Indiana State Department of Health

Epidemiology Resource Center

Neisseria meningitidis

Investigation and Reporting Resource Manual

5/3/2012

Revised 7/15/13

Table of Contents:

	Page
Meningitis Introduction	3
Laboratory Review of Meningitis Cases: Cerebral Spinal Fluid Analysis	4
Meningitis Work Sheet	5
Meningococcal Disease Investigation Manual	6
Purpose	6
Background	6
Case Classification	6
Personnel Responsible for Investigation	7
Initiation of the Investigation	7
Form to be Used	7
Contact Tracing and Chemoprophylaxis Recommendations	7
Medical and Laboratory Information	8
Communications	9
Closing the Case	9
Chemoprophylaxis of Healthcare Workers Exposed to *Neisseria meningitidis*	11
Recommendations for the management of laboratory worker exposed to *N. meningitidis*	15
Bacterial Meningitis Surveillance and Investigation – Important Reminders	16
Attachment 1 – Disease risk for contacts	18
Attachment 2 – Recommended Chemoprophylaxis Regimens for High-Risk Contacts	19
Attachment 3 – Letter for Schools	20
Attachment 4 – Letter for Child Care	21
Attachment 5 – Letter for Workplace	22
Attachment 6 – Letter for Family and Friends	23
Attachment 7 – Spanish Letter for Schools	24
Attachment 8 – Spanish Letter for Child Care	25
Attachment 9 – Spanish Letter for Family and Friends	26
Attachment 10 – Quick Facts	27
Attachment 11 – Questions for Family, Patient and/or Contacts	29
Attachment 12 – INEDSS - Case Investigation – Meningococcal Invasive Disease	32
Attachment 13 – INEDSS - Individual Contact Worksheet	37
Attachment 14 – INEDSS – Group Contact Worksheet	38

Meningitis

Meningitis is a severe illness characterized by serous inflammation of the linings of the brain and spinal cord (meninges). Clinical symptoms include headache, stiff neck, high fever, nausea/vomiting and rash. **Bacterial meningitis** is typically most severe. In Indiana, cases of meningitis (and other infections in which the bacteria is isolated from a sterile site, such as the blood or CSF) caused by the following bacterial agents are reportable:

- *Neisseria meningitidis*
- *Haemophilus influenzae*
- *Streptococcus pneumoniae*
- *Streptococcus agalactiae* (group B strep)
- *Streptococcus pyogenes* (group A strep)

Neisseria meningitidis is *immediately* reportable on first knowledge or *suspicion* of the diagnosis due to the potential need for prophylaxis of close contacts within 24 hours of suspected diagnosis (suspicion is normally based on gram stain results – see table on page 4). All other cases of bacterial meningitis are reportable when a culture result becomes available.

For meningococcal meningitis/meningococcemia *any* the following presents as a suspect case and is reportable:

- Gram stain: **gram negative diplococci** or gram negative cocci in pairs
- Clinical purpura fulminans (description of a purpuric or petechial rash) which appears as severe bruising and bleeding under the skin. The rash is a sign of a platelet deficiency and is a sign of overwhelming sepsis.
- *N. meningitidis* by culture
- *N. meningitidis* DNA from validated PCR or *N. meningitidis* identified by rapid bacterial antigen testing or latex agglutination testing (CSF only).

Suspect cases of *Haemophilus influenzae* may be also be reported based on gram stain results; however, prophylaxis is only considered for household contacts in limited circumstances (i.e. if there is an underimmunized or unimmunized child under 5 years of age in the household), but is only necessary following exposure to *Haemophilus influenzae* type b.

Aseptic Meningitis can be caused by multiple conditions including viral, fungal or parasite infections. Non-infectious etiologies include reactions to sulfa, NSAIDS and certain cancer therapies. Cases of aseptic meningitis are much less severe and are usually managed through supportive therapy. Individual cases of aseptic meningitis are no longer a reportable condition, except in instances of outbreaks. Incidence for aseptic meningitis typically peaks in the late summer and early fall (mimicking the pattern of viral etiologies). Cases of viral meningitis are often linked among household members who are experiencing upper respiratory infection; outbreaks are more common with viral meningitis than with bacterial meningitis. Rapid viral PCR or culture can quickly identify the virus (if present) in the CSF. In 2008, 2/3 of IN state's laboratory confirmed cases of aseptic meningitis were caused by different serotypes of enterovirus. Nearly 1/3 of cases were attributed to herpes simplex I or II infections. Other viral etiologies more common are herpes-zoster and Epstein-barr viruses. Mumps used to be a common cause of viral meningitis. Patients with viral meningitis may experience a vesicular rash on the hands, feet, face or oropharynx.

Laboratory Review of Meningitis Cases
Cerebral Spinal Fluid Analysis

CSF Examination	Normal Findings	Bacterial	Aseptic Meningitis
Gram Stain (results available within a few hours)	No organisms detected	Organism detected in approx 80% of untreated cases **Meningococcal** gram neg cocci in pairs (diplococci) **H. flu** gram neg bacilli **Streptococcal** gram positive cocci in chains or pairs **Staphylococcal** gram positive cocci in clusters	No organism detected
CSF Appearance	Clear	Very cloudy or purulent	Clear to slighty cloudy
Glucose	40 – 70 mg/100 mL or approx 60% of serum glucose levels	Low or less than 40% of serum glucose levels	Normal
Protein	20 – 40 mg/dL	High	Normal or slightly elevated
Cell Count	< 4 WBC's per cc	1000 – 100,000 WBC's*	> 5 to 500 WBC's
Cell Differential	Lymphocytes predominate (> 50%)	Neutrophils or monocytes (if early or treated case) predominate	Lymphocytes predominate (>50%)
Other Symptoms	No Rash	Petechial or purpuric lesions (meningococcal disease)	Maculopapular rash (enterovirus-related) Vesicular rash (herpes viruses)

