

# Disease Investigation Manual For Chronic Disease, STD/HIV, TB, and Reportable Conditions



City of El Paso Department of Public Health  
El Paso, Texas

## **Acknowledgements**

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## **Executive Summary**

The City of El Paso Department of Public Health has a mission to work in partnership with people in our community to promote and protect the health of the Borderland.

El Paso, Texas is located along the border between New Mexico and Texas and serves an international boundary of the United States and Mexico. Health, however, has no borders. El Paso has a unique public health situation because it shares immediate geographical proximity to Ciudad Juarez, Chihuahua, Mexico. Monitoring health is vital in preventing disease and essential in agenda setting, policy making, health promotion, and education.

The population of this border region is in an epidemiologic transition stage which morbidity and mortality resulting from infectious and chronic disease coexists. Chronic diseases such as diabetes, cardiovascular diseases, obesity, cancer and respiratory diseases are prevalent in the El Paso community. Communicable diseases such as Tuberculosis and HIV/AIDS are associated conditions that influence diseases behavior. Unfavorable Social determinants of health and other factors affect health outcomes. Factors related to health outcomes include: growth and development, education, employment and type of work, food security, access to health services and the quality of those services, housing status, economic status and, discrimination and social support.

There is a need to establish guidelines and protocols to investigate disease in order to respond adequately to community needs.

The *Disease Investigation Manual for Chronic Disease, STD/HIV, TB, and Reportable Conditions* needs to be followed in order to set standardized, coordinated and effective response to citizens that suspect diseases, and to organize community interventions such as surveillance, communication and education/prevention campaigns.

# **PART I**

## ***Chronic Disease Investigation Protocol Manual***

**City of El Paso**

**Department of Public Health**

**2013**

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# Background

## *Heart Disease and Stroke*

Heart disease and stroke, the first and third leading causes of death in the United States, are the most common cardiovascular diseases.

- Heart disease accounted for 26% of deaths in Texas in 2005, while stroke caused 6% of deaths.
- In 2007, 28% of adults in Texas reported having high blood pressure (hypertension) and 39% of those screened reported having high blood cholesterol, which puts them at greater risk for developing heart disease and stroke.
- Coronary Heart Disease. U.S. Baseline, 126.0 coronary heart disease deaths per 100,000 population occurred in 2007.
- El Paso County: 104.5 cancer deaths per 100,000 population occurred in 2007
- Stroke U.S. Baseline, 42.2 deaths per 100,000 population occurred in 2007.
- El Paso County: 40.8 cancer deaths per 100,000 population occurred in 2007

## *Cancer*

Cancer is the second leading cause of death in the United States, accounting for almost one in every four deaths.

- 22% of all deaths in Texas in 2005 were due to cancer.
- The American Cancer Society estimates that 91,020 new cases of cancer were diagnosed in Texas in 2007, including 9,510 new cases of colorectal cancer and 12,120 new cases of breast cancer in women.
- U.S. Baseline: 178.4 cancer deaths per 100,000 population occurred in 2007
- El Paso County: 145.5 cancer deaths per 100,000 population occurred in 2007

## *Diabetes*

In 2005, diabetes was the sixth leading cause of death in the U.S. Likely to be underreported as a cause of death, the risk of death among people with diabetes is about twice that of people without diabetes of similar age.

- 5,605 adults in Texas died from diabetes mellitus in 2005.
- In 2007, 10% of adults in Texas reported being diagnosed with non-pregnancy related diabetes.<sup>o</sup>
- 8.2% of Adults with Diabetes, State of Texas 2010
- 12.2 of Adults with Diabetes, State of Texas 2010

## *Obesity*

Obesity increases the risk of a number of health conditions including hypertension, adverse lipid concentrations, and type 2 diabetes.

The prevalence of obesity in the United States increased during the last decades of the 20th century.

- More than one-third of adults and almost 17% of youth were obese in the U.S., 2009–2010.
- 31.7 % Adult Obesity (20 years and older), State of Texas, 2010
- 21.6 Adult Obesity (20 years and older), State of Texas, 2010



# Introduction

The Chronic Disease Investigation Protocol has been created to ensure a standardized and coordinated response from the City of El Paso Department of Public Health (EPDPH) employees who receive calls regarding suspected clusters of chronic disease.

The investigation can be divided into four stages: coordination, verification, investigation, and epidemiological study. The first three stages are described here. Conducting an epidemiological study is beyond the scope of this document. The boundaries between these stages are flexible, and the steps do not necessarily follow the order indicated.

In each stage decisions must be made. The results of these decisions must be communicated to those reporting the cluster, local health jurisdictions, and to the public. The investigation process can be described by the following steps:

## *Stage I: Coordination*

- Receive report, pass to proper EPDPH team member
- Contact health jurisdictions
- Work out response plan

## *Stage II: Verification*

- Verify cases
- Compare rates
- Decide if report meets investigation criteria

## *Stage III: Investigation A*

- Collect risk factor information on cases
- Decide if cases can be explained by recognized risk factors
- Obtain information on local exposures of interest
- Decide if cluster meets study criteria

During and after each stage (Appendix VI):

- Communicate findings
- Document findings

#### *Stage IV: Epidemiological Study*

Further investigation may involve a case-control, cohort, or cross-sectional study. Consultation with appropriate specialists and agencies is recommended: Centers for Disease Control and Prevention,, the Agency for Toxic Substances and Disease Registry, and the Environmental Protection Agency. (Appendix VII).

# Appendix I

## Cluster Reports Disease Specialist Guide

When a call comes in reporting a group of diseases in your specialty:

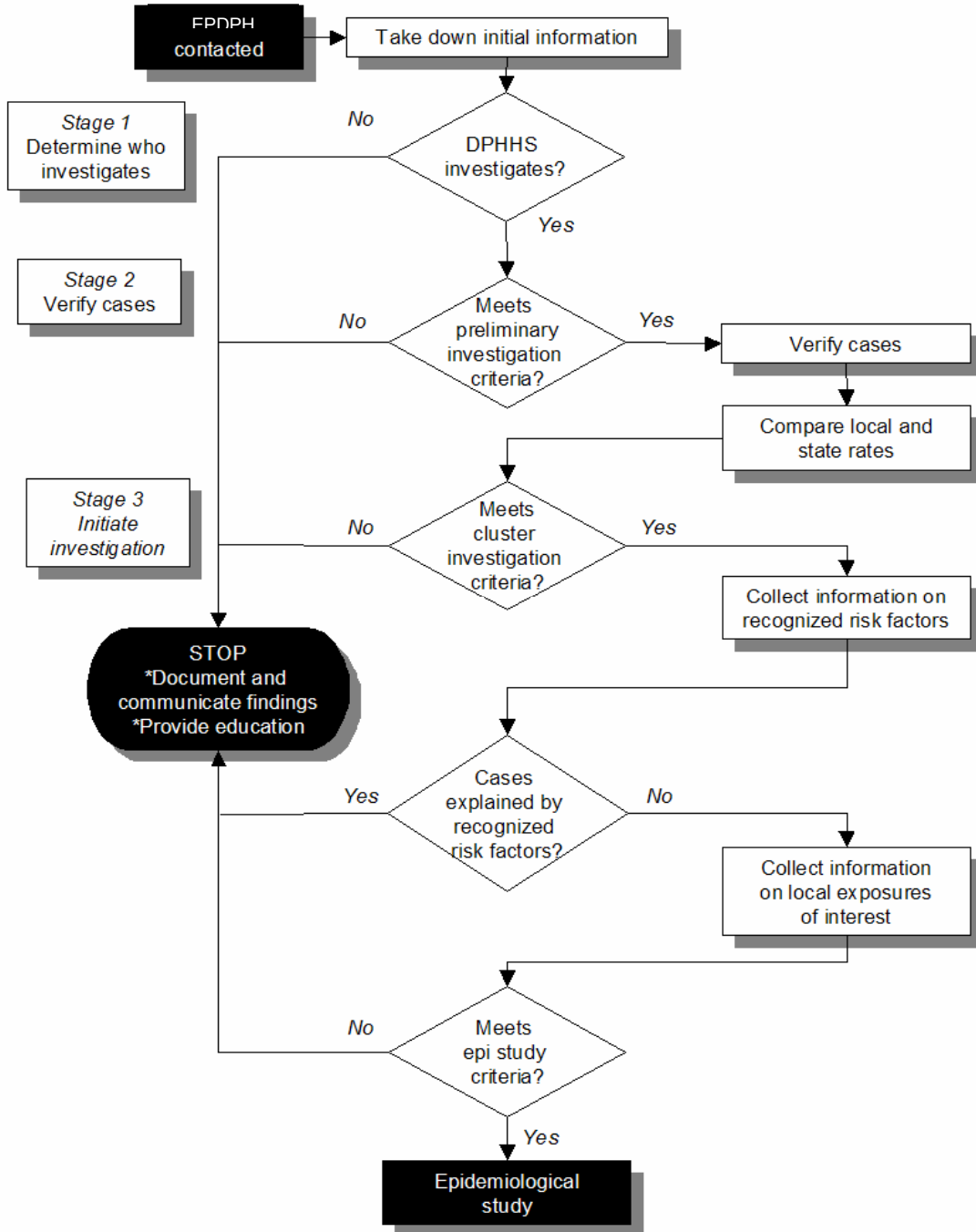
1. Return the informant's call or send acknowledgement letter or e-mail.
  - a. Fill out the Cluster Report Form (Appendix A) and Case Information Forms (Appendix B) as completely as possible. Fill out one Case form for each case known to the informant. These forms will be filled directly into the Non-infectious Cluster Calls Database on a share drive on newaries\epidemiology (z:).
  - b. Acknowledge that their report has been received and an investigation will be conducted. Provide education on the usual frequency, rates and common risk factors for the disease of concern. A sample acknowledgement letter is in Appendix VI.
  - c. Let the informant know what steps will be followed and the time frame when s/he can expect to hear results from you.
  - d. If not already completed, transfer information collected into the Non-infectious Cluster.

Calls Database on the share drive.

2. Contact the appropriate local health department.
  - a. Work out a response plan.
  - b. If the local health department decides to take the lead, provide data and educational materials as needed.
  - c. If the local health department prefers you to take the lead, follow the El Paso Non-infectious Disease Investigation Protocol.
3. Communicate findings.
  - a. Send initial letter or e-mail to informant with preliminary results.
  - b. Send completed report to informant, local health department and environmental contacts, if required.
  - c. Update Non-infectious Cluster Calls Database.

# Appendix II

## Overview: Investigation Process



## Appendix III

### City of El Paso Department of Public Health Contact List

Lead Epidemiologist

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Assistant Director

Bruce Parsons, [parsonsb@elpasotexas.gov](mailto:parsonsb@elpasotexas.gov)

# Appendix IV

## Health Event Report Form

Date: \_\_\_\_\_

Person Completing Form: \_\_\_\_\_

Name of Reporter: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone Number:

(Home) \_\_\_\_\_ (Work) \_\_\_\_\_ (Cell) \_\_\_\_\_

E-mail: \_\_\_\_\_

Affiliation: \_\_\_\_\_

Health Event: \_\_\_\_\_

Other Agencies Contacted: \_\_\_\_\_

\_\_\_\_\_

Additional Information:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Appendix V

## Cluster Case Information Form

Cluster ID: \_\_\_\_\_

Case Number: \_\_\_\_\_

Case's Name: \_\_\_\_\_

Phone: (Home) \_\_\_\_\_ (Work) \_\_\_\_\_ (Cell) \_\_\_\_\_

Gender: \_\_\_\_\_ Ethnicity: \_\_\_\_\_

DOB: \_\_\_\_\_ Age: \_\_\_\_\_

Home Address: \_\_\_\_\_

Dates of Residence: From: \_\_\_\_\_ To: \_\_\_\_\_

Type of Work: \_\_\_\_\_

Place of Work: \_\_\_\_\_

Number of Years Worked: \_\_\_\_\_

Diagnosis: \_\_\_\_\_

Date of Dx: \_\_\_\_\_ Place of Dx: \_\_\_\_\_

Smoking History: \_\_\_\_\_

Suspected Exposure: \_\_\_\_\_

## **Appendix VI**

### **Sample Acknowledgement Letter**

Dear <informant>,

Thank you for contacting The City of El Paso Department of Public Health (EPDPH). I have received your request for information on the number of people with <disease> in <counties> and have begun an investigation.

Unfortunately, no one can say with certainty what caused any one person's <disease>. We can only talk in general terms about the known and suspected factors that increase a person's risk of disease. More information on <disease> and its risk factors can be found on the attached fact sheet.

I hope this information is helpful. I should be able to get the results of our investigation to you by <one month from date>. If you have additional questions about the investigation process, please feel free to contact me.

### **Sample Cancer Results Letter**

Dear <informant>,

Thank you for asking about cancer in El Paso, Texas. You are not alone with questions about cancer and chronic disease. We receive many inquiries from people wondering if the diseases they see occur more frequently in their community than elsewhere.

The Department of State Health Services has collected information since XXX. Information on cancer in <counties> is listed in the table below. In order to determine if there are more cancers in these counties compared to the rest of Texas and the entire United States, rates of cancer have been provided. The rates show the number of cancers expected if there were 100,000 people in these counties. Since people with cancer tend to be older, these rates have also been adjusted to take into account the age distributions of the counties.



## Example Table

### Sample Non-cancer Results Letter

Dear <informant>,

Thank you for asking about <disease> in El Paso, Texas. You are not alone with questions about cancer and chronic disease. We receive many inquiries from people wondering if the diseases they see occur more frequently in their community than elsewhere.

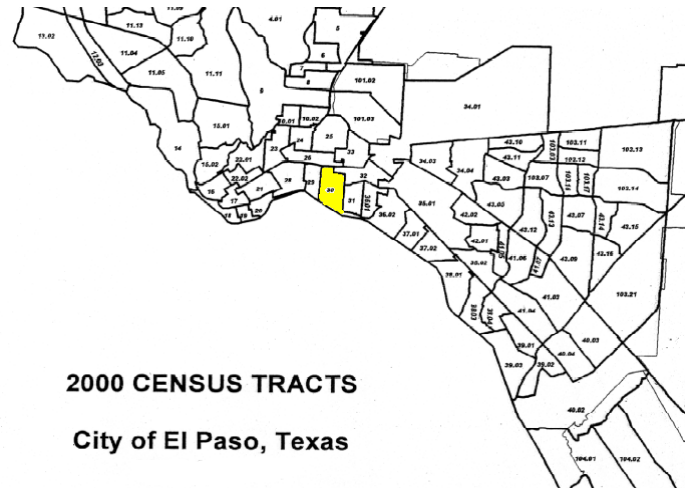
The City of El Paso Department of Public Health does not collect information on <disease>. Nationally, <what is known>. Information about <disease> in Texas comes from <source>. Unfortunately, no one can say with certainty what caused any one person's <disease>. We can only talk in general terms about the known and suspected factors that increase a person's risk of disease. More information on <disease> and its risk factors can be found on the attached fact sheet.

I hope this information is helpful to you. Please feel free to contact me with any further questions.

## Appendix VII

City of El Paso, Department of Public Health  
Epidemiology Program  
Cancer Investigation Report  
September 13, 2010

On the cancer cluster alarm reported from the Modesto Park area (Census Tract 30, 79905)



### Final results and conclusions:

Based on information reported from the Texas Cancer Registry, Epidemiology studies and initiatives branch of the Texas Department of State Health Services, it is concluded that the present case does not represent a cancer cluster.

All the cancer rates, not only for lung and leukemia subtypes (which were the types of cancer of main concern for the community) but also for breast, prostate, bladder, Kidney, and all those types of cancer analyzed, show no excess; this means that the actual number of cancer cases in the Modesto Park area (census tract 30) falls within the range of expected cases of cancer, thus, the occurrences do not represent a Public Health Problem.

### Recommendations:

1. The American Cancer Society contact is Maria Ruiz, Community Relations Officer, (915) 544-4478. They can provide assistance in related cancer services.
2. From the investigation report for Census Tract 30, El Paso, general information on risk factors for each type of cancer investigated can be found, however, a very important source of information on local cancer services such as screening, cancer education and cancer case management services is: the Cancer and Chronic Disease Consortium <http://swccdc.org/>

## Appendix VIII

### About the NCCN Guidelines for Patients<sup>®</sup>

The National Comprehensive Cancer Network<sup>®</sup> (NCCN<sup>®</sup>) aims to provide people with cancer and the general public state-of-the-art cancer treatment information in easy-to-understand language. The NCCN Guidelines for Patients<sup>®</sup>, based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines<sup>®</sup>), are meant to help you when you talk with your doctor about treatment options that are best for you. These guidelines do not replace the expertise and clinical judgment of your doctor.

NCCN is pleased to present the new NCCN Guidelines for Patients<sup>®</sup> on Breast Cancer, Caring for Adolescents and Young Adults, Chronic Myelogenous Leukemia, Colon Cancer, Lung Cancer Screening, Non-Small Cell Lung Cancer, Malignant Pleural Mesothelioma, Melanoma, Multiple Myeloma, Prostate Cancer, Ovarian Cancer, and Pancreatic Cancer. Additional NCCN Guidelines for Patients<sup>®</sup> will be available shortly, and NCCN is committed, with the support of the NCCN Foundation, to develop and distribute many more in the coming months.

<http://www.nccn.com/>

## Appendix IX

### Nationally Notifiable Non-Infectious Conditions

- Cancer
- Elevated blood lead levels
  - Child (<16 years)
  - Adult (≥16 Years)
- Foodborne disease outbreak
- Pesticide-related illness, acute
- Silicosis
- Waterborne disease outbreak

### 2012 Nationally Notifiable Diseases and Conditions and Current Case Definitions

Prepared by:

The Division of Notifiable Diseases and Healthcare Information (proposed)

Public Health Surveillance and Informatics Program Office (proposed)

Office of Surveillance Epidemiology and Laboratory Services

Centers for Disease Control and Prevention

*Case Definitions based upon CSTE Position Statements available at [www.CSTE.org](http://www.CSTE.org)*

## ***Cancer***

2010 Case Definition

CSTE Position Statement Number: 09-CD-01

### Clinical Description

Cancer cases under national public health surveillance include:

- Incident invasive cancers at all sites with the exception of basal cell and squamous cell carcinoma of the skin;
- Incident *in situ* cancers at all sites with the exception of carcinoma *in situ* of the cervix uteri, or any intraepithelial neoplasia (cervical intraepithelial neoplasia [CIN], prostate intraepithelial neoplasia [PIN], etc.);
- Incident benign and borderline central nervous system tumors

### Laboratory Criteria for Diagnosis

Pathological or cytological diagnosis

### Case Classification

Confirmed

- A diagnosis of cancer (*in situ* or invasive) or central nervous system tumor (benign or borderline) by a recognized medical practitioner that includes the use of specific terms synonymous with cancer, including but not limited to: “cancer,” “malignant,” “carcinoma,” “sarcoma,” “leukemia,” and “lymphoma,” OR
- Laboratory-confirmed cases are those that have a positive histology or cytology, or other positive microscopic confirmation\*.

### Comment

\*Although more than 90 percent of cancer cases are confirmed microscopically, microscopic confirmation is not required for a confirmed or definite case.

Incident cancer cases are classified according to primary anatomic site (topography) and cellular characteristics (morphology including histology, behavior, and grade) using the International Classification of Diseases for Oncology, Third Edition (ICD-O-3).

Elevated Blood Lead Levels

### *Elevated Blood Lead Levels, Children (<16 Years)*

#### Laboratory Criteria for Diagnosis

Blood lead concentration, as determined by a CLIA-certified facility,  $\geq 10$   $\mu\text{g/dL}$  (0.48  $\mu\text{mol/L}$ ) in a child (person < 16 years of age)

#### Case Classification

##### Suspected

A single capillary blood specimen with elevated lead concentration

##### Probable

Two capillary blood specimens, drawn greater than 12 weeks apart, both with elevated lead concentration

##### Confirmed

One venous blood specimen with elevated lead concentration, or two capillary blood specimens, drawn within 12 weeks of each other, both with elevated lead concentration

### *Elevated Blood Lead Levels, Adult ( $\geq 16$ Years)*

#### Laboratory Criteria for Diagnosis

An adult blood lead level that should be maintained under surveillance by the NPHSS is defined as an adult ( $\geq 16$  years) with a venous (or comparable) blood lead concentration  $\geq 10$   $\mu\text{g/dL}$  (0.48  $\mu\text{mol/L}$ ) of whole blood

#### Case Classification

##### Confirmed

One venous (or comparable) blood specimen with elevated lead concentration  
Elevated blood lead levels, as defined above, should be used for the purposes of surveillance only to apply standard criteria for case classification and may not correspond to action levels determined by individual programs or providers.

## *Foodborne Disease Outbreak*

### 2011 Case Definition

CSTE Position Statement Number: 10-ID-13

#### Clinical Description

Symptoms of illness depend upon etiologic agent. Please see the “Guidelines for Confirmation of Foodborne-Disease Outbreaks.” ([http://www.cdc.gov/outbreaknet/references\\_resources/guide\\_confirming\\_diagnosis.html](http://www.cdc.gov/outbreaknet/references_resources/guide_confirming_diagnosis.html)).

#### Laboratory Criteria for Diagnosis

Diagnostic laboratory criteria depend upon the etiologic agent. Please see the “Guidelines for Confirmation of Foodborne-Disease Outbreaks.” ([http://www.cdc.gov/outbreaknet/references\\_resources/guide\\_confirming\\_diagnosis.html](http://www.cdc.gov/outbreaknet/references_resources/guide_confirming_diagnosis.html)).

#### Definition

An incident in which two or more persons experience a similar illness after ingestion of a common food, and epidemiologic analysis implicates the food as the source of the illness.

#### Comment

There are two exceptions: one case of botulism or chemical poisoning linked to a food item constitutes a notifiable outbreak.

#### Data sharing

Notification to CDC of confirmed cases of foodborne disease outbreaks (preferably using the CDC National Outbreak Reporting System) is recommended (for more information, go to <http://www.cdc.gov/outbreaknet/nors/> ).

## *Pesticide-related Illness and Injury, Acute*

### 2010 Case Definition

CSTE Position Statement Number: 09-OH-3

### Clinical Description

This surveillance case definition refers to any acute adverse health effect resulting from exposure to a pesticide product (defined under the Federal Insecticide Fungicide and Rodenticide Act [FIFRA]3) including health effects due to an unpleasant odor, injury from explosion of a product, inhalation of smoke from a burning product, and allergic reaction. Because public health agencies seek to limit all adverse effects from regulated pesticides, notification is needed even when the responsible ingredient is not the active ingredient.

A case is characterized by an acute onset of symptoms that are dependent on the formulation of the pesticide product and involve one or more of the following:

- Systemic signs or symptoms (including respiratory, gastrointestinal, allergic and neurological signs/symptoms)
- Dermatologic lesions
- Ocular lesions

### Evidence Supporting a Causal Relationship Between Pesticide Exposure and Health Effects

Where the findings documented under the clinical description and lab criteria are: Characteristic for the pesticide as provided in NIOSH Appendix 2, and the temporal relationship between exposure and health effects is plausible, AND/OR Consistent with an exposure-health effect relationship based upon the known toxicology (i.e. exposure dose, symptoms and temporal relationship) of the putative agent (i.e. the agent classified under criteria A) from commonly available toxicology texts, government publications, information supplied by the manufacturer, or two or more case series or positive epidemiologic studies published in the peer-reviewed literature

### Laboratory Criteria for Diagnosis

If available, the following laboratory data can confirm exposure to a pesticide: Biological tests for the presence of, or toxic response to, the pesticide and/or its metabolite (in blood, urine, etc.);

- Measurement of the pesticide and/or its metabolite(s) in the biological specimen
- Measurement of a biochemical response to the pesticide in a biological specimen (e.g., cholinesterase levels)
- Environmental tests for the pesticide (e.g., foliage residue, analysis of suspect liquid);
- Pesticide detection on clothing or equipment used by the case subject.

### Exposure

Laboratory, clinical, or environmental evidence to corroborate exposure



Analytical results from foliage residue, clothing residue, air, soil, water or biologic samples;

- Observation of residue and/or contamination (including damage to plant material from herbicides) by a trained professional [Note: a trained professional may be a plant pathologist, agricultural inspector, agricultural extension agent, industrial hygienist or any other licensed or academically trained specialist with expertise in plant pathology and/or environmental effects of pesticides. A licensed pesticide applicator not directly involved with the application may also be considered a trained professional.];
- Biologic evidence of exposure (e.g., response to administration of an antidote such as 2-PAM, Vitamin K1, or repeated doses of atropine);
- Documentation by a licensed health care professional of a characteristic eye injury or dermatologic effects at the site of direct exposure to a pesticide product known to produce such effects;
- Clinical description by a licensed health care professional of two or more postexposure health effects (at least one of which is a sign) characteristic for the pesticide as provided in NIOSH Appendix 2.

Evidence of exposure based solely upon written or verbal report

- Report by case;
- Report by witness;
- Written records of application;
- Observation of residue and/or contamination (including damage to plant material from herbicides) by other than a trained professional;
- Other evidence suggesting that an exposure occurred.

### Case Classification

#### Suspected

Insufficient toxicological information is available to determine causal relationship between exposure and health effects

Case meets one of the exposure criteria:

- At least one laboratory, clinical, or environmental evidence found to corroborate exposure, OR
- There is evidence of exposure based solely upon written or verbal report

#### AND

Case meets one or more criteria

- Two or more new post-exposure abnormal symptoms; OR
- Two or more new post-exposure abnormal signs; OR
- Two or more laboratory findings reported by a licensed health care professional; OR
- One or more new post-exposure abnormal symptoms or signs AND one or more laboratory findings reported by a licensed health care professional.

## Possible

There is evidence to support a causal relationship between pesticide exposure and health effects, AND

There is evidence of exposure based solely upon written or verbal report, AND

Case meets one or both criteria:

- Two or more new post-exposure abnormal symptoms; OR
- Any new illness or exacerbation of pre-existing illness diagnosed by a licensed physician

## Probable

There is evidence to support a causal relationship between pesticide exposure and health effects, AND

At least one laboratory, clinical, or environmental evidence found to corroborate exposure, AND

Case meets one or both criteria:

- Two or more new post-exposure abnormal symptoms; OR
- Any new illness or exacerbation of pre-existing illness diagnosed by a licensed physician

## OR

There is evidence to support a causal relationship between pesticide exposure and health effects, AND

There is evidence of exposure based solely upon written or verbal report, AND

Case meets one or both criteria:

- Two or more new post-exposure abnormal signs; OR
- Two or more laboratory findings reported by a licensed health care professional; OR
- One or more new post-exposure abnormal signs AND one or more laboratory findings reported by a licensed health care professional

## Confirmed/Definite

There is evidence to support a causal relationship between pesticide exposure and health effects, AND

At least one laboratory, clinical, or environmental evidence found to corroborate exposure, AND

Case meets one or both criteria:

- Two or more new post-exposure abnormal signs; AND/OR/ o Two or more laboratory findings reported by a licensed health care professional; OR
- One or more new post-exposure abnormal symptoms or signs AND one or more laboratory findings reported by a licensed health care professional

## *Silicosis*

### 2010 Case Definition

CSTE Position Statement Number: 09-OH-01

## Clinical Description

Silicosis is an occupational lung disease caused by the inhalation of respirable dust containing crystalline silica. There are two forms of the disease: nodular silicosis and silicoproteinosis (acute silicosis). Nodular silicosis (chronic and accelerated) is slowly progressing and manifests as scarring of the lung tissue. It is typically evident on chest x-ray only after 10 or more years of exposure (chronic silicosis), but may be seen after as little as five years (accelerated silicosis). Nodular silicosis may present without symptoms; shortness of breath and cough typically accompany advanced disease.

Silicoproteinosis (acute silicosis), a less common form of silicosis, is an alveolar filling process which becomes evident within weeks to months after a very intense initial exposure; death usually occurs within a few years of onset. Except in acute silicosis, lung biopsy is rarely needed for diagnosis, as the radiologic picture is often sufficiently distinct to permit diagnosis of silicosis in persons with a clear history of exposure.

Individuals with silicosis are at increased risk of tuberculosis and lung cancer. Silica exposure and/or silicosis has also been associated with autoimmune diseases such as lupus erythematosus, rheumatoid arthritis, scleroderma, and with glomerulonephritis. Silicosis is a progressive, incurable, and potentially fatal disease that can be effectively prevented by limiting exposure to respirable crystalline silica dust.

## Case Classification

### Probable

- Death certificate record listing silicosis or pneumoconiosis due to dust containing silica (as underlying or contributing cause of death); OR
- Hospital discharge record listing silicosis or pneumoconiosis due to dust containing silica (as primary, secondary, or other diagnosis); OR
- Workers' compensation claim with a diagnosis of silicosis or pneumoconiosis due to dust containing silica; OR
- Health care professional's report of an individual diagnosed with silicosis or pneumoconiosis due to dust containing silica.

### Confirmed

History of occupational exposure to airborne silica dust and either or both:

- Chest radiograph (or other radiographic image, such as computed tomography) showing abnormalities interpreted as consistent with silicosis; OR
- Lung histopathology consistent with silicosis.

## *Waterborne Disease Outbreak*

### 2010 Case Definition

CSTE Position Statement Number: 09-ID-02

A waterborne disease outbreak is an incident in which two or more epidemiologically-linked persons experience a similar illness after exposure to the same water source and epidemiologic evidence implicates the water as the likely source of the illness.

### Clinical Description

Symptoms of illness depend upon etiologic agent.

### Laboratory Criteria for Diagnosis

Depends upon etiologic agent.

### Case Classification

#### Confirmed

Any outbreak of an infectious disease, chemical poisoning or toxin-mediated illness where water is indicated as the source by an epidemiological investigation

### Comment

The implicated water in these waterborne disease outbreaks may be drinking water, recreational water, water not intended for drinking (e.g., water used for agricultural purposes or in a cooling tower) or water of unknown intent. The route of exposure may be ingestion, inhalation, intranasal, or contact. The agent associated with the waterborne disease outbreak may be a microbe, chemical, or toxin. Water testing to demonstrate contamination or identify the etiologic agent is preferred, but not required for inclusion. Chemicals (including disinfection byproducts) in drinking water or in recreational water that cause health effects either through water exposure or by volatilization leading to poor air quality are included. Reports of waterborne disease outbreaks received through the National Outbreak Reporting System (NORS) are captured in the Waterborne Disease and Outbreak Surveillance System (WBD OSS).

Although not reported through NORS, the WBD OSS also accepts single cases of chemical exposure, wound infection and other illnesses, (e.g., Naegleria infections) that are epidemiologically linked to water exposure as well as aquatic facility-related health events (e.g., chemical mixing accidents or air quality problems). However, these single cases or aquatic facility-related health events are not reported

## References

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# **PART II**

## ***Sexually Transmitted Disease Investigation Protocol Manual***

**City of El Paso Department of Public Health**

**2013**

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## I. Introduction

This protocol provides general guidance to Sexually Transmitted Disease (STD)/Human Immunodeficiency Virus (HIV) Prevention staff working for The City of El Paso Department of Public Health (DPH). The DPH provides disease investigation for reportable diseases in El Paso County. Disease investigation, education (including risk reduction), partner counseling and referral services are provided along with treatment if applicable. This protocol provides the investigation staff with the knowledge needed to keep the process moving smoothly regardless of the number of entities involved.

The primary focus of disease investigation is to prevent further spread thereby reducing morbidity by offering public health services which providers are unable to render. Those services include: partner elicitation, contact investigation, and contact/partner notification. Other important responsibilities include assuring timely and accurate treatment of every case reported, appropriate counseling and education to affected individuals, and working as a partner with the Texas Department of State Health Services (TDSHS).

STD/HIV Prevention Disease Investigation Specialists (DIS) often face challenging situations which warrant unique approaches to providing care. The procedures outlined in the document may not apply in every situation. Staff is encouraged to discuss difficult or unusual cases with their nurse supervisor and with colleagues. In addition to familiarizing themselves with these procedures, staff will be expected to demonstrate the following qualities.

1. **Professionalism:** Contentious, have integrity, and be self-motivated. Must be willing to learn and implement basic and advanced principles of epidemiology.
2. **Persistence:** Must be able to motivate patients during interviews including provoking third parties to discuss whereabouts of certain persons, and obtaining demographic and treatment information from health care providers. Successfully referring a person for medical evaluation often requiring multiple home visits and phone calls. Must be able to make home visits and display a competent demeanor while in a patient's home.
3. **Nonjudgmental attitude:** Must be able to motivate people to discuss very personal health information as well as ascertain sexual partners. This skill can be difficult to develop while remembering to leave personal judgment aside. The patient should not perceive discomfort from disease investigation staff while discussing personal health and lifestyle information.
4. **Effective listening:** Must immediately remove distractions and interruptions during interviews. Paraphrasing information demonstrates you understand what the patients are trying to say.
5. **Assertiveness:** Must tactfully confront topics that will provide necessary contacts to the investigation. Examine medical facts and timeline of possible exposure of each contact. Ensure these contacts have a reasonable link to the positive case.

6. **Health literacy:** Communicate at the patient's level of understanding. Avoiding use of complicated language and technical language. Use visual aids if necessary to ensure patient understands diagnosis. Communicate CDC recommendations in a clear concise manner to ensure medical providers understand diagnosis and related exposures when indicated.
7. **Rapport:** Must build a relationship that establishes trust to ensure data collection is reliable and useful.

## II. Confidentiality in the Workplace

Documents should be handled with care and understanding that they are confidential. This information must NOT be visible to other employees, patients, or visitors to the DPH. As a general rule, all documentation of cases is stored in either STD MIS (state confidential database) or the DIS record room.

1. Open Field Records (FR's) in paper format must remain in the possession of the DIS via pouch system; FR's will be left out of sight.
2. Closed FR's and all interview records including progress notes shall be entered into the STD MIS.
3. Caution should be consistently displayed so that unauthorized persons cannot overhear confidential conversations discussing a patient's disease or contact information.
4. All materials that are not in immediate use should be turned over as to not be viewed by others.
5. Do not fax confidential information when possible. Ensure email connections are encrypted and secure prior to sending. All HIV lab results are to be picked up in person or mailed; not faxed or emailed.
6. Lock confidential information when away for breaks, meetings, and when leaving the office for the day.
7. Log off computer before leaving the office for the day. Lock computer if leaving for breaks or meeting. This can be accomplished by using a lock function on your computer's START menu.

## III. Safety in the Field

Safety in the field is of paramount concern. While most encounters will be cooperative, always be aware of surroundings and exits. DIS that feel there is a risk to making a home visit, or are uncomfortable making a home visit based on risks associated with a particular case should inform the Nurse Supervisor to identify alternative solutions. Those solutions include assigning a

member at the office to receive reports of the DIS whereabouts or assigning two DIS to make a home visit. If home visits are planned, a list of addresses, phone number where you can be reached, patient number, and the current date will be left visible to all DIS and the nurse supervisor prior to leaving. If the location is unknown, a description of the area being investigated should be included. If the field activity changes once the DIS has left the office, they will inform the nurse supervisor via city provided cell phone. A voicemail is sufficient. A back up office contact will be identified if the nurse supervisor is out of the office.

## **Safety Tips for DIS**

1. Always carry a cell phone. Bring this inside to the actual visit. Have the cell phone pre-programmed to 911. Ensure the cell phone is turned on during the visit in case a phone call for assistance needs to be made quickly.
2. Take another DIS with you if you feel there is a risk.
3. Stay alert of your surroundings at all times.
4. Park on the street, never park on a driveway.
5. Do not take valuables with you. If you carry a purse, place in the trunk prior to leaving the parking lot of the DPH.
6. Make home visits in the lightest part of the day.
7. Have an exit plan. Establish seating arrangements so that you are always accessible to an exit.
8. If you prefer, the patient may be asked to come outside.
9. You can have another staff person call your cell phone.
10. Listen to your feelings of the environment and your general safety. If it doesn't feel right, leave.

## **IV. Purpose: To investigate STDs such as Chlamydia (pregnant female), Gonorrhea (pregnant female), Syphilis, HIV infections and Acquired Immunodeficiency Syndrome (AIDS).**

### **a. Procedure:**

Test results are reported to the DPH in a variety of ways. This may include electronic reporting, faxes and letters from TDSHS, Hospitals, Blood Banks or otherwise. On occasion, physician's offices, or the patient themselves may call. It is essential to follow the same process for each new case.

1. Preventive Medicine Staff (Nurse Supervisor, Nurse, DIS, Surveillance Specialist, Clinical Assistant, or Medical Assistant) will determine if the case has been reported by checking MIS or by asking the Surveillance Specialist.

2. If the case has been reported and the patient has an address in El Paso County, Surveillance Specialist will wait for the report to come to the DPH before initiating the investigation. If the case has not yet been reported to DPH, Preventive Medicine Staff member receiving information will notify Surveillance Specialist of the details reported in the contact you received. If the case has an address outside of El Paso County, have Surveillance Specialist initiate an out of jurisdiction contact.
3. Ensure documentation of pregnancy status, patient demographics, and contact information is obtained from the provider.
4. Call by Surveillance Specialist or DIS is then placed to physicians to verify diagnosis to determine if the case is a previous or new case, if treatment was given and if the patient presented with any signs and symptoms during their initial visit.
5. If the individual does not have a previous history, a case is assigned by the Surveillance Specialist to the DIS.
6. An investigation is initiated by the DIS; the DIS calls the individual to set up an interview, if no response, then a field visit is made by the DIS to the address on the field record.
7. During the patient interview/investigation process one of the following is conducted: a blood draw, treatment is provided by the clinical staff (Nurse or Medical Assistant), or Early Intervention Program (EIP) referral given by DIS.
8. An interview is conducted by the DIS once a screening and confirmatory test are both reactive or a detectable viral load has been reported.
9. During the interview process the goal for the DIS is to collect at least two partners and one cluster.
10. If partners/clusters are named, the investigation portion repeats itself.
11. If the confirmatory test is negative, the field record will be closed by the DIS and considered not to be a case.

\*Please see Appendix II for further details on Case Management Plan for sexually transmitted disease outbreak.

## **V. Disease specific investigation, documentation, and timeline requirements for DIS:**

- a. STD/HIV confirmed cases will be initiated and first contact made within (3) days of receipt. This includes the initial interview for the original patient. Date of initiation indicates the date the DIS receives the case from the Surveillance Specialist.
- b. All partners and contacts for STD cases will be closed by the DIS within (7) days of the date initiated.
- c. All cases will be closed within 30 days. Reasons for closing a case prior to interview is lack of follow up, death, unable to locate.
- d. All notes, interview records, etc. must be updated on MIS for record keeping by the DIS. The DIS will make note of all phone conversations, field visits, and other contacts. Include: Date, Time, and Activity with each visit.

### Examples of progress note documentation

1. 9/1/11:3:15PM. Phone call to patient, no answer. YOUR DIS#
  2. 9/2/11:9:00AM Phone call to patient, left message. YOUR DIS#
  3. 9/3/11: Received phone call from patient, interview completed. Contacts identified, completed in MIS. Identified patient is a Dallas County resident and wishes to receive treatment from Dallas County Public Health. Case transferred to Dallas County Public Health 9/3/11. Record sent. YOUR DIS#
- e. If a patient was tested at one facility and will receive treatment at another facility (e.g. tested at a physician's office but going to local health department for treatment), notify appropriate personnel of test results and need for treatment and interview. If the change in agency involves transferring the case to another jurisdiction, send the DIS all documentation of interview, contacts, and progress notes to the receiving agency through the Surveillance Specialist.
  - f. After the patient has received treatment, the DIS will document immediately in MIS.
  - g. Contact identification will occur when a patient names a contact to the case being investigated. These contacts are listed in MIS.
  - h. If a contact to a case is located out of El Paso County, notify the Surveillance Specialist. The Surveillance Specialist will work with other state agencies or the state office to determine if follow up investigation will be completed by the DPH. If an out of state case is assigned to the DPH, investigation, DIS follow up, and treatment will be completed by the DPH.
  - i. Exceptions may be made for difficult or unusual cases. Discussions about such cases should occur with the nurse supervisor as to why cases are not interviewed or closed within required timeframes. At times, patients who reside in another County may prefer to receive treatment at the DPH due to confidentiality. This will be allowed at any time the patient chooses to be treated at the DPH.
  - j. See STD clinic policies for patients treated at the DPH.

## **a. Interview Record Management**

Fulfilling interview record requirements should not alter the interview process. Information not required for initiating partners and clusters should be collected at the end of the interview. For example, questions relating to risk assessment that are not answered during the normal course of the interview should be gathered after locating information has been taken for all partners and contacts. The interview record is not designed to be completed in front of the patient. Interview records should be complete in MIS and marked closed within 30 days of date assigned unless unusual circumstances prevent this from occurring.

## **VI. Types of Re-interviews/Investigations**

Re-interviews are expected in order to collect information, not gained in the original interview and when information gained in the original interview is illogical or inconsistent. A re-interview may be especially beneficial when a patient has clearly evaded discussion for referring all partners or suspects during the original interview or when an investigator believes more partners will be recalled by the original patient as time goes on.

To ensure any missed or new information is gathered, re-interviews are the rule rather than the exception with high priority infections (HIV/AIDS, Syphilis). Conduct re-interviews with a plan to accomplish specific objectives that are the product of careful view and analysis. Re-interviews are to be conducted within 3 days of the original interview. Maintaining 3 day intervals between the original interview and the re-interview allows the patient enough time to be likely to share additional information while keeping the investigation swift enough to interrupt disease spread.

Re-interviews can be conducted via phone or in person. It can be beneficial for re-interview to be conducted by a different DIS if rapport with the original DIS has been damaged or if there is reason to believe the individual will respond knowing that more than one DIS is working the case. Occasionally, additional information on partners will become available after initial closure of case. In these instances, the new information should be added to the partner section.

## **a. Cluster Interviews/Investigations**

Cluster interviewing is to be used with extreme selectivity. A cluster interview is a controlled discussion with a person who received a medical examination because of exposure or some other relationship to a case, but for whom physical examination and clinical tests show an apparent absence of infection. The purpose of a cluster interview is to gather information about previously unidentified partners or contacts of known cases and about individuals of concern (such as those with symptoms) who should be provided an examination. The objective of the cluster interview is to expedite disease intervention by expanding the base of information about a

high risk group. As a part of a special effort to address an outbreak situation, clustering may have a more extensive role than under normal program circumstances. Persons who receive a cluster interview are selected because the index patient's exposure information is so questionable that accepting it without confirmation might result in the inappropriate provision of continued partner services.

Cluster interviews are conducted so that each individual is:

- Approached with an agenda developed from a thorough analysis of all available disease intervention information.
- Given no information by the DIS which could breach confidentiality.
- Given logical reasons to conclude that it is in their personal interest to discuss partners or contacts, and the behavior of others, to reduce the disease risk in their peer group.
- Provided easily understood information about a disease, to which he/she has been exposed and practical, acceptable ways to avoid similar risks in the future. This will include disease specific education and prevention.

## **b. Lost to Follow-up**

Patients Lost to Follow-up may be either unable to locate or unable to be treated. It is important to document all information on the field record regarding attempts to locate the individual. Exhaust all practical leads to locate a patient. Leads can be obtained from a variety of sources, such as, physicians' offices, telephone directories, Facebook, Twitter, MySpace, local public health agency records, and other resources. Attempts should be made by the DIS at varying times of the day, evenings, or weekends if necessary. Phone calls should be attempted first, followed by field visits. The following is the acceptable follow up interval for all disease investigations:

1. Three phone calls to each telephone number.
2. Two Field or home visits to each possible address/ location patient is suspected to be at.

Exceptions may be made for difficult or unusual cases. The DIS will discuss difficult cases with the STD Nurse Supervisor.

## **c. Internet Notification**

- While interviewing the Original Patient (OP), the DIS will acquire what websites are used to meet partners.
- Internet Notification will only be used if traditional means of contacting the OP/ contacts have been unsuccessful.

- If the OP has an account with any websites, the DIS will inform the OP that services are available to notify partners on their behalf or to assist in doing their own partner notification.
- If the internet contact is needed, the DIS will submit a notification request to the Internet Notification Liaison in Houston HD.

#### **d. E-Mail Protocol**

- The initial e-mail may only be sent Monday – Thursday. At no time will internet notification be initiated on a Friday or a day before a holiday. If a leave is planned, internet notification will not be used prior to the day they are scheduled to be off. If email is sent before a leave is scheduled, instructions will be provided in the email of who to contact and your schedule.
- Send all messages with the subject field: Health Matter
- If possible, include the contact’s first name only in order to protect confidentiality while at the same time indicating that this message is not computer-generated spam.

## **Examples**

### **1st Attempt**

Subject: URGENT HEALTH MATTER

My name is \_\_\_\_\_, I work for the City of El Paso Department of Public Health. I have urgent and confidential health information to discuss with you. I can be reached at my office at (915) 771-xxxx or my cell (915) 355-xxxx. Please contact me as soon as possible.

### **2nd Attempt**

Subject: URGENT HEALTH DEPARTMENT MATTER

My name is \_\_\_\_\_, and I work with the City of El Paso Department of Public Health. I attempted to contact you on MM/DD/YY; I have some very important health information to share with you. This is a very urgent matter, and because of the confidential nature of this information, it is vital you contact me. Please call me at (915)771-xxxx. I can be reached at this number from 7:00 am – 6:00 pm. Monday through Thursday or you can contact me using my e-mail address [JohnDoe@elpasotexas.gov](mailto:JohnDoe@elpasotexas.gov) or my cell phone at (915)355-xxxx. To assist you in confirming my identity, I have included my nurse supervisor’s name and phone number: Nurse Supervisor Name, (915)771-xxxx. Please do not delay in contacting me.



## **e. Text Messaging Notification**

Text messaging with cell phones is another investigative method that the DIS can utilize to attempt contact with a case. The method should be used after the traditional method of phone contact has been unsuccessful. It can be used as an option of contact prior to field visits.

Cell phone numbers are requested, but not required when collecting demographics. The DIS will document text contact in the field record, and include as an attempt to contact when data is entered into MIS. The messages will be stated as:

Please call me at (phone number). I need to talk about an urgent and confidential matter with you.

If the patient replies back and wants more information about why you are contacting them, text the person back and request phone call or in person meeting. Every attempt should be made to have the person call back on the phone or to come into the clinic.

## **VII. Case Management Tools:**

### **a. Pouch /Field Record/ Open Case Management**

DIS are expected to have their open case documentation with them every day. In the event one DIS is out of the office and unable to take a phone call for a case, other team members will have adequate information to be capable of answering questions. Open case records must be organized so that co-workers or the STD Nurse Supervisor can easily locate any needed documentation. For ease of coverage, daily updates of case work into MIS are optimal and a desired practice.

## **VIII. Special Considerations**

In 2010 Advanced Business Software (ABS) was implemented at the DPH electronic medical record documentation of all patients receiving care. STD MIS is an electronic case management system used by the DIS to enter STD/HIV case information. Each system is independent of itself. As documentation is entered into either system, special care must be taken to complete a full record of the clinic visit, the interview, and the treatment. Documentation must occur at the time of the encounter, and be completed within 24 hours to ensure communication of events of the case can be found.

The Nurse has been trained to assist the DIS with field visits and the interview process if the DIS is not available or is assisting another client.

## **IX. Program-Specific Required Training**

New Employee Orientation- City of El Paso

New Employee Orientation- Department of Public Health

All City Required Trainings

Data Security and Confidentiality- Texas Train Module

Employment Development Guide (EDG) - series modules on CD Rom

Review of TDSHS Program Operating Procedures and Standards (POPS)

Rapid HIV Testing Module

Venipuncture Training (if not already completed)

Fundamentals of STD Interventions (FSTDI)

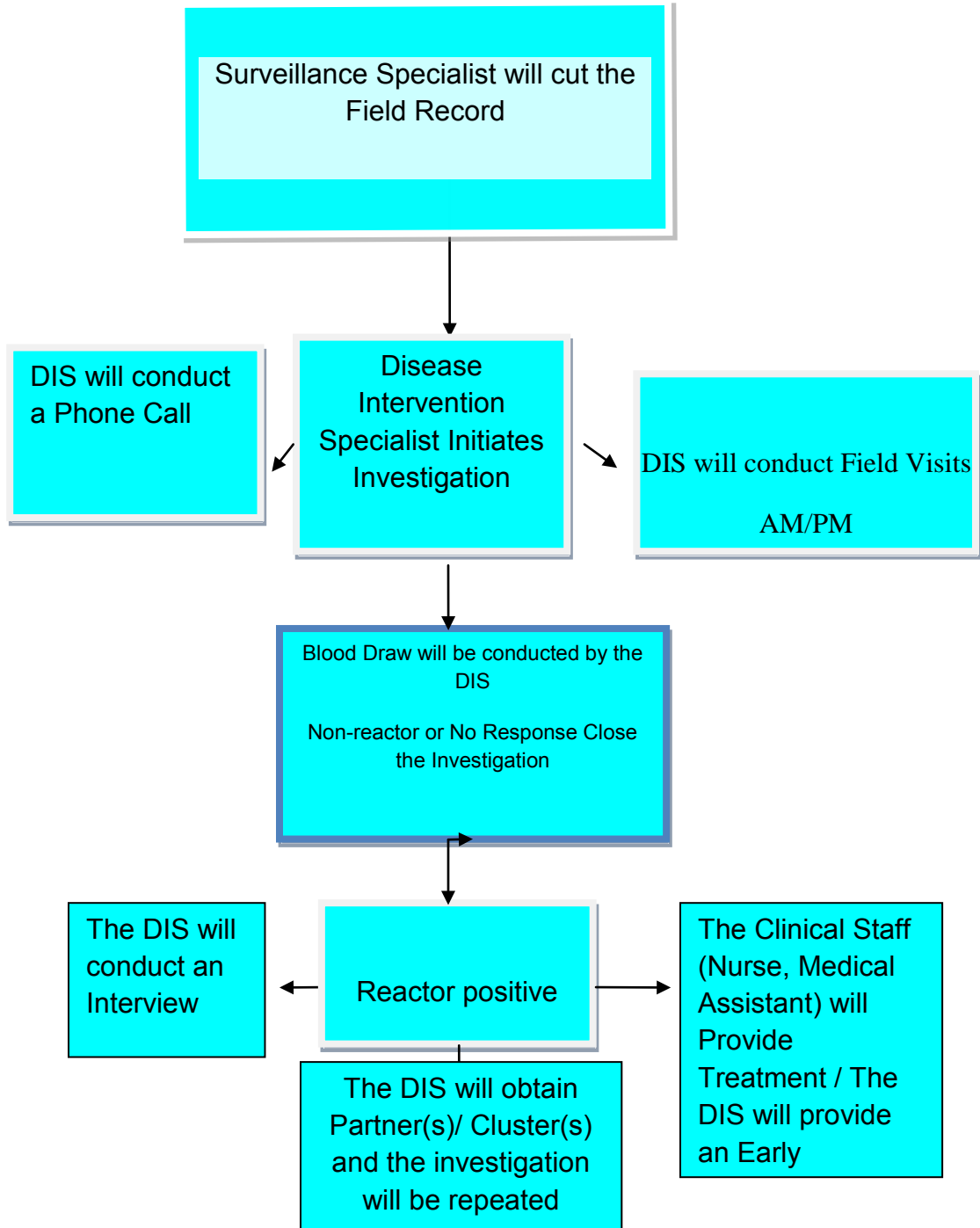
See 2010 Centers for Disease Control and Prevention, MMWR, titled: Sexually Transmitted Diseases Treatment Guidelines, 2010 for specific treatment interventions.

Resources:

<http://www.dshs.state.tx.us/hivstd/pops/default.shtm>

# Appendix I

## X. Flow Chart



## **Appendix II**

### **X. Case Management Plan**

#### **SEXUALLY TRANSMITTED DISEASE OUTBREAK MANAGEMENT PLAN**

City of El Paso Department of Public Health Outbreak Response Plan

##### **BACKGROUND**

The Outbreak Response Plan outlines the effective management of intervention efforts among state, regional, and local health authorities to limit the negative impact of sexually transmitted diseases (STDs) on the public. This is accomplished through enhanced outreach, surveillance activity, education, screening/assessment, diagnosis, partner notification and treatment in areas where increased numbers of reportable diseases have been observed. This intensive effort is provided in addition to routine treatment and prevention services. The plan uses personnel from the health departments, and solicits the cooperation of community-based organizations, civic groups, and community leaders in mobilizing manpower and resources.

A coordinated response plan can provide a long-range perspective that encourages collaboration between state and local agencies, care providers and educators to ensure the integrity of the public health overall, and to elevate the standards of health in affected communities and individuals in particular by reducing the threat imposed by sexually transmitted diseases.

##### **METHODOLOGY**

The primary responsibility for declaring an outbreak lies with the public health authority in the locality of a reported morbidity increase. Epidemiologists, appropriate health authorities, STD/HIV program managers in consultation with the STD/HIV surveillance specialists, local physicians, field clinics, local health departments, HIV program manager and DIS will determine if an outbreak exists and to what extent. The necessary response is determined after analysis of pertinent data. Comparing expected morbidity levels to present levels of morbidity for a given area, should a statistically significant increase be determined, and outbreak is declared. The City of El Paso Department of Public Health physician contractor will make this determination, based on an observed increase that is significant in relation to the STD under consideration (i.e., the % increase necessary to call it an outbreak varies according to the infection).

For Syphilis, Gonorrhea, Chlamydia, and HIV, clinical case definitions criteria will be used for reported cases, with appropriate treatment and follow-up. (Attachment 1)

El Paso City/County areas will have DIS, Disease Surveillance Specialist, Clinical Staff, First Line Supervisor, Program Managers and the Chief Nursing Officer handle an outbreak. The City of El Paso Department of Public Health will notify Region 9/10 HIV/STD Program Manager about the possible outbreak and request assistance if required. Personnel will include physicians, public health nurses, clinic and clerical staff. In case of widespread outbreak or emergency, the assistance of temporary-duty staff may be enlisted through surveillance and field operations in central office. Joint discussions will determine temporary duty staff between the region and central office and may include DSHS or local health department staff from around the state.

The Chief Nursing Officer, in consultation with FLS/ Program Manager will direct STD/HIV surveillance activities. STD/HIV Program staff will elicit, identify, screen and refer partners of reported cases to identified clinics, field office nurses, field clinics, or to physicians within the area for testing and treatment. If necessary, the Director will issue an alert to clinical staff in the outbreak/emergency area to recruit local staff to provide testing/treatment of referrals for a contracted rate.

The City of El Paso Department of Public Health staff is vital in helping eliminate an outbreak in rural areas. Clinic-based staff will be included to assist in providing testing, counseling, treatment (non-injectable only out on the field), and referrals. Nurses can provide assistance to the STD/HIV program and the communities they serve by providing information and guidance. During those times of outbreaks, other clinic functions may be decreased or delayed until normal operations can be resumed. This decision will be made after the Director, Chief Nursing Officer, and Regional Director have been consulted.

#### Local Contacts

Primary – Roxann Parks, Chief Nursing Officer TB/ STD/ HIV/Imm.

Programs (915) 771-1245 or (915) 600-0700

Secondary -Christina Limon, Nurse Supervisor

STD/HIV FLS/Program Manager (915) 771-1215

Contacts Initiated by Chief Nursing Officer

Contact Medical Doctor STD/HIV Program TBA

Robert Resendes, Health Director (915) 771-5709

Bruce A Parsons, Assistant Health Director (915) 771-5702

Yvonne Vasquez, Epidemiologist (915) 771-5817

City Lab (915) 543-3535

Debra De Santis, Pharmacist (915) 771-1248

Hector Ocaranza, Health Authority

Regional Health Authority if no communication has previously taken place

(915) 571-4146

#### PARTNERS IN PUBLIC HEALTH

Region 9/10 DSHS

Texas Department of State Health Services Field Offices

#### PUBLIC HEALTH RESPONSE

DIS - Disease Intervention Specialist will investigate, interview and elicit contacts to determine source and spread of an outbreak. Personnel from regional DIS and DSHS field offices may assist the local health departments and those on temporary duty assignment from other areas as needed in emergencies.

Nurses - Sexual or needle sharing contacts of infected persons will be referred to nurses at local health departments or field offices for screening, and/or serology (STD/HIV); or to DSHS-funded community-based organizations (for syphilis bloods or HIV testing and counseling).

CBOs -Outreach workers and prevention educators at Community-based Organizations raise awareness in the community regarding risk reduction and management, symptomology, and referrals for testing and counseling.

Clinic - Provides for expanded staffing and increased clinic hours, if necessary.

Management Coordinates volunteers, and makes arrangements with community organizations, non-governmental agencies, and businesses, as necessary.

Region - Reports of confirmed cases to DSHS HIV/STD Comprehensive Services Branch.

DSHS Central

Office -Reports confirmed cases to CDC.

OTHER IMPORTANT CONTACTS(Phone or e-mail)

Businesses related to high-risk populations (e.g., gay bars, sex shops)

Nurse, Public Health (STD) 915-771-1205

Pharmacist 915-771-1248

STD/HIV Surveillance 915-771-1209

Disease Intervention Specialist 915-771-1208

Disease Intervention Specialist 915-771-1210

DSHS, Senior Public Health Advisor 512-533-3109

DSHS, Field Operations Consultant 512-533-3092

DSHS, STD Surveillance Coordinator 512-533-3032

DSHS (Region 9&10)

DSHS Emergency Line 1-888-705-8868

(24 hour Physician on call-Go through all the message and wait for an answer)

Center for Disease Control 404-639-3311

Media - A single point of contact will be appointed to Armando Saldivar.

Source Documents:

MMWR 2010 Guidelines for Treatment of Sexually Transmitted Diseases

US. Department of Health and Human Services Guidelines for Prevention of Transmission of HIV and Hepatitis B Virus to Health Care and Public Safety Workers Report forms -

STD – 27 (all STDs excluding HIV/AIDS)

STD – 28 (laboratories only)

CDC 50.42A, 50.42B (HIV/AIDS)

## **Glossary**

### CLINICAL CASE DEFINITIONS – Diagnostic Criteria

Syphilis – Clinical Case Definition

Criterion includes:

Identification of the causative organism *T. palladium* by dark field examination, OR

Presumptive diagnosis using a nontreponemal (VDRL or RPR) test, plus

A treponemal (FTA-ABS or MHA-TP) test.

Treatment consists of penicillin or doxycycline.

Follow-up nontreponemal serologies should be drawn to ascertain treatment response.

Gonorrhea – Clinical Case Definition

Criteria include:

Identification of the causative organism *N. Gonorrhea*

Treatment consists of a regimen of cephalosporin antibiotics

NB *N. Gonorrhea* has become increasingly resistant to penicillin and other antibiotics. There are reported cases of gonococcal resistance to the family of fluoroquinolones. The majority of these



reports have come from Asia. If a case of drug resistant N. Gonorrhoea was to be identified in El Paso, it would generate a need for an emergency response.

#### Chlamydia – Clinical Case Definition

Criteria include:

Identification of the causative organism *C. Trachomatis* from direct fluorescent antibody tests or immunoassays.

Treatment consists of azithromycin, doxycycline, ofloxacin or erythromycin in a recommended regimen.

#### Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) Clinical Description: Infection with the Human Immunodeficiency Virus

#### CLINICAL CASE DEFINITION

Criteria include:

ELISA (EIA) and Western Blot reactive serum specimen.

A positive test for serum HIV antigen.

A positive lymphocyte culture confirmed by HIV specific antigen test.

An insitu hybridization technique using a DNA probe.

A detectable HIV viral load test by PCR or b-DNA (pending).

#### AIDS Clinical Case Definition

All HIV infected individuals with CD4+ T-lymphocyte counts <200 cells/us, or <14% of total lymphocytes, OR presentation of one or more of 26 clinical conditions including TB, recurrent pneumonia, and invasive cervical cancer.

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***PART III***

***POLICIES***  
***&***  
***PROCEDURES***  
***FOR***  
***TUBERCULOSIS***  
***CONTACT INVESTIGATION***

**City of El Paso Department of Public Health**

**2013**

## **Acknowledgment**

**Material adapted from the Centers for Disease Control and Prevention's Effective TB Interviewing and Contact Investigation Course Materials.**

**Guidelines for the Investigation of Contact of Persons with Infectious Disease, MMWR, Dec. 2005**

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# INTRODUCTION

The goal of the City of El Paso Department of Public (DPH) Tuberculosis Program (TB) is to eliminate TB from the El Paso community. Despite the low rates of TB disease, elimination of TB continues to face major barriers, including difficulty to detect, diagnose and treat. In addition there is a persistence in the growth of global TB epidemic, limitations of current control measures, need for new test, and treatments.

Some of the challenges of the DPH TB Program include an increasing number of new immigrants from foreign countries with high incidence of TB, HIV co-infection transmission of TB at congregation settings, and the development of multi-drug resistant population.

The TB investigation interview plays an important and integral role in the contact investigation process. This involves a careful and planned approach and strong communication skills.

Enclosed in this manual is a tool to guide DPH TB team in conducting a thorough TB investigation. The manual contains 14 policy stages to guide the investigation interviews. Each section details the tasks and essential points to be covered during the investigation process. Therefore, it is important to understand and apply local and state health department guidelines in addition to the content of the manual itself.

Use of the Policies and Procedures for Tuberculosis Contact Investigation Manual will provide guidance to TB program staff on procedures to conduct contact investigations, to enhance knowledge and interviewing skills.

## **I. Confidentiality and Consent in Contact Investigations**

**Policy Statement:** All patient information will be held in confidence and will only be released according to program confidentiality policy

**Purpose:** To maintain and protect patient information according to prescribed guidelines, procedures and protocols.

**Staff Responsible:** Public Health Specialist (contact investigators), Public Health Nurse (case manager)

### **Procedure:**

- All staff involved in contact investigation will receive training in confidentiality laws and practice.
- Discussion with the case patient and contacts regarding their confidentiality, beliefs, and concerns is initiated during the initial visit.
- Contact Investigators and Case Managers will explain to the case patient that measures that will be taken to maintain confidentiality.
- Patients will receive a copy of the pamphlet entitled “Notice of Privacy Practices”.
- Procedures to protecting confidentiality are utilized at each site visit during an investigation.

## **I. Prioritizing Contacts for Investigation**

**Policy Statement:** All identified cases of TB and suspected TB are reviewed by the Case Manager and Outreach Specialist to identify priorities for contact investigations. Physician, Nurse Supervisor or Program Manager may be consulted as indicated. Once a decision has been made to initiate contact investigation, the Public Health Specialist identifies contacts and prioritizes for investigation according to the following criteria. Initial education, testing and evaluation of contacts shall be completed within three weeks of the report of the suspect to the local health department.

**Purpose:** To prioritize contacts for investigation and utilize resources effectively.

**Staff Responsible:** Public Health Specialist and Case Manager.

**Procedure:** Medical Records are reviewed by Case Manager & Public Health Specialists, X-rays are reviewed by physicians.

Investigations are assigned by Case Managers according the following priorities:

- Patients
  1. Infectiousness: smear positive patients are high priority
  2. Symptomatology: respiratory symptoms (i.e.: coughing, sneezing).
  
- Contacts characteristics:
  1. Age: Children aged <5 years are considered high priority
  2. Immune status, patients who are HIV positive, taking over 15 mg. Prednisone or its equivalent for >4 weeks and patients on immunosuppressive medicines are high priority
  3. Other medical conditions such as silicosis, diabetes and status after gastrectomy or jejunoleal bypass surgery
  
- Circumstances of the exposure
  1. Duration of exposure: The optimal exposure cut-off durations for assigning priorities to contacts have not been determined because available data lack this level of precision.
  2. Environmental Factors: air volume, exhaust rate and circulation
  3. Proximity to patient

**Note:** High and medium priority contacts should be assessed initially <7 working days of being identified by the patient. High and medium priority contacts should be evaluated medically to determine whether TB disease and latent infection with M. tuberculosis are present or absent.

- Prioritizing contacts
  1. Contact to persons with positive smears or cavitory tuberculosis
    - a. High
      - 1) Household
      - 2) Contact age <5 years
      - 3) Contacts with medical risk factors
      - 4) Contacts with exposure during medical procedures
      - 5) Contacts exposed in congregate setting
  
    - b. Medium
      - 1) Contact age 5-15 years



2. Contacts to persons with negative smears and a chest x-ray suggestive of TB disease
  - a. High
    - 1) Contacts aged <5 years
    - 2) Contacts with medical risk factors
    - 3) Contacts with exposure during medical procedures
  - b. Medium
    - 1) Household contacts
    - 2) Contacts with exposure in congregate setting
3. Contacts to persons with TB disease
  - a. High
    - 1) Household contacts
    - 2) Contacts age < 5 years
    - 3) Contact with medical risk factor
    - 4) Contact with exposure during medical procedure
4. Evaluation consist of conducting interviews by the TB Public Specialist (PHS) on all contacts to obtain their relevant medical history, including specific questions about the symptoms of TB disease, previous positive tuberculin reaction and/or previous treatment for TB and may include administration and reading of a tuberculin skin test (TST) or a Quantiferon-Gold (QFT-G) test; a chest radiograph; and collection of sputum or other samples for examination.
5. If a contact has symptoms of TB disease, refer to clinic for x-ray and evaluation.
6. Children less than five years of age, HIV infected individuals, and other immunosuppressed persons should be placed on window prophylaxis treatment, the chest x-ray is not suggestive of TB disease, the individual has no symptoms of TB disease, and there are no contraindications to treatment, pending the outcome of 2<sup>nd</sup> TST.
7. If there is no history of a previously positive TST and the initial PPD test result is positive, refer to the TB Registered Nurse (RN) for a chest x-ray referral within 14 days of evaluation. If the chest x-ray is not suggestive of TB disease and the individual has no symptoms of TB disease, offer the patient treatment for LTBI unless there are contraindications to treatment.

- **Follow-up evaluation of contacts without history of previously positive TST.**

1. If the initial TST result is negative, a second TST is to be administered within 8 to 10 weeks after the contact has been broken. Break in contact is defined as physical separation of the contact from the presenting case or when the presenting case is no longer considered infectious due to response to treatment, (e.g., three consecutive negative sputum smears or for MDR-TB three consecutive negative cultures.)
2. If the repeat TST remains negative for children less than five years of age, HIV infected individuals, and other immunosuppressed persons placed on treatment for potential LTBI and contact with the source case has been broken, treatment for LTBI may be discontinued with the following exceptions. If the second TST is negative, infants less than 6 months old and HIV infected individuals with advanced immunodeficiency should be evaluated by the Registered Nurse for continuation and completion of treatment for LTBI based on evidence of transmission of infection in other high priority contacts.
3. If the repeat TST is positive for any contact, refer patient for a chest x-ray within 14 days. If the chest x-ray is not suggestive of TB disease and the individual has no symptoms of TB disease, offer the patient treatment for LTBI unless there are contraindications to treatment.

Evidence that a second tuberculin skin test for contacts that are initially negative reactors is administered 8-10 weeks from the date contact was broken must be documented on the forms TB-340/TB-341 and reported to the State. Once it's been reported the investigation is considered to be closed.

### **III. Prioritizing Cases to Initiate a Contact Investigation**

**Policy Statement:** The features of the TB case under investigation inform decisions about whether to perform a contact investigation. An investigation (i.e., seeking and evaluating contacts) is recommended for the following forms of suspected or confirmed TB because they are likely to be infectious: pulmonary, laryngeal, or pleural TB disease with 1) pulmonary cavities, 2) respiratory specimens that have acid-fast bacilli (AFB) on microscopy, or 3) both.

**Purpose:** To prioritize contact investigations and in order to utilize resources more effectively where the highest risk of acquiring and spreading disease.

**Procedure:**

- Case Manager and Outreach Specialist will review case information.
- Pulmonary cases that are smear positive and or cavitary are highest priority cases for investigation.
- As time and resources permit and as higher priority investigations are completed successfully, other pulmonary TB cases may be investigated if they are confirmed by culture of respiratory secretions.
- Pulmonary TB cases without positive microbiology results should not be investigated unless circumstances indicate otherwise (e.g., if microbiologic results are absent because of an error or if prior information raises suspicion that contacts have been infected).
- The only forms of purely extrapulmonary TB (i.e., cases without pulmonary disease) that should be investigated are laryngeal or pleural disease. For other forms, source-case investigations can be considered under special circumstances (see Source-Case Investigations).

Appendix A: TB Contact Investigation Flow Chart

## **IV. Contact Investigations in Special Circumstances**

**(clusters, outbreaks, secondary cases, unusual exposure)**

**Policy Statement:** When certain circumstances such as Clusters, Outbreaks, Secondary Cases, an Unusual Exposure or other event taxes resources or expertise, a review of investigative strategy or assistance from Department of State Health Services (DSHS) or CDC may be required.

**Purpose:** To provide guidance for contact investigation of special circumstances such as cluster, outbreaks, secondary cases or other unusual exposure or cases arise.

**Staff Responsible:** Case Manager, Public Health Specialist, Public Health Technician, Program Supervisor.

**Procedure:**

- A cluster of TB cases (i.e., a presumed outbreak) indicates potential lapses in TB control which should be investigated along with the outbreak. Assistance by the Department of State Health Services, Infectious Disease Division and the Centers for Disease Control will be requested if the scope of the investigation exceeds local capacity or disrupts key activities of TB control.

- When secondary TB cases are discovered unexpectedly (e.g., outside of a contact investigation), this indicates a potential outbreak. Review of the investigative strategy by the Case Manager, Public Health Specialist, Program Manager or Nurse Supervisor and Physicians' recommended.
- When contact investigations include congregate settings, officials or administrators at the setting will be enlisted as collaborators. Access to employee and occupancy rosters will be sought. Sensitivities and needs of the setting and its populace should be accommodated to the extent permitted by good public health practice.
- When few contacts are listed because information cannot be obtained from an index TB patient, alternative or proxy methods, such as interviews in the extended social network, will be done.
- Contact investigations for multidrug-resistant TB do not require a change in procedures, but the reasons for the drug resistance will be explored.
- Inter-jurisdictional contact investigations should be planned collaboratively from the inception. DSHS Assistance in coordinating such investigation may be sought from the next higher public-health administrative level.
- Unusual exposures to *M. tuberculosis*-complex, such as laboratory accidents or Tuberculosis animals, will be investigated on site, and contacts will be selected in accordance with the event, in consultation with subject-matter experts at Heartland National TB Center.

## V. Expanding a Contact Investigation

**Policy Statement:** When the results of the contact investigation determine that certain criteria are met, the contact investigation will be expanded to medium or low-risk priority contacts.

**Purpose:** Inclusion of lower-priority contacts generally is not recommended unless objectives for high and medium priority contacts are being met, and the vulnerability or susceptibility of the contact to disease progression from *M. tuberculosis* infection. Priorities are directed to contacts who:

- have secondary cases of TB disease,
- have recent M TB infection and so are most likely to benefit from treatment, and
- are most likely to become ill with TB disease if they are infected (susceptible contacts) or will suffer severe morbidity if they have TB disease (vulnerable contacts) and have been assigned to a Case Manager.

**Staff Responsible:** Case Manager and Public Health Specialist

**Procedure:**

- Consider expanding the scope (i.e., number of contacts) of an investigation if any one or more of the following criteria exist:
  - unexpectedly large rate of infection or TB disease in high-priority contacts,
  - evidence of second-generation transmission,
  - TB disease in any contacts, who had been assigned low priority,
  - infection in any contacts aged <5 years, and
  - contacts with change in skin test status from negative to positive.
- After reviewing the results from the investigation to date (i.e., for high and medium priority contacts), select the additional contacts by extrapolating the risks for infection as shown by the data.
- When results from an investigation indicate that it should be expanded, but resources are insufficient, DSHS in Austin may be notified for assistance.

## **VI. Investigating the Index Patient and Sites of Transmission**

**Policy Statement:** The Public Health Specialist or RN Case Manager shall interview the \* index patient in person  $\leq 1$  business day after notification for cases indicating infectiousness and  $\leq 3$  business days for others. For patients who have died or who are inaccessible, alternative sources of information regarding contacts should be sought.

**Purpose:** To assist communication with the patient and identify other cases and high risk contacts.

**Procedure:**

- The Interviews should be in the index patient's primary language and be conducted by persons fluent in that language or in conjunction with fluent interpreters.
- Whenever possible, the place of residence for the index patient should be visited ~~within~~ business days of initiating the contact investigation.
- All potential settings for transmission should be visited  $\leq 5$  working days of initiating the contact investigation.
- The contact list and priority assignments should be written into an investigative plan.
- Information regarding the index patient should be reassessed at least weekly until drug-susceptibility results are available for the Mycobacterium tuberculosis isolate, for 2 months after notification, or until infectiousness has diminished, whichever is longer.

- At 1-2 weeks after the first interview, the index patient should be interviewed again as necessary for clarification and additional information.

\*Index Patient: The patient who initially brings attention to a potential health problem.

## VII. Assigning Priorities to Contacts

- Priorities for ranking contacts for investigation are set on the basis of the characteristics of the index patient, the duration and circumstances of exposure, and the vulnerability or susceptibility of the contact to disease progression from *M. Tuberculosis* infection.
- The optimal exposure cut-off durations for assigning priorities to contacts have not been determined because available data lack this level of precision. The National Tuberculosis Controllers Association work group did not reach consensus on cut-off durations. On the basis of local experience and adjusting for resource limitation, public health officials should set local standards for the durations of exposure that define high, medium, and low priority.

## VIII. Treatment for Contacts with *M. Tuberculosis* Infection

**Policy Statement:** Treatment for latent infection should be offered to all contacts that have a positive tuberculin skin test result, after active TB is excluded.

**Purpose:** Treating contacts that have latent *M. tuberculosis* infection through completion is a DPH responsibility to prevent communicable diseases.

**Staff Responsible:** Registered Nurse

### **Procedure:**

- The emphasis of the program is to complete treatment in high and medium priority contacts.
- High and medium priority contacts with positive TSTs who come from countries with prevalent TB will be offered treatment, regardless of whether they have had routine BCG vaccination.
- Patients will be treated as per ATS/CDC recommendations and standing orders.
- Window-period prophylaxis is offered as per ATS/CDC recommendations and standing orders.

- The decision to treat contacts that have documentation of a previous positive skin test results or TB disease should be made on an individual basis. Treatment is recommended for HIV-infected contacts in this category, even if infection has been treated previously.
- Directly observed therapy (DOT) for latent infection is preferred over self-supervised. DOT preference is assigned to these groups, in this general order:
  - ❖ confirmed or suspected TB disease;
  - ❖ latent *M. tuberculosis* infection in contacts aged <5 years;
  - ❖ latent *M. tuberculosis* infection in contacts who have HIV infection or other conditions that limit immune response to TB;
  - ❖ latent *M. tuberculosis* infection in contacts with documented change in tuberculin sensitivity, from a negative to a positive results; and
  - ❖ latent *M. tuberculosis* infection in contacts who might not complete treatment because of social or behavioral impediments (e.g., alcohol addiction, chronic mental illness, injection-drug use, unstable housing, unemployment).
- Monitoring for adherence and adverse effects by clinic appointments monthly or more often is recommended for contacts on self-administered treatment.

## IX. Diagnostic and Public Health Evaluation of Contacts

**Policy Statement:** Each high and medium priority contact should be evaluated medically to determine whether TB disease and latent infection with *M. tuberculosis* are present or absent.

