinely. Equivalent to rifampin for eradication of <i>Neisseria meningitidis</i> from nasopharynx in one study.

<sup>1</sup> Not recommended for use in pregnant women

<sup>2</sup>Use only if fluoroquinolone-resistant strains of *N. meningitidis* have not been identified in the community; Centers for Disease Control and Prevention. Emergence of fluoroquinolone-resistant *N. meningitidis* – Minnesota and North Dakota, 2007-2008. *MMWR Morb Mortal Wkly Rep.* 2008;57(7):173-175.

Source:

American Academy of Pediatrics. Meningococcal Disease. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. *Red Book: 2012 Report of the Committee on Infectious Diseases.* 29<sup>th</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics; 2012: 500-509.

## Recommended Rifampin<sup>1,2</sup> Dosage for Chemoprophylaxis Regimen of High-Risk Contacts of Invasive Meningococcal Disease.

<b>MENINGOCOCCAL PEP with RIFAMPIN: 2 Day Regimen</b>					
<b>per dose, administered PO q12 hours</b>					
<b>Weight</b>		<b>&lt; 1 month age</b>	<b>≥ 1 month age</b>	<b>Total mg per 2-day Treatment</b>	
<b>Kg</b>	<b>Lbs.</b>	Use oral suspension dose calculated by age and weight*			
< 15	<33	5 mg/kg	10 mg/kg	Varies	
<b>If not using oral suspension, rounding up is allowed for use of 150 mg capsule (maximum 600 mg per dose):</b>					
<b>Weight</b>					
<b>Kg</b>	<b>Lbs.</b>			<b>Total mg per 2-day Treatment</b>	
15	33			10 mg/kg	600 mg
>15 to 30	34 to 66			150 mg	1200 mg
>30 to 45	67 to 99			300 mg	1800 mg
> 45	100 +			450 mg	2400 mg
				600 mg	2400 mg

\* Calculate dosage using above recommended dosage per kilogram or pound. Confer with DNM or designee before giving.

<sup>1</sup> Not to be taken during pregnancy.

<sup>2</sup> Side effects of Rifampin include orange discoloration of urine, discoloration of soft contact lenses (removal recommended for duration of chemotherapy), discoloration of teeth, nausea, vomiting, and diarrhea. May interfere with efficacy of oral contraceptives and some seizure prevention and anticoagulant medications.

Adapted from:

American Academy of Pediatrics . Meningococcal Infections. In: Pickering LK, Baker CJ, Long SS, McMillan JA, eds. *Red Book: 2012 Report of the Committee on Infectious Diseases*. 29<sup>th</sup> ed. Elk Grove Village, IL

American Academy of Pediatrics; 2012:500-509.

Heymann, D. ed., *Control of Communicable Diseases Manual*. 19<sup>th</sup> Edition. Washington, DC, American Public Health Association, 2008: 415 – 421.

V. CLIENT EDUCATION AND COUNSELING:

- A. Describe the disease and mode of transmission. Define contacts and preventive measures necessary to reduce the risk of secondary spread.
- B. Describe the goal of chemoprophylaxis, which is to prevent exposures by eradicating nasopharyngeal carriage of *Neisseria meningitidis*.
- C. Report potential side effects to medication.

REFERENCES:

- Heymann, D. ed., Control of Communicable Diseases Manual. 19<sup>th</sup> Edition. Washington, DC, American Public Health Association, 2008: 415 – 421.
- American Academy of Pediatrics. Meningococcal Disease. In: Pickering L ed. *Red Book 2012: Report of the Committee on Infectious Diseases*. 29<sup>th</sup> Ed. Elk Grove Village, IL: American Academy of Pediatrics, 2012: 500-509.
- Centers for Disease Control and Prevention. Prevention and control of meningococcal disease Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2013;62(No. RR-2): 1-28.
- Mandell, Douglas, and Bennett's principles and practice of infectious diseases. [edited by] Gerald L. Mandell, John E. Bennett, Raphael Dolin. 7<sup>th</sup> ed., 2010: 2737-2749.
- Nursing 2014 Drug Handbook. [edited by] Rita M. Doyle, Patricia Nale, Carol A. Turkington. 34<sup>th</sup> ed. Philadelphia: Williams and Wilkins; c2014.

