Meningococcal Infection, Invasive

BASIC EPIDEMIOLOGY

Infectious Agent
Neisseria meningitidis is a Gram-negative, aerobic diplococcus with at least 13 serogroups. Serogroups A, B, C, Y, W-135 and X are all capable of causing outbreaks**.** In the United States and in Texas, B, C and Y are the most common serogroups.

Transmission
N. meningitidis spreads from person to person either by direct contact with respiratory secretions (e.g., kissing), indirect contact (e.g., sharing of eating utensils), or by aerosol droplets (e.g., coughing and sneezing). Up to 10% - 20% of people can be asymptomatic nasopharyngeal carriers of *N. meningitidis*. Less than 1% of those will progress to invasive disease.

Incubation Period
The incubation period is usually 3–4 days, but it can range from 1–10 days.

Communicability
A person can pass the infection to others for as long as the bacteria are present in discharges from the nose and mouth. A person is no longer infectious after 24 hours of appropriate antimicrobial treatment. (Antimicrobial treatment should be continued for the full duration that it is prescribed.)

Clinical Illness

- **Meningitis** is the most common presentation of invasive meningococcal disease. Meningococcal infection is similar to other forms of meningitis, with sudden onset of fever, headache and stiff neck, often accompanied by nausea, vomiting, photophobia (sensitivity to light) or altered mental status.
- **Meningococcal sepsis (meningococcemia or bacteremia)** is the most severe form and can occur without meningitis in 5%-20% of invasive infections. Sepsis is characterized by abrupt onset of fever and a petechial or purpuric (red or purplish spots caused by bleeding under the skin) rash, and is often associated with hypotension, shock, acute adrenal hemorrhage and multiple organ failure.
- Less common presentations of meningococcal disease include pneumonia, arthritis, otitis media and epiglottitis.
- Texas invasive meningococcal disease cases from 2010-2014 reported the following clinical illness manifestations: meningococcal meningitis (48%), meningococcal sepsis (34%), pneumonia (3%), septic arthritis (2%), peritonitis (1%), multiple manifestations (5%), unknown manifestation (7%).

Severity
The case fatality rate is 8%-15% even with appropriate antibiotic treatment. Sequelae occur in 11%-19% of people and may include hearing loss, neurologic disability, amputation or loss of limb use.

DEFINITIONS

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

Laboratory Criteria for Diagnosis

- **Confirmed:**
  - Isolation of *Neisseria meningitidis* from a normally sterile site
  - Isolation of *Neisseria meningitidis* from purpuric lesions
  - Detection of *Neisseria meningitidis*- specific nucleic acid in a specimen obtained from a normally sterile site, using a validated polymerase chain reaction (PCR) assay
- **Probable:**
  - *Neisseria meningitidis* antigen detection by immunohistochemistry (IHC) onformalin-fixed tissue
  - *Neisseria meningitidis* antigen detection by latex agglutination of CSF
- **Suspect:**
  - Gram negative diplococci, not yet identified, isolated from a normally sterile site (e.g., blood or CSF)

Case Classification

- **Confirmed**: A case that meets at least one of the confirmed laboratory criteria
- **Probable**: A case that meets at least one of the probable laboratory criteria
- **Suspect**: A case that meets the suspect laboratory criteria, or a case with clinical purpura fulminans in the absence of a positive blood culture

Note: All *Neisseria meningitidis* isolates from normally sterile sites and/or purpuric lesions must be submitted to the DSHS laboratory for typing and molecular analysis.

See the Sterile Site and Invasive Disease Determination Flowchart in Appendix A for confirming that a specimen meets the criteria for sterile site.

See the Meningococcal Infection: Case Status Classification Flowchart at the end of this section for assistance with case classification.

Other Definitions

For a definition of "close contacts" see the Case Investigation section (subsection: Control Measures). For cluster and outbreak definitions see the Managing Special Situations section.

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should investigate all reports of invasive meningococcal infections. Investigations should include an interview of the case or a surrogate to obtain a detailed exposure history. Please use the Meningococcal Infection Investigation Form available on the DSHS website: http://www.dshs.texas.gov/idcu/investigation.aspx.

Case Investigation Checklist

- ☐ An investigation should begin immediately for any person, living or deceased, who is suspected of having invasive meningococcal disease.
  - Immediately inform the Regional Health Department and DSHS EAIDU when an investigation is being done or considered.
- ☐ Confirm that laboratory results indicate invasive disease.
  - See the Sterile Site and Invasive Disease Determination Flowchart in Appendix A.
- ☐ Review medical records or speak to an infection preventionist or physician to obtain demographics and case-patient symptoms.
- ☐ Determine vaccination status of the case. Sources of vaccination status that should be checked include:
  - Case (or parent), ImmTrac2, school nurse records, primary care provider, etc.
- ☐ Ensure that appropriate control measures are implemented (see Control Measures below).
- ☐ Interview the case (or surrogate) to identify close contacts (see "close contacts" definition in

Control Measures section, below).
- Obtain detailed information on close contacts including address, place of work, occupation, and daycare or school information.
- If needed, the Respiratory Contact Tracking Form may be used to document contacts (available at https://www.dshs.texas.gov/idcu/investigation.aspx).