**Purpose:** The peer review process works to ensure quality and proper credentialing by reviewing sub-standard health care outcomes while maintaining confidence. At its best, the process is non-confrontational. Since the discussions and conclusions of most peer review sessions cannot be used in malpractice actions, dialogue among practitioners as to the proper method of care and failure to achieve it can be frank and truthful.

**Staff Responsible:** Public Health Specialist, Case Manager

### Procedure:

- Each high and medium priority contact should be assessed initially  $\leq 7$  working days after being listed.
- The same diagnostic methods are recommended for all contacts except when they have medical or constitutional conditions making TB more likely or more difficult to diagnose. A contact's country of origin and Bacille Calmette-Guerin (BCG) vaccination status are not included in algorithms for diagnosis or treatment.

- Voluntary HIV Counseling, Testing, and Referral
  1. Inform all contacts that HIV infection is the greatest known risk factor for TB disease progressing from M. tuberculosis infection, and ask whether they have been tested for HIV infection.
  2. Offer voluntary HIV counseling, testing, and referral to TB contacts who do not know their HIV infection status. Collaboration with HIV-AIDS programs is recommended for establishing systems that are convenient and flexible for patients.
  3. Voluntary HIV counseling, testing, and referral are recommended for contacts of HIV-infected infectious TB patients.
- Tuberculin Skin Testing (TST) is recommended for all contacts that do not have a prior documented positive test result or documented prior TB disease. The skin test can be administered at the time of the initial assessment. High-priority contacts should receive a test  $\leq 7$  days after they are listed, and medium-priority contacts  $\leq 14$  days. A two-step TST as defined for infection control surveillance is not recommended for contact investigations.
- Evaluation of Children Aged  $\leq 5$  years
  1. Contacts aged  $\leq 5$  years exposed to an infectious index patient are assigned a high priority.
  2. Contacts aged  $\leq 5$  years should be medically examined and have a chest radiograph regardless of the result of the current or prior skin tests or history of prior TB disease.
  3. Window-period prophylaxis is recommended until second TST results are obtained. Window-period prophylaxis (see Diagnostic and Public Health Evaluation of Contacts)
- Evaluation of HIV-infected or Other Immunocompromised Contacts
  1. HIV-infected or other immunocompromised contacts are high-priority contacts.
  2. Medical history, examination, TST and a chest radiograph is recommended for all these contacts.



3. Sputum collection for AFB microscopy and culture is recommended if the contact has symptoms consistent with TB disease or if the chest radiograph has abnormalities that could be caused by TB.
- All contacts being evaluated that have a positive TST result ( $\geq 5$ mm) should be medically examined, including a chest radiograph, to rule out TB disease.
  - Contacts that have symptoms consistent with TB also should be medically evaluated, including a chest radiograph, to rule out TB, regardless of the results of the skin test, history of a prior positive result, or history of prior TB disease.
  - During the infectious period, those high and medium priority contacts who have a negative skin test result <8 weeks after their most recent exposure should have a second skin test 8-10 weeks after that exposure.
  - For low priority contacts, the initial skin test may be delayed until 8 – 10 weeks after the most recent exposure if the contact does not have symptoms suggestive of TB disease. If the test is administered <8 weeks after the most recent exposure, the decision to give a second, post-exposure skin test can be made on a case by case basis.

## **X. Data Management and Evaluation of Contact Investigations**

**Policy Statement:** Data collected on patients and contacts is confidential and may be used to calculate performance indices and reviewed for trends.

**Purpose:** To utilize available data to improve patient care.

**Staff Responsible:** Case Manager, Case Registry, Public Health Technician

### **Procedure:**

- Collection of specific data elements on index patients and their contacts is collected by Outreach Specialist (ORS). The data elements shall be used to calculate program performance indices.
- Data is collected on standardized forms.
- Data collected is reviewed by the Case Manager and Outreach Specialist. The Nursing Supervisor, Program Manager and physician may be consulted as indicated.
- Decisions involving priority of investigation and testing are made after analysis of patient information. Variables include: site of infection, smear sputum results, chest x-ray results (cavitary or non-cavitary), symptoms and duration of symptoms environmental factors, and client risk factors.
- Progress of contact investigation is reviewed at weekly Case Management meetings.
- Contact investigation on new cases is reviewed at monthly Care Review meeting.

- Contact investigation on closed cases is reviewed for opportunities to improve at monthly Case Review meeting.
- Program evaluation for contact investigation activities is ongoing.

## **XI. Staffing and Training For Contact Investigations**

**Policy Statement:** Personnel will receive necessary training in specialized functions of contact investigation to allow them to develop the skills and expertise needed.

**Purpose:** To ensure effective and comprehensive investigation and proper utilization of resources.

**Staff Responsible:** Program Supervisor, Public Health Specialist and Case Manager

### **Procedure:**

- All TB program personnel will receive training before assigned to contact investigation.
- Direct observation by experienced personnel will be provided for all TB personnel assuming a new function.
- Opportunities for practicing skills with a preceptor will be provided for any personnel assuming new functions for contact investigations.
- Consultation is available for any personnel encountering a new function.
- Clerical personnel, receptionists, and Case managers who assist with contact investigations will be familiar with and understand the overall purpose and methods of contact investigations.
- When sources outside the DPH serve essential functions in a contact investigation, the DPH is responsible for assessing whether the skills are sufficient and offering training so that the functions are met correctly.

## **XII. Source-Case Investigations**

**Policy Statement:** Because TB infections in children \*5 years are believed to represent recent transmission from an adult in the community source-case investigations are only recommended for TB disease in children aged <5 years. Source case investigations are not recommended unless investigations of infectious cases have been successfully completed and program objectives for investigating contagious patients and treating their infected contacts are being met.

**Staff Responsible:** Case Manager, Public Health Specialist

**Procedure:**

Data is collected and reviewed by the public health specialist and case manager to attempt to identify:

- The person who transmitted *M. tuberculosis* to the child, index patient, or persons in the cluster of skin test conversions
- Whether this person is still infectious,
- Whether the case of TB was reported to the DPH
- Whether any others were infected by the source patient

Data on source-case investigations is reviewed at weekly case management meetings and at monthly case review meetings when opened and when closed.

### **XIII. Obtaining Court Order for Management**

**Policy Statement:** Any patient who refuses treatment for Communicable Tuberculosis Disease may be subject to Health Authority Orders of the State of Texas, Health and Safety Code, section 81.083 or other actions to protect the public health.

**Purpose:** To prevent the spread of Tuberculosis in the Community

**Process:**

- All patients are informed as to responsibilities of the person with a communicable disease.
  - All infectious patients will sign a Health Authority Order.
  - If the individual, or the individual's parent, legal guardian or managing conservator of the individual is a minor, does not comply with the written orders of the Department or a Health Authority, the individual may be subject to court orders up to and including confinement.
  - City Attorney and Director will be notified of patient non-compliance.
  - City Attorney will follow up as necessary, up to and including court order for management.
  - Copies of pertinent records are forwarded to the City Attorney as well.
- \*See attached Health Authority Form TB-410 (Appendix C)**

## **XIV. Communicating Through the Media**

**Policy Statement:** Anticipatory media communications (e.g., with a press release) for large or highly visible TB contact investigations is recommended to capitalize on the opportunity for constructive public communications.

**Purpose:** To coordinate information given to the media in order to deliver a calm organized message to the public.

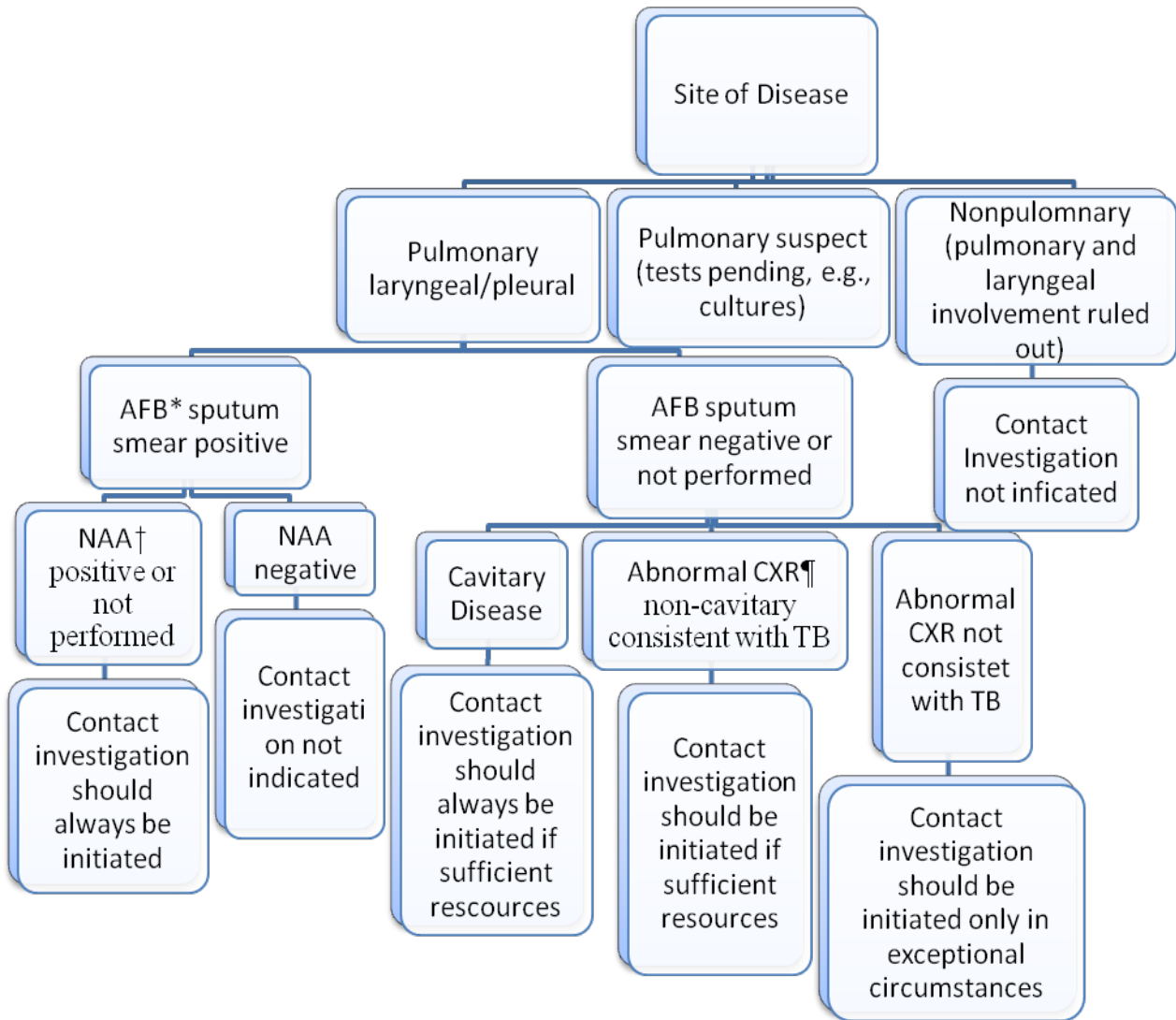
**Staff Responsible:** Public Affairs Officer (PHO)

### **Procedure:**

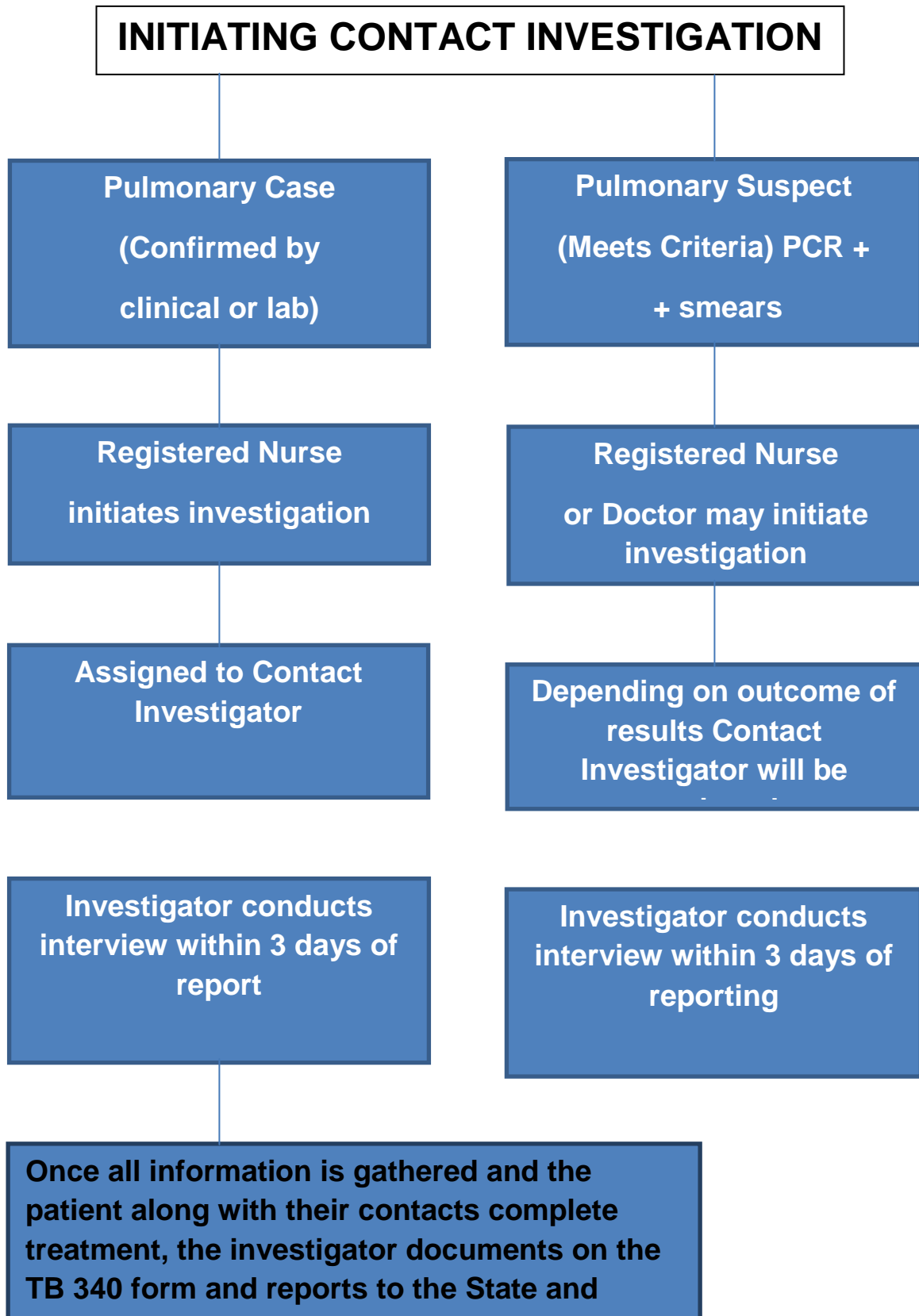
- Administration and PHO will be notified before speaking to the media.
- The Program Manager, Nurse Supervisor or their designee may deliver information when cleared by administration.
- DSHS will be notified via Incident Report for cases which may have media interest.
- Coordination of media communications, both within the health department and with collaborating partners outside the health department, improves the clarity and consistency of media messages.
- Review additional information in the PHO Education & Communication Protocols.

# Appendix A

## CONTACT INVESTIGATION FLOW



## Appendix B



# Appendix C

## Texas Department of State Health Services Order to Implement and Carry Out Measures For a Client with Tuberculosis

To: (Name) \_\_\_\_\_  
(Address) \_\_\_\_\_  
(Phone #) \_\_\_\_\_

I have reasonable cause to believe that your diagnosis, based on information available at this time, is (probably/ definitely) TUBERCULOSIS, which is a serious communicable disease. By the authority given to me by the State of Texas, Health and Safety Code, section 81.083, I hereby order you to do the following:

1. Keep all appointments with clinical staff as instructed.
2. Follow all medical instructions from your physician or clinic staff regarding treatment for your tuberculosis.
3. Come to the Public Health Department Clinic or be at an agreed location and time for taking Directly Observed Therapy (DOT).
4. Do not return to work or school until authorized by your clinic physician.
5. Do not allow anyone other than those living with you or health department staff into your home until authorized.
6. Do not leave your home except as authorized by your clinic physician.
7. Special Orders - see reverse side.

YOU MUST UNDERSTAND, INITIAL AND FOLLOW THE INSTRUCTIONS ON THE BACK OF THIS ORDER.

This order shall be effective until you no longer need treatment for TUBERCULOSIS.

If you fail to follow these orders, court proceedings may be initiated against you as dictated by State law. After a hearing, the Court may order you to be hospitalized at The Texas Center for Infectious Diseases in San Antonio or another facility. The Court also has the option to order you to go to treatment at a health clinic. The court proceedings could also include having you placed in the custody of the County Sheriff until the hearing.

Signed this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

Local Health Authority of El Paso City/County

\_\_\_\_\_  
HECTOR I. OCARANZA, MD

-----Please  
sign in the space provided below to show that you received these orders and understand them.

I hereby acknowledge that I received a copy of these orders and understand them.

Signed \_\_\_\_\_ Date \_\_\_\_\_  
(client's signature)

SUBSCRIBED and SWORN to before me the undersigned authority on this the \_\_\_\_\_ day  
of \_\_\_\_\_, 2013.

My Commission Expires:

\_\_\_\_\_  
**NOTARY PUBLIC IN AND FOR THE  
STATE OF TEXAS**

Instructions for Client

Client's Name \_\_\_\_\_ Date \_\_\_\_\_

Physician's Name \_\_\_\_\_

1. Keep all appointments given to you by clinical staff.  
Several appointments will be necessary to be sure your treatment is working. The treatment for tuberculosis is usually for six or more months. It is very important for you to keep all of the appointments made for you.

\_\_\_\_\_  
(client's initials)

2. Be sure you take your medicine for the treatment of your tuberculosis as your doctor or other clinic staff tells you. This means you must: keep all appointments at the clinic or other locations that have been discussed with you; take your medication as advised; provide sputum, urine or blood specimen as requested; report changes in your health; report when you move from where you live now and provide information about those with whom you spend a lot of time.

\_\_\_\_\_  
(client's initials)

3. Come to the Public Health Department Clinic or be at an agreed place and time to take Directly Observed Therapy (DOT). DOT is a way we can be sure that you take all the medication needed to cure your tuberculosis. Taking DOT means that a health care worker will meet you at a scheduled time and place and give you your medication as ordered by the doctor. Location for DOT \_\_\_\_\_ / \_\_\_\_\_.

(location) (client's initials)

best chance to cure your TB. \_\_\_\_\_

(client's initials)

4. Do not return to work or school until authorized by your clinic physician. \_\_\_\_\_

(client's initials)

5. Do not allow anyone other than those living with you or health department staff into your home until authorized. \_\_\_\_\_

(client's initials)

6. Do not leave your home unless authorized by your clinic physician. \_\_\_\_\_

(client's initials)

- You are or may be capable of spreading TB to others and must remain in your home or in a place where you will not expose others to the TB germ. When you take your TB medicines, you may quickly decrease the likelihood of spreading TB to others. Your doctor will decide when this occurs at your follow-up appointments.

\_\_\_\_\_  
/

(client's initials)

(physician's signature)

\_\_\_\_\_

(date)



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***PART IV***

**Reportable Disease Investigation  
Protocol**

**City of El Paso Department of Public Health**

**2013**

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## **EXECUTIVE SUMMARY**

The City of El Paso Department of Public Health's mission is to promote, ensure, and improve the health and wellness of the El Paso Community. El Paso is located in the westernmost corner of Texas, right where Texas, New Mexico, and Mexico come together. El Paso hugs the Rio Grande and sits on the border of America's southern neighbor, Ciudad Juárez, Chihuahua, Mexico. The cultures and economies of these two cities are seamlessly linked, and together they form the largest international metroplex along the United States – Mexican border. El Paso is also home to Fort Bliss, one of the largest military complexes of the United States Army. Public health monitoring and intervention in this unique geographic location is vital in preventing disease and the spread of it.

## **INTRODUCTION**

The mission of the Epidemiology Program within the City of El Paso Department of Public Health is to rapidly detect and investigate communicable diseases and environmental health hazards, provide prevention-focused education, and to institute control measures to prevent and reduce the impact of diseases.

This manual was designed to serve as a field guide to assist with epidemiological investigations of infectious diseases and prevention and control of outbreaks. The manual is divided into two sections. The first section covers general information on preparing for and conducting epidemiological investigations. The second section includes guidance for disease outbreak investigation.

# BACKGROUND

## Notifiable Conditions Reported for Year 2012

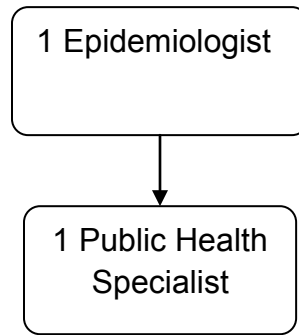
Notifiable Conditions	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD
Amebiasis	0	0	0	0	0	0	0	0	0	0	1	0	1
Anthrax	0	0	0	0	0	0	0	0	0	0	0	0	0
Botulism, foodborne	0	0	0	0	0	0	0	0	0	0	0	0	0
Botulism, infant	0	0	0	0	0	0	0	0	0	0	0	0	0
Botulism, wound	0	0	0	1	0	0	0	0	0	0	0	0	1
Brucellosis	0	0	0	0	0	0	0	0	0	0	0	0	0
Campylobacteriosis	0	1	2	3	4	7	7	8	5	4	1	1	43
Chickenpox (varicella)	2	2	1	2	1	2	0	4	5	3	0	1	23
Creutzfeldt-Jakob disease (CJD)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cryptosporidiosis	1	0	0	0	0	0	1	0	0	0	0	0	2
Cyclosporiasis	0	0	0	0	0	0	0	0	0	0	0	0	0
Cysticercosis	1	0	0	0	0	0	0	0	0	0	0	0	1
Dengue	0	0	0	0	0	0	0	1	0	0	0	0	1
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0
Drowning/near drowning	1	0	0	1	1	1	0	0	1	3	0	0	8
Ehrlichiosis	0	0	0	0	0	0	0	0	0	0	0	0	0
Escherichia coli, enterohemorrhagic	0	0	0	0	0	1	0	0	0	0	0	0	1
Hansen's disease (leprosy)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hantavirus infection	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemolytic uremic syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0
Haemophilus influenzae type b infections, invasive	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis A (acute)	0	0	0	1	0	0	0	0	0	0	0	1	2
Hepatitis B (acute)	0	0	0	0	0	0	0	0	0	0	1	0	1
Hepatitis C (acute)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis E (acute)	0	0	0	1	0	0	0	0	0	1	0	1	3
Influenza (rapid testing)	45	235	611	138	19	2	4	13	50	62	211	1704	3094
Influenza A, H1N1	1	10	21	2	0	0	0	0	0	0	0	0	34
Legionellosis	0	1	0	0	1	0	0	0	0	0	0	0	2
Leishmaniasis	0	0	0	0	0	0	0	0	0	0	0	0	0
Listeriosis	0	0	0	0	0	0	0	0	0	0	0	1	1
Lyme disease	0	0	0	0	0	0	0	0	0	0	0	0	0
Malaria	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningococcal infections, invasive	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis, aseptic/viral	5	4	3	2	2	2	4	6	1	2	1	1	33
Meningitis, bacterial	4	3	2	0	1	0	1	0	1	4	0	0	16
Meningitis, fungal	0	0	0	0	0	0	0	1	0	0	0	0	1
Measles (rubeola)	0	0	0	0	0	0	0	0	0	0	0	0	0
Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0
Pertussis	2	2	3	3	10	3	17	1	7	7	0	0	55
Plague	0	0	0	0	0	0	0	0	0	0	0	0	0
Polio myelitis, acute paralytic	0	0	0	0	0	0	0	0	0	0	0	0	0
Q fever	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies, human	0	0	0	0	0	0	0	0	0	0	0	0	0
Relapsing fever	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubella (Congenital)	0	0	0	0	0	0	0	0	0	0	0	0	0
Salmonellosis	7	5	2	15	6	11	12	10	8	9	7	6	98
Shigellosis	8	12	6	2	1	3	0	6	7	13	3	1	62
Spotted fever group (rickettsioses)	0	0	0	0	0	0	0	0	0	0	0	0	0
Staph. aureus, vancomycin intermediate or resistant	0	0	0	0	0	0	0	0	0	0	0	0	0
Streptococcal disease (group A ,B, S. pneumo), invasive	7	12	6	3	1	1	3	4	1	3	4	5	50
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichinosis	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	3	7	2	0	1	2	5	1	7	1	6	3	38
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhus	0	0	0	0	0	0	0	0	0	0	0	0	0
Vibrio infection, including cholera	0	0	0	0	0	0	0	0	0	0	0	0	0
West Nile Virus - Fever	0	0	0	0	0	0	0	1	6	3	0	0	10
West Nile Virus - Neuroinvasive	0	0	0	0	0	0	0	11	9	0	0	2	22
West Nile Virus - Infection	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow fever	0	0	0	0	0	0	0	0	0	0	0	0	0
Yersiniosis	0	0	0	0	0	0	0	0	0	0	0	0	0

## **EPIDEMIOLOGY PROGRAM**

The Epidemiology Program conducts investigations, surveillance, prevention, and control of communicable diseases of public health importance that are not covered by the Tuberculosis Program and the Sexually Transmitted Disease Program. Approximately 74 of the 81 notifiable conditions mandated by the State of Texas are investigated by the Epidemiology Program in the city and county of El Paso, TX. Diseases followed by the Epidemiology Program include vaccine preventable, foodborne, waterborne, vector-borne, zoonotic, and emerging infectious diseases.

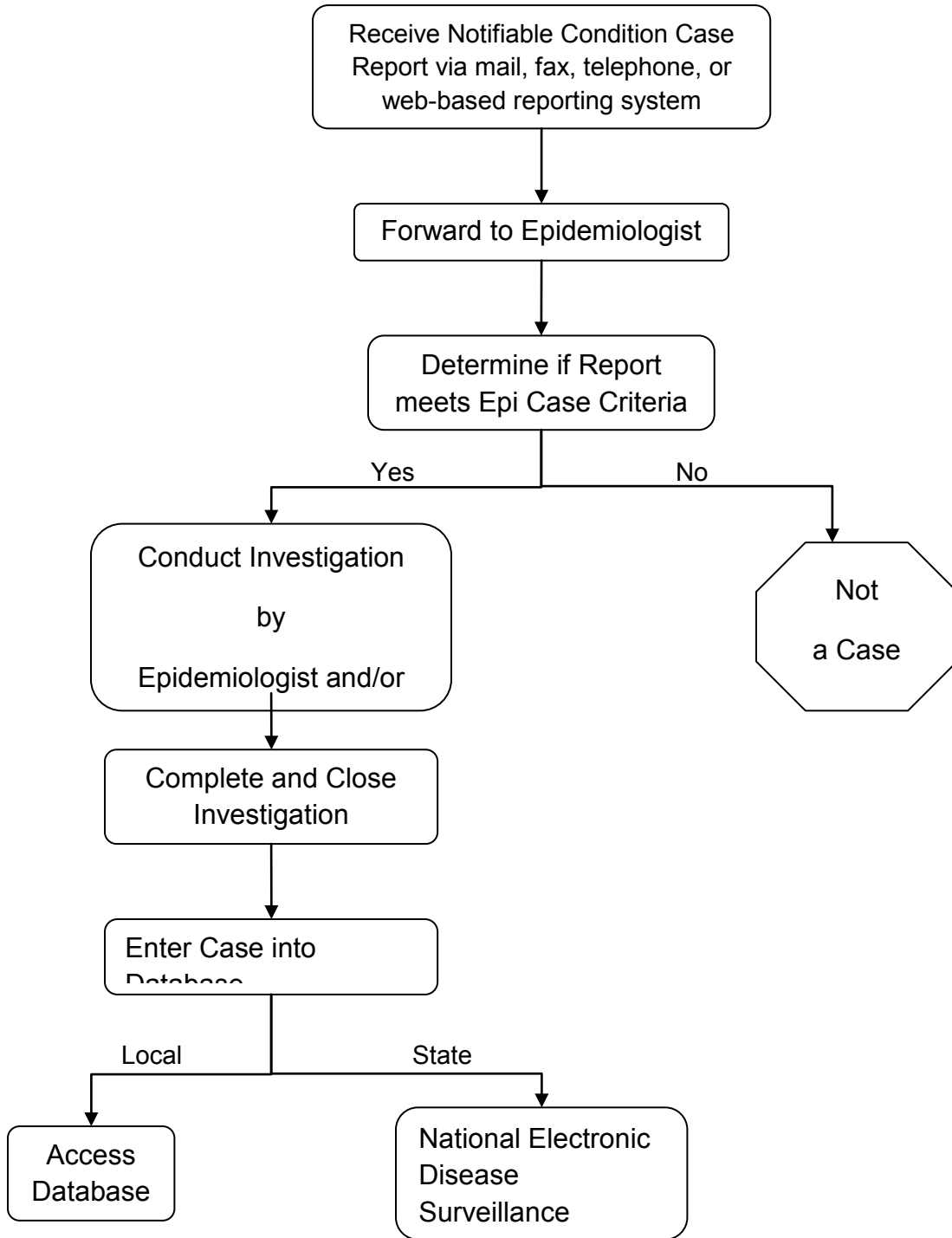
The notifiable conditions are: Amebiasis, Amebic meningitis and encephalitis, Anaplasmosis, Anthrax, Arbovirus infection, Asbestosis, Babesiosis, Infant botulism, Foodborne botulism, Wound botulism, Brucellosis, Campylobacteriosis, Chagas' disease, Chickenpox, Cholera, Coccidioidomycosis, Creutzfeldt-Jakob disease (CJD), Cryptosporidiosis, Cyclosporiasis, Cysticercosis, Dengue, Diphtheria, Drowning/near drowning, Ehrlichiosis, Shiga-toxin producing E. coli, Haemophilus influenzae type b invasive infections, Heat stroke, Hantavirus infection, Hemolytic uremic syndrome (HUS), Hepatitis A, Hepatitis B, Hepatitis C, Influenza, Influenza-associated pediatric mortality, elevated blood levels of lead, Legionellosis, Leishmaniasis, Listeriosis, Lyme disease, Malaria, Measles, Meningococcal infections, Mumps, Pertussis, Plague, acute paralytic Poliomyelitis, non-paralytic Poliovirus infection, Q fever, human Rabies, Relapsing fever, rubella, congenital Rubella, Salmonellosis, Severe Acute Respiratory Syndrome (SARS), Shigellosis, Silicosis, Smallpox, Spotted fever group Rickettsioses, vancomycin-intermediate or resistant Staphylococcus aureus, invasive Streptococcal disease (Group A Streptococcus, Group B Streptococcus, Streptococcus pneumoniae), Taenia solium, Tetanus, Trichinosis, Tularemia, Typhoid Fever, Typhus, Vibrio infection, Viral hemorrhagic fever, West Nile Virus, Yellow Fever, Yersiniosis, Disease Cluster or Outbreak, Exotic Emerging diseases, and Pandemics.

The Epidemiology Program consists of the following staff to conduct investigations:





# SECTION 1: CONDUCTING EPIDEMIOLOGICAL INVESTIGATIONS



***The following outline provides an overview in conducting a case investigation.***

The City of El Paso Department of Public Health, under the legal authority of Chapter 97, Title 25, Texas Administrative Code, has designated certain diseases and conditions notifiable (Appendix I). The list provides information to health care professional on what, when, and how to report each condition.

1. Upon receipt of a case report via mail, fax, telephone, or web-based reporting system, forward information to Epidemiology Program Epidemiologist. The Epidemiologist will then conduct the investigation or assign a Public Health Specialist to the case.
2. Upon assignment, review the information for completeness and refer to the “Guidelines for Investigation and Control of Invasive, Respiratory and Vaccine Preventable Diseases”, “Epi Case Criteria Guide”, and/or the “Control of Communicable Disease Manual” for appropriate interventions and follow-up.
3. After the case investigation has been reviewed for completeness and accuracy, enter case investigations with a confirmed case status to the local health department database.
4. Also report findings to Texas Department of State Health Services by entering completed case investigation into the National Electronic Disease Surveillance System (NEDSS) within 30 days of initial report.
5. Once the data entry tasks have been completed, initial the case investigation form and provide the data entry date. Also provide the NEDSS patient identification number at the top of the investigation form.

Additional Resources:

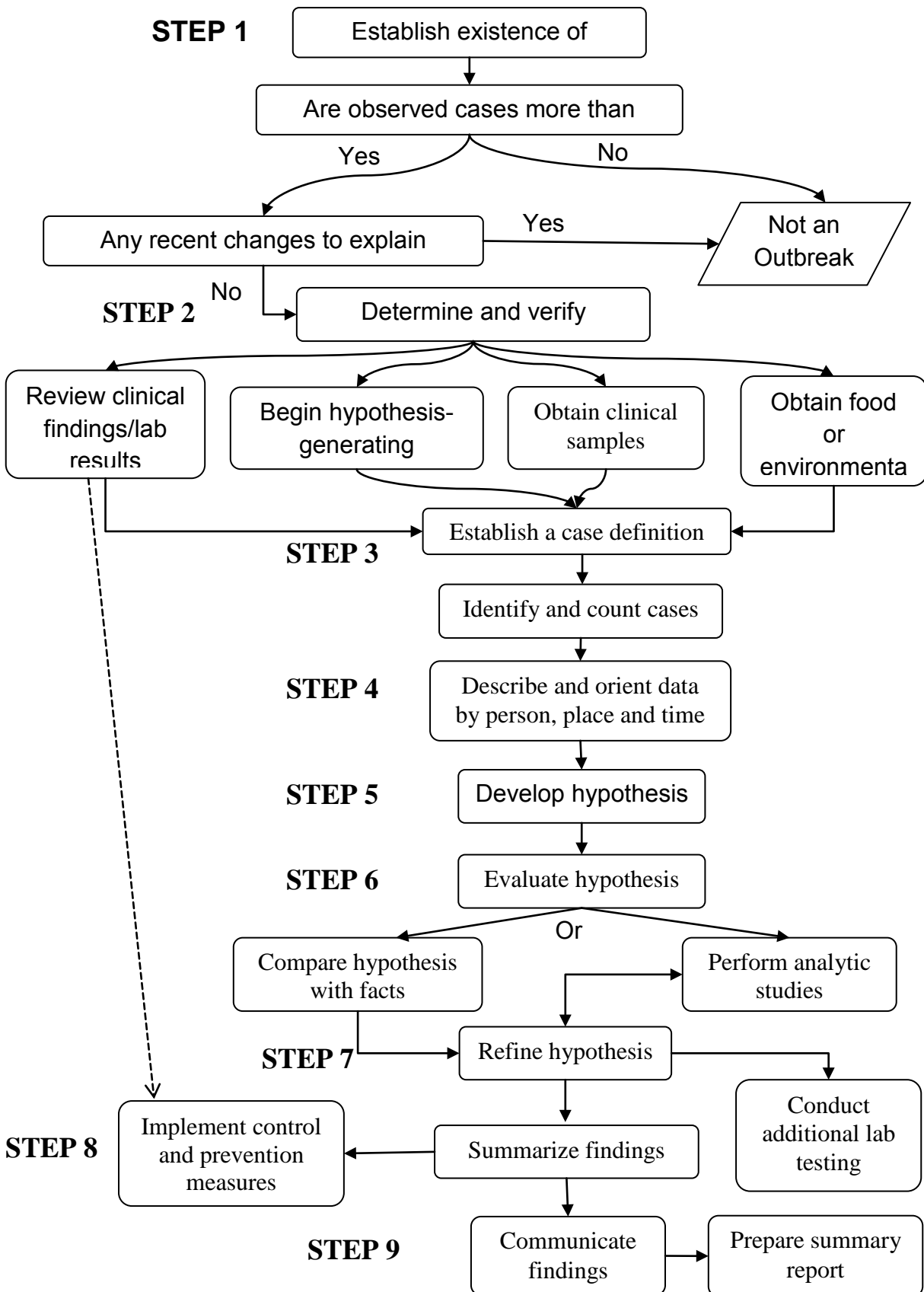
***Appendix I:*** Notifiable Conditions

***Appendix II:*** Guidelines for Investigation and Control of Invasive, Respiratory and Vaccine Preventable Diseases

***Appendix III:*** Epi Case Criteria Guide

Heymann D, editor. Control of Communicable Disease Manual, 19<sup>th</sup> ed. Washington: American Public Health Association; 2008. 746p.

## SECTION 2: DISEASE OUTBREAK INVESTIGATION



*The following outline provides an overview of steps to perform in an outbreak investigation. Note that several of the steps may be performed simultaneously and not necessarily in the order presented here (e.g. control measures should be implemented as soon as a source and mode of transmission are identified).*

**(1) Establish the existence of an outbreak**

1. Determine whether the observed number of cases is more than would normally be expected. Use data from outbreak location (e.g. hospital records, school absenteeism, etc.) or county surveillance data, as applicable.
2. Determine whether there have been any recent changes that would explain increase (e.g. increased testing in lab, changes in reporting or case definitions, new health care workers, increase in population size, increase in awareness, etc.)

**(2) Determine and verify the diagnosis**

1. Review the clinical findings and lab results (if available)
  - a. Verify that the event has been properly diagnosed and that clinical findings are consistent with lab results
2. Talk with cases and/or outbreak site contact person
  - a. Ask about exposures prior to becoming ill, what cases think caused their illness, awareness of others with similar symptoms, events in common with other ill persons (if outbreak not defined to a single location), etc.
  - b. Begin a line list with case information
3. Obtain additional clinical samples
  - a. Complete specimen collection form for each sample
  - b. Use consent form, if necessary
  - c. Arrange transport to designated lab for testing; contact lab to inform about delivery

4. Obtain additional samples (environmental, food) as needed
  - a. Arrange transport to designated lab for testing; contact lab to inform about delivery

### **(3) Define and identify cases**

1. Establish a case definition
  - a. Include: clinical information on disease, characteristics of affected persons, information about location & a specification of time during which outbreak occurred.
  - b. May classify cases as “confirmed” (laboratory confirmation), “probable” (consistent clinical features without lab confirmation) or “possible” (fewer clinical symptoms). All classes must include common person, place and time.
2. Identify and count cases
  - a. If outbreak affects population in restricted setting (e.g. school, nursing home, etc.), survey entire population. Ask cases if they know of others who are ill.
  - b. If outbreak not defined to particular setting, establish case finding at hospitals, doctor’s offices, ERs, clinics, laboratories, other restaurant patrons (if restaurant outbreak); use media if appropriate
  - c. Use standardized report form, questionnaire or data abstraction form that includes:
    - Identifying information (name, address, telephone number)
    - Demographics (age, sex, race, occupation)
    - Clinical (symptoms, date of onset, hospitalization, death)
    - Risk factors (exposure to risk factors associated with disease under investigation)
  - d. Store information in a computerized file (Excel, EpiInfo, Access)

### **(4) Describe and orient the data**

1. Characterize data by time
  - Make and interpret epidemic curve

- Calculate incubation time

## 2. Characterize data by place

- Make a spot map

## 3. Characterize by person

- Describe cases by personal characteristics (age, race, sex, medical status) or by exposures (occupation, leisure activities, use of medications, drugs)

## 4. Summarize data by time, place and person

- Who is at risk for disease? Is outbreak ongoing? Does the epi curve suggest a common source? What is the mode of spread? Do these findings support your initial ideas about the source of the outbreak?

## **(5) Develop hypothesis**

### **1. Based on available information, develop hypothesis as to source of outbreak**

- a. Address source of agent, mode of transmission and exposure(s) that caused the disease.
- b. Formulate hypothesis in a manner that can be tested

## **(6) Evaluate hypothesis**

### 1. Determine whether a formal epidemiological study should be conducted. Based on decision, proceed with Step 2 or Step 3

- a. Determine based on seriousness and extent of problem, whether formal investigation is important to the implementation of control measures, availability of resources, etc.

### 2. Compare hypothesis with established facts

- a. This method is used when the evidence is so strong that the hypothesis does not need to be tested

3. If indicated, perform an analytical study (case-control or cohort)

## **(7) Refine hypothesis and carry out additional studies**

1. If initial investigation failed to identify a source, reconsider hypothesis and look for new vehicles of transmission
2. If necessary, refine hypothesis to look for specific exposure.  
e.g. implicated sandwich as vehicle in study, now focus on ingredient(s)
3. If necessary, conduct further laboratory testing (subtyping) or an environmental study

## **(8) Implement control and prevention measures**

Based on findings from the study,

1. Make recommendations and implement appropriate control measures
  - a. Some examples include:
    - Closing the establishment (restaurant, school, etc.)
    - Cohorting infectious or exposed persons
    - Excluding infectious employees from work or children from daycare
    - Destroying contaminated food
    - Providing prophylaxis or treatment (immunizations, antibiotics, etc.)
    - Handwashing and other education

## **(9) Communicate findings**

1. Work with public relations to prepare a press release(s)/public notification(s) (if needed)



- a. Provide information on symptoms of disease, risk factors, control measures and results of investigation
  - b. Provide information on what is not yet known and work that is ongoing
  - c. In general, point of contact for press is outbreak location (school, etc.)
2. Lead investigator or his/her designee will write a report/summary of investigation
    - a. Include summary of epi and lab results, findings of investigation, control measures and recommendations
    - b. Prepare report in a standardized format

# APPENDIX I

## NOTIFIABLE CONDITIONS



### City of El Paso Department of Public Health **NOTIFIABLE CONDITIONS**



TELEPHONE (915) 771-5810

FAX (915) 771-5801

24/7 Confidential Web-Based Disease Reporting System

<https://elpaso.phims.org/cmr/login.aspx>

REPORT BY NAME, AGE, DOB, SEX, RACE/ETHNICITY, ADDRESS, TELEPHONE NUMBER, DISEASE, DATE OF ONSET, METHOD OF DIAGNOSIS, AND NAME, ADDRESS AND TELEPHONE NUMBER OF PHYSICIAN

A-I	When to Report	I-Y	When to Report
Acquired immune deficiency syndrome (AIDS) <sup>1</sup>	Within 72 hrs	Influenza-associated pediatric mortality	Within 1 work day
Amebiasis	Within 72 hrs	Lead, any blood level (child or adult)	Call Immediately
Amebic meningitis and encephalitis	Within 72 hrs	Legionellosis	Within 72 hrs
Anaplasmosis	Within 72 hrs	Leishmaniasis	Within 72 hrs
Anthrax <sup>6</sup>	Call Immediately	Listeriosis <sup>6</sup>	Within 72 hrs
Arbovirus infection <sup>2</sup>	Within 72 hrs	Lyme Disease	Within 72 hrs
Asbestosis	Within 72 hrs	Malaria	Within 72 hrs
Babesiosis	Within 72 hrs	Measles (rubeola)	Call Immediately
Botulism (foodborne, infant, and wound) <sup>4</sup>	Call Immediately	Meningococcal infections, invasive <sup>4,6</sup>	Call Immediately
Brucellosis <sup>6</sup>	Within 1 work day	Mumps	Within 72 hrs
Campylobacteriosis	Within 72 hrs	Pertussis	Call Immediately
Chagas' Disease	Within 72 hrs	Plaque ( <i>Yersinia pestis</i> ) <sup>6</sup>	Call Immediately
Chancroid <sup>3</sup>	Within 72 hrs	Poliomyelitis, acute paralytic	Call Immediately
Chickenpox (Varicella)	Within 72 hrs	Poliovirus infection, non-paralytic	Within 1 work day
<i>Chlamydia trachomatis</i> infection <sup>3</sup>	Within 72 hrs	Q fever	Within 1 work day
Coccidioidomycosis	Within 72 hrs	Rabies, human	Call Immediately
Creutzfeldt-Jakob disease (CJD)	Within 72 hrs	Relapsing fever	Within 72 hrs
Cryptosporidiosis	Within 72 hrs	Rubella (including congenital)	Within 1 work day
Cyclosporiasis	Within 72 hrs	Salmonellosis, including typhoid fever	Within 72 hrs
Cysticercosis	Within 72 hrs	Severe Acute Respiratory Syndrome (SARS)	Call Immediately
Dengue	Within 72 hrs	Shigellosis	Within 72 hrs
Diphtheria	Call Immediately	Silicosis	Within 72 hrs
Drowning/near drowning	Within 72 hrs	Smallpox	Call Immediately
Ehrlichiosis	Within 72 hrs	Spotted fever group rickettsioses	Within 72 hrs
<i>Escherichia coli</i> , Shiga toxin-producing <sup>6</sup>	Within 72 hrs	<i>Staph. aureus</i> , vancomycin-intermediate (VISA) or resistant (VRSA) <sup>6</sup>	Call Immediately
Gonorrhea <sup>3</sup>	Within 72 hrs	Streptococcal disease (group A, B, S. pneumo), invasive <sup>4</sup>	Within 72 hrs
<i>Haemophilus influenzae</i> type b infections, invasive	Call Immediately	Syphilis <sup>3</sup>	Within 72 hrs
Hansen's disease (Leprosy)	Within 72 hrs	<i>Taenia solium</i> & undifferentiated <i>Taenia</i> infection	Within 72 hrs
Heat Stroke	Within 72 hrs	Tetanus	Within 72 hrs
Hantavirus infection	Within 72 hrs	Trichinosis	Within 72 hrs
Hemolytic Uremic Syndrome (HUS)	Within 72 hrs	Tuberculosis <sup>6,6</sup>	Within 1 work day
Hepatitis A (acute)	Within 1 work day	Tularemia <sup>6</sup>	Call Immediately
Hepatitis B identified prenatally or at delivery (acute and chronic)	Within 72 hrs	Typhus	Within 72 hrs
Hepatitis B, perinatal (HBsAg+ <24 months old)	Within 1 work day	<i>Vibrio</i> infection, including cholera <sup>6</sup>	Within 1 work day
Hepatitis B and E (acute)	Within 72 hrs	Viral hemorrhagic fever	Call Immediately
Hepatitis C (acute and chronic)	Within 72 hrs	West Nile Virus (neuroinvasive and fever)	Within 72 hrs
Human immunodeficiency virus (HIV) infection <sup>1</sup>	Within 72 hrs	Yellow fever	Call Immediately
Influenza (type A, B, and novel)	Within 72 hrs	Yersiniosis <sup>6</sup>	Within 72 hrs

ANY OUTBREAKS, EXOTIC EMERGING DISEASES, AND UNUSUAL GROUP EXPRESSIONS OF DISEASE CONSIDERED TO BE PUBLIC HEALTH CONCERN MUST BE REPORTED IMMEDIATELY

#### Texas Law

Several Texas Laws (Health & Safety Code, Chapters 81, 84, and 87) require specific information regarding notifiable conditions to be provided to local and state health departments (CEPDPH & TDSHS). Health care providers, hospitals, laboratories, schools, and others are required to report patients who are suspected of having a notifiable condition (Chapter 97, Title 25, Texas Administrative Code). Failure to report is a Class B misdemeanor that carries a sentence of up to 180 days and a fine of up to \$2000 under the Texas Health and Safety Code, §81.049.

#### HIPAA

The HIPAA Privacy Rule [45 C.F.R. Section 164.512(b)] allows reporting without authorization for public health purposes and where required by law.

#### Special Instructions

- AIDS should only be reported once following the initial physician diagnosis. The report date, type, and results of tests including a CD4 + T lymphocyte cell count below 200 cells per microliter or percentage <14% must be included with the report. Questions on reporting procedures may be directed to (915) 771-1200.
- Reportable Arbovirus infections – include neuroinvasive and non-neuroinvasive Cache Valley, California serogroup, Eastern Equine (EEE), Dengue, Powassan, St. Louis Encephalitis (SLE), Venezuelan equine (VEE), West Nile, and Western Equine (WEE).
- Chancroid, chlamydia, gonorrhea, HIV, and syphilis reports must also include the report date, type, and results of tests including a CD4 + T lymphocyte cell count below 200 cells per microliter or percentage <14% for HIV infection. Questions/reports may be directed to (915) 771-1200.
- Invasive streptococcal disease, invasive meningococcal infection, or *Haemophilus influenzae* type b infections refers to isolates from normally sterile sites and includes meningitis, septicemia, cellulitis, epiglottitis, osteomyelitis, pericarditis, septic arthritis, and necrotizing fasciitis.
- Tuberculosis may be reported on Form TB-400, "Report of Case and Patient Services". Telephone reports may be directed to (915) 771-1230.
- Lab isolates must be sent to DSHS lab. Call 512-458-7598 for specimen submission information.

Revised 2013

• 5115 El Paso Drive • • El Paso, Texas 79905 • • (915) 771-5810 (24hrs/7 days a week) • • www.elpasotexas.gov/health/ •



# **Guidelines for Investigation and Control of Invasive, Respiratory and Vaccine- Preventable Diseases**

**Infectious Disease Control Unit  
Emerging & Acute Infectious Disease Branch  
Ph.: (512) 776-7676  
Fax: (512) 776-7616**

**January 2013  
Stock No. 6-106**

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# Section 1: Diphtheria

## BASIC EPIDEMIOLOGY

### Infectious Agent

Toxin-producing strains of *Corynebacterium diphtheriae*.

### Transmission

Direct person-to-person transmission by intimate respiratory and physical contact. Cutaneous skin lesions are also important in transmission.

### Incubation Period

Usually 2-5 days (range 1-10 days)

### Communicability

Infected individuals are communicable for up to 4 days after antibiotic treatment has been initiated. Untreated individuals generally shed bacteria from the respiratory tract or from skin lesions for 2-4 weeks after infection. A chronic carrier state is extremely rare, but known to exist, and such a carrier may shed organisms for up to 6 months or longer.

### Clinical Illness

Classic diphtheria is an upper respiratory tract illness characterized by sore throat, low-grade fever, and an [adherent membrane of the tonsils, pharynx, and/or nose](#). The disease can involve almost any mucous membrane. Growth of the adherent membrane can cause a potentially fatal airway obstruction. Patients with severe disease can develop a “bullneck” appearance caused by edema of the anterior neck.

Cutaneous diphtheria is either caused by toxigenic or non-toxigenic strains of *C. diphtheriae*. The disease is usually mild, typically consisting of non-distinctive sores or shallow ulcers, and rarely causes toxic complications. Cutaneous infections represent 1-2% of infections with toxigenic strains. Cutaneous diphtheria is not reportable, but should be promptly investigated to determine whether the strain is toxigenic.

## DEFINITIONS

### Clinical Case Definition

An upper respiratory tract illness typically characterized by sore throat, low-grade fever, and an adherent membrane of the tonsil(s), pharynx, and/or nose.

### Laboratory Confirmation

- Isolation of *Corynebacterium diphtheriae* from a clinical specimen, or
- Histopathologic diagnosis of diphtheria.

### Case Classifications

- **Confirmed:** A clinically compatible case that is laboratory confirmed or is epidemiologically linked to a laboratory-confirmed case.

**Note:** Cutaneous diphtheria should not be reported. All diphtheria isolates regardless of association with disease, should be sent to the DSHS Laboratory.

## CASE INVESTIGATION & TREATMENT

**\*\*If a provider suspects diphtheria, the provider should be instructed to call the CDC to obtain anti-toxin immediately. During business hours, the provider should call 404-639-3158, after hours the number is 404-639-7100. If the CDC releases anti-toxin, the following control measures should be implemented immediately. If the CDC does not feel anti-toxin is warranted, the control measures can be implemented after laboratory/pathological confirmation.\*\***

### Control Measures

- Reports of suspected diphtheria should be investigated **immediately**.
- Identify close contacts.
- Only close contacts of a patient with culture-confirmed or suspected diphtheria should be considered at increased risk for acquiring secondary disease. Such contacts include all household members and other persons with a history of habitual close contact with the patient, as well as those directly exposed to oral secretions of the patient.
- Close contacts should be cultured, receive prompt antimicrobial chemoprophylaxis, and be examined daily for seven days for evidence of disease. Do not wait for culture results before treating contacts.
- Recommended prophylaxis is a 7-10 day course of oral erythromycin (children 40 mg/kg/day and adults 1 g/day).
- Identified carriers of *C. diphtheriae* should be cultured after they complete antimicrobial therapy. Those who continue to carry the organism should receive an additional 10-day course of oral erythromycin and follow-up cultures.
- All close contacts who have received fewer than three (3) doses of diphtheria toxoid or whose vaccination status is unknown should receive an immediate dose of a diphtheria toxoid-containing preparation appropriate for their age and should complete the primary series according to the recommended schedule.
- Close contacts who have completed a primary series of three (3) or more doses of diphtheria toxoid and who have not been vaccinated with diphtheria toxoid within the previous five (5) years should receive a booster dose appropriate for their age.
- Patient should be kept in strict isolation until two cultures from both throat and nose, taken at least 24 hours apart and at least 24 hours after cessation of antimicrobial therapy, are negative for diphtheria bacilli. If cultures are not possible, patient should be kept in isolation for 14 days following appropriate antibiotic treatment.

### **Treatment**

The mainstay of treatment of a case of suspected diphtheria is prompt administration of diphtheria antitoxin. This should be given without waiting for laboratory confirmation of a diagnosis. Antitoxin is only available from the Centers for Disease Control and Prevention (CDC). The provider should contact the CDC at 404-639-3158 or 404-639-7100 (after hours).

### **Exclusion**

Patient should be excluded until released from isolation by provider.

## **REPORTING AND DATA ENTRY REQUIREMENTS**

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Providers and any individuals knowledgeable of suspected cases of diphtheria are required to immediately report to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### **Local and Regional Reporting and Follow-up Responsibilities**

Immediately investigate any reported suspect cases of diphtheria. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Report all cases of diphtheria as soon as possible to DSHS IDCU. There is no specific case investigation form; however, the DSHS IDCU will require a detailed written report, hospital records, and laboratory reports if a case is confirmed. In the event of a death, please provide copies of the hospital discharge summary, death certificate, and autopsy report to DSHS. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all diphtheria investigations with a confirmed or probable case status and submit notification in the NEDSS Based System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

Isolation and identification of *Corynebacterium diphtheriae* is available through the DSHS Laboratory.

To obtain a collection kit, contact the DSHS Laboratory at (512) 776-7661. Before shipping specimens, be sure to notify DSHS IDCU VPD staff at (512) 776-7676.

### Specimen Collection

- Use a cotton-tipped or polyester-tipped swab.
- Swabs should be taken below the membrane, if possible. (A portion of the membrane may be submitted for culture, but does not always yield *C.diphtheriae* well.)
- Ship swabs in Amie's or Stuarts Transport or transfer to a Loeffler's Slant for transport to DSHS Labs.

### Submission Form

- Use DSHS Laboratory G-2B form for specimen submission.
- Make sure the patient's name and date of birth or social security number match exactly what is written on the transport tubes.
- Fill in the date of collection, date of onset, and diagnosis/symptoms.

### Specimen Shipping

- Transport temperature: Keep at 2° - 25° C
- Ship specimens via overnight delivery on cold packs or wet ice (double bagged) within 48 hours of collection.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

### Causes for Rejection:

- Incorrect source of specimen.
- Specimen > 24 hours not in transport medium.
- Missing or discrepant information on form/specimen.



# Section 2: *Haemophilus influenzae* type B (HIB)

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Haemophilus influenzae* (*H.flu*) is a small, gram-negative bacillus, a bacterium capable of causing a range of diseases including ear infections, [cellulitis](#) (soft tissue infection), upper respiratory infections, [pneumonia](#), and such serious invasive infections as meningitis with potential brain damage and epiglottitis with airway obstruction. There are at least six serotypes of *H. influenzae* (designated a-f) distinguished by their capsular antigens, as well as unencapsulated (nontypable) strains. *Haemophilus influenzae*, type B (HIB), however, often causes the most severe disease and is the only type which is preventable by vaccine. Despite its name, this bacterium has nothing to do with the influenza viruses. (Note also that it is spelled differently.)

### Transmission

*Haemophilus influenzae* bacteria are found in the nose and throat, usually without causing symptoms, and are spread mainly by breathing, coughing and sneezing. *H.flu* is transmitted by direct contact with respiratory droplets and discharges from the nose and throat of infected/colonized persons.

### Incubation Period

The incubation period is hard to define, because most persons who acquire *Haemophilus influenzae* infections are asymptotically colonized. Those who become ill following exposure to a case usually do so within 10 days, although the risk may be slightly elevated for up to 60 days.

### Communicability

As long as the organism is present in discharges from the nose or throat. Communicability ends within 24 hours of initiation of appropriate chemoprophylaxis. Note, however, that treatment of invasive disease does not necessarily eradicate the organism from the nose/throat. Those exposed more than 7 days before onset of illness in the case are not at significantly increased risk. Hib cases are probably most infectious during the 3 days prior to onset of symptoms.

### Clinical Illness

Disease can take many forms, including:

- Meningitis- brain swelling
- Bacteremia- blood infection
- Periorbital or other cellulitis- skin lesions
- Septic arthritis- joint infection
- Osteomyelitis- bone infection
- Pericarditis- infection of the sac around the heart
- Pneumonia- lung infection

Onset of symptoms is usually abrupt, and may include:

- Fever
- Headache
- Lethargy
- Anorexia
- Nausea
- Vomiting
- Irritability

Progressive stupor or coma is common with meningitis. Infections spread via the bloodstream after penetration of the mucous membranes of the nasopharynx. The exact mechanism allowing the penetration is unknown, but a recent upper respiratory tract infection may facilitate invasion. Recently, having a cochlear implant procedure has been identified as a possible risk factor for invasive disease. Asymptomatic carriage of Hib is not uncommon; in the pre-vaccine era the organism was recovered from the upper respiratory tract of 2–5% of healthy children. Thus, isolates from sputum or other not-normally-sterile sites are *not* indicative of invasive disease. Neonatal sepsis and non-invasive upper respiratory tract disease, including otitis media, sinusitis, and bronchitis are often caused by other, nonencapsulated strains (non-type b) of *H. influenzae*. These organisms are extremely common and can be recovered from the nasopharynx of 40% to 80% of healthy children.

## DEFINITIONS

### Clinical Case Definition

*Haemophilus influenzae* type b may produce any of several clinical syndromes. Only invasive manifestations, however, are reportable. These include meningitis, bacteremia/septicemia, epiglottitis, pericarditis, osteomyelitis, septic arthritis, and cellulitis.

### Laboratory Confirmation

- Isolation of *H. influenzae b* from a normally sterile site (e.g., blood, **cerebrospinal fluid** [CSF] or, less commonly, joint fluid, or pericardial fluid).

**Note:** *Haemophilus influenzae* that is not typed or is not type b is not reportable as *H. flu* type b. Serotyping of isolates can be performed at the DSHS laboratory.

### Case Classifications

- **Confirmed:** A clinically compatible case that is culture confirmed and identified specifically as *H. influenzae* type b.
- **Probable:** A clinically compatible illness with detection of *Haemophilus influenzae* type b antigen in cerebrospinal fluid (CSF). (Antigen test results in urine or serum are unreliable for diagnosis of *H. influenzae* disease.)

## CASE INVESTIGATION & TREATMENT

### Control Measures

- Reports of invasive Hib disease should be investigated immediately.
- In households with a child younger than 12 months of age who has not received the three-dose primary series of Hib conjugate vaccine, all household members should receive rifampin prophylaxis.
- In households with at least one contact who is younger than 48 months of age and unvaccinated or incompletely vaccinated against Hib, rifampin prophylaxis is recommended for all household contacts regardless of age.
- In households with an immunocompromised child, even if the child is older than 48 months and fully vaccinated, all members of the household should receive rifampin because of the possibility that the vaccination may not have been effective.
- Chemoprophylaxis is not recommended for occupants of households that do not have children younger than 48 months of age (other than the index case) or when all household contacts 12 to 48 months of age are immunocompetent and have completed their Hib vaccination series.
- If a case of Hib disease occurs in a child-care facility, and a child <2 years of age has been exposed, all parents should be notified. All students and staff in the classroom where this case occurred should receive rifampin prophylaxis; however, rifampin is not necessary if ALL children <4 years of age are fully vaccinated.
- Hospital personnel exposed to a child with invasive Hib disease do not need prophylaxis.
- The recommended dose of rifampin is 20 mg/kg as a single daily dose (maximum daily dose 600 mg) for 4 days. Neonates (<1 month of age) should receive 10 mg/kg once daily for 4 days.
- Rifampin prophylaxis should be instituted as rapidly as possible.
- The index patient should also receive rifampin prophylaxis preferably just before hospital discharge.
- Children <24 months of age who have had invasive Hib disease (culture confirmed) should still receive Hib vaccine, since many children of that age fail to develop adequate immunity following natural disease.

### Exclusion

Exclude all children with proven Hib infection until treatment is completed. Do not exclude exposed children and staff as long as they have no other reasons for exclusion.

## REPORTING AND DATA ENTRY REQUIREMENTS

### Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Invasive Hib cases are required to be reported immediately to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**. Conjunctivitis, otitis media, and bronchitis caused by *H. influenzae* are not invasive infections, and do not need to be reported.

### **Local and Regional Reporting and Follow-up Responsibilities**

Immediately investigate any reported cases of invasive Hib. Facilitate the typing of untyped specimens as soon as possible. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Investigation forms for invasive *Haemophilus influenzae* type b must be sent to DSHS IDCU. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to (512) 776-7616 or mailed to the following address:

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

### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all Hib investigations with a confirmed or probable case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## **LABORATORY PROCEDURES**

Although not required by law, serotyping of *H. flu* isolates is an important process. Only *H. flu* type b is reportable in Texas and is the only type that is preventable by vaccine. Serotyping of *H. flu* isolates allows us to understand the epidemiology of *H. flu* and how the vaccine has affected *H. flu* in Texas. The DSHS laboratory can perform serotyping for *H. flu* isolates collected from sterile sites. DO NOT submit isolates from sputum for serotyping.

### **Isolate submission**

- Submit isolates of *H. influenzae* on chocolate agar slants (or media that has the necessary growth requirements for *Haemophilus*) at ambient temperature.
- Ship isolate to the DSHS laboratory via overnight delivery. The viability of the organism is short lived; therefore, isolate must arrive at the DSHS lab in Austin within 48 hours after subculture.
- If a delay of more than 48 hours in transport is anticipated, use a CO<sub>2</sub> generator bag.
- Use Specimen Submission form G-2B.

### **Specimen Shipping**

- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

H. influenzae is considered an infectious agent, biosafety level 2. The isolate should be triple contained in accordance with federal regulations.

**Causes for Rejection**

- Discrepant or missing information between isolate and paperwork.
- Expired media used.

# Section 3: Hepatitis A

## BASIC EPIDEMIOLOGY

### Infectious Agent

Hepatitis A virus (HAV), a picornavirus.

### Transmission

Transmitted from person to person through the fecal-oral route. Common source outbreaks are rare but have been linked to contaminated water, food contaminated by infected persons where the food was not properly cooked or handled after cooking, raw or undercooked mollusks harvested from contaminated waters, and contaminated produce.

### Incubation Period

Average of 28-30 days (range 15-50 days).

### Communicability

Persons with HAV shed the most virus during the 1-2 weeks prior to symptom onset. In most cases, persons are no longer infectious after the first week of jaundice.

### Clinical Illness

The clinical course of illness is indistinguishable from the other types of acute viral hepatitis. The illness typically has an abrupt onset of fever, malaise, anorexia, nausea, abdominal discomfort, jaundice and dark urine. Clinical illness does not usually last longer than two months.

Up to 70% of illness in children younger than 6 years old is likely to be asymptomatic. In older children and adults, infection is usually symptomatic, with up to 70% having jaundice.

Unlike some of the other viral hepatitis infections, hepatitis A does not create a chronic carrier state. Some patients, however, may have prolonged symptoms or relapse up to six months, during which the virus may be shed.

## DEFINITIONS

### Clinical Case Definition

An acute illness with at least one of the following: a) discrete onset of symptoms b) jaundice or c) elevated serum aminotransferase levels.

### Laboratory Confirmation

- Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive

## Case Classifications

- **Confirmed:**
  - A case that meets the clinical case definition (if known) and is laboratory confirmed OR
  - A case that meets the clinical case definition and has an epidemiological link with a person who has laboratory-confirmed hepatitis A.

**Note: There is not a probable case definition for Hepatitis A.**

## CASE INVESTIGATION & TREATMENT

### Control Measures

- Investigate reports of suspected hepatitis A promptly.
- Household and sexual contacts should be identified immediately and those that are unvaccinated should be offered post exposure prophylaxis with immune globulin (IG) or vaccine as follows:
  - For persons 1-40 years of age, offer vaccine within 2 weeks of exposure
  - For persons <1 or >40, immunocompromised, diagnosed with liver disease, or cannot receive vaccine, provide IG within 2 weeks of exposure
  - Contact DSHS IDCU if vaccine or IG is needed
- Contacts who have received one dose of hepatitis A vaccine at least one month prior to exposure do not need post-exposure prophylaxis.
- The patient should be educated on enteric precautions, which should be undertaken the first two weeks of symptoms and up to one week after the onset of jaundice.
- Generally, IG and vaccine are not recommended for school or work contacts with the following exceptions. At day care centers, IG and/or vaccine should be offered if a day care attendee or employee is IgM-positive or if two household contacts of an employee or attendee are IgM-positive. If a food-handler is diagnosed with hepatitis A, the other food handlers should be offered IG and/or vaccine. Patrons generally do not need prophylaxis although it may be considered if the food-handler prepared food that was not heated, had diarrhea, and IG and vaccine can be provided within two weeks of exposure.

### Exclusion

Food-handlers and school children should be kept out of work for seven days after the onset of symptoms.

## REPORTING AND DATA ENTRY REQUIREMENTS

### Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Providers and any individuals knowledgeable of cases of hepatitis A are required to immediately report to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### Local and Regional Reporting and Follow-up Responsibilities

Immediately investigate any reported cases of hepatitis A. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Report

all cases of hepatitis A as soon as possible to DSHS IDCU. Hepatitis A investigation forms are required by Central Office. In the event of a death, submit a hepatitis A investigation form and copies of the hospital discharge summary, death certificate, and autopsy report to DSHS. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

#### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all hepatitis A investigations with a confirmed case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## **LABORATORY PROCEDURES**

Testing for hepatitis A is widely available from most private laboratories. If hepatitis A testing is needed through the DSHS State Laboratory, please contact the Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.



# Section 4: Hepatitis B, Acute & Perinatal

## BASIC EPIDEMIOLOGY

### Infectious Agent

Hepatitis B virus (HBV) is the causative agent.

### Transmission

- Transfusion of contaminated blood or blood products
- Sharing or reusing non-sterilized needles, syringes, razors, toothbrushes, manicure equipment, or any other items which may contain the blood or body fluid of an infected person
- Percutaneous or mucous membrane exposure to blood or body fluids of an infected person
- Sexual activity with an infected person
- Tattooing and/or body piercing
- Perinatally (either in utero or at delivery)

### Incubation Period

The incubation period is 45–180 days with an average of 60–90 days.

### Communicability

The blood of infected persons is infective many weeks before the onset of symptoms and remains infective through the acute clinical course of the disease and during the chronic carrier state, which may persist for life. The younger a person is when infected, the more likely it is he or she will become chronic disease carriers. Additionally, persons who are Hepatitis Be virus Antigen (HBsAg, also referred to as “little e antigen”) positive are highly infectious.

### Clinical Illness

The clinical course of acute hepatitis B is indistinguishable from that of other types of acute viral hepatitis. Clinical signs and symptoms occur more often in adults than in infants or children, who usually have an asymptomatic acute course. However, approximately 50% of adults who have acute infections are asymptomatic.

The prodromal phase from initial symptoms to onset of jaundice usually lasts from 3 to 10 days. It is nonspecific and is characterized by a slow onset of malaise, anorexia, nausea, vomiting, right upper quadrant abdominal pain, fever, headache, myalgia, skin rashes, arthralgia and arthritis, and dark urine. The icteric phase is variable but usually lasts from 1 to 3 weeks and is characterized by jaundice, light or gray stools, hepatic tenderness and hepatomegaly (splenomegaly is less common). During convalescence, malaise and fatigue may persist for weeks or months, while jaundice, anorexia, and other symptoms disappear.

Most acute HBV infections in adults result in complete recovery with elimination of hepatitis B surface antigen (HBsAg) from the blood and the production of hepatitis B surface antibody (anti-HBs), creating immunity to future infection.

## DEFINITIONS

**Note:** Refer to Table 1 for hepatitis B diagnostic test definitions and abbreviations and Table 2 for interpretation of hepatitis B serological tests.

### Clinical Case Definition

- **Acute:** An acute illness with at least one of the following:
  - a) discrete onset of symptoms\*, or
  - b) jaundice, or
  - c) elevated serum aminotransferase levels >100 IU/L.
- **Perinatal:** Perinatal hepatitis B in the newborn may range from asymptomatic to fulminant hepatitis.
- **Chronic:** Persons with chronic hepatitis B virus (HBV) infection may have no evidence of liver disease or may have a spectrum of disease ranging from chronic hepatitis to cirrhosis or liver cancer. Persons with chronic infection may be asymptomatic. **Please note that chronic hepatitis B is not a reportable condition in Texas.**

\*A documented negative hepatitis B surface antigen (HBsAg) laboratory test result within 6 months prior to a positive test (either HBsAg, hepatitis H “e” antigen (HBeAg), or hepatitis B virus nucleic acid testing (HBV NAT) including genotype) result does not require an acute clinical presentation to meet the surveillance case definition.

### Case Classifications and Laboratory Confirmation

- **Confirmed Acute:**
  - A case that meets the clinical case definition, is known not to have chronic hepatitis B\*\* and also meets one of the following laboratory criteria:
    - IgM antibody to hepatitis B core antigen (anti-HBc IgM) positive, or
    - Hepatitis B surface antigen (HBsAg) positive

\*\*A person should be considered chronically infected if the hepatitis B surface antigen (HBsAg) has been positive for 6 months or longer or if the patient has a history of chronic hepatitis B diagnosis.

**Note:** There is not a probable case status for Acute or Perinatal Hepatitis B.

- **Confirmed Perinatal:** HBsAg positivity in any infant 1-24 months of age who was born in the United States or in U.S. territories to an HBsAg-positive mother.

**Note:** A pregnant woman with hepatitis B should NOT be entered into NBS as a perinatal case. Perinatal cases must be 24 months of age or younger. Positive mothers with acute hepatitis B should be entered as acute cases. If a pregnant woman has chronic hepatitis B, she can be entered as a chronic case of hepatitis B, if the jurisdiction chooses to maintain a database of chronic hepatitis B patients.

## SURVEILLANCE AND CASE INVESTIGATION

Acute hepatitis B surveillance is used to 1) identify contacts of case-patients who may require testing or prophylaxis; 2) detect outbreaks; 3) identify infected persons who need counseling and

referral for medical management; 4) monitor disease incidence and prevalence; and 5) determine the epidemiologic characteristics of infected persons, including the source of their infection, to assess and reduce missed opportunities for vaccination.

### **Getting the Most Out of Surveillance**

- Provider education
  - Providers should be educated about the importance of performing appropriate serologic tests to determine the etiology of viral hepatitis and reporting all cases of acute and perinatal HBV. Providers are required by law to test pregnant women for hepatitis B.
  - Hospitals and infection control practitioners should be encouraged to report all persons with acute viral hepatitis (ICD-10 code B16), and all births to HBsAg-positive women. This is required by Texas Administrative Code.
- Case investigation
  - Case investigation is essential for determining contacts who are eligible for prophylaxis and for collection of risk factor data.
  - Analysis of risk factor data can identify populations where targeted interventions may be needed.
- Laboratory reporting
  - Laboratories should be encouraged to report all persons with serologic markers of acute or chronic hepatitis to the state or local health department.
    - Currently Texas receives over 50,000 hepatitis B laboratory results through NBS. At this time, only IgM anti-HBc and HbsAg results populate the “Documents Requiring Review” queue (where all electronic laboratory results first appear). All other hepatitis B laboratory results are automatically swept off that queue by the system. They are still stored in NBS and can be located by searching for a specific patient or by running a report for one or more specific laboratory result.
  - All IgM anti-HBc and HBsAg positive results should be reported.
  - To facilitate reporting, these laboratory results are included in the state’s list of laboratory-reportable conditions.
- Monitoring surveillance indicators
  - Regular monitoring of surveillance indicators, including date of report, timeliness, and completeness of reporting, may identify specific areas of the surveillance and reporting system that need improvement. Important program indicators that can be monitored through the surveillance, reporting and case investigation system include the following:
    - Characteristics of cases of acute hepatitis B that occur in children and adolescents younger than 20 years of age and missed opportunities for vaccination.
    - Characteristics of cases of acute hepatitis in which death has occurred.
    - Characteristics of cases of acute hepatitis B in persons reporting a history of vaccination.
    - Characteristics of cases of acute hepatitis B in persons over 70 years of age.
    - Characteristics of cases of acute hepatitis B associated with healthcare transmission.
- Registries/databases for HBsAg-positive persons

- NBS can serve as a de facto chronic B registry and the positive hepatitis B results can be used to distinguish newly reported cases of infection from previously identified cases.

### **Information to Collect for Acute Hepatitis B**

The following information is epidemiologically important to collect in a case investigation for acute hepatitis B. The CDC viral hepatitis form and the DSHS Hepatitis B case track include spaces to record most of this information. All information collected during investigation should be entered into NBS.

- Demographic information
- Clinical details
  - Date of illness onset
  - Symptoms, including jaundice
  - Hospitalization
  - Provider information
- Laboratory results
- Vaccination status
- Risk behaviors and exposures
  - Sexual
  - Drug use
  - Tattoos/piercings
  - Healthcare
    - Receipt of organs/blood products
    - Accidental needle stick
    - Medical/dental procedures
    - Hospitalization/resident in long term care facilities
  - Other blood exposure
  - Occupational
  - Incarceration
- Contact investigation and prophylaxis
  - Sexual contacts
  - Household contacts
  - Pregnancy status
  - Bloodborne exposures (e.g. recently donated blood or an organ)

### **Routine Case Investigation for Suspected Cases of Acute Hepatitis B**

- Evaluate the diagnosis
  - Review laboratory tests
    - Identify all HBsAg+ and/or anti-Hep B IgM+ in NBS or received via fax
    - Check patient's name in NBS to see if patient has already been identified as a hepatitis B case or has previous (> 6 mos) positive lab results for hepatitis B.
      - If patient has a previous positive hep lab result or a hep B investigation, mark lab as reviewed. Share HBsAg+ results with the perinatal program for women 13-55.
  - Contact provider

- If patient is not identified as a chronic case, contact healthcare provider for additional laboratory and clinical information, and pregnancy status if age/gender appropriate.
  - If patient is pregnant, refer to perinatal program
  - If patient is not pregnant and the provider indicates the patient is a known chronic case OR the patient's clinical information is not consistent with acute hepatitis B, investigation can be closed.
    - Mark lab as reviewed in NBS OR
    - If an acute investigation was opened in NBS, close as "not a case" (and do not send a notification) OR
    - If desired and appropriate, enter the case in NBS as a chronic hep B case. Do not submit a notification.
  - If patient is identified as acute by provider or has a clinical presentation consistent with acute hepatitis B, continue investigation.
  - Contacting the provider can be done by fax, phone, e-mail or mail.
    - Some health departments find it useful to initiate contact with a form letter that the provider completes with information on pregnancy status, chronic status, and any additional liver test results.