* ratio of 500:1 RBC's to WBC's indicates a traumatic tap and cell counts should not be used in the diagnosis

Meningitis Work Sheet: Date_____

Patient Name:_____ DOB:_____

Notification to ISDH:
ISDH Epi_____phone_____date_____

Specimen source:_____smear result:_____
Culture result :(3-5 days)_____isolate sent to ISDH Lab_____

Hospitalized_____Condition_____
Infection Preventionist _____Phone_____
Symptoms: Petechial rash □ Purpuric rash □ fever (sudden onset) □ stiff neck □
photophobia □ severe headache □ drowsiness or confusion □ nausea and vomiting □
Other:_____

Date of onset:_____
Infectious period: (7 days before onset date)_____
Chemoprophylaxis end date: _____
(Two weeks after initial infectious period date – prophylaxis given more than two weeks after exposure has little value)

High Risks Contacts:
Pre School_____Child care_____Other_____

Entered in INEDSS_____Date_____
Submitted to ISDH_____Date_____

Others notified:

Notes:

Meningococcal Disease Investigation Manual

Purpose

The purpose of this manual is to provide guidance for the investigation of reported cases of *Neisseria meningitidis*.

Background

Cases which have had *N. meningitidis* isolated from a sterile site (i.e. CSF, blood) are to be investigated in accordance with the Communicable Disease Reporting Rule (410 IAC 1-2.3). The investigation shall include collecting case information, obtaining laboratory data, other medical information, and contact tracing. Suspect or probable cases shall be investigated in the same manner as described in this manual until information indicates that the cause of illness is not due to *N. meningitidis*.

Meningococcal infections are life-threatening and therefore the investigation should begin immediately upon notification from the person/organization (physician, hospital, laboratory) submitting the report of the case. Reported cases should be given the highest priority.

Case Classification

Suspect:

- Clinical purpura fulminans in the absence of a positive blood culture; OR
- Gram-negative diplococci, not yet identified, isolated from a normally sterile body site.

  A **sterile body site** includes blood, cerebrospinal fluid (CSF), pleural fluid, peritoneal fluid, surgical aspirate, bone, joint fluid, or internal body site (e.g., lymph node, brain, muscle if surgically removed).

Probable:

- Detection of *N. meningitidis* – specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood or CSF), using a validated polymerase chain reaction (PCR) assay OR
- Detection of *N. meningitidis* antigen
  - In formalin-fixed tissue by immunohistochemistry (IHC); or
  - In CSF by latex agglutination.

Confirmed:

- Isolation of *Neisseria meningitidis*

- From a normally sterile body site (e.g., blood or CSF), or
- From purpuric lesions.

The Investigation Process

Personnel Responsible for Investigation

- According to the Communicable Disease Rule (Section 85) the investigation of a meningococcal case shall be performed by the local health officer (or designee).
- The Invasive Disease Epidemiologist, Indiana State Department of Health (ISDH), will monitor the investigation for the ISDH.
- The ISDH field epidemiologist for the area where the case resides shall be informed of the case and available to assist if necessary.

Initiation of the Investigation

An investigation should be initiated when a laboratory report indicates isolation of *N. meningitidis* from an invasive site. Sometimes information related to the isolation of the *N. meningitidis* bacteria from an invasive site is not available at the time of the initial report. Case investigation (Attachment 12), including contact tracing (Attachment 13 & 14), should be initiated immediately when any of the following information has been provided to the local health department (LHD) or ISDH:

- Gram negative diplococci from a normally sterile site (i.e. blood, CSF);
- Evidence of *N. meningitidis* DNA from a validated PCR assay;
- Evidence of *N. meningitidis* antigen by immunohistochemistry on formalin fixed tissue or latex agglutination of CSF;
- An investigation should also be initiated for a suspected or probable case.

<u>The LHD shall notify the Invasive Disease Epidemiologist (317-234-2807) immediately upon learning of a case which has any of the above laboratory or clinical findings.</u>

Form to be Used

The LHD shall use the Meningococcal Invasive Disease Case Investigation Form in INEDSS (Indiana National Electronic Disease Surveillance System) to conduct the investigation (Attachment 12). This form is also found in INEDSS under the CD list tab – locate and select Meningococcal Disease, find the hyperlink for the case investigation form.

Contact Tracing and Chemoprophylaxis Recommendations

The LHD conducting the investigation shall begin immediately to identify contacts, who may be in need of chemoprophylaxis. Individuals considered at **<u>high risk</u>** for developing disease and in need of chemoprophylaxis are listed below:

- Any household contact
- Child care or nursery school contact
- Direct exposure to oral secretions of the case
- Mouth-to-mouth resuscitation, unprotected contact during endotracheal intubation
- Frequent sleeping or eating at same dwelling as patient
- Passengers seated directly next to index case during flight lasting more than eight hours

Chemoprophylaxis is warranted for these high risk contacts if they were exposed during the seven days before the onset of symptoms in the index case. Chemoprophylaxis should be administered as soon as possible, but can be administered up to fourteen days after the first exposure to the case.

There are persons who are thought to need prophylaxis, but are actually at low risk for infection and prophylaxis is not normally recommended for these persons. Persons included in the **low risk** category include:

- Casual contact with no direct exposure to patient's oral secretions (e.g. school or work contacts)
- Indirect contact – where the persons contact is with an asymptomatic high risk contact.
- Health care professionals without direct exposure to patient's oral secretions

A listing of high risk and low risk individuals as defined above can be found in Attachment 1. This document can be used for distribution to hospital infection control staff, health care providers or others who may need this listing for making chemoprophylaxis recommendations. Attachment 2 also contains the recommended antibiotics and dosing for chemoprophylaxis.