- Ensure that close contacts are offered and receive appropriate chemoprophylaxis.
- Ensure that all other appropriate control measures are implemented (see Control Measures).
- Within 24 hours of starting the investigation, contact the testing laboratory to ensure that the isolate has been forwarded to the DSHS laboratory (see Laboratory Procedures).
  - If an isolate (culture) is not available but invasive meningococcal disease is suspected, forward any specimen from a sterile site that is available.
  - If an isolate is available but no longer viable, please contact EAIDU at 512-776-7676 to discuss testing options.
- Complete the Meningococcal Infection Investigation Form using <u>all</u> of the following sources:
  - Medical records
    - Alternate or supplemental source: infection preventionist or physician responsible for the patient's care during the meningococcal illness
  - Patient (or surrogate) interview
  - <u>All possible sources of vaccination status</u> including patient, parent/guardian, school, hospital records, primary care provider, and ImmTrac
- If applicable, complete steps in the Managing Special Situations section.
- **Fax or securely email the completed investigation form and lab results to EAIDU.**
- Enter and submit for notification all suspect, probable, and confirmed invasive meningococcal cases in the NEDSS Base System (NBS).

Control Measures

Cases

- Investigate reports of suspected invasive meningococcal disease promptly to identify at-risk contacts.
- Start appropriate antibiotic treatment immediately upon diagnosis.
- Ensure that patients remain in respiratory isolation for 24 hours after the start of appropriate antibiotic therapy.
- Verify that school/daycare exclusion criteria are followed (see below).
- Disinfect any clothing or bedding that is soiled from nose or throat discharges. A patient's hospital room should be terminally cleaned upon discharge.

Contacts

- Advise contacts of signs and symptoms of illness, and refer them to their healthcare providers if they experience any symptoms compatible with invasive meningococcal disease.
- Recommend antibiotic postexposure prophylaxis for close contacts (regardless of meningococcal immunization status) who were exposed to the case in the 7 days before onset of disease in the case and until the case has had 24 hours of effective antibiotic therapy. Postexposure prophylaxis for close contacts should be initiated as soon as possible, ideally within 24 hours of identification of the index case and up to 14 days from the last exposure (see below for close contacts definition and prophlyaxis recommendations).

Managing Close Contacts

- Close contacts include people in the same household, child-care center contacts, roommates, or anyone with direct contact with the patient's saliva. See table below for classifying contacts.
- Provide close contacts with chemoprophylaxis as needed (see Prophylaxis Guidelines).

- Monitor close contacts for signs of illness, especially fever, for up to 10 days.
- Provide close contacts with meningococcal disease fact sheets and other information.
    - A fact sheet for meningococcal meningitis is available on the IDCU (Infectious Disease Control Unit) web site: http://www.dshs.state.tx.us/idcu/disease/meningococcal_invasive/faqs/Information is also available on all types of meningococcal disease: http://www.cdc.gov/meningococcal/about/

Managing Close Contacts

High risk: chemoprophylaxis recommended (close contacts)
• Household contacts, especially children younger than 2 years of age • Child care or preschool contact at any time during 7 days before onset of illness • Direct exposure to the index patient's secretions through kissing or through sharing toothbrushes or eating utensils—markers of close social contact—at any time during 7 days before onset of illness • Mouth-to-mouth resuscitation, unprotected contact during endotracheal intubation at any time 7 days before onset of illness • Frequently slept in same dwelling as index patient during 7 days before onset of illness • Passengers seated directly next to the index case during airline flights lasting more than 8 hours (gate to gate)
Low risk: chemoprophylaxis not recommended
• Casual contact: no history of direct exposure to index patient's oral secretions (e.g., school or work) • Indirect contact: only contact is with a high-risk contact, no direct contact with the index patient • Health care personnel without direct exposure to patient's oral secretions o Note: Hospital personnel should receive prophylaxis only if they were directly exposed to the patient's nasal or throat secretions and failed to correctly use appropriate personal protective equipment (PPE).
In outbreak or cluster
• Chemoprophylaxis for people other than people at high risk should be administered only after consultation with local public health authorities.

- The Texas Medical Board recently changed its rules (Texas Administrative Code, Title 22, Part 9, Chapter 190, Subchapter B, §190.8) regarding the prescribing of prophylaxis for close contacts of patients with certain infectious diseases. Physicians can now prescribe antibiotics to contacts of invasive meningococcal disease cases without first medically evaluating the contact.

Prophylaxis Guidelines

- Antimicrobial chemoprophylaxis should be administered as soon as possible (ideally <24 hours after identification of the index patient).
- Chemoprophylaxis administered >14 days after exposure to the index patient is probably of limited or no value.