**Any woman that has a positive hepatitis B laboratory result AND is known to be pregnant must be referred to a perinatal hepatitis B program for case management. Any woman age 13-55 that has an unknown pregnancy status and a positive hepatitis B lab result should also be referred to a perinatal hepatitis B program for further investigation of pregnancy status.**

- Interview the patient
  - Identify the Source of Infection
    - Obtain information on high risk behaviors, medical/dental/commercial procedures in 45-180 days prior to onset
      - Close contact with any household or sexual contact with acute or chronic hepatitis B infection
      - Receipt of blood transfusion or other blood products
      - History of dental or surgical care including renal dialysis
      - Blood exposure through needles, tattooing, piercing or acupuncture
      - Accidental exposure of skin, eyes, mucous membranes, or a wound to blood of another person
      - Work in occupational settings with elevated risk of exposures (e.g. medical, dental, or clinical laboratory work, or employment in facilities for mentally disabled persons)
      - Sexual contact with multiple sex partners or a sex partner with a risk factor
    - Possible sources should be pursued if additional exposures may be prevented (e.g. illegal tattooing, likely healthcare transmission, etc)
  - Identify Potentially Exposed Persons
    - Identify persons potentially exposed to the case during the communicable period

- Household members
    - Sexual contacts
    - Needle-sharing contacts
    - Others potentially exposed to blood/sexual fluids
  - Evaluation special situations (see “Managing Special Situations” below)
    - If patient is a healthcare worker, evaluation potential for exposing patients.
    - If patient has recently donated blood/plasma, notify the blood bank.
    - If patient is pregnant, refer patient to perinatal program.
- Contact Investigation
  - Evaluate immunization and disease history of household and sexual contacts
    - **Susceptible:** persons who are not immune to HBV or who have not been appropriately vaccinated against HBV
    - **Protected:** persons with adequate antibody response (anti-HBs  $\geq$  10 milli-IUs/mL) due to vaccination or natural infection
    - **Primary non-responder:** persons who do not demonstrate adequate antibody response after three doses of hepatitis B vaccine
    - **Non-responder:** persons who have received two complete series of the hepatitis B vaccine but still do not demonstrate adequate antibody response
    - **Unknown:** persons whose anti-HBs status is unknown are always considered susceptible
  - Test or refer for testing as appropriate
  - Offer vaccine or refer to provider for vaccine, if susceptible (see Table 3)
    - Sexual contacts: Susceptible sexual partners should receive both a single dose of .06 mL/kg hepatitis B immune globulin (HBIG) and the first dose of hepatitis B vaccine at the same time and within 14 days of their last sexual contact. The remaining two doses of hepatitis B vaccine should be administered at one (1) and six (6) months from the date of the first vaccine. Sexual contacts whose immune status is unknown are considered susceptible.
    - Non-sexual household contacts: Infants who have not completed the three-dose hepatitis B vaccine series, and who have close contact with acutely infected primary care givers, should receive HBIG and complete the hepatitis B vaccine series. Other susceptible household contacts should begin the hepatitis B vaccine series, but HBIG is not indicated unless there has been an identified blood exposure such as the sharing of toothbrushes or razors. Contacts whose immune status is unknown should be considered susceptible.
  - Offer education on preventing hep B
  - Refer to prevention and/or treatment resources
- Follow-up
  - Refer acute cases to provider for follow up testing to establish resolution or carrier status
    - Offer education on reducing risk of further transmission
    - Refer to treatment
- Date entry (also see “Reporting and Data Entry Requirements” below)
  - Enter information into NBS within 30 days of initial report
    - Demographic

- Clinical
- Laboratory
- Vaccination history
- Risk factor/exposure information
- Submit notification to Central Office
- Fax or mail case track to Central Office (or regional office as appropriate)

### **Information to Collect for Perinatal Hepatitis B**

The Texas Perinatal Hepatitis B Prevention Program has extensive information on diagnosis, case management, and follow-up of pregnant women with hepatitis B and their infants. Their program can be accessed at: [http://www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis\\_b/perinatal/](http://www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis_b/perinatal/).

The information provided below is the information that is needed for perinatal hepatitis B surveillance information that is shared with the CDC via NBS.

- Demographic information
  - Infant
  - Mother
- Clinical details
  - Laboratory results for mother
  - Laboratory results for infant
- Vaccination
  - Dates
  - HBIG information
  - Was series given more than once

All information collected for perinatal hepatitis B investigations should be entered into NBS within 30 days of the report of a positive hepatitis B lab on the infant. Investigation forms (or a copy of the infant and mother's perinatal program case management forms) should be submitted to the Infectious Disease Control Unit.

## **MANAGING SPECIAL SITUATIONS**

### **Positive Lab Results Received on a Child Under 4**

All positive laboratory results indicative of hepatitis B infection in children under 4 should be investigated to ensure the child is not a case of perinatal hepatitis B.

1. Ascertain if additional laboratory results exist in NBS
2. Contact the submitting laboratory or provider to find additional laboratory results and information on the mother's hepatitis B status.
3. If mother is positive and child has acute or chronic infection, investigate as a potential perinatal case.

### **Case is a Health Care Worker (HCW)**

If the case is a dentist, physician, nurse, or other health care worker (HCW) with potential for exposing patients by blood or other body fluids:

1. The HCW should be discouraged from working until the acute clinical illness has resolved;
2. Upon returning to work, special precautions should be practiced until the HCW is no longer infectious, including:

- a. Wearing gloves for all procedures during which the hands will be in contact with the patients' mucosal surfaces or broken skin;
- b. Avoiding situations involving sharps that could lead to exposures of susceptible individuals to blood or objects contaminated with blood of the case;
- c. Careful and frequent hand washing.

#### **Health Care Associated Infection is Suspected**

If two or more iatrogenic (health care associated) cases occur in patients of the same dental or health care provider, residential care facility, or nonhospital health care facility (e.g. dialysis center); and the cases have no other identified plausible source of infection; or if other circumstances suggest the possibility of iatrogenic infection, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

#### **Case is a Recent Blood Donor**

If the case has donated blood or plasma within the eight weeks prior to onset of symptoms, the agency that received the blood or plasma should be notified so that any unused product can be recalled.

#### **Case is a Recent Transfusion Recipient**

If transfused blood or blood products are suspected as the possible source of infection, the blood bank or other agency that provided the implicated lot should be notified so that aliquots of the blood still on hand (or the donors themselves) can be retested for HBsAg or tested for anti-HBc. Lot numbers for tracking are usually available through the blood bank at the hospital where the units were transfused.

#### **Case is Pregnant or Has Recently Delivered**

Preventing perinatal transmission is perhaps the most important part of case follow-up, and for this reason the Texas Department of State Health Services has an official Perinatal Hepatitis B Prevention Program for Texas. Please contact the program at **512-776-6535** or go to their website [http://www.dshs.state.tx.us/idcu/disease/hepatitis\\_b/perinatal/](http://www.dshs.state.tx.us/idcu/disease/hepatitis_b/perinatal/) for more information or to refer a pregnant or recently delivered woman for evaluation.

#### **Possible Common-Source Outbreaks**

Report immediately to the Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

## **REPORTING AND DATA ENTRY REQUIREMENTS**

#### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Acute hepatitis B cases are required to be reported within one week. Perinatal hepatitis B cases are required to be reported within one work day to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

#### **Local and Regional Reporting and Follow-up Responsibilities**

Investigate any reported cases of acute or perinatal hepatitis B. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Investigation forms for perinatal hepatitis B must be sent to DSHS IDCU. In the event of a death, please provide copies of the hospital discharge summary, death certificate, and autopsy report to DSHS. Records must be faxed within 30 days of initial report to **(512) 776-7676** or mailed to the following address:



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

**Note:** HBsAg-positive pregnant women (acute and chronic infections) should also be reported to the Texas Department of State Health Services, Perinatal Hepatitis B Prevention Program at **(512) 776-6535**. For information on perinatal hepatitis B prevention activities, please refer to the Perinatal Hepatitis B Prevention Program Manual at <http://www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis%5Fb/perinatal/manual/>.

### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all acute hepatitis B and perinatal hepatitis B investigations with a confirmed case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. **Please do not submit notifications on chronic hepatitis B cases entered into NBS.** Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## **LABORATORY PROCEDURES**

Testing for hepatitis B is widely available from most private laboratories. If hepatitis B testing is needed through the DSHS State Laboratory, please contact the Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

For testing in regard to a possible perinatal case, please contact the Perinatal Hepatitis B program at **(512) 776-6535**.

## TABLES

**Table 1. Diagnostic Tests for Hepatitis B Virus (HBV) Antigens and Antibodies**

Abbreviation	Marker	Use
<b>HBsAg</b>	Hepatitis B surface antigen	Detection of acutely or chronically infected persons; antigen used in hepatitis B vaccine
<b>IgM Anti-HBc</b>	M class immunoglobulin antibody to hepatitis B core antigen	Identification of acute or recent HBV infections (including HBsAg-negative persons during the “window” phase of infection)
<b>Anti-HBc</b>	Antibody to hepatitis B core antigen	Identification of persons with acute, resolved, or chronic HBV infection (not present after vaccination)
<b>HBeAg</b>	Hepatitis B e antigen	Identification of infected persons at increased risk for transmitting HBV
<b>Anti-HBe</b>	Antibody to Hepatitis B e antigen	Identification of infected person with lower risk for transmitting HBV

Source: American Academy of Pediatrics. Hepatitis B. In: Pickering LK, Baker CJ, Long SS, McMillan JA, eds. *Red Book: 2006 Report of the Committee on Infectious Diseases*. 27<sup>th</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006: 339.

**Table 2. Interpretation of Hepatitis B Serological Tests and Health Department Response**

Tests	Results	Interpretation	Health Department Response
HBsAg Anti-HBc Anti-HBs	Negative Negative Negative	Susceptible (Never infected or vaccinated)	Vaccinate or refer for vaccine if appropriate
HBsAg Anti-HBc Anti-HBs	Negative Negative Positive	Immune due to vaccination	No further action needed
HBsAg Anti-HBc Anti-HBs	Negative Positive Positive	Immune due to past infection	No further action needed
HBsAg Anti-HBc IgM anti-HBc Anti-HBs	Positive Positive Positive Negative	Acutely Infected	Initiate case investigation. If case is pregnant, refer to Perinatal hepatitis B program. Enter case into NBS if meets confirmed case status (no probable case status for acute hepatitis b).
HBsAg Anti-HBc IgM anti-HBc Anti-HBs	Positive Positive Negative Negative	Chronically Infected	Follow-up to determine if patient may be pregnant. If pregnant, refer case to Perinatal hepatitis B program. If case is chronic, it is not required to be reported. No NBS entry required. If entry is made, please do not submit notification.
HBsAg Anti-HBc Anti-HBs	Negative Positive Negative	Four interpretations possible*	Recommend patient follow-up with physician and/or recommend more testing be completed if applicable.
<p>* 1. May be recovering from acute HBV infection.            2. May be distantly immune and test not sensitive enough to detect very low level of anti-HBs in serum            3. May be susceptible with a false positive anti-HBc.            4. May be undetectable level of HBsAg present in the serum and the person is actually a carrier.</p>			

**Source: Adapted from Centers for Disease Control and Prevention (CDC).**

**Table 3. Postexposure Prophylaxis for Perinatal and Sexual Exposures**

Exposure	HBIG		Vaccine	
	Dose	Recommended timing	Dose	Recommended timing
Perinatal	0.5 ml IM	Within 12 hours of birth	0.5 ml IM	Within 12 hours of birth
Sexual	0.06 ml/kg IM	Single dose ASAP, but not more than 14 days after last sexual contact	Administer age-appropriate hepatitis B vaccine series	First dose at same time as HBIG; but give in a different site

\*For premature infants born to positive moms, be sure to contact Perinatal Hepatitis B Program.

\*\*For age-specific doses, refer to [current hepatitis B vaccine schedule](#).

# Section 5: Influenza-Associated Pediatric Mortality

## BASIC EPIDEMIOLOGY

### Infectious Agent

Influenza A, B or C virus

### Transmission

Transmission occurs via droplet spread. After a person infected with influenza coughs or sneezes, influenza viruses contained in the respiratory droplets travel through the air; other persons nearby can become infected if these droplets land in their noses or mouths. These droplets can also contaminate surfaces, and people can become infected when they touch an object or a surface on which these droplets have landed and then touch their noses or mouths. Transmission may also occur by direct contact, such as kissing.

### Incubation Period

The incubation period is 1 to 4 days with most infections occurring within 2 days of exposure to an infected individual.

### Communicability

Influenza is easily transmitted from person to person. Infected persons can start shedding virus up to 24 hours before the onset of symptoms. Additionally, some persons who become infected with influenza remain asymptomatic.

### Clinical Illness

Symptoms of influenza include fever, cough, sore throat, myalgia (muscle aches), headaches and fatigue. Among children, otitis media, nausea, vomiting and diarrhea are also commonly reported. Influenza is usually a self-limiting infection, but in people with chronic medical conditions such as heart or lung disease, it can lead to pneumonia and other life-threatening complications.

### Severity

An estimated 23,607 (range 3,349-48,614) deaths associated with influenza occur every year in the United States.

## DEFINITIONS

### Clinical Case Definition

An influenza-associated death is defined for surveillance purposes as a death resulting from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test. There should be no period of complete recovery between the illness and death. Influenza-associated deaths in all persons aged <18 years should be reported.

- A death should not be reported if there is
  - no laboratory confirmation of influenza virus infection;

- the influenza illness is followed by full recovery to baseline health status prior to death;
- the death occurs in a person 18 years or older;
- or after review and consultation there is an alternative agreed upon cause of death which is unrelated to an infectious process.
  - For example, a child with a positive influenza test whose death clearly resulted from trauma after a car accident would not qualify as a case. However, a child with a respiratory illness and a positive influenza test whose death is attributed to another infectious cause such as staphylococcal pneumonia would still qualify as a case.)

### Laboratory Confirmation

Laboratory testing for influenza virus infection may be done on pre- or post-mortem clinical specimens, and may include identification of influenza A or B virus infections by a positive result by at least one of the following:

- Influenza virus isolation in tissue cell culture from respiratory specimens;
- Reverse-transcriptase polymerase chain reaction (RT-PCR) testing of respiratory specimens;
- Immunofluorescent antibody staining (direct or indirect) of respiratory specimens;
- Rapid influenza diagnostic testing of respiratory specimens;
- Immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract tissue from autopsy specimens;
- Four-fold rise in influenza hemagglutination inhibition (HI) antibody titer in paired acute and convalescent sera

### Case Classifications

- **Confirmed:** A death meeting the clinical case definition that is laboratory confirmed
- **Probable:** No probable case definition

## CASE INVESTIGATION & TREATMENT

### Case Investigation

Local and regional health departments should investigate all reports of suspected influenza-associated deaths in any person under 18 years of age.

### Case Investigation Checklist

- Confirm that laboratory results meet the case definition.
- Review medical records or speak to an infection preventionist or physician to verify case definition, underlying health conditions and course of illness.
- Interview case (or surrogate) to identify vaccination status and risk factors.
  - If multiple attempts were made to contact the case or surrogate and attempts were unsuccessful, please fill out the case investigation form with as much information as possible and indicate reasons for missing information (e.g. lost to follow up – patient did not return call; multiple messages left).
- Complete the influenza-associated pediatric mortality form and fax it to DSHS.

- All confirmed case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.
- **Control Measures**
- Provide education on influenza as needed.
  - Get vaccinated for influenza every year
  - Wash hands frequently with soap and water, especially after coughing or sneezing.
  - Use alcohol-based hand sanitizers when facilities are not available for hand washing.
  - Cover coughs and sneezes with disposable tissues or your arm/sleeve.
  - Avoid touching your eyes, nose or mouth.
  - Avoid close contact with people who are sick.
  - When you are sick, limit contact with others and stay home until fever free for 24 hours without the use of fever-reducing medications.
  - Take antiviral medications if prescribed by your doctor.
- Recommend that anyone with risk factors experiencing symptoms or anyone with severe illness be evaluated by a healthcare provider.
- See the Texas Influenza Surveillance Handbook for additional influenza control measures.

### **Exclusion**

Children with influenza are required to be excluded from school/daycare for at least 24 hours after fever has subsided without the use of fever suppressing medications. It is recommended that adults with influenza not return to work for at least 24 hours after fever has subsided without the use of fever suppressing medications.

## **MANAGING SPECIAL SITUATIONS**

### **Outbreaks**

Influenza-associated pediatric deaths may result in high levels of media and public attention. If the death is linked to an influenza outbreak, then the outbreak investigation may also be subject to additional media or public attention. If an outbreak of influenza is suspected, notify the DSHS Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

The local/regional health department should:

- Work with the facility to ensure staff and students/residents get hand hygiene and respiratory etiquette education.
- Recommend staff with influenza be restricted from working until 24 hours after fever has subsided without the use of fever suppressing medications.
- Recommend that anyone with risk factors experiencing symptoms or anyone with severe illness be evaluated by a healthcare provider.
- See the Texas Influenza Surveillance Handbook for more information on control measures and responding to influenza outbreaks.

## REPORTING AND DATA ENTRY REQUIREMENTS

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Confirmed and suspected cases should be reported within 1 week of suspicion to the local or regional health department or the Texas Department of State Health Services, Infectious Disease Control Unit at (800) 252-8239 or (512) 512-776-7676.

### **Local and Regional Reporting and Follow-up Responsibilities**

Local and regional health departments should fax (or mail) a completed investigation form and submit an NBS notification on all confirmed cases to DSHS within 30 days of receiving a report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules. Investigation forms may be faxed to 512-776-7616 or mailed to

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

Local and regional health departments should report suspected outbreaks of influenza or influenza-like illness within 24 hours of identification to the regional DSHS office or to DSHS at 512-776-7676 and submit a completed respiratory outbreak form at the conclusion of the outbreak investigation (fax a copy to the DSHS regional office and/or IDCU 512-776-7676)

## LABORATORY PROCEDURES

Specimens for influenza testing should be submitted to the DSHS Laboratory (or an LRN laboratory) for any influenza-associated pediatric mortality. It is especially important to submit specimens if influenza was suspected but not confirmed or only confirmed with a rapid influenza test.

Please note that post-mortem specimens collected during an autopsy may be tested for influenza and bacterial co-infections by the CDC. Contact the Texas Department of State Health Services, Infectious Disease Control Unit at (800) 252-8239 or (512) 512-7676 for instructions on post-mortem autopsy specimen collection and submission.

### **Specimen Collection**

- Follow the specimen collection instructions in the current influenza season's laboratory surveillance protocol. The protocol is available by request from the DSHS Emerging and Acute Infectious Disease Branch (EAIDB) or from the regional influenza surveillance coordinator.
- A nasopharyngeal swab is the preferred specimen type. Other respiratory specimens may be accepted as described in the current protocol.
- Refrigerate (2°–8 °C) or freeze (-70°C) specimen vials immediately after collection.



### Submission Form

- Use the DSHS Laboratory G2-A Specimen Submission Form for specimen submission. On the form, under the Virology section, check the box for **influenza surveillance**. In the blank space at the bottom of the Virology section next to other, write “pediatric flu death”.

**Section 10. VIROLOGY**

Electron microscopy

Influenza surveillance  
Vaccine received:  Yes  No

Reference culture (Virus ID on isolate)  
Suspected: \_\_\_\_\_  
Submitted on: \_\_\_\_\_

Virus isolation (comprehensive)  
Suspected if any: \_\_\_\_\_

Other: *Pediatric flu death*

- Make sure the patient's name and date of birth on the form exactly match what is written on the transport tubes.
- Make sure to fill in the date and time of collection in addition to the patient demographics on the form.

### Specimen Shipping

- Transport temperature: Store the specimen at 2°-8°C if the specimen will be received at the laboratory within 72 hours of collection: ship the specimen on cold packs or wet ice (double bagged). Otherwise, the specimen must be stored frozen (-70°C) and shipped on dry ice.
- Ship specimens via overnight delivery.
- DO NOT mail specimens on a Friday or the day before a holiday unless special arrangements have been made in advance with the DSHS Laboratory.
- 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

### Common Causes for Rejection:

- Discrepancy between name on tube and name on form
- Not shipped in viral transport media or media is expired
- Specimen is received more than 72 hours after collection (if refrigerated)
- Specimen is received at ambient temperature

# Section 6: Influenza - Variant / Novel

## BASIC EPIDEMIOLOGY

### **Infectious Agent**

Variant or novel influenza is caused by an influenza virus that is not known to circulate in humans. Some animals (avian and swine populations) are considered higher risk for transmitting a variant influenza strain to humans.

### **Transmission**

The transmission route of variant influenza viruses is likely to be similar to seasonal influenza which is primarily by droplet spread. Transmission may also occur by direct or indirect contact with oral secretions or fecal material from infected animals

### **Incubation Period**

The incubation period is likely to be similar to seasonal influenza with an incubation period of 1 to 4 days.

### **Communicability**

The communicability of variant influenza viruses is unknown and strain specific. It may range from low communicability to high communicability depending on how well adapted the strain is to humans. Susceptibility is considered to be universal since by definition a variant influenza strain is one that is not known to circulate in humans.

### **Clinical Illness**

Symptoms are likely to be similar to seasonal influenza with high fever, chills, muscle aches, headache and cough. Many variant influenza infections have had increased incidence of gastrointestinal symptoms such as vomiting and diarrhea as well.

### **Severity**

The severity of illness is unknown and may vary from mild to severe depending on the specific strain and characteristics of the population.

## DEFINITIONS

### **Clinical Case Definition**

An illness compatible with influenza virus infection such as fever >100 degrees Fahrenheit, with cough and/or sore throat

### **Laboratory Confirmation**

Identification of an influenza A virus subtype or strain that is different from currently circulating human influenza H1 and H3 strains as confirmed by CDC's influenza laboratory, by public health laboratories using CDC-approved protocols for that specific strain, or by labs using FDA-approved test for specific strain.

- Novel subtypes include, but are not limited to, H2, H5, H7, and H9 subtypes.

- Influenza H1 and H3 subtypes originating from a non-human species or from genetic reassortment between animal and human viruses are also novel / variant subtypes or strains.
- Suspected novel / variant subtypes and strains will be detected with methods available for detection of currently circulating human influenza viruses at public health laboratories (e.g., rRT-PCR).
- Initial confirmation that a specific influenza A virus represents a novel / variant virus will be performed by CDC's influenza laboratory.

### Case Classifications

- **Confirmed:** A case of human infection with a laboratory confirmed novel influenza A virus
- **Probable:** A case meeting the clinical criteria and epidemiologically linked to a confirmed case, but for whom no confirmatory laboratory testing for influenza virus infection has been performed or test results are inconclusive for a novel influenza A virus infection
- **Suspect:** A case meeting the clinical criteria in which influenza A has been detected but is pending laboratory confirmation
  - In addition, a history of either close contact with ill animals known to transmit novel subtypes of influenza A (such as wild birds or poultry, swine or other mammals) OR
  - travel within 14 days of onset, to any country where a novel influenza A virus (such as highly pathogenic avian influenza A H5N1) has been recently identified in animals or people, is required

### Criteria for epidemiologic linkage

- The patient has had recent contact with one or more persons who either have or had the disease and
- Transmission of the agent by the usual modes of transmission is plausible.
- A case may be considered epidemiologically linked to a laboratory confirmed case if at least one case in the chain of transmission is laboratory confirmed.

## CASE INVESTIGATION

### Case Investigation

Local and regional health departments should investigate all reports of suspected variant influenza. Health care providers may report suspected cases of variant influenza. Only the state laboratory or the CDC can identify a confirmed or probable case of variant influenza.

### Suspect Case Investigation Checklist

- Determine why the healthcare provider suspects variant influenza.
- Follow the current influenza season's laboratory surveillance protocol to give instructions for the collection and submission of specimens.
- Complete the general influenza investigation form and fax it to DSHS.
- Suspect cases do not need to be entered into NBS unless specifically requested.

### **Confirmed / Probable Case Investigation Checklist**

- Confirm that the laboratory results meet the case definition.
- Review medical records or speak to an infection preventionist or physician to verify underlying health conditions and course of illness.
- Interview case (or surrogate) to identify travel history, animal contact and other risk factors.
- Enhance surveillance for ILI
  - Ensure that all regular influenza reporters are reporting ILI data to public health (if the case occurs outside of flu reporting season, contact regular flu reporters and request that they to report ILI for at least 4 weeks).
  - Contact local hospitals and large clinics to see if any increases in ILI activity have occurred. Follow up with hospitals and large clinics weekly for at least 4 weeks.
  - Contact local schools to see if any increases in ILI activity have occurred. Follow up with schools weekly for at least four weeks.
- Complete the variant influenza investigation form and fax it to DSHS.
- All confirmed and probable case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

### **Control Measures**

- Provide education on influenza to contacts of the case as needed.
- Recommend that anyone with risk factors experiencing symptoms or anyone with severe illness be evaluated by a healthcare provider.
- Remind local healthcare providers to consider influenza and report suspected cases.
- Antivirals may be used to treat and prevent influenza according to CDC guidance.

### **Exclusion**

Children are required to be excluded from school/daycare for at least 24 hours after fever has subsided without the use of fever suppressing medications. It is recommended that adults not return to work for at least 24 hours after fever has subsided without the use of fever suppressing medications. In the event of a pandemic or unusually severe presentation the exclusion period may be extended.

## **MANAGING SPECIAL SITUATIONS**

### **Animal (swine or avian) exposure identified**

If the influenza case is determined to be a variant strain and if exposure to domestic or wild animals is identified during the investigation, DSHS should be notified immediately so that partners in Zoonosis Control, the Texas Animal Health Commission (TAHC) and/or Texas Parks and Wildlife (TPW) can be included in the investigation.

Extensive efforts should be made to identify all animal contacts up to onset of illness. Zoonosis Control, TAHC or TPW will conduct trace backs and investigations on animal contacts.

### **Multiple cases of variant influenza identified**

If more than one case of variant influenza is identified enhanced surveillance will be expanded.

The local/regional health department should:

- Alert all acute care healthcare providers in the area to be cognizant of possible cases and encourage reporting of suspected cases.
- Continue to work with existing influenza surveillance partners and hospitals/large clinics in the area to track influenza-like illness and identify new cases.
- Investigate common exposures among the cases and work with any identified facilities or entities.
  - Recommend control measures based on the type of entity or setting.
  - Recommendations should be jointly developed with TAHC / TPW if animals are present.
- Encourage anyone with symptoms be evaluated by a healthcare provider.
- See the Texas Influenza Surveillance Handbook for more information on control measures and outbreak response.

### **Pandemic**

During a pandemic, DSHS will determine what information should be collected on individual cases of pandemic influenza or if only aggregate data will be collected. It is anticipated that a complete variant influenza investigation will be performed on initial cases. As the case count increases, a general influenza investigation form should be completed for all or a subset of cases.

Once a pandemic influenza strain becomes widespread in Texas it is likely that individual investigations will no longer be performed for all cases and only aggregate reporting of cases or full investigation of a subset of cases will be needed. Individual investigations may continue for a subset of cases such as influenza-associated deaths among pregnant/postpartum women or other group(s) of interest.

Investigation and reporting guidance specific to the pandemic will be shared by DSHS.

## **REPORTING AND DATA ENTRY REQUIREMENTS**

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Confirmed and suspected cases of variant influenza should be reported within 1 week of suspicion to the local or regional health department or the Texas Department of State Health Services, Infectious Disease Control Unit at (800) 252-8239 or (512) 512-7676. Healthcare providers are encouraged to report suspected cases of influenza with a recent history of international travel and/or with recent contact with swine or poultry.

### **Local and Regional Reporting and Follow-up Responsibilities**

Local and regional health departments should fax (or mail) a completed investigation form and submit an NBS notification on all confirmed and probable cases to DSHS within 1 week of receiving lab confirmation of variant influenza. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules. Investigation forms may be faxed to 512-776-7616 or mailed to

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

## LABORATORY PROCEDURES

Specimens associated with suspected variant influenza cases should be submitted to the DSHS laboratory following the protocol for seasonal influenza surveillance. The protocol is available by request from the DSHS Emerging and Acute Infectious Disease Branch (EAIDB) or from the regional influenza surveillance coordinator.

### Specimen Collection

- Follow the specimen collection instructions in the current influenza season's laboratory surveillance protocol.

### Submission Form

- Use the DSHS Laboratory G2-A Specimen Submission Form for specimen submission. On the form, under the Virology section, check the box for **influenza surveillance**. In the blank space at the bottom of the Virology section near other, write "suspect variant influenza".

**Section 10. VIROLOGY**

Electron microscopy

Influenza surveillance  
Vaccine received:  Yes  No

Reference culture (Virus ID on isolate)  
Suspected: \_\_\_\_\_  
Submitted on: \_\_\_\_\_

Virus isolation (comprehensive)  
Suspected if any: \_\_\_\_\_

*Suspect variant influenza*

- Make sure the patient's name and date of birth on the form exactly match what is written on the transport tubes.
- Make sure to fill in the date and time of collection in addition to the patient demographics on the form.
- In section 2 under the heading for risk, make sure to clearly indicate why a variant influenza is suspected. Examples include:
  - Travel to \_\_\_\_\_ {insert name of country}
  - Contact with swine
  - Contact with poultry

Section 2. PATIENT INFORMATION -- (** REQUIRED)					
NOTE: Patient name on specimen is REQUIRED & MUST match name on this form & Medicare/Medicaid card.					
Last Name **		First Name **		MI	
Address **			Telephone Number		
City **		State **	Zip Code **	Country of Origin / Bi-National ID #	
DOB (mm/dd/yyyy) **		Sex **	SSN	Pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	
Race: <input type="checkbox"/> White <input type="checkbox"/> American Indian / Native Alaskan <input type="checkbox"/> Native Hawaiian / Pacific Islander		Black or African American <input type="checkbox"/> Asian <input type="checkbox"/> Other		Ethnicity: <input type="checkbox"/> Hispanic <input type="checkbox"/> Non-Hispanic <input type="checkbox"/> Unknown	
Date of Collection ** (REQUIRED)		Time of Collection <input type="checkbox"/> AM <input type="checkbox"/> PM	Collected By		
Medical Record #	Alien # / CUI / CDC ID		Previous DSHS Specimen Lab Number		
ICD Diagnosis Code ** (1)		ICD Diagnosis Code ** (2)		ICD Diagnosis Code ** (3)	
Date of Onset	Diagnosis / Symptoms			Risk <i>Swine contact</i>	
<input type="checkbox"/> Inpatient	<input type="checkbox"/> Outpatient	<input type="checkbox"/> Outbreak association:		<input type="checkbox"/> Surveillance	

- Follow the submission form instructions found in the current influenza season's laboratory surveillance protocol.
- Transport temperature: Store the specimen at 2°-8°C if the specimen will be received at the laboratory within 72 hours of collection; ship the specimen on cold packs or wet ice (double bagged). Otherwise, the specimen must be stored frozen (-70°C) and shipped on dry ice.
- Ship specimens via overnight delivery.
- DO NOT mail specimens on a Friday or the day before a holiday unless special arrangements have been made in advance with the DSHS Laboratory.
- 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

**Common Causes for Rejection:**

- Discrepancy between name on specimen tube and name on form
- Not shipped in viral transport media or media is expired
- Specimen is received more than 72 hours after collection (if refrigerated)
- Specimen is received at ambient temperature

# Section 7: Legionellosis

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Legionella* species are gram negative bacilli commonly found in water. There are over 50 species and ~70 serogroups currently recognized. *L. pneumophila* serogroup 1 is primarily responsible for human disease.

### Transmission

Transmission occurs by inhaling mist from a water source contaminated with the *Legionella* bacteria. An example is breathing in steam from a contaminated hot tub. Transmission may also occur by aspirating contaminated water.

### Incubation Period

The incubation period is 2–10 days with most infections occurring 5–6 days after exposure. Mild presentations (Pontiac Fever) can occur in 5–72 hours after exposure.

### Communicability

No human-to-human transmission occurs.

### Clinical Illness

- **Legionnaires' Disease** presents as pneumonia with a non-productive cough. Symptoms may include a high fever, chills, non-productive cough, muscle aches, and/or headache. Abdominal pain, nausea, vomiting, and diarrhea are also common.
- **Pontiac Fever** presents as a self-limited febrile illness that does not result in pneumonia. Symptoms may include fever, headaches, and muscle aches. Complete recovery usually occurs within a week without antibiotics.

### Severity

The case fatality rate of Legionnaires' Disease is 5% to 30%.

## DEFINITIONS

### Clinical Case Definition

Legionellosis is associated with two clinically and epidemiologically distinct illnesses: Legionnaires' disease, which is characterized by fever, myalgia, cough, and clinical or radiological pneumonia; and Pontiac Fever, a milder illness without pneumonia.



### Laboratory Confirmation

A clinically compatible case that meets at least one of the confirmatory laboratory criteria

- Isolation (culture) of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid, or
- Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents, or
- Demonstration of seroconversion by a fourfold or greater rise in specific serum antibody titer between paired acute and convalescent phase serum specimens to *Legionella pneumophila* serogroup 1 using validated reagents

### Case Classifications

- **Confirmed:** A clinically compatible case that meets at least one of the confirmatory laboratory criteria
- **Probable:** No probable case definition for legionellosis

**Case Categories** (confirmed cases of legionellosis may be further categorized to describe type of exposure)

- Travel-associated case
  - Definitely: A case that has a history of spending the entire 10-day incubation period away from home, either in the same country of residence or abroad
  - Possibly: A case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the 10-day incubation period
- Healthcare-associated (nosocomial) case
  - Definitely: A case that has a history of spending the entire 10-day incubation period in a hospital and / or a long term care facility
  - Possibly: A case that had exposure to a healthcare facility for any portion of the 10-day incubation period
- Community-acquired case
  - Any case that does not meet the criteria for travel-associated or healthcare-associated

### Cluster and Outbreak Definitions

- Cluster:
  - Two or more cases linked by areas (building, street block, neighborhood, etc.) of residence, work, or places visited, with sufficient closeness in dates of onset of illness to warrant further investigation
- Outbreak:
  - Two or more cases associated with the same facility or location (e.g., hotel, gym, amusement park, etc.) or other common location within 1 year, OR
  - One definitely healthcare-associated case or two or more possibly healthcare-associated cases within 1 year associated with the same healthcare facility

## CASE INVESTIGATION

### Case Investigation

Local and regional health departments should investigate all reports of clinically suspected legionellosis. Investigations should include an interview of the case-patient or a surrogate to get a detailed exposure history. Please use the Legionellosis Investigation Report Form available on the DSHS website: <http://www.dshs.state.tx.us/idcu/investigation/>

### Case Investigation Checklist

- Confirm that the laboratory results meet the laboratory confirmation portion of the case definition.
  - If only one antibody test was performed and symptoms are consistent with legionellosis, consider requesting that the attending physician order a convalescent antibody test or a urine antigen test.
- Review medical records or speak to an infection preventionist or physician to verify demographics, symptoms, underlying health conditions, and course of illness.
- Interview case-patient (or surrogate) to identify risk factors, travel history and other potential exposures such as hospital, dental and long-term care facility visits / stays or visits to any other location where aerosolization of water may have occurred (e.g., gyms, saunas, restaurants with outdoor misters, truck stops with showers, etc).
  - When possible, obtain detailed information on travel or facility exposures including exact dates, room numbers and name of facility and full address. An example of a Legionellosis hypothesis-gathering questionnaire is available at [www.cdc.gov/legionella/files/hypothesis-generating-questionnaire.pdf](http://www.cdc.gov/legionella/files/hypothesis-generating-questionnaire.pdf)
  - If multiple attempts were made to contact the case-patient or surrogate and attempts were unsuccessful, please fill out the case investigation form with as much information as possible and indicate the reason for missing information (e.g., lost to follow up – patient did not return call; multiple messages left).
- Implement control measures for cases, contacts, and/or facilities in assigned jurisdiction (see list of control measures below).
- If suspected healthcare-associated, travel-related or other exposures are identified, using appropriate notification channels, notify DSHS and/or the jurisdiction in which the possible exposure occurred.
  - DSHS and/or the jurisdiction in which the possible exposure occurred should be notified within 1 business day of when a healthcare-associated or travel-related exposure is identified.
  - DSHS tracks potential legionellosis exposures in Texas.
  - DSHS will share all out of state exposures and in-state exposures that may affect out-of-state residents with the CDC who will notify other states/jurisdictions as needed.
- If applicable, complete steps in the Managing Special Situations section.
- Complete the Legionellosis Investigation Report Form and fax it to DSHS.
- Enter all confirmed legionellosis case investigations and submit a notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.

## **Control Measures**

### Control measures for cases, contacts and general public

- Provide education on legionellosis as needed. Emphasize:
  - Low risk of infection for healthy individuals of all ages
  - No human-to-human transmission
  - Close contacts of the case are only at risk if they are exposed to the same source as the case
  - Increased risk of infection for individuals who are immunosuppressed, have COPD or have other risk factors such as diabetes or history of smoking
- Recommend not using tap water for respiratory therapy devices. Bottled water may be used instead.
- Recommend that high risk sources such as hot tubs are maintained properly including
  - maintenance of appropriate pH (7.2 – 7.8) and disinfectant levels,
  - removal of slime or biofilm, and
  - replacement of filters as recommended by the manufacturer.
- Recommend that anyone experiencing symptoms be evaluated by a physician.
  - Collect demographic information and symptom history on ill contacts.
- Remind local healthcare providers to consider legionellosis and report confirmed or clinically suspected cases.
- No environmental testing of water is recommended for a single case.
- Notify the infection preventionist or medical director of any healthcare facility the case-patient stayed at or visited during the incubation period to verify that he is aware of the case.

### Control measures for facilities

- Request that the facility notify the health department if any guest/customer/resident complains of respiratory illness or pneumonia after staying/visiting there.
  - If there were additional complaints of illness, collect suspected case-patient names, room numbers, and contact information.
- Remind the facility of the importance of proper maintenance and recommend review of maintenance procedures of hot tubs, pools, whirlpools, cooling towers, decorative fountains or any other sources of possible aerosolization of water. Important features in maintenance plans include procedures to
  - maintain appropriate hot and cold water temperatures,
  - maintain and monitor disinfectant levels including residual free chlorine,
  - replace filters per manufacture's recommendations, and
  - perform emergency disinfection as needed.
- Point of use filtration (0.2 micrometer) may be used at specific faucets as an added control measure.
- Water testing is not recommended for isolated cases.
- For additional information specific to facilities review the Managing Special Situations section.

## **Exclusion**

No exclusion from work, school or daycare is required for disease control purposes.

## MANAGING SPECIAL SITUATIONS

### Travel-Associated Cases

If a single confirmed case of legionellosis reported staying at a hotel for at least one day/night during his incubation period, the hotel should be notified. Do not share the patient's name or exact date of stay. With only one confirmed case, the exposure may or may not have occurred at the hotel.

The local/regional health department should:

- Recommend that the hotel review their maintenance procedures for their cooling system, decorative fountains, pools and any hot tubs/whirlpools.
- Request that the hotel notify the health department if any guest complains of respiratory illness or pneumonia after staying there.
  - A sample letter is available on the CDC website at <http://www.cdc.gov/legionella/downloads/sample-hotel-letter.pdf>
- Water testing is not recommended for a single case staying at a hotel.

If two or more unrelated, confirmed cases of legionellosis reported staying at least one night/day at the same hotel within a one-year period, notify the Infectious Disease Control Unit (IDCU) at (800) 252-8239 or (512) 776-7676. Cases are considered related if they are members of the same household, traveling together, staying in the same room and otherwise spending significant amounts of time together outside of suspected travel exposure. For example, a husband and wife staying in the same room and traveling together would count as related but members of the same sports team staying in different rooms would not be related.

For multiple confirmed cases, the local/regional health department should:

- Work with the hotel to conduct an environmental assessment to determine possible sources of exposure and to verify maintenance procedures are being followed.
  - An example environmental assessment form is available from the CDC at <http://www.cdc.gov/legionella/downloads/environ-assess-instrument.pdf>
- Recommend that the hotel take measures to reduce/eliminate *Legionella* from its water system. The hotel should follow American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) remediation guidance.
  - The hotel may need to consider hiring a contractor/consultant familiar with *Legionella* remediation.
- Request water testing results if water testing is done. Water testing may be considered when more than one case of legionellosis is associated with a facility within a one-year period and the epidemiological investigation or environmental assessment identifies potential exposures or sources of infection. Water testing should be done if remediation efforts were implemented and a new case is identified with exposure occurring after remediation was done.
  - Water testing should be performed by an ELITE-certified laboratory capable of culturing *Legionella* species. A list of ELITE-certified laboratories is available at: <https://wwwn.cdc.gov/elite/Public/MemberList.aspx>.
  - The DSHS laboratory will accept isolates of cultures from environmental samples if there is also an isolate available from a human case associated with the facility for comparison.

### **Healthcare-Associated Cases**

If one or more definitely healthcare-associated or two or more possibly healthcare-associated cases occur in patients of the same dental or healthcare provider, hospital, residential care facility, or other long term care facility AND the cases have no other identified plausible source of infection OR if other circumstances suggest the possibility of healthcare-associated infection, notify the Infectious Disease Control Unit (IDCU) at (800) 252-8239 or (512) 776-7676.

The local/regional health department should:

- Work with the facility to conduct retrospective and prospective surveillance to identify potentially missed or new cases for a minimum of 6 months before and after the most recent onset date. Active surveillance may include daily review of chest x-rays, sputum cultures and new diagnoses of pneumonia.
- Recommend testing of patients with compatible symptoms at least 60 days before and 60 days after the most recent healthcare associated case.
  - All patients who developed pneumonia in the last 60 days should be tested with a urine antigen test.
  - All patients who develop pneumonia 2 or more days after admission over the next 60 days should be tested by both culture and urine antigen.
  - Testing may be done in-house or by a commercial laboratory.
- Review the facility's infection control measures to prevent legionellosis exposures and work with the facility to identify potential gaps. Refer to the Texas Legionellosis Task Force guidance for detailed legionellosis response measures in acute care hospitals and long term care facilities.
- Recommend the facility conduct an environmental assessment to determine possible sources of exposure and to verify maintenance procedures are being followed.
  - An example environmental assessment form is available from the CDC at <http://www.cdc.gov/legionella/downloads/envirom-assess-instrument.pdf>
- Request water testing results if water testing is done. Water testing may be considered when one definite healthcare associated case or two or more possible healthcare associated cases of legionellosis are associated with a facility within a one-year period. Water testing should be done if remediation efforts were implemented and a new case is identified with exposure occurring after remediation was done.
  - Water testing should be performed by an ELITE-certified laboratory capable of culturing *Legionella* species. A list of ELITE-certified laboratories is available at: <https://wwwn.cdc.gov/elite/Public/MemberList.aspx>.
  - The DSHS laboratory will accept isolates from environmental sources if there is an isolate available from a human case associated with the facility for comparison.
- Recommend that the facility take measures to reduce/eliminate *Legionella* from its water system. The facility should follow American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) remediation guidance.
  - The facility may want to consider hiring a consultant or contractor to assist with *Legionella* remediation
- If needed, conduct a case-control study to identify specific exposures within the facility.

### **Multiple Cases Associated with a Gym, Spa, or Other Facility**

If a confirmed case of legionellosis reported exposure to a source of aerosolized water (pool, whirlpool, hot tub, mister, etc.) at a public facility during at least one day/night during the

incubation period, the facility should be notified. Do not share the patient's name or exact date of exposure. With only one confirmed case, the exposure may or may not have occurred at the facility.

The local/regional health department should:

- Recommend that the facility review their maintenance procedures for any sources of possible aerosolization of water (including pools, hot tubs/whirlpools, misters, etc.).
- Request the facility to notify the health department if any customer complains of pneumonia after visiting the facility. A sample letter for hotels is available on the CDC website at <http://www.cdc.gov/legionella/downloads/sample-hotel-letter.pdf>. This letter can be modified for any facility. Water testing is not recommended for isolated cases.

If two or more confirmed cases of legionellosis reported exposure to a source of aerosolized water (pool, whirlpool, hot tub, mister, etc.) at a facility during at least one day/night during the incubation period within a one-year period, notify the Infectious Disease Control Unit (IDCU) at (800) 252-8239 or (512) 776-7676.

The local/regional health department should:

- Contact local hospital infection control staff and emergency room staff to determine whether they have observed an increase in community-acquired pneumonia patients admitted to the facility.
  - If cultures or respiratory specimens are available on potential cases, these should be held (i.e., not discarded) in case further testing is requested.
- Inform primary care physicians, emergency room staff, and radiologists in the potential outbreak area and any other locations necessary of the following:
  - That there is a cluster of legionellosis cases
  - The signs and symptoms of legionellosis
  - The recommended lab tests to confirm legionellosis
  - Reporting requirements
- Work with the facility to conduct an environmental assessment to determine possible sources of exposure and to verify maintenance procedures are being followed. An example environmental assessment form is available from the CDC at <http://www.cdc.gov/legionella/downloads/environ-assess-instrument.pdf>
- Ensure the facility takes measures to reduce/eliminate *Legionella* from the water system. The facility should follow American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) guidance.
  - The facility may want to consider hiring a consultant or contractor to assist with *Legionella* remediation
- Request water testing results if water testing is done. Water testing may be considered when more than one case of legionellosis is associated with a facility within a one-year period and the epidemiological investigation or environmental assessment identifies potential exposures or sources of infection. Water testing should be done if remediation efforts were implemented and a new case is identified with exposure occurring after remediation was done.
  - Water testing should be performed by an ELITE-certified laboratory capable of culturing *Legionella* species. A list of ELITE-certified laboratories is available at: <https://wwwn.cdc.gov/elite/Public/MemberList.aspx>.
  - The DSHS laboratory will accept isolates from an environmental source if there is an isolate available from a human case associated with the facility for comparison.

## REPORTING AND DATA ENTRY REQUIREMENTS

### Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Confirmed and clinically suspected cases of legionellosis should be reported within 1 week of suspicion to the local or regional health department or the Texas Department of State Health Services (DSHS) Infectious Disease Control Unit at (800) 252-8239 or (512) 512-7676.

### Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Fax (or mail) a completed investigation form within 30 days of completing the investigation
  - Investigations forms may be faxed to 512-776-7616 or mailed to:  
Infectious Disease Control Unit  
Texas Department of State Health Services  
Mail Code: 1960  
PO Box 149347  
Austin, TX 78714-9347
- Enter the case into NBS and submit an NBS notification on all confirmed cases to DSHS within 30 days of receiving a report of confirmed legionellosis. Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.

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 the Infectious Disease Control Unit 512-776-7676
- Submit a completed National Outbreak Reporting System (NORS) outbreak form at the conclusion of the outbreak investigation (enter into NORS online reporting system and fax a copy to the DSHS regional office and/or to the Infectious Disease Control Unit at 512-776-7676). The NORS form is available at <http://www.cdc.gov/healthywater/statistics/wbdoss/nors/forms.html>.

## LABORATORY PROCEDURES

Specimens associated with legionellosis cases are not routinely submitted to the DSHS laboratory in Austin. When multiple legionellosis cases are associated with a single facility, DSHS will accept isolates from other laboratories conducting environmental testing if clinical specimens (*Legionella* culture) are available for comparison. Contact the Infectious Disease Control Unit at (512) 512-7676 for approval for *Legionella* testing before submitting clinical or environmental specimens.

### Specimen Collection

Clinical specimen

- Acceptable specimens: sputum, bronchial washing, tracheal aspirate, or lung biopsy
- Bronchial washing or tracheal aspirate:
  - Collect washing or aspirate using sterile water, not saline
  - 2mL minimum needed
  - Refrigerate at 2°–8 °C. Do not freeze.

- Sputum, expectorated:
  - Collect in a sterile container
  - Collect specimen under the direct supervision of a nurse or physician
  - Have patient rinse or gargle with water first to remove excess oral flora
  - Instruct patient to cough deeply to produce a lower respiratory specimen (not postnasal fluid)
  - For pediatric patients unable to produce a sputum specimen, a respiratory therapist should collect a specimen via suction. The best specimen should have <10 squamous cells/100X field (10X objective and 10X ocular).
  - Refrigerate at 2°–8 °C. Do not freeze.
- Sputum, induced:
  - Collect in a sterile container
  - Have patient rinse mouth with water after brushing gums and tongue
  - With the aid of a nebulizer, have patients inhale approximately 25 ml of 3-10% sterile saline
  - Refrigerate at 2°–8 °C. Do not freeze.
- Lung biopsy:
  - Collect during surgery or cutaneous biopsy procedure
  - Place in an anaerobic transport system or sterile, screw-cap container
  - Add several drops of sterile saline to keep small pieces of tissue moist
  - Always submit as much tissue as possible. If excess tissue is available, save a portion of surgical tissue at -70°C in case further studies are needed. Never submit a swab that has been rubbed over the surface of a tissue.
  - Refrigerate at 2°–8°C. Do not freeze.
  - Do not suspend the specimen in formalin or other preserving liquid.

#### Clinical isolates (pure cultures)

- Submit a pure culture on a BCYE slant
- May be kept at ambient temperature

#### Laboratory Submission Form

- For clinical specimens and isolates, use DSHS Laboratory G-2B Submission Form.
  - For clinical specimens: On the form under Section 4 check the box for ‘Aerobe isolation’ under *Clinical Specimens* and write in “Legionella” in the open space.



Section 4. BACTERIOLOGY	
<b>Clinical specimens:</b> <input checked="" type="checkbox"/> Aerobe isolation <i>Legionella</i> <input type="checkbox"/> Amplified probe (for Gonorrhea/Chlamydia only) <input type="checkbox"/> Anaerobe isolation <input type="checkbox"/> Botulism @ <input type="checkbox"/> Diphtheria screen <input type="checkbox"/> Enteric pathogens <input type="checkbox"/> Gonorrhea culture <input type="checkbox"/> Pertussis culture <input type="checkbox"/> Strep screen (Group B only) <input type="checkbox"/> Toxin / EHEC <input type="checkbox"/> Toxin / Other: _____	<b>Pure cultures:</b> <input type="checkbox"/> Aerobe ID only Organism suspected: _____ <input type="checkbox"/> Anaerobe ID only Organism suspected: _____ <input type="checkbox"/> Campylobacter ID only <b>Special studies:</b> <input type="checkbox"/> Toxin studies <input type="checkbox"/> Other: _____ <b>ID and typing:</b> <input type="checkbox"/> E. coli (EHEC confirmation) <input type="checkbox"/> Haemophilus influenzae <input type="checkbox"/> Neisseria meningitides <input type="checkbox"/> Salmonella <input type="checkbox"/> Shigella <input type="checkbox"/> Other: _____
<b>Section 5. MOLECULAR STUDIES</b>	
<input type="checkbox"/> PCR for:  <input type="checkbox"/> PFGE for:  <input type="checkbox"/> Other:	
<b>Section 6. ENTOMOLOGY</b>	
<input type="checkbox"/> Insect ID <input type="checkbox"/> Other:	

- For clinical isolates: On the form under Section 4 check the box for ‘Aerobe ID only’ under *Pure Cultures* and write in “Legionella” as the organism suspected.

Section 4. BACTERIOLOGY	
<b>Clinical specimens:</b> <input type="checkbox"/> Aerobe isolation <input type="checkbox"/> Amplified probe (for Gonorrhea/Chlamydia only) <input type="checkbox"/> Anaerobe isolation <input type="checkbox"/> Botulism @ <input type="checkbox"/> Diphtheria screen <input type="checkbox"/> Enteric pathogens <input type="checkbox"/> Gonorrhea culture <input type="checkbox"/> Pertussis culture <input type="checkbox"/> Strep screen (Group B only) <input type="checkbox"/> Toxin / EHEC <input type="checkbox"/> Toxin / Other: _____	<b>Pure cultures:</b> <input checked="" type="checkbox"/> Aerobe ID only Organism suspected: <i>Legionella</i> <input type="checkbox"/> Anaerobe ID only Organism suspected: _____ <input type="checkbox"/> Campylobacter ID only <b>Special studies:</b> <input type="checkbox"/> Toxin studies <input type="checkbox"/> Other: _____ <b>ID and typing:</b> <input type="checkbox"/> E. coli (EHEC confirmation) <input type="checkbox"/> Haemophilus influenzae <input type="checkbox"/> Neisseria meningitides <input type="checkbox"/> Salmonella <input type="checkbox"/> Shigella <input type="checkbox"/> Other: _____
<b>Section 5. MOLECULAR STUDIES</b>	
<input type="checkbox"/> PCR for:  <input type="checkbox"/> PFGE for:  <input type="checkbox"/> Other:	
<b>Section 6. ENTOMOLOGY</b>	
<input type="checkbox"/> Insect ID <input type="checkbox"/> Other:	

- For clinical specimens and isolates, make sure the patient's name and date of birth on the submission form exactly match what is written on the specimen containers. Make sure to fill in the date of collection, date of onset, and diagnosis/symptoms.

### **Specimen Shipping**

- Transport temperature for clinical specimens: Keep at 2°–8°C (refrigerated/ice packs). Do not use dry ice.
- Transport temperature for isolates (pure culture): May be shipped at ambient temperature. Do not use dry ice.
- Ship specimens via overnight delivery on cold packs or wet ice (double bagged) within 24 hours of collection if possible. Note: While *Legionella* may survive extended transport, their isolation may be compromised by overgrowth of commensal bacteria in the specimens; therefore, specimens should arrive at the laboratory as soon as possible for the best results.
- DO NOT ship specimens on a Friday or the day before a state holiday unless special arrangements have been made with the DSHS Laboratory.
- 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:**

- Sputum specimen consists of saliva only
- Insufficient quantity submitted for testing
- Discrepancy between name on specimen container and name on submission form
- Container broken in transport
- Expired media used

### **Results Available:**

- Culture results typically available in 3 – 21 days (15 days of no growth = negative)
- Identification from pure isolate typically available in 4 – 7 days

# Section 8: Measles

## BASIC EPIDEMIOLOGY

### Infectious Agent

The measles virus—a single-stranded, RNA-encoded paramyxovirus.

### Transmission

Virus is spread directly from person to person by inhalation of suspended droplet nuclei or by contact with infective nasopharyngeal secretions. It can also be transmitted indirectly by objects (fomites) contaminated with nasopharyngeal secretions. Measles is one of the most contagious of all infectious diseases, with >90% attack rates among susceptible close contacts.

### Incubation Period

The incubation period ranges from 7–18 days (average 10–12 days) from exposure to the onset of prodromal symptoms.

### Communicability

Measles is most communicable during the 3–4 days preceding rash onset. Persons with measles have been shown to shed virus between 4–5 days prior to rash onset (1–2 days prior to onset of prodromal symptoms) and for 4 days after the rash has appeared.

### Clinical Illness

Measles is characterized by a generalized maculopapular rash (a flat, red area on the skin that is covered with small confluent bumps), fever, and one or more of the following: cough, coryza (runny nose), conjunctivitis (eye inflammation or pink eye), or Koplik's spots. There are three stages of illness:

- **Prodrome**
  - Measles has a distinct prodromal stage that begins with a mild to moderate fever and malaise. Usually within 24 hours there is an onset of conjunctivitis, photophobia (sensitivity to light), coryza (sneezing, nasal congestion, and nasal discharge), an increasingly severe cough, swollen lymph nodes (occipital, postauricular and cervical at the angle of the jaw), and [Koplik's spots](#) (seen only for a day or two before and after onset of rash). These spots are seen as bluish-white specks on a rose-red background appearing on the buccal and labial mucosa usually opposite the molars.
- **Rash**
  - The rash begins with flat, faint eruptions of upper lateral parts of the neck, behind the ears, along the hairline and on the posterior parts of the cheeks. The rash may appear from 1–7 days after the onset of the prodromal symptoms, but usually appears within 3–4 days. Individual lesions become more raised as the rash rapidly spreads over the entire face, neck, upper arms and chest. In severe cases, the lesions may merge together to form large rash masses. In mild cases, the rash may be macular and more nearly pinpoint, resembling that of scarlet fever.
- **Fever**
  - Fever is mild to moderate early in the prodrome, and goes up when the rash appears. Temperatures may exceed 40°C (104°F), and usually falls 2–3 days after

rash onset. High fever persisting beyond the third day of the rash suggests that a complication (e.g., ear infection) may have occurred.

## DEFINITIONS

### Clinical Case Definition

An illness characterized by all of the following criteria:

- A generalized rash lasting at least 3 days, and
- A temperature  $\geq 101.0^{\circ}\text{F}$  ( $\geq 38.3^{\circ}\text{C}$ ), and
- Cough, coryza, or conjunctivitis.

### Laboratory Confirmation

- Positive serologic test for measles-specific IgM antibody performed at a public health laboratory, or
- Significant rise in measles antibody level by any standard serologic assay (i.e. four-fold rise in IgG antibody from acute to convalescent samples), or
- Isolation of measles virus from a clinical specimen, or
- Detection of measles-virus-specific nucleic acid by PCR.

### Case Classification

- **Confirmed:**
  - A case that meets the clinical case definition and is laboratory confirmed by either: 1) a positive serologic test for measles immunoglobulin M antibody performed by a public health laboratory; 2) epidemiologic linkage to a confirmed measles case; or 3) travel to a measles endemic/outbreak area. OR
  - A compatible illness (may or may not meet the clinical description) with isolation of measles virus from a clinical specimen, detection of measles-virus specific nucleic acid by polymerase chain reaction from a clinical specimen, or a significant rise in measles immunoglobulin G antibody by any valid methodology.
- **Probable:** No probable case definition

## CASE INVESTIGATION & INFECTION CONTROL

In the current setting of measles elimination in the United States, rapid investigation and reporting of all suspected measles cases is extremely important to ensure that measles remains controlled. The investigation steps below describe public health activities that should be completed when a suspect measles case is reported.

### Establish diagnosis

- All suspect measles reports should be investigated immediately.
- Anyone with suspect measles should be isolated immediately - either at home or in the hospital under airborne precautions (respiratory isolation in negative air pressure room, if possible).
- Obtain the necessary clinical information to establish whether or not a suspect case meets the clinical case definition for measles.

- At a minimum, a suspect case should have an acute illness with fever >101°F and a generalized, maculopapular rash for which there is not a more compelling diagnosis.
- If the suspect case was reported within 3 days of rash onset, there should be appropriate follow-up to establish a rash duration of at least 3 days.
- **Alert appropriate local and regional health departments as well as DSHS IDCU in Austin immediately.**
- Assess vaccination history.
- Determine if suspect case has an epidemiological link or an epidemiological risk factor for measles in the three weeks prior to symptom onset, such as:
  - exposure to a confirmed or probable measles case;
  - travel to a measles endemic/outbreak area or contact with a traveler from a measles endemic/outbreak area;
  - transit through an international airport;
  - exposure to international visitors (includes visiting or working in U.S. tourist venues); or
  - use of public transit in a major U.S. city.
- Collect serological and virological specimens as soon as possible.

Laboratory confirmation is essential because in a setting of measles elimination, most cases that meet the clinical case definition are not measles. Additionally, because measles IgM assays may be falsely positive, collection of respiratory and/or urine specimens for PCR and viral isolation are encouraged. Testing at a public health laboratory is preferred. **If a private provider/hospital cannot or will not collect specimens, public health staff should make every arrangement to collect specimens instead.**

#### **Determine whether to initiate a contact investigation**

- If a case is highly suspicious for measles (e.g., clinically compatible illness in an unvaccinated person with history of travel to a measles endemic area), a contact investigation should be initiated even if laboratory confirmation of the case is not yet available.
- If a suspect measles case is not strongly suspicious for measles (e.g., clinically compatible illness in a person who has received one or two doses of MMR vaccine and does not have an epidemiologic risk factor for measles), the results of laboratory testing should be obtained before initiating a contact investigation.
- If an IgM positive test result has already been obtained on a suspect case who is not strongly suspicious for measles, repeat IgM testing or additional measles testing should be performed at a public health laboratory before a contact investigation is initiated.

#### **Identify contacts**

- A contact of a measles case is anyone who has shared the same airspace with a person who is infectious with measles (the infectious period is four days before rash onset through four days after rash onset [day of rash onset is day 0]), e.g., same classroom, home, clinic waiting room, airplane etc., or were in these areas up to 2 hours after the infectious person was present.
- No minimum time period has been established for exposure, but it is presumed that longer exposures are more likely to result in measles transmission than brief, transient exposures.
- When exposures have occurred in venues in which it is not possible to identify individuals, it is helpful to notify local health care providers so that they can be on the alert for possible cases. In addition, some health jurisdictions have issued press releases to notify the public.

- If the case was traveling by plane or ship during the infectious period, obtain all travel information (obtain boarding pass or e-reservation, if possible) and call IDCU, who will contact the CDC.

### **Prioritize contacts for investigation**

If it is not feasible to investigate all possible contacts in an exposure setting, possible contacts may need to be prioritized for investigation. The following contacts, if susceptible to measles, are at the greatest risk of infection or severe disease, or are more likely to transmit measles to others and should be prioritized for investigation:

- household contacts;
- healthcare personnel of any age or others with occupations that require interaction with high risk populations;
- pregnant women;
- immunocompromised people;
- persons under five years of age in settings with known unvaccinated persons (e.g., childcare settings); and
- infants.

### **Other factors to consider**

There are scant data on factors that make transmission of measles more likely, however if it is necessary to prioritize the investigation further, possible information to consider includes the following:

- length of time of exposure to case;
- proximity to case;
- ventilation in the exposure setting; and
- the time of exposure related to when the case left the setting.

In addition, the infectiousness of the case at the time of exposure may increase or decrease the possibility of transmission. Persons with measles are most infectious at the late prodromal phase of illness immediately prior to rash onset when cough and coryza are at their peak. The presence and frequency of cough in the case may affect the possibility of transmission. Cases who have received measles-containing vaccine in the past may be less symptomatic and also less infectious.

### **Provide post exposure prophylaxis for susceptible contacts**

- The MMR vaccine may be given within 72 hours of exposure to persons  $\geq 12$  months of age with 1 or no documented doses of MMR, if not contraindicated.
- Immune globulin (IG) may be given to exposed susceptible people of any age through day six day after exposure.
  - The recommended dose of IG is 0.25 mL/kg (maximum dose=15 mL) intramuscularly (IM).
  - Immunocompromised persons should receive 0.5 mL/kg (maximum dose=15 mL) IM.
  - For persons receiving IVIG therapy,  $\geq 400$  mg/kg  $< 3$  weeks before measles exposure should be sufficient to prevent measles infection.

- It is unknown if administration of IG prolongs the incubation period. If symptoms consistent with measles occur  $\leq 28$  days of exposure, persons who have received IG should be instructed to isolate themselves immediately and notify their health department.

### **Monitor measles contacts**

Measles contacts should monitor themselves for measles symptoms from day 5 after first exposure through day 21 after last exposure (day of exposure is day 0). Contacts should be instructed to isolate themselves immediately if measles symptoms develop and notify their health department (see Table 2 below). If they plan to seek medical care, they should contact the MD or ER ahead of time to notify them that they might have the measles and are coming in.

### **Control Measures**

- Susceptible contacts to suspected cases should be vaccinated with measles vaccine within 72 hours of exposure OR should have immune globulin (IG) administered within six (6) days of exposure. Contact DSHS IDCU if IG/vaccine is needed.
- Children  $\geq 1$  year and  $< 4$  years should have history of at least one (1) dose of MMR vaccine.
- Persons  $\geq 4$  years and born after 1956 should have history of two (2) doses of MMR vaccine.
- If vaccination of exposed contact is contraindicated, exclude exposed contact from school or child-care facility for at least 14 days after last rash onset.
- Persons who cannot readily provide documentation of measles immunity should be vaccinated or excluded from the setting (e.g., school, child-care facility, work place).
- Anyone in the same airspace (same room, no minimum amount of time) with the suspected case up to 2 hours after the case has left should be considered exposed.

### **Exclusion**

According to the Texas Administrative Code, children in school and childcare should be excluded for four (4) days from rash onset. In an outbreak, unvaccinated children should be excluded for at least 14 days after last rash onset. Adults should be instructed to stay home from work and any other activities.

Children as young as 6 months of age can receive measles vaccine if they have been exposed or are likely to be exposed.

## Recommendations for prophylaxis, quarantine and monitoring of measles contacts

Category	IgG testing	MMR vaccine	Home quarantine	Symptom watch
<b>People born before 1957¶</b> (5% will be susceptible)	No	No	No	Yes
<b>People born during or after 1957 or high-risk people who were born before 1957, who:</b>				
Have 2 documented doses of MMR (~1% will be susceptible)	No	No	No	Yes
Have 1 documented dose of MMR (5% will be susceptible) <u>or</u> no documented doses of MMR but are presumed to be immune to measles** and <b>are not</b> a high-risk person¶	If desired	If desired	No (unless tested and found to be susceptible)	Yes
Have no or 1 documented dose of MMR, but are presumed to be immune to measles** and <b>are</b> a high-risk person¶	If desired	Yes††	Work exclusion until immunity confirmed	Yes
First MMR dose given <72 hours of exposure	No	N/A	No	Yes
Immune globulin (IG) given ≤6 days of exposure‡‡	No	No	No	Yes
Unknown immune status, no presumption of immunity	If desired	Yes††	Yes	Yes
IgG negative/not vaccinated <72 hours of exposure/not given IG/known to be unvaccinated for measles	N/A	Yes††	Yes	Yes

||If symptoms consistent with measles develop, person should be isolated. If there is concern about whether measles symptoms will be reported or compliance with quarantine, periodic calls to the exposed person to monitor for development of measles symptoms are recommended (see above for symptom watch time period and additional guidance).

¶ Ensure documentation of immunity (documented IgG+ or 2 documented doses MMR) in all high-risk persons, e.g., exposed healthcare personnel (including those born <1957), pregnant women, immunocompromised persons, and persons ≥4 years of age in settings with known unvaccinated persons, e.g., childcare settings (children aged 1-3 years should have 1 dose MMR).

\*\*Immunity may be presumed in persons who have served in the U.S. armed forces, or were born in the U.S. in 1970 or later and attended a U.S. elementary school; or entered the U.S. in 1996 or later on an immigrant visa or have a green card (unless known to be unvaccinated).

††Vaccinate persons ≥1 year of age at the same time blood is drawn for serology unless IG is given.

‡‡IG may be administered ≤6 days of exposure to susceptible contacts of any age who did not receive MMR <72 hours of exposure. MMR should not be given until 5 months after IG in healthy people and until 6 months after IG in immunocompromised people. Persons who have received IG should monitor themselves for symptoms for 28 days.

### Active surveillance for measles

In the case of an outbreak, local or state health departments should contact healthcare providers in the outbreak area to inform them of the outbreak and request reporting of any suspected cases. These activities are especially important in large cities and cities with large numbers of international visitors.

### Testing of suspect cases who have recently received measles-containing vaccine

Ten percent of recipients of measles-containing vaccine may develop fever and rash approximately 1 week after vaccination, and vaccination of susceptible persons results in production of IgM antibody that cannot be distinguished from the antibody resulting from natural infection.



A positive measles IgM test cannot be used to confirm the diagnosis of measles in persons with measles-like illness who received measles vaccine 6–45 days before onset of rash. A negative test would exclude the diagnosis. For persons receiving vaccine 6–14 days prior to rash onset, a viral specimen should be obtained to distinguish between vaccine virus and wild-type virus.

## REPORTING AND DATA ENTRY REQUIREMENTS

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Suspected measles cases are required to be reported immediately to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### **Local and Regional Reporting and Follow-up Responsibilities**

DSHS Central Office must be notified immediately of any suspect cases of measles. Investigate any reported cases of measles. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Measles investigation forms for must be sent to DSHS IDCU. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all measles investigations with a confirmed case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

To obtain testing kits, contact the DSHS Laboratory at **(512) 776-7661**. Before shipping specimens, be sure to notify DSHS IDCU VPD staff at **(512) 776-7676**.

**IgM Serology:** A single specimen should be collected as soon as possible. A negative IgM result from a specimen collected before the fifth day of rash onset may not, however, rule out the diagnosis of measles. While we encourage early testing of patients with a rash-fever illness, testing may need to be repeated if specimen was collected before the fifth day of rash onset.

**IgG Serology:** Acute AND convalescent samples. Collect acute sample early in the course of illness and convalescent sample 10-14 days later. DSHS Laboratory can only conduct acute/convalescent testing if the first sample is negative (usually an unvaccinated individual). Otherwise, the acute/convalescent testing will need to be conducted through a private laboratory or hospital laboratory.

### Measles serology results and interpretation

IgM result	IgG result	Previous infection history	Current infection/vaccination status	Comments
+	+ or -	Not vaccinated, no history of measles	Wild-type measles	Seroconversion <sup>†</sup> , classic measles
+	+ or -	Previously vaccinated, primary vaccine failure	Recent 2nd MMR	Seroconversion <sup>†</sup>
-	+	Previously vaccinated, IgG+	Recent 2nd MMR	IgG level may stay same or boost
+	+	Previously vaccinated, IgG+	Wild-type measles	May have few or no symptoms <sup>‡</sup>
+	+	Recently vaccinated	Exposed to wild-type measles	Cannot distinguish if vaccine or wild-type, evaluate on epidemiologic grounds <sup>§</sup>

<sup>†</sup> IgG response depends on timing of specimen collection.

<sup>‡</sup> If so, do not consider contagious unless clinical presentation is consistent with measles.

<sup>§</sup> If IgM negative, helpful to rule out wild-type measles infection.

### Specimen Collection

#### Option 1:

- Collect at least 5 mL blood in red top tube.
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the **red top blood** collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot).
  - Transfer the serum from the red top tube into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship cold with cool packs and must be received within 48 hours.
  - If the serum samples will not be delivered to the laboratory within 48 hours of collection, then the samples must be frozen at  $-20^{\circ}\text{C}$  (frozen) or lower and shipped frozen with dry ice.
  - Do not freeze whole blood in red top tube for shipping.

**Option 2:**

- Collect at least 5 mL blood in **gold top** or **tiger top** blood collection tube containing a gel serum separator (Gold top or tiger top tubes are types of Serum Separator Tubes with the gel that keeps the serum separated from the clot after the centrifugation).
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the gold top blood collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot) and ship cold with cool packs and must be received within 48 hours.
  - If more than 48 hours, transfer the serum into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship frozen with dry ice.
  - Do not freeze serum in SST for shipping. Freezing will cause hemolysis and hemolyzed specimens will be unsatisfactory for testing.

**Submission Form**

- Use the DSHS Laboratory current version of G-2A form (Dec 2011, Rev 4) for specimen submission.
- Make sure the patient's first and last name and date of birth / social security number match exactly what is written on the tube.
- Mark the laboratory test requested, date of onset, and date of collection. Be certain that the names on acute and convalescent sera match exactly.
- Call DSHS Laboratory at 512-776-7138 if needing information for specimen submission. Submitters must have a submitter number assigned by the DSHS Laboratory. If you do not have a submitter number, one can be obtained by calling 512-776-2377.

**Specimen Shipping**

- To avoid specimen rejection, ship separated serum or centrifuged SST Mon-Thurs to the DSHS laboratory via overnight delivery following the above guidelines.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
  - If the serum samples will not be delivered to the DSHS laboratory within 48 hours of collection, transfer into a serum transport tube and freeze on Fridays. Ship frozen specimens with dry ice on Monday. Lone Star service will not deliver specimen to the DSHS lab on Saturday.
- 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

**Causes for Rejection:**

- Discrepancy between name on tube and name on form.
- Insufficient quantity of serum for testing.
- Specimens received with extended transit time or received at incorrect temperature or no date of collection.

## **Viral Isolation**

Viral isolation can confirm the diagnosis in measles, especially in vaccinated persons. Molecular epidemiologic techniques are used to genetically type measles viruses and identify the source of wild viruses and establish chains of transmission. The CDC can perform PCR testing on specimens forwarded to them.

## **Specimen Collection**

- **Pharyngeal swab (preferred method):** The oropharynx should be rubbed vigorously with the swab to scrape off mucosal cells. The swab should then be placed in 2-3 mL of viral transport media. A viral culturette may also be used if 2-3mL of transport media is used.
- **Nasal Aspirates:** Obtain nasal specimen with a sterile rubber bulb aspirator. The aspirate should be discharged into a small sterile container.
- **Urine:** Urine specimens should be collected aseptically in a sterile container; up to 45 mL placed in a sterile 50 mL centrifuge tube.
- Specimen should be collected within four (4) days of rash onset.
- Keep specimen at 2-8°C. Specimens received in the lab greater than 48 hours after collection should be stored frozen at -70 °C and shipped on dry ice.

## **Submission Form**

- Use Specimen Submission Form G-2A.
- Make sure the patient's name and date of birth / social security number match exactly what is written on the specimen container.
- Mark the laboratory test requested (virus isolation), disease suspected (measles), date of onset, and date of collection.

## **Specimen Shipping**

- Ship specimen immediately via overnight delivery on wet ice.
- If specimen cannot be shipped immediately and received in the lab within 48 hours of collection, it may be stored at -70°C and shipped on dry ice.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

## **Causes for Rejection:**

- Specimens submitted on a preservative, such as formalin.
- Insufficient quantity of urine for testing.

# Section 9: Amebic Meningitis/Encephalitis

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Naegleria fowleri*, *Acanthamoeba* spp. and *Balamuthia* are microscopic, free-living amoebae (single-celled living organisms). *Naegleria fowleri* is the causal agent of Primary Amebic Meningoencephalitis (PAM), while *Acanthamoeba* spp. and *Balamuthia* are the causal agents of Granulomatous Amebic Encephalitis (GAE).

- *Naegleria fowleri* is a heat-loving (thermophilic), free-living amoeba (single-celled microbe), commonly found around the world in warm fresh water (like lakes, rivers, and hot springs) and soil. *Naegleria fowleri* is the only species of *Naegleria* known to infect people. Most of the time, it lives in freshwater habitats by feeding on bacteria. However, in rare instances, the amoeba can infect humans by entering the nose during water-related activities.
- *Acanthamoeba* is found worldwide. Most commonly, the amoeba is found in soil, dust, fresh water sources (such as lakes, rivers, and hot springs), in brackish water (such as a marsh), and sea water. *Acanthamoeba* can also be found in swimming pools, hot tubs, and drinking water systems (for example, slime layers in pipes and taps), as well as in heating, ventilating, and air conditioning (HVAC) systems and humidifiers. While only one species of *Naegleria*, *N. fowleri*, is known to infect humans, several species of *Acanthamoeba*, including *A. culbertsoni*, *A. polyphaga*, *A. castellanii*, *A. astronyxis*, *A. hatchetti*, *A. rhyodes*, *A. divionensis*, *A. lugdunensis*, and *A. lenticulata* are implicated in human disease.
- *Balamuthia mandrillaris* is found in soil and believed to enter the body through skin wounds and cuts, or when dust containing *Balamuthia* is breathed in or gets in the mouth. Exposure to *Balamuthia* is likely to be common because of how widespread it is in the environment. However, very few cases of disease in humans have been found worldwide since *Balamuthia* was discovered.