If possible, the investigator should obtain information on close contacts from the case. If the case is not able to supply contact information, the investigator should confer with family, other persons living with the case (i.e. roommates) and friends to determine who may be a close contact of the case.

Contact information can be collected and recorded on the contact tracing form provided by the ISDH (Attachment 11) or some other appropriate documentation by the LHD. Attachments 13 and 14 are the contact information forms found in INEDSS.

Medical and Laboratory Information

The LHD investigator should obtain hospital, emergency department and other physician records pertaining to the case. An immunization history should be obtained on the case. These records shall be attached to the case investigation.

The ISDH may maintain regular contact with the LHD and laboratory doing the testing for the purpose of obtaining information on any pending laboratory results.

Any *N. meningitidis* isolate from a sterile site shall be sent to the ISDH Laboratory for serogrouping. The LHD should contact the laboratory holding the isolate and request submission of the isolate to the ISDH Special Reference Bacteriology Laboratory at 550 W. 16th Street. The ISDH laboratory serogrouping report shall become part of the investigation. Questions regarding specimen submission may be directed to the Special Reference Bacteriology Laboratory at 317-921-5543.

Communications

Upon notification of a meningococcal case LHD staff should notify the local health officer in addition to the ISDH.

Media releases are not normally issued by the ISDH for one meningococcal case, but the LHD may wish to release information to the local media. If the LHD is considering a media release the ISDH shall be notified. An ISDH Public Information Officer can be assigned to assist if necessary (if assistance is required please call the Invasive Disease Epidemiologist at 317.234.2807 who will coordinate with the ISDH Office of Public Affairs).

Letters for schools, child care centers, employers, etc. are available for use if potential exposure has occurred in institutional settings. Samples are found in Attachments 3 (school), 4 (child care), and 5 (workplace). The ISDH Meningococcal Quick Fact Sheet (Attachment 10) can accompany these letters or can be used separately to provide up-to-date information for the public.

Closing the Case

Upon completion of the case investigation, the LHD should review the total case investigation package which may include the following:

- Invasive Meningococcal Disease Investigation Form – Attachment 12
- Emergency Department Medical Records (if available)
- Hospital Inpatient Records (if available).
- Laboratory Results
- Immunization History
- Other medical records, if available
- Contact worksheets

Please check for completeness of the case investigation form. All records utilized during the investigation shall be attached to the case investigation form prior to final submission to ISDH.

Resources

1. 2009 Report of the Committee on Infectious Diseases (Red Book), 28th Edition; American Academy of Pediatrics: 455-463.

2. CDC. Prevention and Control of Meningococcal Disease – Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR. 2005: 54/:1-21 (No. RR-7).

   http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5407a1.htm

3. CDC. Meningococcal Disease. 2010 Case Definition.

http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/meningococcalcurrent.htm

4. Indiana State Department of Health (ISDH). Communicable Disease Reporting Rule for Physicians, Hospitals and Laboratories (410 IAC 1-2.3); December 12, 2008; Section 85: 47.

   http://www.in.gov/legislative/iac/T04100/A00010.PDF

5. APHA. Control of Communicable Diseases Manual; 19th Edition; 2008: 415-421.

Other Meningococcal/Meningitis Links

1. College Info from American College Health

   http://www.acha.org/Topics/meningitis.cfm

2. National Meningitis Association

   http://www.nmaus.org/about_meningitis/

3. Meningitis Foundation of America

   http://musa.org/

Chemoprophylaxis of Healthcare Workers Exposed to *Neisseria meningitidis:*

Is Indiana Demonstrating Good Antimicrobial Stewardship?

Invasive meningococcal disease is most frequently characterized by bacteremia, sepsis and meningitis, although cases may also present as pneumonia, septic arthritis and pericarditis. The most severe form the disease meningococcemia presents as hypotension, disseminated intravascular coagulation and multi-organ failure and is fatal in up to 40% of all cases[1].

Neisseria meningitidis is transmitted through direct contact with respiratory secretions of infected individuals. The incubation period for the infection ranges from 2 -10 days, most frequently 3-4 days[3]; however, the highest incidence of secondary cases occurs immediately after the onset of disease in the index patient making it important to prophylax close contacts as soon as possible, ideally less than 24 hours after identification of the primary case.

Recommendations for Healthcare Workers

Postexposure prophylaxis is recommended for healthcare workers who have had intensive, unprotected contact (without wearing a mask) with infected patients' oral or nasal secretions. This would include individuals performing an intubation or handling the endotracheal tube, mouth to mouth resuscitation, or performing a close examination of the oropharynx of patients. Healthcare workers may also be at increased risk for meningococcal infection if exposed to patients with a lower respiratory infection who are experiencing an active, productive cough[4]. The best way healthcare workers can protect themselves is by adhering to droplet precautions until the patient is considered no longer infectious (after 24 hours of antimicrobial therapy).

Any healthcare worker who has *not* had direct contact with the patient's respiratory droplets is considered at *low-risk* for nasopharyngeal carriage of the bacteria and should *not* receive antimicrobial prophylaxis regardless of that individual's current health status or exposure to individuals who have suffer from chronic conditions or are currently pregnant.

