

Meningitis, Bacterial Investigation Guideline

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Meningitis, Bacterial Other

Disease Management and Investigative Guidelines

CASE DEFINITION (CDC 1996)

A. Clinical Description for Public Health Surveillance:

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

B. Laboratory Criteria for Case Classification:

- Isolation of a bacterial species from the cerebrospinal fluid.

C. Case Classification:

- Confirmed: A clinically compatible case that is either laboratory confirmed or is accompanied by a positive blood culture.
- Suspected (internal use only not reported to CDC): A clinical compatible case in which laboratory results are pending or only results from positive gram stain results are available

Note: Cases of bacterial meningitis caused by *Haemophilus influenzae*, *Neisseria meningitidis*, group A *Streptococcus*, and *Listeria monocytogenes* should be reported under 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, Other Bacterial."

D. Laboratory Testing:

- Gram stains and cultures performed routinely by commercial laboratories.
- Remarks: Submission of bacterial isolates to the Kansas Health and Environmental Laboratories (KHEL) is required by law.
- Shipping of isolates: Use Miscellaneous Infectious Disease (IDS) Shipper.
- For additional information and/or questions concerning isolate submission, and laboratory kits call (785) 296-1620 or refer to online guidance at www.kdheks.gov/labs/packaging_and_shipping.html.

E. Bioterrorism Potential: None.

INVESTIGATOR RESPONSIBILITIES

A. Investigation Related Tasks and Activities:

Note: Begin investigational activities as soon as possible ideally within 24 hours of diagnosis. Assure that any suspected diagnosis *Haemophilus influenzae*, *Neisseria meningitidis*, group A *Streptococcus*, or *Listeria monocytogenes* are investigated with specific disease investigation guidelines.

1) Confirm diagnosis with appropriate medical provider.

- Before contacting the patient or family, discuss what they have been told about his/her evaluation for disease.
- Obtain information that supports clinical findings in the case definition and information on the onset date of the symptoms.
- Obtain information on any laboratory tests performed and results.
 - Gram stain results should be available within 1 hour of CSF collection. Culture results may take more than 48 hours.

- Culture results may be negative, even with a positive gram stain, if antibiotic treatment occurred prior to specimen collection or if the culture method used was unsuitable for bacterial growth (i.e. anaerobic bacteria in aerobic conditions)
- If bacteria were isolated from clinical specimen, ensure bacterial isolate was sent to state lab.
- For hospitalization, obtain medical records, including admission notes, progress notes, lab report(s), and discharge summary.

2) Rule-out meningitis caused by *N. meningitidis* or *H. influenzae*.

Investigate and carry out appropriate prophylactic measures as directed in the disease-specific investigation guidelines:

- Consider *N. meningitidis* (meningococcal infection) in the following situations:
 - Clinical purpura fulminans
 - Gram negative diplococci* on a gram-stain from a sterile site
 - o Note that *N. gonorrhoeae* is also gram negative diplococci, but complications of meningitis from gonorrhea are rare.
 - Antigen detection of *N. meningitidis* in a normally sterile body fluid
 - Physician’s diagnosis of meningococcal, meningococcemia or meningitis caused by *N. meningitidis*
 - Consider *H. influenzae* in the following situations;
 - Pleomorphic gram negative rods (sometimes reported as coccobacilli) on gram-stain from a normal sterile site
 - Antigen detection of *H. influenzae* in a normally sterile body fluid
 - Physician’s diagnosis of *H. influenzae* meningitis or invasive disease
- * Reports of gram negative cocci may be over-decolorized gram positive cocci, sometimes suggestive of anaerobic bacteria or rarely a discrepancy in reporting (i.e, not reported as pleomorphic, coccobacilli). Consultation should occur with the laboratory and physician.