### Transmission

Transmission of *Naegleria fowleri* to humans occurs when water containing amoebae enters the nose. Trophozoites infect humans or animals by penetrating the nasal tissue and migrating to the brain via the olfactory nerves causing primary amebic meningoencephalitis. Infection can occur in young immune-competent individuals. Exposure occurs when people go swimming or diving in warm freshwater places, like lakes and rivers. People do not become infected from drinking contaminated water. In very rare instances, *Naegleria* infections may also occur when contaminated water from other sources (such as inadequately chlorinated swimming pool water or heated and contaminated tap water) enters the nose, for example when people submerge their heads or cleanse during religious practices, and when people irrigate their sinuses (nose) using contaminated tap water.

*Acanthamoeba* can enter the body through the eye, the nasal passages, cuts or skin wounds, or by being inhaled into the lungs. The trophozoites are the infective forms, although both cysts and trophozoites gain entry into the body through various means. When *Acanthamoeba* spp. enters the eye it can cause severe keratitis in otherwise healthy individuals, particularly contact lens users. When it enters the respiratory system or through the skin, it can invade the central nervous system by hematogenous dissemination causing granulomatous amebic encephalitis (GAE) or disseminated disease, or skin lesions in individuals with compromised immune systems.

Granulomatous Amebic Encephalitis (GAE) and disseminated infection are very rare forms of *Acanthamoeba* infection and primarily affect people with compromised immune systems. While unusual, disseminated infection can also affect healthy children and adults. Conditions that may increase a patient's risk for GAE and disseminated infection include: AIDS, organ/tissue transplant, steroids or excessive use of antibiotics, diabetes mellitus, cancer, disorders in which white blood cells in the lymphatic tissue are over-produced or abnormal, disorders in which blood cells or blood clotting mechanisms do not function properly or are abnormal, liver cirrhosis, and lupus.

*Balamuthia* GAE occurs when the amebae infect the body, possibly through skin wounds and cuts, or when dust containing *Balamuthia* is breathed in through the nose or mouth. The trophozoites are the infective forms, although both cysts and trophozoites gain entry into the body through various means. Entry can occur through the nasal passages to the lower respiratory tract, or ulcerated or broken skin. When *B. mandrillaris* enters the respiratory system or through the skin, it can invade the central nervous system by hematogenous dissemination causing granulomatous amebic encephalitis (GAE) or disseminated disease, or skin lesions in individuals who are immune competent as well as those with compromised immune systems. *Balamuthia* GAE is a very rare but usually fatal disease. The *Balamuthia* ameba is able to infect anyone, including healthy people. Those at increased risk for infection include immunocompromised individuals: People with HIV/AIDS, cancer, liver disease, or diabetes mellitus, people taking immune system inhibiting drugs; alcoholics; young children or the elderly; and pregnant women.

### **Incubation Period**

*Naegleria fowleri*:

- Incubation period: Symptoms start 1-7 days (median 5 days) after exposure.
- Duration of illness: Death occurs 1-12 days (median 5.3 days) after symptoms begin.

*Balamuthia* and *Acanthamoeba*:

- Incubation period: Weeks to months.
- Duration of illness: Weeks to months.

### **Communicability**

Amebic meningitis/encephalitis is not spread person to person.

### **Clinical Illness**

Infections with *Naegleria fowleri* cause the rare disease PAM, a brain infection that leads to the destruction of brain tissue. In its early stages, *Naegleria fowleri* infection may be similar to bacterial meningitis. Initial symptoms of PAM start 1 to 7 days after infection. Symptoms may include headache, fever, nausea, vomiting, and/or stiff neck. Later symptoms may include

confusion, lack of attention to people and surroundings, a loss of balance, seizures, and/or hallucinations. These symptoms are followed by coma and death. After the start of symptoms, the disease progresses rapidly and death occurs within 10 days, usually on the fifth or sixth day.

Granulomatous Amebic Encephalitis (GAE) often has a slow, insidious onset and then develops into a subacute or chronic disease lasting several weeks to months. GAE is caused by *Balamuthia* and *Acanthamoeba* species.

GAE caused by *Acanthamoeba* can cause a serious, usually fatal, infection of the brain and spinal cord. Once infected, a person may suffer with headaches, stiff neck, nausea and vomiting, tiredness, confusion, lack of attention to people and surroundings, loss of balance and bodily control, seizures, and hallucinations. Symptoms progress over several weeks and death usually occurs. Skin infections do not necessarily lead to disseminated disease.

*Balamuthia* amebae can infect the skin, sinuses, brain and other organs of the body. Therefore, *Balamuthia* infection can cause a wide range of symptoms. Disease can begin with a skin wound on the face, trunk, or limbs and can then progress to the brain where it causes GAE. Diagnosis of *Balamuthia* GAE can be difficult, but some early symptoms may include headaches, stiff neck or head and neck pain with neck movement, sensitivity to light, nausea, vomiting, lethargy (tiredness), and low-grade fever. Other signs of *Balamuthia* GAE may include behavioral changes, seizures, weight loss, partial paralysis, speech difficulties, and difficulty walking. *Balamuthia* can also cause a widespread infection involving multiple body parts. The disease might appear mild at first but can become more severe over weeks to several months. Often the disease is fatal, with a death rate of more than 95%. Overall, the outlook for people with this disease is poor, although early diagnosis and treatment may increase the chances for survival.

### Severity

More than 95% of PAM and GAE cases are fatal. Only 1 person with PAM has survived out of 123 known infected individuals in the United States from 1962 to 2011.

## DEFINITIONS

Amebic meningitis / encephalitis is classified as either Primary Amebic Meningoencephalitis (if it is caused by *Naegleria fowleri*) or as Other Amebic Meningitis (if it is caused by another ameba). See case definitions for both conditions below.

### Clinical Case Definition of PAM

- Is caused by *Naegleria fowleri*, a free-living ameboflagellate. *Naegleria fowleri* invades the brain and meninges via the nasal mucosa and olfactory nerve to cause acute, fulminant hemorrhagic meningoencephalitis (primary amebic meningoencephalitis – PAM), primarily in healthy children and young adults with a recent history of exposure to warm fresh water.
- PAM typically presents 1 to 14 days after infection with signs and symptoms of fever, nausea, vomiting, and meningeal irritation (the triad of 1. nuchal rigidity (neck stiffness), 2. photophobia (intolerance of bright light) and 3. Severe headache). Physical

examination might reveal positive meningeal signs (Kernig's sign, Brudzinski's sign, and nuchal rigidity).

- Other symptoms such as lethargy, dizziness, loss of balance, mental status abnormalities, visual disturbances, hallucinations, delirium, seizures, and coma have been reported as the disease progresses.
- In some cases, abnormalities in taste or smell, nasal obstruction, and nasal discharge have been observed.
- After the onset of symptoms, the disease progresses rapidly and usually results in death within 3 to 7 days. Although a variety of treatments have been shown to be active against amebae in vitro and have been used to treat infected persons, most infections have still been fatal.

### **Laboratory Confirmation of PAM**

In CSF, biopsy, or tissue specimens detection of *Naegleria fowleri* by

- Microscopic examination, or
- Detection of nucleic acid (e.g., PCR), or
- Detection of antigen (e.g., DFA)

### **Case Classifications for PAM**

- **Confirmed:** A clinically compatible case that is laboratory confirmed
- **Probable:** No probable case definition

### **Clinical Case Definition of Other Amebic Meningitis**

Amebic meningitis / encephalitis can present with signs and symptoms commonly associated with other causes of meningitis including fever, headache, photophobia or stiff neck. Other signs and symptoms may also be present. One specific type of amebic meningitis is granulomatous amebic meningoencephalitis (GAE). This form of amebic meningitis has a slow, insidious onset and develops into a subacute or chronic disease lasting several weeks to months. GAE is generally fatal though a few patients have survived.

### **Laboratory Confirmation of Other Amebic Meningitis**

In CSF, biopsy, or tissue specimens detection of a free-living amebic organisms other than *Naegleria Fowleri* by

- Microscopic examination, or
- Detection of nucleic acid (e.g., PCR), or
- Detection of antigen (e.g., DFA)

### **Case Classifications for Other Amebic Meningitis**

- **Confirmed:** A clinically compatible case that is laboratory confirmed
- **Probable:** No probable case definition



## Cluster and Outbreak Definitions for PAM and Other Amebic Meningitis

- Cluster:
  - Two or more cases linked by place of residence or places visited within 1 year
- Outbreak:
  - Two or more cases associated with the same body of water or other common water exposure event/practice (e.g. neti pot usage) within 1 year

## CASE INVESTIGATION

### Case Investigation

- Local and regional health departments should investigate all reports of suspected amebic meningitis or encephalitis.
- Primary amebic meningoencephalitis cases tend to receive substantial amounts of attention from the community and the media.

### Case Investigation Checklist

- Confirm the laboratory results meet the case definition.
- Review medical records or speak to an infection preventionist or physician to verify case definition, underlying health conditions and course of illness.
- Interview case (or surrogate) to identify risk factors.
  - If multiple attempts were made to contact the case or surrogate and attempts were unsuccessful, please fill out the case investigation form with as much information as possible and indicate reason for missing information (e.g. lost to follow up – patient did not return call; multiple messages left).
- Complete the Free Living Ameba Case Report form and fax it to DSHS.
- All confirmed case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

### Control Measures

- Provide education on amebic meningitis as needed with emphasis on rarity of disease.
  - Although infections are severe, the risk of *Naegleria fowleri* infection is very low. There have been 30 reported infections in the U.S. during the 10 years from 2000-2009, despite millions of recreational water exposures each year. By comparison, during the ten years from 1996 to 2005, there were over 36,000 drowning deaths in the U.S.
  - It is likely that a low risk of *Naegleria fowleri* infection will always exist with recreational use of warm freshwater lakes, rivers and hot springs. The low number of infections makes it difficult to know why some people have been infected compared to the millions of other people using the same or similar waters across the U.S.
  - The only way to prevent *Naegleria fowleri* infections is to refrain from water-related activities. If you do plan to take part in water-related activities, here are some measures that might reduce risk:
- Provide education on prevention of exposure
  - Avoid water-related activities in bodies of warm freshwater during periods of high water temperature and low water levels.

- Hold the nose shut or use nose clips when taking part in water-related activities in bodies of warm freshwater such as lakes, rivers, or hot springs.
- Avoid digging in or stirring up the sediment while taking part in water-related activities in shallow, warm, freshwater areas.
- If you use a Neti Pot or syringe for nasal irrigation or sinus flushes be sure to use only sterile, distilled, or lukewarm previously boiled water.
- Recommend that anyone experiencing symptoms be evaluated by a physician.
- Several drugs are effective against *Naegleria fowleri* in the laboratory. However, their effectiveness in humans is unclear since almost all infections have been fatal even when people were treated.

**Exclusion**

No exclusion required for disease control purposes

**MANAGING SPECIAL SITUATIONS**

**Multiple cases associated with a single water source**

If one or more cases occur that are associated with a single water source within a one year period, notify the Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

**REPORTING AND DATA ENTRY REQUIREMENTS**

**Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Confirmed and suspected cases of amebic meningitis should be reported within 1 week of suspicion to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit at **(800) 252-8239** or **(512) 512-7676**.

**Local and Regional Reporting and Follow-up Responsibilities**

Local and regional health departments should fax (or mail) a completed investigation form and submit an NBS notification on all confirmed cases to DSHS within 30 days of receiving a report of amebic meningitis. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules. Investigations forms may be faxed to **(512)-776-7616** or mailed to

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

Local and regional health departments should report suspected outbreaks within 24 hours of identification to the regional DSHS office or to 512-776-7676 and submit a completed NORS outbreak form at the conclusion of the outbreak investigation (enter into NORS and fax a copy to the DSHS regional office and/or IDCU 512-776-7676) .

## LABORATORY PROCEDURES

**Important note: For CSF samples - Do NOT refrigerate or freeze; Do NOT centrifuge (refrigeration or freezing will rapidly LYSE & KILL the ameba, preventing visual detection and identification.)**

- It is recommended that CSF, serum, and tissue specimens (including: biopsy, surgical or necropsy specimens) be collected for the detection of free-living amebae (*Naegleria*, *Balamuthia*, and *Acanthamoeba*) and be sent directly to the CDC along with the CDC Form for Free-living Amebae (FLA) Testing which can be requested by emailing [dpdx@cdc.gov](mailto:dpdx@cdc.gov).
- The DSHS Parasitology Laboratory may be contacted for assistance and coordination in submitting specimen samples and electronic images to the CDC. The team lead, Cathy Snider, will work with the hospital to coordinate all CSF specimen shipments to the CDC.

Cathy Snider – Team leader - Parasitology  
DSHS Parasitology Lab  
1100 West 49<sup>th</sup> Street  
Austin, TX 78756  
Phone: 512-458-7560  
Email: [cathy.snider@dshs.state.tx.us](mailto:cathy.snider@dshs.state.tx.us)

### Specimen Collection

The following CDC guidelines are available at [www.cdc.gov/parasites/naegleria/diagnosis-hcp.html](http://www.cdc.gov/parasites/naegleria/diagnosis-hcp.html)

Tissue specimens, including biopsy, surgical or necropsy specimens, may be collected for the detection of free-living amebae (*Naegleria*, *Balamuthia*, and *Acanthamoeba*).

#### *A. Specimens Needed for Pre-Mortem Diagnosis*

- Fresh CSF (Please DO NOT FREEZE and DO NOT REFRIGERATE as this kills the amebae)
  - If the patient has had a biopsy, we also request:
  - Fresh brain tissue (Please DO NOT FREEZE and DO NOT REFRIGERATE);
  - Formalin-fixed and paraffin embedded tissues
  - Three stained H&E slides
  - Six unstained slides

#### *B. Specimens Needed for Post-Mortem and Autopsy Diagnosis*

To better understand the pathogenesis of PAM and the potential for transmission via organ transplantation, CDC would like to encourage autopsies for PAM case patients whose families consent.

- CNS Tissue: *Naegleria fowleri* is most likely detected in biopsy or autopsy tissue collected from the area surrounding the nasal-olfactory bulbs in the brain. However, CDC requests that tissues be collected from other CNS sites in addition to the olfactory bulb to look for other possible locations of ameba entry into the brain, such as around the auditory nerve.

- Extra-CNS Tissue: All possible steps should be taken to minimize the possibility of cross-tissue contamination between CNS and extra-CNS tissues. These steps should, at a minimum, include:
  - Completing the gross examination and sample collection from all extra-CNS tissues prior to examination of the CNS tissues
  - Utilizing separate workspaces and dissecting tools for the extra-CNS and CNS tissues
  - Placing recovered samples of extra-CNS and CNS tissues in separate formalin containers
  - Processing all tissues, particularly extra-CNS and CNS, separately
  - Cutting extra-CNS and CNS tissues separately
  - If the same equipment is used to cut the tissue, cut extra-CNS tissues first and include a cleaning step in between different tissues

If possible, please send the following specimens:

- Fresh CSF (Please DO NOT FREEZE and DO NOT REFRIGERATE as this kills the amebae)
- Fresh, unfixed brain tissue
- Fresh, unfixed tissue (other than brain)
- Formalin-fixed, paraffin-embedded, tissue
- Three hematoxylin and eosin (H&E) - stained slides
- Six unstained slides (for indirect Immunofluorescence, or IIF)
- Paraffin-embedded tissue block
- Unfixed corneal scrapings (for Acanthamoeba).
- Photos of gross brain morphology
- Particularly around olfactory and auditory areas
- Serum

### Submission Form

- Specimen submission forms for free-living amebae (FLA) testing can be requested by emailing: [dpdx@cdc.gov](mailto:dpdx@cdc.gov).

### Specimen Shipping

- Ship samples according to shipping guidelines and requirements available at [http://www.dpd.cdc.gov/dpdx/HTML/Frames/DiagnosticProcedures/body\\_dp\\_otherspec\\_shipment.htm](http://www.dpd.cdc.gov/dpdx/HTML/Frames/DiagnosticProcedures/body_dp_otherspec_shipment.htm). Unfixed specimens for culture should be sent at ambient temperature by overnight priority mail. For PCR, sterile unfixed specimens or specimens in 70-90% ethanol should be sent by overnight priority mail on ice packs. If specimens have been previously frozen, please send on dry ice or ice packs. Care should be taken to pack glass slides securely, as they can be damaged in shipment if not packed in a crush-proof container.
- **Please arrange Monday–Friday delivery only.** Packages cannot be accepted on weekends or federal holidays. Please send any fresh tissue, CSF, whole blood, or serum specimens by overnight express to the following address, using the “FLA” form:

Dr. Govinda Visvesvara  
Centers for Disease Control and Prevention  
Bldg 23, Room 9-621, Mailstop D-66 (note; online says 624)  
1600 Clifton Road  
Atlanta, GA 30333  
Phone: 404-718-4159; 404-718-417

- For additional information about tissue specimens or shipping, please call the Division of Parasitic Diseases at (770) 488-4474.

### **Digital laboratory and pathology image submission**

- Please send your diagnostic request to [dpdx@cdc.gov](mailto:dpdx@cdc.gov). Attaching several images will assist in making identification. When submitting a digital image, please include the following information along with your message:
  1. Your name
  2. Your affiliation
  3. Your telephone contact number (optional)
  4. Mailing address for final reporting
  5. Specimen ID code
  6. Type of specimen
  7. Date specimen was collected
  8. Stain used, and magnification of the microscopic field captured
  9. Presumed diagnosis
  10. Any other pertinent data (e.g., pre or post treatment, travel history, etc).
  11. If you have other relevant supporting documents or clinical information, please attach them.

# Section 10: Meningococcal Disease, Invasive

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Neisseria Meningitidis* (*N. meningitidis*) is a gram-negative, aerobic diplococcus with at least 14 serogroups. Serogroups A, B, C, Y, W-135 and X are all capable of causing outbreaks. In the United States, B, C and Y are the most common.

### 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 to 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 within 24 to 48 hours after starting appropriate antimicrobial treatment.

### 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 multiorgan failure.
- Less common presentations of meningococcal disease include pneumonia, arthritis, otitis media, and epiglottitis.

### Severity

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

## DEFINITIONS

### Clinical Case Definition

Meningococcal disease manifests most commonly as meningitis and/or meningococemia that may progress rapidly to purpura fulminans, shock, and death. However, other manifestations might be observed.

### Laboratory Confirmation

A clinically compatible case that meets at least one of the confirmatory laboratory criteria

- Isolation of *Neisseria meningitidis* from a normally sterile site
- Isolation of *Neisseria meningitidis* from purpuric lesions

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.

### Case Classifications

- **Confirmed:** A clinically compatible case that is laboratory confirmed
- **Probable:** A clinically compatible case that has one of the following:
  - *N. meningitidis* nucleic acid detected using a validated polymerase chain reaction (PCR), obtained from a normally sterile site; or
  - *N. meningitidis* antigen by immunohistochemistry (IHC) on formalin-fixed tissue; or
  - *N. meningitidis* antigen by latex agglutination of CSF; or
  - Clinical purpura fulminans in the absence of a positive blood culture; or
  - Clinically compatible case with gram negative diplococci from a normally sterile site (e.g., blood or CSF)

### Cluster and Outbreak Definitions

- Cluster:
  - Two or more cases with matching PFGE patterns in 1 county in a 1 year period OR
  - 2 or more cases with matching PFGE patterns anywhere in a 3 month period OR
  - any investigation of multiple cases that resulted in threshold calculations
- Outbreak:
  - Occurrence of three or more confirmed or probable cases of meningococcal disease during a period of less than 3 months with the resulting primary attack rate of at least 10 cases per 100,000 population.

## 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 get a detailed

exposure history. Please use the Meningococcal Infection Investigation Form available on the DSHS website: <http://www.dshs.state.tx.us/idcu/investigation/>

### Case Investigation Checklist

- Confirm laboratory results meet the case definition. Identification of gram negative diplococci from a sterile site (e.g. blood or CSF) or from purpuric lesions is sufficient to initiate an investigation and warrant prophylaxis of close contacts.
  - See the Sterile Site and Invasive Disease Determination Flowchart for confirming a specimen meets the criteria for sterile site.
- Verify that the laboratory has forwarded the isolate to the DSHS laboratory for typing and molecular analysis. If an isolate is not available but *Neisseria meningitidis* is suspected, forward any specimen that is available.
- Review medical records or speak to an infection preventionist or physician to verify demographics, symptoms, underlying health conditions, and course of illness.
- Complete the Meningococcal Infection Investigation Form by interviewing the case (or surrogate) to identify close contacts, risk factors and other pertinent information.
  - When possible, 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.
- Ensure appropriate control measures are implemented (see control measures below).
- Refer close contacts to healthcare providers for appropriate chemoprophylaxis
- If applicable, complete steps in the Managing Special Situations section.
- Complete the Meningococcal Infection Investigation Form and fax it to DSHS.
- All probable and confirmed meningococcal case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules ([https://txnedss.dshs.state.tx.us:8009/PHINDox/UserResources/Data\\_Entry\\_Guidelines\\_2007.pdf](https://txnedss.dshs.state.tx.us:8009/PHINDox/UserResources/Data_Entry_Guidelines_2007.pdf)).
- In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be faxed to DSHS IDCU.

### Control Measures

#### Cases

- Investigate reports of suspected meningococcal disease promptly to identify at risk contacts.
- Treatment should be started immediately upon diagnosis.
- Respiratory isolation of patients for 24 hours after start of appropriate chemotherapy.
- Any clothing or bedding that is soiled from nose or throat discharges should be disinfected. 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 health care providers if they experience any symptoms compatible with invasive meningococcal disease.
- Provide close contacts with a Meningococcal Meningitis fact sheet.



- A fact sheet is available on the IDCU (Infectious Disease Control Unit) web site: [http://www.dshs.state.tx.us/idcu/disease/meningococcal\\_invasive/faqs/](http://www.dshs.state.tx.us/idcu/disease/meningococcal_invasive/faqs/)
- Prophylaxis should be given to household members, people sharing sleeping quarters with the case (e.g. military barracks, same bedroom, etc), and anyone that is a close enough contact to have shared eating utensils within 2 weeks of exposure. Guidance for identification of and prophylaxis of contacts can be found in the Red Book.
- Close contacts should be monitored for signs of illness, especially fever, for up to ten days.
- Hospital personnel only need prophylaxis if they are directly exposed to the patient's nasal or throat secretions and failed to wear appropriate PPE.

#### General Public

- There is a vaccine that offers protection against 4 out of the 5 serogroups of *N. meningitidis*. The meningococcal conjugate (Menactra® and Menveo®) and polysaccharide (Menomune®) vaccines are available in the USA. For more information about vaccine call the Immunization Division at 1-512-776-7284.
- Routine hand washing and practicing respiratory etiquette (e.g. covering mouth and nose while sneezing or coughing) is essential to prevent spread of bacteria.
- Limit sharing food, eating utensils, and other personal belongings.

Close contacts definition: any member of the case's household or other individual who may have had direct contact with the case's saliva or oral/nasal secretion. Healthcare providers who have direct contact with the case's oral/nasal secretions (e.g. unprotected mouth-to-mouth resuscitation, intubation, or suctioning) are also considered close contacts. See the Red Book for more information on determining close contacts.

#### Exclusion

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

Children with meningococcal meningitis should be excluded from school/daycare until written permission is provided by their healthcare provider.

## MANAGING SPECIAL SITUATIONS

#### Cases Associated with a School or Daycare

If multiple cases occur among children/students and/or staff at a school or daycare immediately notify the Infectious Disease Control Unit (IDCU) at (800) 252-8239 or (512) 776-7676.

The local / regional health department should

- Investigate links between the cases.
- Recommend basic control measures including hand hygiene / respiratory etiquette education.
- Calculate attack rates for the school / daycare by classroom, grade or other grouping. (Attack rate is number of ill people divided by total number of exposed people).

- Conduct surveillance for new cases of disease for a minimum of two weeks after the onset of the last case.

**Multiple Cases Located in one Community (school district, zip code, city, county)**

If multiple cases occur within a community (school district, zip code, city, county) notify the Infectious Disease Control Unit (IDCU) at (800) 252-8239 or (512) 776-7676.

The local / regional health department should:

- Determine the population of the community and perform epidemic threshold calculations as described in the Control of Communicable Diseases
  - Alert threshold is 10 cases/100000 population
  - Epidemic threshold is: a weekly doubling of cases during a three week period or 15 cases/100000 population or 2 cases at a mass gathering or among refugees or displaced person.
- If at least 3 cases occur in a three month period AND the alert threshold is met then active surveillance to detect other cases in the population should be conducted.
  - If the strain is covered by the vaccine then immunization of unvaccinated members of the at-risk population may be considered
- If the epidemic threshold is exceeded and if the cases are predominantly a strain that is vaccine preventable (serogroup A, C, Y or W-135), then
  - conduct a public education campaign and
  - coordinate a mass vaccination campaign for the affected community
- Note: Mass chemoprophylaxis is not usually effective for widespread communities but may be considered for small sub-populations (e.g. schools) that are directly experiencing cases.

**REPORTING AND DATA ENTRY REQUIREMENTS**

**Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

According to Texas Administrative Code meningococcal infection should be reported immediately by phone to the local health authority or the DSHS regional director or to the Texas Department of State Health Services (DSHS) Infectious Disease Control Unit (IDCU) at (800) 252-8239 or (512) 512-7676.

**Local and Regional Reporting and Follow-up Responsibilities**

Local and regional health departments should

- Immediately investigate any reported cases of invasive meningococcal disease.
- Identify and evaluate close contacts.
- Implement control measures and provide education to prevent further spread of disease.
- fax (or mail) a completed investigation form on all confirmed and probable cases within 30 days of notification.
  - Investigations forms may be faxed to 512-776-7616 or mailed to:  
 Infectious Disease Control Unit  
 Texas Department of State Health Services

Mail Code: 1960  
PO Box 149347  
Austin, TX 78714-9347

- Enter case into NBS and submit an NBS notification on all confirmed and probable cases to DSHS within 30 days of receiving a report of confirmed/probable cases of meningococcal infections. Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules ([https://txnedss.dshs.state.tx.us:8009/PHINDox/UserResources/Data\\_Entry\\_Guidelines\\_2007.pdf](https://txnedss.dshs.state.tx.us:8009/PHINDox/UserResources/Data_Entry_Guidelines_2007.pdf)).

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

- Report suspected outbreaks within 24 hours of identification to the regional DSHS office or to the Infectious Disease Control Unit 512-776-7676 and
- Submit a completed Respiratory Disease Outbreak Summary Form at the conclusion of the outbreak investigation (fax a copy to the DSHS regional office and/or IDCU 512-776-7676)

## LABORATORY PROCEDURES

*Neisseria meningitidis* isolates from normally sterile site and/or purpuric lesions are required by law to be submitted to the DSHS Laboratory for typing and molecular analysis. To obtain testing kits, contact the DSHS Laboratory at (512) 776-7661. Before shipping specimens, be sure to notify DSHS IDCU staff at (512) 776-7676.

### Specimen Collection

- Submit isolates of *N. meningitidis* on blood or chocolate agar at ambient temperature.
- 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 DSHS Laboratory G-2B Submission Form.

### Specimen Shipping

- DO NOT ship specimens on a Friday or the day before a state holiday unless special arrangements have been pre-arranged 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 name on tube and name on form.
- Expired media used.

# Section 11: Mumps

## BASIC EPIDEMIOLOGY

### Infectious Agent

Mumps virus, a single-stranded RNA paramyxovirus.

### Transmission

Transmission occurs through respiratory droplets or through direct contact with nasopharyngeal secretions.

### Incubation Period

Average of 16-18 days (range 12-25 days)

### Communicability

Mumps virus has been found in respiratory secretions as early as 3 days before the start of symptoms and up to 9 days after onset. However, the patient is most infectious within the first 5 days after symptom onset.

### Clinical Illness

Prodromal symptoms are nonspecific; they include myalgia (muscle pain), anorexia, malaise, headache, and low-grade fever, and may last 3–4 days. [Parotitis \(inflammation and swelling of the parotid glands\)](#) is the most common manifestation of clinical mumps, affecting 30–40% of infected persons. Parotitis can be unilateral (one side of cheek) or bilateral (both sides of cheek); other combinations of single or multiple salivary glands may be affected. Parotitis usually occurs within the first 2 days of symptom onset and may present as an earache or tenderness on palpation of the angle of the jaw. Symptoms usually decrease within 1 week and generally resolve within 10 days.

Up to 20% of infections are asymptomatic; an additional 40–50% may have only nonspecific or primarily respiratory symptoms.

The most common complication is orchitis, affecting up to 50% of infected males who have reached puberty. While painful, only rarely does this lead to infertility. Other complications are rare, but may include encephalitis (inflammation of the brain), meningitis, oophoritis (inflammation of an ovary), mastitis (inflammation of the breast), pancreatitis (inflammation of the pancreas), myocarditis (inflammation of heart muscle), arthritis (inflammation of joints), and nephritis (inflammation of the kidneys). Spontaneous abortion (miscarriage) can result if an infection occurs during pregnancy, particularly in the first trimester. Rarely (~1 in 20,000), mumps infection can cause deafness, which is usually permanent.

Not all cases of parotitis are caused by mumps virus. Parotitis can also occur as a result of infection with other viruses such as cytomegalovirus, parainfluenza virus, influenza A, Coxsackie A, echovirus, lymphocytic choriomeningitis virus, and HIV as well as *Staphylococcus aureus*, and other bacteria. Non-infectious causes of parotitis include drugs, tumors, immunologic diseases, and obstruction of the salivary duct. Mumps, however, is the only agent that can cause outbreaks (i.e. multiple cases at once) of parotitis.

## DEFINITIONS

### Clinical Case Definition

An acute parotitis or other salivary gland swelling lasting at least 2 days, or orchitis or oophoritis unexplained by another more likely diagnosis.

Note: Influenza, parainfluenza type 3, and cytomegaloviruses (CMV) can also cause parotitis. In addition, there are numerous other non-infectious causes of parotid swelling. Approximately 30% of sporadic parotitis cases are NOT caused by the mumps virus, and 20% to 40% of mumps cases may not have parotid swelling. Mumps can only be confirmed through mumps-specific laboratory testing.

### Laboratory Confirmation

- Isolation of mumps virus from a clinical specimen, or
- Detection of mumps-virus-specific nucleic acid by PCR.

Note: An elevated serum amylase is **not** confirmatory for mumps

### Case Classifications

- **Confirmed:**
  - A case that has a positive mumps PCR result OR has a positive mumps culture AND either meets clinical case definition or has aseptic meningitis, encephalitis, hearing loss, mastitis, or pancreatitis.
- **Probable:** A case that meets the clinical case definition AND
  - Has a positive test for serum anti-mumps immunoglobulin M (IgM) antibody, OR
  - Has an epidemiologic link to another probable or confirmed case or linkage to a group/community defined by public health during an outbreak of mumps.

## CASE INVESTIGATION & TREATMENT

### Case Investigation

- All suspect mumps reports should be promptly investigated.
- Alert appropriate local and regional health departments as well as DSHS IDCU in Austin.
- Identify all susceptible contacts and initiate control measures.
- Collect serology and virology specimens as soon as possible.

### Control Measures

- Although vaccination after exposure to mumps may not prevent disease, the vaccine will protect persons from subsequent exposures. If ongoing exposure is expected, quarantine and/or vaccinating contacts may be of use.
- Persons who are unsure of their mumps disease history or mumps vaccination history should be vaccinated.
- IG is not effective and not recommended.

### Exclusion

CDC now recommends isolating mumps patients for 5 days following onset of symptoms.

## REPORTING AND DATA ENTRY REQUIREMENTS

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Mumps cases are required to be reported within 1 week to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### **Local and Regional Reporting and Follow-up Responsibilities**

Promptly investigate any reported cases of mumps. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Completed mumps investigation forms for confirmed and probable cases must be submitted to DSHS IDCU. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all mumps investigations with a confirmed or probable case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

### **Diagnosing Mumps**

Serologic tests should be interpreted with caution, as false-positive and false-negative results are possible with IgM tests. Therefore, mumps cases should not be ruled out by negative laboratory results. With previous contact with mumps virus either through vaccination (particularly with 2 doses) or natural infection, serum mumps IgM test results may be negative; IgG test results may be positive at initial blood draw and viral detection in RT-PCR or culture may have low yield.

### **Serology**

The first (acute-phase) serum sample should be collected as soon as possible upon suspicion of mumps disease. Convalescent-phase serum samples should be collected about 2-3 weeks after the acute-phase sample.

*Persons with a history of mumps vaccination may not have detectable mumps IgM antibody regardless of timing of specimen collection.*

### **Specimen Collection**

#### **Option 1:**

- Collect at least 5 mL blood in red top tube.
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the **red top blood** collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot).
  - Transfer the serum from the red top tube into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship cold with cool packs and must be received within 48 hours.
  - If the serum samples will not be delivered to the laboratory within 48 hours of collection, then the samples must be frozen at  $-20^{\circ}\text{C}$  (frozen) or lower and shipped frozen with dry ice.
  - Do not freeze whole blood in red top tube for shipping.

**Option 2:**

- Collect at least 5 mL blood in **gold top** or **tiger top** blood collection tube containing a gel serum separator (Gold top or tiger top tubes are types of Serum Separator Tubes with the gel that keeps the serum separated from the clot after the centrifugation).
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the gold top blood collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot) and ship cold with cool packs and must be received within 48 hours.
  - If more than 48 hours, transfer the serum into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship frozen with dry ice.
  - Do not freeze serum in SST for shipping. Freezing will cause hemolysis and hemolyzed specimens will be unsatisfactory for testing.

**Submission Form**

- Use the DSHS Laboratory current version of G-2A form (Dec 2011, Rev 4) for specimen submission.
- Make sure the patient's first and last name and date of birth / social security number match exactly what is written on the tube.
- Mark the laboratory test requested, date of onset, and date of collection. Be certain that the names on acute and convalescent sera match exactly.
- Call DSHS Laboratory at 512-776-7138 if needing information for specimen submission.

**Specimen Shipping**

- To avoid specimen rejection, ship separated serum or centrifuged SST Mon-Thur to the DSHS laboratory via overnight delivery following the above guidelines.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
  - If the serum samples will not be delivered to the DSHS laboratory within 48 hours of collection, transfer into a serum transport tube and freeze on Fridays. Ship frozen specimens with dry ice on Monday. Lone Star service will not deliver specimen to the DSHS lab on Saturday.
- 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

#### **Causes for Rejection:**

- Discrepancy between name on tube and name on form.
- Insufficient quantity of serum for testing.
- Specimens received with extended transit time or received at incorrect temperature or no date of collection.

#### **Virus Isolation and PCR**

Specimens should be obtained early in the course of illness when the quantity of virus shed is highest. Collect buccal or oral swab samples as soon as mumps disease is suspected. Samples collected when the patient first presents with symptoms have the best chance of having a positive result by RT-PCR.

#### **Specimen Collection**

Processing the swabs within 24 hours of collection will enhance the sensitivity of both the RT-PCR and virus isolation techniques.

- Using a buccal or oral swab, massage the parotid gland area for 30 seconds prior to swabbing the area around Stensen's duct.
  - A commercial product designed for the collection of throat specimens or a flocced polyester fiber swab can be used. Synthetic swabs are preferred. Do not use cotton swabs, which may contain substances that are inhibitory to enzymes used in RT-PCR. Flocced synthetic swabs appear to be more absorbent and elute samples more efficiently.
- Swabs should be placed in 2 ml of standard viral transport medium.

#### **Submission Form**

- Use specimen submission for G-2A.
- If more than 1 swab is submitted, a G-2A must be provided for each swab.

#### **Specimen Shipping**

- All clinical specimens for virus isolation should be kept at 2-8°C during storage and shipment. Ship specimens on ice via overnight delivery.
- If there is a delay in shipment or the specimen will not be received at the laboratory within 48 hours of collection, the sample should be frozen at -70°C. Frozen samples should be shipped on dry ice.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

**Causes for Rejection:**

- Specimens submitted on a preservative, such as formalin.
- Insufficient quantity of urine for testing.
- Specimens received at room temperature or cold greater than 48 hours of collection.

# Section 12: Pertussis

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Bordetella pertussis* (*B. pertussis*), a fastidious gram-negative bacillus.

### Transmission

Transmitted from person to person through direct contact with respiratory secretions, most commonly through direct contact with airborne droplets from infectious individuals.

### Incubation Period

Average of 7-10 days (ranges 4-21 days).

### Communicability

Pertussis is highly contagious. Persons with pertussis are most infectious during the catarrhal period and 21 days after cough onset.

### Clinical Illness

The incubation period of pertussis is usually 7 to 10 days, with a range of 4 to 21 days. The clinical course of illness is divided into the following three stages:

- The **catarrhal stage** is characterized by the onset of a runny nose, sneezing, low-grade fever, and a slight cough. The cough gradually becomes more severe and after 1-2 weeks, the next stage develops.
- The **paroxysmal stage** is characterized by coughing fits (paroxysms), which may be followed by an inspiratory whooping sound, apnea, or vomiting. This usually lasts 1-6 weeks, but may continue for 10 weeks.
- In the **convalescent stage**, there is a gradual resolution of the paroxysmal coughing. The coughing may resolve after a few weeks, but may continue for months.

Regardless of vaccination history, pertussis can occur at any age. In infants less than 6 months of age, apnea may be the initial or most important symptom. An indication to the diagnosis **in infants only** is an elevated white blood count (over 15,000/mm<sup>3</sup>). In infants pertussis symptoms can include apnea, pneumonia, pulmonary hypertension, seizures, and encephalopathy. Pertussis can cause serious complications and can even cause death in infants. Among older children, adolescents, and adults pertussis symptoms are usually milder.

## DEFINITIONS

### Clinical Case Definition

For endemic or sporadic cases, a cough illness lasting at least 14 days AND at least one of the following additional symptoms and without other apparent cause (as reported by a health professional):

- Paroxysmal coughing, or
- Inspiratory “whoop,” or

- Post-tussive vomiting.

### Laboratory Confirmation

- Isolation of *Bordetella pertussis* from a clinical specimen, or
- Positive PCR assay for *Bordetella pertussis*.

### Note:

- Because *B. pertussis* can be difficult to culture, a negative culture result does not rule out pertussis.
- Negative PCR results do not require investigation unless reported as a suspected case by a health professional.
- Direct fluorescent antibody (DFA) staining of a patient's specimen and serological laboratory results (pertussis IgA, IgG or IgM) are NOT considered confirmatory for pertussis, but should be investigated as soon as possible.

### Case Classifications

- **Confirmed:** Must meet one of the following criteria:
  - A person with an acute cough illness of any duration who is culture positive, or
  - A person who meets the clinical case definition and is PCR positive, or
  - A person who meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case. (This does not include linkage to a patient with a positive laboratory result that does not meet the clinical criteria, i.e., classified as Not a Case.)
- **Probable:** Must meet all of the following criteria:
  - Meets the clinical case definition, and
  - Is not laboratory confirmed (not tested, tests are negative, or tested by serology or DFA), and
  - Is not epidemiologically linked to a laboratory-confirmed case.

### Outbreak Settings

In outbreak settings of 3 or more cases including at least 1 that is laboratory confirmed (i.e. meets the confirmed case definition in addition to being either PCR or culture positive), the clinical case definition used can be modified to a “cough illness lasting at least 14 days”.

## CASE INVESTIGATION & TREATMENT

### Case Investigation

- Investigate reports of suspected pertussis promptly.
- A close contact is defined as being within close proximity (2 feet) for 2 hours or longer at any one period of time. Identify all exposed contacts including the following:
  - Household contacts
  - Other persons having direct prolonged exposure to the case while case was contagious.
- Antibiotic prophylaxis is recommended if initiated within 21 days of exposure. Initiating antibiotic treatment more than 3 weeks after exposure has limited benefit and is not

- recommended, except for high-risk contacts that may benefit from antibiotic prophylaxis up to 6 weeks after exposure.
- Exposed children should be observed for 14 days after last contact with the exposed person.
  - Close contacts younger than seven (7) years who are unvaccinated or who have fewer than four (4) doses of DTaP vaccine should be vaccinated according to the recommended schedule. Children who received their third dose of DTaP vaccine six (6) months or more before exposure should be given a fourth dose at this time. Those who have had at least four (4) doses of DTaP should receive a booster dose of DTaP unless a dose has been given within the last three (3) years or they are seven (7) years of age or older.
  - Adolescents 11 through 18 years of age should get one booster dose of Tdap. A dose of Tdap is recommended for adolescents who have not yet gotten a dose of Td. Adolescents who have already gotten a booster dose of Td are encouraged to get Tdap as well, for protection against pertussis. Waiting at least 5 years between Td and Tdap is encouraged, but not required. Adolescents who did not get all their scheduled doses of DTaP or DTP as children should complete the series using a combination of Td and Tdap.
  - Adults aged 19 through 64 years of age should substitute Tdap for one booster dose of Td. Td should be used for later booster doses. Adults who expect to have close contact with an infant younger than 12 months of age should get a dose of Tdap. Healthcare workers who have direct patient contact in hospitals or clinics should also get a dose of Tdap. Waiting at least 2 years since the last dose of Td is suggested, but not required.

**Exclusion**

Until completion of five (5) days of antibiotic therapy if cough onset is within 21 days.

The current CDC guidelines for treatment and postexposure prophylaxis of pertussis are summarized in the table below and can also be found at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5414a1.htm>.

**Recommended Antimicrobial Treatment and Postexposure Prophylaxis for Pertussis, by Age Group**

Age Group	Primary Agents			Alternate Agent*
	Azithromycin	Erythromycin	Clarithromycin	TMP-SMZ
<1 month	Recommended agent. 10 mg/kg per day in a single dose for 5 days (only limited safety data available)	Not preferred. Erythromycin is associated with infantile hypertrophic pyloric stenosis  Use if azithromycin is unavailable; 40 to 50 mg/kg per day in 4 divided doses for 14 days	Not recommended (safety data unavailable)	Contraindicated for infants aged <2 months (risk for kernicterus)
1-5 months	10 mg/kg per day in a single dose for 5 days	40 to 50 mg/kg per day in 4 divided doses for 14 days	15 mg/kg per day in 2 divided doses for 7 days	Contraindicated at age <2 months. For infants aged ≥2 months, TMP 8 mg/kg per day, SMZ 40 mg/kg per day in 2 divided doses for 14 days

Primary Agents				Alternate Agent*
Age Group	Azithromycin	Erythromycin	Clarithromycin	TMP-SMZ
<b>Infants (aged ≥6 months) and children</b>	10 mg/kg in a single dose on day 1 then 5 mg/kg per day (maximum: 500 mg) on days 2-5	40 to 50 mg/kg per day (maximum: 2 g per day) in 4 divided doses for 14 days	15 mg/kg per day in 2 divided doses (maximum: 1 g per day) for 7 days	TMP 8 mg/kg per day, SMZ 40 mg/kg per day in 2 divided doses for 14 days
<b>Adults</b>	500 mg in a single dose on day 1 then 250 mg per day on days 2-5	2 g per day in 4 divided doses for 14 days	1 g per day in 2 divided doses for 7 days	TMP 320 mg per day, SMZ 1,600 mg per day in 2 divided doses for 14 days

\* Trimethoprim sulfamethoxazole (TMP-SMZ) can be used as an alternative agent to macrolides in patients aged ≥2 months who are allergic to macrolides, who cannot tolerate macrolides, or who are infected with a rare macrolide-resistant strain of *Bordetella pertussis*

## REPORTING AND DATA ENTRY REQUIREMENTS

### Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Suspect cases of pertussis are required to be reported within 1 work day to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### Local and Regional Reporting and Follow-up Responsibilities

Promptly investigate any reported cases of pertussis. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Completed pertussis case investigation forms must be submitted to DSHS IDCU. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### Data Entry

The principle investigator (Local or Regional health department) is required to enter all pertussis investigations with a confirmed or probable case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

If using or applying 'Outbreak' case definition (refer to Outbreak Settings), the outbreak must be named in NBS. Outbreak names must be requested through the NEDSS (NBS) office.

## LABORATORY PROCEDURES

### SPECIFIC LABORATORY PROCEDURES

Isolation of the organism by culture is ideal; however, it is not readily available. Culture is highly specific, but relatively insensitive. Culture confirmation is recommended for outbreaks. Contact IDCU for further information during outbreaks. Direct fluorescent antibody (DFA) testing of nasopharyngeal secretions has been shown to have low sensitivity and variable specificity; therefore, it should only be used for screening and not relied upon for laboratory confirmation. DFA is not available from the DSHS Laboratory. The preferred laboratory test for pertussis is Polymerase Chain Reaction (PCR). PCR testing can be a rapid, sensitive, and specific method for diagnosing pertussis

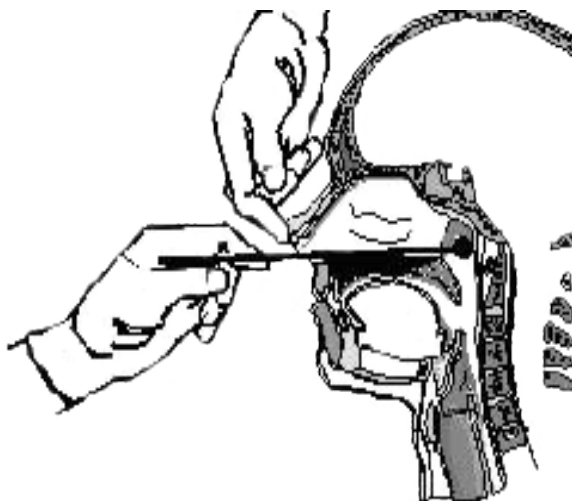
To obtain pertussis testing kits, contact the DSHS Laboratory at (512) 776-7661.

### Specimen Collection

#### Nasopharyngeal Swab for PCR Testing

##### *Appropriate positioning of a nasopharyngeal swab*

- Use a Rayon or Dacron nasopharyngeal swab with aluminum or plastic handles.
  - If you are not using swabs provided through the DSHS testing kit, be sure the swab you are using is a “mini-tip” Rayon or Dacron swab.
- Immobilize the patient’s head.
- Gently insert nasopharyngeal swab into a nostril until the posterior nares is reached.
- Leave the swab in place for up to 10 seconds. This procedure may induce coughing and tearing.
- If resistance is encountered during insertion of the swab, remove it and attempt insertion on the opposite nostril.
- Remove the swab slowly.
- After collection, the swab should be inserted back into the dry transport tube. Store at 2-8°C until shipment at refrigerated temperature (2-8°C).



### Submission Form

- Use a G-2B Specimen Submission Form.
- Make sure the patient's name and date of birth or social security number match exactly what is written on the transport tubes.
- On the DSHS Specimen Submission Form G-2B, in section 7: Molecular Studies, check PCR for and write in Pertussis ( PCR for: Pertussis)

- Fill in the date of collection, date of onset, and diagnosis/symptoms.

### **Specimen Shipping**

- Transport temperature: Keep at 2-8°C (refrigerated)
- Ship specimens via overnight delivery on cold packs or wet ice (double bagged) within 48 hours of collection.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

### **Causes for Rejection:**

- Discrepancy between name on tube and name on form.
- Incorrect swab (must use nasopharyngeal swab).
- Obvious contamination with blood.
- Tube broken in transport.
- Received at ambient temperature.



# Section 13: Polio

## (Paralytic and Nonparalytic infection)

### BASIC EPIDEMIOLOGY

#### Infectious Agent

Poliovirus (genus *Enterovirus*) types, 1, 2, and 3.

#### Transmission

Poliovirus is transmitted by person-to-person contact, primarily via the fecal-oral route. Virus proliferates in both the pharynx (throat) and intestines. Infection may occur following inhalation of contaminated salivary droplets or ingestion of contaminated food products. It should be made clear that poliovirus is disseminated via droplet spread and is not airborne. Virus may persist in the feces of those with and without symptoms for 3-6 weeks post-infection.

#### Incubation Period

Commonly 7-14 days for paralytic cases; reported range of up to 35 days.

#### Communicability

Not precisely defined, but transmission is possible as long as the virus is excreted.

#### Clinical Illness

The virus infects the throat and intestine, with invasion of local lymph nodes. Up to 95% of polio infections are asymptomatic or unapparent. Some persons have nonspecific mild illnesses including fever, sore throat, or gastrointestinal symptoms. In rare cases poliovirus infects the spinal cord or brain stem resulting in aseptic meningitis or acute asymmetric flaccid paralysis.

### DEFINITIONS

#### Clinical Case Definition

Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss.

#### Laboratory Confirmation

- Isolation of wild-type poliovirus type 1, 2, or 3 from a clinical specimen (stool or CSF).

#### Case Classifications

- **Confirmed:** A case that meets the clinical case definition, is laboratory confirmed, and in which the patient has a neurologic deficit 60 days after onset of initial symptoms, has died, or has unknown follow-up status.
- **Probable:** A case that meets the clinical case definition.

**Note:** All suspected cases of paralytic poliomyelitis are reviewed by a panel of expert consultants at the Centers for Disease Control and Prevention (CDC) before final case classification occurs. Final case classification could take 6 to 12 months.

## **CASE INVESTIGATION & TREATMENT**

**DSHS IDCU should be notified IMMEDIATELY of any suspected cases of polio.**

### **Control Measures**

- Educate the public on the advantages of immunization in early childhood.

### **Case Investigation**

- Gather demographic data (name, age, sex, race, complete address, and occupation of patient).
- Assess immunization history of the patient (the number, dates, and lot numbers of all previous doses of polio vaccine).
- Examine clinical information (include the course of illness and sites of paralysis and any complications).
- Immunologic status (If any doubt exists about the patient's status, an immunologic evaluation of quantitative immunoglobulin, T and B cell quantification, lymphocyte transformation, etc. should be considered.).
- Exposure history:
  - Recent travel of patient or a close contact outside of the US.
  - Contact with any known case of poliomyelitis.
  - Please note that polio only occurs in very limited locations throughout the world.
  - Contact within previous 30 days with any person who received oral poliovirus vaccine (OPV) within the last 60 days (include date of contact, nature of contact, date contact received OPV, lot number of vaccine, age of contact, and relationship to patient). Please note that OPV is no longer used in the United States, but is routinely used in other countries.
- Obtain copy of hospital discharge summary.
- Obtain copy of 60-day follow-up report to ascertain if there is any residual paralysis.
- If patient died, obtain copy of autopsy report or death summary.

### **Polio Reports among a Recently Vaccinated Child**

It is not uncommon for a poliovirus to be identified in a clinical specimen from an infant or young child who has recently received a dose of OPV. If you receive a laboratory report indicating that a poliovirus has been identified, obtain the following information on the patient:

- Complete immunization history (the number, dates, and lot numbers of all previous doses of OPV and inactivated poliovirus vaccine (IPV) vaccine);
- Clinical history (were there any clinical signs of paralysis?); and
- Diagnosis.

If there was no suspicion of paralytic poliomyelitis, no further action is needed. If the patient is suspected of having paralytic poliomyelitis, investigate case according to paralytic poliomyelitis guidelines.

## REPORTING AND DATA ENTRY REQUIREMENTS

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Providers and any individuals knowledgeable of suspected cases of polio are required to immediately report to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### **Local and Regional Reporting and Follow-up Responsibilities**

Immediately investigate any reported suspect cases of polio. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Report all cases of suspected polio immediately to DSHS IDCU. There is no specific case investigation form for polio; however, the DSHS IDCU will require a detailed written report if a case is confirmed. In the event of a death, please provide copies of the hospital discharge summary, death certificate, and autopsy report to DSHS. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all polio investigations with a confirmed or probable case status and submit notification in the NEDSS Based System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

### **SPECIFIC LABORATORY PROCEDURES**

To obtain testing kits, contact the DSHS Laboratory at **(512) 776-7661**. Before shipping specimens, be sure to notify DSHS IDCU VPD staff at **(512) 776-7676**.

### **Specimen Collection**

#### **Enterovirus Culture - Isolation**

- Preferred specimen and quantity:
  - CSF- 2-5 mL.
  - Stool- 2-4g. Place specimen in viral transport media.

- NP Swab – in 2-4 mL of viral transport media.
- Tissue in enough viral transport media to prevent drying.

**Submission Form**

- Use a G-2A Specimen Submission Form.
- Make sure the patient's name and date of birth or social security number match exactly what is written on the transport tubes.
- Fill in the date of collection, date of onset, and diagnosis/symptoms.

**Specimen Shipping**

- Transport temperature: Keep at 2-8°C (refrigerated).
- If specimen will arrive at lab > 48 hours from collection, store at -70° C and send on dry ice.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

**Causes for Rejection:**

- Specimen submitted on a preservative, such as formalin.
- Discrepancy between name on tube and name on form.

# Section 14: Rubella

## BASIC EPIDEMIOLOGY

### Infectious Agent

Rubella virus (family togaviridae; genus *rubivirus*).

### Transmission

Rubella is spread from person to person via airborne transmission or droplets shed from the respiratory secretions of infected persons. Rubella may be transmitted by persons with subclinical or asymptomatic cases (up to 50% of all rubella virus infections).

### Incubation Period

From 14-17 days with a range of 14-21 days.

### Communicability

Rubella is only moderately contagious. The disease is most contagious when the rash first appears, but virus may be shed from 7 days before rash to 5–7 days or more after rash onset.

### Clinical Illness

Symptoms are often mild, and up to 50% of infections may be subclinical or inapparent. In children, rash is usually the first manifestation and a prodrome (early symptom indicating onset of disease) is rare. In older children and adults, there is often a 1 to 5 day prodrome with low-grade fever, malaise, lymphadenopathy (disease of the lymph nodes), and upper respiratory symptoms preceding the rash. The rash of rubella is maculopapular (rash characterized by flat, red on the skin that is covered with small confluent bumps) and occurs 14 to 17 days after exposure. The rash usually occurs initially on the face and then progresses from head to foot. It lasts about 3 days and is occasionally pruritic (intensely itchy). The rash is fainter than measles rash and does not come together to form one massive rash. The rash is often more prominent after a hot shower or bath. Lymphadenopathy may begin a week before the rash and last several weeks. Postauricular, posterior cervical, and suboccipital nodes are commonly involved.

Arthralgia (joint pain) and arthritis (inflammation and stiffness of joints) occur so frequently in adults that they are considered by many to be an integral part of the illness rather than a complication. Other symptoms of rubella include conjunctivitis (pink eye), testalgia (testicular pain), or orchitis (inflammation of the testicles). [Forschheimer spots](#) may be noted on the soft palate but are not diagnostic for rubella. A rubella rash may be confused or mistaken to be parvovirus B19 (Fifth's disease) because the rashes are similar in appearance.

## DEFINITIONS

### Clinical Case Definition

An illness that has all of the following characteristics:

- Acute onset of generalized maculopapular rash, and
- Temperature  $\geq 99^{\circ}\text{F}$ , if measured, and
- Arthralgia/arthritis, lymphadenopathy, or conjunctivitis.

### Laboratory Confirmation

- Positive serologic test for rubella-specific IgM antibody, or
- Significant rise in rubella antibody by any standard serologic assay (i.e. four-fold rise in IgG antibody from acute to convalescent samples), or
- Isolation of rubella virus from a clinical specimen, or
- Detection of rubella-virus-specific nucleic acid by PCR.

### Case Classification

- **Confirmed:** A case that meets one of the following:
  - Meets clinical case definition and is laboratory confirmed, or
  - Meets clinical case definition and is epidemiologically linked to a laboratory-confirmed case.

Serum rubella IgM test results that are false positives have been reported in persons with other viral infections (e.g., acute infection with Epstein-Barr virus [infectious mononucleosis], recent cytomegalovirus infection, and parvovirus infection) or in the presence of rheumatoid factor. Patients who have laboratory evidence of recent measles infection are excluded.

## CASE INVESTIGATION & TREATMENT

### Case Investigation

A completed case investigation form on all suspected cases must be submitted to the DSHS Infectious Disease Control Unit within 30 days of initial report. In the event of death, please provide copies of the hospital discharge summary, death certificate, and autopsy report.

### Control Measures

- All reports of suspected rubella should be investigated promptly. Treat all cases as confirmed until laboratory testing or other information rules out rubella.
- Identify all exposed contacts.
- Determine vaccine status of exposed contacts. If not up-to-date with vaccination, vaccinate with MMR according to the recommended immunization schedule.
- Persons  $\geq 1$  year of age should have a history of one (1) dose of MMR or serologic evidence of immunity to rubella.
- Persons who cannot readily provide laboratory evidence of rubella or a documented history of vaccination on or after their first birthday should be considered susceptible and should be vaccinated if there are no contraindications.
- If vaccination of exposed contact is contraindicated, exclude exposed contact from school or child-care facility for at least three (3) weeks after last rash onset.
- If a pregnant woman is exposed to rubella, evidence of rubella immunity should be obtained as soon as possible. If rubella IgG antibodies are not detected, a second specimen should be obtained 3-4 weeks later and tested again for rubella IgM and rubella IgG antibodies. If IgG is present, infection is assumed to have occurred and precautions will need to take place at delivery as the infant may be infectious (see Section 12: CRS).

**Exclusion:** Seven (7) days after onset of rash. In an outbreak, unvaccinated children and pregnant women should be excluded for at least three weeks after rash onset.

## REPORTING AND DATA REQUIREMENTS

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Cases of rubella are required to be reported within 1 work day to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at (800) 252-8239 or (512) 776-7676.

### **Local and Regional Reporting and Follow-up Responsibilities**

Promptly investigate any reported cases of rubella. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Completed rubella case investigation forms must be submitted to DSHS IDCU. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to (512) 776-7616 or mailed to the following address:

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

### **Data Entry**

The principle investigator (Local or Regional health department) is required to enter all rubella investigations with a confirmed case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

**SPECIFIC LABORATORY PROCEDURES:** Culture and PCR testing is preferred.

**IgM Serology:** Single specimen collected early in the course of illness. Because rubella IgM antibodies rise more slowly in some individuals, a negative rubella IgM result on a specimen collected within 5 days of rash onset will NOT rule out a diagnosis of rubella; the only exception to this is when the specimen is IgG positive, indicating prior immunity. Therefore if the patient is an unvaccinated infant, a specimen for IgM testing should be collected at least 5 days post rash onset. All other specimens should be collected as soon as possible. Rubella IgM may cross-react with other viruses, especially parvovirus.

**IgG Serology:** Acute AND convalescent samples required. Collect acute early in course of illness and convalescent 10-14 days later. Evidence of rubella immunity by measuring IgG antibody (e.g. in an exposed pregnant woman) can be determined with a single blood specimen.

### **Specimen Collection**

#### **Option 1:**

- Collect at least 5 mL blood in red top tube.
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the **red top blood** collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot).
  - Transfer the serum from the red top tube into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship cold with cool packs and must be received within 48 hours.
  - If the serum samples will not be delivered to the laboratory within 48 hours of collection, then the samples must be frozen at  $-20^{\circ}\text{C}$  (frozen) or lower and shipped frozen with dry ice.
  - Do not freeze whole blood in red top tube for shipping.

**Option 2:**

- Collect at least 5 mL blood in **gold top** or **tiger top** blood collection tube containing a gel serum separator (Gold top or tiger top tubes are types of Serum Separator Tubes with the gel that keeps the serum separated from the clot after the centrifugation).
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the gold top blood collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot) and ship cold with cool packs and must be received within 48 hours.
  - If more than 48 hours, transfer the serum into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship frozen with dry ice.
  - Do not freeze serum in SST for shipping. Freezing will cause hemolysis and hemolyzed specimens will be unsatisfactory for testing.

**Submission Form**

- Use the DSHS Laboratory current version of G-2A form (Dec 2011, Rev 4) for specimen submission.
- Make sure the patient's first and last name and date of birth / social security number match exactly what is written on the tube.
- Mark the laboratory test requested, date of onset, and date of collection. Be certain that the names on acute and convalescent sera match exactly.
- Call DSHS Laboratory at 512-776-7138 if needing information for specimen submission.

**Specimen Shipping**

- To avoid specimen rejection, ship separated serum or centrifuged SST Mon-Thur to the DSHS laboratory via overnight delivery following the above guidelines.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
  - If the serum samples will not be delivered to the DSHS laboratory within 48 hours of collection, transfer into a serum transport tube and freeze on Fridays. Ship frozen specimens with dry ice on Monday. Lone Star service will not deliver specimen to the DSHS lab on Saturday.



- 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

#### **Causes for Rejection:**

- Discrepancy between name on tube and name on form.
- Insufficient quantity of serum for testing specimens received with extended transit time.
- Received at incorrect temperature or no date of collection.

#### **Virus Isolation**

Rubella virus isolates are critical in the diagnosis of acute rubella and CRS, and are needed to establish the molecular epidemiology of rubella and to distinguish rubella from other viral rash illnesses.

#### **Specimen Collection**

- Use a synthetic swab such as polyester or rayon swab. Flocked synthetic swabs are acceptable. Do not use cotton swabs. Place the swab in 2-3 mL of viral transport media.
- Obtain a pharyngeal swab within 4 days of rash onset.
- Label the specimen tube with the patient's name and date of birth or social security number.

#### **Submission Form**

- Use Specimen Submission Form G-2A.
- Make sure the patient's name and date of birth/ social security number match exactly what is written on the specimen tube.
- Mark the laboratory test requested (virus isolation-rubella), disease suspected, date of onset, and date of collection.

#### **Specimen Shipping**

- Transport temperature:
  - Keep the specimen at 2-8°C and ship overnight on wet ice within 48 hours.
  - If the specimen must be held longer, freeze at -70°C and ship on dry ice.
  - Send the specimen to the laboratory via overnight delivery on wet or dry ice as noted above.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

# Section 15: Congenital Rubella Syndrome (CRS)

## BASIC EPIDEMIOLOGY

### Infectious Agent

Rubella virus (family togaviridae; genus *rubivirus*).

### Transmission

Transmission occurs from person to person through contact with infectious nasopharyngeal secretions and droplets and indirectly by objects contaminated with nasopharyngeal secretions of an infected patient, or through contact with the urine of an infant with CRS. Rubella virus may also be transmitted from mother to fetus during pregnancy.

### Communicability

Infants with CRS can shed the virus in the nasopharyngeal secretions and urine for up to a year or longer. Rubella virus has been recovered from the lens of children with CRS who have congenital cataracts for up to several years. Therefore, it is essential that infected infants be identified as early in life as possible in order to prevent further spread of the virus. Infected infants should be considered infectious until they are at least 1 year old or until two cultures of clinical specimens obtained 1 month apart after the infant is older than 3 months of age are negative for rubella virus.

### Clinical Illness

CRS may consist of many problems including low birth weight, eye defects, cardiac defects, central nervous system defects, hepatitis, thrombocytopenic purpura, splenomegaly, and bone lesions. Deafness is the most common manifestation of CRS, and is sometimes the only manifestation. In mild forms of CRS, there may be no obvious clinical manifestations at birth, and the onset of CRS-related symptoms can be delayed until 2-4 years.

The severity of effects on the fetus depends on the period of gestation at which the infection occurs. A fetus infected early in the pregnancy (especially during the first trimester) has a high probability of developing CRS. In symptomatic women infected with rubella during the first 12 weeks (first trimester) of pregnancy, CRS-associated congenital defects occur in up to 85% of infants. The likelihood of congenital defects decreases if the woman's rubella infection occurs later in the gestational period, dropping to 25% when the woman has a rubella infection late in the second trimester.

## DEFINITIONS

### Clinical Case Definition

An illness of newborns resulting from rubella infection *in utero* and characterized by signs or symptoms from the following categories:

- (A) Cataracts/congenital glaucoma, congenital heart disease (most commonly patent ductus arteriosus, peripheral pulmonary artery stenosis), hearing loss, pigmentary retinopathy.
- (B) Purpura, hepatosplenomegaly, jaundice, microcephaly, developmental delay, meningoencephalitis, radiolucent bone disease.

### Laboratory Confirmation

- Isolation of the rubella virus, or
- Serologic evidence of rubella-specific IgM antibody, or
- An infant's rubella antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody (i.e., rubella titer that does not drop at the expected rate of a two-fold dilution per month), or
- Detection of rubella-virus-specific nucleic acid by PCR.

### Case Classifications

- **Confirmed:** A case that meets clinical case definition and is laboratory confirmed.
- **Probable:** A case that meets one of the following:
  - Is not laboratory confirmed and has any two complications listed in (A) of the clinical case definition above, or
  - Is not laboratory confirmed and has one complication from (A) and one from (B); and lacks evidence of any other etiology.

## CASE INVESTIGATION & TREATMENT

### Case Investigation

A completed case investigation form on all confirmed or probable cases of CRS must be to the DSHS Infectious Disease Control Unit within 30 days of initial report. In the event of death, please provide copies of the hospital discharge summary, death certificate, and autopsy report.

### Control Measures

- All reports of suspected congenital rubella syndrome should be investigated promptly.
- Identify all exposed contacts and determine their susceptibility to rubella.
- Patients with congenital rubella syndrome should be considered contagious until they are one (1) year of age or until two cultures of clinical specimens obtained 1 month apart after the infant is older than 3 months of age are negative for rubella virus.
- Parents should be made aware of the potential hazard of their infants to susceptible, pregnant contacts.

### Exclusion

Infants with CRS should be placed in contact isolation. These precautions should be enforced during any hospital admission before the child's first birthday, unless two cultures of clinical specimens obtained 1 month apart are negative for rubella virus after infant is older than 3 months of age.

## REPORTING AND DATA REQUIREMENTS

### Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Cases of congenital rubella syndrome (CRS) are required to be reported within 1 work day to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### Local and Regional Reporting and Follow-up Responsibilities

Promptly investigate any reported cases of CRS. Identify and evaluate close contacts. Implement control measures and provide education to prevent further spread of disease. Completed CRS case investigation forms must be submitted to DSHS IDCU. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### Data Entry

The principle investigator (Local or Regional health department) is required to enter all CRS investigations with a confirmed or probable case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

**IgM Serology:** Single specimen collected soon after birth or soon after suspected diagnosis of CRS is made.

### Specimen Collection

#### Option 1:

- Collect at least 5 mL blood in red top tube.
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the **red top blood** collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot).
  - Transfer the serum from the red top tube into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship cold with cool packs and must be received within 48 hours.
  - If the serum samples will not be delivered to the laboratory within 48 hours of collection, then the samples must be frozen at  $-20^{\circ}\text{C}$  (frozen) or lower and shipped frozen with dry ice.
  - Do not freeze whole blood in red top tube for shipping.

**Option 2:**

- Collect at least 5 mL blood in **gold top** or **tiger top** blood collection tube containing a gel serum separator (Gold top or tiger top tubes are types of Serum Separator Tubes with the gel that keeps the serum separated from the clot after the centrifugation).
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the gold top blood collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot) and ship cold with cool packs and must be received within 48 hours.
  - If more than 48 hours, transfer the serum into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship frozen with dry ice.
  - Do not freeze serum in SST for shipping. Freezing will cause hemolysis and hemolyzed specimens will be unsatisfactory for testing.

**Submission Form**

- Use the DSHS Laboratory current version of G-2A form (Dec 2011, Rev 4) for specimen submission.
- Make sure the patient's first and last name and date of birth / social security number match exactly what is written on the tube.
- Mark the laboratory test requested, date of onset, and date of collection. Be certain that the names on acute and convalescent sera match exactly.
- Call DSHS Laboratory at 512-776-7138 if needing information for specimen submission.

**Specimen Shipping**

- To avoid specimen rejection, ship separated serum or centrifuged SST Mon-Thur to the DSHS laboratory via overnight delivery following the above guidelines.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
  - If the serum samples will not be delivered to the DSHS laboratory within 48 hours of collection, transfer into a serum transport tube and freeze on Fridays. Ship frozen specimens with dry ice on Monday. Lone Star service will not deliver specimen to the DSHS lab on Saturday.
- 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

**Causes for Rejection:**

- Discrepancy between name on tube and name on form.
- Insufficient quantity of serum for testing specimens received with extended transit time.
- Received at incorrect temperature.
- No date of collection.

### **Virus Isolation**

Rubella virus can be isolated from throat, nasopharynx, blood, urine, and cerebrospinal fluid specimens from rubella and CRS cases. Efforts should be made to obtain clinical specimens (particularly pharyngeal swabs) for viral isolation from infants at the time of the initial investigation. Infants with CRS may, however, shed virus for a prolonged period (up to one year) so specimens obtained later may also yield rubella virus. Specimens for virus isolation (pharyngeal swabs) should be obtained monthly until cultures are repeatedly negative.

### **Specimen Collection**

- Use a viral culturette or synthetic swab (collection and transport system) to obtain a pharyngeal swab and place in 2-3 mL of viral transport media.
- Label the culturette or specimen tube with the patient's name and date of birth or social security number.

### **Submission Form**

- Use Specimen Submission Form G-2A.
- Make sure the patient's name and date of birth/ social security number match exactly what is written on the culturette or specimen tube.
- Mark the laboratory test requested (virus isolation-rubella), disease suspected, date of onset, and date of collection.

### **Specimen Shipping**

- Keep the specimen at 2-8°C and ship overnight on wet ice within 48 hours.
- If the specimen must be held longer, freeze at -70°C and ship on dry ice.
- Send the specimen to the laboratory via overnight delivery on wet or dry ice as noted above.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

# Section 16: *Streptococcus pneumoniae*, Invasive, (Pneumococcal Infection)

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Streptococcus pneumoniae* (*S. pneumoniae*), is a beta hemolytic gram positive cocci.

### Transmission

Transmission of *S. pneumoniae* occurs as a result of direct person-to-person contact via respiratory droplets and by autoinoculation in persons carrying the bacteria in their upper respiratory tract.

### Incubation Period

The incubation period varies by type of infection and can be as short as 1 to 3 days.

### Communicability

The period of communicability is unknown and may be as long as the organism is present in respiratory tract secretions but is probably less than 24 hours after effective antimicrobial therapy is begun.

### Clinical Illness

The major clinical manifestations of invasive pneumococcal disease are bacteremia and meningitis. Pneumonia is the most common clinical presentation of pneumococcal disease among adults. Symptoms generally include an abrupt onset of fever and chills or rigors. Other common symptoms include pleuritic chest pain, productive cough, shortness of breath, rapid breathing, hypoxia, rapid heart rate, malaise, and weakness.

Bacteremia without a known site of infection is the most common invasive clinical presentation of pneumococcal infection among children 2 years of age and younger.

### Severity

The case fatality rate of pneumococcal pneumonia is 5%-7% and may be much higher among elderly persons. Bacteremia occurs in about 25%-30% of patients with pneumococcal pneumonia. The case fatality rate of pneumococcal bacteremia is about 20%, but may be as high as 60% among elderly persons. The case fatality rate of pneumococcal meningitis is about 30% and may be as high as 80% among elderly persons.

## DEFINITIONS

### Clinical Case Definition

*Streptococcus pneumoniae* causes many clinical syndromes, depending on the site of infection (e.g., pneumonia, bacteremia, or meningitis). Only invasive *Streptococcus pneumoniae* is reportable.

### Laboratory Confirmation

- Isolation of *S. pneumoniae* from a normally sterile site.

**Normally sterile site:** Invasive diseases typically cause significant morbidity and mortality. Sterile sites include:

- blood (excluding cord blood)
- cerebrospinal fluid (CSF)
- pericardial fluid
- pleural fluid
- peritoneal fluid
- bone or bone marrow

The following are also considered sterile sites when certain other criteria are met:

- joint fluid when the joint surface is intact (no abscess or significant break in the skin)
- internal body sites (brain, heart, liver, spleen, vitreous fluid, kidney, pancreas, lymph node or ovary) when the specimen is collected aseptically during a surgical procedure

### Normally sterile sites do *not* include:

- Anatomical areas of the body that normally harbor either resident or transient flora (bacteria) including mucous membranes (throat, vagina), sputum, and skin, or abscesses or localized soft tissue infections.

### Case Classifications

- **Confirmed:** A case that is laboratory confirmed
- **Probable:** No probable case definition

## CASE INVESTIGATION

### Case Investigation Checklist

- Confirm laboratory results meet the case definition. Only specimens from sterile sites are accepted as evidence of invasive disease.
  - See the Sterile Site and Invasive Disease Determination Flowchart for confirming a specimen meets the criteria for sterile site.
- Review medical records or speak to an infection preventionist or physician to verify case definition, identify underlying health conditions and describe course of illness.
  - The Streptococcal Investigation Form is available as a tool to use to record information. This form does not need to be sent to DSHS.
- Determine vaccination status of the case. Sources of vaccination status that should be checked include:
  - Case (or parent), IMMTRAC, school nurse records, primary care provider, etc



- All confirmed strep pneumo case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

### **Control Measures**

- Provide education on streptococcus as needed.
- Recommend that anyone experiencing symptoms be evaluated by a healthcare provider.
- Promote respiratory etiquette.
- Encourage vaccination per ACIP guidance.
  - Two pneumococcal vaccines are currently available for use in children, the pneumococcal conjugate vaccine (PCV7) and the pneumococcal polysaccharide vaccine (PPV23).
  - A pneumococcal polysaccharide vaccine (PPSV23) is licensed for use in adults 65 years and older and in persons ages 2-49 years with certain risk factors.

### **Exclusion**

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

## **MANAGING SPECIAL SITUATIONS**

### **Case is a Suspected Health Care-Associated (Nosocomial) Infection**

If one or more nosocomial (health care-associated) cases occur in patients of the same hospital, residential care facility, or other long-term care facility; and the cases have no other identified plausible source of infection; or if other circumstances suggest the possibility of nosocomial infection, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### **Outbreaks**

If an outbreak is suspected, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

The local/regional health department should

- Review infection prevention practices currently in place.
- Work with the facility to ensure everyone gets hand hygiene and respiratory etiquette education.
- Cohort ill patients / residents together.
- Encourage anyone with symptoms be evaluated by a healthcare provider.
- Review vaccination status of exposed persons and recommend vaccination as per ACIP guidance.
- Note: Treatment of asymptomatic carriers is considered ineffective.

## REPORTING AND DATA ENTRY REQUIREMENTS

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Suspected cases of pneumococcal disease (*S. pneumoniae*) should be reported within 1 week to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### **Local and Regional Reporting and Follow-up Responsibilities**

Local and regional health departments should submit an NBS notification on all confirmed cases to DSHS within 30 days of receiving a report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules. Investigations forms are not required to be submitted.

Local and regional health departments should report suspected outbreaks within 24 hours of identification to the regional DSHS office or to 512-776-7676 and submit a completed respiratory outbreak form at the conclusion of the outbreak investigation (fax a copy to the DSHS regional office and/or IDCU 512-776-7676).

## LABORATORY PROCEDURES

Testing for pneumococcal disease is widely available from most hospital or private laboratories. Pneumococcal serotyping is no longer available through the DSHS laboratory.

# Section 17: *Streptococcal pyogenes*, Invasive (Group A Streptococcus)

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Streptococcus pyogenes* (group A streptococcus / GAS) is a beta hemolytic gram positive cocci. There are over 130 serotypes.

### Transmission

Spread occurs via large respiratory droplets and direct contact. Spread via indirect contact with objects is rare. Foodborne spread has been associated with milk, milk products and egg products. Food products are contaminated by an infected individual. Raw milk may be contaminated if GAS is transmitted to the cow.

### Incubation Period

The incubation period is 1 to 5 days.

### Communicability

Untreated cases may be infectious 10–21 days, longer if purulent discharges are present. The infectious period ends 24 hours after start of appropriate treatment. Asymptomatic carriage is possible.

