

INVASIVE MENINGOCOCCAL DISEASE FACT SHEET

(including meningococcal meningitis)

Agent: *Neisseria meningitidis*

Brief Description: An acute bacterial infection characterized by sudden onset of fever, intense headache, nausea and vomiting, stiff neck, sometimes associated with petechial rash. With early diagnosis, modern therapy, and support measures, the case-fatality rate is between 5-15%. In some cases not associated with meningitis, the meningococcus can cause overwhelming sepsis with refractory hypotension, pneumonia, arthritis, or (rarely) milder febrile illness with bloodstream infection.

Reservoir: Humans.

Mode of Transmission: Direct contact with oral secretions of an infected person, such as mouth-to-mouth contact or sharing eating utensils, and droplet spread from the nose and throat.

Incubation Period: Varies from 2-10 days, commonly 3-4 days.

Laboratory criteria for diagnosis: Isolation of *Neisseria meningitidis* from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid).

Presumptive diagnoses can be made with positive latex agglutination antigen testing from the CSF. Positive antigen test results from urine or serum samples are unreliable for diagnosing meningococcal disease.

Diagnostic Testing:

A. Pure Culture

1. Specimen: cerebrospinal fluid, blood, and other usually sterile sites
2. Outfits: (Culture referral)
3. Lab Form: Form 3410 or 3415
4. Lab Test Performed: Bacterial isolation, confirmation, and/or serogrouping.
5. Lab: State Bacteriology Lab, Georgia Public Health Laboratory (GPHL) in Decatur.

NOTE: Hospital or commercial laboratories usually perform primary isolation. All isolates should be sent to the Georgia Public Health Laboratory for serogrouping and outbreak surveillance.

Case classification:

- Probable: a case with a positive antigen test in CSF or clinical purpura fulminans in the absence of a positive blood culture
- Confirmed: a clinically compatible case that is culture-confirmed

Period of Communicability: As long as meningococci are present in discharges from the nose and mouth. Organisms usually disappear from the nasopharynx after 24 hours of treatment with antimicrobial agents to which the organisms are sensitive.

Vaccination: The vaccine for meningococcal disease is not routinely recommended in the U.S. because it is not effective in controlling the spread of **sporadic** disease.

- Meningococcal vaccines do not protect children under 2 years of age. Most meningococcal infections occur in this age group, and so vaccines do not help the children most at risk.
- Meningococcal vaccines do not protect against Group B disease, which accounts for up to one third of all meningococcal cases.
- Meningococcal vaccines do not provide permanent protection. Children are protected for only one or two years, and adults are protected for about four years.
- Meningococcal vaccines cannot eliminate carriage of meningococcus from the nose and throat — a condition that exists in up to 15% of the population.

Treatment: Therapy for meningitis or sepsis must be initiated before culture results are available. For children, initial therapy must be effective against *Haemophilus influenzae*, drug-resistant *Streptococcus pneumoniae* (DRSP) and meningococci. When pathogen identification and sensitivity results are available, therapy can be adjusted. Penicillin given parenterally in adequate dosage is the drug of choice for proven meningococcal disease. Ceftriaxone and cefotaxime are acceptable alternatives. Culture confirmed cases should also be given rifampin prior to release from the hospital to eradicate throat carriage of the invasive strain, unless ceftriaxone or cefotaxime (which also eradicate carriage) were used to treat the infection.

Prophylaxis of Contacts: Persons with meningococcal disease are considered to have been potentially infectious during the 7 days prior to illness onset. Prophylactic antibiotics should be provided for **close contacts** that were exposed during this period. Close contacts include persons sharing the same household, the same daycare classroom, those who kissed or shared eating utensils with the index case, and hospital personnel having contact with the patient's secretions, such as through intubation or mouth-to-mouth resuscitation. Chemoprophylaxis is not recommended for casual contacts such as school or work mates, indirect contacts whose only contact is with a high-risk contact of the index case, or for medical personnel without direct exposure to the patient's oral secretions.

Rifampin is the drug of choice in most instances. Other options for prophylaxis include ceftriaxone (an injection), ciprofloxacin (for adults only), and sulfisoxazole (if the organism is known to be sulfonamide-sensitive). Pregnant women should not use rifampin, ciprofloxacin, or sulfonamides without the advice of a physician. (See Table for dosages).