3) Identify the following situations that do not require prophylactic measures but should be investigated based on disease-specific guidelines:

- Streptococcal invasive: From a normally sterile site or body fluid, gram positive cocci on gram-stain and/or antigen detection or isolation of *S. pneumoniae* (in diplococci) or Group A *Streptococcus* (in chains).
- Listeriosis: From a normally sterile site or body fluid, gram positive rod on gram-stain and/or antigen detection or isolation of *L. monocytogenes*.
- Viral meningitis: Any laboratory tests* and/or physician diagnosis that suggests aseptic or viral meningitis. The only viral meningitis that usually needs follow-up investigation is an arboviral disease and in rare instances sexually transmitted diseases and some complications from vaccine preventable diseases.
(* See Additional Information / References section for “Typical CSF Finding in Bacterial vs. Viral Meningitis”)
- Mycobacterium tuberculosis infection can have complications of meningitis and will also have a report of no bacteria on a gram stain.

- 4) Consider the following situations that do not require prophylactic measures but should be investigated based on this disease-specific guidelines:
 - *Staphylococcus* invasive: From normally sterile site, gram positive cocci (in clusters) on a gram stain. (Consider the possibility of Streptococcal infection described above)
 - Enteric bacteria invasive: From a normally sterile site, gram negative rods on a gram stain (Consider the possibility of over-decolorized *Listeria* bacteria or *H. influenzae* whose shape is much smaller and more cocci than an enteric organism.)
- 5) Report all cases to the KDHE Office of Surveillance and Epidemiology at KDHE (1-877-427-7317) within 4 hours of the initial report.

B. Notifications:

- 1) Report all cases by telephone to the Local Health Officer, the local on-call epidemiologist and KDHE (1-877-427-7317) within 4 hours of initial report.
- 2) As appropriate, use the notification letter(s) and the disease fact sheet to notify the case, contacts and other individuals or groups.

EPIDEMIOLOGY

Neisseria meningitidis, *Streptococcus pneumoniae* and *Haemophilus influenzae* type B (Hib) account for more than 75% of all cases of bacterial meningitis in most studies, and 90% of bacterial meningitis in children. The agent causing disease varies by age group. In the United States and other countries, the median age of persons with bacterial meningitis increased dramatically from 15 months in 1986 to 25 years or more in 1995, due to the reduction in Hib disease through vaccination programs. Meningococcal disease is unique among the major cause of bacterial meningitis in that it causes both endemic and epidemic disease. The less common bacterial causes of meningitis, such as staphylococci, enteric bacteria, group B streptococci, and *Listeria*, occur in persons with specific susceptibilities (such as neonates and patients with impaired immunity) or as a consequence of head trauma.

DISEASE OVERVIEW

A. Agent:

Various bacterial agents; including *Neisseria meningitidis*; *Streptococcus pneumoniae*; *Haemophilus influenzae*; staphylococci; streptococci, including Group A and B; enteric bacteria and *Listeria*. Today, *Streptococcus pneumoniae* and *Neisseria meningitidis* are the leading causes.

B. Clinical Description:

High fever, headache, and stiff neck are common symptoms of meningitis in anyone over the age of 2 years. These symptoms can develop over several hours, or they may take 1 to 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, or be irritable, have vomiting, or be feeding poorly. As

the disease progresses, patients of any age may have seizures.

C. Reservoirs: Humans.

D. Mode(s) of Transmission:

Varies by agent. Some forms could be transmitted by direct contact with an infected person's oral and/or nasal secretions, but none are as contagious as things like the common cold or flu, and they are not spread by casual contact or by simply breathing the air where a person with meningitis has been.

E. Incubation Period: Varies by agent.

F. Period of Communicability: Varies by agent.

G. Susceptibility and Resistance: Varies by agent.

H. Treatment: Antibiotics.

STANDARD CASE INVESTIGATION AND CONTROL METHODS

Standard investigation activities include the following:

- 1) Confirmation of diagnosis using case definition.
- 2) Collection of demographic data (birth date, county, sex, race/ethnicity)
 - If less <6 years of age, is patient in daycare.
- 3) Collection of clinical:
 - Date of illness onset
 - Symptoms
 - Type of infection caused by organism. (i.e. Primary Bacteremia, meningitis)
 - Bacterial species isolated from any normally sterile site
 - Date first positive culture obtained; specimen from which organism isolated
 - Hospitalizations
 - Underlying medical conditions; history of cochlear implant
 - Outcomes: survived or date of death
 - Vaccination history of pneumococcal and *H. influenzae*, Serotype B (HIB) vaccine.