Recommended Chemoprophylaxis Regimen

The current regimen for post-exposure prophylaxis is listed in the Indiana *Communicable Disease Reporting Rule for Physicians, Hospitals and Laboratories*, 410 IAC 1-2.3; December 12, 2008. A printed copy of the rule has been distributed to local health departments and is also available online at: http://www.in.gov/isdh/files/comm_dis_rule.pdf

Recommended Chemoprophylaxis for High-Risk Close Contacts

Age	Dose	Duration	Cautions
Rifampin			
< 1 month	5 mg/kg oral every 12 hours	2 days	
> 1 month	10 mg/kg oral every 12 hours	2 days	Not recommended for use during pregnancy
Ceftriaxone			
< 15 years	125 mg IM	single dose	
> 15 years	250 mg IM	single dose	
Ciprofloxacin			
> 18 years	500 mg oral	single dose	Not recommended for use during pregnancy

The ISDH frequently receives questions on the appropriate use of chemoprophylaxis in healthcare workers. Listed below are answers to the most frequently asked questions regarding the prophylaxis of healthcare workers:

1. **What prophylaxis regimen is recommended after exposure to individuals who are identified as carriers of the bacteria?**

   Prophylaxis for exposure to nasopharyngeal carriers of the disease (i.e. a workplace exposure to an individual with a positive sputum culture) is not necessary or recommended. It is currently estimated that 5 – 10 % of the general population are asymptomatic carriers of the bacteria; however, less than 1% of all carriers will develop invasive disease[1].

   Meningococci are classified into serogroups according to the immunological reactivity of the polysaccharide capsule antigen. 13 serogroups have been identified, but only 5 of these groups can cause invasive disease (A, B, C, Y and W135). Of these 5 groups, only 3 are

endemic to the United States (B, C, and Y). A positive result from a respiratory specimen does not indicate that an individual is a carrier of a pathogenic serogroup of the bacteria.

2. **When is it most appropriate to offer prophylaxis to healthcare workers?**

   While it is recommended to offer prophylaxis to high-risk close contacts within 24 hours of identification of a case, it is most appropriate to offer the prophylaxis *after* the organism has been identified:

   - Lab report of positive *N. meningitidis* culture from an invasive site
   - Lab report of gram negative diplococci (or cocci) from an invasive site
   - Clinical purpuric fulminans present (with or without culture results)
   - Lab report of positive *N. meningitidis* result from validated PCR.

   A general rule to follow with the prophylaxis of healthcare workers is to offer the prophylaxis when you report the case to the health department.

3. **What dosage of ciprofloxacin, rifampin or ceftriaxone is recommended for individuals with previously diagnosed immunodeficiencies?**

   It is not necessary to prescribe more than the recommended regimen of antibiotic therapy, even in individuals with underlying immunodeficiencies.

4. **When is mass vaccination recommended?**

   During unusual outbreak/cluster (other than serogroup B), mass vaccination should be considered when the attack rate in an organization or community exceeds 10 cases per 100,000*. Mass prophylaxis with antimicrobials may be considered in outbreaks involving limited populations, and should be administered to all targeted persons at the same time. It should not be used during a community-wide outbreak[5].

   *When calculating attack rates, co-primary or secondary cases that are close contacts cases should not be included in the case count.

References

1. Rosenstein NE, Perkins BA, Stephens DS, Popovic T, Hughes JM. Meningococcal disease. N Engl J Med 2001;344:1378-88.

2. CDC. Prevention and control of meningococcal disease. MMWR 2005;54 (No.RR-7): 1-17.

3. Heyman DL, editor. Control of Communicable Diseases Manual 19th ed. 2008: 415 – 421.

4. Bolyard EA, Tablan OC, Wiliams WW, Pearson ML, Shapiro CN, Deitchman SD, et al. Guideline for infection control in health care personnel, 1998. AJIC 1998;26:289-354.

5. CDC. Control and prevention of meningococcal disease and prevention of serogroup C meningococcal disease: evaluation and management of suspected outbreaks; recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1997; 46(No.RR-5): 1-21.

7/27/09 **2nd edition**

Recommendations for the management of laboratory worker exposure to *N. meningitidis*

Laboratory workers who routinely handle *N. meningitidis* should do so using appropriate precautions. Any manipulation of isolates of *N. meningitidis*, including subplating with an inoculation loop, should be performed in a biosafety cabinet, and never on an open laboratory bench. Gloves should be worn to protect against percutaneous exposure to *N. meningitidis* isolates. All eligible laboratory staff working with *N. meningitidis* should be vaccinated with meningococcal conjugate vaccine (MCV4 - Menactra is currently the only available conjugate vaccine). If there is a significant contraindication to the MCV4 vaccine, meningococcal polysaccharide vaccine should be given (MPSV4 – Menommune). All exposed laboratory workers should be revaccinated after 5 years, preferably with MCV4 (MPSV4 may be used if there is a contraindication to MCV4). Neither of these vaccines provides coverage for *N. meningitidis* serotype B, however.

Although *N. meningitidis* isolates obtained from a respiratory source are in general less pathogenic and pose a lower risk of causing invasive disease, any manipulation of *N. meningitidis* isolates, including those from a non-sterile site, should be taken seriously and performed in a biosafety cabinet wearing gloves. The exclusive occurrence of probably laboratory-acquired cases in microbiologists suggests that exposure to isolates, and not patient samples, increases the risk for infection.

Laboratory workers, including those who have been immunized against *N. meningitidis*, who manipulate colonies of *N. meningitidis* outside a biosafety cabinet, are at risk for **aerosolized** exposure and should be provided with appropriate pharmaceutical **prophylaxis**. Those who are stuck with a sharp or needle contaminated with *N. meningitidis* isolates have a **percutaneous** exposure. Lab workers who contaminate their skin with isolates of *N. meningitidis* should be assessed for possible **percutaneous** exposure through an open wound or breach in the integrity of the skin caused by eczema or other dermatologic condition. Percutaneous exposure, or direct

inoculation with *N. meningitidis*, requires **treatment** (appropriate intravenous antibiotic therapy), not prophylaxis.