### Clinical Illness

Group A streptococcus has multiple invasive and non-invasive presentations. Non-invasive presentations include strep throat, scarlet fever, impetigo, cellulitis, Otitis media, and wound infections. Invasive presentations include meningitis, septicemia, septic arthritis, necrotizing fasciitis, peritonitis, osteomyelitis and toxic shock syndrome.

### Severity

Severity varies by clinical presentation. Mortality of invasive infections ranges from 12–13% and can be as high as 40% in cases with toxic shock syndrome. The Centers for Disease Control and Prevention estimates that 0.4 deaths per 100,000 people occur annually.

## DEFINITIONS

### Clinical Case Definition

Invasive group A streptococcal infections may manifest as any of several clinical syndromes, including pneumonia, bacteremia in association with cutaneous infection (e.g., cellulitis, erysipelas, or infection of a surgical or nonsurgical wound), deep soft-tissue infection (e.g., myositis or necrotizing fasciitis), meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis, and non-focal bacteremia.

### Laboratory Confirmation

- Isolation of group A streptococci (*Streptococcus pyogenes*) by culture from a normally sterile site (e.g., blood or cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid)
- Isolation of group A streptococci (*Streptococcus pyogenes*) by culture from any site when Toxic Shock Syndrome or Necrotizing Fasciitis is present

**Normally sterile site:** Invasive diseases typically cause significant morbidity and mortality. Normally sterile sites include:

- blood (excluding cord blood)
- cerebrospinal fluid (CSF)
- pericardial fluid
- pleural fluid
- peritoneal fluid
- bone or bone marrow

The following are also considered sterile sites when certain other criteria are met:

- joint fluid when the joint surface is intact (no abscess or significant break in the skin)
- internal body sites (brain, heart, liver, spleen, vitreous fluid, kidney, pancreas, lymph node or ovary) when the specimen is collected aseptically during a surgical procedure

**Normally sterile sites do *not* include:**

- Anatomical areas of the body that normally harbor either resident or transient flora (bacteria) including mucous membranes (throat, vagina), sputum, and skin, or abscesses or localized soft tissue infections.

#### Case Classifications

- **Confirmed:** A case that is laboratory confirmed
- **Probable:** No probable case definition

## CASE INVESTIGATION

#### Case Investigation

Local and regional health departments should investigate all reports of suspected group A streptococcus.

#### Case Investigation Checklist

- Confirm laboratory results meet the case definition.
  - See the Sterile Site and Invasive Disease Determination Flowchart for confirming a specimen meets the criteria for sterile site.
- Review medical records or speak to an infection preventionist or healthcare provider to verify case definition, identify underlying health conditions and describe course of illness.
  - The Streptococcal Investigation Form may be used to record information collected during the investigation. This form is not required to be sent to DSHS.

- All confirmed case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

### Control Measures

- Provide education on invasive streptococcus as needed.
- Use appropriate food safety practices
- Recommend only pasteurized milk be consumed.
- Prohibit infected people from handling milk and prohibit people with uncontained skin lesions from handling prepared food.
- Recommend that anyone experiencing symptoms including signs of a wound infection (redness, swelling, drainage, pain) be evaluated by a healthcare provider.
- Promote basic control measures which include:
  - Keep cuts, scratches, sores and wounds clean and covered
  - Cover your mouth and nose when you sneeze and cough
  - Wash your hands often using hot water and soap
  - Don't share toothbrushes or eating utensils
  - Vaccinate children over 1 year of age against chickenpox (Some children get invasive GAS infection right after they've had the chickenpox)
- Note: For household contacts of persons with invasive GAS infection, routine screening for GAS colonization and chemoprophylaxis is not recommended

### Exclusion

Children with streptococcal sore throat or scarlet fever should be excluded from school and daycare until 24 hours after initiation of antibiotic treatment and until fever subsides. Children with a fever from any infectious cause should be excluded from school/daycare for at least 24 hours after fever has subsided without the use of fever suppressing medications.

## MANAGING SPECIAL SITUATIONS

### Case is a Suspected Health Care-Associated Infection

If one or more health care-associated (nosocomial) cases occur in patients of the same dental or healthcare provider, acute care hospital, residential care facility, or other long-term care facility; and the cases have no other identified plausible source of infection; or if other circumstances suggest the possibility of nosocomial infection, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239 or (512) 776-7676**. A single case of postpartum or post-surgical GAS infection requires prompt epidemiologic investigation and assessment of potential nosocomial spread from an asymptomatic carrier may be required

The local/regional health department should

- Review infection prevention practices at the facility.
- Request the facility to conduct enhanced surveillance for GAS for 6 months before and after the first (and last) case is identified.

- Work with the DSHS IDCU healthcare associated infections (HAI) team or the regional HAI epidemiologist to rule out transmission within the healthcare setting.

### **Outbreaks**

If an outbreak is suspected, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**. Outbreaks of invasive disease in children or of rheumatic fever require immediate public health attention.

The local/regional health department should

- Rule out foodborne exposure.
- Work with the facility to ensure staff and students/residents get hand hygiene and respiratory etiquette education.
- Recommend staff with strep infections be restricted from working until 24 hours after antibiotic treatment is initiated.
- Encourage anyone with symptoms be evaluated by a healthcare provider.
- In childcare settings, limit transfers of children to other childcare settings.
- If cases continue to occur after basic control measures are implemented and the contacts are at high risk for complications or the presentation of illness is severe (rheumatic fever, acute nephritis, etc), consider testing to identify carriers.

## **REPORTING AND DATA ENTRY REQUIREMENTS**

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Confirmed and suspected cases of group A streptococcus should be reported within 1 week of suspicion to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit at (800) 252-8239 or (512) 512-7676.

### **Local and Regional Reporting and Follow-up Responsibilities**

Local and regional health departments should submit an NBS notification on all confirmed cases to DSHS within 30 days of receiving a report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules. Investigations forms are not required to be submitted.

Local and regional health departments should report suspected outbreaks within 24 hours of identification to the regional DSHS office or to 512-776-7676 and submit a completed respiratory outbreak form at the conclusion of the outbreak investigation (fax a copy to the DSHS regional office and/or IDCU 512-776-7676)

## **LABORATORY PROCEDURES**

Testing for group A streptococcus is widely available from most private laboratories. Specimens should not be submitted to the DSHS laboratory.

# Section 18: *Streptococcus agalactiae*, Invasive (Group B Streptococcus)

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Streptococcus agalactiae* (group B streptococcus / GBS) is a beta hemolytic gram positive cocci.

### Transmission

Transmission of group B streptococcus from mother to infant occurs just before or during delivery. After delivery, infants are occasionally infected via person-to-person transmission in the nursery. In adults, GBS can be acquired through person-to-person transmission from healthy carriers (colonized but asymptomatic) in the community.

### Incubation Period

The incubation period for early onset GBS disease in neonates is <7 days. The incubation period for late onset GBS disease in infants, children and adults is unknown.

### Communicability

An estimated 10 - 30% of women are carriers. GBS colonization occurs primarily in the gastrointestinal and genital tracts. Colonization is most often asymptomatic and does not require treatment. About half the infants born to colonized mothers are also colonized on the skin and mucosal surfaces as a result of passage through the birth canal or as a result of GBS ascending into the amniotic fluid. The majority of colonized infants, 98%, are asymptomatic

### Clinical Illness

In neonates two syndromes exist: early-onset (<7 days old) and late-onset (7-90 days old). Both syndromes can include sepsis, pneumonia and meningitis. Pregnancy-related infections include sepsis, amnionitis, urinary tract infection, and stillbirth. In adults, pneumonia, bacteremia, meningitis, joint infections or soft tissue infections can occur.

### Severity

The Centers for Disease Control and Prevention estimates that 0.53 deaths per 100,000 people occur annually. GBS is the leading cause of neonatal sepsis in the US. The case fatality rate in term infants is 1 – 3% and as high as 20% in pre-term infants. The case fatality rate in adults is 8%.

## DEFINITIONS

### Clinical Case Definition

Group B *Streptococcus* is the most common cause of life-threatening infections, sepsis (blood infection) and meningitis (infection of the fluid and lining around the brain) in newborns. In infants, group B *Streptococcus* is characterized by sepsis, respiratory distress, apnea, shock, pneumonia and meningitis. GBS is acquired in utero or during delivery, and occurs more frequently in low birth weight infants.

Group B *Streptococcus*, invasive disease can present in a number of different ways in adults. The most common problems in adults are bloodstream infections, pneumonia, skin and soft-tissue infections, and bone and joint infections. Rarely, group B streptococcus can cause meningitis in adults.

### Laboratory Confirmation

Confirmatory laboratory criteria

- Isolation of group B streptococci (*Streptococcus agalactiae*) species by a culture from a normally sterile site
- Isolation of group B streptococci (*Streptococcus agalactiae*) species by a culture from placenta or amniotic fluid

**Normally sterile site:** Invasive diseases typically cause significant morbidity and mortality.

Normally sterile sites include:

- blood (excluding cord blood)
- cerebrospinal fluid (CSF)
- pericardial fluid
- pleural fluid
- peritoneal fluid
- bone or bone marrow

The following are also considered sterile sites when certain other criteria are met:

- joint fluid when the joint surface is intact (no abscess or significant break in the skin)
- internal body sites (brain, heart, liver, spleen, vitreous fluid, kidney, pancreas, lymph node or ovary) when the specimen is collected aseptically during a surgical procedure

**Normally sterile sites do *not* include:**

- Anatomical areas of the body that normally harbor either resident or transient flora (bacteria) including mucous membranes (throat, vagina), sputum, and skin, or abscesses or localized soft tissue infections.

### Case Classifications

- **Confirmed:** A case that is laboratory confirmed
- **Probable:** No probable case definition

## CASE INVESTIGATION

### Case Investigation

Local and regional health departments should investigate all reports of suspected group B streptococcus.

### Case Investigation Checklist

- Confirm laboratory results meet the case definition.
  - See the Sterile Site and Invasive Disease Determination Flowchart for confirming a specimen meets the criteria for sterile site.



- Review medical records or speak to an infection preventionist or physician to verify case definition, identify underlying health conditions and describe course of illness.
  - The Streptococcal Investigation Form may be used to record information collected during the investigation. This form is not required to be sent to DSHS.
- All confirmed case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

### Control Measures

- Provide education on invasive streptococcus as needed.
- Recommend that anyone experiencing symptoms be evaluated by a healthcare provider.
- Promote routine hand washing with soap and warm water.
- Pregnant women should undergo vaginal-rectal screening for GBS colonization at 35-37 weeks.
- Use standard precautions. In the case of a nursery outbreak, use contact precautions.
- Antibiotic prophylaxis during non-C-section labor is recommended if the mother:
  - Has a positive GBS screen between weeks 35 and 37
  - Has a positive GBS urine result anytime during the current pregnancy
  - Delivered a previous baby with GBS disease
  - Develops fever ( $\geq 100.4^{\circ}\text{F}$ ) during labor
  - Has not delivered her baby within 18 hours of her water breaking
  - Goes into labor before 37 weeks and has not been tested for GBS

### Exclusion

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

## MANAGING SPECIAL SITUATIONS

### Case is a Suspected Health Care-Associated (Nosocomial) Infection

If one or more nosocomial (health care-associated) cases occur in patients of the same labor and delivery facility, residential care facility, or other long-term care facility; and the cases have no other identified plausible source of infection; or if other circumstances suggest the possibility of nosocomial infection, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239 or (512) 776-7676**.

### Outbreaks

If an outbreak is suspected, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239 or (512) 776-7676**.

The local/regional health department should

- Review infection prevention practices currently in place.
- Work with the facility to ensure everyone gets hand hygiene education.
- Recommend cohorting of ill and colonized infants together and the use contact precautions in nursery settings.
- Encourage anyone with symptoms be evaluated by a healthcare provider.
- Note: Treatment of asymptomatic carriers is considered ineffective.

## REPORTING AND DATA ENTRY REQUIREMENTS

### **Provider, School & Child-Care Facilities, and General Public Reporting Requirements**

Confirmed and suspected cases of group B streptococcus should be reported within 1 week of suspicion to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit at (800) 252-8239 or (512) 512-7676.

### **Local and Regional Reporting and Follow-up Responsibilities**

Local and regional health departments should submit an NBS notification on all confirmed cases to DSHS within 30 days of receiving a report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules. Investigations forms are not required to be submitted.

Local and regional health departments should report suspected outbreaks within 24 hours of identification to the regional DSHS office or to 512-776-7676 and submit a completed respiratory outbreak form at the conclusion of the outbreak investigation (fax a copy to the DSHS regional office and/or IDCU 512-776-7676)

## LABORATORY PROCEDURES

Testing for group B streptococcus is widely available from most private laboratories. Specimens should not be submitted to the DSHS laboratory.

# Section 19: Tetanus

## BASIC EPIDEMIOLOGY

### Infectious Agent

*Clostridium tetani*, a gram positive, spore forming drumstick shaped bacilli

### Reservoir

Tetanus spores are found in soil and in the intestines and feces of many domestic animals and fowl. Spores have also been reported in contaminated heroin.

### Transmission

Transmission is primarily by contaminated wounds (severe or minor, even those inapparent to the injured). In recent years, however, a higher proportion of patients had minor wounds, probably because severe wounds are more likely to be properly managed. Tetanus may follow elective surgery, burns, deep puncture wounds, crush wounds, otitis media (ear infections), dental infection, animal bites, abortion, and pregnancy.

### Incubation Period

Usually 3–21 days, although it may range from 1 day to several months, depending on the type, severity and location of the wound; average 10 days. Most cases occur within 14 days. In general, shorter incubation periods are associated with more heavily contaminated wounds, more severe disease and a worse prognosis.

### Communicability

Tetanus is not transmitted from one person to another. A person with tetanus is not infectious to others.

### Clinical Illness

Tetanus is a neurological disease caused by tetanus toxin. Three different clinical forms have been described; generalized (~80%), local and cephalic tetanus. Symptoms of generalized tetanus include rigidity and painful spasms of skeletal muscles. Initial muscles affected are often in the jaw and neck (leading to the common name for the disease: “lockjaw”) followed by involvement of larger muscles in a descending pattern. Seizures may occur. Less common forms of tetanus are local tetanus which is localized to the anatomic area of injury and cephalic tetanus which involves the cranial nerves. In countries with poor hygiene, neonatal tetanus causes significant mortality when infants born to unimmunized women have infection of the umbilical stump that was contaminated with soil or alternative medical treatment.

Complications of tetanus include fractures, difficulty breathing (due to spasms of the respiratory muscles), and abnormal heart rhythms. In addition, nosocomial infections related to prolonged hospitalization can occur. Death results in approximately 11% of affected persons. The case fatality rate ranges from 10% to over 80%, it is highest in infants and the elderly, and varies inversely with the length of the incubation period and the availability of experienced intensive care unit personnel and resources.

Attempts at laboratory confirmation are of little help. The organism is rarely recovered from the site of infection, and usually there is no detectable antibody response.

## DEFINITIONS

### Clinical Case Definition

Acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck) and generalized muscle spasms without other apparent medical cause.

### Laboratory Confirmation

- None, there is no laboratory criteria for tetanus.

### Case Classification

- **Probable:** A case that meets the clinical case definition as reported by a healthcare professional.

**Note:** There is not a confirmed case status for tetanus.

## CASE INVESTIGATION & TREATMENT

### Case Investigation

A completed case track record on all suspected cases must be submitted to the DSHS Infectious Disease Control Unit within 30 days of initial report. In the event of death, please provide copies of the hospital discharge summary and autopsy report.

### Control Measures

- Please note that a tetanus case must be followed up until death or resolution of symptoms (e.g. mechanical ventilation no longer needed).
- The best method for controlling tetanus is preventing tetanus through active immunization with adsorbed tetanus toxoid; combined Tdap is recommended.
- Tdap is recommended for universal use regardless of age, especially for persons employed in occupations which put them in contact with soil, sewage, or domestic animals; military personnel, policeman, firefighters, and others with greater than usual risk of traumatic injury; the elderly; and international travelers.

**Table 1. Guide to tetanus prophylaxis in routine wound management.**

History of adsorbed tetanus toxoid (doses)	Clean minor wounds Tdap or Td†	Clean minor wounds TIG§	All other wounds* Tdap or Td†	All other wounds* TIG§
less than 3 or unknown	Yes	No	Yes	Yes
3 or more doses¶	No**	No	No††	No

\* Such as (but not limited to) wounds contaminated with dirt, feces, soil, and saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns, and frostbite.

† For children younger than 7 years of age, DTaP is recommended; if pertussis vaccine is contraindicated, DT is given. For persons 7–9 years of age, Td is recommended. For persons >10 years, Tdap is preferred to Td if the patient has never received Tdap and has no contraindication to pertussis vaccine. For persons 7 years of age or older, if Tdap is not available or not indicated because of age, Td is preferred to Tetanus Toxoid (TT).

§ TIG is human tetanus immune globulin. Equine tetanus antitoxin should be used when TIG is not available.

¶ If only three doses of fluid toxoid have been received, a fourth dose of toxoid, preferably an adsorbed toxoid, should be given. Although licensed, fluid tetanus toxoid is rarely used.

\*\* Yes, if it has been 10 years or longer since the last dose.

†† Yes, if it has been 5 years or longer since the last dose. More frequent boosters are not needed and can accentuate side effects.

## REPORTING AND DATA ENTRY REQUIREMENTS

### Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Tetanus cases are required to be reported within 1 week to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

### Local and Regional Reporting and Follow-up Responsibilities

Promptly investigate any reported cases of tetanus. Provide education to prevent further spread of disease. Completed tetanus case investigation forms must be submitted to DSHS IDCU. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### Data Entry

The principle investigator (Local or Regional health department) is required to enter all tetanus investigations with a probable case status and submit notification in the NEDSS Base System (NBS) within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

Laboratory confirmation is not necessary for case confirmation. No serology specimen is needed.

# Section 20: Varicella

## BASIC EPIDEMIOLOGY

### Infectious Agent

Human (alpha) herpesvirus 3 (varicella-zoster virus, VZV) a member of the *Herpesvirus* group.

### Transmission

Direct contact with patient with varicella (chickenpox) or zoster (shingles); droplet or airborne spread of vesicle fluid (chickenpox and zoster) or secretions of the respiratory tract (chickenpox); indirectly by contaminated fomites. Scabs are not infectious.

### Incubation Period

Usually 14-16 days but can be as short as 10 or as long as 21 days. May be prolonged after receipt of varicella zoster immune globulin (VZIG) and in the immunodeficient.

### Communicability

Communicable 5 days before rash onset (especially 1-2 days before rash onset) and for up to 5 days after onset of lesions. Communicability may be prolonged in persons with altered immunity.

### Clinical Illness

Varicella, the primary infection with VZV is an acute, generalized disease that occurs most commonly in children and is characterized by a maculopapular rash (few hours), then vesicular rash (3-4 days), often accompanied by fever. Lesions are typically more abundant on trunk; but sometimes present on scalp, mucous membranes of mouth and upper respiratory tract. Lesions commonly occur in successive crops, with several stages of maturity present at the same time. Lesions are discrete, scattered and pruritic. Mild, atypical and inapparent infections also occur.

Vaccinated persons with varicella may not have fever and may only have a few lesions that may resemble bug bites. Successive crops of lesions are unusual in vaccinated individuals. "Breakthrough" vesicles which can be seen in previously vaccinated persons, is usually a mild illness characterized by few lesions, most of which are papular or papulovesicular.

## DEFINITIONS

### Clinical Case Definition

An illness with acute onset of diffuse (generalized) maculopapulovesicular rash without other apparent cause. In vaccinated persons who develop varicella more than 42 days after vaccination (breakthrough disease), the disease is almost always mild with fewer than 50 skin lesions and shorter duration of illness. The rash may also be atypical in appearance (maculopapular with few or no vesicles).

### Laboratory Confirmation

- None required, but several testing methods are available.

### Case Classifications

- **Confirmed:** A case that meets the clinical case definition AND is either laboratory confirmed OR epidemiologically linked to another probable or confirmed case.
- **Probable:** A case that meets the clinical case definition without epidemiologic linkage or laboratory confirmation.

**Note: Two or more patients that meet clinical case definition and are epidemiologically linked to one another meet the confirmed case definition.**

### Outbreak Investigation

In general, the threshold for a community outbreak investigation should be 5 or more cases related in location within a 3-week period. In the presence of nosocomial varicella of known or suspected concurrent streptococcal infections, or among populations at high risk for complications (e.g., immunocompromised or susceptible adolescents or adults), the threshold for response should be 2 cases.

## CASE INVESTIGATION & TREATMENT

### Control Measures

- **Healthy Persons**  
Varicella vaccine is recommended for post-exposure administration for unvaccinated persons without other evidence of exposure. The varicella vaccine should be administered within 3 to 5 days after exposure in order to be effective. Persons who have not received two doses should be brought up to date.
- **Pregnant women**  
Evidence of varicella immunity should be obtained as soon as possible. If no varicella antibody is detectable, Varicella-Zoster Immune Globulin (VZIG) given within 96 hours of exposure may prevent or modify disease in susceptible close contacts of cases. VZIG is indicated for newborns of mothers who develop chickenpox within 5 days prior to delivery or within 48 hours after delivery. There is no evidence that administration of VZIG to a pregnant woman will prevent fetal infections. Susceptible pregnant women are at risk for associated complications when they contract varicella. Varicella causes severe maternal morbidity, and 10%-20% of infected women develop varicella pneumonia, with mortality reported as high as 40%. Their babies may also develop Congenital Varicella Syndrome, which may lead to severe complications, even death of the newborn.
- **Health-Care Personnel (HCP):**  
Nosocomial transmission of varicella is well recognized. To prevent disease and nosocomial spread, vaccination is recommended routinely for all health care personnel without evidence of immunity and is the preferred method for preventing varicella in health-care settings. Preferably, HCP should be vaccinated when they begin employment. Routine testing for varicella immunity after 2 doses of vaccine is not recommended for the management of those fully vaccinated. HCP who have received 2 doses of vaccine and who are exposed should be monitored daily during days 10-21 after exposure through the employee health program or by an infection control nurse to determine clinical status. HCP who have received 1 dose of vaccine and who are exposed should receive the second dose with single-antigen varicella vaccine within 3-5 days after exposure. Unvaccinated HCP who have no other evidence of immunity who are exposed to VZV are potentially infective from days 10-21 after exposure and should

be furloughed during this period. They should receive post-exposure vaccination as soon as possible.

## **Recommendations for the Use of VZIG:**

### **Immunocompromised patients**

This category is comprised of persons who have primary and acquired immune-deficiency disorders, neoplastic diseases and those who are receiving immunosuppressive treatment. Patients receiving monthly high-dose Immune Globulin Intravenous (IGIV) ( $\geq 400$  mg/kg) are likely to be protected and probably do not require VZIG if the last dose of IGIV was administered  $\leq 3$  weeks before exposure.

### **Neonates whose mothers have signs and symptoms of varicella around the time of delivery**

VZIG should be administered to neonates whose mothers have signs and symptoms of varicella from 5 days before to 2 days after delivery.

### **Premature neonates exposed post-natally**

Infants born at greater or equal to 28 weeks of gestation who are exposed during the neonatal period and whose mothers do not have evidence of immunity should receive VZIG because the immune system of premature infants is not fully developed. Premature infants born less than 28 weeks of gestation who weigh  $\leq 1,000$ g at birth and were exposed during the neonatal period should receive VZIG regardless of maternal immunity because these infants might not have acquired maternal antibodies.

### **Pregnant women**

Evidence of varicella immunity should be obtained as soon as possible. If no varicella antibody is detectable, VZIG should be strongly considered for pregnant women who have been exposed. Administration of VZIG to these women has not been found to prevent viremia, fetal infection, congenital varicella syndrome, or neonatal varicella. Thus, the primary indication for VZIG in pregnant women is to prevent complications of VZIG in the pregnant mother rather than to protect the fetus. VZIG is not recommended for healthy, full-term infants who are exposed post-natally, even if their mothers have no history of varicella.

- **Child-care facility setting:**

VZIG (or history of prior disease) is required for all children ( $\geq 12$  months of age) to enroll in any licensed child-care facility in Texas, and vaccine is recommended for all susceptible children ( $\geq 12$  months of age).

- **Persons who have contraindications to vaccination:**

Persons with a severe allergic reaction to a vaccine component or following a prior dose of vaccine should not receive varicella vaccine. Most immunocompromised persons should also not receive varicella vaccine. Women known to be pregnant or attempting to become pregnant should not receive a varicella-containing vaccine. Vaccinations of persons with moderate or severe acute illness should be postponed until the condition has improved.

### **Exclusion**

- Exclude from work, school and health care facilities until vesicles become dry.
- In the hospital, strict isolation is appropriate because of the risk of serious varicella complications in immunocompromised susceptible patients.



## REPORTING AND DATA ENTRY REQUIREMENTS

### Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Varicella (chickenpox) cases are required to be reported within 1 week to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**. Cases of varicella (chickenpox) are reportable weekly by name, date of birth, sex, race and ethnicity, address, date of onset, and varicella vaccination history.

### Local and Regional Reporting and Follow-up Responsibilities

No case investigation is required for varicella, however local and regional health authorities should provide education to prevent further spread of disease. Discuss exclusion criteria with reporters. Encourage timely vaccinations. In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should be sent to DSHS IDCU. Records must be faxed within 30 days of initial report to **(512) 776-7616** or mailed to the following address:

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

### Data Entry

Local and regional health authorities are required to enter all varicella investigations with complete information into the NEDSS Base System and submit notifications within 30 days of initial report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

## LABORATORY PROCEDURES

To obtain testing kits, contact the DSHS Laboratory at **(512) 776-7661**. Before shipping specimens, be sure to notify DSHS IDCU VPD staff at **(512) 776-7676**.

### SPECIFIC LABORATORY PROCEDURES

**IgG Serology:** Acute AND convalescent samples. Collect acute early in the course of illness and convalescent 10-14 days later. Do not send serology solely to confirm immunity. If an acute specimen is obtained, every effort should be made to collect a convalescent sample.

### Specimen Collection

#### Option 1:

- Collect at least 5 mL blood in red top tube.
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the **red top blood** collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot).

- Transfer the serum from the red top tube into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship cold with cool packs and must be received within 48 hours.
- If the serum samples will not be delivered to the laboratory within 48 hours of collection, then the samples must be frozen at  $-20^{\circ}\text{C}$  (frozen) or lower and shipped frozen with dry ice.
- Do not freeze whole blood in red top tube for shipping.

**Option 2:**

- Collect at least 5 mL blood in **gold top** or **tiger top** blood collection tube containing a gel serum separator (Gold top or tiger top tubes are types of Serum Separator Tubes with the gel that keeps the serum separated from the clot after the centrifugation).
- Label blood tubes with patient's first and last name, and we recommend a second identifier such as date of birth or medical record number or social security number. If the first and last name is not provided, the specimen will be rejected.
  - Centrifuge the gold top blood collection tube within 2 hours from the time of collection to separate the serum from the red blood cells (clot) and ship cold with cool packs and must be received within 48 hours.
  - If more than 48 hours, transfer the serum into a serum transport tube properly labeled with the patient's name and date of birth or social security number and ship frozen with dry ice.
  - Do not freeze serum in SST for shipping. Freezing will cause hemolysis and hemolyzed specimens will be unsatisfactory for testing.

**Submission Form**

- Use the DSHS Laboratory current version of G-2A form (Dec 2011, Rev 4) for specimen submission.
- Make sure the patient's first and last name and date of birth / social security number match exactly what is written on the tube.
- Mark the laboratory test requested, date of onset, and date of collection. Be certain that the names on acute and convalescent sera match exactly.
- Call DSHS Laboratory at 512-776-7138 if needing information for specimen submission.

**Specimen Shipping**

- To avoid specimen rejection, ship separated serum or centrifuged SST Mon-Thur to the DSHS laboratory via overnight delivery following the above guidelines.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
  - If the serum samples will not be delivered to the DSHS laboratory within 48 hours of collection, transfer into a serum transport tube and freeze on Fridays. Ship frozen specimens with dry ice on Monday. Lone Star service will not deliver specimen to the DSHS lab on Saturday.
- 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

**Causes for Rejection:**

- Discrepancy between name on tube and name on form,

- Insufficient quantity of serum for testing specimens received with extended transit time, or
- Specimens received with extended transit time or received at incorrect temperature or no date of collection.

### **Varicella Culture**

#### **Specimen Collection**

- The preferred specimens are vesicle fluids or skin scrapings.
- Specimens should be collected as close to onset date as possible and no later than one week from onset date.
- Place swab in 1-2 mL of viral transport media. Synthetic swabs should be used. Do not use cotton swabs for specimen collection.

#### **Submission Form**

- Use Specimen Submission Form G-2A.
- Make sure the patient's name and date of birth / social security number match exactly what is written on the container.
- Mark the laboratory test requested (viral isolation), date of onset, and date of collection. List the suspected virus or disease in the Virology section.

#### **Specimen Shipping**

- Maintain specimens at 2-8°C immediately after collection. Specimens not received at the lab within 12 hours of collection should be frozen at -70°C. Specimens should be shipped on dry ice.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- 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

#### **Causes for Rejection:**

- Specimen submitted on a preservative such as formalin.

# **APPENDIX A: Disease Flowcharts**

## **Flow Charts:**

Haemophilus influenzae type b (Hib): Case Status Classification

Hepatitis A: Case Status Classification

Acute Hepatitis B: Case Status Classification

Measles: Case Status Classification

Meningococcal Infection: Case Status Classification

Mumps: Case Status Classification

Pertussis: Case Status Classification for Sporadic Cases

Pertussis: Case Status Classification for Cluster Cases

Pertussis: Case Status Classification for Epi-linked Cases

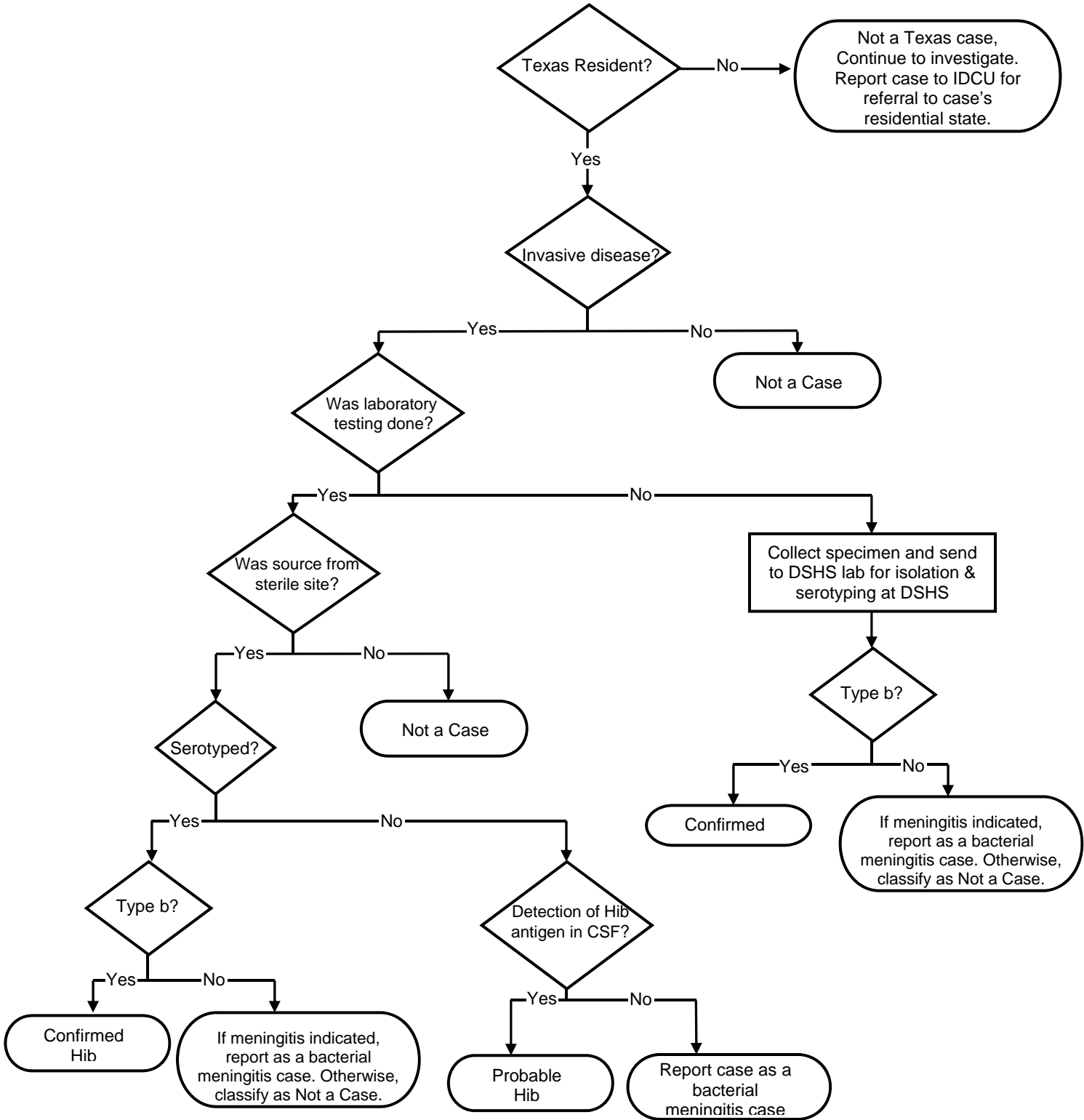
Rubella: Case Status Classification

Streptococcal Infection: Case Status Classification

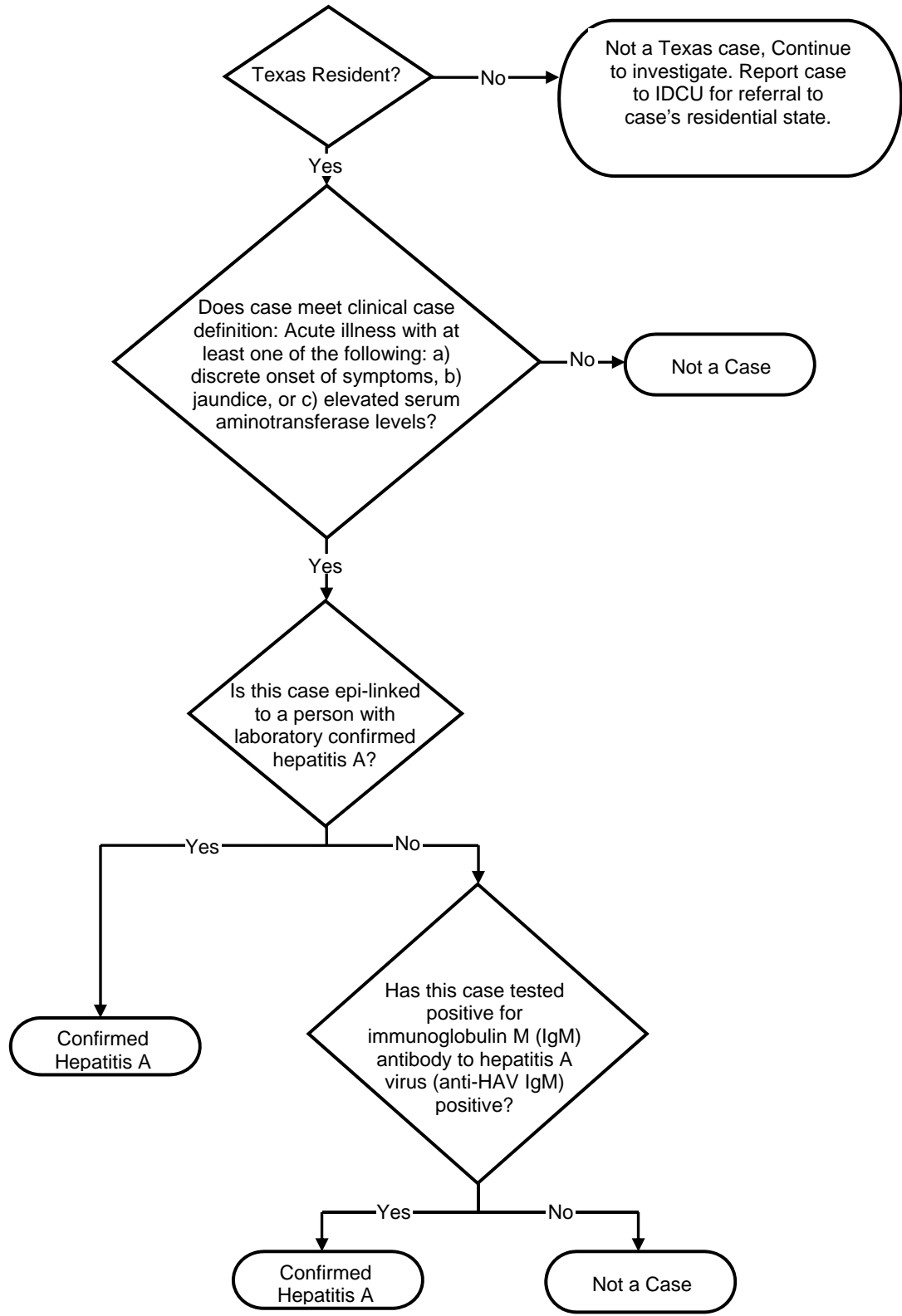
Varicella: Case Status Classification

Sterile Site and Invasive Disease Determination

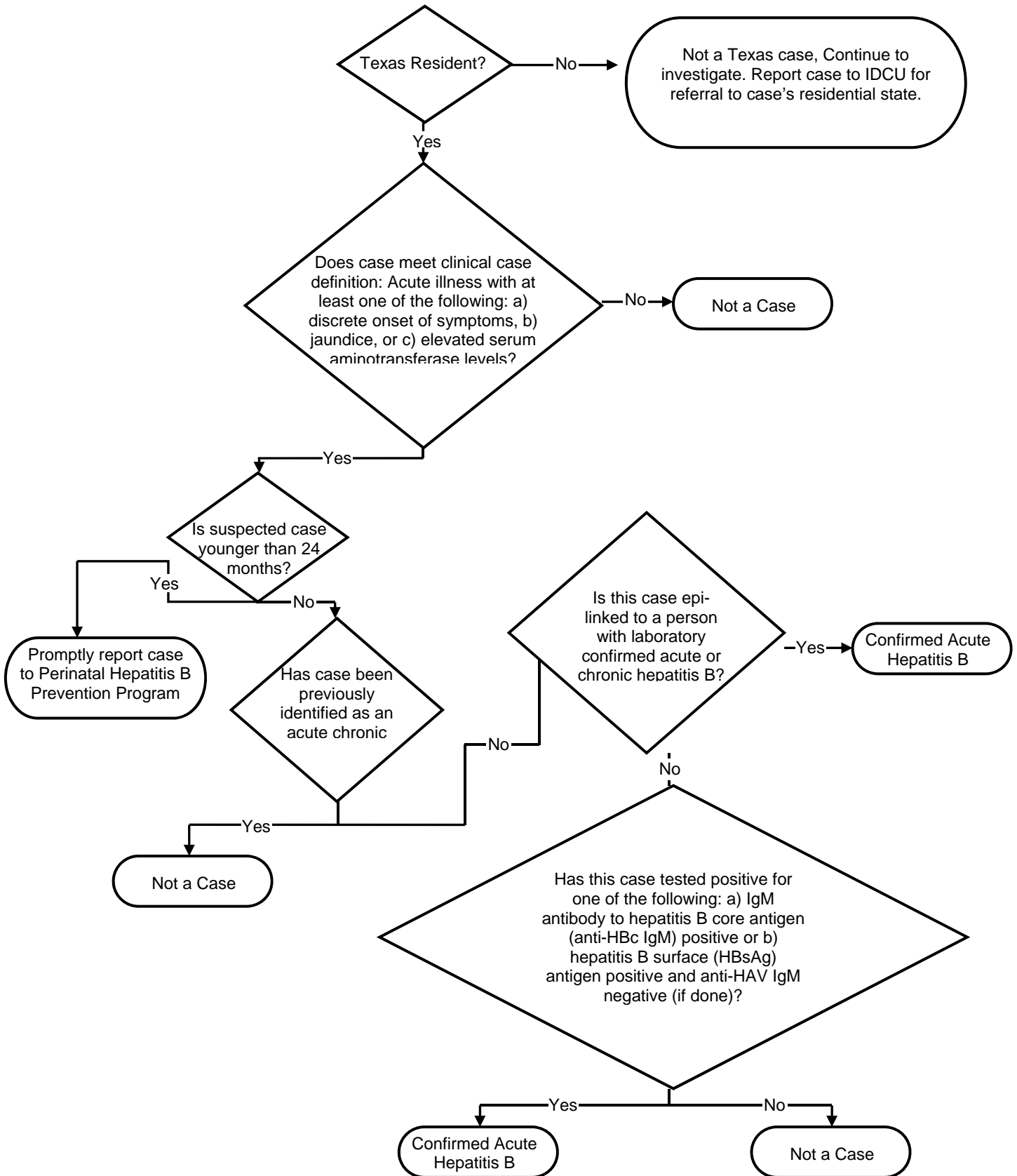
# Haemophilus influenzae type b (Hib): Case Status Classification



# Hepatitis A: Case Status Classification

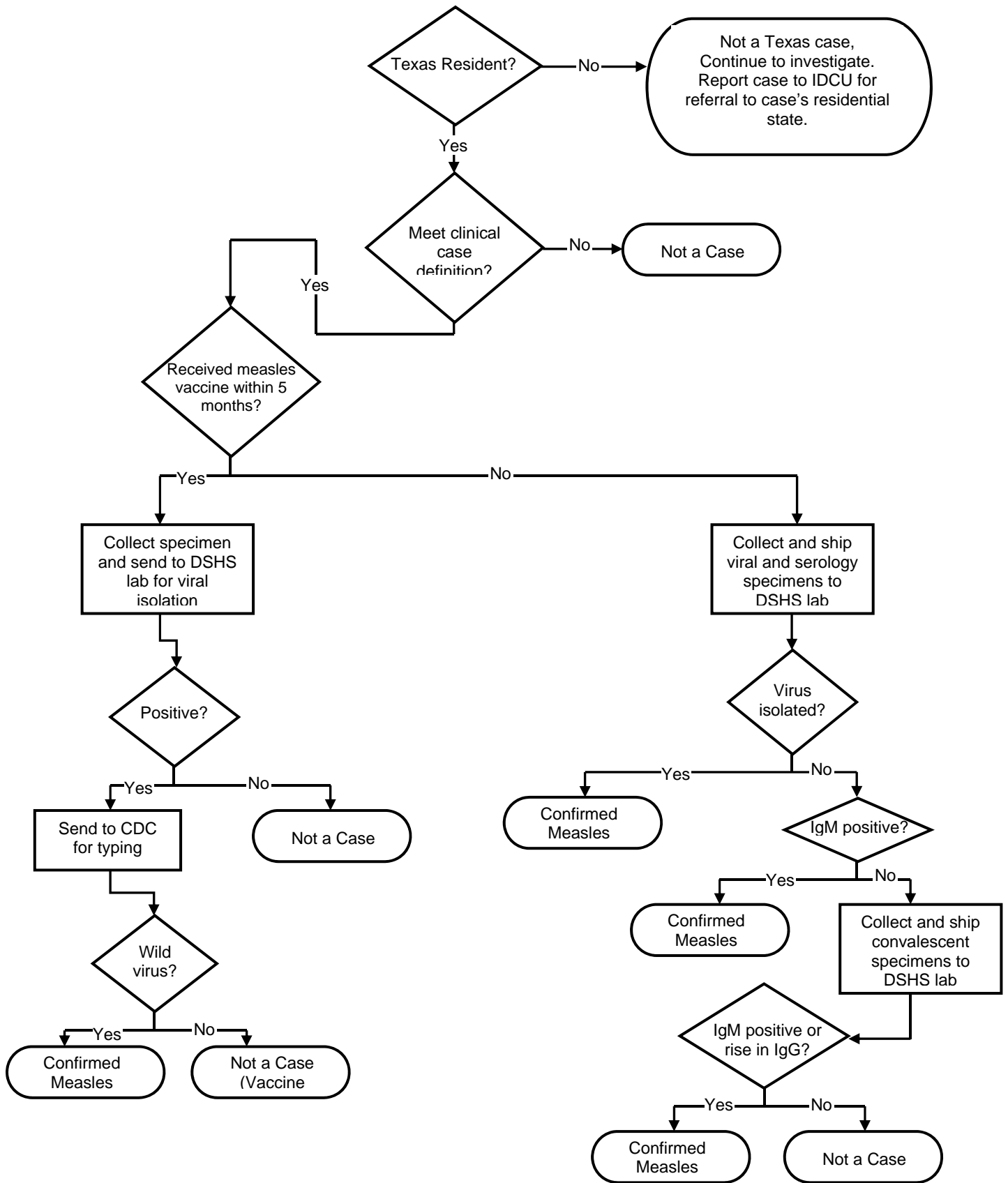


# Acute Hepatitis B: Case Status Classification

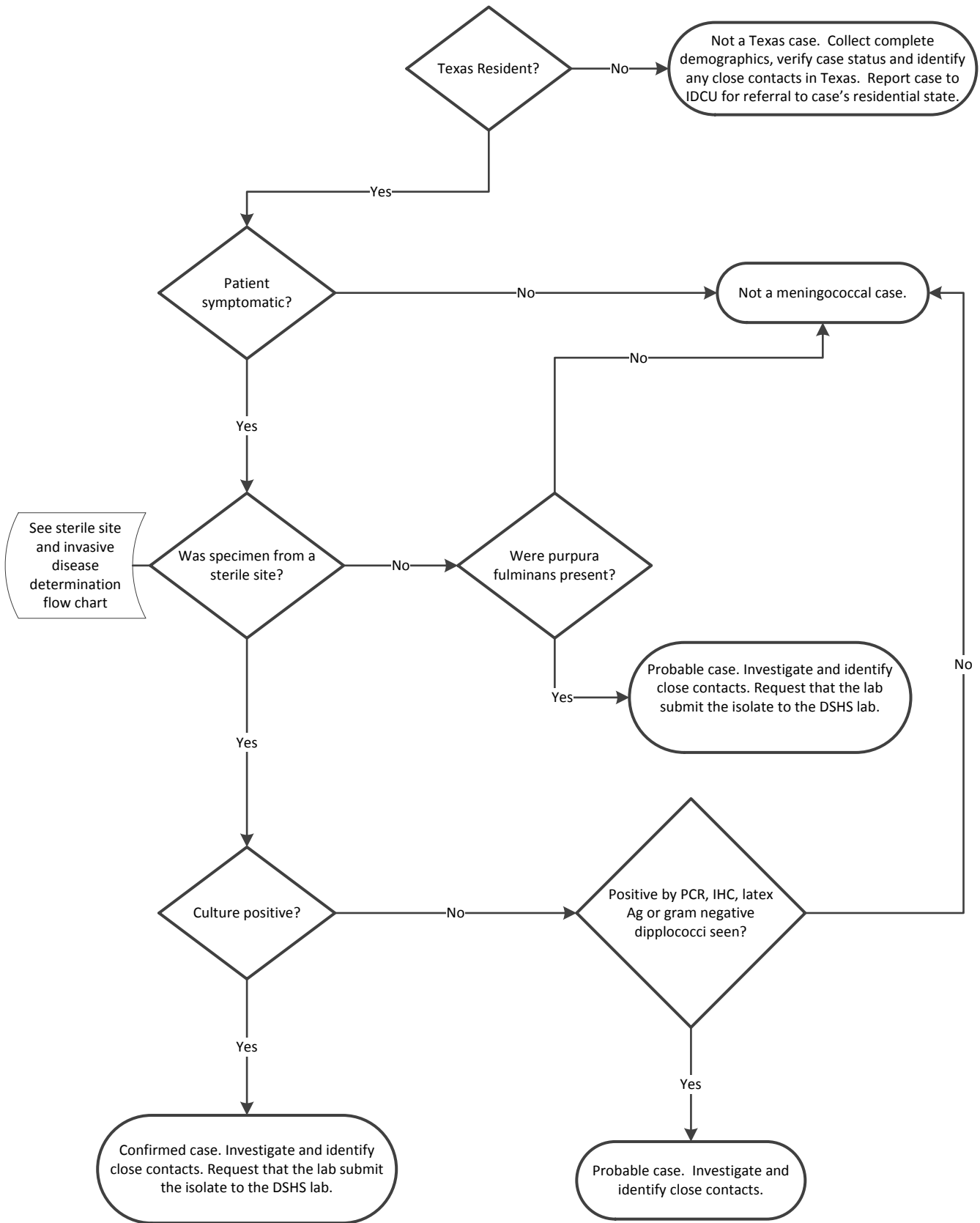




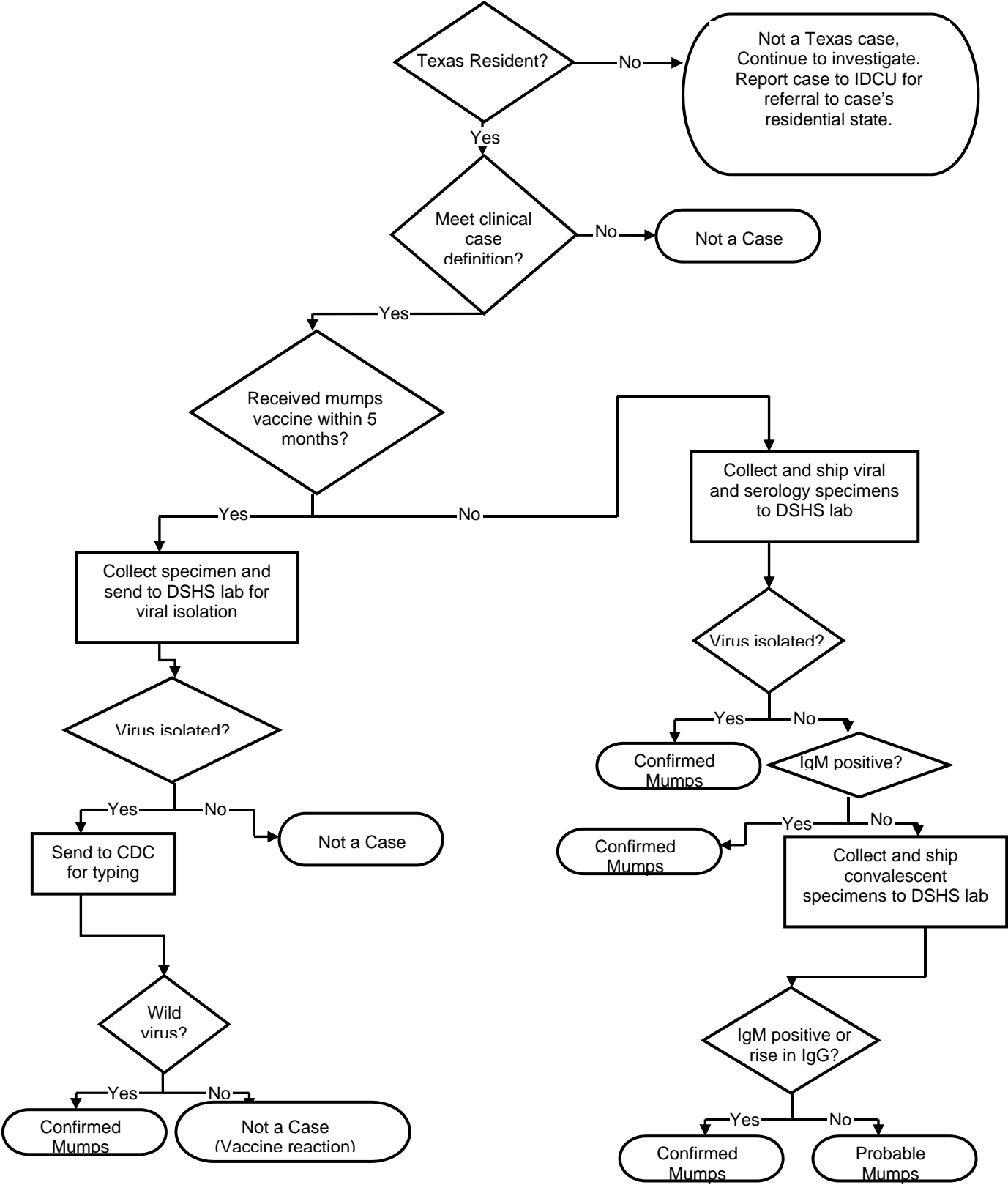
# Measles: Case Status Classification



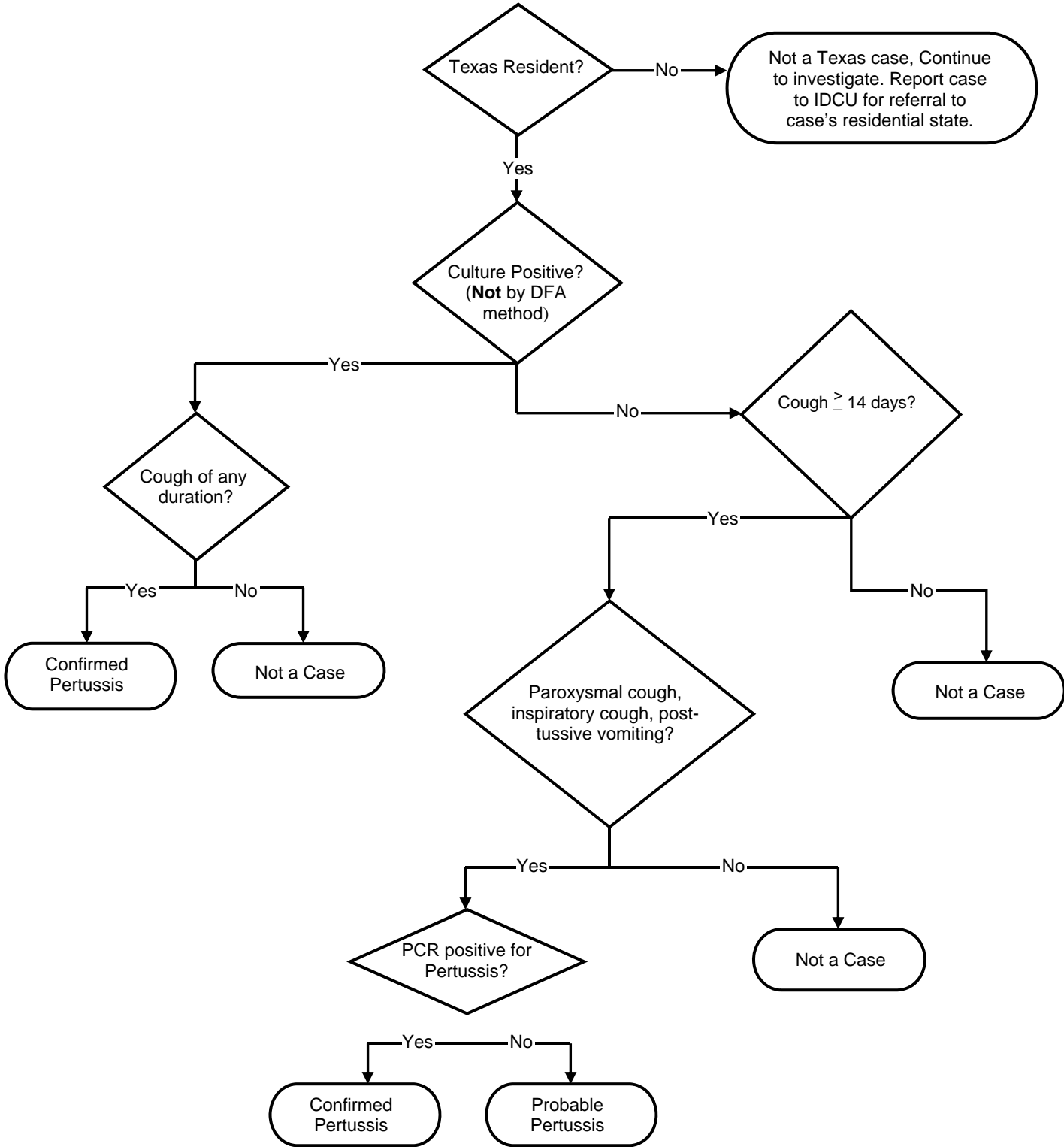
# Meningococcal Infection: Case Status Classification



# Mumps: Case Status Classification

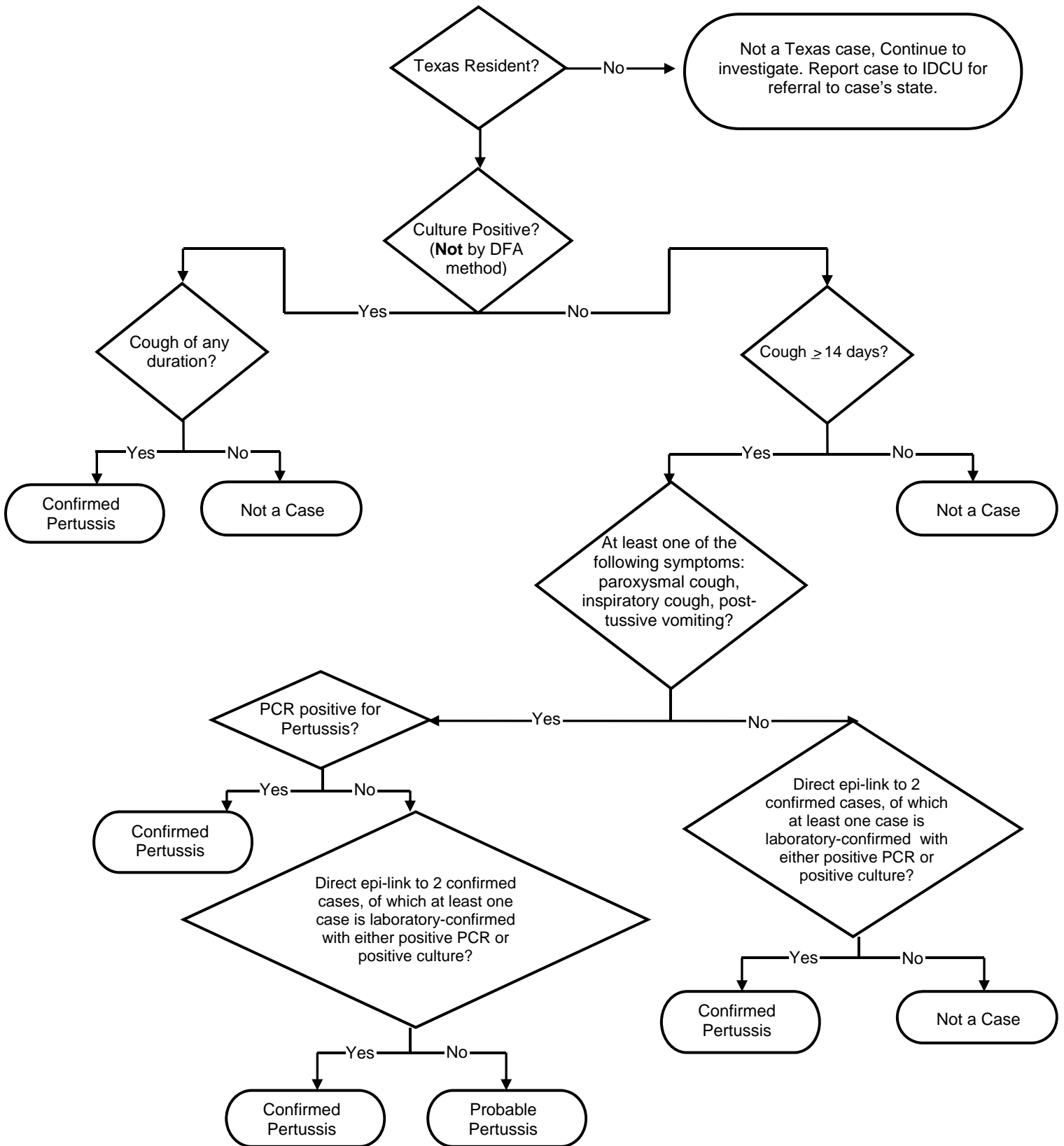


# Pertussis: Case Status Classification for **Sporadic Cases**

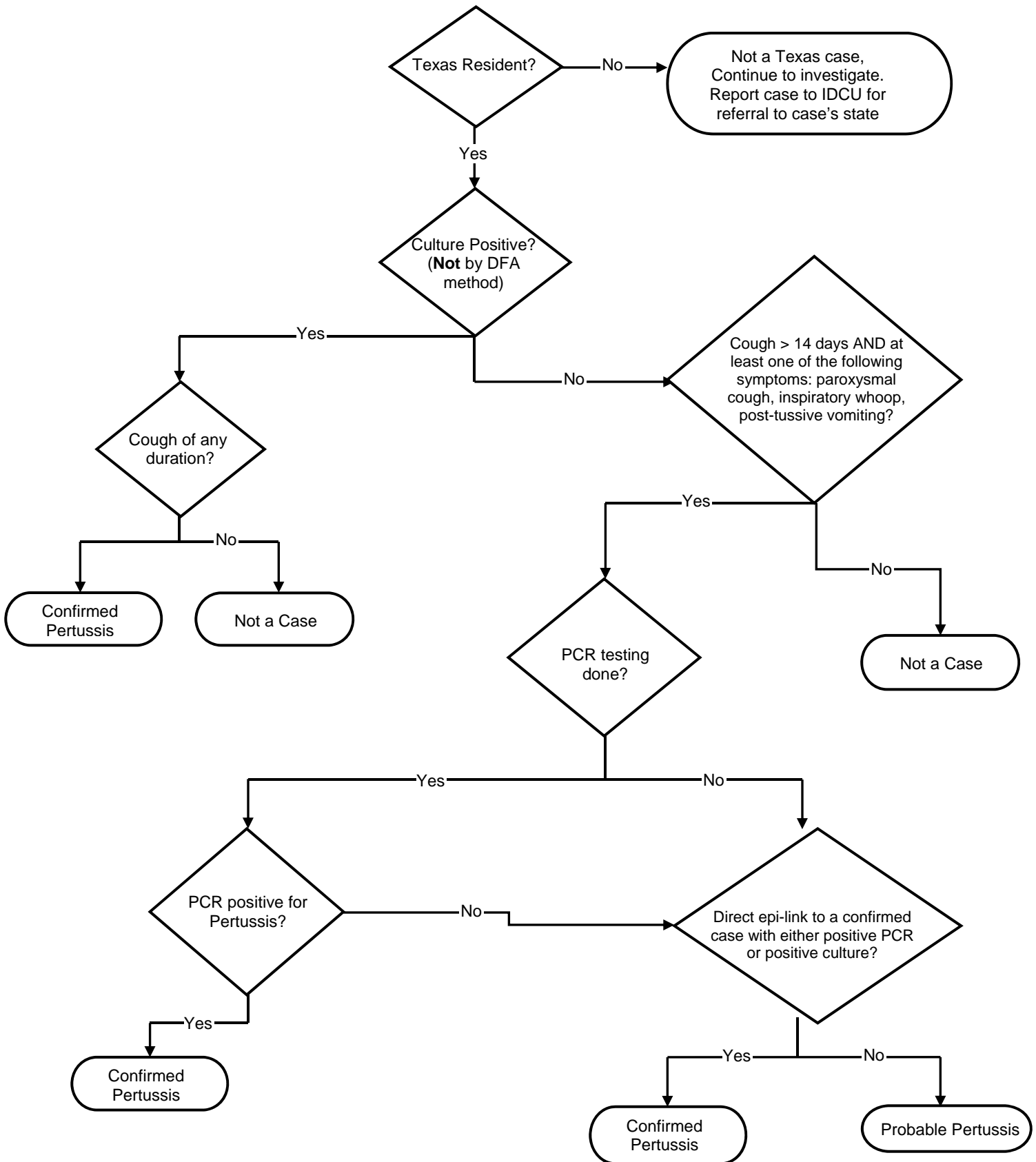


# Pertussis: Case Status Classification for **Cluster Cases**

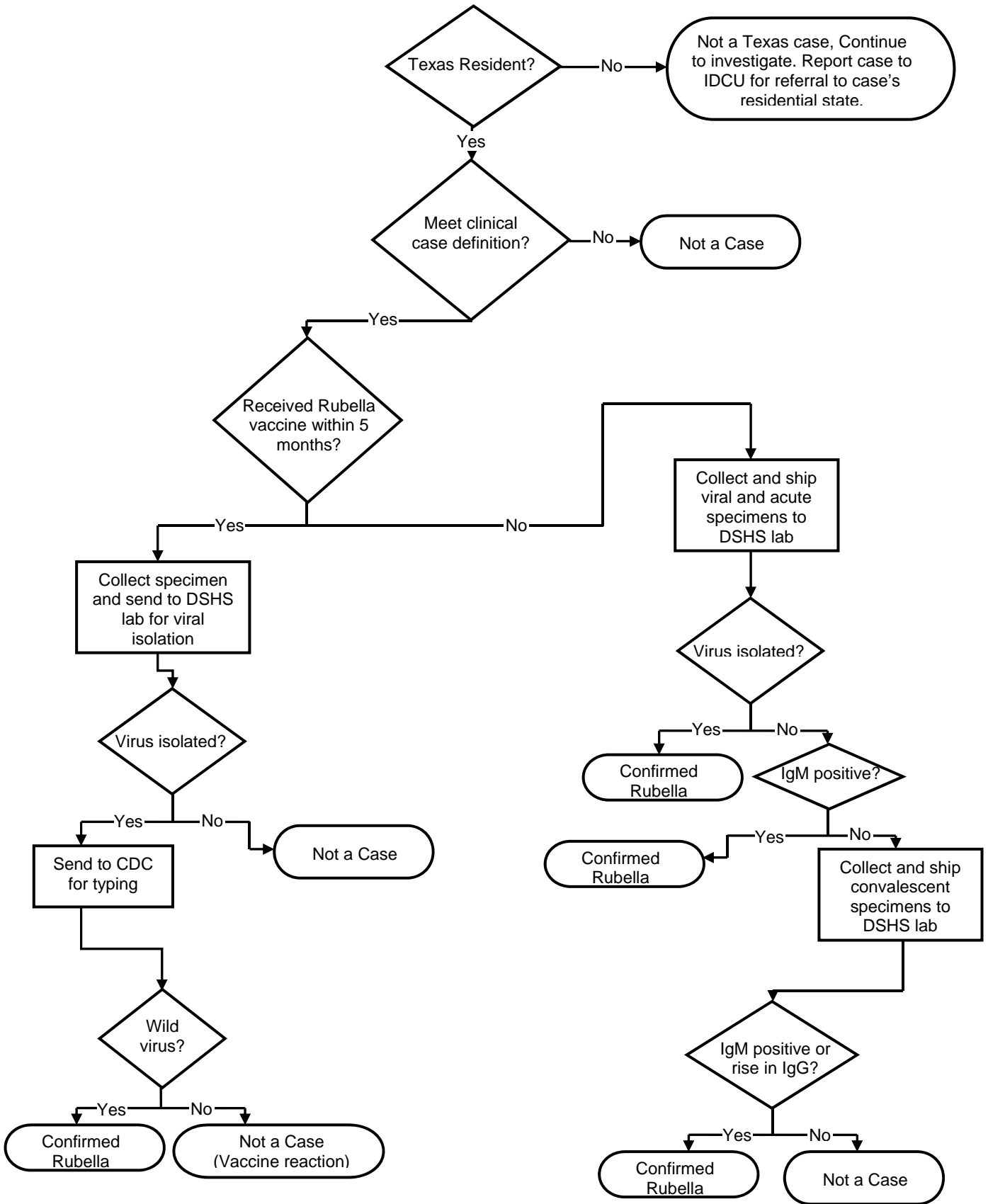
**Note: Assuming you have at least two cases with at least one Confirmed case who is also confirmed by laboratory confirmation (PCR+ or + culture) and this is your third case to investigate**



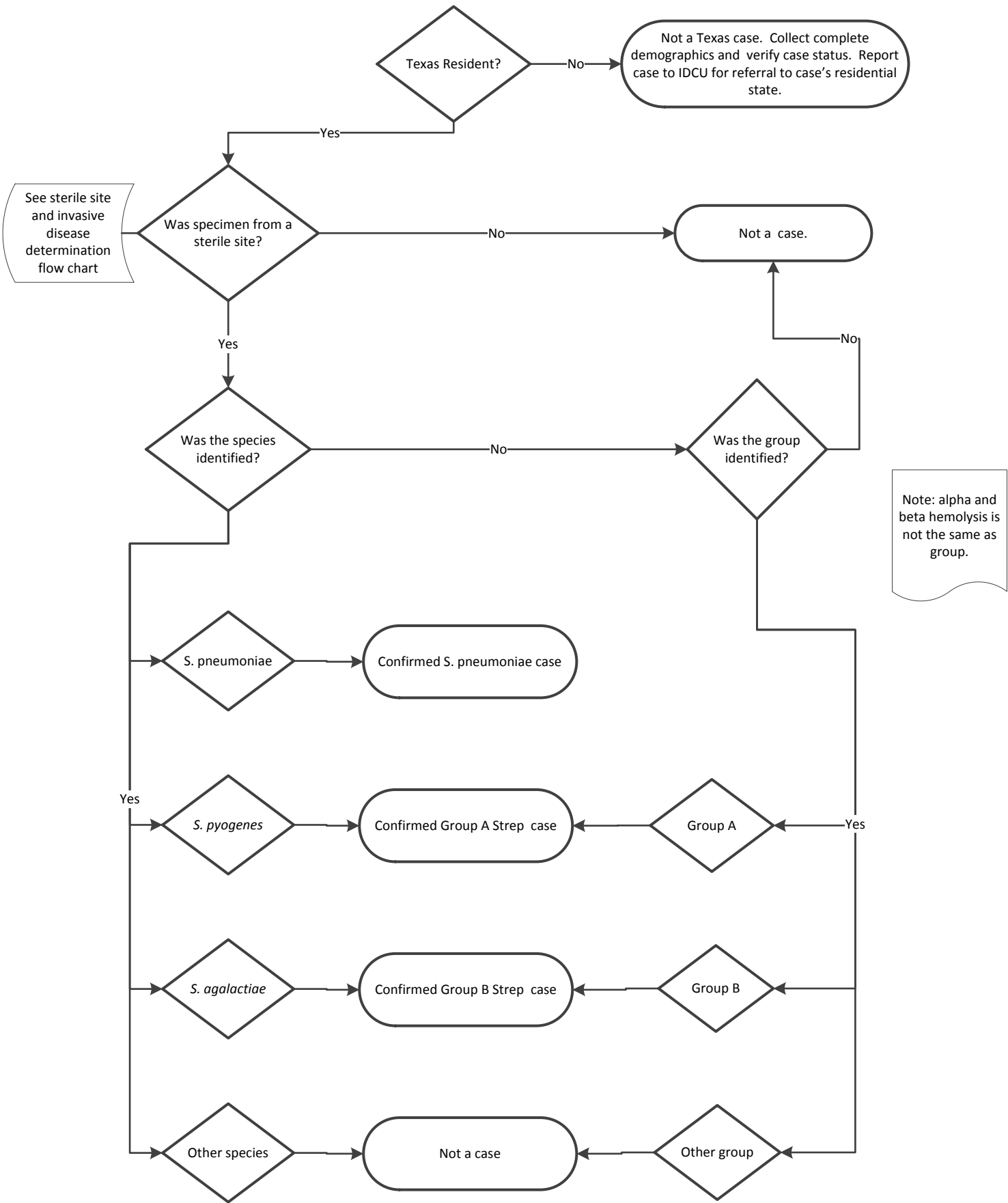
# Pertussis: Case Status Classification for Epi-linked Cases



# Rubella: Case Status Classification

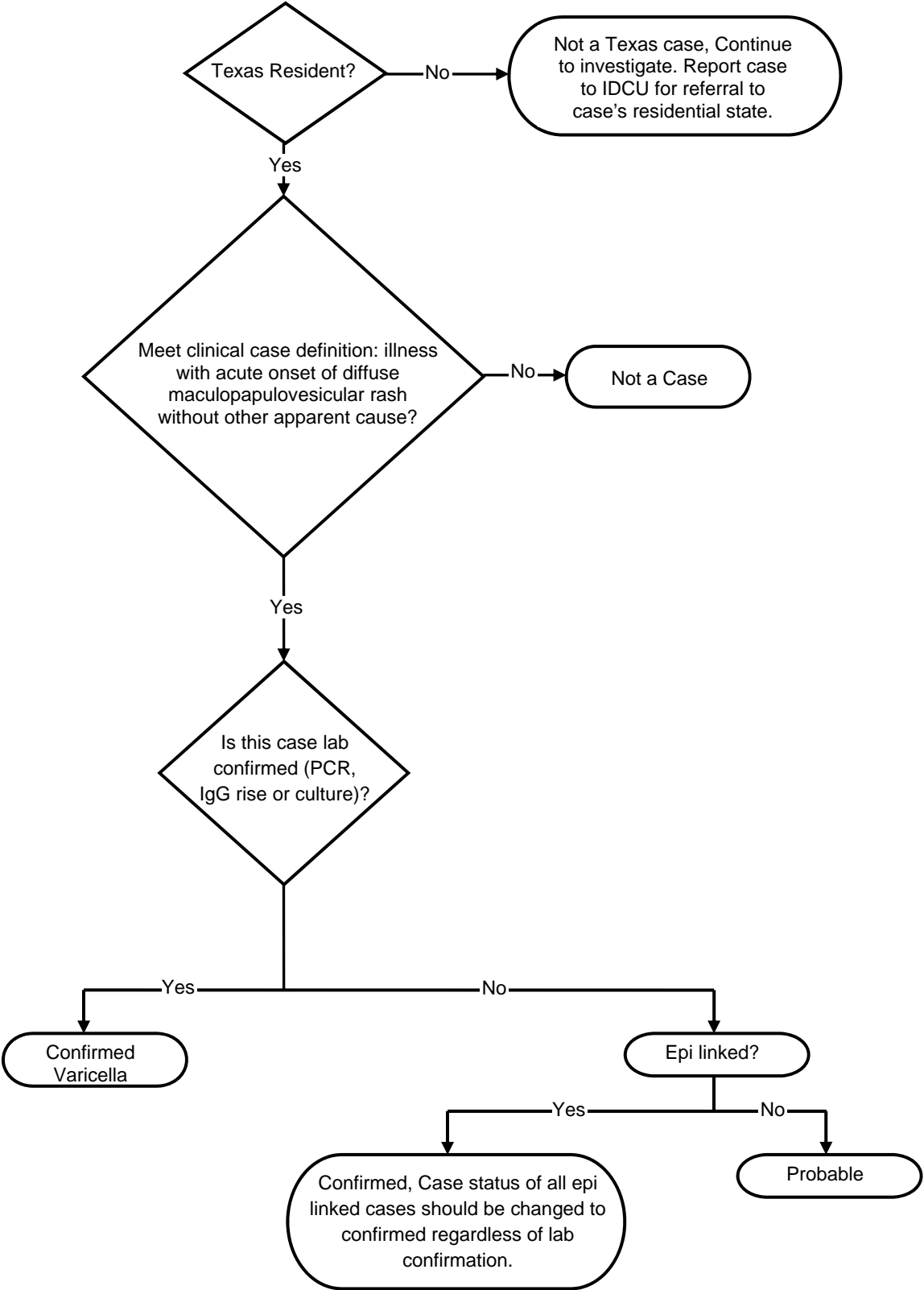


# Streptococcal Infection: Case Status Classification

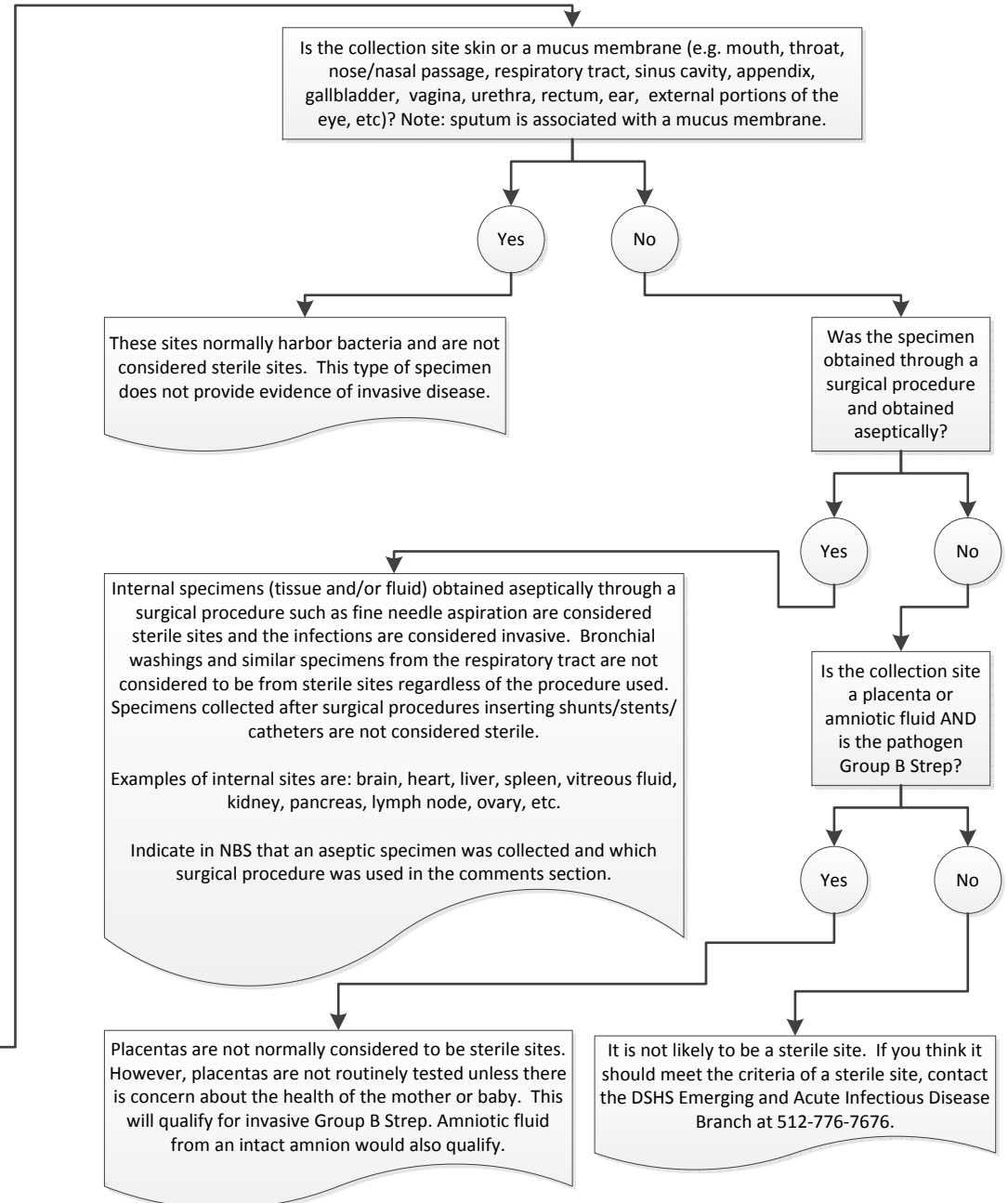
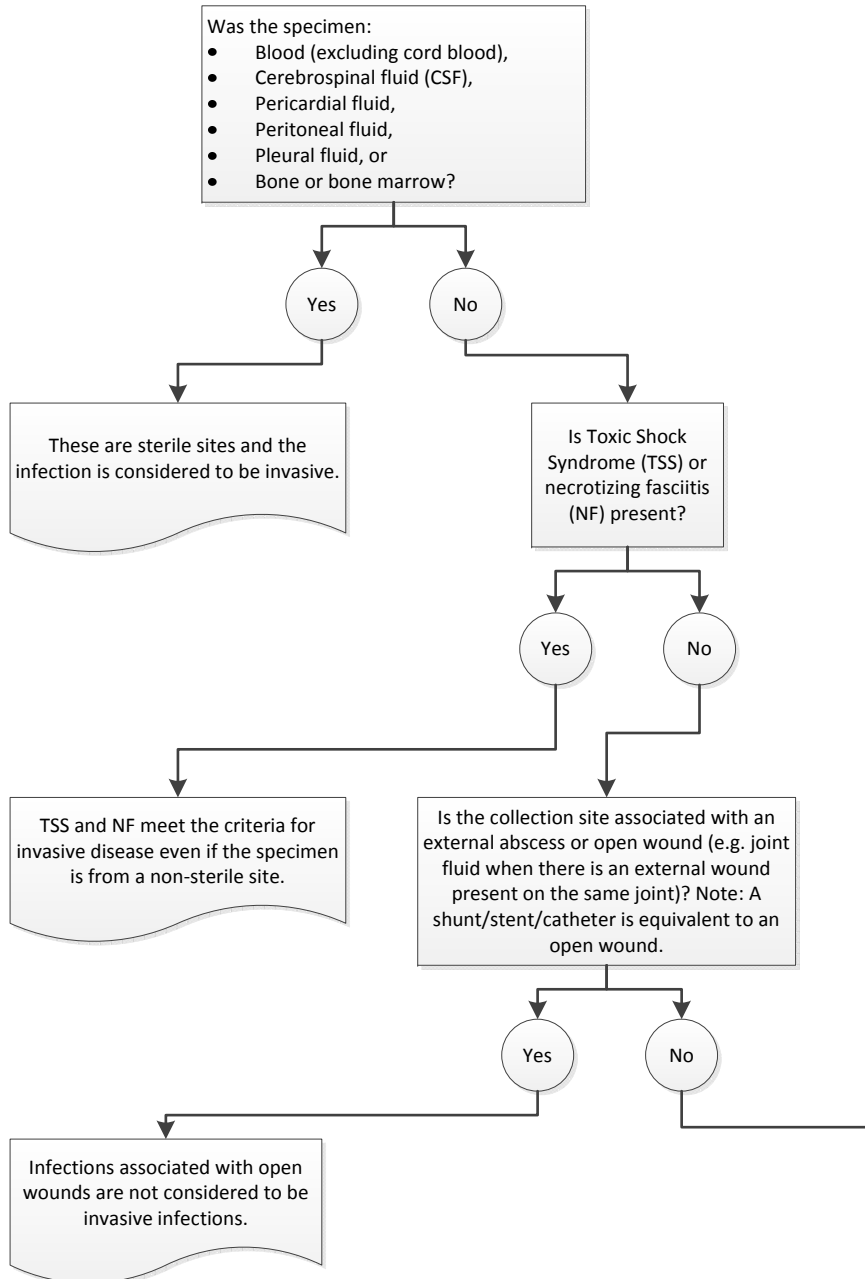




# Varicella: Case Status Classification



## Sterile Site and Invasive Disease Determination



# **APPENDIX B: Disease Investigation Forms**

## **Forms:**

*Haemophilus influenzae* type B Case Track Record

Viral Hepatitis Case Track Record

General Influenza Investigation Form

Influenza-Associated Pediatric Mortality Case Report Form

Legionellosis Investigation Report Form

Free Living Ameba Case Report

Meningococcal Infection Investigation Form

Mumps Case Track Record

Pertussis Case Track Record

Pertussis Death Worksheet

Rash-Fever Illness Case Track Record [Measles, Rubella and Unspecified Rash-Fever]

Invasive Streptococcal Investigation Form

Tetanus Case Track Record

Varicella (Chickenpox) Reporting Form

Varicella Death Investigation Worksheet

Respiratory Disease Outbreak Summary Form



Haemophilus influenzae type B Case Track Record

NBS PATIENT ID#:

FINAL STATUS:

- CONFIRMED PROBABLE RULED OUT/DROPPED/NOT A CASE

NBS PATIENT INVESTIGATION#:

Patient's Name: Address: City: County: Zip: Region: Phone: Parent/Guardian: Physician: Physician's Address:

Reported By: Agency: Phone: Date: Report Given to: Organization: Phone: Date:

DEMOGRAPHICS:

DATE OF BIRTH: AGE: SEX: RACE: HISPANIC:

CLINICAL DATA: Onset Date:

TYPE OF INFECTION: (check all that apply)

- Primary Bacteremia Pneumonia Peritonitis Meningitis Cellulitis Septic Arthritis Otitis Media Epiglottitis Other:

Hospitalized at:

Admitted: Discharged:

OUTCOME: Survived Died: Unknown

LABORATORY DATA: DATE FIRST POSITIVE CULTURE OBTAINED:

Specimen from which organism was isolated: (check all that apply) Blood Pleural Fluid Placenta Pericardial Fluid CSF

Peritoneal Fluid Joint Other Normally Sterile Site:

What was the serotype? Type b Not Typable Not Tested or Unknown Other:

VACCINATION HISTORY: CDC Objective: 90% of pertussis cases must have a vaccination history reported.

