MENINGITIS, BACTERIAL

REPORTING INFORMATION

- **Class B:** Report by the close of the next business day after the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Types of bacterial meningitis which are addressed separately in this manual and might have different reporting requirements include meningococcal meningitis, *Haemophilus influenzae* meningitis, *Streptococcus pneumoniae* meningitis, group B streptococcal infection of the newborn, and *Listeria*.
- Reporting Form(s) and/or Mechanism: The Ohio Disease Reporting System (ODRS) should be used to report lab findings to the Ohio Department of Health (ODH). For healthcare providers without access to ODRS, you may use the Ohio Confidential Reportable Disease Form (HEA 3334, rev. 1/09). http://www.odh.ohio.gov/pdf/forms/hea3334.pdf).
- Key fields for ODRS reporting include: specimen type (the bacteria must be isolated from cerebrospinal fluid or blood), test name (select the appropriate lab test identifying the organism), organism (select the organism from the drop-down menu; if the organism is not on the list, select "other" and enter the organism in the next field); type of infection (select the appropriate check box[es] indicating the type of infection caused by the organism).

AGENTS

- *Neisseria meningitidis*
- *Haemophilus influenzae* type b (Hib))
- *Streptococcus pneumoniae*
- **Others** (non-exhaustive list)
  - *Listeria monocytogenes*
  - *Streptococcus agalactiae* (see *Streptococcus*, Group B, Disease of the Newborn)
  - *Streptococcus*, Group A (see *Streptococcus*, Group A, Invasive Disease)
  - *Streptococcus*, Group B (see *Streptococcus*, Group B, Disease of the Newborn)
  - *Cryptococcus*
  - *Escherichia coli*
  - *Staphylococcus aureus*
  - *Salmonella*
  - *Pseudomonas aeruginosa*
  - *Klebsiella*
  - *Enterococcus*
  - *Serratia*

CASE DEFINITION

Clinical Description

Bacterial meningitis manifests most commonly with fever, headache and stiff neck. The disease may progress rapidly to shock and death. However, other manifestations may be observed.

Laboratory Criteria for Diagnosis

Isolation of a bacterial species from the cerebrospinal fluid

Case Classification

Suspect: A case reported as bacterial meningitis without any laboratory or clinical confirmation.

Probable: A clinically compatible case that is not laboratory confirmed due to antibiotic therapy prior to lab draws *or* a clinically compatible case with identification of a bacterial antigen in the blood or cerebrospinal fluid.

Confirmed: A clinically compatible illness that is either laboratory confirmed *or* is accompanied by a positive blood culture.

Not a Case: This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

Comment

Cases of bacterial meningitis caused by *Haemophilus influenzae*, *Neisseria meningitidis*, group A *Streptococcus* and *Listeria monocytogenes* (and, in Ohio, *Streptococcus pneumoniae, Streptococcus agalactiae* [group B *Streptococcus*] or another specifically reportable organism are reported by the Ohio Department of Health (ODH) to the Centers for Disease Control and Prevention (CDC) as the disease specific for these organisms. Only cases of bacterial meningitis caused by organisms other than those specified should be reported as cases of "meningitis, bacterial."

SIGNS AND SYMPTOMS

In adults, signs and symptoms include headache, meningismus, cerebral dysfunction (e.g. confusion, delirium, lethargy, or coma) and fever. Signs and symptoms in infants are often non-specific, including irritability, poor feeding and fever.

DIAGNOSIS

Diagnosis is confirmed by a culture of the blood or cerebrospinal fluid (CSF), identifying the specific causative organism. Examination of the CSF generally reveals elevated opening pressure, elevated WBCs with a predominance of neutrophils, elevated protein and decreased glucose. Rapid agglutination techniques can identify bacterial antigens in CSF and allow a presumptive diagnosis pending culture or when antibiotics may interfere with the culture of the organism.

EPIDEMIOLOGY

Source

Neisseria meningitidis, Haemophilus influenzae and *Streptococcus pneumoniae* account for the majority of all reported cases of bacterial meningitis in the United States, although the incidence of *H. influenzae* meningitis has greatly decreased since the use of Hib vaccine began. "Other" purulent meningitides are often secondary to systemic disease or parameningeal involvement originating from the nose, accessory nasal sinuses, middle ear or mastoid. Secondary immunosuppression has contributed to the frequency of the "other" meningitides in recent years.

PUBLIC HEALTH MANAGEMENT

Investigation of cases, prophylaxis of contacts and other public health measures are restricted primarily to *N. meningitidis* and *H. influenza* type b (Hib) invasive disease. Protocols have been developed to prevent Group B streptococcal disease of the newborn. Vaccinations are available in special situations for *N. meningitidis* and *S. pneumoniae* and routinely for *H. influenzae*. Please refer to the specific sections of this manual for details.

What is meningitis?

Meningitis is an infection of the fluid of a person's spinal cord and the fluid that surrounds the brain. People sometimes refer to it as spinal meningitis. Meningitis is usually caused by a viral or bacterial infection. Knowing whether meningitis is caused by a virus or bacterium is important because the severity of illness and the treatment differ. Viral meningitis is generally less severe and resolves without specific treatment, while bacterial meningitis can be quite severe and can result in brain damage, hearing loss or learning disability. For bacterial meningitis, it is also important to know which type of bacterium is causing the meningitis to direct antibiotic therapy and prevention. Today, *Streptococcus pneumoniae* and *Neisseria meningitidis* are the leading causes of bacterial meningitis.

What are the signs and symptoms of meningitis?

High fever, headache and stiff neck are common symptoms of meningitis in anyone over 2 years of age. These symptoms may develop over several hours, or they may take 1-2 days. Other symptoms may include nausea, vomiting, discomfort looking into bright lights, confusion and sleepiness. In newborns and small infants, the classic symptoms of fever, headache and neck stiffness may be absent or difficult to detect and the infant may only appear slow or inactive, irritable, with vomiting or poor feeding. As the disease progresses, patients of any age may have seizures.

How is meningitis diagnosed?

Early diagnosis and treatment are very important. If symptoms occur, the patient should see a doctor immediately. The diagnosis is usually made by growing bacteria from a sample of spinal fluid. 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.

Can meningitis be treated?

Bacterial meningitis is treated with a number of effective antibiotics. It is important, however, that treatment be started early in the course of the disease. Appropriate antibiotic treatment of most common types of bacterial meningitis reduces the risk of dying from meningitis to less than 15%, although the risk is higher among the elderly.

Is meningitis contagious?

Yes. Some forms are bacterial meningitis are contagious. The bacteria are spread through the exchange of respiratory and throat secretions (i.e. coughing, kissing). Fortunately, none of the bacteria that cause meningitis are as contagious as the common cold or the flu and they are not spread by casual contact or by simply breathing the air where a person with meningitis has been. However, sometimes the bacteria that cause meningitis have spread to other people who have had close or prolonged contact with a patient with meningitis caused by *Neisseria meningitidis* (also called meningococcal meningitis) or *Haemophilus influenzae* type b (Hib). People in the same household or child care center or anyone with direct contact with a patient's oral secretions (such as a boyfriend or girlfriend) would be considered at increased risk of acquiring the infection. People who are close contacts of a person with meningitis caused by *N. meningitidis* should receive antibiotics to prevent them from getting the disease. Antibiotics for contacts of a person with Hib meningitis disease are no longer recommended if all contacts 4 years of age or younger are fully vaccinated against Hib disease.

Are there vaccines against meningitis?
Yes. There are vaccines against Hib and against some strains of *N. meningitidis* and many types of *S. pneumoniae.*