For additional information, refer to the Centers for Disease Control and Prevention (CDC) Morbidity and Mortality Weekly Review (MMWR) published February 22, 2002. www.cdc.gov/mmwr/preview/mmwrhtml/mm5107a1.htm

Bacterial Meningitis Surveillance and Investigation – Important Reminders

Meningitis is an inflammation of the tissues covering the brain and or spinal cord. Symptoms can include headache, stiff neck, photophobia, nausea, vomiting, fever, confusion and sometimes seizures. Infants may appear irritable, feed poorly or be less active than usual.

Although bacterial meningitis can be caused by various organisms, the Indiana Communicable Disease Rule for Physicians, Hospitals and Laboratories, 410 IAC 1-2.3 revised on December 12, 2008 requires reporting of cases of meningitis (and other infections in which the bacteria is isolated from a sterile site, such as blood or CSF) caused by the following bacterial agents:

- *Neisseria meningitidis*
- *Haemophilus influenzae*
- *Streptococcus pneumoniae*
- *Streptococcus agalactiae* (group B strep)
- *Streptococcus pyogenes* (group A strep)

Furthermore, cases of *Neisseria meningitidis* and *Haemophilus influenzae* are to be "reported immediately by telephone or other instantaneous means of communication on first knowledge or *suspicion* of the diagnosis". For meningococcal meningitis, this includes cases that may not yet be laboratory confirmed by a culture result:

Meningococcal Meningitis – When to Report a Suspect Case
• Lab report of *N. meningitidis* (culture) from an invasive site • Gram stain reporting gram negative diplococci (or cocci) from the CSF • Clinical purpuric fulminans present with or without culture results (often the case with Meningococcemia or blood infection)

- *N. meningitidis* DNA from validated PCR

When any of the above criteria is met for a case of meningococcal meningitis, an investigation shall be started immediately. During weekend, evening or holiday hours it is important to contact an after-hours duty officer for the LHD or the ISDH duty officer if unable to reach an after-hours officer in the county where the patient resides. Prompt reporting allows the investigator to locate all close contacts and provide antibiotic prophylaxis within the first 24 hours as recommended by the Centers for Disease Control and Prevention (CDC). In addition, the LHD should notify ISDH upon learning of a new case immediately to improve state-wide disease surveillance. The ISDH has many resources available to assist the LHD with the case investigations, such as this meningococcal disease investigation and reporting resource manual.

When submitting a case investigation of bacterial meningitis, or invasive disease, please remember to submit the following information with each case investigation:

Bacterial Agent	**Information to Send**
Haemophilus influenzae	final culture results susceptibility testing results (if available) available hospital records
Streptococcus pneumoniae	Final culture results susceptibility testing results available hospital records
Neisseria meningitidis	final culture results available hospital records
Streptococcus agalactiae	final culture results
Streptococcus pyogenes	final culture results

When a case of invasive disease from *Streptococcus pneumoniae* in children under the age of 5, *Neisseria meningitidis* (in any age) or *Haemophilus influenzae* (in any age) is confirmed by culture, the reference laboratory is to send the isolate to the ISDH laboratory within 5 business days.

Beginning in the year 2009, the ISDH is no longer requesting reports of cases using the National Bacterial Meningitis and Bacteremia Case Report form used by the CDC. These are cases of bacterial meningitis of a non-reportable etiology. The Surveillance and Investigation Division

appreciates the efforts of local health departments and health care providers who have participated in voluntary reporting of cases.

Indiana State Department of Health

Attachment 1

Disease Risk for Contacts of Individuals with Invasive Meningococcal Disease*

High Risk: chemoprophylaxis recommended

- Any household contact, especially young children
- Child care or nursery school contact during 7 days before onset of illness
- Direct exposure to patient's oral secretions through activities such as kissing, sharing toothbrushes, eating utensils or drinking containers
- Mouth-to-mouth resuscitation, unprotected contact during endotracheal intubation during seven days before onset of illness
- Frequent sleeping or eating at same dwelling as patient during seven days before onset of illness.
- Passengers seated directly next to index case during airline flight lasting more than eight hours during 14 days prior to onset of illness

Low Risk: chemoprophylaxis not recommended

- Casual contact: no history of direct exposure to index patient's oral secretions (eg, school or work)
- Indirect contact: only contact is with high risk contact, no direct contact with index patient

- Health care professionals without direct exposure to patient's oral secretions

In outbreak or cluster

- Chemoprophylaxis for people other than people at high risk should be administered only after consultation with public health authorities

Revised 4/10/2012

Recommended Chemoprophylaxis Regimens for

High-Risk Contacts

Meningococcal Cases*

Attachment 2

Age	Dose	Duration	Efficacy (%)	Cautions
Rifampin[1]				
< 1 month	5mg/kg, orally, every 12 hours	2 days	90-95%	
≥ 1 month	10 mg/kg (max. 600mg), orally, every 12 hours	2 days	90-95%	Can interfere with efficacy of oral contraceptives and some seizure prevention and anticoagulant medications; may stain soft contact lenses
Ceftriaxone				
<15 years	125 mg, intramuscularly	Single Dose	90-95%	To decrease pain at injection site, dilute with 1% lidocaine
≥ 15 years	250 mg, intramuscularly	Single Dose	90-95%	

Ciprofloxacin[1]				
≥ 18 years	500 mg. orally	Single Dose	90-95%	Not recommended for persons <18 years of age

[1] Not recommended for use in pregnant women*

Adapted from 28h Edition of The Red Book, 2009 Report of the Committee on

Infectious Diseases, American Academy of Pediatrics

For Children less than 100 pounds liquid Rifampin offered in 10mg/cc. To get therapeutic dosage, round dose to nearest 10 mg.