Recommended chemoprophylaxis regimens for high risk contacts and people with invasive meningococcal disease				
Drug	Age Group	Dosage	Duration and route of administration*	Cautions

Rifampin[a]	<1 mo	5 mg/kg every 12 hrs	2 days	Discussion with an expert for infants <1mo
	≥ 1 mo	15-20 mg/kg (maximum 600 mg) every 12 hrs	2 days	Can interfere with efficacy of oral contraceptives and some seizure and anticoagulant medications; can stain soft contact lenses
Ceftriaxone	< 15 y	125 mg, IM	Single dose	To decrease pain at injection site, dilute with 1% lidocaine
	≥15 y	250 mg, IM		
Ciprofloxacin[b]	≥ 1 mo	20 mg/kg (maximum 500 kg)	Single dose	
Azithromycin		10 mg/kg (maximum 500 mg)	Single dose	Not recommended routinely; equivalent to rifampin for eradication of *Neisseria meningitidis* from nasopharynx in one study of young adults

IM= intramuscularly
*Oral administration unless indicated otherwise
[a]Rifampin is not recommended for pregnant women because the drug is teratogenic in laboratory animals. Because the reliability of oral contraceptives might be affected by rifampin therapy, consideration should be given to using alternative contraceptive measures while rifampin is being administered.
[b]Ciprofloxacin is not generally recommended for persons aged <18 years or for pregnant and lactating women because the drug causes cartilage damage for immature laboratory animals. However, ciprofloxacin may be used for chemoprophylaxis of children when no acceptable alternative therapy is available. A recent review identified no reports of irreversible cartilage toxicity or age-associated adverse events in children and adolescents (Source: Burstein GR, Berman SM, Blumer JL, Moran JS. Ciprofloxacin for the treatment of uncomplicated gonorrhea infection in adolescents: does the benefit outweigh the risk? Clin Infect Dis 2002;35:S191–9).

Above information taken from *Red Book: 2018-2021 Report of the Committee on Infectious Diseases*

Activities by Setting

Schools or Institutions

- When a case of invasive meningococcal disease is identified in a school or other institution, public health should immediately contact facility administrators to recommend that the institution rapidly communicate with its population, and to help guide messaging.
    - Information communicated should include:
        - Notification about the case (obtain consent if the name of the case is tobe released)
        - Reassurance that the chance of another case is remote
        - Signs and symptoms of invasive meningococcal disease and instructions to seek care promptly if they occur
        - Chemoprophylaxis is not needed unless individuals have been contacted by public health authorities.
- Vaccination with available meningococcal vaccines offers longer-term protection and is routinely recommended for adolescents and others at increased risk.
    - Meningococcal conjugate vaccines (Menactra® and Menveo®) available in the US provide protection against 4 of the 5 most common serogroups of *N. meningitidis* (serogroups A, C, W, and Y).
    - Serogroup B vaccines (Trumenba® and Bexsero®) provides protection for the other most common serogroup, serogroup B.
    - Approximately 2 weeks are required following vaccination for the development of protective antibody levels.
        - For more information about these vaccines call the DSHS Immunization Division at 512-776-7284.

General Public

- Provide education, when needed:

- There are 2 vaccines available in the US that provide protection against the 5most common serogroups of *N. meningitidis* (serogroups A,B, C, W, and Y). These are meningococcal conjugate and serogroup B vaccines. For more information about these vaccines call the DSHS Immunization Division at 512-776-7284.
- Routine hand washing and practicing respiratory etiquette (e.g., covering mouthand nose while sneezing or coughing) are essential to prevent the spread of bacteria.
- Limit sharing food, eating utensils and other personal belongings.

Exclusion
Children with meningitis and bloodstream infections caused by *N. meningitidis* should be excluded from school and daycare until written permission is provided by their healthcare provider. According to the Texas Administrative Code (TAC), children in school and childcare settings shall be excluded until 24 hours after start of effective treatment and approval by health care provider.

Children with a fever from any infectious cause should be excluded from school and daycare for at least 24 hours after fever has subsided without the use of fever suppressing medications.

MANAGING SPECIAL SITUATIONS

If there are ≥2 suspected cases in the same institution or social group, an area or organization has met the outbreak threshold, and for guidance about other unusual situations, immediately notify EAIDU at **(800) 252-8239 or (512) 776-7676**.

Attack Rate Calculations
Attack rates are calculated to determine the risk for disease among the general population and to determine whether overall rates have increased.