VACCINATED: Yes No Unknown

1 HIB: Type: Manufacturer: Lot #: 2 HIB: Type: Manufacturer: Lot #: 3 HIB: Type: Manufacturer: Lot #: 4 HIB: Type: Manufacturer: Lot #:

If no, indicate reason: Religious Exemption Medical Contraindication Evidence of Immunity Previous Disease - Lab Confirmed

Previous Disease - MD Diagnosed Under Age Parental Refusal Unknown Other:

HOUSEHOLD CONTACTS: Were control activities initiated?: Yes No Unknown If no, explain:

Table with 6 columns: Name, Relation to Case, Age, Vaccination HX, \*Symptoms/Date of Onset, Type of Prophylaxis/Date Treated

\*Investigations must be completed on all symptomatic contacts of confirmed or probable cases

Patient Name: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

**POSSIBLE SPREAD CONTACTS:**

**Setting:**  No Spread  Day-care  School  College  Work  Home  Dr. Office  Hospital ER  Hospital Inpatient  
 Hospital Outpatient  Military  Jail  Church  Travel  Unknown  Other: \_\_\_\_\_

Name (s) of Settings: \_\_\_\_\_

Name	Relation to Case	Age	Vaccination HX	*Symptoms/Date of Onset	Type of Prophylaxis/Date Treated
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

*\*Investigations must be completed on all contacts with symptoms*

**PROPHYLAXIS RECOMMENDATIONS:**

*Haemophilus influenzae, type B (HIB)* (small gram-negative rods); incubation period is probably short, usually only 2-4 days.

Who should receive prophylaxis?

- All "family contacts" (members of the patient's household) if there is another child under 4 years of age residing in the home.
- Prophylaxis should strongly be considered for all staff and children--regardless of age--in the day-care classroom in which an invasive Hib infection has occurred, and in which one or more children under 2 years of age have been exposed.
- Children in the day-care classroom who have been vaccinated with the Hib vaccine SHOULD also receive rifampin.
- Hospital personnel DO NOT need prophylaxis.

Rifampin Dosage:\*

- Adults: 600 mg PO once a day x 4 days.
- Infants and children (1 month-12 years): 20 mg/kg\*\* PO once a day x 4 days.

In addition to the routine medications used to treat *H. influenzae* infections, the index case should receive the above regimen before going home from the hospital in order to eradicate pharyngeal carriage of the organism.

\* Before administering rifampin, note that rifampin:

- is not recommended for use during pregnancy.
- interferes temporarily with effectiveness of oral contraceptives.
- will turn urine, tears, saliva an orange/red color; soft contact lenses will be permanently stained if worn while taking rifampin.

\*\* The maximum dosage of rifampin should not exceed a total of 600 mg per dose.

**COMMENTS:**

*CDC Objective: 85% of vaccine preventable cases must be investigated and reported to the CDC within 30 days of initial report.*

Date Investigation Initiated: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Investigation Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Reported to DSHS: \_\_\_\_/\_\_\_\_/\_\_\_\_

Investigator's Name: \_\_\_\_\_ Agency name: \_\_\_\_\_ Phone :( ) \_\_\_\_\_

Closed in NBS?  Yes  No

If confirmed or probable, notification submitted?  Yes  No



During the **2-6 weeks** prior to onset of symptoms:

Was the patient a contact of a person with confirmed or suspected Hepatitis A virus infection?.....	Yes	No	Unk
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes, was the contact ( <i>check one</i> )			
• Household member (non-sexual).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Sex partner.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Child cared for by this patient.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Babysitter of this patient.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Playmate.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Other.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the patient:			
• A child or employee in a daycare center, nursery, or preschool?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• A household contact of a child or employee in a day care center, nursery, or preschool?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes for either of these, was there an identified hepatitis A in the child care facility?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please ask both of the following questions regardless of the patient's gender.**

In the **2-6 weeks** before symptom onset how many:

- Male sex partners did the patient have?.....
- Female sex partners did the patient have?.....

In the **2-6 weeks** before symptom onset:

Did the patient inject drugs not prescribed by a doctor?.....

Did the patient use street drugs but not inject?.....

Did the patient **travel** outside of the U.S.A. or Canada?.....

- If yes, where? (Country) 1) \_\_\_\_\_ 2) \_\_\_\_\_

In the **3 months** prior to symptoms onset:

Did anyone in the patient's household travel outside of the U.S.A. or Canada?.....

- If yes, where? (Country) 1) \_\_\_\_\_ 2) \_\_\_\_\_

Is the patient suspected as being part of a common-source outbreak?.....

If yes, was the outbreak:

Foodborne -- associated with an infected food handler .....

Foodborne – NOT associated with an infected handler.....

- Specify food item \_\_\_\_\_

Waterborne.....

Source not identified.....

Was the patient employed as a food handler during the **TWO WEEKS** prior to onset of symptoms or while ill?.....

- If yes, where? \_\_\_\_\_
- Last day of work? \_\_\_\_ / \_\_\_\_ / \_\_\_\_

**VACCINATION HISTORY**

Has the patient ever received the hepatitis A vaccine?.....	Yes	No	Unk
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• If yes, how many doses?.....	1	>2	
	<input type="checkbox"/>	<input type="checkbox"/>	
• In what year was the last dose received?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the patient ever received immune globulin?.....	Yes	No	Unk
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• If yes, when was the last dose received?.....	____ / ____ / ____		
	MO	YR	

Investigator's Name: \_\_\_\_\_ Agency name: \_\_\_\_\_

Phone: ( ) \_\_\_\_\_ Date Investigation Initiated: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Date Completed: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

**Date Earliest Public Health Control Measure Initiated:** \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Comments:



During the **6 weeks-6 months** prior to onset of symptoms was the patient a contact of a confirmed or suspected acute or chronic hepatitis B case?

**If yes, type of contact:**

	Yes	No	Unk
• Sexual.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Household (non-sexual).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Other.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please ask both of the following questions regardless of the patient's gender.**

In the **6 months** before symptom onset how many:

	0	1	2-5	>5	Unk
• Male sex partners did the patient have?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Female sex partners did the patient have?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Was the patient **EVER** treated for a sexually-transmitted disease?..... Yes No Unk

If yes, in what year was the most recent treatment?

During the **6 weeks-6 months** prior to onset of symptoms:

- Inject drugs not prescribed by a doctor?.....
- Use street drugs but not inject?.....

During the **6 weeks-6 months** prior to onset of symptoms

Did the patient:

	Yes	No	Unk
• Undergo hemodialysis?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Have an accidental stick or puncture with a needle or other object contaminated with blood?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Receive blood or blood products [transfusion].....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes, when? ____/____/____			
• Receive any IV infusions and/or injections in the outpatient setting?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Have other exposure to someone else's blood?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
specify: _____			

During the **6 weeks-6 months** prior to onset of symptoms

Was the patient employed in a medical or dental field involving direct contact with human blood?.....

If yes, frequency of direct blood contact:  
Frequent (several times weekly)  Infrequent

Was the patient employed as a public safety worker (fire fighter, law enforcement or correctional officer) having contact with human blood?.....

If yes, frequency of direct blood contact:  
Frequent (several times weekly)  Infrequent

Did the patient receive a tattoo?.....

Where was the tattooing performed? (*select all that apply*)

Commercial parlor/shop     Correctional facility     other \_\_\_\_\_

During the **6 weeks-6 months** prior to onset of symptoms

- Did the patient have any part of their body pierced (other than ear)?

Where was the piercing performed? (*select all that apply*)

Commercial parlor/shop     Correctional facility     other \_\_\_\_\_

	Yes	No	Unk
• Did the patient have dental work or oral surgery?....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Did the patient have surgery?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Was the patient –( <i>check all that apply</i> )			
-hospitalized?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-a resident of a long term care facility?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-incarcerated for longer than 24 hours?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes, what type of facility ( <i>check all that apply</i> )			
Prison.....	<input type="checkbox"/>	<input type="checkbox"/>	
Jail.....	<input type="checkbox"/>	<input type="checkbox"/>	
Juvenile facility.....	<input type="checkbox"/>	<input type="checkbox"/>	

During his/her lifetime, was the patient **EVER**

	Yes	No	Unk
• Incarcerated for longer than 6 months?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes,			
-what year was the most recent incarceration?...	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
-for how long?.....	___	___	months.

Did the patient ever receive hepatitis B vaccine? Yes No Unk

	Yes	No	Unk
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3+
If yes, how many shots?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In what year was the last shot received?.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		

Was the patient tested for antibody to HBsAg (anti-HBs) within 1-2 months after the last dose?..... Yes No Unk

	Yes	No	Unk
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If yes, was the serum anti-HBs >10mIU/ml?.....

(answer 'yes' if the laboratory result was reported as 'positive' or 'reactive')

**Non-sexual Household and Sexual Contacts Requiring Prophylaxis:**

Name	Relation to Case	Age	HBIG	HB Vaccine
_____	_____	_____	____/____/____	____/____/____
_____	_____	_____	____/____/____	____/____/____
_____	_____	_____	____/____/____	____/____/____
_____	_____	_____	____/____/____	____/____/____

**Control Measures (check all that apply):**

<input type="checkbox"/> Notified blood center(s)	<input type="checkbox"/> Vaccinated susceptible contacts
<input type="checkbox"/> Notified dialysis center, surgeon(s), acupuncturist, and/or tattoo parlor	<input type="checkbox"/> Notified delivery hospital and obstetrician if a woman is pregnant
<input type="checkbox"/> Disinfected all equipment contaminated with blood or infectious body fluids	<input type="checkbox"/> Vaccinated infant born to HBsAg-positive women

Investigator's Name: \_\_\_\_\_ Agency name: \_\_\_\_\_

Phone: ( ) \_\_\_\_\_ Date Investigation Initiated: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Comments**

<p>During the <b>2 weeks-6 months</b> prior to onset of symptoms was the patient a contact of a confirmed or suspected acute or chronic hepatitis C case?</p> <p><b>If yes, type of contact:</b></p> <table style="width:100%; border: none;"> <tr> <td style="width: 80%;"></td> <td style="text-align: center; border: none;">Yes</td> <td style="text-align: center; border: none;">No</td> <td style="text-align: center; border: none;">Unk</td> </tr> <tr> <td style="border: none;">• Sexual.....</td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">• Household (non-sexual).....</td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">• Other.....</td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> </tr> </table>		Yes	No	Unk	• Sexual.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Household (non-sexual).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Other.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><b>Please ask both of the following questions regardless of the patient's gender.</b></p> <p>In the <b>6 months</b> before symptom onset how many:</p> <table style="width:100%; border: none;"> <tr> <td style="width: 20%;"></td> <td style="text-align: center; border: none;">0</td> <td style="text-align: center; border: none;">1</td> <td style="text-align: center; border: none;">2-5</td> <td style="text-align: center; border: none;">&gt;5</td> <td style="text-align: center; border: none;">Unk</td> </tr> <tr> <td style="border: none;">• Male sex partners did the patient have?.....</td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">• Female sex partners did the patient have?.....</td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> </tr> </table> <p>Was the patient <b>EVER</b> treated for a sexually-transmitted disease?.....</p> <table style="width:100%; border: none;"> <tr> <td style="width: 80%;"></td> <td style="text-align: center; border: none;">Yes</td> <td style="text-align: center; border: none;">No</td> <td style="text-align: center; border: none;">Unk</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> </tr> </table> <p style="margin-left: 40px;">If yes, in what year was the most recent treatment? 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• Did the patient have surgery?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																																
Prison.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																																
Jail.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																																
Juvenile facility.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																																

<p>During his/her lifetime, was the patient <b>EVER</b></p> <table style="width:100%; border: none;"> <tr> <td style="width: 80%;"></td> <td style="text-align: center; border: none;">Yes</td> <td style="text-align: center; border: none;">No</td> <td style="text-align: center; border: none;">Unk</td> </tr> <tr> <td style="border: none;">• Incarcerated for longer than 6 months?.....</td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> <td style="border: none; text-align: center;"><input type="checkbox"/></td> </tr> </table> <p style="margin-left: 40px;">If yes, -what year was the most recent incarceration?... <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/></p> <p style="margin-left: 40px;">-for how long?..... _____ months.</p>		Yes	No	Unk	• Incarcerated for longer than 6 months?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Yes	No	Unk						
• Incarcerated for longer than 6 months?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						

**Control Measures (check all that apply):**

Notified blood center(s)

Notified delivery hospital and obstetrician if women is pregnant

Notified dialysis center, surgeon(s), acupuncturist, and/or tattoo parlor

Disinfected all equipment contaminated with blood or infectious body fluids

Investigator's Name: \_\_\_\_\_ Agency name: \_\_\_\_\_

Phone: (     ) \_\_\_\_\_ Date Investigation Initiated: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Comments:**



<b>General Influenza Investigation Form</b>		Reason for report: <input type="checkbox"/> Outbreak <input type="checkbox"/> Vaccinated Patient <input type="checkbox"/> Other* _____	
<b>Patient's name:</b> _____ Last First MI <b>Address:</b> _____ <b>City:</b> _____ <b>County:</b> _____ <b>Zip:</b> _____ <b>Phone 1:</b> ( ) _____ <b>Phone 2:</b> ( ) _____ <b>Date of birth:</b> ___/___/___ <b>Age:</b> _____ <b>Sex:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown <b>Race:</b> <input type="checkbox"/> White <input type="checkbox"/> Black <input type="checkbox"/> Asian <input type="checkbox"/> Pacific Islander <input type="checkbox"/> Native American/Alaskan <input type="checkbox"/> Unknown <input type="checkbox"/> Other: _____ <b>Hispanic:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Occupation:</b> _____ <b>HCW:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Long-term care resident:</b> <input type="checkbox"/> Yes, at: _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown		<b>Reported by:</b> _____ <b>Agency:</b> _____ <b>Phone:</b> ( ) _____ <b>Date reported:</b> ___/___/___ <b>Investigated by:</b> _____ <b>Agency:</b> _____ <b>Phone:</b> ( ) _____ <b>Email:</b> _____ <b>Investigation start date:</b> ___/___/___	
<b>CLINICAL DATA</b> <b>Date of symptom onset:</b> ___/___/___ <b>Date illness ended:</b> ___/___/___ <b>Did patient die?</b> <input type="checkbox"/> Yes, date of death: ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Weight:</b> _____ lbs <b>Height:</b> _____ ft _____ in <b>Pregnant:</b> <input type="checkbox"/> Yes: # weeks gestation: _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Postpartum:</b> <input type="checkbox"/> Yes: date of delivery: ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Signs and symptoms (Check all that apply):</b> <input type="checkbox"/> Runny nose/nasal congestion <input type="checkbox"/> Cough <input type="checkbox"/> Conjunctivitis <input type="checkbox"/> Diarrhea <input type="checkbox"/> Headache <input type="checkbox"/> Muscle aches <input type="checkbox"/> Feverishness (measured or not) <input type="checkbox"/> Fever greater than 37.8°C (100°F) <input type="checkbox"/> Rash <input type="checkbox"/> Seizures <input type="checkbox"/> Shortness of breath <input type="checkbox"/> Sore throat <input type="checkbox"/> Vomiting <input type="checkbox"/> Other: _____		<b>UNDERLYING HEALTH CONDITIONS</b> <b>Does the patient have any underlying health conditions?</b> <input type="checkbox"/> Yes (check all that apply) <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Asthma <input type="checkbox"/> Chronic lung disease <input type="checkbox"/> Heart disease <input type="checkbox"/> Diabetes Mellitus <input type="checkbox"/> Hemoglobinopathy <input type="checkbox"/> Kidney disease <input type="checkbox"/> Seizures / Neuromuscular <input type="checkbox"/> Other: _____ <b>Does the patient have compromised immune function?</b> <input type="checkbox"/> Yes (check all that apply) <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Cancer in last 12 months <input type="checkbox"/> HIV infection <input type="checkbox"/> Corticosteroid therapy <input type="checkbox"/> Organ transplant recipient <input type="checkbox"/> Autoimmune disorder <input type="checkbox"/> Other: _____	
<b>VACCINATION HISTORY</b> <b>Received current season Flu vaccine?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, date 1 <sup>st</sup> vaccine ___/___/___ Date 2 <sup>nd</sup> vaccine ___/___/___ Vaccine type: <input type="checkbox"/> TIV, regular (injected) <input type="checkbox"/> TIV, high dose (injected) <input type="checkbox"/> LAIV (nasal mist) <input type="checkbox"/> Unknown Manufacturer: _____ Lot Number: _____ <b>Received influenza vaccine in any previous season?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Received pneumococcal vaccine?</b> <input type="checkbox"/> Yes, date of vaccine ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown			
<b>TREATMENT HISTORY</b> <b>Did the patient receive antiviral medication?</b> <input type="checkbox"/> Yes, start date ___/___/___ end date ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, check all that apply: <input type="checkbox"/> Oseltamivir <input type="checkbox"/> Zanamivir <input type="checkbox"/> Rimantidine <input type="checkbox"/> Amantadine <input type="checkbox"/> Other: _____			
<b>HOSPITALIZATION INFORMATION</b> <b>Was the patient hospitalized for flu or flu related illness?</b> <input type="checkbox"/> Yes, name of hospital: _____ <input type="checkbox"/> No Date of admission: ___/___/___ Chief complaint or reason for admission: _____ Date of discharge: ___/___/___ Discharge status: <input type="checkbox"/> Recovered <input type="checkbox"/> Deceased (flu related) <input type="checkbox"/> Deceased (unrelated to flu) <input type="checkbox"/> Unknown <b>Complications?</b> <input type="checkbox"/> Pneumonia <input type="checkbox"/> Acute Respiratory Distress Syndrome <input type="checkbox"/> Sepsis <input type="checkbox"/> Hemoptysis <input type="checkbox"/> Other: _____ <b>Was the patient admitted to the intensive care unit?</b> <input type="checkbox"/> Yes, admitted to ICU date: ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Did the patient have evidence of secondary bacterial infection?</b> <input type="checkbox"/> Yes, culture result (organism): _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown Specimen source: <input type="checkbox"/> Blood <input type="checkbox"/> Sputum <input type="checkbox"/> Other: _____ Collection date: ___/___/___			
<b>LABORATORY DATA</b> <b>Was influenza testing done?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Specimen sent to DSHS?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Rapid influenza test:</b> Date collected: ___/___/___ Result: <input type="checkbox"/> Influenza A <input type="checkbox"/> Influenza B <input type="checkbox"/> Influenza, undifferentiated <input type="checkbox"/> Negative <input type="checkbox"/> Unknown <b>PCR test:</b> Date collected: ___/___/___ Laboratory name: _____ Specimen#: _____ Result: <input type="checkbox"/> Influenza A, 2009 H1N1 <input type="checkbox"/> Influenza A, other H1N1 <input type="checkbox"/> Influenza A, H3N2 <input type="checkbox"/> Influenza A, subtyping not performed <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Inconclusive <input type="checkbox"/> Unknown <input type="checkbox"/> Pending <b>Other influenza test:</b> Test name: <input type="checkbox"/> Culture <input type="checkbox"/> Enzyme immunoassay (EIA) <input type="checkbox"/> Direct fluorescent antibody (DFA) <input type="checkbox"/> Other: _____ Date collected: ___/___/___ Laboratory name: _____ Specimen#: _____ Specimen Source: <input type="checkbox"/> Nasal swab <input type="checkbox"/> NP swab <input type="checkbox"/> NP aspirate <input type="checkbox"/> Throat swab <input type="checkbox"/> Other: _____ Result: <input type="checkbox"/> Influenza A, 2009 H1N1 <input type="checkbox"/> Influenza A, other H1N1 <input type="checkbox"/> Influenza A, H3N2 <input type="checkbox"/> Influenza A, subtyping not performed <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Inconclusive <input type="checkbox"/> Unknown <input type="checkbox"/> Pending			

EAIDB Form EF59-13659 v(08/22/11) \*Some flu investigations may require additional information (e.g. novel flu). Flu-associated pediatric mortality requires a different form.

# Influenza-Associated Pediatric Mortality Case Report Form

Form Approved  
OMB No. 0920-0004  
Exp. Date 6/30/2013

**STATE USE ONLY – DO NOT SEND INFORMATION IN THIS SECTION TO CDC**

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_ County: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_ State, Zip: \_\_\_\_\_

**Patient Demographics**

1. State:	2. County:	3. State ID:	4. CDC ID:
5. Age: _____ <input type="radio"/> Days <input type="radio"/> Months <input type="radio"/> Years	6. Date of birth: _____ / _____ / _____ MM DD YYYY	7. Sex: <input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Unknown	8. Ethnicity: <input type="radio"/> Hispanic or Latino <input type="radio"/> Not Hispanic or Latino <input type="radio"/> Unknown
9. Race: <input type="checkbox"/> White <input type="checkbox"/> Black <input type="checkbox"/> Asian <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Unknown			

**Death Information**

10. Date of illness onset: _____ / _____ / _____ MM DD YYYY	11. Date of death: _____ / _____ / _____ MM DD YYYY	12. Was an autopsy performed? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown
13 a. Did cardiac/respiratory arrest occur outside the hospital? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown		
13 b. Location of death: <input type="radio"/> Outside the Hospital (e.g. home or in transit to hospital) <input type="radio"/> Emergency Dept (ED) <input type="radio"/> Inpatient ward <input type="radio"/> ICU <input type="radio"/> Other (specify): _____		
13 c. If the death occurred in the hospital, what was the date of admission? _____ / _____ / _____ MM DD YYYY		

**CDC Laboratory Specimens**

14 a. Were pathology specimens sent to CDC's Infectious Diseases Pathology Branch? Please provide the lab ID No. if known _____	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown
14 b. Were influenza isolates or original clinical material sent to CDC's Influenza Division? Please provide the lab ID No. if known _____	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown
14 c. Were <i>Staph aureus</i> isolates sent to CDC's Division of Healthcare Quality Promotion? Please provide the lab ID No. if known _____	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown

Public reporting burden of this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Information Collection Review Office, 1600 Clifton Road NE, MS D-74, Atlanta, Georgia 30333; ATTN: PRA (0920-0004).



**Culture confirmation of bacterial pathogens from NON-STERILE SITES**

16 d. Were other **respiratory** specimens collected for bacterial culture (e.g., sputum, ET tube aspirate)? O Yes O No O Unknown

16 e. If yes, please indicate the site from which the specimen was obtained and the result. *If more than one specimen type is positive and more than one organism is identified please indicate the organism cultured from each specimen type in the comments section.*

Specimen Type	Collection Date	Result
<input type="checkbox"/> Sputum	Date <u>  </u> / <u>  </u> / <u>  </u>	<input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Unknown
<input type="checkbox"/> ET tube	Date <u>  </u> / <u>  </u> / <u>  </u>	<input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Unknown
<input type="checkbox"/> Other _____	Date <u>  </u> / <u>  </u> / <u>  </u>	<input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Unknown
<input type="checkbox"/> Unknown		

16 f. If positive, please check the organism cultured.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> <i>Streptococcus pneumoniae</i> | <input type="checkbox"/> <i>Staphylococcus aureus</i> , methicillin <b>sensitive</b> (MSSA) | <input type="checkbox"/> <i>Haemophilus influenzae</i> not-type b |
| <input type="checkbox"/> Group A <i>Streptococcus</i>    | <input type="checkbox"/> <i>Staphylococcus aureus</i> , methicillin <b>resistant</b> (MRSA) | <input type="checkbox"/> <i>Haemophilus influenzae</i> type b     |
| <input type="checkbox"/> Other bacteria:<br>_____        | <input type="checkbox"/> <i>Staphylococcus aureus</i> , <b>sensitivity not done</b>         | <input type="checkbox"/> <i>Pseudomonas aeruginosa</i>            |

*(If reporting another viral co-infection please do so in section 18 Clinical Diagnosis and Complications)*

**Pathology confirmation of bacterial pathogens**

16 g. Was a specimen (e.g., fixed lung tissue) collected from an autopsy for testing of bacterial pathogens by a local or state pathologist? *(If pathology results are available from CDC it is not necessary to input those results here, however please make sure to complete section 14 "CDC Laboratory Specimens")* O Yes O No O Unknown

*If yes please indicate the results of these tests in the comments section at the end of the form.*

**Medical Care**

17. Was the patient placed on mechanical ventilation? O Yes O No O Unknown

## Clinical Diagnoses and Complications

18 a. Did complications occur during the acute illness?       Yes     No     Unknown

18 b. **If yes**, check all complications that occurred during the acute illness:

- |  |  |   |                                   |
|--|--|---|-----------------------------------|
| <input type="checkbox"/> Pneumonia (Chest X-Ray confirmed) | <input type="checkbox"/> Acute Respiratory Disease Syndrome (ARDS) | <input type="checkbox"/> Croup                      | <input type="checkbox"/> Seizures |
| <input type="checkbox"/> Bronchiolitis                     | <input type="checkbox"/> Encephalopathy/encephalitis               | <input type="checkbox"/> Reye syndrome              | <input type="checkbox"/> Shock    |
| <input type="checkbox"/> Sepsis                            | <input type="checkbox"/> Hemorrhagic pneumonia/pneumonitis         | <input type="checkbox"/> Cardiomyopathy/myocarditis |                                   |
| <input type="checkbox"/> Another viral co-infection: _____ |  | <input type="checkbox"/> Other: _____               |                                   |

19 a. Did the child have any medical conditions that existed before the start of the acute illness?       Yes     No     Unknown

19 b. **If yes**, check all medical conditions that existed before the start of the acute illness:

- |  |  |   |  |   |
|--|--|---|--|---|
| <input type="checkbox"/> Moderate to severe developmental delay  | <input type="checkbox"/> Hemoglobinopathy (e.g. sickle cell disease) | <input type="checkbox"/> Asthma/ reactive airway disease      |  |   |
| <input type="checkbox"/> Diabetes mellitus   | <input type="checkbox"/> History of febrile seizures                 | <input type="checkbox"/> Seizure disorder                     | <input type="checkbox"/> Cystic fibrosis |   |
| <input type="checkbox"/> Cardiac disease/congenital heart disease (specify) _____                        | <input type="checkbox"/> Renal disease (specify) _____               | <input type="checkbox"/> Skin or soft tissue infection (SSTI) |  |   |
| <input type="checkbox"/> Chromosomal Abnormality/Genetic Syndrome (specify) _____                        | <input type="checkbox"/> Mitochondrial Disorder (specify) _____      |   |  |   |
| <input type="checkbox"/> Chronic pulmonary disease (specify) _____                                       | <input type="checkbox"/> Immunosuppressive condition (specify) _____ |   |  |   |
| <input type="checkbox"/> Cancer (diagnosis and/or treatment began in previous 12 months) (specify) _____ | <input type="checkbox"/> Endocrine disorder (specify) _____          | <input type="checkbox"/> Obesity                              | <input type="checkbox"/> Cerebral Palsy  | <input type="checkbox"/> Premature at birth (specify gestational age) _____ weeks |
| <input type="checkbox"/> Neuromuscular disorder (e.g. muscular dystrophy) (specify) _____                | <input type="checkbox"/> Other Neurological disorder (specify) _____ |   |  |   |
| <input type="checkbox"/> Pregnant (specify gestational age) _____ weeks                                  | <input type="checkbox"/> Other (specify) _____                       |   |  |   |

## Medication and Therapy History

20 a. Was the patient receiving any of the following therapies *prior* to illness onset? **(if yes, check all that apply)**

- |   |  |  |   |
|---|--|--|---|
| <input type="checkbox"/> Yes                                    | <input type="checkbox"/> No                      | <input type="checkbox"/> Unknown                           |   |
| <input type="checkbox"/> Antiviral Prophylaxis                  | <input type="checkbox"/> Chronic aspirin therapy | <input type="checkbox"/> Chemotherapy or radiation therapy | <input type="checkbox"/> Steroids by mouth or injection |
| <input type="checkbox"/> Other immunosuppressive therapy: _____ |  |  |   |

20 b. Did the patient receive any of the following *after* illness onset? **(if yes, check all that apply)**

- |   |  |                                  |
|---|--|----------------------------------|
| <input type="checkbox"/> Yes                              | <input type="checkbox"/> No                              | <input type="checkbox"/> Unknown |
| <input type="checkbox"/> Antibiotic therapy specify _____ | <input type="checkbox"/> Antiviral therapy specify _____ |                                  |

## Influenza Vaccine History

21. Did the patient receive any influenza vaccine during the current season (before illness)  Yes  No  Unknown

22. If YES\*, please specify the influenza vaccine received before illness onset:

- Trivalent inactivated influenza vaccine (TIV) [injected]  
 Live-attenuated influenza vaccine (LAIV) [nasal spray]  
 Unknown

23. If YES\*, how many doses did the patient receive and what was the timing of each dose? (Enter vaccination dates if available)

O 1 dose  <14 days prior to illness onset  
**ONLY**  ≥14 days prior to illness onset

Date dose given: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
MM DD YYYY

O 2 doses  2<sup>nd</sup> dose given <14 days prior to onset  
 2<sup>nd</sup> dose given ≥14 days prior to onset

Date of 1<sup>st</sup> dose: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
MM DD YYYY

Date of 2<sup>nd</sup> dose: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
MM DD YYYY

24. Did the patient receive any influenza vaccine in previous seasons?  Yes  No  Unknown

24 a. If YES, and patient was ≤8 years of age at the time of death, did they receive 2 doses of vaccine during a previous season?

Yes  No  Unknown

Submitted By: \_\_\_\_\_ Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
Phone No.: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ MM DD YYYY  
E-mail Address: \_\_\_\_\_





**OTHER EXPOSURE HISTORY** Is this case associated with an outbreak?  Yes, location: \_\_\_\_\_  No  Unknown

**In the 10 days before onset, did the patient visit or stay at a healthcare setting (e.g., hospital, rehab facility, clinic, dental office)?**

Yes  No  Unknown If yes, please complete the following table:

Type of healthcare setting	Type of exposure	Name of facility	Reason for visit	City	State	Date(s) of visit / admission	Date of discharge
<input type="checkbox"/> Hospital <input type="checkbox"/> Rehab <input type="checkbox"/> Clinic <input type="checkbox"/> Dental <input type="checkbox"/> Other: _____	<input type="checkbox"/> Inpatient <input type="checkbox"/> Outpatient <input type="checkbox"/> Visitor <input type="checkbox"/> Employee <input type="checkbox"/> Volunteer						
<input type="checkbox"/> Hospital <input type="checkbox"/> Rehab <input type="checkbox"/> Clinic <input type="checkbox"/> Dental <input type="checkbox"/> Other: _____	<input type="checkbox"/> Inpatient <input type="checkbox"/> Outpatient <input type="checkbox"/> Visitor <input type="checkbox"/> Employee <input type="checkbox"/> Volunteer						

If yes, was the facility a transplant center?  Yes  No  Unknown

If yes, was the patient hospitalized or living at the healthcare facility for the entire 10 days before onset?  Yes  No  Not applicable  Unknown

**In the 10 days before onset, did the patient visit or stay at a nursing home, assisted living facility or senior living facility?**

Yes  No  Unknown If yes, please complete the following table:

Type of facility	Type of exposure	Name of facility	City	State	Date(s) of visit / admission	Date of discharge
<input type="checkbox"/> Nursing home (with skilled nursing or personal care) <input type="checkbox"/> Assisted living facility <input type="checkbox"/> Senior living facility (without skilled nursing or personal care) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Resident <input type="checkbox"/> Visitor <input type="checkbox"/> Employee <input type="checkbox"/> Volunteer					
<input type="checkbox"/> Nursing home (with skilled nursing or personal care) <input type="checkbox"/> Assisted living facility <input type="checkbox"/> Senior living facility (without skilled nursing or personal care) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Resident <input type="checkbox"/> Visitor <input type="checkbox"/> Employee <input type="checkbox"/> Volunteer					

If yes, was the patient living at the facility for the entire 10 days before onset?  Yes  No  Not applicable  Unknown

**In the 10 days before onset, did the patient get in or spend time near a whirlpool spa / hot tub / Jacuzzi?**  Yes  No  Unknown

If yes, where: \_\_\_\_\_ What dates: \_\_\_\_\_

**In the 10 days before onset, did the patient use a nebulizer, CPAP, BiPAP or any other respiratory therapy equipment for the treatment of sleep apnea, COPD, asthma or for any other reason?**  Yes  No  Unknown

If yes, does the device have a humidifier?  Yes  No  Unknown

What type of water is used in the device?  Sterile  Distilled  Bottled  Tap (well)  Tap (city)  Other: \_\_\_\_\_  None  Unknown

**In the 10 days before onset, did the patient have any other exposures to 'misty' water (fountains, misters, etc)?**  Yes  No  Unknown

If yes, what and where: \_\_\_\_\_ What dates: \_\_\_\_\_

**In the 10 days before onset, did the patient have any exposures to soil (gardening, excavation, etc)?**  Yes  No  Unknown

If yes, what and where: \_\_\_\_\_ What dates: \_\_\_\_\_

**In the 10 days before onset, did any remodeling or construction occur at or near the patient's home or work?**  Yes  No  Unknown

If yes, what and where: \_\_\_\_\_ What dates: \_\_\_\_\_

**Comments**

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## Free Living Ameba Case Report

Date of Report: \_\_\_\_\_

### Demographics

Patient's Last Name		First	M.I.	Age	Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown
Ethnicity: <input type="checkbox"/> Hispanic <input type="checkbox"/> Unknown <input type="checkbox"/> Non-Hispanic		Race: <input type="checkbox"/> White <input type="checkbox"/> Asian/Pacific Islander <input type="checkbox"/> Unknown <input type="checkbox"/> Black <input type="checkbox"/> American Indian <input type="checkbox"/> Other _____		County and State of Residence: _____ County and State of Treatment: _____	
Immigrant? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				Country of origin: _____	
Length of time since immigrated: _____				Occupation: _____	

### Exposure History

County/State of Suspected Exposure: \_\_\_\_\_ / \_\_\_\_\_      Number of persons exposed (if known): \_\_\_\_\_

**Source of possible exposure, if known:** (please check all that apply and provide best estimates of dates)

<b>Water Exposures</b>	<b>Type:</b>	<b>Date(s):</b>	<b>Type:</b>	<b>Date(s):</b>	<b>Type:</b>	<b>Date(s):</b>		
<input type="checkbox"/> Yes	<input type="checkbox"/> Canal	_____	<input type="checkbox"/> Private Club Pool	_____	<input type="checkbox"/> Community Pool	_____		
<input type="checkbox"/> No	<input type="checkbox"/> Lake	_____	<input type="checkbox"/> Private Home Pool	_____	<input type="checkbox"/> Apartment Pool	_____		
<input type="checkbox"/> Unknown	<input type="checkbox"/> Pond	_____	<input type="checkbox"/> Fill-and-Drain Pool	_____	<input type="checkbox"/> Fountain	_____		
	<input type="checkbox"/> Ocean	_____	<input type="checkbox"/> Hotel Pool	_____	<input type="checkbox"/> Water park	_____		
	<input type="checkbox"/> River/Stream	_____	<input type="checkbox"/> Spring (hot/cold)	_____				
	<input type="checkbox"/> Well	_____	<input type="checkbox"/> Spa/hot tub/whirlpool	_____				
	<input type="checkbox"/> Other, specify _____	_____		Date(s): _____				
<i>If "yes", please fill out section on right</i>								
<b>Water Activities</b>		Yes	No	Unknown		Yes	No	Unknown
<input type="checkbox"/> Yes	Diving into water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Snorkeling/scuba diving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> No	Inhaled water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Unknown	Jumped into water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water sports (skiing etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Swallowed water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wore nose clip or plugged nose when jumping/diving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Splashed water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other, specify _____			
<i>If "yes", please fill out specifics on right</i>								
<b>Soil Exposures</b>	<b>Type:</b>	<b>Date(s):</b>		<b>Occupational Exposures</b>				
<input type="checkbox"/> Yes	<input type="checkbox"/> Gardening	_____		<input type="checkbox"/> Farmer/rancher				
<input type="checkbox"/> No	<input type="checkbox"/> Composting	_____		<input type="checkbox"/> Firefighter				
<input type="checkbox"/> Unknown	<input type="checkbox"/> Farm/Ranch	_____		<input type="checkbox"/> Lifeguard/pool attendant				
	<input type="checkbox"/> Other, specify: _____	Date(s): _____		<input type="checkbox"/> Other, specify: _____				
<i>If "yes", please fill out specifics on right</i>								

**Route of Entry if known:** (please check all that apply)

Inhalation       Contact       Other, specify: \_\_\_\_\_

Ingestion       Via Wound

**If Water Source, Please List Source Characteristics:**

Name of Water Exposure: \_\_\_\_\_      Geospatial Coordinates: \_\_\_\_\_      Thermally Polluted: Y / N

Size of Body Water:  < 10 acres      Water Turbidity:  Clear      Water level:  Low  High      Flow Rate:  Slow

10-100 acres  >100 acres       Cloudy  Murky  Unknown       Normal  Flood Stage       Normal  Fast

Unknown       Unknown       Unknown       Unknown

Ambient Air Temperature: \_\_\_ F/C      Water Temperature: \_\_\_ F/C      Depth: \_\_\_\_\_

**Travel History last 2 years:**  Yes  No  Unknown If yes, please specify in table below:

Locations	Dates (from – to)

**Past Medical History:**

*Please check all conditions/symptoms that patient has currently or has had within past 2 years:*

**Treatment/drugs:**

- Excessive antibiotic use (specify in Provider comments)
- Illegal drug use, specify: \_\_\_\_\_
- Immunosuppressants
- Radiation therapy
- Steroid use

**HIV/AIDS:**

HIV	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
AIDS	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
On Antiretrovirals	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown

**Other Immunocompromised Conditions**

- Alcohol misuse
- G6PD deficiency
- Malnourishment
- Renal failure
- Systemic Lupus Erythematosus (SLE)
- Cancer, specify: \_\_\_\_\_
- Other hematologic disease, specify: \_\_\_\_\_
- Other autoimmune disease, specify: \_\_\_\_\_
- Organ transplant, specify: \_\_\_\_\_
- Diabetes mellitus
- Liver cirrhosis
- Pregnancy (recent)
- Lymphoproliferative disease

**ENT/Respiratory:**

- Otitis
- Rhinitis
- Broken Nose
- Deviated septum
- Tuberculosis
- Other lung disease, specify: \_\_\_\_\_

**Other Conditions:**

- Sinusitis
- Epistaxis
- Nasal Surgery
- Pharyngitis
- Pneumonitis
- Dermatitis
- Skin infections
- Eye infection
- Other, specify: \_\_\_\_\_
- Injury, specify: \_\_\_\_\_

**Current Illness**

Date of Illness onset: \_\_\_\_\_ Duration of illness: (in days) \_\_\_\_\_

Was patient admitted to hospital for current illness?  Yes  No  Unknown

If Yes, Date of **most recent** hospitalization: \_\_\_\_\_ Duration of most recent hospitalization (in days): \_\_\_\_\_

Hospital Name: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Physician Name 1: \_\_\_\_\_ E-mail (if avail): \_\_\_\_\_ Phone: \_\_\_\_\_

Physician Name 2: \_\_\_\_\_ E-mail (if avail): \_\_\_\_\_ Phone: \_\_\_\_\_

Other Recent Hospitalizations:  Yes  No  Unknown

Dates (from- to)	Diagnosis

**History of Present Illness:**

Please provide a brief description of the patient's clinical course, prior to hospitalization:

**Signs/Symptoms on Presentation (most recent hospitalization):**

**Vital Signs:**

Temperature: \_\_\_\_\_ F / C      P: \_\_\_\_\_ bpm      R= \_\_\_\_\_ breaths/min      BP: \_\_\_\_\_ mmHg

**General:**

- |   |                       |  |                       |
|---|-----------------------|--|-----------------------|
| <input type="checkbox"/> Fever                                      | Duration (days) _____ | <input type="checkbox"/> Myalgia             | Duration (days) _____ |
| <input type="checkbox"/> Nausea                                     | _____                 | <input type="checkbox"/> Back Pain           | _____                 |
| <input type="checkbox"/> Vomiting                                   | _____                 | <input type="checkbox"/> Cough               | _____                 |
| <input type="checkbox"/> Diarrhea                                   | _____                 | <input type="checkbox"/> Shortness of breath | _____                 |
| <input type="checkbox"/> Weight loss                                | _____                 | <input type="checkbox"/> Sinus problems      | _____                 |
| <input type="checkbox"/> Anorexia                                   | _____                 | <input type="checkbox"/> Abnormal reflexes   | _____                 |
| <input type="checkbox"/> Headache                                   | _____                 | <input type="checkbox"/> Disorientation      | _____                 |
| <input type="checkbox"/> Stiff neck                                 | _____                 | <input type="checkbox"/> Lethargy/fatigue    | _____                 |
| <input type="checkbox"/> Other general symptom/sign, specify: _____ |                       | _____  |                       |

**Visual**

- |   |                       |
|---|-----------------------|
| <input type="checkbox"/> Blurred vision                 | Duration (days) _____ |
| <input type="checkbox"/> Diplopia                       | _____                 |
| <input type="checkbox"/> Photophobia                    | _____                 |
| <input type="checkbox"/> Other visual changes, specify: | _____                 |

**Neurologic:**

- |  |                       |   |                       |  |                       |
|--|-----------------------|---|-----------------------|--|-----------------------|
| <input type="checkbox"/> Altered mental status                       | Duration (days) _____ | <input type="checkbox"/> Dysphagia                                | Duration (days) _____ | <input type="checkbox"/> Weakness                  | Duration (days) _____ |
| <input type="checkbox"/> Aphasia                                     | _____                 | <input type="checkbox"/> Facial numbness/Parathesia               | _____                 | <input type="checkbox"/> Hemiparesis/Hemiplegia    | _____                 |
| <input type="checkbox"/> Ataxia                                      | _____                 | <input type="checkbox"/> Hallucinations                           | _____                 | <input type="checkbox"/> Altered sense of taste    | _____                 |
| <input type="checkbox"/> Behavioral changes                          | _____                 | <input type="checkbox"/> Combativeness                            | _____                 | <input type="checkbox"/> Altered sense of smell    | _____                 |
| <input type="checkbox"/> Coma  | _____                 | <input type="checkbox"/> Hyperreflexia                            | _____                 | <input type="checkbox"/> Decerebrate posturing     | _____                 |
| <input type="checkbox"/> Confusion                                   | _____                 | <input type="checkbox"/> Loss of balance                          | _____                 | <input type="checkbox"/> Decorticate posturing     | _____                 |
| <input type="checkbox"/> Cranial nerve VI deficit                    | _____                 | <input type="checkbox"/> Numbness                                 | _____                 | <input type="checkbox"/> Fixed, nonreactive pupils | _____                 |
| <input type="checkbox"/> Cranial nerve VII deficit                   | _____                 | <input type="checkbox"/> Seizures                                 | _____                 | <input type="checkbox"/> Dilated pupils            | _____                 |
| <input type="checkbox"/> Cranial nerve XII deficit                   | _____                 | <input type="checkbox"/> Upgoing toes                             | _____                 | <input type="checkbox"/> Nystagmus                 | _____                 |
| <input type="checkbox"/> Other cranial nerve deficit, specify: _____ |                       | <input type="checkbox"/> Other neurologic deficit, specify: _____ |                       | Duration: _____                                    |                       |

**Skin Lesions:**  Yes  No  Unknown *If yes, please specify in table below.*

Lesion type	Anatomic location	Size	Number	Duration (days)
Ulcers				
Plaques				
Erythematous nodules				
Other				

**Other Symptoms/Signs:**

Other, specify: \_\_\_\_\_

**Signs/Symptoms developed while in hospital:**

**General:**

- Fever
- Nausea
- Vomiting
- Diarrhea
- Weight loss
- Anorexia
- Headache
- Stiff neck
- Other general symptom/sign, specify: \_\_\_\_\_
- Myalgia
- Back Pain
- Cough
- Shortness of breath
- Sinus problems
- Abnormal Reflexes
- Disorientation
- Lethargy/fatigue

**Visual :**

- Blurred vision
- Diplopia
- Photophobia
- Other visual changes, specify: \_\_\_\_\_

**Neurologic:**

- Altered mental status
- Aphasia
- Ataxia
- Behavioral changes
- Coma
- Combativeness
- Confusion
- Cranial nerve VI deficit
- Cranial nerve VII deficit
- Cranial nerve XII deficit
- Other Cranial nerve deficit, specify: \_\_\_\_\_
- Dysphagia
- Facial numbness/Parathesia
- Hallucinations
- Hemiparesis/Hemiplegia
- Hyperreflexia
- Loss of balance
- Numbness
- Seizures
- Upgoing toes
- Weakness
- Other neurologic deficit, specify: \_\_\_\_\_
- Altered sense of taste
- Altered sense of smell
- Decerebrate posturing
- Decorticate posturing
- Fixed, nonreactive pupils
- Dilated pupils
- Nystagmus

**Skin Lesions:**  Yes  No *If yes, please specify in table below:*

Lesion type	Anatomic location	Size	Number
Ulcers			
Plaques			
Erythematous nodules			
Other			

**Other Symptoms/Signs:**

- Other, specify: \_\_\_\_\_

**Diagnostic Tests:** Note please provide dates when possible. If date not available, provide hospital day (i.e. CSF tap on Hosp. Day 2)

**LABORATORY TESTING**

CSF	Date _____	Date _____	Date _____
	<b>Results</b>	<b>Results</b>	<b>Results</b>
Opening pressure (mmH2O)			
WBC count (per mm <sup>3</sup> )			
RBC count (per mm <sup>3</sup> )			
Neutrophil %			
Monocyte %			
Lymphocyte %			
Bands %			
Eosinophil %			
Protein (mg/100ml)			
Glucose (mg/100ml)			
Cytokines			
CSF Culture: *			
CSF PCR: *			
CSF latex agglutination: *			
CSF mount: <i>Please indicate preparation type and findings, if any</i>	<input type="checkbox"/> Centrifuged <input type="checkbox"/> Stained <input type="checkbox"/> Wet Amebae present? Y <input type="checkbox"/> N <input type="checkbox"/>	<input type="checkbox"/> Centrifuged <input type="checkbox"/> Stained <input type="checkbox"/> Wet Amebae present? Y <input type="checkbox"/> N <input type="checkbox"/>	<input type="checkbox"/> Centrifuged <input type="checkbox"/> Stained <input type="checkbox"/> Wet Amebae present? Y <input type="checkbox"/> N <input type="checkbox"/>

\* Please provide results for all bacteria, viral and/or parasitic testing.

**Presenting Lab Values:**

**Date:** \_\_\_\_\_

	<b>Results</b>
RBC count (per mm <sup>3</sup> )	
Hematocrit %	
WBC count (per mm <sup>3</sup> )	
Neutrophil %	
Lymphocyte %	
Monocyte %	
Eosinophil %	
Bands %	
CD4 count (per mm <sup>3</sup> )	
Protein (mg/100ml)	
Sodium (mEq/L)	
Potassium (mEq/L)	
Chloride (mEq/L)	
Bicarbonate (mEq/L)	
BUN (mg/100ml)	
Creatinine (mg/100ml)	
Glucose (mg/100ml)	

**Serology:**

<b>Date</b>	<b>Result</b>

**Cultures for Free Living Amebae:**

<b>Source</b>	<b>Date</b>	<b>Result</b>	
<input type="checkbox"/> Blood		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Skin		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Brain		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Abscess		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Other, specify: _____		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba

**PCR for Free Living Amebae:**

<b>Source</b>	<b>Date</b>	<b>Result</b>	
<input type="checkbox"/> Blood		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Skin		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Brain		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Abscess		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba
<input type="checkbox"/> Other, specify: _____		<input type="checkbox"/> Negative	<input type="checkbox"/> + Balamuthia
		<input type="checkbox"/> + Naegleria	<input type="checkbox"/> + Acanthamoeba

## HISTOPATHOLOGY

**Brain biopsy:**       Yes    No    Unknown

	Date:	Date:
Location		
Timing	<input type="checkbox"/> Antemortem <input type="checkbox"/> Postmortem <input type="checkbox"/> Unknown	<input type="checkbox"/> Antemortem <input type="checkbox"/> Postmortem <input type="checkbox"/> Unknown
Results (check all that apply)	<input type="checkbox"/> Amebic trophozoites	<input type="checkbox"/> Amebic trophozoites
	<input type="checkbox"/> Amebic cysts	<input type="checkbox"/> Amebic cysts
	<input type="checkbox"/> Ameba, not specified	<input type="checkbox"/> Ameba, not specified
	<input type="checkbox"/> Hemorrhage	<input type="checkbox"/> Necrosis
	<input type="checkbox"/> Encephalomalacia	<input type="checkbox"/> Edema
	<input type="checkbox"/> Abscess	<input type="checkbox"/> Vasculitis
	<input type="checkbox"/> Perivascular Inflammation	<input type="checkbox"/> Perivascular Inflammation
	<input type="checkbox"/> Thrombosis	<input type="checkbox"/> Thrombosis
	<input type="checkbox"/> Neovascularization	<input type="checkbox"/> Neovascularization
	<input type="checkbox"/> Neutrophilic inflammation / infiltrate	<input type="checkbox"/> Neutrophilic inflammation / infiltrate
	<input type="checkbox"/> Lymphocytic inflammation / infiltrate	<input type="checkbox"/> Lymphocytic inflammation / infiltrate
	<input type="checkbox"/> Granulomatous inflammation	<input type="checkbox"/> Granulomatous inflammation
	<input type="checkbox"/> Granuloma	<input type="checkbox"/> Granuloma
<input type="checkbox"/> Meningitis	<input type="checkbox"/> Encephalitis	
<input type="checkbox"/> Meningoencephalitis	<input type="checkbox"/> Meningoencephalitis	
Other Results/ Comments		

**Skin biopsy:**       Yes    No    Unknown

	Date:	Date:
Location		
Timing	<input type="checkbox"/> Antemortem <input type="checkbox"/> Postmortem <input type="checkbox"/> Unknown	<input type="checkbox"/> Antemortem <input type="checkbox"/> Postmortem <input type="checkbox"/> Unknown
Results	<input type="checkbox"/> No amebae seen	<input type="checkbox"/> No amebae seen
	<input type="checkbox"/> Amebic trophozoites	<input type="checkbox"/> Amebic trophozoites
	<input type="checkbox"/> Amebic cysts	<input type="checkbox"/> Amebic cysts
	<input type="checkbox"/> Amebae, not specified	<input type="checkbox"/> Amebae, not specified
Other Results/ Comments		

**Sinus biopsy:**       Yes    No    Unknown

	Date:	Date:
Location		
Timing	<input type="checkbox"/> Antemortem <input type="checkbox"/> Postmortem <input type="checkbox"/> Unknown	<input type="checkbox"/> Antemortem <input type="checkbox"/> Postmortem <input type="checkbox"/> Unknown
Results	<input type="checkbox"/> No amebae seen	<input type="checkbox"/> No amebae seen
	<input type="checkbox"/> Amebic trophozoites	<input type="checkbox"/> Amebic trophozoites
	<input type="checkbox"/> Amebic cysts	<input type="checkbox"/> Amebic cysts
	<input type="checkbox"/> Amebae, not specified	<input type="checkbox"/> Amebae, not specified
Other Results/ Comments		

**Other biopsy results:**



**DIAGNOSTIC IMAGING**

CT: Date of First CT: \_\_\_\_\_

**Lesion location: (please check all that apply)**

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Basal Ganglia    | <input type="checkbox"/> Left Occipital  | <input type="checkbox"/> Left Temporal         |
| <input type="checkbox"/> Brainstem        | <input type="checkbox"/> Right Occipital | <input type="checkbox"/> Right Temporal        |
| <input type="checkbox"/> Right Cerebellum | <input type="checkbox"/> Left Parietal   | <input type="checkbox"/> Thalamus              |
| <input type="checkbox"/> Left Cerebellum  | <input type="checkbox"/> Right Parietal  | <input type="checkbox"/> Other, specify: _____ |
| <input type="checkbox"/> Left Frontal     | <input type="checkbox"/> Pons            |  |
| <input type="checkbox"/> Right Frontal    | <input type="checkbox"/> Spinal Cord     |  |

**Lesion: (please check all that apply)**

- |                                     |   |  |
|-------------------------------------|---|--|
| <input type="checkbox"/> Abscess    | <input type="checkbox"/> Hyperdense         | <input type="checkbox"/> Enhancing             |
| <input type="checkbox"/> Edema      | <input type="checkbox"/> Hypodense          | <input type="checkbox"/> Ring enhancing        |
| <input type="checkbox"/> Erosion    | <input type="checkbox"/> Infarcts           | <input type="checkbox"/> Sinusitis             |
| <input type="checkbox"/> Hemorrhage | <input type="checkbox"/> Mass               | <input type="checkbox"/> Ventriculomegaly      |
| <input type="checkbox"/> Herniation | <input type="checkbox"/> Multifocal lesions | <input type="checkbox"/> Other, specify: _____ |

Additional Description, if needed: \_\_\_\_\_

Please list dates of subsequent CT scans and changes noted:

Date	Findings

MRI: Date of First MRI: \_\_\_\_\_

**Lesion location: (please check all that apply)**

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Basal Ganglia    | <input type="checkbox"/> Left Occipital  | <input type="checkbox"/> Left Temporal         |
| <input type="checkbox"/> Brainstem        | <input type="checkbox"/> Right Occipital | <input type="checkbox"/> Right Temporal        |
| <input type="checkbox"/> Right Cerebellum | <input type="checkbox"/> Left Parietal   | <input type="checkbox"/> Thalamus              |
| <input type="checkbox"/> Left Cerebellum  | <input type="checkbox"/> Right Parietal  | <input type="checkbox"/> Other, specify: _____ |
| <input type="checkbox"/> Left Frontal     | <input type="checkbox"/> Pons            |  |
| <input type="checkbox"/> Right Frontal    | <input type="checkbox"/> Spinal Cord     |  |

**Lesion: (please check all that apply)**

- |                                     |   |  |
|-------------------------------------|---|--|
| <input type="checkbox"/> Abscess    | <input type="checkbox"/> Hyperdense         | <input type="checkbox"/> Enhancing             |
| <input type="checkbox"/> Edema      | <input type="checkbox"/> Hypodense          | <input type="checkbox"/> Ring enhancing        |
| <input type="checkbox"/> Erosion    | <input type="checkbox"/> Infarcts           | <input type="checkbox"/> Sinusitis             |
| <input type="checkbox"/> Hemorrhage | <input type="checkbox"/> Mass               | <input type="checkbox"/> Ventriculomegaly      |
| <input type="checkbox"/> Herniation | <input type="checkbox"/> Multifocal lesions | <input type="checkbox"/> Other, specify: _____ |

Additional Description, if needed: \_\_\_\_\_

Please list dates of subsequent MRI scans and changes noted:

Date	Findings



**Other therapies:** (please check all that apply)

	Start date:	Stop date:
<input type="checkbox"/> IV fluids		
<input type="checkbox"/> Total Parenteral Nutrition (TPN)		
<input type="checkbox"/> Dialysis for renal failure		
<input type="checkbox"/> Other, specify _____		
<input type="checkbox"/> Other, specify _____		
<input type="checkbox"/> Other, specify _____		

**Outcome:**

Survived?  Yes  No  Unknown

If survived: Residual neurologic deficits?  Yes  No  Unknown

If Yes, Please describe neurologic deficits: \_\_\_\_\_

Date of discharge: \_\_\_\_\_ OR Date of death: \_\_\_\_\_

If died: Cause of death:

- Brain death                       Removed life support  
 Cardiorespiratory failure       Other, specify: \_\_\_\_\_  
 Herniation

If died: Organs transplanted?  Yes  No

If yes, which ones: \_\_\_\_\_

Please provide a brief description of the patient's clinical course, complications, and any additional comments:

**CDC USE ONLY:**

1 <sup>st</sup> DASH #	
2 <sup>nd</sup> DASH #	
3 <sup>rd</sup> DASH #	
4 <sup>th</sup> DASH #	
5 <sup>th</sup> DASH #	
List additional DASH #s:	

Case report citation 1	
Case report citation 2	
List additional case citations	

**Calculated durations:**

Incubation period (days): \_\_\_\_\_  
 Illness Onset to Admission (days): \_\_\_\_\_  
 Illness Onset to Death (days): \_\_\_\_\_  
 Exposure to Death (days): \_\_\_\_\_  
 Clinical Stage at presentation: \_\_\_\_\_



<b>Meningococcal Infection Investigation Form</b>		NBS Patient ID: _____	NBS Investigation ID _____																				
<b>Patient's name:</b> _____ <small style="display: flex; justify-content: space-between; width: 100%;"> <span>Last</span> <span>First</span> <span>MI</span> </small>		<b>Reported by:</b> _____ <b>Agency:</b> _____ <b>Phone:</b> ( ) _____ <b>Date reported:</b> ___/___/___																					
<b>Address:</b> _____ <b>City:</b> _____ <b>County:</b> _____ <b>Zip:</b> _____ <b>Phone 1:</b> ( ) _____ <b>Phone 2:</b> ( ) _____ <b>Date of birth:</b> ___/___/___ <b>Age:</b> _____ <b>Sex:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unk <b>Race:</b> <input type="checkbox"/> White <input type="checkbox"/> Black <input type="checkbox"/> Asian <input type="checkbox"/> Pacific Islander <input type="checkbox"/> Native American/Alaskan <input type="checkbox"/> Unknown <input type="checkbox"/> Other: _____ <b>Hispanic:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Patient occupation:</b> _____ <b>Parent/guardian's name:</b> _____		<b>Investigated by:</b> _____ <b>Agency:</b> _____ <b>Phone:</b> ( ) _____ <b>Email:</b> _____ <b>Investigation start date:</b> ___/___/___																					
<b>CLINICAL DATA</b> <b>Date of symptom onset:</b> ___/___/___ <b>Illness end date:</b> ___/___/___ <b>Did patient die?</b> <input type="checkbox"/> Yes, date of death: ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unk <b>Signs and symptoms (Check all that apply):</b> <input type="checkbox"/> Fever <input type="checkbox"/> Sensitivity to light <input type="checkbox"/> Stiff neck <input type="checkbox"/> Headache <input type="checkbox"/> Nausea <input type="checkbox"/> Vomiting <input type="checkbox"/> Confusion <input type="checkbox"/> Other: _____ <b>Clinical infection presentation (Check all that apply):</b> <input type="checkbox"/> Bacteremia <input type="checkbox"/> Meningitis <input type="checkbox"/> Septic arthritis <input type="checkbox"/> Pneumonia <input type="checkbox"/> Cellulitis <input type="checkbox"/> Pericarditis <input type="checkbox"/> Osteomyelitis <input type="checkbox"/> Other: _____ <b>Physician's name:</b> _____ <b>Physician's phone:</b> ( ) _____		<b>UNDERLYING CONDITIONS</b> <b>Does the patient have any underlying health conditions?</b> <input type="checkbox"/> Yes (check all that apply) <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Asthma <input type="checkbox"/> Chronic lung disease <input type="checkbox"/> Cancer <input type="checkbox"/> Cochlear implant <input type="checkbox"/> Diabetes <input type="checkbox"/> End stage renal disease <input type="checkbox"/> HIV <input type="checkbox"/> Other: _____ <b>Other prior illness within two weeks of onset?</b> <input type="checkbox"/> Yes, specify _____ <input type="checkbox"/> No <input type="checkbox"/> Unk <b>Does the patient have high risk behaviors?</b> <input type="checkbox"/> Yes (check behaviors below) <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Current smoker <input type="checkbox"/> Intravenous drug user (IVDU) <input type="checkbox"/> Alcohol abuse <input type="checkbox"/> Other: _____																					
<b>HOSPITALIZATION INFORMATION</b> <b>Was the patient hospitalized?</b> <input type="checkbox"/> Yes, name of hospital: _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, Date of admission: ___/___/___ Date of discharge: ___/___/___ How was the patient transported to the hospital? _____ How many people were in the vehicle that transported the patient to the hospital? _____ Was the patient seen at multiple hospitals? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <span style="float: right;">If yes, complete the following table</span>																							
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Hospital / Clinic name</th> <th style="width: 30%;">Mode of transportation to facility</th> <th style="width: 15%;">Date/time of visit/arrival</th> <th style="width: 15%;">Date/time of discharge</th> <th style="width: 10%;">Discharged to*</th> </tr> </thead> <tbody> <tr> <td> </td> <td> <input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family  <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____               </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> <input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family  <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____               </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> <input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family  <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____               </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		Hospital / Clinic name	Mode of transportation to facility	Date/time of visit/arrival	Date/time of discharge	Discharged to*		<input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____					<input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____					<input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____					
Hospital / Clinic name	Mode of transportation to facility	Date/time of visit/arrival	Date/time of discharge	Discharged to*																			
	<input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____																						
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	<input type="checkbox"/> drove self <input type="checkbox"/> driven by friend/family <input type="checkbox"/> ambulance <input type="checkbox"/> other: _____																						
<small>* discharged to home, another facility, or left against medical advice (AMA)</small>																							
<b>TREATMENT HISTORY</b> <b>Did the patient receive antibiotics?</b> <input type="checkbox"/> Yes, start date ___/___/___ end date ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, name or type of antibiotic(s) given: _____ Were any antibiotics given prior to specimen collection? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, antibiotic name: _____ given on ___/___/___ at ___:___ <input type="checkbox"/> AM <input type="checkbox"/> PM If yes, antibiotic name: _____ given on ___/___/___ at ___:___ <input type="checkbox"/> AM <input type="checkbox"/> PM																							
<b>VACCINATION HISTORY</b> <b>Did the patient receive the polysaccharide meningococcal vaccine?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, date of vaccine ___/___/___ Manufacturer: _____ <b>Did the patient receive the conjugate meningococcal vaccine?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, date of vaccine ___/___/___ Manufacturer: _____ <b>Vaccination history was obtained from?</b> <input type="checkbox"/> Patient <input type="checkbox"/> Parent/guardian <input type="checkbox"/> Primary care physician <input type="checkbox"/> Reporting physician/facility <input type="checkbox"/> Imtrac																							

**CONTACTS**

Use the contact tracking sheet to record information on anyone determined to be a close contact as defined by the Red Book.

Was the patient associated with an outbreak?  Yes, outbreak name: \_\_\_\_\_  No  Unknown

How many people live in the patient's household? \_\_\_\_\_

During the two weeks before onset, how many people did the patient

kiss: \_\_\_\_\_ share a sleeping area with: \_\_\_\_\_ share a toothbrush with: \_\_\_\_\_ share food or utensils with: \_\_\_\_\_ share drinks with: \_\_\_\_\_

share (brass or wind) band instruments with: \_\_\_\_\_ share cigarettes with: \_\_\_\_\_ share drugs with: \_\_\_\_\_

Did the patient perform mouth to mouth resuscitation on anyone?  Yes  No  Unknown

If yes, name of person: \_\_\_\_\_ Date performed: \_\_\_\_/\_\_\_\_/\_\_\_\_

Did any member of the patient's household have a similar illness during the two weeks prior to onset?  Yes  No  Unknown

If yes, name of person: \_\_\_\_\_ Date of onset \_\_\_\_/\_\_\_\_/\_\_\_\_

Did the patient attend, visit or work at a school?  Yes, student  Yes, faculty/staff  Yes, visitor  No  UnknownIf a college student, college year:  Fr  So  Jr  Sr Live in a dorm?  Yes  No  UnknownDid the patient attend, visit or work at a child care center / home during the two weeks prior to illness?  Yes  No  UnknownDid the patient stay at, visit or work at a nursing home / long term care facility during the two weeks prior to illness?  Yes  No  Unk

If yes to school, child care or long term care facility, please complete the following:

School / facility name: \_\_\_\_\_ Date last attended/worked/visited before onset: \_\_\_\_/\_\_\_\_/\_\_\_\_

Total contacts: \_\_\_\_\_ students/residents \_\_\_\_\_ staff Total close contacts: \_\_\_\_\_ students/residents \_\_\_\_\_ staff

Did anyone associated with the facility have a similar illness during the two weeks prior to onset?  Yes  No  Unknown

If yes, name of person: \_\_\_\_\_ Date of onset \_\_\_\_/\_\_\_\_/\_\_\_\_ if needed, attach list to this report

**ADDITIONAL EXPOSURE HISTORY**Did the patient travel anywhere during the two weeks prior to onset?  Yes  No  Unknown

If yes, location traveled to: \_\_\_\_\_ Dates of travel: \_\_\_\_/\_\_\_\_/\_\_\_\_ to \_\_\_\_/\_\_\_\_/\_\_\_\_

Did the patient spend 8 or more hours on a plane (or bus or train)?  Yes  No  Unknown

If yes, airline: \_\_\_\_\_ flight number: \_\_\_\_\_ Flight date: \_\_\_\_/\_\_\_\_/\_\_\_\_ time: \_\_\_\_:\_\_\_\_ Departure city: \_\_\_\_\_

Did the patient attend any public gatherings / parties during the two weeks prior to onset?  Yes  No  Unknown

If yes, complete the following table

Event	Location	# of people present	Date of event
			____/____/____
			____/____/____

**PROPHYLAXIS**

Date prophylaxis recommendations were first made: \_\_\_\_/\_\_\_\_/\_\_\_\_

Prophylaxis provided by (check all that apply):  DSHS or LHD  Hospital  Private physician  Other: \_\_\_\_\_  None given

Number of people	Household	Students at school &/or daycare	Staff at school &/or daycare	Residents at long term care facility	Staff at long term care facility	Healthcare workers including EMS	Other close contacts*
Prophylaxis recommended for:							
Declined recommended prophylaxis:							
Received prophylaxis:							

\* friends, colleagues, extended family, etc.