Revised April 2012

Attachment 3

(Insert Date)

Dear Parents and Students,

The purpose of this letter is to inform you that a case of meningococcal disease occurred at (insert name of school). This disease is caused by the bacterium *Neisseria meningitidis* and generally affects people in two ways:

- meningitis (an inflammation of the tissues covering the brain and or spinal cord)
- bloodstream infection (that usually leads to bleeding under the skin)

The case is under medical supervision and can no longer spread the disease. A person must have direct contact with an infected person's saliva during the 7 days prior to the onset of illness in order to become infected. The disease is not spread through casual contact or by simply being in the same room as an infected person.

The (insert name of local health department) is in the process of identifying and contacting persons who have had close contact with the case and is making recommendations on who should have antibiotics to prevent infection. Close contacts include persons:

- living in the same household as the infected person;
- who have kissed the infected person on the mouth;
- who have items that come in contact with an infected person's saliva, such as drinks from the same container (i.e. water bottles, cups, glasses), eating utensils, cigarettes, or lipstick

For all other persons, including those who had casual contact as would occur in most school related activities, the risk of infection is very low. Preventive antibiotics are not recommended for casual contacts of infected persons.

Although the risk of disease to other students is quite low, parents are advised to be alert for signs of meningococcal disease. These include, but are not limited to, a sudden onset of fever, headache, stiff neck, confusion and sometimes a rash. If any of these signs or symptoms should develop, the student should be taken immediately to a physician or emergency room to be evaluated for possible meningococcal disease. Antibiotic treatment of the disease is usually successful, especially if it is started early after symptoms begin.

To reduce the spread and risk of any communicable disease, it is recommended that students and staff not share items that come in contact with another person's saliva such as foods, drinks, lipstick/balm, or cigarettes.

If you have questions please call the (insert health dept. name) at (insert phone number).

Sincerely,

(insert date)

Attachment 4

Dear Parent/Guardian:

The purpose of this letter is to inform you that a case of meningococcal disease occurred at (insert name of child care center). This disease is caused by the bacterium *Neisseria meningitidis* and generally affects people in two ways:

- meningitis (an inflammation of the tissues covering the brain and or spinal cord) or
- bloodstream infection (that usually leads to bleeding under the skin)

These include, but are not limited to a sudden onset of fever, headache, stiff neck, confusion and sometimes a rash. Newborns and small infants may also vomit, and be tired or very fussy**.** If any of these signs or symptoms should develop, your child should be taken immediately to a physician or emergency room to be evaluated for possible meningococcal disease. You should observe your child for ten days from the date of this letter.

Antibiotic treatment of the disease is usually successful, especially if it is started early after symptoms begin. Three antibiotics (rifampin, ciprofloxacin, or ceftriaxone) are used to prevent infection in persons who have had close contact with a case of meningococcal disease. Close contact means:

- household members
- persons who frequently eat or sleep in the same house
- persons who spent 4-6 hours per day together
- children attending the same child care
- persons who have come in contact with saliva of the infected person by kissing, sharing eating and drinking utensils

We strongly encourage you to contact your physician regarding possible preventive treatment with antibiotics.

If you have questions please call the (insert health dept. name) at (insert phone number).

Sincerely

Attachment 5

(insert date)

Dear Employee,

The purpose of this letter is to inform you that a case of meningococcal disease occurred at (insert name of employer). This disease is caused by the bacterium *Neisseria meningitidis* and generally affects people in two ways:

- meningitis (an inflammation of the tissues covering the brain and or spinal cord) or
- bloodstream infection (that usually leads to bleeding under the skin)

The case is under medical supervision and can no longer spread the disease. A person must have direct contact with an infected person's saliva during the 7 days prior to the onset of illness in order to become infected. The disease is not spread through casual contact or by simply being in the same room as an infected person.

The (insert name of local health department) is in the process of identifying and contacting persons who have had close contact with the case and is making recommendations on who should have antibiotics to prevent infection. Close contacts include persons:

- living in the same household as the infected person;
- who have kissed the infected person on the mouth;
- who have items that come in contact with an infected person's saliva, such as drinks from the same container (i.e. water bottles, cups, glasses), eating utensils, cigarettes, or lipstick

For all other persons, including those who had casual contact as would occur in most work related activities, the risk of infection is very low. Preventive antibiotics are not recommended for casual contacts of infected persons.

Although the risk of disease to other employees is quite low, you are advised to be alert for signs of meningococcal disease. These include, but are not limited to a sudden onset of fever, headache, stiff neck, confusion and sometimes a rash. If any of these signs or symptoms should develop, contact your physician immediately or go to a hospital emergency room to be evaluated for possible meningococcal disease. Antibiotic treatment of the disease is usually successful, especially if it is started early after symptoms appear.

To reduce the spread and risk of any communicable disease, it is recommended that students and staff not share items that come in contact with another person's saliva such as foods, drinks, lipstick/balm, or cigarettes.

If you have questions please call the (insert health dept. name) at (insert phone number).

Sincerely,

Attachment 6

Insert Letter head

Date: _____

Dear Family and Friends of _____
This letter is to inform you that you or your family members may have been exposed to a case of meningococcal disease. This disease can cause both meningitis (an inflammation of the fluid surrounding the brain and spinal cord), or an invasive bloodstream infection. This disease is spread through direct contact with an infected person's saliva. Individuals who are considered at high-risk for acquiring the infection include:

- Sleeping in the same dwelling as the infected person
- Kissing the infected person on the mouth
- Having direct contact with an infected person's saliva, such as drinks from the same container, eating utensils, etc.