1. Determine if any cases are secondary or co-primary cases. If the two cases are determined not to be co-primary or secondary, evaluation should continue to see if the cases represent an organizational outbreak.
    a. Primary case: A primary a case of invasive meningococcal disease is one thatoccurs in the absence of previous known close contact with another patient with invasive meningococcal disease.
    b. Secondary case: A secondary case of invasive meningococcal disease is one that occurs among close contacts of a primary case-patient 24 hours or more after onset of illness in the primary patient. (Note: Occurrence of secondary cases will be rareif chemoprophylaxis is administered as recommended.)
    c. Co-primary case: Co-primary cases are two or more cases that occur among agroup of close contacts with onset of illness separated by less than 24 hours.
    d. Close contacts: Close contacts of a patient who has invasive meningococcal disease include household members (including dormitory room, barracks), child care center contacts, and persons directly exposed to the patient's oral/nasal secretions (e.g., by kissing, mouth-to-mouth resuscitation, unprotected endotracheal intubation, or unprotected endotracheal tube management).
2. To calculate a primary attack rate all confirmed cases of the same serogroup should be summed, secondary cases should be excluded, and each set of co-primarycases should be counted as one case.

$$\text{Attack rate/100,000} = \frac{\text{Number of primary confirmed or probable cases occurring during a 3-month period}}{\text{Number of population at risk during the same time period}} \times 100{,}000$$

Population at risk: Persons who are considered to be at increased risk for invasive

meningococcal disease compared with historical rates of disease in the same group of the general US population. Population at risk is usually defined on the basis of community of residence or organizational affiliation. In organization-based outbreaks, the population at risk can be defined as the group of persons that best represent the affiliation. In community-based outbreaks, patients do not share any common affiliation besides an area of residence.

Two or More Cases with the Same or Similar PFGE Patterns

DSHS EAIDU monitors molecular laboratory data for invasive meningococcal disease cases whose isolates have indistinguishable (matching) or similar pulsed-field gel electrophoresis (PFGE) patterns. EAIDU defines a PFGE cluster as one of the following:

- At least 2 cases with matching pulsed-field gel electrophoresis (PFGE) patterns in a county in a 1-year period
- At least 2 cases with matching PFGE patterns anywhere in Texas in a 3-monthperiod

When a PFGE cluster is identified:

- EAIDU will inform the Health Service Region (HSR); the HSR should inform thelocal health department(s) (LHDs) with jurisdiction over the cases (if applicable).
- If not already submitted, completed case investigation forms will be requested on cases that are part of the cluster.
- Case investigation forms for the clustered cases should be reviewed for common exposures.
- The investigating jurisdiction(s) may be asked to re-interview the cases or completea supplemental case form.
- Threshold calculations may be conducted.
- Enhanced surveillance may be considered if cases are sufficiently temporally and/or geographically clustered or if they occur in a defined population and outbreak thresholds are not met.

Two or More Cases Associated with a School, Daycare, Nursing Home, Correctional Facility or Closed Setting

When ≥2 invasive meningococcal disease cases are associated with an organization, the local/regional health department:

- Should thoroughly investigate links between the cases
    - LHDs should work closely with HSRs and EAIDU to coordinate information on invasive meningococcal disease cases from different jurisdictions.
- Should recommend basic control measures including hand hygiene, and respiratory etiquette education for residents/patients and staff
- Should conduct active surveillance for new cases of disease for a minimum of2 weeks after the onset of the last case
- Should take steps to reduce overcrowding (if applicable)
- Should determine the population of the organization or affiliation and calculate attack rates for the organization by classroom, grade, unit or other grouping.
    - Organization-based outbreak: The occurrence of 2-3 confirmed or probable cases of invasive meningococcal disease of the same serogroup in a period of ≤3 months among persons who have a common affiliation but no close contact with each other, resulting in a primary disease attack rate of >10 cases per 100,000 persons.
    - Organization-based outbreaks may occur among children, students, residents and/or staff at a university, school, daycare, nursing home, correctional facility, church, employer, club, sports team or other organizational or closed setting.
- May consider mass antibiotic chemoprophylaxis for limited or closed populations (e.g., a single school or residential facility)
    - If mass chemoprophylaxis is undertaken, it should be administered to all targeted persons at the same time.
    - It is possible that even in a vaccine-preventable, organization-based outbreak, antibiotic distribution may be a more timely intervention, since preventive antibodies take 7-10 days to develop after vaccination.

- Should vaccinate the population at risk if the attack rate is >10 cases per 100,000 population
    - In some instances, the attack rate will be >10 cases per 100,000 populations with only 2-3 cases. In these situations, vaccination may be considered after only 2 primary cases are identified.
    - The actual attack rate at which the decision to vaccinate is made may vary and the following factors should be considered:
        - Completeness of case reporting and number of possible cases of invasive meningococcal disease for which bacteriologic confirmation or serogroup data are not available
        - Occurrence of additional cases of invasive meningococcal disease after recognition of a suspected outbreak
        - Logistic and financial considerations
    - Consult with EAIDU and the DSHS Immunization Branch to determine the need for and availability of vaccine.

Note: In the United States, measures that have not been recommended for control of invasive meningococcal disease outbreaks include restricting travel to areas with an outbreak, closing schools or universities, or canceling sporting or social events.