Investigation: Send the isolate to the Georgia Public Health Laboratory for serogrouping. The physician

and public health personnel should identify household and other close contacts of patients. Chemoprophylaxis should then be immediately provided to such contacts. Secondary cases are rare, but likely to occur early after the index case, if at all. Educate contacts about signs and symptoms of meningococcal disease, and encourage early medical contact for illness. Major emphasis must be placed on careful surveillance, early diagnosis and immediate treatment of suspected cases.

Vaccination in the context of an outbreak:

The use of vaccine in all age groups affected should be strongly considered if an **outbreak** occurs in a large institutional or community setting in which cases are due to groups A, C, Y, or W-135. Immunization of all those in the group should be considered if:

1. At least 3 cases of group C or Y disease with the same subtype have occurred during a 3-month period.
2. New cases are still occurring.
3. The attack rate exceeds 10 group C or Y cases per 100,000 in the population at risk.

Reporting: Report *probable* and *confirmed* cases **IMMEDIATELY** by phone to your local health department, District Health Office, or the Epidemiology Branch at 404-657-2588. If calling after regular business hours, it is very important to report cases to the Epidemiology Branch answering service (770-578-4104). After a verbal report has been made, please transmit the case information electronically through the State Electronic Notifiable Disease Surveillance System (SENDSS) at <http://sendss.state.ga.us>, or complete and mail a GA Notifiable Disease Report Form (#3095). Assistance with locating and caring for household and other close contacts can be provided.

Report all *suspected* cases to the Epidemiology Branch electronically through SENDSS or using a GA Notifiable Disease Report Form. Districts should complete the “Active Bacterial Core Surveillance Case Report Form” and forward it to the Epidemiology Branch as soon as possible.

Reported Meningococcal Infections in Georgia, 1990-2000

(Meningitis and Septicemia)

Year	Number of cases	Deaths
1990	72	9
1991	92	6
1992	55	2
1993	93	7
1994	82	3
1995	111	7
1996	147	9
1997	107	12
1998	103	11
1999	72	7
2000	53	9

Note: Not all of these infections represent meningitis.

References:

1. American Academy of Pediatrics. Meningococcal Infections. In Peter G, ed. 1997 Red Book: Report of the Committee on Infectious Diseases. 24th ed. Elk Grove Village, IL: American Academy of Pediatrics; 1997: 357-362.
2. Chin J, ed. MENINGOCOCCAL INFECTION. In: Control of Communicable Diseases Manual. 17th ed. Washington, DC: American Public Health Association, 2000: 340-345.
3. CDC. Change in Recommendation for Meningococcal Vaccine for Travelers. *MMWR* Vol 48(5), 1999: 104.
4. CDC. Control and prevention of meningococcal disease and control and prevention of serogroup C meningococcal disease: evaluation and management of suspected outbreaks. Recommendations

of the Advisory Committee on Immunization Practices (ACIP). *MMWR* Vol 46(RR-5), 1997: 1-27.

Links:

- CDC meningitis – http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal_g.htm
- American Academy of Pediatrics Policy Statement – <http://www.aap.org/policy/01262.html>
- CDC Vaccine Information – <http://www.cdc.gov/nip/publications/VIS/Mening2000.pdf>
- Guidelines for travelers – <http://www.cdc.gov/travel>
- Recommendations of the Advisory Committee on Immunization Practices (ACIP) – <http://www.cdc.gov/nip/publications/acip-list.htm>

Suggested Check List for Follow-up of Meningococcal Meningitis Cases

1. Contact District Health Office and/or Epidemiology Branch (404-657-2588) to coordinate investigation with them immediately.
2. Alert other physicians in the community that the case exists within 8 hours.
3. Identify all **close** contacts, and give prophylaxis and an information sheet within 24 hours. Close contacts are defined as household contacts, daycare contacts, military personnel sharing the same sleeping space and people socially close enough to have shared eating utensils, e.g., close friends at school but not the whole class.
4. Consider providing **casual** contacts with an information sheet.
5. Follow-up in two days to see if contacts took medication.
6. Check to see that laboratory isolate was

sent to the Georgia Public Health Laboratory for serogrouping.