Symptoms of meningococcal disease include fever, headache, stiff neck, red rash, drowsiness, nausea, vomiting and sensitivity to light. It is important that you contact a health care provider if you or your child experiences 1 or more of these symptoms.
The (insert your agency) recommends preventive treatment for close contacts who have had a high-risk exposure to the case.
Please contact the (your agency name and phone) to obtain more information.

Sincerely,

Attachment 7

Fecha: _____

Estimados padres y alumnos:

El objeto de la presente es informarles que en _____ ha surgido un presunto caso de enfermedad meningocócica. Esta enfermedad es causada por la bacteria *Neisseria meningitidis* y en general afecta a las personas en dos formas:

- meningitis (que es una inflamación de los tejidos que recubren el cerebro o la médula espinal)
- infección del torrente sanguíneo (que generalmente da como resultado hemorragias debajo de la piel)

El caso se encuentra bajo supervisión médica y la enfermedad ya no puede propagarse. Una persona debe tener contacto directo con la saliva de una persona infectada durante los 7 días anteriores al comienzo de la enfermedad para infectarse. La enfermedad no se propaga por contacto casual o por estar simplemente en el mismo ambiente que la persona infectada.

El **departamento de salud local de** _____ y el Departamento de Salud del Estado de Indiana están en el proceso de identificar y de comunicarse con las personas que hayan tenido contacto directo con el afectado y hacen recomendaciones acerca de quiénes deben tomar antibióticos para prevenir la infección. Los contactos directos incluyen a las personas que:

- vivan en la misma residencia que la persona infectada,
- hayan besado en la boca a la persona infectada,
- tengan elementos que hayan entrado en contacto con la saliva de la persona infectada, como bebidas del mismo envase (por ejemplo, botellas de agua, tazas, vasos), utensilios de comer, cigarrillos o lápices labiales.

Para todas las personas, inclusive los que tuvieron contacto casual como ocurriría en la mayoría de las actividades escolares, el riesgo de contagiarse la infección es muy bajo. No se recomiendan antibióticos preventivos para los casos en que haya habido contactos casuales con las personas infectadas.

Aunque el riesgo de que la enfermedad se desarrolle en otros alumnos es muy bajo, se recomienda a los padres que estén alerta ante los signos de la enfermedad meningocócica. Esto incluye, entre otras cuestiones, una repentina aparición de fiebre, dolor de cabeza, rigidez en el cuello, confusión y, en algunas ocasiones, erupciones cutáneas. En caso de que alguno de estos signos o síntomas se desarrollara, se debe llevar al alumno de inmediato al médico o a la sala de emergencias para que se lo evalúe para detectar una posible enfermedad meningocócica. El tratamiento con antibióticos de la enfermedad en general es exitoso, especialmente si se inicia poco después del comienzo de los síntomas.

A los fines de disminuir las posibilidades de propagación y riesgo de contraer una enfermedad contagiosa, se recomienda a los alumnos y al personal no compartir elementos que hayan entrado en contacto con la saliva de otras personas como alimentos, bebidas, lápices o bálsamos labiales o cigarrillos.

En caso de que tenga consultas, llame al **departamento de salud local de** _____ al _____.

Atentamente,

Attachment 8

Fecha: _____

Estimados padres o tutores:

El objeto de la presente es informarles que en _____ ha surgido un caso de enfermedad meningocócica. Esta enfermedad es causada por la bacteria *Neisseria meningitidis* y en general afecta a las personas en dos formas:

- meningitis (que es una inflamación de los tejidos que recubren el cerebro o la médula espinal) o
- infección del torrente sanguíneo (que generalmente da como resultado hemorragias debajo de la piel)

Los síntomas incluyen, entre otras cuestiones, una repentina aparición de fiebre, dolor de cabeza, rigidez en el cuello, confusión y, en algunas ocasiones, erupción cutánea. Los recién nacidos y niños pequeños también pueden tener vómitos y sentirse cansados o muy fastidiosos. En caso de que alguno de estos signos o síntomas se desarrollara, debe llevar a su hijo de inmediato al médico o a la sala de emergencias para que se lo evalúe para detectar una posible enfermedad meningocócica. Debe observar a su hijo durante _____ días a partir de la fecha de esta carta.

El tratamiento con antibióticos de la enfermedad en general es exitoso, especialmente si se inicia poco después del comienzo de los síntomas. Se utilizan tres antibióticos (rifampicina, ciprofloxacina o ceftriaxona) para prevenir la infección en personas que han tenido contacto directo con un caso de enfermedad meningocócica. El contacto directo implica:

- integrantes de la residencia familiar
- personas que coman o duerman con frecuencia en la misma casa
- personas que pasen juntos de 4 a 6 horas por día
- <u>niños que asistan a la misma guardería y que hayan tenido interacción con el afectado</u>
- personas que han entrado en contacto con la saliva de la persona infectada al besarla o compartir utensilios para comer y beber.

Encarecidamente los instamos a que contacten a su médico con respecto a un posible tratamiento preventivo con antibióticos.

Si tiene alguna consulta, llame al (insert your agency name and phone).

Atentamente,

Attachment 9

Fecha: _____

Estimados familiares y amigos de _____:

La presente carta tiene el fin de informarles que ustedes o sus familiares posiblemente se hayan visto expuestos a un caso de enfermedad meningocócica. Esta enfermedad puede causar meningitis (inflamación del líquido que cubre el cerebro y la médula espinal) o una infección invasiva del torrente sanguíneo. Esta enfermedad se contagia por contacto directo con la saliva de una persona infectada. Las personas que se consideran que presentan un alto riesgo de contagiarse la infección son:

- las que duerman en la misma residencia que la persona infectada,
- las que besen en la boca a la persona infectada
- las que tengan contacto directo con la saliva de una persona infectada, como en el caso de compartir bebidas de un mismo envase, utensilios de comer, etc.