Multiple Cases Located within a Community

When multiple cases occur in a community, the local/regional health department should:

- Thoroughly investigate links between the cases
    - LHDs should work closely with HSRs and EAIDU to coordinate information on meningococcal disease cases from different jurisdictions.
- Consider enhanced surveillance to detect additional cases in the community
- Determine the population of the community and calculate attack rates with the outbreak strain among the population at risk, as described in the *Control of Communicable Diseases Manual, Epidemiology and Prevention of Vaccine-Preventable Diseases* ("Pink book") and *Manual for the Surveillance of Vaccine-Preventable Diseases*.
    - Community-based outbreak**:** Multiple outbreak-associated cases with an incidence of meningococcal disease that is above the expected incidence in a community during a 3-month period. Cases have no common affiliations to an organization but are instead linked by a shared, geographically defined community with a primary attack rate of >10 cases per 100,000 population.
    - Examples of settings for a community-based outbreak include neighborhood, zip code, school district, city or county, and may include populations with shared characteristics, such as men who have sex with men, as long as no affiliation to a specific organization is identified.
    - Note: For outbreak threshold calculations, population-based rates are used, and not age-specific attack rates, as have been calculated for college students.

When a community-based outbreak (based on calculations) is occurring:

- Conduct active surveillance to detect other cases in the population.
- Conduct a public education campaign.
- Immunize unvaccinated members of the at-risk population.
    - The actual attack rate at which the decision to vaccinate is made may vary and the following factors should be considered:
        - Completeness of case reporting and number of possible cases of invasive meningococcal disease for which bacteriologic confirmation or serogroup data are not available
        - Occurrence of additional cases of invasive meningococcal disease after recognition of a suspected outbreak
        - Logistic and financial considerations
    - Consult with EAIDU and the DSHS Immunization Branch to determine the need for and availability of vaccine.

Note: Mass chemoprophylaxis (with antibiotics) is not usually effective for widespread communities but may be considered for small sub-populations (e.g., schools) that are directly experiencing cases. If mass chemoprophylaxis is undertaken, it should be administered to all targeted persons at the same time.

Outbreaks
If an outbreak of meningococcal disease is suspected, notify the regional DSHS office or EAIDU at **(800) 252-8239 or (512) 776-7676**.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School & Child-Care Facilities, and General Public Reporting Requirements
Laboratory confirmed and clinically suspected cases are required to be reported **immediately** to the local or regional health department or to DSHS EAIDU at **(800) 252-8239 or (512) 776-7676.**

Local and Regional Reporting and Follow-up Responsibilities
Local and regional health departments should:

- Call DSHS EAIDU immediately when an investigation is being done or considered.
- Enter the case into NBS and submit an NBS notification on all **confirmed**, **probable, and suspect** cases to DSHS within 30 days of receiving a report of a confirmed, probable, or suspect case.
    - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules (forlink to NBS guidelines see Appendix D).
    - A notification can be sent as soon as the case criteria havebeen met. Additional information from the investigation may be entered upon completion of the investigation.
- Fax, send a secure email, or mail a completed investigation form when the NBSnotification is submitted.
    - **In the event of a death, copies of the hospital discharge summary, death certificate and autopsy report should also be sent to DSHS EAIDU.**
    - Investigation forms may be faxed to **512-776-7616**, securely emailed to VPDTexas@dshs.texas.gov or mailed to:

      Emerging and Acute Infectious Disease Unit
      Texas Department of State Health Services
      Mail Code: 1960
      PO Box 149347
      Austin, TX 78714-9347

When an outbreak is investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDU at **(800) 252-8239 or 512-776-7676.**
- Submit a completed **Respiratory Disease Outbreak Summary Form** at the conclusion of the outbreak investigation.
    - Send a copy to the DSHS regional office and/or to EAIDU see above methodsfor sending.
    - The Respiratory Disease Outbreak Summary Form is available at https://www.dshs.texas.gov/idcu/investigation.aspx

LABORATORY PROCEDURES

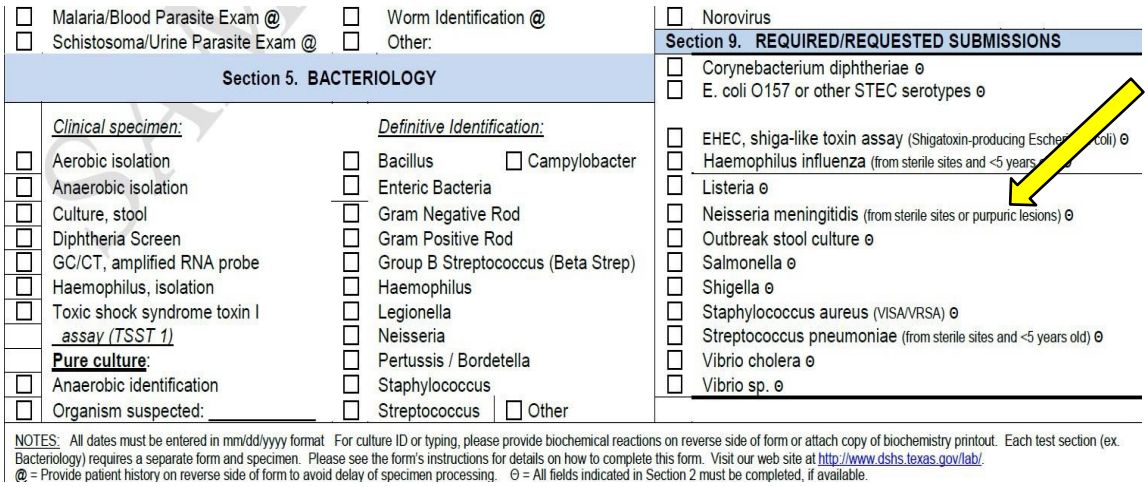
Neisseria meningitidis isolates from normally sterile sites and/or purpuric lesions are required to be submitted to the DSHS Laboratory for typing and molecular analysis. Before shipping specimens, be sure to notify DSHS EAIDU staff at **(512) 776-7676**.