7. Complete history and contact forms for case showing all known contacts, treatment, outcome, etc.
8. Forward a copy of case history forms to the Epidemiology Branch when completed.

Prophylaxis Guidelines for Contacts of a Person with Meningococcal Disease

Prophylaxis should be considered for those persons having prolonged, close contact with an infected individual or direct exposure to infectious respiratory secretions (coughing or sneezing). Particularly consider household contacts, daycare center contacts, romantic contacts, close playmates, or hospital personnel having direct contact with patient secretions. For high-risk post-exposure prophylaxis, the following recommendations are made:

RIFAMPIN PROPHYLAXIS

- **Adults:** 600 mg rifampin administered twice daily for two days.
- **Infants and Children (one month and older):** 10 mg/kg rifampin every 12 hours for two days.
- **Children under 1 month of age:** 5 mg/kg rifampin every 12 hours for two days

Rifampin can be administered to infants and children suspended in simple syrup or as a dry powder mixed with applesauce. Since rifampin has been reported to cross the placental barrier and appear in cord blood and maternal milk, neonates and newborns of rifampin-treated mothers should be carefully observed for any evidence of adverse effects.

To preserve the usefulness of rifampin in the treatment of asymptomatic meningococcal carriers, rifampin should be used only when the risk of meningococcal disease is high. Since resistance can emerge rapidly, susceptibility tests should be performed in the event of persistent positive cultures among colonized patients.

Patients with impaired liver function should be given rifampin only in case of necessity, with caution, and under strict medical supervision.

Contraindications: *Rifampin is not to be used for the treatment of meningococcal disease.*

Rifampin is contraindicated for individuals with a history of hypersensitivity to the rifamycins. Rifampin is not recommended for use in pregnancy. The patient should be told that this medication might cause the urine, feces, saliva, sputum, sweat, and tears to temporarily turn red-orange. Permanent discoloration of soft contact lenses may occur. In addition, the reliability of oral contraceptives may be affected. Diabetes may be more difficult to control during rifampin therapy. Ketoconazole, when given concomitantly with rifampin, has been shown to reduce the serum concentrations of both drugs. An interaction has also been reported with rifampin, isoniazid and Vitamin D.

Alternative Prophylaxis:

CIPROFLOXACIN

A single oral dosage of ciprofloxacin can be substituted for rifampin. The recent favorable pricing of ciprofloxacin (equivalent or less than rifampin at the required dosage) and single dosage regimen makes ciprofloxacin an attractive alternative to rifampin for adults, particularly in situations where compliance cannot be ensured. Ciprofloxacin is not recommended for use in pregnancy or in children under age 18.

SULFADIAZINE/SULFISOXAZOLE

Sulfadiazine is no longer manufactured in the USA, and assistance from CDC may be needed to obtain this drug. The American Academy of Pediatrics' Red Book suggests use of sulfisoxazole in lieu of sulfadiazine. Either drug should only be used if the isolate is known to be sensitive to the sulfonamides. Sulfonamides

are not recommended for use in pregnancy. Sulfadiazine or sulfisoxazole is given for 2 days in divided doses (see Table).

CEFTRIAXONE

Ceftriaxone is considered safer for use in pregnancy than rifampin, ciprofloxacin, or sulfonamides. It is given as a single IM injection (See Table).

RECOMMENDED REGIMENS FOR MENINGITIS PROPHYLAXIS

DRUG	AGE GROUP	DOSAGE	DURATION
Rifampin ¹	Adults	600 mg	Twice daily for 2 days
	Children or infants over one month	10 mg/kg (max 600 mg)	Twice daily for 2 days
	Infants younger than one month	5 mg/kg	Twice daily for 2 days
Ciprofloxacin	Adults only	500 mg	Single oral dose
Ceftriaxone ²	Children (\leq 12 yrs)	125 mg	Single IM dose
	Adults and children >12 yrs	250 mg	Single IM dose
Sulfadiazine ³	Infants	30-40 mg/kg	Four times daily for 2 days
	Adults/Children	1 g	Every 12 hours for 2 days
Sulfisoxazole ⁴	Infants <1 year	500 mg	Once daily for 2 days
	Children 1 to 12 years	500 mg	Every 12 hours for 2 days
	Adults and children over 12	1 g	Every 12 hours for 2 days