Standard investigation **includes** completion of the General Investigation Form and Bacterial Meningitis Supplemental Form.

A. Standard Case Investigation:

- The prompt reporting and investigation of cases of bacterial meningitis is necessary to allow for the following:
 - The rapid identification of *N. meningitidis* or *H. influenzae* cases to assure that proper prophylactic measures are taken,
 - The complete reporting of invasive streptococcal cases, and
 - To allow public health officials to provide sound recommendations in cases where chemoprophylaxis is unneeded.

B. Education:

- Contacts should be instructed that
 - Bacterial meningitis caused by bacteria other than *N. meningitidis*, *H. influenzae* and *S. pneumoniae* usually only occurs in persons with specific susceptibilities (such as neonates and patients with impaired

- immunity) or as a consequence of head trauma;
- Antibiotic treatment is not considered an effective way of protect contacts exposed to a meningitis case caused by bacteria other than *N. meningitidis* or *H. influenzae*; and
- Medical attention should be sought immediately if they begin to exhibit signs and symptoms of severe illness compatible with meningitis.

MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:

- Notify KDHE immediately, 1-877-427-7317.
- Active case finding will be an important part of any investigation.

DATA MANAGEMENT AND REPORTING TO THE KDHE

A. Organize, collect and report data with the “General Investigation Form(s)” and “Bacterial Meningitis Supplemental Form.”

B. Report data electronically via KS-EDSS or by fax, include:

- At a minimum, all data that was collected during the investigation that helps to confirm or classify a case.
- All information collected on the General Investigation and Bacterial Meningitis Supplemental forms.

Note: Report *H. influenzae*, *N. meningitidis*, *S. pneumoniae*, group A *Streptococcus* or *Listeria monocytogenes* based on specific disease name. Report all other bacterial meningitis as “Meningitis, other bacterial”.

If a case is first entered in as “Meningitis, other bacterial” and an organism listed above is isolated, the case event should be changed to the appropriate event representing that organism.

Case Event	Organism
Haemophilus influenzae, invasive	<i>H. influenzae</i>
Listeriosis	<i>Listeria monocytogenes</i>
Meningitis, Hib	<i>H. influenzae</i> , Serotype B
Meningitis, Neisseria Meningitidis or Meningococccemia	<i>N. meningitidis</i>
Streptococcus pneumonia, invasive	<i>S. pneumoniae</i>
Streptococcus pneumonia, invasive, drug resistant	<i>S. pneumoniae</i> , with drug resistant susceptibility reported
Streptococcal Disease, invasive, Group A	group A <i>Streptococcus</i> or <i>Streptococcus pyogenes</i>
Meningitis, other bacterial	All other bacterial isolates, including group B <i>Streptococcus</i> , staphylococci, and enteric bacteria.

ADDITIONAL INFORMATION / REFERENCES

- A. Treatment / Differential Diagnosis:** American Academy of Pediatrics. 2006 Red Book: Report of the Committee on Infectious Disease, 27th Edition. Illinois, Academy of Pediatrics, 2006.
- B. Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 18th Edition. Washington, DC, American Public Health Association, 2004.
- C. Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: http://www.cdc.gov/ncphi/diss/ndss/casedef/case_definitions.htm
- D. Additional Information (CDC):** <http://www.cdc.gov/health/default.htm>
- E. Typical CSF Finding in Bacterial vs. Viral Meningitis.**

	Bacterial	Viral
Cell Count	1,000 – 5,000* (range: 1,000 – 100,000) * may be normal in premature neonates and infants < 1 month	100-1,000
Cell Type	Neutrophils/polys predominate (>80%)	Mostly mononuclear/lymphs (early, polys may predominate)
Pressure	> 180 mm	Normal
Protein	>45 (usually 100-500)	Normal/ slightly elevated
Glucose	<40 (or <40% of blood glucose)	Normal/ slightly elevated
Gram Stain	<i>H. influenzae</i> & <i>S. pneumonia</i> more readily identified than <i>N. meningitidis</i> (Subject to misreading/false +'s)	Negative

Notes: White blood cells (WBCs) can be divided into the following groups; Neutrophils, Lymphocytes, Monocytes, Eosinophils and Basophils. Neutrophils may also be called “Polys” or “Segs”. Neutrophils can be designated as mature or “bands”. “Bands” are immature neutrophils, which normally are only in the bone marrow but are released into the bloodstream with significant infection, especially sepsis. The term “left shift” indicates the presence of “bands” on a peripheral blood smear.