Los síntomas de la enfermedad meningocócica son fiebre, dolor de cabeza, rigidez en el cuello, erupción cutánea, somnolencia, náuseas, vómitos y sensibilidad a la luz. Es importante que se contacte con un proveedor de atención médica si usted o su hijo experimentan uno o más de estos síntomas.

El Departamento de Salud del Estado de Indiana recomienda que se aplique tratamiento preventivo para los casos de personas que hayan tenido contacto directo y hayan tenido un elevado riesgo de exposición con la persona afectada.

Contáctese con el Departamento de Salud de _____ al _____ para obtener más información.

Atentamente,

Quick Facts

About… Meningococcal Disease

What is meningococcal disease?

Neisseria meningitidis bacteria are normally found in the nose and throat of 10 – 15% of healthy persons. Rarely, the bacteria enter areas of the body where bacteria are normally not found and cause a severe, life-threatening ("invasive infection") known as meningococcal disease. Examples of the disease include meningitis (infection of the lining of the brain and spinal cord) and septicemia (bloodstream infection). There were 9 cases of *N.meningitidis* in Indiana in 2012.

What are the symptoms of meningococcal disease?

Symptoms include:

- Fever (sudden onset)
- Severe headache
- Stiff neck
- Drowsiness or confusion
- Skin rash that appears as bruising or bleeding under the skin
- Nausea and vomiting
- Eyes that are sensitive to light

In babies, the symptoms are more difficult to identify but may include:

- Fever
- Fretfulness or irritability
- Poor appetite
- Difficulty in waking

How is meningococcal disease spread?

These germs are spread from person to person *only through* direct contact with an infected person's nose or throat secretions, such as saliva. Some common ways the germs can be spread from an infected person are:

- Living in the same household
- Kissing on the lips
- Sharing drinks from the same container (glasses, cups, water bottles)
- Sharing eating utensils (forks and spoons)
- Sharing a toothbrush, cigarettes, or lipstick

Preventive antibiotic treatment is recommended for individuals who are close contacts of someone who has the disease.

Who is at risk for meningococcal disease?

Young infants, students attending high school or college, and military recruits are more likely to get the disease. People with a weakened immune system are also at higher risk for the disease, as well as those who live in crowded settings or have household exposure to cigarette smoke.

How is meningococcal disease diagnosed?

Your health care provider may collect blood or spinal fluid to see if meningococcal bacteria are present.

How can meningococcal disease be treated?

The disease is treated with several different types of antibiotics. A 24-hour course of antibiotic therapy reduces a person's likelihood of spreading the bacteria. It is important to seek medical attention immediately as an infected person may become very sick within a few hours. Early treatment may reduce the risk of complications or death from the disease.

How is meningococcal disease prevented?

Good hygiene can prevent the disease. Cover the nose and mouth when sneezing or coughing, throw away used tissues, and wash hands often. Do not share eating or drinking utensils with anyone.

There are vaccines in the U.S. that protect against most types of this disease. See your health care provider about which one is right for you. A dose of meningococcal vaccine is recommended for children 11 or 12 years of age with a booster at 16 years of age. The vaccine is also recommended for people with increased risk for the disease. Revaccination after five years may be indicated for certain at-risk individuals.

All information presented is intended for public use. For more information, please refer to: http://www.cdc.gov/meningococcal/index.html.

This page was last reviewed May 16, 2013.

Questions for Family, Patient and/or Contacts

Date of Symptom Onset: _____

1. Did the patient travel outside of Indiana in the 14 days prior to symptom onset? **Y N**

Where did the patient travel (city, state and country)?

_____

_____

_____

Method of transportation (circle all that apply):

- Airplane Airline _____ Flight Number _____ Duration _____
- Automobile
- Bus Transit Company _____
- Train

Date(s) of travel _____

2. Is the patient employed? **Y N**

Name of Employer _____ Occupation _____

Last Date Worked _____

Description of Job Duties

_____

_____

_____

3. Is this patient a college student? **Y N**

Name of College/University _____ Year in School _____

Contact Name at University _____ Telephone Number _____

Address _____

_____

Housing Situation:

- Dormitory
- Apartment
- Other _____
- Single Family Dwelling with Student(s)
- Single Family Dwelling with Family

4. Did the patient have contact with a daycare or school during the 7 days prior to the onset of symptoms?

Name of School _____

Description of daycare or school contact:

- Attendee
- Volunteer
- Staff Member

Number of hours per week _____

Contact Name at Daycare or School _____ Telephone Number _____

Address _____

_____

5. Did the patient attend any social gatherings in the 7 days prior to symptom onset (circle all that apply)?

6.

- Church or other religious organization
- Concert
- Tavern or Bar
- Support Group
- Family gathering
- Movie
- Party
- Restaurant(s)
- Sporting events
- Other

Provide additional information for all items that were selected. This includes name of location(s) and date(s) in attendance

_____

_____

_____

7. Can the patient or family identify other individuals who have shared respiratory secretions with the patient?

8.

- Kissing
- Shared musical instruments
- Shared toothbrush
- Shared utensils
- Shared food/drink
- Shared cigarettes
- Other _____

9. In the 7 days prior to illness onset, did any of the following transmission risks exist? (circle all that apply):

- Sleepovers
- Houseguests in patient's home in past 7 days
- Military Service
- Jail/Prison
- Presence at Shelter
- Other _____