Specimen Collection

- Submit isolates of *N. meningitidis* (preferred specimen) on blood or chocolate agar at ambient temperature.
    - Note: Isolates that are no longer viable can still be tested. Please contact EAIDU to discuss testing options. If an isolate/culture is not available, EAIDU recommends sending blood, CSF, or any other available specimen from a sterile site or purpuric lesions (for PCR testing at CDC).
- Submit blood in a red or tiger-top vacutainer. Transport at ambient temperature.
- Submit spinal fluid. Transport at room temperature. DO NOT REFRIGERATE.

Laboratory Submission Form

- Use the DSHS Laboratory G-2B Specimen Submission Form.
- For isolates of *N. meningitidis*:
    - On the G-2B Form in "Section 9. Required/Requested Submissions" check "Neisseria meningitidis". Also select the appropriate box in "Section. 5 Bacteriology."



☐ Malaria/Blood Parasite Exam @ ☐ Worm Identification @
☐ Schistosoma/Urine Parasite Exam @ ☐ Other:

Section 5. BACTERIOLOGY

Clinical specimen:	*Definitive Identification:*
☐ Aerobic isolation	☐ Bacillus ☐ Campylobacter
☐ Anaerobic isolation	☐ Enteric Bacteria
☐ Culture, stool	☐ Gram Negative Rod
☐ Diphtheria Screen	☐ Gram Positive Rod
☐ GC/CT, amplified RNA probe	☐ Group B Streptococcus (Beta Strep)
☐ Haemophilus, isolation	☐ Haemophilus
☐ Toxic shock syndrome toxin I assay (TSST 1)	☐ Legionella
	☐ Neisseria
Pure culture:	☐ Pertussis / Bordetella
☐ Anaerobic identification	☐ Staphylococcus
☐ Organism suspected: _____	☐ Streptococcus ☐ Other

☐ Norovirus

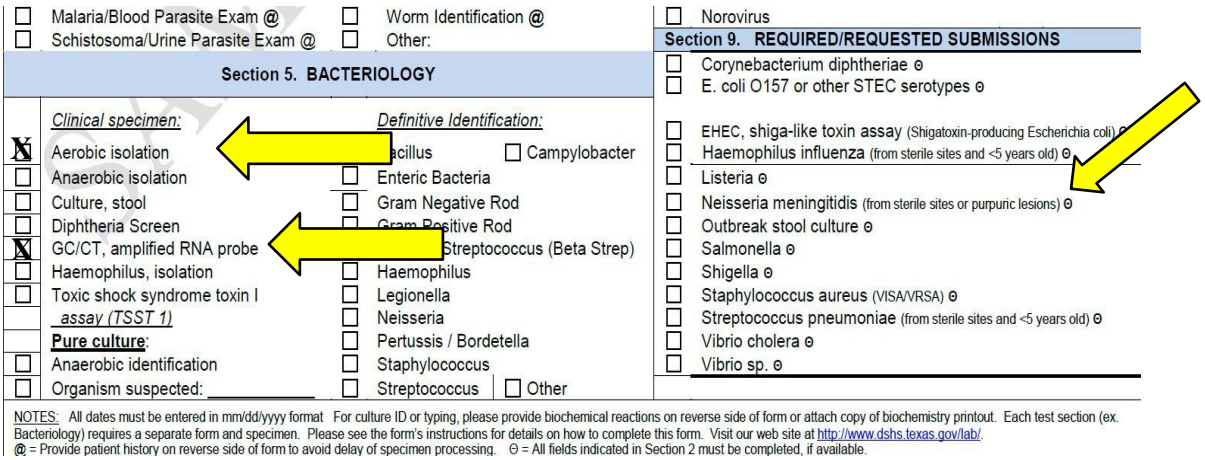
Section 9. REQUIRED/REQUESTED SUBMISSIONS