(Source: Colorado Department of Public Health and Environment, Dr. Ken Gershman. Available on-line at:

<http://www.cdphe.state.co.us/dc/epidemiology/MengSuspForm.pdf>)

Kansas Disease Investigation Guidelines

General Investigation Form

Investigation Information		
Case Type: <input type="checkbox"/> Human Case <input type="checkbox"/> Non-human Case	Disease Name: _____	
Classification: <input type="checkbox"/> Suspect <input type="checkbox"/> Probable <input type="checkbox"/> Confirmed	KS-EDSS Investigation ID: _____	
Outbreak: <input type="checkbox"/> Yes <input type="checkbox"/> No	Outbreak Name: _____	Outbreak #: _____
Onset Date: _____	Diagnosis Date: _____	Report Date: _____
Assigned to (Investigator): _____	Patient Died: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	
Patient Information		
Name Type: <input type="checkbox"/> Default/Common <input type="checkbox"/> Legal <input type="checkbox"/> Maiden <input type="checkbox"/> Nickname		
Last: _____	First: _____	Middle: _____
Street: _____	City/State: _____	Zip: _____
Evening Phone #: _____	Daytime Phone #: _____	
Sex: <input type="checkbox"/> Failure to Report <input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Other <input type="checkbox"/> Transexual <input type="checkbox"/> Unknown		
Race: <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black or African American <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Unknown		
Hispanic / Latino Ethnicity: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Date of Birth: _____	Age: _____	Age Unit: <input type="checkbox"/> Days <input type="checkbox"/> Weeks <input type="checkbox"/> Months <input type="checkbox"/> Years
Parent Information (if under 18)		
Last: _____	First: _____	Middle: _____
Street: _____	City/State: _____	Zip: _____
Evening Phone #: _____	Daytime Phone #: _____	
Work / Occupation or School / Grade		
Worksites / School: _____		
Occupations / Grade: _____		
Travel History		
1st	Destination: _____	Depart Date: _____ Return Date: _____
2nd	Destination: _____	Depart Date: _____ Return Date: _____
3rd	Destination: _____	Depart Date: _____ Return Date: _____
4th	Destination: _____	Depart Date: _____ Return Date: _____

Supplemental Laboratory Report Form

Lab Reports

Laboratory Name: _____

Lab Report Date: _____

Ordering Provider Name: _____

Phone: _____

Facility: _____

Specimen Accession Number: _____

Specimen Collection Date: _____

Organism Name: _____

Organism Species: _____

Organism Serogroup: _____

Organism Serotype: _____

PFGE Results

Pattern 1 KS: _____

Other State: _____

CDC: _____

Pattern 2 KS: _____

Other State: _____

CDC: _____

Pattern 3 KS: _____

Other State: _____

CDC: _____

Additional Results Information

Reported Test Name:

Coded Result:

Text Result:

Numeric Result:

Comments:

Supplemental Contact Form

Contacts

Last: _____ **First:** _____ **Middle:** _____

Street: _____ **City/State:** _____ **Zip:** _____

Evening Phone #: _____ **Daytime Phone #:** _____ **E-mail:** _____

Sex: Failure to Report Female Male Other Transexual Unknown

Race: American Indian or Alaska Native Asian Black or African American Native Hawaiian or Other Pacific Islander White Unknown

Hispanic / Latino Ethnicity: Yes No

Date of Birth: _____ **Age:** _____ **Age Unit:** Days Weeks Months Years

Worksites / School: _____

Occupations / Grade: _____

Exposure Information

Contact Type: Household Sexual Other: _____ **Partner / Cluster Code:** _____

Date of First Exposure: _____ **Date of Last Exposure:** _____ **Frequency:** _____

