PROTOCOL: Invasive Meningococcal Disease Protocol

Public Health Action

- 1. Educate the public about meningococcal meningitis, especially its transmission.
- 2. Educate providers and laboratories to report confirmed and probable cases of invasive meningococcal disease immediately to the local health department to assure follow-up of close contacts, recognize outbreaks, and facilitate community education.
- 3. Educate laboratories to submit *all* invasive meningococcal isolates cultured from normally sterile sites to the West Virginia Office of Laboratory Services for serogrouping. This will determine if circulating strains are vaccine preventable, and assist with outbreak management, if necessary.
- 4. Educate providers about prophylaxis for high risk contacts.
- 5. Upon receiving a report of invasive meningococcal disease:
 - a. Check to confirm that the reported case meets the case definition. Meningococcus cultured from a non sterile site (throat, sputum, etc) does not need to be reported.
 - b. Assure that isolates are forwarded to the Office of Laboratory Services for serogrouping.
 - c. For invasive cases, identify all close contacts. A close contact is defined as any members of the case's household or other individuals who had intimate contact with the case's saliva or oral/nasal secretions. Health care workers who have intimate contact with the case's oral/nasal secretions (through unprotected mouth-to-mouth resuscitation, intubation, or suctioning) are also considered close contacts.
 - d. Alert close contacts (family, daycare, nursery school, etc.) to watch for early signs of illness, especially fever, and assure that close contacts are prophylaxed as follows:

Recommended Chemoprophylaxis Regimens for High Risk Contacts and Index Cases of Invasive Meningococcal Disease

Infants, Children, and Adults	Dose	Duration	Percentage of Efficacy	Cautions
Rifampin* <u><</u> 1month	5 mg/kg orally every 12 hrs	2 days		
<u>></u> 1 month	10 mg/kg (maximum, 600 mg) orally every 12 hrs	2 days,	72-90	May interfere with efficacy of oral contraceptives and some seizures prevention and anticoagulant medications; may stain soft contact lenses
Ceftriaxone <u><</u> 12 years	125mg intramuscularly	Single dose	97	To decrease pain at injection site, dilute with 1% lidocaine
>12 years	250 mg intramuscularly	Single dose		
Ciprofloxacin* <u>></u> 18 years	500 mg orally	Single dose	90-95	Not recommended for use in persons <18 years of age and pregnant women

*Not recommended for use in pregnant women.

- e. Chemoprophylaxis is not recommended for the following persons:
 - i. persons having casual contact with the case and no direct contact with oral secretions, e.g school or work mates;
 - ii. persons who had contact only with a high risk contact, i.e no direct contact with the case;
 - iii. medical personnel who did not have contact with the case's oral secretions.
- 6. For outbreaks of meningococcal disease :
 - a. Check to confirm that the reported cases meet the confirmed or probable case definition.
 - b. Assure that all isolates are forwarded to Office of Laboratory Services for serogrouping
 - c. Consult IDEP urgently for recommendations on outbreak control.
 - d. Assure that close contacts are identified and prophylaxed as above.
- 7. For reported cases of meningococcal disease, complete the front and back of the yellow card. Investigate using the CDC meningitis and bacteremia form by collecting information from providers and laboratories. Document prophylaxis and attach copies of laboratory reports. Forward all paperwork to Infectious Disease Epidemiology Program (IDEP).

Disease Prevention Objectives

Reduce the risk of disease through the education of the general public to:

- 1. Practice good hand washing and basic hygiene as a primary means of preventing spread of infectious agents.
- 2. Educate children not to share spoons, forks, cups, soft drink cans or sport water bottles.
- 3. Educate adults not to share personal items such as glasses, cigarettes, lipsticks or other items that may be covered in oral or nasal secretions.

Disease Control Objectives

Reduce the risk of secondary cases by early identification and prophylaxis of close contacts to cases.

Disease Surveillance Objectives

- 1. To determine the incidence of meningococcal disease in West Virginia;
- 2. To detect trends in patient characteristics, antibiotic resistance, and sero-group specific incidence of disease;
- 3. To identify cases promptly;
- 4. To identify all close contacts of cases promptly;
- 5. To promptly identify clusters or outbreaks of invasive meningococcal disease and initiate appropriate prevention and control measures.
- 6. To provide data for evaluation of preventive measures for close contacts to prevent further spread of disease.

Public Health Significance

Invasive meningococcal disease is of public health importance, is frequently a cause of public health alarm and receives a high level of media attention. Responding to cases places heavy demands on clinical and public health disease control services. *Neisseria meningitidis* causes both endemic and epidemic disease, principally meningitis and meningococcemia. It is the leading cause of bacterial meningitis in children and young adults in the United States, with an estimated 2,600 cases each year. 10 - 15% of cases are fatal. Of patients who recover 11%-19% have a permanent hearing loss or other serious sequelae. Incidence of meningococcal disease peaks in late winter to early spring. Attack rates are highest among children 3-12 months of age and then steadily decline among older age groups. Persons who have certain medical conditions are at increased risk for developing meningococcal infection, including:

persons with complement deficiency; persons with anatomic or functional asplenia; and selected research, clinical laboratory or industrial workers who may be exposed to Neisseria meningitidis aerosols.