**LABORATORY DATA** Isolate sent to DSHS (required)?  Yes, on \_\_\_/\_\_\_/\_\_\_  No  Unknown If no, reason: \_\_\_\_\_

Was *Neisseria meningitidis* testing done :  Yes  No, diagnosis based on clinical purpura fulminans  Other: \_\_\_\_\_

**Gram stain:** Date collected: \_\_\_/\_\_\_/\_\_\_ Time collected: \_\_\_:\_\_\_  AM  PM  
Specimen Source:  CSF  Blood  Other: \_\_\_\_\_  
Result:  Gram negative diplococci  Negative  Inconclusive  Unknown  Other: \_\_\_\_\_

**CSF Profile:** Date collected: \_\_\_/\_\_\_/\_\_\_ Appearance: \_\_\_\_\_ Pressure: \_\_\_\_\_ mm  
Glucose: \_\_\_\_\_ mg/dl Protein: \_\_\_\_\_ mg/dl RBCs: \_\_\_\_\_ mm<sup>3</sup> WBCs: \_\_\_\_\_ mm<sup>3</sup> Lymphs: \_\_\_\_\_ % Polys: \_\_\_\_\_ % Mono: \_\_\_\_\_ %

**Culture:** Date collected: \_\_\_/\_\_\_/\_\_\_ Time collected: \_\_\_:\_\_\_  AM  PM  
Specimen Source:  CSF  Blood  Other: \_\_\_\_\_  
Result:  Positive  Negative  Inconclusive  Unknown  Other: \_\_\_\_\_

**Other test:** Test name:  Latex agglutination  Immunohistochemistry (HIC)  PCR  Other: \_\_\_\_\_  
Date collected: \_\_\_/\_\_\_/\_\_\_ Time collected: \_\_\_:\_\_\_  AM  PM  
Specimen Source:  CSF  Blood  Other: \_\_\_\_\_  
Result:  Positive  Negative  Inconclusive  Unknown  Pending

**Serogroup results :**  A  B  C  Y  W135  Other: \_\_\_\_\_  Not groupable  Unknown  Pending

**Antibiotic resistance** (please attach lab report if you need to record more than three antibiotic resistance results):  
Name 1: \_\_\_\_\_  Resistant  Intermediate  Susceptible  Not tested  Unknown MIC values : \_\_\_\_\_  
Name 2: \_\_\_\_\_  Resistant  Intermediate  Susceptible  Not tested  Unknown MIC values : \_\_\_\_\_  
Name 3: \_\_\_\_\_  Resistant  Intermediate  Susceptible  Not tested  Unknown MIC values : \_\_\_\_\_

**ADDITIONAL HEALTH DEPARTMENT ACTIONS AND CONTROL MEASURES IMPLEMENTED** (check all that apply and indicate date initiated)

- Confirmed that symptomatic individuals are placed on droplet precautions until 24 hours after effective antibiotic treatment on \_\_\_/\_\_\_/\_\_\_
- Reviewed high risk exposures with medical provider on \_\_\_/\_\_\_/\_\_\_
- Contact tracing (identifying close contacts through patient or surrogate interview) initiated on \_\_\_/\_\_\_/\_\_\_
- Education (risk, transmission, symptoms) provided to contacts starting on \_\_\_/\_\_\_/\_\_\_
- Requested the hospital or laboratory forward the isolate to the DSHS lab on \_\_\_/\_\_\_/\_\_\_
- Worked with school, daycare or long term care facility to identify and notify close contacts starting on \_\_\_/\_\_\_/\_\_\_
- Other (specify): \_\_\_\_\_ \_\_\_/\_\_\_/\_\_\_
- Other (specify) \_\_\_\_\_ \_\_\_/\_\_\_/\_\_\_

**COMMENTS**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PROPHYLAXIS RECOMMENDATIONS**

The following groups of individuals should receive prophylaxis after exposure to meningococcal disease

- All family contacts or household members who spend at least 8 hours a day with the case.
- Classroom contacts in the childcare center or childcare home attended by the case.
- Persons directly exposed to infectious oral secretions without personal protective equipment (PPE) including through kissing, sharing utensils, sharing toothbrushes or unprotected mouth to mouth resuscitation.

It is important that antimicrobial chemoprophylaxis be administered as soon as possible, ideally within 24 hours. The incubation period is 1 to 10 days. Chemoprophylaxis given more than 14 days after exposure is of limited value. When prophylaxis is indicated, it should be administered to all eligible contacts at the same time to eliminate the organism from the population. Prophylaxis should begin within 24 hours of diagnosis or strong suspicion of case. Culturing of contacts is not recommended. Prophylaxis should not substitute for close observation of case contacts for symptoms. Refer to the current American Academy of Pediatrics Red Book for prophylaxis dosages.

Prophylaxis is not recommended for casual contacts without direct exposure to the patient's oral secretions (e.g. school or work). All contacts should be provided education on risk, transmission and symptoms.



- SOURCE OF INFECTION:**  No exposure identified  Close contact with a known or suspected case: \_\_\_\_\_
- Where did this case acquire mumps?:  Day-care  School  College  Work  Home  Dr. Office  Hospital ER  Hospital Inpatient  Hospital Outpatient  Military  Jail  Church  International Travel  Unknown  Other: \_\_\_\_\_
  - Has any travel occurred within the exposure period?  Yes  No  Unknown If yes, list location: \_\_\_\_\_
  - Importation Class\*:  Indigenous  International  Out-of-state  Unknown If imported, from what country/state: \_\_\_\_\_
  - Is case traceable within 2 generations to international import?  Yes  No  Unknown
  - Is case part of an outbreak?:  Yes  No  Unknown If yes, list outbreak name: \_\_\_\_\_

\*<http://wwwn.cdc.gov/NNDSS/beta/bcasedef.aspx?CondYrID=783&DatePub=1/1/2012>

**HOUSEHOLD CONTACTS:** Were Control Activities Initiated?:  Yes  No  Unknown If no, explain: \_\_\_\_\_

Name	Relation to Case	Age	Mumps Disease History	Mumps Vaccine History
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown

**POSSIBLE SPREAD CONTACTS:**

Name	Relation to Case	Age	Mumps Disease History	Mumps Vaccine History
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown

*CDC Objective: 85% of vaccine preventable cases must be investigated and reported to the CDC within 30 days of initial report.*

Date Investigation Initiated: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Investigation Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Reported to DSHS: \_\_\_\_/\_\_\_\_/\_\_\_\_

Investigator's Name: \_\_\_\_\_ Agency name: \_\_\_\_\_ Phone :( ) \_\_\_\_\_

Closed in NBS?  Yes  No

If confirmed or probable, notification submitted?  Yes  No

**COMMENTS:**

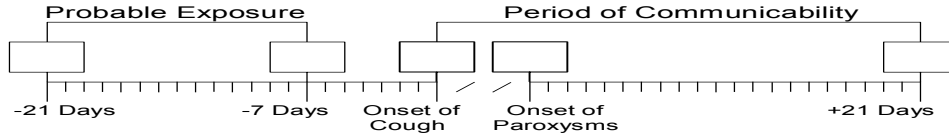




Name: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

**INFECTION TIMELINE:** Enter onset of cough. Count backwards and forwards to enter dates for probable exposure and communicable periods.



**SOURCE OF INFECTION:**  No exposure identified  Close contact with a known or suspected case  Household exposure

Date of Contact	Name	Age	Address	Phone	NBS Case No.
____/____/____	_____	____	_____	(____) _____	_____

Is case epidemiologically linked to a lab-confirmed case?  Yes  No  Unknown NBS Case # \_\_\_\_\_

Where did this case acquire pertussis?:  Day-care  School  College  Work  Home  Dr Office  Hospital ER  
 Hospital Inpatient  Hospital Outpatient  Military  Jail  Church  Travel  Unknown  Other: \_\_\_\_\_  
Name(s) of Setting: \_\_\_\_\_

Has any travel occurred within the exposure period?  Yes  No  Unknown If yes, list location: \_\_\_\_\_

Is case part of an outbreak?:  Yes  No  Unknown If yes, list outbreak name: \_\_\_\_\_

Number of contacts recommended to receive antibiotics prophylaxis: \_\_\_\_\_

Did patient attend school/daycare?  Yes  No  Unknown If yes, which school/daycare: \_\_\_\_\_ Grade: \_\_\_\_ Teacher's name \_\_\_\_\_

Transportation to school:  Walk  Carpool  Car  Bus# \_\_\_\_\_ Last date of attendance: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Returned: \_\_\_\_/\_\_\_\_/\_\_\_\_

After school care: \_\_\_\_\_ Other after school activities: \_\_\_\_\_ Where: \_\_\_\_\_

Did patient attend any of the following while symptomatic:  Sleepover  Church activities  Babysit  Visit hospital patient

**HOUSEHOLD CONTACTS:** Were control activities initiated?:  Yes  No  Unknown If no, explain: \_\_\_\_\_

Name	Relation to Case	Age	Vaccination HX	*Symptoms/Date of Onset	Type of Prophylaxis/Date Treated
_____	_____	____	_____	_____	_____
_____	_____	____	_____	_____	_____
_____	_____	____	_____	_____	_____
_____	_____	____	_____	_____	_____

*\*Investigations must be completed on all symptomatic contacts of confirmed or probable cases*

**POSSIBLE SPREAD CONTACTS:**

**Setting:**  No Spread  Day-care  School  College  Work  Home  Dr. Office  Hospital ER  Hospital Inpatient  
 Hospital Outpatient  Military  Jail  Church  Travel  Unknown  Other: \_\_\_\_\_

Name (s) of Settings: \_\_\_\_\_

Name	Relation to Case	Age	Vaccination HX	*Symptoms/Date of Onset	Type of Prophylaxis/Date Treated
_____	_____	____	_____	_____	_____
_____	_____	____	_____	_____	_____
_____	_____	____	_____	_____	_____

*\*Investigations must be completed on all contacts with symptoms*

**PROVIDED INFORMATION TO PATIENT:**

Vaccinations for Contacts/Household (most effective way to prevent pertussis)  Transmission (person-person; by breathing in the bacteria)  
 Daycare/school restriction, if applicable (may return after 5 days of antibiotics)

**CDC Objective:** 90% of vaccine preventable cases must be investigated and reported to the CDC within 30 days of initial report.

Date Investigation Initiated: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Investigation Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Reported to DSHS: \_\_\_\_/\_\_\_\_/\_\_\_\_

Investigator's Name: \_\_\_\_\_ Agency name: \_\_\_\_\_ Phone :(\_\_\_\_) \_\_\_\_\_

Closed in NBS?  Yes  No If confirmed or probable, notification submitted?  Yes  No

**COMMENTS:**

\_\_\_\_\_



Name (last, first):		Caseid:	
Address:	City:	County:	Zip:
Reporting Provider:		Address:	Phone:

### Pertussis Death Worksheet

-----Detach here and transmit only lower portion to CDC-----

### Pertussis Death Worksheet

**Data related to case:**

1. Did the patient have underlying or previous medical conditions?  Yes  No  Unknown

*If yes*, please give details.

2. Was pulmonary hypertension a diagnosis in this patient?  Yes  No  Unknown

3. Was patient hospitalized?  Yes  No

*If yes*, please submit a copy of the hospital admission and discharge summary to DSHS

4. Where did the patient die?  Home  Hospital  En route to hospital

Other (Specify) \_\_\_\_\_

5. Was an autopsy performed?  Yes  No

*If yes*, please submit a copy to DSHS.

6. Did the patient have a contact who had a cough illness?  Yes  No  Unknown

*If yes*, then who? \_\_\_\_\_

<b>DOCTOR'S OFFICE/CLINIC/EMERGENCY DEPARTMENT VISITS</b>
---

Please list the dates and name of all clinics or doctor's offices/emergency department visits made by the patient for this illness in chronological order.

Date of Visit	Name and Address of Clinic, Doctor's Office, or Emergency Department visited	Telephone No.

**CLINICAL DATA**

Please list the admission date(s) and discharge dates/transfer dates for this illness in chronological order.

Hospital name	Date of Admission	Date of Discharge/transfer	Discharge Diagnosis

**RESPIRATORY SUPPORT:.**

	Yes/No	Date Started
Supplemental O <sub>2</sub> without intubation e.g. mask		
Supplemental O <sub>2</sub> via endotracheal intubation		
Continuous mechanical ventilation		
High Frequency Oscillatory Ventilation		
Extra Corporeal Membrane Oxygenation		

**LABORATORY STUDIES: (Including tests obtained 30 days before onset of illness)**

Specimen	Collection Date	Culture Result	PCR	DFA	ELISA
Nasopharyngeal - <i>B. pertussis</i>					
-RSV					
-Adenovirus					
-Influenza					
-Parainfluenza					
- Other (specify pathogen)					
Blood					
	<b>Date</b>	<b>Count</b>			
Total WBC Count (Initial)			% Lymphocyte		
Highest WBC Count			% Lymphocyte		

**OTHER MEDICAL AND FAMILY INFORMATION**

**If the patient was <1 year of age:**

7. What was the gestational age of the case? \_\_\_\_\_ weeks

What was the weight of the infant at birth? [    lb    oz] or [    kg    gm]

**If the patient was <12 years of age:**

8. What was the mother's age at time of patient's onset of coughing due to pertussis?  
\_\_\_\_\_ years

9. At the time of the patient's birth, did the mother have an immune-suppressed or a chronic underlying medical condition?

Yes  No  Unknown

**If yes**, what is the name of the condition? [\_\_\_\_\_]

In the table below, list everyone who lives in the household, their date of birth, age, sex, the number of doses of pertussis containing vaccine received, and date of the last pertussis vaccine dose, smoking habits at home, and the presence of a cough illness during the 3-week period prior to the cough onset date in the patient. Please indicate if pertussis was the diagnosis for the cough illness, and if so, how pertussis was confirmed.

No.	Relationship to Patient	Date of Birth	Age	Sex	No. doses DTP/DTaP/DT	Date of last dose	Smoking habits at home		Cough illness in family member during 3-week period prior to cough onset date in case-patient			
							Current smoker (Yes/No)	Avg. no. of cigarettes smoked daily	Cough (Yes/No)	Cough Onset Date	Pertussis diagnosis (Yes/No)	Confirmation method (Culture/ PCR / DFA/None)
1												
2												
3												
4												
5												
6												
7												
8												
9												

During the 3-week period prior to the cough onset, was the patient exposed to anyone **outside of the household** who was known to have a cough illness?  Yes  No  Unknown

If yes, list all persons who had a cough illness and who may have exposed the patient, with the dates of cough onset in the table below.

No.	Relationship to Patient	Date of Birth	Age	Sex	No. doses DTP DTaP/DT vaccine*	Date of last Dose	Cough onset date	Date cough stopped	Pertussis Diagnosis	Confirmation Method (Culture/ PCR/DFA/ None)
1										
2										
3										
4										
5										

\* Indicate type of vaccine if available



Name: \_\_\_\_\_

**Rubella Reporting for Pregnant Cases:** Was the case pregnant?  Yes  No  Unknown If yes, # of weeks gestation at onset: \_\_\_\_\_  
Prior evidence of serologic immunity:  Yes  No  Unknown If yes, year of test: \_\_\_\_\_ or, age at test: \_\_\_\_\_  
Previous rubella diagnosed by MD:  Yes  No  Unknown If yes, age at time of disease: \_\_\_\_\_  
Was rubella confirmed by serology?:  Yes  No  Unknown Patient's due date: \_\_\_\_\_

Results called to local investigator:  Yes  No  Unknown  
Person Contacted: \_\_\_\_\_ Date Called: \_\_\_\_/\_\_\_\_/\_\_\_\_ Initials: \_\_\_\_\_

**INFECTION TIMELINE:** Enter onset of rash. Count backwards and forwards to enter dates for probable exposure and communicable periods.

**Measles**

**Probable Exposure** (7 to 18 days prior to fever onset) **Period of Communicability** (2 days before fever onset to 4 days after rash onset)

**Rubella**

**Probable Exposure** **Period of Communicability**

**SOURCE OF INFECTION:**  No exposure Identified  Close contact with a known or suspected case: \_\_\_\_\_

Where did case acquire measles or rubella?:  Day-care  School  College  Work  Home  Dr. Office  Hospital ER  Hospital Inpatient  Hospital Outpatient  Military  Jail  Church  International Travel  Unknown  Other: \_\_\_\_\_

Has any travel occurred within the exposure period?  Yes  No  Unknown If yes, list location: \_\_\_\_\_

Importation Class:  Indigenous  International  Out-of-state  Unknown If imported, from what country/state: \_\_\_\_\_

Is case traceable within 2 generations to international import?  Yes  No  Unknown

Is case part of an outbreak?:  Yes  No  Unknown If yes, list outbreak name: \_\_\_\_\_

**HOUSEHOLD CONTACTS:** Were control activities initiated?:  Yes  No  Unknown If no, explain: \_\_\_\_\_

Name	Relation to Case	Age	Measles/Rubella History	Vaccination History
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown

**POSSIBLE SPREAD CONTACTS:**

Name	Relation to Case	Age	Measles/Rubella History	Vaccination History
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown
_____	_____	_____	<input type="checkbox"/> Yes-_____ <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> 2 MMR <input type="checkbox"/> 1 MMR <input type="checkbox"/> None <input type="checkbox"/> Unknown

*CDC Objective: 85% of vaccine preventable cases must be investigated and reported to the CDC within 30 days of initial report.*

Investigator's Name: \_\_\_\_\_ Agency Name: \_\_\_\_\_  
Phone : ( ) \_\_\_\_\_ Date Investigation Initiated: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date Investigation Completed: \_\_\_\_/\_\_\_\_/\_\_\_\_

**COMMENTS:**

Invasive Streptococcal Investigation Form		NBS Patient ID: _____																					
<b>Patient's name:</b> _____ <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Last</span> <span>First</span> <span>MI</span> </div> <b>Address:</b> _____ <b>City:</b> _____ <b>County:</b> _____ <b>Zip:</b> _____ <b>Phone 1:</b> ( ) _____ <b>Phone 2:</b> ( ) _____ <b>Date of birth:</b> ___/___/___ <b>Age:</b> ____ <b>Sex:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown <b>Race:</b> <input type="checkbox"/> White <input type="checkbox"/> Black <input type="checkbox"/> Asian <input type="checkbox"/> Pacific Islander <input type="checkbox"/> Native American/Alaskan <input type="checkbox"/> Unknown <input type="checkbox"/> Other: _____ <b>Hispanic:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Occupation:</b> _____ <b>Long-term care resident:</b> <input type="checkbox"/> Yes, at: _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown		<b>Reported by:</b> _____ <b>Agency:</b> _____ <b>Phone:</b> ( ) _____ <b>Date reported:</b> ___/___/___ <b>Investigated by:</b> _____ <b>Agency:</b> _____ <b>Phone:</b> ( ) _____ <b>Email:</b> _____ <b>Investigation start date:</b> ___/___/___																					
<b>CLINICAL DATA</b> <b>Physician's name:</b> _____ <b>Physician's phone:</b> ( ) _____ <b>Date of symptom onset:</b> ___/___/___ <b>Date illness ended:</b> ___/___/___ <b>Did patient die?</b> <input type="checkbox"/> Yes, date of death: ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Type of Infection (Check all that apply):</b> <input type="checkbox"/> Bacteremia / Sepsis <input type="checkbox"/> Pneumonia <input type="checkbox"/> Toxic Shock Syndrome <input type="checkbox"/> Necrotizing Fasciitis <input type="checkbox"/> Meningitis <input type="checkbox"/> Sinusitis <input type="checkbox"/> Otis Media <input type="checkbox"/> Endocarditis <input type="checkbox"/> Peritonitis <input type="checkbox"/> Septic Arthritis <input type="checkbox"/> Other: _____ <i>For Group B Strep investigations:</i> <b>Pregnant:</b> <input type="checkbox"/> Yes: # weeks gestation: _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Postpartum:</b> <input type="checkbox"/> Yes: date of delivery: ___/___/___ <input type="checkbox"/> No <input type="checkbox"/> Unknown		<b>UNDERLYING HEALTH CONDITIONS</b> <b>Does the patient have any underlying health conditions?</b> <input type="checkbox"/> Yes (check all that apply) <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Asthma <input type="checkbox"/> Chronic lung disease <input type="checkbox"/> Cancer <input type="checkbox"/> Cochlear implant <input type="checkbox"/> Diabetes <input type="checkbox"/> Heart disease <input type="checkbox"/> Hemoglobinopathy <input type="checkbox"/> HIV <input type="checkbox"/> Kidney disease <input type="checkbox"/> Organ transplant recipient <input type="checkbox"/> Other: _____ <b>Does the patient have high risk behaviors?</b> <input type="checkbox"/> Yes (check behaviors below) <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Consumes raw (unpasteurized) milk/cheese <input type="checkbox"/> Current smoker <input type="checkbox"/> Intravenous drug user (IVDU) <input type="checkbox"/> Alcohol abuse <input type="checkbox"/> Other: _____																					
<b>VACCINATION HISTORY</b> (For <i>S. pneumoniae</i> investigations) <b>Source of vaccine history:</b> <input type="checkbox"/> ImmTrac <input type="checkbox"/> Parent <input type="checkbox"/> Doctor <input type="checkbox"/> School <input type="checkbox"/> Other <b>Did the patient receive a pneumococcal vaccine?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, year vaccine was given: _____ If yes, which vaccine: <input type="checkbox"/> Conjugate pneumococcal vaccine <input type="checkbox"/> Polysaccharide pneumococcal vaccine <input type="checkbox"/> Other: _____ <input type="checkbox"/> Unknown																							
<b>HOSPITALIZATION INFORMATION</b> <b>Was the patient seen in an emergency room?</b> <input type="checkbox"/> Yes, name of hospital: _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown <b>Was the patient hospitalized?</b> <input type="checkbox"/> Yes, name of hospital: _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, date of admission: ___/___/___ Date of discharge: ___/___/___																							
<b>LABORATORY DATA</b> <table border="1" style="width:100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th style="width: 15%;">Date of collection</th> <th style="width: 25%;">Sterile specimen source</th> <th style="width: 25%;">Non-sterile specimen source</th> <th style="width: 15%;">Was specimen collected during a surgical procedure?</th> <th style="width: 20%;">Bacterial species identified*</th> </tr> </thead> <tbody> <tr> <td>___/___/___</td> <td> <input type="checkbox"/> CSF <input type="checkbox"/> Blood  <input type="checkbox"/> Pericardial fluid <input type="checkbox"/> Bone  <input type="checkbox"/> Joint fluid (no abscess)  <input type="checkbox"/> Other: _____               </td> <td> <input type="checkbox"/> Wound <input type="checkbox"/> Urine  <input type="checkbox"/> Skin <input type="checkbox"/> Throat  <input type="checkbox"/> Joint fluid (abscess present)  <input type="checkbox"/> Other: _____               </td> <td> <input type="checkbox"/> Yes  <input type="checkbox"/> No  <input type="checkbox"/> Unknown               </td> <td> <input type="checkbox"/> Group A Strep (<i>S. pyogenes</i>)  <input type="checkbox"/> Group B Strep (<i>S. agalactiae</i>)  <input type="checkbox"/> <i>Streptococcus pneumoniae</i>  <input type="checkbox"/> Other: _____               </td> </tr> <tr> <td>___/___/___</td> <td> <input type="checkbox"/> CSF <input type="checkbox"/> Blood  <input type="checkbox"/> Pericardial fluid <input type="checkbox"/> Bone  <input type="checkbox"/> Joint fluid (no abscess)  <input type="checkbox"/> Other: _____               </td> <td> <input type="checkbox"/> Wound <input type="checkbox"/> Urine  <input type="checkbox"/> Skin <input type="checkbox"/> Throat  <input type="checkbox"/> Joint fluid (abscess present)  <input type="checkbox"/> Other: _____               </td> <td> <input type="checkbox"/> Yes  <input type="checkbox"/> No  <input type="checkbox"/> Unknown               </td> <td> <input type="checkbox"/> Group A Strep (<i>S. pyogenes</i>)  <input type="checkbox"/> Group B Strep (<i>S. agalactiae</i>)  <input type="checkbox"/> <i>Streptococcus pneumoniae</i>  <input type="checkbox"/> Other: _____               </td> </tr> <tr> <td>___/___/___</td> <td> <input type="checkbox"/> CSF <input type="checkbox"/> Blood  <input type="checkbox"/> Pericardial fluid <input type="checkbox"/> Bone  <input type="checkbox"/> Joint fluid (no abscess)  <input type="checkbox"/> Other: _____               </td> <td> <input type="checkbox"/> Wound <input type="checkbox"/> Urine  <input type="checkbox"/> Skin <input type="checkbox"/> Throat  <input type="checkbox"/> Joint fluid (abscess present)  <input type="checkbox"/> Other: _____               </td> <td> <input type="checkbox"/> Yes  <input type="checkbox"/> No  <input type="checkbox"/> Unknown               </td> <td> <input type="checkbox"/> Group A Strep (<i>S. pyogenes</i>)  <input type="checkbox"/> Group B Strep (<i>S. agalactiae</i>)  <input type="checkbox"/> <i>Streptococcus pneumoniae</i>  <input type="checkbox"/> Other: _____               </td> </tr> </tbody> </table>				Date of collection	Sterile specimen source	Non-sterile specimen source	Was specimen collected during a surgical procedure?	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<b>COMMENTS</b> _____ _____ _____																							





**Clinical cont'd:**

Was medical care obtained for the acute wound or injury before tetanus symptom onset?  Yes  No  Unknown

If YES, date of wound care: \_\_\_/\_\_\_/\_\_\_

Was tetanus toxoid (Td, TT, DT, DTaP) administered for the acute wound or injury before tetanus symptom onset?  Yes  No  Unknown

Date patient received tetanus toxoid (Td, TT, DT, DTaP): \_\_\_/\_\_\_/\_\_\_

Was tetanus immune globulin (TIG) prophylaxis given as part of wound care before tetanus symptom onset?  Yes  No  Unknown

Date patient received TIG prophylaxis: \_\_\_/\_\_\_/\_\_\_ Prophylactic TIG dosage (units): \_\_\_\_\_

Were there signs of infection at the time of care for the acute wound or injury?  Yes  No  Unknown

If NO acute injury, identify associated condition:  Abscess  Ulcer  Blister  Gangrene  Cellulitis  Cancer  
 Dental Infection/Gingivitis  Ear Infection  Injection Drug Use  Other, specify \_\_\_\_\_

Was medical care obtained for the non-acute condition before tetanus symptom onset?  Yes  No If YES, date wound occurred: \_\_\_/\_\_\_/\_\_\_

Was tetanus toxoid (Td, TT, DT, DTaP) administered for the non-acute condition before tetanus symptom onset?  Yes  No  Unknown

Date patient received tetanus toxoid (Td, TT, DT, DTaP): \_\_\_/\_\_\_/\_\_\_

**Treatment of Tetanus:**

Was wound infected at the time of tetanus diagnosis?  Yes  No  Unknown

Was TETANUS IMMUNE GLOBULIN therapy given?  Yes  No  Unknown Date received: \_\_\_/\_\_\_/\_\_\_

Final outcome:  Recovered  Convalescing  Died If deceased, DATE: \_\_\_/\_\_\_/\_\_\_

Was a tetanus antibody test performed?  Yes  No  Unknown Date of tetanus antibody test: \_\_\_/\_\_\_/\_\_\_

Result of tetanus antibody test : \_\_\_\_\_ IU/mL (.01 thru 100):

**VACCINE HISTORY:** *CDC Objective: 90% of pertussis cases must have a vaccination history reported.*

TETANUS TOXOID history **PRIOR** to tetanus disease (**EXCLUDE** doses received since acute injury)

Never Vaccinated  1 Dose  2 Doses  3 Doses  4 Doses  Unknown Date of last dose: : \_\_\_/\_\_\_/\_\_\_

Interval since last **TETANUS TOXOID** dose: \_\_\_\_\_ years

If the patient is unsure about his/her tetanus vaccination history, did the patient have:  Immunizations in childhood?  Immunizations for school?  
 Immunizations for work?  Immunizations for military?  Immunizations for travel?  Immunizations for immigration?  
 Immunizations for other reasons?

If patient never received tetanus vaccination, give reason: \_\_\_\_\_

**Epidemiological:**

Was the patient born in the U.S.?  Yes  No  Unknown If not U.S. born, patient's birth country: \_\_\_\_\_

Occupation: \_\_\_\_\_

Diabetes?  Yes  No  Unknown If YES, insulin-dependent diabetes?  Yes  No  Unknown

Intravenous drug abuse?  Yes  No  Unknown

*CDC Objective: 85% of vaccine preventable cases must be investigated and reported to the CDC within 30 days of initial report.*

Date Investigation Started: \_\_\_/\_\_\_/\_\_\_ Date Investigation Completed: \_\_\_/\_\_\_/\_\_\_ Date Reported to DSHS: \_\_\_/\_\_\_/\_\_\_

Investigator's Name: \_\_\_\_\_ Jurisdiction: \_\_\_\_\_ Phone : ( ) \_\_\_\_\_

Closed in NBS?  Yes  No If confirmed or probable, notification submitted?  Yes  No

**COMMENTS:**



## VARICELLA (chickenpox) Reporting Form

Please use this form to report cases of varicella to your local or regional health office, or you can fax a copy of this document to the Texas Department of State Health Services in Austin at (512) 776-7616 at the end of every week. Please complete as many of the questions as possible. A report can still be submitted if all questions cannot be answered.

Onset Date ____/____/____  Last day of school attended ____/____/____	History of Disease?                      Yes      No                      Date of Disease ____/____/____  Vaccinated against Varicella?            Yes      No                      Number of Doses Received?    1      2  Date(s) Varicella Vaccine Administered:    (1) ____/____/____    (2) ____/____/____			
LAST NAME	FIRST	DOB	AGE	SEX
ADDRESS		CITY		ZIP CODE
PHONE		RACE		HISPANIC? Yes                      No
Is this patient a contact to another known Varicella case? Name of contact:  Phone:	Was the patient hospitalized?  Yes                      No		Did the patient have a fever? Yes                      No Date:	
Was lab testing done for Varicella?    Yes      No Lab test: DFA    PCR    IgM    IgG    Other  Date: _____                      Result:	Number of lesions in total: <i>(circle number of lesions)</i>  <50                      50-249  250-499                      500+		Did the patient attend daycare/after school care? Yes                      No Name of Facility:	
Ordering Physician:				

Onset Date ____/____/____  Last day of school attended ____/____/____	History of Disease?                      Yes      No                      Date of Disease ____/____/____  Vaccinated against Varicella?            Yes      No                      Number of Doses Received?    1      2  Date(s) Varicella Vaccine Administered:    (1) ____/____/____    (2) ____/____/____			
LAST NAME	FIRST	DOB	AGE	SEX
ADDRESS		CITY		ZIP CODE
PHONE		RACE		HISPANIC? Yes                      No
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Was lab testing done for Varicella?    Yes      No Lab test: DFA    PCR    IgM    IgG    Other  Date: _____                      Result:	Number of lesions in total: <i>(circle number of lesions)</i>  <50                      50-249  250-499                      500+		Did the patient attend daycare/after school care? Yes                      No Name of Facility:	
Ordering Physician:				

Name of Person Reporting: \_\_\_\_\_ PHONE: \_\_\_\_\_

Agency/Organization Name: \_\_\_\_\_

Address: \_\_\_\_\_

CITY: \_\_\_\_\_ ZIP: \_\_\_\_\_ COUNTY: \_\_\_\_\_

DATE REPORTED: \_\_\_\_\_

Name \_\_\_\_\_ Hospital Record Number \_\_\_\_\_
LAST / FIRST / MIDDLE
Current Address \_\_\_\_\_ Reporting Physician/ Nurse/Hospital/ Clinic/Lab \_\_\_\_\_
NUMBER / STREET / APT. NUMBER
CITY / COUNTY / STATE ZIP CODE ADDRESS
Telephone: Home \_\_\_\_\_ Work \_\_\_\_\_ Telephone Number \_\_\_\_\_
AREA CODE + 7 DIGITS AREA CODE + 7 DIGITS AREA CODE + 7 DIGITS

Detach here — Transmit only lower portion if sent to CDC

VARICELLA DEATH INVESTIGATION WORKSHEET

Form Approved OMB No. 0920-0007 Exp. Date 7/31/2007

Reported by: State \_\_\_\_\_ Case Number \_\_\_\_\_

DEMOGRAPHIC DATA

1. Date of Birth [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
MONTH DAY YEAR
2. Current Age [ ] [ ] [ ] (Unknown=999)
3. Age Type [ ] Years [ ] Days [ ] Hours
[ ] Months [ ] Weeks [ ] Unknown
4. Current Sex [ ] Male [ ] Female [ ] Unknown
5. Ethnicity [ ] Hispanic [ ] Not Hispanic [ ] Unknown
6. Race [ ] American Indian or Alaska Native
[ ] Asian [ ] Black or African-American
[ ] Native Hawaiian or Other Pacific Islander
[ ] White [ ] Other [ ] Unknown

7. Date of Death [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
MONTH DAY YEAR
8. Country of Birth \_\_\_\_\_
9. If not born in the U.S., case lived in U.S. for [ ] [ ] years.
10. Occupation
[ ] Healthcare Worker
[ ] Teacher
[ ] Day Care Worker
[ ] Military Personnel
[ ] College Student
[ ] Staff in Institutional Setting (e.g., Correctional Facility)
[ ] Other (specify) \_\_\_\_\_

MEDICAL HISTORY

Y=Yes N=No U=Unknown

11. History of varicella before this infection? [ ] Y [ ] N [ ] U
12. If yes, age at infection? [ ] [ ] [ ] (Unknown=999)
13. Age Type [ ] Years [ ] Days [ ] Hours
[ ] Months [ ] Weeks [ ] Unknown
14. History of serologic evidence of immunity? [ ] Y [ ] N [ ] U
15. Varicella Vaccine History [ ] Vaccinated
[ ] Not Vaccinated
[ ] Unknown
16. If vaccinated
Date Dose 1 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
MONTH DAY YEAR
Date Dose 2 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
MONTH DAY YEAR
17. If not vaccinated, was there a contraindication to vaccination? [ ] Y [ ] N [ ] U
If yes, specify \_\_\_\_\_
18. Type of contraindication
[ ] Medical [ ] Philosophical
[ ] Religious [ ] Other \_\_\_\_\_

19. Pre-existing conditions? [ ] Y [ ] N [ ] U
(Check all that apply)
[ ] Cancer Type: \_\_\_\_\_
[ ] Transplant Recipient Organ: \_\_\_\_\_
[ ] Immune Deficiency Type: \_\_\_\_\_
[ ] Pregnancy
[ ] Chronic Renal Failure
[ ] Diabetes Mellitus
[ ] Tuberculosis
[ ] Asthma
[ ] Chronic Lung Disease Specify: \_\_\_\_\_
[ ] Chronic Dermatologic Disorder Specify: \_\_\_\_\_
[ ] Chronic Autoimmune Disease (e.g., Lupus, Rheumatoid Arthritis) Specify: \_\_\_\_\_
[ ] Other Specify: \_\_\_\_\_
20. For a child <1 year old, did his/her mother have a history of varicella? [ ] Y [ ] N [ ] U
21. For a child <1 year old, did his/her mother have a history of receipt of varicella vaccine? [ ] Y [ ] N [ ] U
22. Is this death the result of congenital varicella infection? [ ] Y [ ] N [ ] U
23. In the month prior to rash onset, did the decedent take any of the following?
Systemic Steroids [ ] Y [ ] N [ ] U
Name of Steroid: \_\_\_\_\_
Dose: [ ] [ ] mg/day
Inhaled Steroids [ ] Y [ ] N [ ] U
Name of Steroid: \_\_\_\_\_
Dose: [ ] [ ] mg/day
Other Systemic Medication [ ] Y [ ] N [ ] U
List medication
1) \_\_\_\_\_ 3) \_\_\_\_\_
2) \_\_\_\_\_ 4) \_\_\_\_\_



Public reporting burden of this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer, 1600 Clifton Road NE, MS D-74 Atlanta, Georgia 30333; ATTN: PRA (0920-0007).

**ILLNESS PRIOR TO DEATH**

Y=Yes N=No U=Unknown

24. **Rash Onset Date**          
MONTH DAY YEAR
25. **Was the rash generalized?**  Y  N  U
26. **When first noted, did rash lesions seem to cluster on one side of the body?**  Y  N  U
- If "yes," were lesions clustered on one limited area of the body involving no more than 3 dermatomes?**  Y  N  U
- If "yes," which area? (check all that apply)**
- Face/Head  
 Arms  
 Legs  
 Trunk  
 Inside Mouth  
 Other (Specify) \_\_\_\_\_

27. **Was the case hospitalized?**  Y  N  U
- Admission Date**          
MONTH DAY YEAR

*If obtainable, please attach a copy of the hospital discharge summary.*

**COMPLICATIONS (check all that apply)**

28.  **Secondary Infection**
- From*  Strep  
 Group A beta-hemolytic  
 Other type  
 Unknown type
- Staph  
 MRSA  
 Other (Specify) \_\_\_\_\_
- Mixed  
 Other (Specify) \_\_\_\_\_
- Type of Infection*
- Cellulitis  
 Osteomyelitis  
 Impetigo/Infected Skin Lesions  
 Necrotizing Fasciitis  
 Lymphadenitis  
 Toxic Shock Syndrome  
 Abscess  
 Sepsis/Septicemia  
 Septic Arthritis  
 Other (Specify) \_\_\_\_\_

29.  **Pneumonia/Pneumonitis**  
*Etiology, if known* \_\_\_\_\_

30.  **Neurologic Complications**
- Cerebellitis/Ataxia  
 Encephalitis  
 Other (Specify) \_\_\_\_\_

31.  **Reye's Syndrome**

32.  **Other (Specify)** \_\_\_\_\_

**TREATMENT - MEDICATIONS (check all that apply)**

33.  **Acyclovir**
- Oral** Dose     mg/day  
Start Date          
MONTH DAY YEAR  
Duration    days
- IV** Dose     mg/day  
Start Date          
MONTH DAY YEAR  
Duration    days

34.  **Famciclovir**
- Dose     mg/day  
Start Date          
MONTH DAY YEAR  
Duration    days

35.  **Valacyclovir**
- Dose     mg/day  
Start Date          
MONTH DAY YEAR  
Duration    days

36.  **Varicella Zoster Immune Globulin (VZIG)**
- Dose     U's  
Date Admin'd          
MONTH DAY YEAR

37.  **Aspirin**

38.  **Non-Steroidal Anti-Inflammatory Drugs (i.e., ibuprofen)**

continues

39. Was laboratory testing done for varicella? If "yes":  Y  N  U

40. Direct fluorescent antibody (DFA) technique?  Y  N  U

Date of DFA          
MONTH DAY YEAR

DFA Result  Positive  Pending  
 Negative  Not Done  
 Indeterminate  Unknown

41. PCR specimen?  Y  N  U

Date of PCR Specimen          
MONTH DAY YEAR

Source of PCR specimen: (check all that apply)  
 Vesicular Swab  Saliva  
 Scab  Blood  
 Tissue Culture  Urine  
 Buccal Swab  Macular Scraping  
 Other \_\_\_\_\_

PCR Result  Varicella Positive  Not Done  
 Varicella Negative  Pending  
 Indeterminate  Unknown  
 Other \_\_\_\_\_

Was the PCR specimen adequate (i.e., was it actin positive)?  Y  N  U

42. Culture performed?  Y  N  U

Date of Culture Specimen          
MONTH DAY YEAR

Culture Result  Positive  Pending  
 Negative  Not Done  
 Indeterminate  Unknown

43. Was other laboratory testing done? If "yes":  Y  N  U

Specify Other Test  Tzanck smear  
 Electron microscopy

Date of Other Test          
MONTH DAY YEAR

Other Lab Test Result  Positive (results consistent with varicella infection)  
 Negative  Not Done  
 Indeterminate  Unknown  
 Pending

Test Result Value \_\_\_\_\_

44. Serology performed?  Y  N  U

45. IgM performed? If "yes":  Y  N  U

Type of IgM Test  Capture ELISA  Unknown  
 Indirect ELISA  Other \_\_\_\_\_

Date IgM Specimen Taken          
MONTH DAY YEAR

IgM Test Result  Positive  Pending  
 Negative  Not Done  
 Indeterminate  Unknown

Test Result Value \_\_\_\_\_

46. IgG performed? If "yes":  Y  N  U

Type of IgG Test:

Whole Cell ELISA (specify manufacturer): \_\_\_\_\_

gp ELISA (specify manufacturer): \_\_\_\_\_

FAMA  Latex Bead Agglutination

Other \_\_\_\_\_

Date of IgG-Acute          
MONTH DAY YEAR

IgG-Acute Result  Positive  Pending  
 Negative  Not Done  
 Indeterminate  Unknown

Test Result Value \_\_\_\_\_

Date of IgG-Convalescent          
MONTH DAY YEAR

IgG-Conv. Result  Positive  Pending  
 Negative  Not Done  
 Indeterminate  Unknown

Test Result Value \_\_\_\_\_

47. Were the clinical specimens sent to CDC for genotyping (molecular typing)? If "yes":  Y  N  U

Date sent for genotyping          
MONTH DAY YEAR

48. Was specimen sent for strain (wild- or vaccine-type) identification?  Y  N  U

Strain Type  Wild Type Strain  
 Vaccine Type Strain  
 Unknown

49. Any herpes simplex virus testing performed? If "yes":  Y  N  U

Type of Test \_\_\_\_\_

Date of Other Test          
MONTH DAY YEAR

Test Result  Positive  Pending  
 Negative  Unknown  
 Indeterminate

**It can be difficult to distinguish varicella from disseminated herpes zoster (shingles). Serum or blood** obtained from the decedent prior to or early in illness (i.e., weeks before to ~4 days after rash onset) could be used to test for evidence of prior varicella infection, which could sometimes help distinguish these two conditions. **If there is doubt whether the cause of death was related to varicella or to disseminated herpes zoster, an effort should be made as soon as possible to determine whether any such blood or serum specimens may be available.** For instance, serum specimens at hospital laboratories or a blood banks may be retained for many weeks.

HOSPITAL DISCHARGE		Y=Yes	N=No	U=Unknown
50. Discharge summary information available?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
51. Varicella included among diagnoses?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
52. Discharge Diagnoses	ICD-9 Code			
a. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	d. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
b. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	e. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
c. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	f. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
		g. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
		h. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
		i. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
		j. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	

POST-MORTEM EXAM		Y=Yes	N=No	U=Unknown
53. Post-mortem exam done?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
54. Varicella included among diagnoses?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
55. If evidence of varicella, significant findings related to varicella-zoster virus infection, by organ system:				
a. Organ _____				
Findings _____				
b. Organ _____				
Findings _____				
c. Organ _____				
Findings _____				
d. Organ _____				
Findings _____				
e. Organ _____				
Findings _____				
f. Other _____				

DEATH CERTIFICATE		Y=Yes	N=No	U=Unknown
56. Death certificate available?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
57. Varicella included as one cause of death?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
58. Cause of Death	ICD-9 Code	Contributing Conditions		
a. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	a. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
b. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	b. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
c. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	c. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	
d. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	d. _____	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/>	

SOURCE		Y=Yes	N=No	U=Unknown
59. Case had close contact with a person with known or suspected infection 10-21 days before rash onset?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
60. Source had	<input type="checkbox"/> Shingles <input type="checkbox"/> Varicella <input type="checkbox"/> Unknown			
61. Current Age	<input type="text"/> <input type="text"/> <input type="text"/> (Unknown=999)			
62. Age Type	<input type="checkbox"/> Years <input type="checkbox"/> Days <input type="checkbox"/> Hours <input type="checkbox"/> Months <input type="checkbox"/> Weeks <input type="checkbox"/> Unknown			
63. Varicella vaccine history of source	<input type="checkbox"/> Source vaccinated <input type="checkbox"/> Source not vaccinated			
64. If not vaccinated, source had contraindication to vaccination?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
If yes, specify _____				
65. Transmission Setting (Setting of Exposure)	<input type="checkbox"/> Athletics <input type="checkbox"/> Hospital Outpatient Clinic <input type="checkbox"/> College <input type="checkbox"/> Hospital Ward <input type="checkbox"/> Community <input type="checkbox"/> International Travel <input type="checkbox"/> Correctional Facility <input type="checkbox"/> Military <input type="checkbox"/> Daycare <input type="checkbox"/> Place of Worship <input type="checkbox"/> Doctor's Office <input type="checkbox"/> School <input type="checkbox"/> Home <input type="checkbox"/> Hospital ER <input type="checkbox"/> Hospital ER <input type="checkbox"/> Work <input type="checkbox"/> Other _____ <input type="checkbox"/> Unknown			
66. If transmission was in the home	<input type="checkbox"/> Transmission from family member by adoption <input type="checkbox"/> Transmission from family member biologically related			
67. Any international travel in the 4 weeks prior to illness?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U			
If yes, what dates? _____				
What country(ies)? _____				



**Respiratory Disease Outbreak Summary Form**

Report type:  Initial or preliminary  Updated  Final Report date \_\_\_/\_\_\_/\_\_\_

**BASIC INFORMATION**

Primary investigating health department (HD): \_\_\_\_\_ Date HD first notified: \_\_\_/\_\_\_/\_\_\_  
 Name of lead investigator: \_\_\_\_\_ Lead investigator's phone: (\_\_\_\_) \_\_\_\_\_-\_\_\_\_\_  
 Date investigation started: \_\_\_/\_\_\_/\_\_\_ Lead investigator's email: \_\_\_\_\_  
 Other local, state or federal agencies involved with response: \_\_\_\_\_

**OUTBREAK OVERVIEW**

Outbreak name: \_\_\_\_\_ Pathogen, syndrome or suspected etiology: \_\_\_\_\_  
 Geographical distribution of the outbreak (Cities/counties involved): \_\_\_\_\_  
 In what setting did the outbreak occur? (Check all that apply):  Community  Correctional facility  School (K-12)  College  Cruise ship  
 Child care facility  Summer camp  Business (non-healthcare)  Long term care facility (nursing home)  Hospital or clinic  
 Other (specify): \_\_\_\_\_  
 If facility based, name of facility: \_\_\_\_\_ City: \_\_\_\_\_

Case definitions\*

Confirmed case:	
Probable case:	
Suspect case:	

\*Please write in the case criteria used for the outbreak. If the clinical portion of the case criteria is the same as the case criteria for reporting a notifiable condition just include the additional information used to associate the case with this outbreak (e.g., person, place, time).

**CASE INFORMATION**

Date first case became ill: \_\_\_/\_\_\_/\_\_\_ Date most recent case became ill: \_\_\_/\_\_\_/\_\_\_ Average length of illness: \_\_\_\_\_  
 If applicable, describe identified exposure (e.g. setting, equipment item, procedure, etc.): \_\_\_\_\_  
 Date of first exposure (if applicable): \_\_\_/\_\_\_/\_\_\_ Date of most recent exposure (if applicable): \_\_\_/\_\_\_/\_\_\_

Case summary table:		Primary cases		Exposed (cases and non-cases)*		Secondary cases
		Residents / patients / inmates / students / attendees	Employees / staff / faculty / volunteers	Residents / patients / inmates / students / attendees	Employees / staff / faculty / volunteers	Cases among family members, friends, or other contacts not associated with the primary outbreak setting
The information from this table can be used to calculate attack rates and assess severity						
Total numbers:						
Case status	# of confirmed cases:					
	# of probable cases:					
	# of suspect cases:					
Severity	# of people hospitalized:					
	# of people who died:					
Lab	# of specimens tested:					
	# of specimens positive:					

\*e.g., number of persons on ship, number of residents in nursing home or affected ward, number of students in classroom, etc.



**CASE INFORMATION CONTINUED**

Number of people in sex and age group categories by case status	Confirmed cases	Probable cases	Suspect cases
Male			
Female			
Unknown sex			
<1 year old			
1 to 4 years old			
5 to 9 years old			
10 to 17 years old			
18 to 24 years old			
25 to 49 years old			
50 to 64 years old			
65+ years old			
Unknown age			

**SYMPTOMS**

Total number of people with each symptom by case status	Confirmed cases	Probable cases	Suspect cases
Cough			
Fever			
Sore throat			
Pneumonia			
Other: _____			
Other: _____			
Other: _____			
Other: _____			
Other: _____			
Other: _____			
Other: _____			
Other: _____			

**LABORATORY DATA** *If needed, attach a summary of additional tests conducted to this report.*

Were clinical specimens collected for testing?  Yes  No  Unknown      Were specimens sent to DSHS?  Yes  No  Unknown

Test name	Total # of people tested	Total # of people negative	Total # of residents / patients / inmates / students / attendees positive	Total # of employees / staff / faculty / volunteers positive	Total # of secondary cases positive	Pathogen identified
Test 1: _____						
Test 2: _____						
Test 3: _____						
Test 4: _____						

**ACTIONS TAKEN BY HEALTH DEPARTMENT** (check all that apply and if applicable indicate the date first done):

- Provided or reviewed prevention and control guidance \_\_\_/\_\_\_/\_\_\_       Interviewed cases       Activated ICS on \_\_\_/\_\_\_/\_\_\_
- Conducted a site visit on \_\_\_/\_\_\_/\_\_\_       Notified a regulatory agency on \_\_\_/\_\_\_/\_\_\_       Conducted active case finding
- Conducted a case-control study       Conducted a cohort study       Collected clinical samples       Collected environmental samples
- Reviewed medical records       Other (specify): \_\_\_\_\_       Other (specify): \_\_\_\_\_
- Other (specify): \_\_\_\_\_       Other (specify): \_\_\_\_\_       None

**CONTROL MEASURES IMPLEMENTED** (check all that apply)

*If needed, attach a list of implemented control measures to this report.*

- Isolation of ill       Cohorting of ill/exposed and well       Movement of staff limited       Educational materials provided to facility
- Educational materials distributed or displayed by facility       Facility modified procedures       Health alert sent       Facility closed
- Vaccinations recommended       Vaccinations given       Prophylaxis given, specify what was given: \_\_\_\_\_
- Other (specify): \_\_\_\_\_       Other (specify): \_\_\_\_\_       None

Date control measures were first implemented: \_\_\_/\_\_\_/\_\_\_

**SUPPLEMENTAL INFORMATION INCLUDED WITH THIS REPORT** (check all that apply):

Total pages attached: \_\_\_\_\_

- Copies of interview forms       Line list       Written outbreak report or after action report       Epi curve       Environmental or sanitation report
- Educational materials       Other (specify): \_\_\_\_\_       Other (specify): \_\_\_\_\_       None



# **APPENDIX C: Resources**

## INVASIVE, RESPIRATORY AND VACCINE PREVENTABLE DISEASE RESOURCES

### DSHS Disease Investigation Tools/Resources:

- Invasive, Respiratory and Vaccine Preventable Disease Guidelines: [www.dshs.state.tx.us/idcu/health/vaccine\\_preventable\\_diseases/resources/vpd\\_guide.pdf](http://www.dshs.state.tx.us/idcu/health/vaccine_preventable_diseases/resources/vpd_guide.pdf)
- DSHS Reporting Forms: [www.dshs.state.tx.us/idcu/investigation/forms/](http://www.dshs.state.tx.us/idcu/investigation/forms/)
- VPD Investigation Forms: [www.dshs.state.tx.us/idcu/health/vaccine\\_preventable\\_diseases/forms/](http://www.dshs.state.tx.us/idcu/health/vaccine_preventable_diseases/forms/)
- Other Investigation Forms: [www.dshs.state.tx.us/idcu/investigation/#E](http://www.dshs.state.tx.us/idcu/investigation/#E)
- Notifiable Conditions List: [www.dshs.state.tx.us/idcu/investigation/conditions/](http://www.dshs.state.tx.us/idcu/investigation/conditions/)
- Epi Case Criteria Guide: [www.dshs.state.tx.us/idcu/investigation/forms/EpiCaseGuide.pdf](http://www.dshs.state.tx.us/idcu/investigation/forms/EpiCaseGuide.pdf)
- NBS (NEDSS) Data Entry Guidelines: [https://txnedss.dshs.state.tx.us:8009/PHINDox/UserResources/Data\\_Entry\\_Guidelines\\_2007.pdf](https://txnedss.dshs.state.tx.us:8009/PHINDox/UserResources/Data_Entry_Guidelines_2007.pdf)
- Laboratory Submission Guide: [www.dshs.state.tx.us/lab/MRS\\_labtests\\_toc.shtm](http://www.dshs.state.tx.us/lab/MRS_labtests_toc.shtm)
- NORS Outbreak Reporting Form: <http://www.cdc.gov/healthywater/statistics/wbdoss/nors/forms.html>
- CDC Hypothesis-Generating Form: [www.cdc.gov/legionella/files/hypothesis-generating-questionnaire.pdf](http://www.cdc.gov/legionella/files/hypothesis-generating-questionnaire.pdf)
- CDC Environmental Assessment Form: [www.cdc.gov/legionella/files/EnvironmentalAssessmentInstrument.pdf](http://www.cdc.gov/legionella/files/EnvironmentalAssessmentInstrument.pdf)
- Texas Influenza Surveillance Handbook: [www.dshs.state.tx.us/idcu/disease/influenza/Texas-Influenza-Surveillance-Handbook/](http://www.dshs.state.tx.us/idcu/disease/influenza/Texas-Influenza-Surveillance-Handbook/)

### Texas Department of State Health Services:

- Main Agency Website: [www.dshs.state.tx.us/](http://www.dshs.state.tx.us/)
- Emerging and Acute Infectious Disease Branch: [www.dshs.state.tx.us/idcu/health/ideas/](http://www.dshs.state.tx.us/idcu/health/ideas/)
- Hepatitis B Perinatal Prevention Program: [www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis\\_b/perinatal/](http://www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis_b/perinatal/)
- Immunization Branch: [www.ImmunizeTexas.com](http://www.ImmunizeTexas.com)

- Infectious Disease Control Unit: [www.texasdisease.org](http://www.texasdisease.org)
- Recommended Immunization Schedules:  
[www.dshs.state.tx.us/immunize/schedule/default.shtm](http://www.dshs.state.tx.us/immunize/schedule/default.shtm)
- School & Child-Care Facility Requirements:  
[www.dshs.state.tx.us/immunize/school/default.shtm](http://www.dshs.state.tx.us/immunize/school/default.shtm)
- Texas Administrative Code (TAC), Title 25 Health Services, §§97.1-97.14:  
[http://info.sos.state.tx.us/pls/pub/readtac\\$ext.ViewTAC?tac\\_view=5&ti=25&pt=1&ch=97&sch=A&rl=Y](http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=25&pt=1&ch=97&sch=A&rl=Y)
- Vaccine Adverse Event Reporting System (VAERS):  
[www.dshs.state.tx.us/immunize/safety/vaersweb.shtm](http://www.dshs.state.tx.us/immunize/safety/vaersweb.shtm)
- Vaccine Preventable Diseases Main Page:  
[www.dshs.state.tx.us/idcu/health/vaccine\\_preventable\\_diseases/](http://www.dshs.state.tx.us/idcu/health/vaccine_preventable_diseases/)

**Centers for Disease Control and Prevention:**

- CDC Vaccine Preventable Diseases: [www.cdc.gov/vaccines/vpd-vac/default.htm](http://www.cdc.gov/vaccines/vpd-vac/default.htm)
- Manual for the Surveillance of Vaccine Preventable Diseases:  
[www.cdc.gov/vaccines/pubs/surv-manual/index.html](http://www.cdc.gov/vaccines/pubs/surv-manual/index.html)
- Morbidity and Mortality Weekly Report (MMWR): [www.cdc.gov/mmwr/](http://www.cdc.gov/mmwr/)
- Epidemiology and Prevention of Vaccine Preventable Disease (Pink Book):  
[www.cdc.gov/vaccines/pubs/pinkbook/default.htm](http://www.cdc.gov/vaccines/pubs/pinkbook/default.htm)
- Epidemiology & Prevention of Vaccine-Preventable Diseases 2011 (EpiVac) Web-On-Demand Modules: [www.cdc.gov/vaccines/ed/epivac/default.htm](http://www.cdc.gov/vaccines/ed/epivac/default.htm)
- Recommendations of the Advisory Committee on Immunization Practices (ACIP) Influenza Prevention and Control Recommendations:  
[www.cdc.gov/flu/professionals/acip/index.htm](http://www.cdc.gov/flu/professionals/acip/index.htm)
- Centers for Disease Control and Prevention Strep Pneumo information:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/streppneum\\_t.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/streppneum_t.htm)
- Centers for Disease Control and Prevention GAS information:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal\\_a.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_a.htm)

### **Additional Useful Links/Resources:**

- Control of Communicable Diseases Manual (19<sup>th</sup> Edition). Heymann, D.L. (Ed). American Public Health Association: Washington; 2008.  
[www.unboundmedicine.com/ccdm/ub](http://www.unboundmedicine.com/ccdm/ub) (A subscription is required for full online access. If you are in need of a printed book copy, please contact DSHS IDCU.)
- Red Book:  
2012 Report of the Committee on Infectious Diseases (29<sup>th</sup> Edition). Pickering LK, Baker CJ, Kimberlin DW, Long SS (Eds). American Academy of Pediatrics: Elk Grove Village, IL; 2009. [aapredbook.aappublications.org/](http://aapredbook.aappublications.org/) (A subscription is required for full online access. If you are in need of a printed book copy, please contact DSHS IDCU.)
- Hepatitis B Foundation: [www.hepb.org/](http://www.hepb.org/)
- Immunization Action Coalition: [www.immunize.org/](http://www.immunize.org/)
- Viral Hepatitis Serology Training Online:  
[www.cdc.gov/hepatitis/Resources/Professionals/Training/Serology/training.htm](http://www.cdc.gov/hepatitis/Resources/Professionals/Training/Serology/training.htm)
- Prevention of Invasive Group A Streptococcal Disease among Household Contacts of Case Patients and among Postpartum and Postsurgical Patients: Recommendations from the Centers for Disease Control and Prevention:  
<http://cid.oxfordjournals.org/content/35/8/950.long>
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) guidance: [www.techstreet.com/cgi-bin/detail?product\\_id=232891](http://www.techstreet.com/cgi-bin/detail?product_id=232891)
- Texas Legionellosis Task Force Guidance:  
[www.dshs.state.tx.us/idcu/disease/legionnaires/taskforce/](http://www.dshs.state.tx.us/idcu/disease/legionnaires/taskforce/)

## APPENDIX III

TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Infectious Disease Control Unit



# Epi Case Criteria Guide, 2013

# Epi Case Criteria Guide, 2013

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## ***Editor:***

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Michael Fischer, MD, MPH & TM

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Revised: March 2013





## UPDATES AND REVISIONS MADE FROM THE 2012 TO THE 2013 EPI CASE CRITERIA GUIDE:

### Diseases notifiable as of December 2012, (not notifiable in the 2012 guide) (*Title 25, Texas Administrative Code, Chapter 97, Subchapter A, Control of Communicable Diseases*):

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>▪ Amebic meningitis/encephalitis* (Amebic meningitis/encephalitis, other AND Amebic meningoencephalitis, primary)</li> <li>▪ <i>Anaplasma phagocytophilum</i></li> <li>▪ Babesiosis</li> <li>▪ Chagas disease, acute</li> <li>▪ Chagas disease, chronic</li> <li>▪ Influenza A - novel/variant</li> <li>▪ Poliovirus infection, non-paralytic</li> </ul> | <p>*The Texas Administrative Code (TAC) now lists “amebic meningitis/encephalitis” as a notifiable condition. Two categories have been assigned to satisfy the administrative code’s mandate and intent. “Primary amebic meningoencephalitis (PAM)” will retain its condition code but now is referred to as “amebic meningoencephalitis, primary (PAM).” All other amebic meningitis/encephalitis cases including granulomatous amebic encephalitis (GAE) will be classified as amebic meningitis / encephalitis other” which will retain the previous condition code of GAE.</p> |
|---|--|

### Diseases removed from the guide and are not reportable (unless they meet the inclusion criteria of a reportable disease including outbreaks, exotic diseases, and unusual expression of disease):

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>▪ Aseptic meningitis*</li> <li>▪ Bacterial &amp; other meningitis*</li> <li>▪ Coccidioidomycosis</li> <li>▪ Encephalitis, Nonarboviral*</li> </ul> | <ul style="list-style-type: none"> <li>▪ Hepatitis non-ABC, acute*</li> <li>▪ Hepatitis Delta co- or super-infection, acute (Hepatitis D)*</li> <li>▪ Hepatitis C virus infection, chronic (past or present)</li> <li>▪ <i>Streptococcus</i>, other, invasive, beta-hemolytic</li> </ul> |
|---|--|

\*Removed from TAC as of December 2012

### Changes in nomenclature:

- |  |    |   |
|--|----|---|
| ▪ <i>Escherichia coli</i> , Shiga toxin-producing (STEC) .....                         | TO | Shiga toxin-producing <i>Escherichia coli</i> (STEC)        |
| ▪ Granulomatous amebic encephalitis (GAE) .....  | TO | Amebic meningitis, other                                    |
| ▪ Group A <i>Streptococcus</i> , invasive (GAS) .....                                  | TO | <i>Streptococcus</i> , invasive Group A (GAS)               |
| ▪ Group B <i>Streptococcus</i> , invasive (GBS) .....                                  | TO | <i>Streptococcus</i> , invasive Group B (GBS)               |
| ▪ Influenza A – novel viral infections .....   | TO | Influenza A, novel/variant                                  |
| ▪ Primary amebic meningoencephalitis (PAM) .....                                       | TO | Amebic meningoencephalitis, primary (PAM)                   |
| ▪ <i>Staphylococcus aureus</i> , coagulase-positive, vancomycin-resistant (VRSA) ..... | TO | Vancomycin-resistant <i>Staphylococcus aureus</i> (VRSA)    |
| ▪ <i>Staphylococcus aureus</i> , vancomycin-intermediate susceptibility (VISA) ....    | TO | Vancomycin-intermediate <i>Staphylococcus aureus</i> (VISA) |

### Disease specific revisions: description of condition (DC), case criteria (C), laboratory confirmation tests (L)

- |   |            |   |            |
|---|------------|---|------------|
| ▪ Amebiasis .....                                 | DC & C     | ▪ Diphtheria .....                                    | C          |
| ▪ Amebic meningitis/encephalitis, other .....     | DC & L     | ▪ Hepatitis E, acute .....                            | DC         |
| ▪ Amebic meningoencephalitis, primary (PAM) ..... | DC & L     | ▪ Influenza-associated pediatric mortality .....      | DC         |
| ▪ Campylobacteriosis .....                        | C & L      | ▪ Influenza A-novel/variant viral infections .....    | DC, C, & L |
| ▪ Chagas disease, acute .....                     | DC, C, & L | ▪ Influenza, human isolates .....                     | L          |
| ▪ Chagas disease, chronic .....                   | DC, C, & L | ▪ Measles .....                                       | DC, C, & L |
| ▪ Creutzfeldt-Jakob disease .....                 | DC         | ▪ Severe acute respiratory syndrome (SARS) .....      | DC, C, & L |
| ▪ Cryptosporidiosis .....                         | C & L      | ▪ <i>Streptococcus</i> , invasive Group A (GAS) ..... | DC & L     |
| ▪ Cyclosporiasis .....                            | C & L      | ▪ <i>Streptococcus</i> , invasive Group B (GBS) ..... | L          |

**NOTE: The following are not notifiable (unless they meet the inclusion criteria of a reportable disease including outbreaks, exotic diseases, and unusual expression of disease) and have been included in the 2013 guide for ease of access to their case definition:**

- |                             |  |                                      |
|-----------------------------|--|--------------------------------------|
| ▪ Influenza, human isolates | ▪ <i>Staphylococcus aureus</i> , coagulase-positive, methicillin-or oxacillin-resistant (MRSA) | ▪ Streptococcal toxic-shock syndrome |
| ▪ Norovirus                 |  |                                      |

# TABLE OF CONTENTS



This document provides infectious disease information for surveillance and data entry staff. It contains a table with condition codes, condition names, and case criteria to aid in the classification and coding of conditions. It is organized alphabetically by condition name. Conditions specified as reportable in [Title 25, Texas Administrative Code, Chapter 97, Subchapter A, Control of Communicable Diseases](#) are in **bold type**. Click on a condition in the table of contents to go to the text and on the condition code to move back.

<i>Editor:</i> .....	<i>ii</i>
<i>Contributors:</i> .....	<i>ii</i>
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## Definition of Terms

**Clinically compatible case:** Medical history and/or signs and symptoms generally compatible with the disease, as described in the clinical description

**Confirmed case:** A case that is classified as confirmed for reporting purposes

**Epidemiologically linked case:** A case in which a) the patient has had contact with one or more persons who either have/had the disease or have been exposed to a point source of infection (i.e., a single source of infection, such as an event leading to a foodborne-disease outbreak, to which all confirmed case-patients were exposed) and b) transmission of the agent by the usual modes of transmission is plausible

❖ A case can be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory confirmed.

**Laboratory-confirmed case:** A case that is confirmed by one or more of the laboratory methods listed in the case definition under Laboratory Confirmation Tests. While other laboratory methods can be used in clinical diagnosis, only those listed are accepted as laboratory confirmation for national and state reporting purposes.

**Probable case:** A case that is classified as probable for reporting purposes

**Supportive or presumptive laboratory results:** Specified laboratory results that are consistent with the diagnosis, yet do not meet the criteria for laboratory confirmation

**Suspect case:** A case that is classified as suspect for reporting purposes

**Normally sterile site:** Invasive diseases typically cause significant morbidity and mortality. Sterile sites include:

- blood (excluding cord blood)
- bone or bone marrow
- cerebrospinal fluid (CSF)
- pericardial fluid

- peritoneal fluid
- pleural fluid

The following are also considered sterile sites when certain other criteria are met:

- internal body sites (brain, heart, liver, spleen, vitreous fluid, kidney, pancreas, lymph node or ovary) when the specimen is collected aseptically during a surgical procedure
- joint fluid when the joint surface is intact (no abscess or significant break in the skin)

**Normally sterile sites do not include:**

- Anatomical areas of the body that normally harbor either resident or transient flora (bacteria) including mucous membranes (e.g., throat, vagina), sputum, and skin; abscesses; or localized soft tissue infections

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## ABBREVIATIONS:

### Laboratory Test Abbreviations

CF – Complement fixation  
CLSI- Clinical and Laboratory Standards Institute  
CSF – Cerebrospinal fluid  
DFA – Direct fluorescent antibody  
DNA – Deoxyribonucleic acid  
EEG - Electroencephalogram  
EIA – Enzyme immuno assay  
ELISA – Enzyme-linked immunosorbent assay  
HA – Hemagglutination  
HI – Hemagglutination inhibition  
ID – Immunodiffusion  
IFA – Indirect fluorescent antibody test  
IgG – Immunoglobulin G  
IgM – Immunoglobulin M  
IHA – Indirect hemagglutination  
IHC – Immunohistochemistry  
LA – Latex agglutination  
MA - Microagglutination  
MIC – Minimum inhibitory concentration  
MRI – Magnetic resonance imaging  
NAT – Nucleic acid testing  
PCR – Polymerase chain reaction  
PRNT – Plaque reduction neutralization test  
RIBA – Recombinant immunoblot assay  
RIPA – Radio-immune precipitation assay  
rRT-PCR – Real-time reverse transcriptase polymerase chain reaction  
WB – Western blot

### Hepatitis Test Markers

Hepatitis A – HAV  
Anti-HAV – hepatitis A antibody  
Anti-HAV IgM– hepatitis A IgM antibody  
Hepatitis B – HBV  
HBcAb or anti-HBc – hepatitis B core antibody  
HBc IgM or anti-HBc IgM – hepatitis B core IgM antibody  
HBeAb or anti-HBe – hepatitis B e antibody  
HBeAg – hepatitis B e antigen  
HBsAb or anti-HBs – hepatitis B surface antibody  
HBsAg – hepatitis B surface antigen  
Hepatitis C – HCV  
Anti HCV – hepatitis C antibody  
HCV RNA – hepatitis C nucleic acid  
HCV NAT – hepatitis C nucleic acid testing  
HCV RIBA – hepatitis C recombinant immunoblot assay  
Hepatitis D – HDV  
Anti-HDV – hepatitis D antibody  
Hepatitis E – HEV  
Anti-HEV IgM – hepatitis E IgM antibody

### Other Abbreviations:

ALT - Alanine transaminase  
ARDS - Acute Respiratory Distress Syndrome  
AST –Aspartate transaminase  
CDC – Centers for Disease Control and Prevention  
DSHS –Department of State Health Services  
EAIDB – Emerging and Acute Infectious Disease Branch  
FDA – Food and Drug Administration  
ILI – Influenza-Like Illness  
VHF – Viral hemorrhagic fever

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## NOTES:

### ***Rickettsia* Classification**

The classification of *Rickettsia* into three groups (spotted fever, typhus, and scrub typhus) was based on serology. This grouping has since been confirmed by DNA sequencing except for *R. felis* which is genetically more closely related to the spotted fever group *Rickettsia*. The human pathogens are included in the following conditions. [Spotted fever Rickettsiosis](#) is defined by antigenic group (spotted fever group) and vector (tick). [Murine typhus](#) contains flea-borne species of both the typhus (*Rickettsia typhi*) and spotted fever groups (*Rickettsia felis*). [Epidemic typhus](#) (*Rickettsia prowazekii*) belongs to the typhus group and is louseborne. Scrub typhus (*Orientia tsutsugamushi*, formerly classified as *Rickettsia tsutsugamushi*), a scrub typhus group species transmitted by mites, and rickettsialpox (*Rickettsia akari*), a spotted fever group species transmitted by mites, are not reportable. A table classifying Rickettsial species known to cause disease in humans by antigenic group, disease, primary vector, and reservoir occurrence can be found in the Centers for Disease Control and Prevention, *Traveler's Health Yellow Book* at <http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-5/rickettsial-and-related-infections.aspx>.

### ***Streptococcus* Classification**

Streptococci are facultatively anaerobic, gram-positive organisms that often occur as chains or pairs. There are four different classification systems for *Streptococcus* species, clinical (pyogenic, oral, enteric), hemolysis (alpha-hemolysis, beta-hemolysis, gamma-hemolysis), serological (Lancefield: A-H and K-U), and biochemical (physiological).

#### Lancefield group

Streptococci are subdivided into groups by antibodies that recognize surface antigens. The serologic reactivity of "cell wall" polysaccharide "C" antigens was described by Rebecca Lancefield. Twenty group-specific antigens were established, Lancefield A-H and K-U. Clinically significant Lancefield groups include A, B, C, F, and G. Some streptococci such as *Streptococcus pneumoniae* and the viridans streptococci are Lancefield group nontypeable.

#### Hemolytic reaction

The type of hemolytic reaction displayed on blood agar has also been used to classify the streptococci. Beta-hemolysis is associated with complete lysis of red cells surrounding the colony, whereas alpha-hemolysis is a partial or "green" hemolysis associated with reduction of red cell hemoglobin. Nonhemolytic colonies have been termed gamma-hemolytic.

The property of hemolysis is not very reliable for the absolute identification of streptococci, but it is widely used in rapid screens for identification.

#### Reportable *Streptococcus*

[Group A \*Streptococcus\*](#) (GAS, *Streptococcus pyogenes*) - Lancefield Group A streptococci are nearly always beta-hemolytic.

[Group B \*Streptococcus\*](#) – (GBS, *Streptococcus agalactiae*) Lancefield Group B streptococci are usually beta-hemolytic, but can also be alpha or gamma hemolytic.

[Streptococcus pneumoniae](#) (pneumococcus) - Most strains of *S. pneumoniae* are alpha-hemolytic but can cause  $\beta$ -hemolysis during anaerobic incubation. They are nontypeable by Lancefield group.