Nature of Exposure: _____ **Comments:** _____

Testing and Treatment Information

Clinic Code: _____ **Examination Date:** _____

Examination Test: _____ **Examination Result:** _____

Prophylaxis/empiric treatment date: _____ **Drug / Dosage:** _____

Provider (Name / Facility): _____

Disposition and Diagnosis Information

Initiation Date: _____ **Disposition Date:** _____ **Disposition:** _____

Diagnosis: _____ **Referral Type:** Patient Provider **Post-test Counseled :** Yes No

Currently Assigned To: _____ **Follow-up Date:** _____

Risk Factors

Pregnant: Yes No **If Yes, # of Weeks:** _____

Risk factors for complications in contact: None Pregnant Woman HIV Seropositive Unimmunized Index case is a super-spreader

Child younger than 5 Age > 65 Otherwise immunosuppressed (s/p transplant, high dose steroids, etc)

National Bacterial Meningitis and Bacteremia Supplemental Form

Kansas Department of Health

Epidemiologic Case History

* indicates required fields

Case Type* <i>Human Case Non Human Case</i>	Classification* <i>Confirmed Not a Case Probable Suspect Deleted Unknown</i>
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Supplemental Form Status
Not Done Form Complete Form in Progress Form Approved Form Sent to CDC

Report Date*
mm/dd/yyyy

Patient Demographic Information

* indicates required fields

Last Name*	First Name*	Middle Name	Name Type*	Age
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Age Unit <i>Days Weeks Months Years</i>	Date of Birth <small>mm/dd/yyyy</small>
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Race*
(Check all that apply)

*American Indian or Alaska Native Asian Black or African American
Native Hawaiian or Other Pacific Islander White Unknown*

Ethnicity*
Hispanic or Latino Not Hispanic or Latino Unknown

Sex*
Failure to Report Female Male Other Transsexual Unknown

Street Address

City	County	State	Zip
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Evening Phone <small>###-###-####</small>	Daytime Phone <small>###-###-####</small>
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Occupation

Person Providing Report

Name of Reporting Facility*

National Bacterial Meningitis and Bacteremia Case Report

If <6 years of age, is the patient in daycare?

Daycare is defined as a supervised group of 2 or more unrelated children for greater than 4 hours per week

Yes No Unknown

Type of Infection Caused by Organism

(Check all that apply)

Primary Bacteremia Meningitis Otitis media Pneumonia Cellulitis Epiglottitis
 Peritonitis Pericarditis Septic arthritis Conjunctivitis Other (specify) _____

Bacterial Species Isolated From Any Normally Sterile Site

Neisseria meningitidis Haemophilus influenzae
 Group A Streptococcus Group B Streptococcus
 Lysteria monocytogenes Streptococcus pneumoniae (pneumococcus)
 Other Bacterial Species (Specify: include mycobacteria, fungi) _____

Has Patient Received Cochlear Implants?

Yes No Unknown

If yes, date

mm/dd/yyyy

Physician

-Important- Please Complete For The Following Organisms:

Haemophilus Influenzae

Did the Patient Receive Haemophilus b Vaccine

If YES, please complete the list below.

Yes No Unknown

Dose	Date Given	Vaccine Name	Vaccine Manufacturer	Lot Number
	mm/dd/yyyy			
1				
2				
3				
4				

If H. Influenzae was isolated from blood or CSF, was it resistant to:

Ampicillin

Yes No Not Tested or Unknown

Chloramphenicol

Yes No Not Tested or Unknown

Rifampin

Yes No Not Tested or Unknown

Meningococcal vaccine

Did the patient receive meningococcal vaccine

Yes No Unknown

Dose	Date Given	Vaccine Name	Vaccine Manufacturer	Lot Number
	mm/dd/yyyy			
1				
2				
3				
4				

Did the patient receive the Streptococcus pneumoniae (pneumococcus) vaccine

Yes No Unknown

Dose	Date Given	Vaccine Name	Vaccine Manufacturer	Lot Number
	mm/dd/yyyy			
1				
2				
3				

If N. meningitidis was isolated from blood or CSF, was it resistant to:

Sulfa <i>Yes No Not Tested or Unknown</i>	Rifampin <i>Yes No Not Tested or Unknown</i>
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Public Health Fact Sheet

Meningitis

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 may result in brain damage, hearing loss, or learning disability. For bacterial meningitis, it is also important to know which type of bacteria is causing the meningitis because antibiotics can prevent some types from spreading and infecting other people. Before the 1990s, *Haemophilus influenzae* type b (Hib) was the leading cause of bacterial meningitis, but new vaccines being given to all children as part of their routine immunizations have reduced the occurrence of invasive disease due to *H. influenzae*. 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 the age of 2 years. These symptoms can develop over several hours, or they may take 1 to 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, or be irritable, have vomiting, or be feeding poorly. 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.

How are these illnesses treated?

Bacterial meningitis can be 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 should reduce the risk of dying from meningitis to below 15%, although the risk is higher among the elderly.

This fact sheet is for information only and is not intended for self-diagnosis or as a substitute for consultation. If you have any questions about the disease described above or think that you may have an infection, consult with your healthcare provider. This fact sheet is based on the Centers for Disease Control and Prevention's Health and Safety topic fact sheets.

Is meningitis contagious?

Yes, some forms of 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 things like 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 Hib. People in the same household or day-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 qualify as 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 (see below).

Is there a vaccine to protect me from getting sick?

Yes, there are vaccines against Hib, against some serogroups of *N. meningitidis* and many types of *Streptococcus pneumoniae*. The vaccines against Hib are very safe and highly effective.

There are two vaccines against *N. meningitidis* available in the U.S. Meningococcal polysaccharide vaccine (MPSV4 or Menomune®) has been approved by the Food and Drug Administration (FDA) and available since 1981. Meningococcal conjugate vaccine (MCV4 or MenactraT) was licensed in 2005. Both vaccines can prevent 4 types of meningococcal disease, including 2 of the 3 types most common in the U.S. (serogroup C, Y, and W-135) and a type that causes epidemics in Africa (serogroup A). Meningococcal vaccines cannot prevent all types of the disease. But they do protect many people who might become sick if they didn't get the vaccine. Meningitis cases should be reported to state or local health departments to assure follow-up of close contacts and recognize outbreaks.

MCV4 is recommended for all children at their routine preadolescent visit (11 to 12 years of age). For those who have never gotten MCV4 previously, a dose is recommended at high school entry. Other adolescents who want to decrease their risk of meningococcal disease can also get the vaccine. Other people at increased risk for whom routine vaccination is recommended are college freshmen living in dormitories, microbiologists who are routinely exposed to meningococcal bacteria, U.S. military recruits, anyone who has a damaged spleen or whose spleen has been removed; anyone who has terminal

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complement component deficiency (an immune system disorder), anyone who is traveling to the countries which have an outbreak of meningococcal disease, and those who might have been exposed to meningitis during an outbreak. MCV4 is the preferred vaccine for people 11 to 55 years of age in these risk groups, but MPSV4 can be used if MCV4 is not available. MPSV4 should be used for children 2 to 10 years old, and adults over 55, who are at risk.

Although large epidemics of meningococcal meningitis do not occur in the United States, some countries experience large, periodic epidemics. Overseas travelers should check to see if meningococcal vaccine is recommended for their destination. Travelers should receive the vaccine at least 1 week before departure, if possible. Information on areas for which meningococcal vaccine is recommended can be obtained by calling the Centers for Disease Control and Prevention at (404)-332-4565.

There are vaccines to prevent meningitis due to *S. pneumoniae* (also called pneumococcal meningitis) which can also prevent other forms of infection due to *S. pneumoniae*. The pneumococcal polysaccharide vaccine is recommended for all persons over 65 years of age and younger persons at least 2 years old with certain chronic medical problems. There is a newly licensed vaccine (pneumococcal conjugate vaccine) that appears to be effective in infants for the prevention of pneumococcal infections and is routinely recommended for all children greater than 2 years of age.

Where can I get more information?

- Your Local Health Department
- Kansas Department of Health and Environment, Epidemiologic Services Section at (877) 427-7317
- <http://www.cdc.gov/health/default.htm>
- Your doctor, nurse, or local health center

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