Invasive Meningococcal Disease Investigation Overview

Immediate recognition, treatment and reporting of invasive meningococcal disease is critical for prevention of secondary cases. Meningococcal disease is caused by *Neisseria meningitidis*, a Gram-negative diplococcus. Five to twenty percent of adults are asymptomatic nasopharyngeal carriers of N. meningitidis. Invasive meningococcal disease (i.e. isolation from a normally sterile site) can cause clinical syndromes such as meningitis, bacteremia, sepsis, septic arthritis and bacteremic pneumonia, and is reportable in North Carolina. There are multiple serogroups of *N. meningitidis*. Serogroups B, C, and Y cause most of the disease in the United States while serogroup W-135 causes a small portion of disease. Serogroup A is exceedingly rare in the United States but is common in Africa and Asia. Signs and symptoms of meningococcal meningitis are like those associated with acute meningitis caused by other pathogens. Death can occur within hours despite treatment. The meningococcal disease case fatality rate is 10-15% even with treatment. Up to 20% of survivors can have some disability after infection including neurological deficits, limb amputation and scarring. Transmission occurs through direct contact with a patient's oral secretions. Close contacts require immediate post-exposure prophylaxis (PEP). Cipro- and PCN-resistant serogroup Y cases have been reported in the Charlotte metropolitan area and providers in this region should prescribe alternate PEP medications. Clinical decisions for treatment and PEP should be guided by antibiotic susceptibility testing. Vaccines are available that protect against serogroups A, C, Y, W-135 and B. If three or more cases have occurred in either an organization or a community-based setting within 3 months, additional control measures are recommended. Consult the NC Communicable Disease Branch at (919) 733-3419.

Basic Steps of a Meningococcal Disease Investigation

1. Determine immune status, clinical presentation and epidemiological factors	• Review immune status (history of prior disease and immunization)
	• Clinical description: high fever, neck stiffness, confusion, nausea, vomiting, lethargy, and/or petechial or purpuric rash, relevant lab results, antibiotic susceptibility testing, antibiotic use prior to testing
	• Epidemiologic linkages to similarly ill persons and other risk factors. The incubation period is usually less than 4 days (range 1-10 days). Persons at increased disease risk include:
	  • College freshman living in dormitories
	  • Military recruits
	  • Microbiologists who are routinely exposed to isolates of N. meningitidis
	  • Persons who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic, particularly with prolonged contact with local populations
	  • Persons with conditions such as persistent complement component deficiencies, asplenia

2. Determine infectious period	• The patient is infectious from 7 days before symptom onset until 24 hours after effective antibiotic therapy has been initiated.
3. Manage the case	• Immediate recognition and treatment is critical. Persons with suspected meningococcal disease should be treated promptly without waiting for laboratory confirmation. Verify that the patient has been appropriately tested (PCR or culture of a specimen from a normally sterile body site, i.e., blood, CSF, or synovial, pleural, or pericardial fluid) and treated based on antibiotic susceptibility testing results.
4. Identify all contacts of case during infectious period	• Post exposure prophylaxis (PEP), based on antibiotic susceptibility testing, should be initiated within 24 hours after the index case is identified, regardless of immunization status, after close exposure.

5. Gather information about contacts	• Collect necessary information from contacts including:
	  ❑ Date, location and type of exposure to case patient while infectious
	  ❑ Symptoms (high fever, neck stiffness, confusion, nausea, vomiting, lethargy, rash)
	  ❑ Vaccination status or history of past disease, age and weight (if less than 15 years)

6. Manage contacts	
➢ Symptomatic contacts	• Refer to healthcare provider with prior arrangement for screening and clinical management, including antibiotic susceptibility testing.

➢ Asymptomatic close contacts	• Post exposure prophylaxis (PEP) should be initiated within 24 hours for persons with high-risk exposures which include
	  • Household contacts, spouses, and significant others especially children younger than 2 years
	  • Childcare or preschool contacts at any time during 7 days before illness onset
	  • Direct exposure to case patient's secretions (kissing, sharing toothbrushes, utensils, drinking cups) at any time during 7 days before illness onset
	  • Mouth to mouth resuscitation, endotracheal intubation without personal protective equipment (PPE) at any time during 7 days before illness onset
	  • Frequently sleeping in the same home as the case patient at any time during 7 days before illness onset
	• In outbreak settings when the serogroup is known and can be prevented by vaccine, post exposure immunization should be discussed with the CD Branch at (919) 733-3419.

➢ Asymptomatic airline contacts	• Passengers seated directly next to case patient during airline flights lasting more than 8 hours are considered close contacts and should receive PEP. Alert the CD Branch at (919) 733-3419 to initiate CDC DGMQ notification.
➢ *Resources - https://www.cdc.gov/vaccines/pubs/surv-manual/index.html, and AAP Red Book 31st Edition, pg. 555*	