☐ Corynebacterium diphtheriae ⊖
☐ E. coli O157 or other STEC serotypes ⊖
☐ EHEC, shiga-like toxin assay (Shigatoxin-producing Escherichia coli) ⊖
☐ Haemophilus influenza (from sterile sites and <5 years old) ⊖
☐ Listeria ⊖
☐ Neisseria meningitidis (from sterile sites or purpuric lesions) ⊖
☐ Outbreak stool culture ⊖
☐ Salmonella ⊖
☐ Shigella ⊖
☐ Staphylococcus aureus (VISA/VRSA) ⊖
☐ Streptococcus pneumoniae (from sterile sites and <5 years old) ⊖
☐ Vibrio cholera ⊖
☐ Vibrio sp. ⊖

NOTES: All dates must be entered in mm/dd/yyyy format For culture ID or typing, please provide biochemical reactions on reverse side of form or attach copy of biochemistry printout. Each test section (ex. Bacteriology) requires a separate form and specimen. Please see the form's instructions for details on how to complete this form. Visit our web site at http://www.dshs.texas.gov/lab/.
@ = Provide patient history on reverse side of form to avoid delay of specimen processing. ⊖ = All fields indicated in Section 2 must be completed, if available.

- For blood or spinal fluid specimens:

    On the G-2B Form in "Section 5. BACTERIOLOGY," check "Aerobic isolation" under "*Clinical specimen*". Please write "*N. meningitidis*" in the white space next to "Aerobic isolation" (see below). Also, please check the box for *Neisseria meningitidis* in the required/ requested submission.



☐ Malaria/Blood Parasite Exam @ ☐ Worm Identification @
☐ Schistosoma/Urine Parasite Exam @ ☐ Other:

Section 5. BACTERIOLOGY

Clinical specimen:	*Definitive Identification:*
[X] Aerobic isolation	☐ acillus ☐ Campylobacter
☐ Anaerobic isolation	☐ Enteric Bacteria
☐ Culture, stool	☐ Gram Negative Rod
☐ Diphtheria Screen	☐ Gram Positive Rod
[X] GC/CT, amplified RNA probe	☐ Streptococcus (Beta Strep)
☐ Haemophilus, isolation	☐ Haemophilus
☐ Toxic shock syndrome toxin I assay (TSST 1)	☐ Legionella
	☐ Neisseria
Pure culture:	☐ Pertussis / Bordetella
☐ Anaerobic identification	☐ Staphylococcus
☐ Organism suspected: _____	☐ Streptococcus ☐ Other

☐ Norovirus

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☐ E. coli O157 or other STEC serotypes ⊖
☐ EHEC, shiga-like toxin assay (Shigatoxin-producing Escherichia coli) ⊖
☐ Haemophilus influenza (from sterile sites and <5 years old) ⊖
☐ Listeria ⊖
☐ Neisseria meningitidis (from sterile sites or purpuric lesions) ⊖
☐ Outbreak stool culture ⊖
☐ Salmonella ⊖
☐ Shigella ⊖
☐ Staphylococcus aureus (VISA/VRSA) ⊖
☐ Streptococcus pneumoniae (from sterile sites and <5 years old) ⊖
☐ Vibrio cholera ⊖
☐ Vibrio sp. ⊖

NOTES: All dates must be entered in mm/dd/yyyy format For culture ID or typing, please provide biochemical reactions on reverse side of form or attach copy of biochemistry printout. Each test section (ex. Bacteriology) requires a separate form and specimen. Please see the form's instructions for details on how to complete this form. Visit our web site at http://www.dshs.texas.gov/lab/.
@ = Provide patient history on reverse side of form to avoid delay of specimen processing. ⊖ = All fields indicated in Section 2 must be completed, if available.

Specimen Shipping

- Provide a shipment tracking number to DSHS if possible.
- DO NOT ship specimens on a Friday or the day before a state holiday unless special arrangements have been made with the DSHS Laboratory.
- *N. meningitidis* is considered an infectious agent, biosafety level 2. The isolate should be triple-contained in accordance with federal regulations.
- Ship specimens to:

Laboratory Services Section, MC-1947
Texas Department of State Health Services
Attn. Walter Douglass (512) 776-7569
1100 West 49th Street
Austin, TX 78756-3199

Frequent Causes for Rejection:

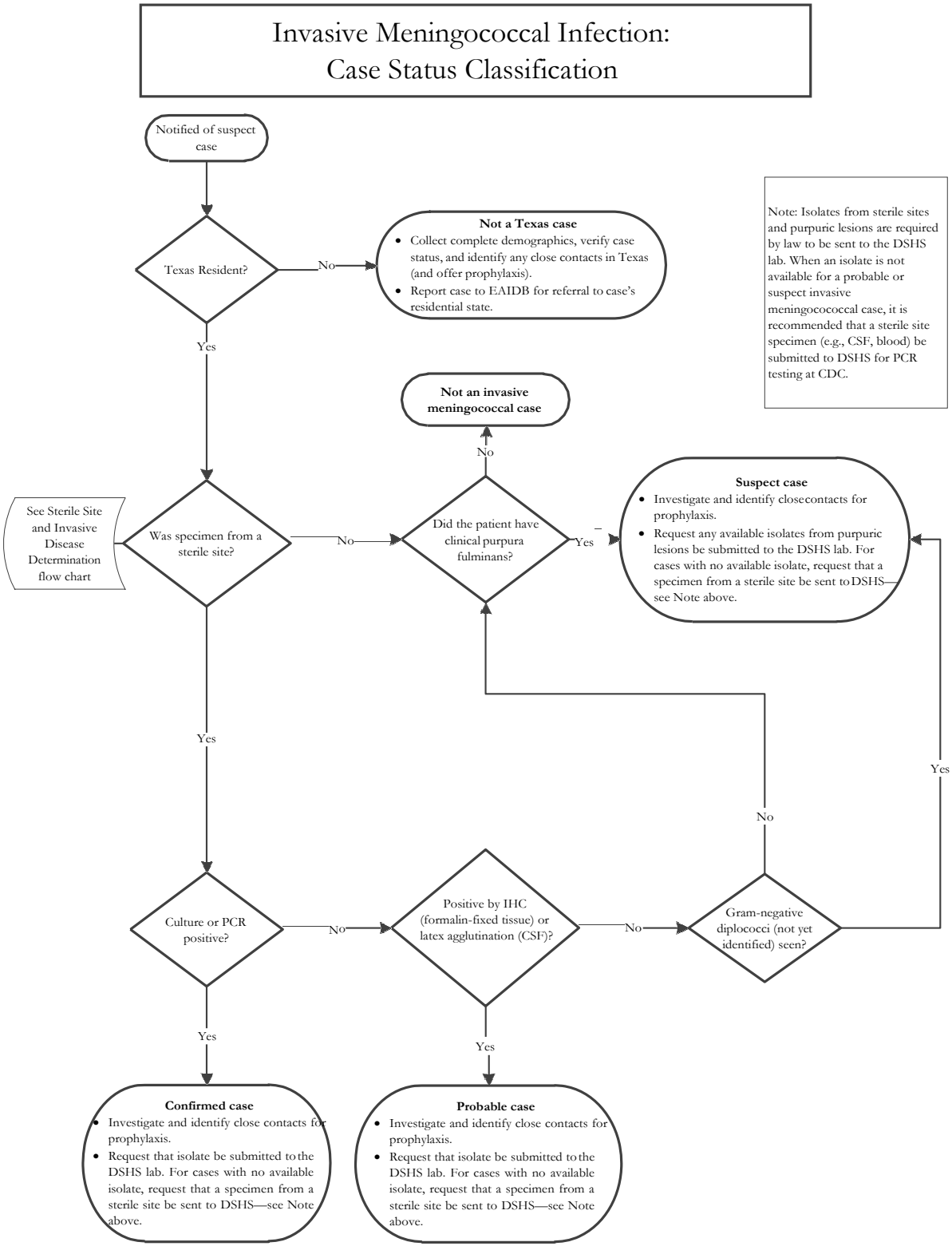
- Discrepancy between patient name on tube and name on submission form
  - Include two patient identifiers on the specimen media such as patient first and last name AND date of birth.
- Expired media used

REVISION HISTORY

March 2021

- Added Prophylaxis Guidelines Section
- Added prophylaxis table based on the Red Book.

FLOW CHART


Invasive Meningococcal Infection:
Case Status Classification
Notified of suspect case
Texas Resident?
No
Not a Texas case
Collect complete demographics, verify case status, and identify any close contacts in Texas (and offer prophylaxis).
Report case to EAIDB for referral to case's residential state.
Yes
Note: Isolates from sterile sites and purpuric lesions are required by law to be sent to the DSHS lab. When an isolate is not available for a probable or suspect invasive meningococcal case, it is recommended that a sterile site specimen (e.g., CSF, blood) be submitted to DSHS for PCR testing at CDC.
Not an invasive meningococcal case
No
See Sterile Site and Invasive Disease Determination flow chart
Was specimen from a sterile site?
No
Did the patient have clinical purpura fulminans?
Yes
Suspect case
Investigate and identify closecontacts for prophylaxis.
Request any available isolates from purpuric lesions be submitted to the DSHS lab. For cases with no available isolate, request that a specimen from a sterile site be sent to DSHS—see Note above.
Yes
No
Yes
Culture or PCR positive?
No
Positive by IHC (formalin-fixed tissue) or latex agglutination (CSF)?
No
Gram-negative diplococci (not yet identified) seen?
Yes
Yes
Yes
Confirmed case
Investigate and identify close contacts for prophylaxis.
Request that isolate be submitted to the DSHS lab. For cases with no available isolate, request that a specimen from a sterile site be sent to DSHS—see Note above.
Probable case
Investigate and identify close contacts for prophylaxis.
Request that isolate be submitted to the DSHS lab. For cases with no available isolate, request that a specimen from a sterile site be sent to DSHS—see Note above.