Clinical Description

The signs and symptoms of meningococcal disease can vary widely. A person may have either meningococcal meningitis or meningococcemia, or both at the same time. The most common symptoms include:

- High fever
- Severe headache
- Difficulty breathing
- Stiff neck and back
- Painful joints and/or sore muscle
- Discomfort looking into bright lights ("Photophobia")
- Extreme sleepiness, drowsiness and confusion
- Vomiting and/or diarrhoea
- Loss of conciousness/seizures
- Rash of red-purple pinkprick spots or larger bruises
- In babies under one year of age, the soft spot on the top of the head (fontanel) may bulge upward.

In newborns and small infants, the classic findings of fever, headache and neck stiffness may be absent or difficult to detect, and the infant may show only extreme listlessness, irritability, poor feeding and sometimes vomiting.

Etiologic Agent

Neisseria meningitidis is a Gram-negative diplococcus bacterium with multiple serogroups (A, B, C, D, 29E, H, I, K, L, W-135, X, Y, and Z). Strains belonging to groups A, B, C, Y and W-135 are implicated most frequently in invasive disease.

<u>Reservoir</u>

Humans are the only known reservoir of Neisseria Meningitidis

Mode of Transmission

By direct contact, including respiratory droplets from nose and throat of infected people; infection usually causes only a subclinical mucosal infection; invasion sufficient to cause systemic disease is comparatively rare. Carrier prevalence of 25% or greater may exist without cases of meningitis. During epidemics, over half the men in a military unit may

be healthy carriers of pathogenic meningococci. Fomite transmission is insignificant.

Incubation Period

The incubation period is variable, 2-10 days, but usually 3-4 days.

Infectious Period

An infected person is infectious as long as meningococci are present in nasal and oral secretions or until 24 hours after initiation of effective antibiotic treatment.

Outbreak Recognition

West Virginia has about 10 to 20 cases of meningococcal disease every year. An outbreak is an unusual increase of disease caused by a single serogroup above the expected number of cases.

Outbreaks of serogroup C meningococcal disease (SCMD) have been occurring more frequently in the United States since the early 1990's, and the use of vaccine to control these outbreaks has increased. These outbreaks are characterized by increased rates of disease among persons who may have a common organizational affiliation or who live in the same community yet do not have close contact.

An **organization-based outbreak** of serogroup C meningococcal disease(SCMD) is defined as the occurance of three or more confirmed or probable cases of SCMD during a period of \leq 3 months is persons who have a common affiliation but no close contact per 100,000 persons.

A **community based outbreak** of serogroup C meningococcal disease (SCMD) is defined as the occurrence of three or more confirmed or probable cases during a period of \leq 3 months among persons residing in the same area who are not close contacts of each other and who do not share a common affiliation, with a primary attack rate of at least 10 cases per 100,000 population.

Outbreak response requires detailed epidemiologic (contact tracing) and laboratory (serogrouping) investigation. If the outbreak strain is a vaccine strain, vaccination of the at risk population should be considered.

Case Definition for Meningococcal Meningitis

Clinical Description

Meningococcal disease manifests most commonly as meningitis and/or meningococcemia that may progress rapidly to purpura fulminans, shock, and death. However, other manifestations might be observed.

Laboratory criteria for diagnosis

• Isolation of Neisseria meningitidis from a normally sterile site (e.g., blood or cerebrospinal fluid (CSF) or, less commonly, joint, pleural, or pericardial fluid)

Case Classification

<u>Probable</u>: a case with a positive antigen test in cerebrospinal fluid or clinical purpura fulminans in the absence of a positive blood culture.

<u>Confirmed</u>: a clinically compatible case that is laboratory confirmed.

<u>Comment</u>

Positive antigen test results from urine or serum samples are unreliable for diagnosing meningococcal disease.

Laboratory Diagnosis of Meningococcal Meningitis

The diagnosis can be made by growing bacteria from a sample of spinal fluid, blood or other sterile fluids. The spinal fluid is obtained by performing a spinal tap, in which a needle is inserted into an area in the lower back where fluid in the spinal canal is readily accessible. Identification of the type of bacteria responsible is important for selection of correct antibiotics.

Serogrouping is performed by the office of laboratory services.

Preventive Interventions

- 1. To avoid further exposure advise individuals to:
 - a. Avoid sharing eating and drinking utensils
 - b. Avoid sharing food, drinks, cigarettes, or mouth pieces from musical instruments.
 - c. Take care to cover your mouth when coughing or sneezing.
 - d. Wash your hands frequently especially following exposure to respiratory secretions (coughing or sneezing).
- 2. To prevent additional cases:
 - a. Refer close contacts to health care providers for appropriate chemoprophylaxis

- b. Advise contacts of signs and symptoms of illness and refer them to their health care provider should they experience any symptoms compatible with invasive meningococcal disease
- 3. Other preventive measures that would help protect individuals are:
 - a. Avoid smoking and smoky environments
 - b. Get plenty of sleep, exercise regularly
 - c. Eat a balanced diet and avoid excessive alcohol consumption
 - d. Meningococcal vaccine is available and should be offered to persons

age > 2 years of age with:

- i. complement deficiency;
- ii. functional or anatomic asplenia;
- iii. research, industrial and clinical laboratory personnel who may be routinely exposed to aerosol containing Neisseria meningitidis;
- travelers visiting the "meningitis belt" in the sub-Saharan Africa (Senegal in the to Ethiopia in the East) during the "dry season" (December to June).

Surveillance Indicators

- Proportion of investigations with complete demographic information.
- Proportion of confirmed cases with known serogroup.
- Proportion of confirmed cases with known antibiotic susceptibility profile.
- Proportion of cases with site of infection recorded.