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## CASE CRITERIA

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Amebiasis</b> <sup>1</sup> <a href="#">11040</a></p>	<p>Infection of the large intestine by <i>Entamoeba histolytica</i> can vary in severity, ranging from an asymptomatic infection to mild, chronic diarrhea to fulminant dysentery. Extraintestinal infection can occur (e.g., hepatic abscess).</p> <p><b>Confirmed, intestinal amebiasis:</b> A clinically compatible illness that is laboratory confirmed</p> <p><b>Suspect, intestinal amebiasis:</b> A clinically compatible case with <i>E. histolytica</i> detected in stool by use of an antigen-based fecal immunoassay</p> <p><b>Confirmed, extra-intestinal amebiasis:</b></p> <ul style="list-style-type: none"> <li>▪ A case with demonstration of the organism, <i>E. histolytica</i>, in at least one extra-intestinal tissue sample, <b>OR</b></li> <li>▪ A symptomatic person (with clinical or radiographic findings consistent with extra-intestinal infection) and demonstration of specific antibody against <i>E. histolytica</i> as measured by reliable immunodiagnostic test (e.g. EIA) and PCR based assays</li> </ul>	<p><i>Intestinal amebiasis:</i></p> <ul style="list-style-type: none"> <li>▪ Demonstration of cysts or trophozoites of <i>E. histolytica</i> in stool, <b>OR</b></li> <li>▪ Demonstration of trophozoites in tissue biopsy or ulcer scrapings by culture or histopathology</li> </ul> <p><i>Extraintestinal amebiasis:</i></p> <ul style="list-style-type: none"> <li>▪ Demonstration of <i>E. histolytica</i> trophozoites in extraintestinal tissue</li> </ul>
<p><b>Amebic meningitis, other</b> <a href="#">10096</a></p>	<p>Amebic meningitis / encephalitis can present with signs and symptoms commonly associated with other causes of meningitis including fever, headache, photophobia or stiff neck. Other signs and symptoms can also be present. One specific type of amebic meningitis is granulomatous amebic meningoencephalitis (GAE). This form of amebic meningitis has a slow, insidious onset and develops into a subacute or chronic disease lasting several weeks to months. GAE is generally fatal though a few patients have survived. The two known causal agents of GAE are <i>Balamuthia mandrillaris</i> and <i>Acanthamoeba</i> ssp.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p>See also <a href="#">Amebic meningoencephalitis, primary (PAM)</a></p>	<p>In CSF, biopsy, or tissue specimens detection of a free-living amebic organisms (other than <i>Naegleria fowleri</i>) by:</p> <ul style="list-style-type: none"> <li>▪ Microscopic examination, <b>OR</b></li> <li>▪ Detection of nucleic acid (e.g., PCR), <b>OR</b></li> <li>▪ Detection of antigen (e.g., DFA)</li> </ul> <p>Contact DSHS epidemiologist for information on diagnostic test availability (DSHS laboratory does not perform these tests for amebic organisms but will assist in coordinating diagnosis with the CDC)</p>
<p><b>Amebic meningoencephalitis- primary (PAM)</b> <a href="#">80750</a></p>	<p><i>Naegleria fowleri</i> is a free-living ameboflagellate, that infrequently and sporadically invades the brain and meninges via the nasal mucosa and olfactory nerve to cause acute, primary amebic meningoencephalitis (PAM) primarily in healthy children and young adults with a recent history of exposure to warm fresh water.</p> <p>PAM typically presents 1 to 14 days after infection with signs and symptoms of fever, nausea, vomiting, and meningeal irritation (the triad of 1. nuchal rigidity (neck stiffness), 2. photophobia (intolerance of bright light) and 3. severe headache). Physical examination might reveal positive meningeal signs (Kernig's sign, Brudzinski's sign, and nuchal rigidity).</p> <p>Other symptoms such as lethargy, dizziness, loss of balance, mental status abnormalities, visual disturbances, hallucinations, delirium, seizures, and coma have been reported as the disease progresses. In some cases, abnormalities in taste or smell, nasal obstruction, and nasal discharge have been observed.</p> <p>After the onset of symptoms, the disease progresses rapidly and usually results in death within 3 to 7 days. Although a variety of treatments have been shown to be active against amebae in vitro and have been used to treat infected persons, most infections have still been fatal.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p>See also <a href="#">Amebic meningitis, other</a></p>	<p>Confirmed presence of <i>Naegleria fowleri</i> in CSF, biopsy, or tissue specimens via:</p> <ul style="list-style-type: none"> <li>▪ Microscopic examination, <b>OR</b></li> <li>▪ Detection of nucleic acid (e.g., PCR), <b>OR</b></li> <li>▪ Detection of antigen (e.g., DFA)</li> </ul> <p>Comments: Contact DSHS epidemiologist if suspected. <i>Naegleria fowleri</i> trophozoites are found in cerebrospinal fluid (CSF) and tissue, while flagellated forms are occasionally found in CSF. Cysts are not seen in brain tissue. If a hospital identifies the ameba in the cerebrospinal fluid (CSF), contact DSHS EAIDB for information on diagnostic testing. DSHS will assist in coordinating specimen and/or electronic images submission to the CDC for verification. Collection &amp; shipping procedures can be found at: <a href="http://www.cdc.gov/parasites/naegleria/diagnosis-hcp.html">http://www.cdc.gov/parasites/naegleria/diagnosis-hcp.html</a></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b><i>Anaplasma phagocytophilum</i></b>  <a href="#">11090</a></p>	<p>A tick-borne illness characterized by acute onset of fever and one or more of the following signs or symptoms: headache, myalgia, malaise, anemia, leucopenia, thrombocytopenia, or elevated hepatic transaminases. Nausea, vomiting, or rash can be present in some cases. Intracytoplasmic bacterial aggregates (morulae) can be visible in the leukocytes of some patients.</p> <p><b>Confirmed:</b> A clinically compatible illness that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible illness with serological evidence of IgG or IgM antibody reactive (<math>\geq 1:128</math>) with <i>A. phagocytophilum</i> antigen by IFA, ELISA, or dot-ELISA</p> <p><b>Suspect:</b> A case with laboratory evidence of past/present infection with <i>A. phagocytophilum</i> (e.g., laboratory report) but no available clinical information</p>	<ul style="list-style-type: none"> <li>▪ Demonstration of a four-fold change in IgG-specific antibody titer to <i>A. phagocytophilum</i> antigen by indirect immunofluorescence assay (IFA) in paired serum samples (one taken in first week of illness and a second taken 2-4 weeks later), <b>OR</b></li> <li>▪ Detection of <i>A. phagocytophilum</i> DNA in a clinical specimen by PCR, <b>OR</b></li> <li>▪ Demonstration of anaplasma antigen in a biopsy/autopsy sample by IHC, <b>OR</b></li> <li>▪ Isolation of <i>A. phagocytophilum</i>, from a clinical specimen, in cell culture.</li> </ul>
<p><b>Anthrax</b>  <a href="#">10350</a></p>	<p>An illness with acute onset characterized by several distinct clinical forms, including the following:</p> <p><i>Cutaneous:</i> A skin lesion evolving during a period of 2-6 days from a papule, through a vesicular stage, to a depressed black eschar. Fever, malaise, and lymphadenopathy can accompany the lesion.</p> <p><i>Inhalation:</i> A prodrome resembling a viral respiratory illness, followed by hypoxia and dyspnea, or acute respiratory distress syndrome (ARDS) with resulting cyanosis and shock. Radiographic evidence of mediastinal widening or pleural effusion is common.</p> <p><i>Intestinal:</i> Severe abdominal distress followed by fever and signs of septicemia</p> <p><i>Oropharyngeal:</i> Mucosal lesion in the oral cavity or oropharynx, with cervical adenopathy, edema, fever, and possible septicemia.</p> <p><i>Meningeal:</i> Fever, convulsions, coma or meningeal signs. This syndrome is usually secondary to the above syndromes.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible illness that does not meet the confirmed case definition, but does meet one of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ Epi-link to a documented anthrax environmental exposure; <b>OR</b></li> <li>▪ Evidence of <i>B. anthracis</i> DNA; <b>OR</b></li> <li>▪ Positive result on serum specimen tests using the Quick ELISA Anthrax-PA kit; <b>OR</b></li> <li>▪ Detection of Lethal Factor (LF) in clinical serum specimens by LF mass spectrometry; <b>OR</b></li> <li>▪ Positive result on testing of culture from clinical specimens with the RedLine Alert test</li> </ul>	<ul style="list-style-type: none"> <li>▪ Culture and identification of <i>B. anthracis</i> from clinical specimens by the Laboratory Response Network; <b>OR</b></li> <li>▪ Detection of <i>B. anthracis</i> antigens in tissues by IHC using both <i>B. anthracis</i> cell wall and capsule monoclonal antibodies; <b>OR</b></li> <li>▪ Evidence of four-fold rise in antibodies or antigen between acute and convalescent sera using CDC IgG ELISA testing; <b>OR</b></li> <li>▪ Documented anthrax environmental exposure <b>AND</b> evidence of <i>B. anthracis</i> DNA.</li> </ul> <p><b>Note: All <i>Bacillus anthracis</i> isolates must be submitted to the DSHS laboratory.</b></p>
<p><b>Antibiotic resistant isolates</b>  <a href="#">(Table of Contents link)</a></p>	<p>Unexpected or unusual susceptibility results should be discussed with the DSHS Emerging and Infectious Disease staff or the DSHS laboratory staff. For example, if susceptibility results indicate an isolate is carbapenemase-producing or carbapenem-resistant Enterobacteriaceae (CRE) such as <i>Klebsiella pneumoniae</i>, the isolate as well as the susceptibility results should be forwarded to the DSHS Laboratory in a timely manner. Clinical laboratories should be aware of the possibility of NDM-1--producing Enterobacteriaceae in patients who have received medical care in India and Pakistan, and should specifically inquire about this risk factor when carbapenem-resistant Enterobacteriaceae are identified.</p> <p>Additional information on CRE can be found at <a href="http://www.cdc.gov/HAI/organisms/cre/index.html">http://www.cdc.gov/HAI/organisms/cre/index.html</a></p>	<p>Antimicrobial Resistance Laboratory Test Results</p> <ul style="list-style-type: none"> <li>▪ Carbapenem resistant <i>Enterobacteriaceae</i> (CRE)</li> <li>▪ Carbapenemase-producing <i>Enterobacteriaceae</i></li> <li>▪ Carbapenem resistance and carbapenemase production conferred by New Delhi metallo-beta-lactamase (NDM-1) detected by phenotypic testing methods currently recommended by the Clinical and Laboratory Standards Institute, including disk diffusion testing and the modified Hodge test</li> </ul>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Arbovirus, neuroinvasive (encephalitis/meningitis) and non-neuroinvasive</b></p> <p><i>Neuroinvasive Disease:</i></p> <p><a href="#">10058</a> Encephalitis, Cache Valley  <a href="#">10054</a> Encephalitis/Meningitis, California*  <a href="#">10053</a> Encephalitis, Eastern equine (EEE)  <a href="#">10059</a> Encephalitis, Japanese  <a href="#">10057</a> Encephalitis, Powassan  <a href="#">10051</a> Encephalitis, St. Louis (SLE)  <a href="#">10055</a> Encephalitis, Venezuelan equine (VEE)  <a href="#">10056</a> Encephalitis, West Nile (WNNND)  <a href="#">10052</a> Encephalitis, Western equine (WEE)</p> <p><i>Non-neuroinvasive Disease:</i></p> <p><a href="#">10066</a> Cache Valley Virus  <a href="#">10061</a> California serogroup virus*  <a href="#">10062</a> Eastern equine encephalitis virus  <a href="#">10068</a> Japanese Encephalitis Virus  <a href="#">10063</a> Powassan virus  <a href="#">10064</a> St. Louis encephalitis virus  <a href="#">10067</a> Venezuelan equine encephalitis Virus  <a href="#">10049</a> West Nile Fever  <a href="#">10065</a> Western equine encephalitis virus</p>	<p>Most arboviral infections are asymptomatic. Clinical disease ranges from mild febrile illness to severe encephalitis. For the purposes of surveillance and reporting, based on their clinical presentation, arboviral disease cases are often categorized into two primary groups: neuroinvasive disease and non-neuroinvasive disease.</p> <p>Many arboviruses cause neuroinvasive disease such as aseptic meningitis, encephalitis, or acute flaccid paralysis (AFP). These illnesses are usually characterized by the acute onset of fever with stiff neck, altered mental status, seizures, limb weakness, cerebrospinal fluid (CSF) pleocytosis, or abnormal neuroimaging. AFP can result from anterior ("polio") myelitis, peripheral neuritis, or post-infectious peripheral demyelinating neuropathy (i.e., Guillain-Barré syndrome). Less common neurological manifestations, such as cranial nerve palsies, also occur. Most arboviruses are capable of causing an acute systemic febrile illness (e.g., West Nile fever) that can include headache, myalgias, arthralgias, rash, or gastrointestinal symptoms. Rarely, myocarditis, pancreatitis, hepatitis, or ocular manifestations such as chorioretinitis and iridocyclitis can occur.</p> <p>Clinical evidence of neuroinvasive disease:</p> <ul style="list-style-type: none"> <li>▪ Fever (<math>\geq 100.4^{\circ}\text{F}</math> or <math>38^{\circ}\text{C}</math>) as reported by the patient or a health-care provider, <b>AND</b></li> <li>▪ Meningitis, encephalitis, acute flaccid paralysis, or other acute signs of central or peripheral neurologic dysfunction, as documented by a physician, <b>AND</b></li> <li>▪ Absence of a more likely clinical explanation</li> </ul> <p>Clinical evidence of non-neuroinvasive disease:</p> <ul style="list-style-type: none"> <li>▪ Fever (<math>\geq 100.4^{\circ}\text{F}</math> or <math>38^{\circ}\text{C}</math>) as reported by the patient or a health-care provider, <b>AND</b></li> <li>▪ Absence of neuroinvasive disease, <b>AND</b></li> <li>▪ Absence of a more likely clinical explanation.</li> </ul> <p><i>Neuroinvasive</i></p> <p><b>Confirmed:</b> A clinically compatible case (meets neuroinvasive clinical evidence criteria) with laboratory confirmation</p> <p><b>Probable:</b> A clinically compatible case (meets neuroinvasive clinical evidence criteria) with virus-specific IgM antibodies in CSF or serum but no other testing</p> <hr/> <p><i>Non-neuroinvasive</i></p> <p><b>Confirmed:</b> A clinically compatible case (meets non-neuroinvasive clinical evidence criteria) with laboratory confirmation</p> <p><b>Probable:</b> A clinically compatible case (meets non-neuroinvasive clinical evidence criteria) with virus-specific IgM antibodies in CSF or serum but no other testing</p>	<ul style="list-style-type: none"> <li>▪ Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, CSF, or other body fluid, <b>OR</b></li> <li>▪ Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, <b>OR</b></li> <li>▪ Virus-specific IgM antibodies in serum with confirmatory virus-specific neutralizing antibodies in the same or a later specimen, <b>OR</b></li> <li>▪ Virus-specific IgM antibodies in CSF and a negative result for other IgM antibodies in CSF for arboviruses endemic to the region where exposure occurred.</li> </ul> <p>*Note: California encephalitis/meningitis refers to all California serogroup viruses. California serogroup includes California encephalitis, Jamestown Canyon, Keystone, La Crosse, snowshoe hare, and trivittatus viruses.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Babesiosis</b> <a href="#">12010</a></p>	<p>Babesiosis is a parasitic disease of the <i>Babesia</i> genus. Infection can range from subclinical to life-threatening. Clinical manifestations can include hemolytic anemia and nonspecific influenza-like signs and symptoms (e.g., fever, chills, sweats, headache, myalgia, arthralgia, malaise, fatigue, and generalized weakness), splenomegaly, hepatomegaly, or jaundice. Laboratory findings can include thrombocytopenia, proteinuria, hemoglobinuria, and elevated levels of liver enzymes, blood urea nitrogen, and creatinine. Severe cases can be associated with marked thrombocytopenia, disseminated intravascular coagulation, hemodynamic instability, acute respiratory distress, myocardial infarction, renal failure, hepatic compromise, altered mental status, and death.</p> <p><u>Objective Clinical Criteria:</u> 1) fever; 2) anemia; 3) thrombocytopenia</p> <p><u>Subjective Clinical Criteria:</u> 1) sweats, 2) headache, 3) myalgia, or 4) arthralgia</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed <b>AND</b> meets at least one objective clinical criterion <b>OR</b> one subjective clinical criterion</p> <p><b>Probable:</b> A case that:</p> <ul style="list-style-type: none"> <li>▪ Has at least one supportive laboratory result (criteria listed below) <b>AND</b> meets at least one objective clinical criterion (subjective clinical criteria alone are not sufficient). <ul style="list-style-type: none"> <li>○ IFA total immunoglobulin (Ig) or IgG titer: <ul style="list-style-type: none"> <li>❖ <i>Babesia microti</i>: <math>\geq 1:256</math> (<math>\geq 1:64</math> in epidemiologically linked blood donors or recipients)</li> <li>❖ <i>Babesia divergens</i>: <math>\geq 1:256</math></li> <li>❖ <i>Babesia duncani</i>: <math>\geq 1:512</math></li> </ul> </li> <li>○ Immunoblot IgG: <i>Babesia microti</i>: positive result</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Is a blood donor or recipient epidemiologically linked to a confirmed or probable babesiosis case</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>○ Has confirmatory laboratory evidence but does not satisfy objective or subjective clinical criterion</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>○ Satisfies the supportive laboratory criteria (same as above)</li> </ul>	<p>At least one of the following must be met:</p> <ul style="list-style-type: none"> <li>▪ Identification of intraerythrocytic <i>Babesia</i> organisms by light microscopy in a Giemsa, Wright, or Wright-Giemsa–stained blood smear; <b>OR</b></li> <li>▪ Detection of <i>Babesia microti</i> DNA in a whole blood specimen by polymerase chain reaction (PCR); <b>OR</b></li> <li>▪ Detection of <i>Babesia</i> spp. genomic sequences in a whole blood specimen by nucleic acid amplification; <b>OR</b></li> <li>▪ Isolation of <i>Babesia</i> organisms from a whole blood specimen by animal inoculation.</li> </ul>
<p><b>Botulism, foodborne</b> <a href="#">10530</a></p>	<p>Ingestion of botulinum toxin results in an illness of variable severity. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis can progress rapidly.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed or that occurs among persons who ate the same food as persons who have laboratory confirmed botulism</p> <p><b>Probable:</b> A clinically compatible case with a history of ingestion of a food item known to carry a risk for the botulism toxin</p>	<ul style="list-style-type: none"> <li>▪ Detection of botulinum toxin in serum, stool, or patient's food, <b>OR</b></li> <li>▪ Isolation of <i>Clostridium botulinum</i> from stool</li> </ul> <p><b>Note: All <i>Clostridium botulinum</i> isolates must be submitted to the DSHS laboratory.</b></p>
<p><b>Botulism, infant</b> <a href="#">10540</a></p>	<p>An illness of infants, characterized by constipation, poor feeding, and “failure to thrive” that can be followed by progressive weakness, impaired respiration, and death.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed, occurring in a child aged less than 1 year</p>	<ul style="list-style-type: none"> <li>▪ Detection of botulinum toxin in stool or serum, <b>OR</b></li> <li>▪ Isolation of <i>Clostridium botulinum</i> from stool</li> </ul> <p><b>Note: All <i>Clostridium botulinum</i> isolates must be submitted to the DSHS laboratory.</b></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>Botulism, other unspecified</b> <a href="#">10548</a>	<p>Ingestion of botulinum toxin results in an illness of variable severity. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis can progress rapidly.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed in a patient aged greater than or equal to 1 year who has no history of ingestion of suspect food and has no wounds</p>	<ul style="list-style-type: none"> <li>▪ Detection of botulinum toxin in clinical specimen,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Isolation of <i>Clostridium botulinum</i> from clinical specimen</li> </ul> <p>Note: All <i>Clostridium botulinum</i> isolates must be submitted to the DSHS laboratory.</p>
<b>Botulism, wound</b> <a href="#">10549</a>	<p>An illness resulting from toxin produced by <i>Clostridium botulinum</i> that has infected a wound. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis can progress rapidly.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed in a patient who has no suspected exposure to contaminated food and who has a history of a fresh, contaminated wound during the 2 weeks before onset of symptoms , or a history of injection drug use within the 2 weeks before onset of symptoms</p> <p><b>Probable:</b> A clinically compatible case in a patient who has no suspected exposure to contaminated food and who has either a history of a fresh, contaminated wound during the 2 weeks before onset of symptoms, or a history of injection drug use within the 2 weeks before onset of symptoms</p>	<ul style="list-style-type: none"> <li>▪ Detection of botulinum toxin in serum, <b>OR</b></li> <li>▪ Isolation of <i>Clostridium botulinum</i> from wound</li> </ul> <p><b>Note: All <i>Clostridium botulinum</i> isolates must be submitted to the DSHS laboratory.</b></p>
<b>Brucellosis</b> <a href="#">10020</a>	<p>An illness characterized by acute or insidious onset of fever and one or more of the following: night sweats, fatigue, anorexia, weight loss, headache, arthralgia, myalgia, meningitis, arthritis/spondylitis, or focal organ involvement (endocarditis, orchitis/epididymitis, hepatomegaly, splenomegaly).</p> <p><b>Confirmed:</b> A clinically compatible illness that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible case with at least one of the following:</p> <ul style="list-style-type: none"> <li>▪ Epidemiologically linked to a confirmed human or animal brucellosis case, <b>OR</b></li> <li>▪ <i>Brucella</i> total antibody agglutination titer greater than or equal to 160 in one or more serum specimens obtained after onset of symptoms, <b>OR</b></li> <li>▪ Detection of <i>Brucella</i> DNA in a clinical specimen by PCR assay</li> </ul>	<ul style="list-style-type: none"> <li>▪ Culture and identification of <i>Brucella</i> spp. from clinical specimens, <b>OR</b></li> <li>▪ Fourfold or greater rise in <i>Brucella</i> agglutination titer between acute- and convalescent-phase serum specimens obtained greater than or equal to 2 weeks apart and studied at the same laboratory</li> </ul> <p><b>Note: All <i>Brucella species</i> isolates must be submitted to the DSHS laboratory.</b></p>
<b>California encephalitis virus - (see Arbovirus)</b>	<p>See Case Definition/Case Classification for <a href="#">Arbovirus</a>, Neuroinvasive (Encephalitis/meningitis) and Non-neuroinvasive</p>	<p>See <a href="#">Lab Confirmation Tests for Arbovirus</a>, Neuroinvasive and Non-neuroinvasive</p>
<b>Campylobacteriosis</b> <a href="#">11020</a>	<p>An infection that can result in diarrheal illness of variable severity.</p> <p><b>Confirmed:</b> A case that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case</p> <p><b>Suspect:</b> A case with <i>Campylobacter</i> spp. detected, in a clinical specimen, by use of culture independent laboratory methods (non-culture based).</p> <p>Note: The use of culture independent methods as standalone tests for the direct detection of <i>Campylobacter</i> in stool appears to be increasing. Data available about the performance characteristics of these assays indicates there is variability in the sensitivity, specificity and positive predictive value of these assays depending on the test (EIA test format -lateral flow or –microplate) and manufacturer. It is therefore useful to collect information on which type of EIA test and manufacturer are used to diagnose a case. Culture confirmation, of culture independent (e.g., EIA) test positive specimens, is ideal.</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Campylobacter</i> spp. in a clinical specimen.</li> </ul>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Chagas disease, acute</b> <sup>2</sup> <a href="#">12041</a></p>	<p>Chagas disease is a parasitic infection caused by <i>Trypanosoma cruzi</i>. The acute phase is characterized by the first 8 weeks of infection, detectable parasitemia, and asymptomatic (most common) or symptomatic manifestations of disease which can include any of the following:</p> <ul style="list-style-type: none"> <li>▪ Fever, malaise, rash, body aches, headache, loss of appetite, vomiting, diarrhea, hepatomegaly, splenomegaly, and lymphadenopathy</li> <li>▪ Characteristic acute signs of disease (Chagoma – nodular swelling at site of inoculation &amp; Romaña's sign – unilateral swelling of eye lid)</li> <li>▪ Acute myocarditis and/or meningoencephalitis are rare, EXCEPT in immunocompromised individuals</li> </ul> <p>Reactivation of the acute phase (parasitemia &amp; symptomology) can occur in chronically infected immunocompromised patients and does not represent a new case and does not meet the definition for acute disease; unless there is an epidemiological history consistent with acute Chagas disease.</p> <p>Congenital infections (vertical transmission) are considered acute up to 8 weeks of age; are commonly asymptomatic but can cause low birth weight, hepatosplenomegaly, myocarditis, and/or meningitis encephalitis with seizures and tremors. Infants up to 8 weeks of age are diagnosed by confirmatory tests. Infants &lt; 9 months &amp; epidemiologically-linked) cannot meet the probable case definitions but cannot be ruled not a case; retest after 9 months of age.</p> <p><b>Confirmed:</b> A case that is laboratory confirmed.</p> <p><b>Probable:</b> A case that meets the supportive laboratory criteria (an antibody specific to <i>T. cruzi</i> that is detected by two or more distinct serological testing formats (combinations commonly used: ELISA and IFA or IFA and RIPA))</p> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>▪ Epidemiological history consistent with acute Chagas disease: <ul style="list-style-type: none"> <li>○ Known exposure to vector in an endemic area in the 8 weeks prior to diagnosis;</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>○ History of blood transfusion or organ transplantation in an endemic country in the 8 weeks prior to diagnosis</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>▪ Absence of epidemiologic history consistent with chronic Chagas disease.</li> </ul> <p>Available serologic laboratory tests for <i>T. cruzi</i> include: 1) IFA, <b>OR</b> 2) TESA immunoblot (available through the CDC), <b>OR</b> 3) two ELISA kits (commercially available/FDA-cleared), <b>OR</b> 4) radio immunoprecipitation assay (RIPA).</p>	<p>Identification of <i>T. Cruzi</i> by microscopy including:</p> <ul style="list-style-type: none"> <li>▪ Microscopic examination of anticoagulated whole blood or its buffy coat for <i>T. cruzi</i> by: <ul style="list-style-type: none"> <li>▪ Wet mount – motile trypanosomes <b>OR</b></li> <li>▪ Thick &amp; thin smears - Giemsa stain</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Isolation of the agent by <ul style="list-style-type: none"> <li>▪ Culture (specialized media - NNN, LIT)</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Inoculation into mice,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Xenodiagnoses</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Detection of <i>T. cruzi</i> DNA by polymerase chain reaction (PCR)</li> </ul> <p>Comments: There is no gold standard for screening or diagnosis. Presence of <i>T. cruzi</i> in circulating blood is unlikely during the chronic phase (higher false negative results). No single supportive test has the sensitivity and specificity to be relied on alone.</p> <p>Donors with a positive screening test can no longer donate blood, regardless of additional test results. Confirmed and probable cases should be encourage to inform their healthcare provider of test results &amp; provide them with the CDC informational fact sheet; <a href="http://www.cdc.gov/parasites/chagas/resources/onepage.pdf">http://www.cdc.gov/parasites/chagas/resources/onepage.pdf</a></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Chagas disease, chronic</b><sup>2</sup> <a href="#">12042</a></p>	<p>The chronic phase of disease (more than 8 weeks post infection) is characterized by undetectable parasitemia. In absence of successful treatment during the acute phase, the chronic phase occurs; most will live out their lives free of signs or symptoms (indeterminate form); 20-30% will develop progressive sequelae (determinate form) involving the heart and/or gastrointestinal tract years to decades post infection. Causes of cardiac symptoms (palpitations, presyncope, and syncope) include conduction system abnormalities (right bundle branch block to complete heart block), ventricular arrhythmias, dilated cardiomyopathy, progression to congestive heart failure, and high risk of sudden death. Causes of gastrointestinal symptoms include megaesophagus (dysphagia, odynophagia, esophageal reflux, weight loss, aspiration, cough, regurgitation constipation, &amp; weight loss) and megacolon (constipation &amp; abdominal pain).</p> <p><b>Confirmed:</b> A case that has confirmatory laboratory results, is &gt; 9 months of age, <b>AND</b></p> <ul style="list-style-type: none"> <li>▪ A physician classified case of chronic Chagas disease; <b>OR</b></li> <li>▪ History of an epidemiological risk factor (listed below) consistent with Chagas disease that occurred more than 8 weeks prior to the collection date of the sample tested. <ul style="list-style-type: none"> <li>a) known exposure to vector in an endemic area, <b>OR</b> b) lived or traveled to an endemic area for over 6 months of duration, <b>OR</b> c) history of blood transfusion or organ transplantation in an endemic country or from a donor diagnosed with Chagas disease, <b>OR</b> d) an infant &gt; 9 months of age; whose mother is from an endemic country.</li> </ul> </li> </ul> <p><b>Probable:</b> A case that has only one positive or reactive serological testing format that is antibody specific to <i>T. cruzi</i> (ELISA, IFA, &amp; RIPA are commonly used); <b>AND</b></p> <ul style="list-style-type: none"> <li>▪ A physician classified case of chronic Chagas disease <b>OR</b></li> <li>▪ History of an epidemiological risk factor (listed below) consistent with Chagas disease that occurred more than 8 weeks prior to the collection date of the sample tested; <ul style="list-style-type: none"> <li>▪ Known exposure to vector in an endemic area; <b>OR</b></li> <li>▪ History of blood transfusion or organ transplantation in an endemic country;</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ An infant &gt; 9 months of age; whose mother is from an endemic country, and does not meet acute Chagas disease criteria</li> </ul> <p><b>Suspect:</b> A case that has only one reactive serological laboratory test result <b>AND</b> missing or negative clinical information. This includes single blood donor screening result with no clinical information.</p> <p>Comments: Women with chronic asymptomatic disease can transmit infection to their unborn babies. Infants &lt;9 months of age with a mother from an endemic area, in absence of direct detection of the organism, cannot be classified or ruled out due to maternal antibodies; perform serology at 9 months of age and classify by the chronic case definition.</p>	<p>Antibody specific to <i>T. cruzi</i> detected by two or more distinct serological tests (combinations commonly used: a) ELISA and IFA or b) IFA and RIPA). Acceptable and available serological tests include:</p> <ul style="list-style-type: none"> <li>▪ IFA,</li> <li>▪ TESA immunoblot (available through the CDC)</li> <li>▪ Two ELISA kits (commercially available/FDA-cleared)</li> <li>▪ Radio immunoprecipitation assay (RIPA)</li> </ul> <p>Comments: There is no gold standard for screening or diagnosis. Presence of <i>T. cruzi</i> in circulating blood is unlikely during the chronic phase (higher false negatives using microscopy or isolation methods). No single supportive test has the sensitivity and specificity to be relied on alone, thus two different methods or antibodies specific to <i>T. cruzi</i> are used.</p> <p>Donors with a positive screening test can no longer donate blood, regardless of additional test results. Confirmed and probable cases should be encourage to inform their healthcare provider of test results &amp; provide them with the CDC informational fact sheet; <a href="http://www.cdc.gov/parasites/chagas/resources/onepage.pdf">http://www.cdc.gov/parasites/chagas/resources/onepage.pdf</a></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>Chickenpox - (see Varicella)</b> <a href="#">10030</a>	See <a href="#">Varicella</a>	
<b>Cholera (toxigenic <i>Vibrio cholerae</i> O1 or O139)</b> <sup>1</sup> <a href="#">10470</a>	<p>An illness characterized by diarrhea and/or vomiting; severity is variable.</p> <p><b>Confirmed:</b> A clinically compatible illness that is laboratory confirmed</p> <p>Note: Illnesses caused by strains of <i>V. cholerae</i> other than toxigenic <i>V. cholerae</i> O1 or O139 should not be reported as cases of cholera. (See <a href="#">Vibrio parahaemolyticus</a>, <a href="#">Vibrio vulnificus</a>, and <a href="#">Vibriosis, other or unspecified</a>)</p>	<ul style="list-style-type: none"> <li>▪ Isolation of toxigenic (i.e., cholera toxin-producing) <i>Vibrio cholerae</i> O1 or O139 from stool or vomitus, <b>OR</b></li> <li>▪ Serologic evidence of recent infection</li> </ul> <p><b>Note: All <a href="#">Vibrio species</a> isolates must be submitted to the DSHS laboratory.</b></p>
<b>Contaminated sharps injury</b> <sup>3</sup> <a href="#">(Table of Contents - link)</a>	<p>Any <a href="#">sharps injury</a> that occurs with a sharp used or encountered in a health care setting that is contaminated with human blood or body fluids. Contaminated sharps injuries in private facilities are reported to OSHA and those in Texas public facilities (government entities) are reported to DSHS Infectious Disease Control Unit. Both source person and injured employee should be tested for HIV, HBV, and HCV. For health care worker HIV risk assessment and follow-up refer to the <a href="#">Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis September 20, 2005</a>. For health care worker HBV and HCV risk assessment and follow-up refer to the <a href="#">Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis</a>.</p>	<p>See referenced U.S. Public Health Service Guidelines for recommended follow-up testing.</p>



Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Creutzfeldt-Jakob disease (CJD)</b> <sup>4,5</sup> <a href="#">80060</a></p> <p>(continued on next page)</p>	<p>Transmissible spongiform encephalopathies (TSEs), prion diseases, are a group of rapidly progressive, invariably fatal, neurodegenerative diseases that affect both humans and animals. Creutzfeldt-Jakob disease (CJD) is a human brain disease that occurs in a sporadic (sCJD), familial (fCJD), or iatrogenic form (iCJD). In sporadic, familial, and iatrogenic forms; affected patients usually present with a rapidly progressive dementia, visual abnormalities, or cerebellar dysfunction, including muscle incoordination and gait and speech abnormalities. Most patients eventually develop pyramidal and extrapyramidal dysfunction: abnormal reflexes (hyperreflexia), spasticity, tremors, and rigidity. Some develop behavioral changes with agitation, depression, or confusion. The affected patients often deteriorate very rapidly and can develop a state of akinetic mutism during the terminal stages of the illness. Myoclonus is the most frequent physical sign seen in classic CJD. Median illness duration of 4 months with a mean of 7.6 months; duration of illness rarely exceeds 12 months.</p> <p><b>Sporadic CJD—</b></p> <p><b>Confirmed:</b> Diagnosed by standard neuropathological techniques; <b>AND/OR</b> immunocytochemically; <b>AND/OR</b> Western blot confirmed protease-resistant PrP; <b>AND/OR</b> presence of scrapie-associated fibrils.</p> <p><b>Probable*:</b> Rapidly progressive dementia <b>AND</b> at least <b>two</b> of the following four clinical features: 1) myoclonus, 2) visual or cerebellar signs, 3) pyramidal /extrapyramidal signs, &amp; 4) akinetic mutism <b>AND</b> a positive result on at least <b>one</b> of the following laboratory tests:</p> <ul style="list-style-type: none"> <li>○ A typical EEG (periodic sharp wave complexes) during an illness of any duration</li> <li>○ A positive 14-3-3 cerebrospinal fluid (CSF) assay in patients with a disease duration of less than 2 years</li> <li>○ Magnetic resonance imaging (MRI) high signal abnormalities in caudate nucleus and/or putamen on diffusion-weighted imaging (DWI) or fluid attenuated inversion recovery (FLAIR)</li> </ul> <p><b>AND</b> absence of routine investigations indicating an alternative diagnosis.</p> <p><b>Possible*:</b> Progressive dementia <b>AND</b> at least <b>two</b> out of the following four clinical features: 1) myoclonus, 2) visual or cerebellar signs, 3) pyramidal / extrapyramidal signs, &amp; 4) akinetic mutism <b>AND</b> all of the following:</p> <ul style="list-style-type: none"> <li>○ The absence of a positive result for any of the three laboratory tests that would classify a case as “probable”</li> <li>○ Duration of illness less than two years</li> <li>○ Absence of routine investigations indicating an alternative diagnosis.</li> </ul> <p>*Exclusion Criterion: If <b>all</b> standard neuropathological techniques are negative for characteristics of CJD (on autopsy tissue), Possible and Probable Cases are reclassified as Not a Case.</p> <p><b>Iatrogenic CJD — Confirmed:</b></p> <ul style="list-style-type: none"> <li>▪ Progressive cerebellar syndrome in a recipient of human cadaveric-derived pituitary hormone; <b>OR</b></li> <li>▪ Sporadic CJD with a recognized exposure risk, e.g., antecedent neurosurgery with Dura mater implantation.</li> </ul> <p><b>Familial CJD —</b></p> <p><b>Confirmed or Probable:</b> CJD plus confirmed or probable CJD in a first degree relative; <b>AND/OR</b></p> <ul style="list-style-type: none"> <li>▪ Neuropsychiatric disorder plus disease-specific PrP gene mutation.</li> </ul>	<p>Neuropathology is necessary for the confirmation of CJD: the use of cerebral biopsy in living patients is to be discouraged unless its purpose is to arrive at an alternative diagnosis of a treatable disorder. Autopsy (or postmortem biopsy of the brain where autopsy is not possible) is strongly encouraged and is necessary to accurately diagnose any suspected case of CJD.</p> <p>Note: The National Prion Disease Pathology Surveillance Center (NPDPS) assists clinicians in the diagnosis of prion disease. The NPDPS assists clinicians by analyzing cerebrospinal fluid, blood, and brain tissue. NPDPS provides free autopsy services for suspected cases of CJD through their autopsy network (the family must initiate contact). Information about diagnostic services, protocols for various CJD testing, and specimen submission can be obtained at <a href="http://www.cjdsurveillance.com/">http://www.cjdsurveillance.com/</a>. Physicians are strongly encouraged to confirm the diagnosis of CJD by arranging for an autopsy following the death of the person suspected of having CJD. This is especially important if the person had an onset at age <b>less than 55</b>. Please contact the center above for assistance or specimen submission.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<i>(CJD - Continued)</i>	<p><b>Variant CJD —</b></p> <p>Variant Creutzfeldt-Jakob disease (vCJD), a TSE found in humans, is caused by the transmission of the infective form of the bovine prion protein to humans through consumption of contaminated meat. vCJD is distinguished from the classic form of CJD (sporadic CJD's typical presentation) by the much younger median age (28 years of age) of affected patient, its clinical presentation (early psychiatric symptoms: anxiety/depression; parasthesia; delayed development of neurologic signs ~4 months), neuropathologic features, and the biochemical properties of the protease-resistant prion protein.</p> <p><b>Confirmed:</b> Neuropathologic examination of brain tissue is required to confirm a diagnosis of variant CJD. The following confirmatory features should be present:</p> <ul style="list-style-type: none"> <li>▪ Numerous widespread kuru-type amyloid plaques surrounded by vacuoles in both the cerebellum and cerebrum - florid plaques.</li> <li>▪ Spongiform change and extensive prion protein deposition shown by immunohistochemistry throughout the cerebellum and cerebrum.</li> </ul> <p><b>Suspect:</b> Variant CJD should be considered for cases with any of the following:</p> <ul style="list-style-type: none"> <li>▪ current age or age at death &lt;55 years (a brain autopsy is recommended for all physician-diagnosed CJD cases); b) psychiatric symptoms at illness onset and/or persistent painful sensory symptoms (frank pain and/or dysesthesia); c) dementia, and development ≥4 months after illness onset of at least two of the following five neurologic signs: poor coordination, myoclonus, chorea, hyperreflexia, or visual signs; d) A normal or an abnormal EEG, but not the diagnostic EEG changes often seen in classic CJD; e) duration of illness of over 6 months; f) routine investigations of the patient do not suggest an alternative, non-CJD diagnosis: g) no history of receipt of cadaveric human pituitary growth hormone or a dura mater graft; h) no history of CJD in a first degree relative or prion protein gene mutation in the patient or travel to a BSE-affected country after 1980 increases the index of suspicion for a variant CJD diagnosis.</li> <li>▪ If a patient has the typical bilateral pulvinar high signal on MRI scan, a suspect diagnosis of variant CJD requires the presence of a progressive neuropsychiatric disorder, d, e, f and g of the above criteria, and four of the following five criteria: 1) early psychiatric symptoms (anxiety, apathy, delusions, depression, withdrawal); 2) persistent painful sensory symptoms (frank pain and/or dysesthesia); 3) ataxia; 4) myoclonus or chorea or dystonia; and 5) dementia.</li> </ul> <p>Note: A history of possible exposure to bovine spongiform encephalopathy (BSE) such as residence or travel to a BSE-affected country after 1980 increases the index of suspicion for a variant CJD diagnosis.</p>	<p>Neuropathology is necessary for the confirmation of CJD: the use of cerebral biopsy in living patients is to be discouraged unless its purpose is to arrive at an alternative diagnosis of a treatable disorder. Autopsy (or postmortem biopsy of the brain where autopsy is not possible) is strongly encouraged and is necessary to accurately diagnose any suspected case of CJD.</p> <p>Note: The National Prion Disease Pathology Surveillance Center (NPDPC) assists clinicians in the diagnosis of prion disease. The NPDPC assists clinicians by analyzing cerebrospinal fluid, blood, and brain tissue. NPDPC provides free autopsy services for suspected cases of CJD through their autopsy network. Information about diagnostic services, protocols for various CJD testing, and specimen submission can be obtained at <a href="http://www.cjdsurveillance.com/">http://www.cjdsurveillance.com/</a> Physicians are strongly encouraged to confirm the diagnosis of CJD by arranging for an autopsy following the death of the person suspected of having CJD. This is especially important if the person had an onset at age less than 55. Please contact the center above for assistance or specimen submission.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Cryptosporidiosis</b> <a href="#">11580</a></p>	<p>An illness caused by the protozoan <i>Cryptosporidium</i> and characterized by diarrhea and/or abdominal cramps that can be accompanied by loss of appetite, low-grade fever, nausea, and vomiting. Infected persons can be asymptomatic. The disease can be prolonged and life-threatening in severely immunocompromised persons.</p> <p><b>Confirmed:</b> A case that is laboratory confirmed</p> <p><b>Probable:</b></p> <ul style="list-style-type: none"> <li>▪ A case with <i>Cryptosporidium</i> antigen detected by a screening test method such as, the immunochromatographic card/rapid card test or a laboratory test of unknown method, <b>OR</b></li> <li>▪ A clinically compatible case that is epidemiologically linked to a confirmed case by one of the following means: <ul style="list-style-type: none"> <li>○ Household or other close contact to a lab-confirmed case with onset of symptoms within 1 month (before or after), <b>OR</b></li> <li>○ Exposure to an outbreak at a body of water or water facility involving at least 2 lab-confirmed cases and onset of symptoms within one month (before or after) of one or more of these cases</li> </ul> </li> </ul>	<p>Detection of <i>Cryptosporidium</i> organisms or DNA in stool, intestinal fluid, tissue samples, biopsy specimens, or other biological sample by certain laboratory methods with a high positive predictive value (PPV), e.g., DFA, PCR, EIA, or light microscopy of stained specimen</p>
<p><b>Cyclosporiasis</b> <a href="#">11575</a></p>	<p>An illness of variable severity caused by the protozoan <i>Cyclospora cayentanensis</i> and commonly characterized by watery diarrhea, loss of appetite, weight loss, abdominal bloating and cramping, increased flatus, nausea, fatigue, and low-grade fever. Vomiting also can be noted. Relapses and asymptomatic infections can occur.</p> <p><b>Confirmed:</b> A laboratory-confirmed case with or without clinical symptoms</p> <p><b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case</p>	<p>Detection—in symptomatic or asymptomatic persons—of <i>Cyclospora</i>:</p> <ul style="list-style-type: none"> <li>▪ Oocysts in stool by microscopic examination, or in intestinal fluid/aspirate or intestinal biopsy specimens, <b>OR</b></li> <li>▪ Demonstration of sporulation, or DNA (by PCR) in stool, intestinal fluid/aspirate or intestinal biopsy specimens</li> </ul>
<p><b>Cysticercosis</b> (also see <i>Taenia solium</i>)<sup>6</sup> <a href="#">12031</a></p>	<p>Cysticercosis is an infection caused by the larval form of the pork tapeworm, <i>Taenia solium</i>. Infection occurs when the tapeworm eggs are ingested, hatch into larvae, and migrate to tissues where they form cysticerci (cysts). The symptoms of cysticercosis reflect the development of cysticerci in various sites. When cysticerci are found in the brain, the condition is called neurocysticercosis, which can cause diverse manifestations including seizures, mental disturbances, focal neurologic deficits, and signs of space-occupying intracerebral lesions. Death can occur suddenly. Extracerebral cysticercosis can cause ocular, cardiac, or spinal lesions with associated symptoms. Asymptomatic subcutaneous nodules and calcified intramuscular nodules can be encountered.</p> <p><b>Confirmed:</b> Laboratory confirmation of the presence of cysticercus in tissue</p> <p>Note: <a href="#">Also see <i>Taenia solium</i></a></p>	<p>Presumptive diagnosis of neurocysticercosis is usually made by MRI or CT brain scans. Blood tests are available to help diagnose an infection, but can not always be accurate. If surgery is necessary, confirmation of the diagnosis can be made by demonstrating the cysticercus in the tissue involved.</p> <p>Note: Demonstration of <i>Taenia solium</i> eggs and proglottids in the feces diagnoses taeniasis and not cysticercosis. While suggestive, it does not necessarily prove that cysticercosis is present. Persons who are found to have eggs or proglottids in their feces should be evaluated serologically since autoinfection, resulting in cysticercosis, can occur.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Dengue fever</b> <a href="#">10680</a></p>	<p>Dengue fever is an acute febrile illness characterized by the presence of fever and two or more of the following: retro-orbital or ocular pain, headache, rash, myalgia, arthralgia, leucopenia or hemorrhagic manifestations (e.g., positive tourniquet test; petechiae; purpura/ecchymosis; epistaxis; gum bleeding; blood in vomitus, urine, or stool; or vaginal bleeding), but <b>NOT</b> meeting the case definition of Dengue hemorrhagic fever.</p> <p><b>Confirmed:</b> A clinically compatible case with confirmatory lab results</p> <p><b>Probable:</b> A clinically compatible case with the following laboratory criteria: Dengue-specific IgM antibodies present in serum with a P/N ratio <math>\geq 2</math></p> <p><b>Suspect:</b> A clinically compatible case that is epidemiologically-linked to a confirmed case</p> <p>Exposure: Travel to a dengue endemic country or presence at location with ongoing outbreak within previous two weeks of dengue-like illness, or association in time and place with a confirmed or probable dengue case</p>	<ul style="list-style-type: none"> <li>▪ Isolation of dengue virus from tissue, blood, CSF, or other body fluid, <b>OR</b></li> <li>▪ Demonstration of specific dengue virus antigen or genomic sequences in tissue, blood, CSF, or other body fluid by PCR, IHC or IFA, <b>OR</b></li> <li>▪ Seroconversion from negative dengue IgM in an acute phase specimen (<math>\leq 5</math> days after symptom onset) to positive IgM in a convalescent-phase specimen (collected <math>\geq 5</math> days after symptom onset), <b>OR</b></li> <li>▪ Demonstration of a <math>\geq 4</math>-fold rise in IgG antibody titer or hemagglutination inhibition (HAI) titer to dengue virus antigens in paired acute and convalescent serum samples, <b>OR</b></li> <li>▪ Demonstration of a <math>&gt;4</math>-fold rise in a plaque reduction neutralization test (PRNT) end point titer between dengue viruses and other flaviviruses tested in a convalescent serum sample, <b>OR</b></li> <li>▪ Dengue-specific IgM antibodies demonstrated in CSF</li> </ul>
<p><b>Dengue hemorrhagic fever</b> <a href="#">10685</a></p>	<p>Dengue hemorrhagic fever is characterized by all of the following:</p> <ul style="list-style-type: none"> <li>▪ Fever lasting from 2-7 days</li> <li>▪ Evidence of hemorrhagic manifestation or a positive tourniquet test</li> <li>▪ Thrombocytopenia (<math>\leq 100,000</math> cells per <math>\text{mm}^3</math>)</li> <li>▪ Evidence of plasma leakage shown by hemoconcentration (an increase in hematocrit <math>&gt;20\%</math> above average for age or a decrease in hematocrit <math>&gt;20\%</math> of baseline following fluid replacement therapy), <b>OR</b> pleural effusion, ascites, or hypoproteinemia.</li> </ul> <p><b>Confirmed, Probable, &amp; Suspect:</b> For case definitions, refer to clinical description above and apply to case classification criteria and exposure note for <a href="#">Dengue Fever (DF), Condition Code 10680</a></p>	<p>*See laboratory confirmation criteria for <a href="#">Dengue Fever (DF), Condition Code 10680</a></p>
<p><b>Dengue shock syndrome (DSS)</b> <a href="#">10685</a></p>	<p>Dengue shock syndrome has all of criteria for DHF, plus circulatory failure, as evidenced by the following:</p> <ul style="list-style-type: none"> <li>▪ Rapid and weak pulse and narrow pulse pressure (<math>&lt;20</math>mm Hg), <b>OR</b></li> <li>▪ Age-specific hypotension, cold, clammy skin, and restlessness</li> </ul> <p><b>Confirmed, Probable, &amp; Suspect:</b> For case definitions, refer to clinical description above and apply to case classification criteria and exposure note for <a href="#">Dengue Hemorrhagic Fever, Condition Code 10685</a></p>	<p>*See laboratory confirmation criteria for <a href="#">Dengue Fever (DF), Condition Code 10680</a></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Diphtheria</b> <sup>7</sup> <a href="#">10040</a></p>	<p>An upper respiratory tract illness characterized by sore throat, low-grade fever, and an adherent membrane of the tonsil(s), pharynx, and/or nose</p> <p><b>Confirmed:</b> A clinically compatible case that is either laboratory confirmed or epidemiologically linked to a laboratory-confirmed case</p> <p>Note: Cutaneous diphtheria should not be reported. All diphtheria isolates, regardless of association with disease, should be sent to the DSHS laboratory.</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Corynebacterium diphtheriae</i> from a clinical specimen, <b>OR</b></li> <li>▪ Histopathologic diagnosis of diphtheria</li> </ul>
<p><b>Eastern equine encephalitis virus (EEE)</b> - (see <b>Arbovirus</b>)</p>	<p>See Case Definition/Case Classification for <a href="#">Arbovirus</a>, Neuroinvasive (Encephalitis/meningitis) and Non-neuroinvasive</p>	<p>See <a href="#">Lab Confirmation Tests for Arbovirus</a>, Neuroinvasive and Non-neuroinvasive</p>
<p><b>Ehrlichia chaffeensis</b> <a href="#">11088</a></p>	<p>A tick-borne illness characterized by acute onset of fever and one or more of the following signs or symptoms: headache, myalgia, malaise, anemia, leucopenia, thrombocytopenia, or elevated hepatic transaminases. Nausea, vomiting, or rash can be present in some cases. Intracytoplasmic bacterial aggregates (morulae) can be visible in the leukocytes of some patients.</p> <p><b>Confirmed:</b> A clinically compatible illness that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible illness with serological evidence of IgG or IgM antibody reactive (<math>\geq</math>1:128) with <i>E. chaffeensis</i> antigen by IFA, ELISA, or dot-ELISA</p> <p><b>Suspect:</b> A case with laboratory evidence of past/present infection with <i>E. chaffeensis</i> (e.g., laboratory report) but no available clinical information</p>	<ul style="list-style-type: none"> <li>▪ Demonstration of a four-fold change in IgG-specific antibody titer to <i>E. chaffeensis</i> antigen by indirect immunofluorescence assay (IFA) in paired serum samples (one taken in first week of illness and a second taken 2-4 weeks later), <b>OR</b></li> <li>▪ Detection of <i>E. chaffeensis</i> DNA in a clinical specimen by PCR, <b>OR</b></li> <li>▪ Demonstration of ehrlichial antigen in a biopsy/autopsy sample by IHC, <b>OR</b></li> <li>▪ Isolation of <i>E. chaffeensis</i> from a clinical specimen in cell culture.</li> </ul>
<p><b>Ehrlichia ewingii</b> <a href="#">11089</a></p>	<p>A tick-borne illness characterized by acute onset of fever and one or more of the following signs or symptoms: headache, myalgia, malaise, anemia, leucopenia, thrombocytopenia, or elevated hepatic transaminases. Nausea, vomiting, or rash can be present in some cases. Intracytoplasmic bacterial aggregates (morulae) can be visible in the leukocytes of some patients.</p> <p><b>Confirmed:</b> A clinically compatible illness that is laboratory confirmed</p> <p><b>Suspect:</b> A case with laboratory evidence of past/present infection with <i>E. ewingii</i> (e.g., laboratory report) but no available clinical information</p>	<ul style="list-style-type: none"> <li>▪ Detection of <i>E. ewingii</i> DNA in a clinical specimen by PCR</li> </ul> <p>Note: Because the organism has never been cultured, antigens are not available. Thus, <i>E. ewingii</i> infections can only be diagnosed by molecular detection methods.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>Ehrlichiosis / Anaplasmosis – undetermined</b> <a href="#">11091</a>	<p>A tick-borne illness characterized by acute onset of fever and one or more of the following signs or symptoms: headache, myalgia, malaise, anemia, leucopenia, thrombocytopenia, or elevated hepatic transaminases. Nausea, vomiting, or rash can be present in some cases. Intracytoplasmic bacterial aggregates (morulae) can be visible in the leukocytes of some patients.</p> <p><b>Probable:</b> A clinically compatible illness with serological evidence of IgG or IgM antibody reactive (<math>\geq 1:128</math>) with <i>Ehrlichia spp.</i> by IFA, ELISA, or dot-ELISA, <b>OR</b> identification of morulae in white cells by microscopic examination in the absence of other supportive lab results.</p> <p><b>Suspect:</b> A case with laboratory evidence of past/present infection with undetermined <i>Ehrlichia/Anaplasma spp.</i> but no available clinical information.</p> <p>Note: For ehrlichiosis/anaplasmosis, an undetermined case can only be classified as probable. This occurs when a case has compatible clinical criteria with laboratory evidence to support infection, but not with sufficient clarity to identify the organism as <i>E. chaffeensis</i>, <i>A. phagocytophilum</i>, or <i>E. ewingii</i>. This can include the identification of morulae in white cells by microscopic examination in the absence of other supportive laboratory results.</p>	Not applicable - See note
<b>Encephalitis, Arboviral</b>	See Case Definition/Case Classification for <a href="#">Arbovirus</a> , Neuroinvasive (Encephalitis/meningitis)	See <a href="#">Lab Confirmation Tests for Arbovirus</a> , Neuroinvasive (Encephalitis/meningitis)
<b><i>Escherichia coli</i>, Shiga toxin-producing (STEC) [see Shiga toxin-producing <i>Escherichia coli</i>]</b> <a href="#">11563</a>	See <a href="#">Shiga toxin-producing <i>Escherichia coli</i> (STEC)</a>	
<b>Group A <i>Streptococcus</i>, invasive (GAS)</b>	See <a href="#">Streptococcus, invasive Group A (GAS)</a>	
<b>Group B <i>Streptococcus</i>, invasive (GBS)</b>	See <a href="#">Streptococcus, Invasive Group B (GBS)</a>	
<b>Granulomatous amebic encephalitis (GAE)</b>	See <a href="#">Amebic meningitis, other</a>	
<b><i>Haemophilus influenzae</i> type b, invasive disease</b> <a href="#">10590</a>	<p><i>Haemophilus influenzae</i> type b can produce any of several clinical syndromes. Only invasive manifestations, however, are reportable. These include meningitis, bacteremia/septicemia, epiglottitis, pericarditis, osteomyelitis, septic arthritis, and cellulitis.</p> <p><b>Confirmed:</b> A clinically compatible case that is lab confirmed and identified specifically as <i>H. influenzae</i> type b</p> <p><b>Probable:</b> A clinically compatible illness with detection of <i>H. influenzae</i> type b antigen in cerebrospinal fluid (CSF)</p>	<ul style="list-style-type: none"> <li>Isolation of <i>H. influenzae</i> type b from a normally sterile site (e.g., blood, cerebrospinal fluid (CSF), or less commonly, joint, pleural, or pericardial fluid)</li> </ul> <p>See <a href="#">Normally Sterile Site</a></p> <p>Note: Positive antigen results from urine or serum samples are unreliable for diagnosis of <i>H. influenzae</i> disease. <i>Haemophilus influenzae</i> that is not typed or is not type b is not reportable as <i>H. flu</i> type b. Serotyping of isolates can be performed at the DSHS laboratory.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>Hantavirus infection</b> <sup>8</sup> <a href="#">11610</a>	<p>An acute zoonotic viral disease characterized by fever, myalgias and GI complaints followed by the abrupt onset of respiratory distress and hypotension. The illness progresses rapidly to severe respiratory failure and shock. An elevated hematocrit, hypoalbuminemia and thrombocytopenia are found in most cases. Renal and hemorrhagic manifestations are usually conspicuously absent except in some severe cases.</p> <p><b>Confirmed:</b> A clinically compatible case with confirmatory laboratory results</p>	<p>Diagnosis is made by the demonstration of specific IgM antibodies using ELISA, Western blot or strip immunoblot techniques. Most patients have IgM antibodies at the time of hospitalization. PCR analysis of autopsy or biopsy tissues and immunohistochemistry are also established diagnostic techniques in specialized laboratories.</p>
<b>Hantavirus pulmonary syndrome</b> <a href="#">11590</a>	<p>Hantavirus pulmonary syndrome (HPS), commonly referred to as hantavirus disease, is a febrile illness characterized by bilateral interstitial pulmonary infiltrates and respiratory compromise usually requiring supplemental oxygen and clinically resembling acute respiratory disease syndrome (ARDS). The typical prodrome consists of fever, chills, myalgia, headache, and gastrointestinal symptoms. Typical clinical laboratory findings include hemoconcentration, left shift in the white blood cell count, neutrophilic leukocytosis, thrombocytopenia, and circulating immunoblasts.</p> <p>Clinical evidence: Illness characterized by one or more of the following:</p> <ul style="list-style-type: none"> <li>▪ A febrile illness (temperature greater than 101.0° F), with <ul style="list-style-type: none"> <li>○ Bilateral diffuse interstitial edema, <b>OR</b></li> <li>○ Clinical diagnosis of acute respiratory distress syndrome (ARDS), <b>OR</b></li> <li>○ Radiographic evidence of noncardiogenic pulmonary edema, <b>OR</b></li> </ul> </li> <li>▪ Unexplained respiratory illness resulting in death in a previously healthy person, <b>OR</b></li> <li>▪ An unexplained respiratory illness resulting in death, with an autopsy examination demonstrating noncardiogenic pulmonary edema without an identifiable cause.</li> </ul> <p><b>Confirmed:</b> A clinically compatible case (meets clinical evidence criteria) with confirmatory laboratory results</p>	<ul style="list-style-type: none"> <li>▪ Detection of hantavirus-specific immunoglobulin M or rising titers of hantavirus-specific immunoglobulin G, <b>OR</b></li> <li>▪ Detection of hantavirus-specific ribonucleic acid sequence by polymerase chain reaction in clinical specimens, <b>OR</b></li> <li>▪ Detection of hantavirus antigen by immunohistochemistry</li> </ul>
<b>Hemolytic uremic syndrome, postdiarrheal (HUS)</b> <a href="#">11550</a>	<p>Hemolytic uremic syndrome (HUS) is characterized by the acute onset of microangiopathic hemolytic anemia, renal injury, and low platelet count. Thrombotic thrombocytopenic purpura (TTP) also is characterized by these features but can include central nervous system (CNS) involvement and fever and can have a more gradual onset. Most cases of HUS (but few cases of TTP) occur after an acute gastrointestinal illness (usually diarrheal).</p> <p><b>Confirmed:</b> An acute illness diagnosed as HUS or TTP that both meets the laboratory criteria and began within 3 weeks after onset of an episode of acute or bloody diarrhea</p> <p><b>Probable:</b></p> <ul style="list-style-type: none"> <li>▪ An acute illness diagnosed as HUS or TTP that meets the laboratory criteria in a patient who does not have a clear history of acute or bloody diarrhea in preceding 3 weeks, <b>OR</b></li> <li>▪ An acute illness diagnosed as HUS or TTP, that a) has onset within 3 weeks after onset of an acute or bloody diarrhea and b) meets the laboratory criteria except that microangiopathic changes are not confirmed</li> </ul> <p>Note: See <a href="#">Shiga toxin-producing Escherichia coli (STEC)</a>. Cases meeting the criteria for both conditions should be reported under each condition.</p>	<p>The following are both present at some time during the illness:</p> <ul style="list-style-type: none"> <li>▪ Anemia (acute onset) with microangiopathic changes (i.e., schistocytes, burr cells, or helmet cells) on peripheral blood smear <b>AND</b></li> <li>▪ Renal injury (acute onset) evidenced by either hematuria, proteinuria, or elevated creatinine level (i.e., greater than or equal to 1.0 mg/dL in a child aged less than 13 years or greater than or equal to 1.5 mg/dL in a person aged greater than or equal to 13 years, or greater than or equal to 50% increase over baseline)</li> </ul> <p>Note: A low platelet count can usually, but not always, be detected early in the illness, but it can then become normal or even high. If a platelet count obtained within 7 days after onset of the acute gastrointestinal illness is not less than 150,000/mm<sup>3</sup>, other diagnoses should be considered.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>Hepatitis A, acute</b> <a href="#">10110</a>	<p>An acute illness with at least one of the following a) discrete onset of symptoms b) jaundice or c) elevated serum aminotransferase levels (&gt;100 IU/L).</p> <p><b>Confirmed:</b> A case that meets the clinical case definition and is laboratory confirmed, <b>OR</b> a case that meets the clinical case definition and occurs in a person who has an epidemiological link with a person who has laboratory-confirmed hepatitis A</p>	<ul style="list-style-type: none"> <li>▪ Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV IgM) positive</li> </ul>
<b>Hepatitis B, acute</b> <a href="#">10100</a>	<p>An acute illness with at least one of the following a) discrete onset of symptoms* b) jaundice or c) elevated serum aminotransferase levels &gt;100 IU/L.</p> <p><b>Confirmed:</b> A case that meets the clinical case definition is laboratory confirmed, and is not known to have chronic hepatitis B**.</p> <p>*A documented negative hepatitis B surface antigen (HBsAg) laboratory test result within 6 months prior to a positive test result (HBsAg, hepatitis B “e” antigen (HBeAg), or hepatitis B virus nucleic acid testing (HBV NAT) including genotype) does not require an acute clinical presentation to meet the surveillance case definition.</p> <p>**A person should be considered chronically infected if hepatitis B antigen tests (HBsAg, HBeAg, and/or nucleic acid tests) have been positive for 6 months or longer or if the patient has a history of chronic hepatitis B diagnosis.</p>	<ul style="list-style-type: none"> <li>▪ IgM antibody to hepatitis B core antigen (anti-HBc IgM) positive, <b>OR</b></li> <li>▪ Hepatitis B surface antigen (HBsAg) positive</li> </ul>
<b>Hepatitis B virus infection, Perinatal</b> <sup>9</sup> <a href="#">10104</a>	<p>Perinatal hepatitis B (HBV) in the newborn can range from asymptomatic to fulminant hepatitis. Confirmed: HBsAg positive in any infant aged &gt;1 through 24 months who was born in the US or in US territories to an HBsAg-positive mother</p>	<ul style="list-style-type: none"> <li>▪ Hepatitis B surface antigen (HBsAg) positive</li> </ul>
<b>Hepatitis C, acute</b> <a href="#">10101</a>	<p>An acute illness with discrete onset of symptoms consistent with acute viral hepatitis (e.g., anorexia, abdominal discomfort, nausea, vomiting) and a) jaundice or b) abnormal serum alanine aminotransferase levels (ALT level &gt;400 IU/L).</p> <p><b>Confirmed:</b> A case that meets the clinical case definition, is laboratory confirmed, and is not known to have chronic hepatitis C (HCV).</p> <hr/> <p><b>Perinatal or Infant Hepatitis C:</b> (birth to two years, if greater than 2 years of age please code as above)</p> <p><b>Confirmed:</b> Any PCR positive infant. (Testing at 12-18 months is recommended to determine whether infection is resolved or chronic.)</p> <p><b>Suspect:</b> Any HCV Ab (EIA, RIBA) positive infant. Due to maternal antibody infants should be followed-up and re-classified at around 12- 18 months of age based on follow-up laboratory testing.</p>	<ul style="list-style-type: none"> <li>▪ Anti-HCV screening-test-positive with a signal to cut-off ratio predictive of a true positive as determined for the particular assay defined and listed by CDC at <a href="http://www.cdc.gov/hepatitis/HCV/LabTesting.htm">http://www.cdc.gov/hepatitis/HCV/LabTesting.htm</a> , <b>OR</b></li> <li>▪ Recombinant immunoblot assay (HCV RIBA) positive, <b>OR</b></li> <li>▪ Nucleic acid testing (NAT) for HCV RNA positive (including genotype);</li> </ul> <p><b>AND</b>, if done, meets the following two criteria:</p> <ul style="list-style-type: none"> <li>▪ IgM antibody to hepatitis A virus (IgM anti-HAV) negative, <b>AND</b></li> <li>▪ IgM antibody to hepatitis B core antigen (IgM anti-HBc) negative</li> </ul>



Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Hepatitis E, Acute</b><sup>1</sup> <a href="#">10103</a></p>	<p>Typical clinical signs and symptoms of acute hepatitis E virus (HEV) are similar to those of other types of acute viral hepatitis and include abdominal pain anorexia, dark urine, fever, hepatomegaly, jaundice, malaise, nausea, and vomiting. Other less common symptoms include arthralgia, diarrhea, pruritus, and urticarial rash. The period of infectivity following acute infection has not been determined but virus excretion in stools has been demonstrated up to 14 days after illness onset. In most hepatitis E outbreaks, the highest rates of clinically evident disease have been in young to middle-age adults; lower disease rates in younger age groups can be the result of an icteric and/or subclinical HEV infection. No evidence of chronic infection has been detected in long-term follow-up of patients with hepatitis E. The case fatality rate is low except in pregnant women where it can reach 20% among those infected during the third trimester of pregnancy.</p> <p><b>Confirmed:</b> A case that meets the clinical case description and is laboratory confirmed</p> <p><b>Probable:</b> A case that meets the clinical case description with supportive laboratory evidence (positive IgM antibody from labs other than CDC); <b>OR</b> negative tests for other acute hepatitis markers and an epidemiological link to other confirmed cases or travel history to an endemic area during exposure period</p>	<p>IgM anti-HEV from CDC laboratory or PCR positive from reference laboratory</p> <p>Note: No FDA approved tests to diagnose HEV infection are available in the United States.</p>
<p>Influenza, human isolates<sup>10</sup> - [outbreaks only] <a href="#">11060</a></p>	<p>The flu is a contagious respiratory illness caused by influenza viruses. It can cause mild to severe illness and at times can lead to death. Symptoms of flu include fever (usually high), headache, extreme tiredness, dry cough, sore throat, runny or stuffy nose, and muscle aches. Stomach symptoms (nausea, vomiting, and diarrhea) can occur but are more common in children than adults. Complications of flu can include bacterial pneumonia, ear infections, sinus infections, dehydration, and worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes.</p> <p><b>Confirmed:</b> Case that is clinically compatible and laboratory confirmed</p> <p>Note: Influenza is not a reportable condition in Texas. See <a href="#">Influenza A, novel / variant infection</a> for reporting of novel /variant strains. See <a href="#">Influenza-associated pediatric mortality</a> for reporting of influenza-associated deaths in all persons aged &lt;18 years.</p>	<ul style="list-style-type: none"> <li>▪ Influenza virus isolation in tissue cell culture from respiratory specimens, <b>OR</b></li> <li>▪ Reverse-transcriptase polymerase chain reaction (RT-PCR) testing of respiratory specimens, <b>OR</b></li> <li>▪ Immunofluorescent antibody staining (direct or indirect) of respiratory specimens, <b>OR</b></li> <li>▪ Rapid influenza diagnostic testing of respiratory specimens, <b>OR</b></li> <li>▪ Immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract tissue from autopsy specimens, <b>OR</b></li> <li>▪ Four-fold rise in influenza hemagglutination inhibition (HI) antibody titer in paired acute and convalescent sera.</li> </ul>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>Influenza A – novel / variant</b> <a href="#">11062</a>	<p>An illness compatible with influenza virus infection (fever &gt;100 degrees Fahrenheit, with cough and/or sore throat)</p> <p><b>Confirmed:</b> A case of human infection with a laboratory confirmed novel influenza A virus</p> <p><b>Probable:</b> A case meeting the clinical criteria and epidemiologically linked to a confirmed case, but for which no confirmatory laboratory testing for novel influenza virus infection has been performed or test results are inconclusive for a novel influenza A virus infection</p> <p><b>Criteria for epidemiologic linkage:</b> a) the patient has had contact with one or more persons who either have or had the disease and b) transmission of the agent by the usual modes of transmission is plausible. A case can be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory confirmed.</p> <p><b>Suspect:</b> A case meeting the clinical criteria in which influenza A has been detected but is pending laboratory confirmation. In addition, a history of either close contact with ill animals known to transmit novel subtypes of influenza A (such as wild birds or poultry, swine or other mammals) <b>OR</b> travel, within 14 days, to any country where a novel influenza A virus (such as highly pathogenic avian influenza A H5N1) has been recently identified in animals or people, is required.</p>	<p>Identification of an influenza A virus subtype or strain that is different from currently circulating human influenza H1 and H3 strains as confirmed by CDC’s influenza laboratory, by public health laboratories using CDC-approved protocols for that specific strain, or by labs using FDA-approved tests for specific strains.</p> <ul style="list-style-type: none"> <li>▪ Novel subtypes include, but are not limited to, H2, H5, H7, and H9 subtypes.</li> <li>▪ Influenza H1 and H3 subtypes originating from a non-human species or from genetic re-assortment between animal and human viruses are also novel /variant subtypes or strains.</li> <li>▪ Initial confirmation that a specific influenza A virus represents a novel / variant virus will be performed by CDC’s influenza laboratory.</li> </ul>
<b>Influenza A – novel viral infections</b>	See <a href="#">Influenza A – novel / variant infections</a>	
<b>Influenza-associated pediatric mortality</b> <a href="#">11061</a>	<p>An influenza-associated death is defined for surveillance purposes as a death resulting from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test. There should be no period of complete recovery between the illness and death. Influenza-associated deaths in all persons aged &lt;18 years should be reported. A death should not be reported if there is no laboratory confirmation of influenza virus infection, the influenza illness is followed by full recovery to baseline health status prior to death, the death occurs in a person 18 years or older, or after review and consultation there is an alternative agreed upon cause of death which is unrelated to an infectious process (for example, a child with a positive influenza test whose death clearly resulted from trauma after a car accident would not qualify as a case. However, a child with a respiratory illness and a positive influenza test whose death is attributed to another infectious cause such as staphylococcal pneumonia would still qualify as a case.)</p> <p><b>Confirmed:</b> A death meeting the clinical case definition that is laboratory confirmed</p>	<p>Laboratory testing for influenza virus infection can be done on pre- or post-mortem clinical specimens, and include identification of influenza A or B virus infections by a positive result by at least one of the following:</p> <ul style="list-style-type: none"> <li>▪ Influenza virus isolation in tissue cell culture from respiratory specimens, <b>OR</b></li> <li>▪ Reverse-transcriptase polymerase chain reaction (RT-PCR) testing of respiratory specimens, <b>OR</b></li> <li>▪ Immunofluorescent antibody staining (direct or indirect) of respiratory specimens, <b>OR</b></li> <li>▪ Rapid influenza diagnostic testing of respiratory specimens, <b>OR</b></li> <li>▪ Immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract tissue from autopsy specimens, <b>OR</b></li> <li>▪ Four-fold rise in influenza hemagglutination inhibition (HI) antibody titer in paired acute and convalescent sera.</li> </ul>

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<p><b>Legionellosis</b> <a href="#">10490</a></p>	<p>Legionellosis is associated with two clinically and epidemiologically distinct illnesses: Legionnaires disease, which is characterized by fever, myalgia, cough, clinical or radiological pneumonia, and Pontiac fever, a milder illness without pneumonia.</p> <p><b>Confirmed:</b> A clinically compatible case that meets at least one of the confirmatory laboratory criteria.</p> <p><b>Travel-associated:</b> A case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness.</p>	<ul style="list-style-type: none"> <li>▪ Isolation (culture) of <b>any</b> <i>Legionella</i> organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid, <b>OR</b></li> <li>▪ Detection of <i>Legionella pneumophila</i> serogroup 1 antigen in urine using validated reagents, <b>OR</b></li> <li>▪ Demonstration of seroconversion by a fourfold or greater rise in specific serum antibody titer between paired acute and convalescent phase serum specimens to <i>Legionella pneumophila</i> serogroup 1 using validated reagents</li> </ul>
<p><b>Leishmaniasis</b> <a href="#">80550</a></p>	<p>Leishmaniasis is a polymorphic protozoan disease of skin and mucous membranes. The disease starts with a macule then a papule that enlarges and typically becomes an indolent ulcer in the absence of bacterial infection. Lesions can be single or multiple, occasionally nonulcerative and diffuse. Lesions can heal spontaneously within weeks to months, or last for a year or more. In some individuals, certain strains can disseminate to cause mucosal lesions (espundia), even years after the primary cutaneous lesion has healed. These sequelae, which involve nasopharyngeal tissues, are characterized by progressive tissue destruction and often scanty presence of parasites, and can be severely disfiguring. Recurrence of cutaneous lesions after apparent cure can occur as ulcers, papules or nodules at or near the healed original ulcer. Mode of transmission to humans is through the infective bite of female sandflies.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p>	<ul style="list-style-type: none"> <li>▪ Microscopic identification of the nonmotile, intracellular form (amastigote) in stained specimens from lesions, <b>OR</b></li> <li>▪ Culture of the motile, extracellular form (promastigote) on suitable media, <b>OR</b></li> <li>▪ An intradermal (Montenegro) test with leishmanin, an antigen derived from the promastigotes is usually positive in established disease, <b>OR</b></li> <li>▪ Serological (IFA or ELISA) can be useful for diagnosis of mucosal leishmaniasis</li> </ul>
<p><b>Listeriosis</b> <a href="#">10640</a></p>	<p>In adults, invasive disease caused by <i>Listeria monocytogenes</i> manifests most commonly as meningitis or bacteremia; infection during pregnancy can result in fetal loss through miscarriage or stillbirth, or neonatal meningitis or bacteremia. Other manifestations can also be observed.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p><b>Note: For fetal or neonatal (≤1 month of age) infections, the MOTHER is the case-patient.</b></p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>L. monocytogenes</i> from a normally sterile site, e.g., blood, cerebrospinal fluid (CSF), or less commonly, joint, pleural, or pericardial fluid, <b>OR</b></li> <li>▪ In the setting of miscarriage or stillbirth, isolation of <i>L. monocytogenes</i> from placental or fetal tissue, <b>OR</b></li> <li>▪ In the setting of pregnancy or live birth, isolation of <i>L. monocytogenes</i> from mother's or neonate's blood or other sterile site, or from placental or amniotic fluid.</li> </ul> <p>See <a href="#">Normally Sterile Site</a></p> <p><b>Note: All <i>Listeria monocytogenes</i> isolates must be submitted to the DSHS laboratory.</b></p>

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<p><b>Lyme disease</b> <a href="#">11080</a></p>	<p>A systemic, tickborne disease with protean manifestations, including dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The best clinical marker for the disease is the initial skin lesion, erythema migrans (EM), which occurs in 60%-80% of patients.</p> <p><b>Confirmed:</b> A case with a physician-diagnosed EM that is greater than or equal to 5 cm in size with a known exposure*, <b>OR</b> a case of physician-diagnosed EM of any size with laboratory confirmation, <b>OR</b> a case with at least one late manifestation** that has laboratory confirmation.</p> <p>*Exposure is defined as having been (less than or equal to 30 days prior to onset of EM) in wooded, brushy, or grassy areas in a county in which Lyme disease is endemic. (Currently, there are no Texas counties that are considered to be endemic for Lyme disease.) A history of tick bite is not required.</p> <p>**For purposes of surveillance, late manifestations include any of the following when an alternate explanation is not found:</p> <ul style="list-style-type: none"> <li>▪ Musculoskeletal system. Recurrent, brief attacks (weeks or months) of objective joint swelling in one or a few joints, sometimes followed by chronic arthritis in one or a few joints.</li> <li>▪ Nervous system. Any of the following, alone or in combination: lymphocytic meningitis; cranial neuritis, particularly facial palsy (can be bilateral); radiculoneuropathy; or, rarely, encephalomyelitis. Encephalomyelitis must be confirmed by demonstration of antibody production against <i>Borrelia burgdorferi</i> in the cerebrospinal fluid (CSF), evidenced by a higher titer of antibody in CSF than in serum.</li> <li>▪ Cardiovascular system. Acute onset of high-grade (2nd-degree or 3rd-degree) atrioventricular conduction defects that resolve in days to weeks and are sometimes associated with myocarditis.</li> </ul> <p><b>Probable:</b> Any other case of physician-diagnosed Lyme disease that has laboratory confirmation.</p> <p><b>Suspect:</b> A case of EM with no known exposure and no laboratory evidence of infection, <b>OR</b> a case with laboratory evidence of infection, but no clinical information available.</p> <p>Note: Lyme disease reports will not be considered cases if the medical provider specifically states this is <i>not</i> a case of Lyme disease, or the only symptom listed is “tick bite” or “insect bite.”</p>	<ul style="list-style-type: none"> <li>▪ Positive culture for <i>Borrelia burgdorferi</i>, <b>OR</b></li> <li>▪ IgG immunoblot seropositivity using established criteria*, <b>OR</b></li> <li>▪ IgM immunoblot seropositivity using established criteria* with <ul style="list-style-type: none"> <li>▪ Positive EIA or IFA test, AND</li> <li>▪ Specimen collected within 30 days of onset.</li> </ul> </li> </ul> <p>*Immunoblot interpretation criteria: <i>It was recommended that an IgM immunoblot be considered positive if two of the following three bands are present: 24 kDa (OspC) *, 39 kDa (BmpA), and 41 kDa (Fla). It was further recommended that an IgG immunoblot be considered positive if five of the following 10 bands are present: 18 kDa, 21 kDa (OspC) *, 28 kDa, 30 kDa, 39 kDa (BmpA), 41 kDa (Fla), 45 kDa, 58 kDa (not GroEL), 66 kDa, and 93 kDa.</i> -- Centers for Disease Control and Prevention. <i>Recommendations for test performance and interpretation from the Second National Conference on Serologic Diagnosis of Lyme Disease.</i> <a href="#">MMWR 1995; 44:590–1.</a></p>
<p><b>Malaria</b> <a href="#">10130</a></p>	<p>The first symptoms of malaria (fever, chills, sweats, headaches, muscle pains, nausea and vomiting) are also found in other disease such as influenza and other common viral infections. In severe malaria (caused by <i>P. falciparum</i>), clinical findings such as confusion, coma, neurologic focal signs, severe anemia, and respiratory difficulties are more striking and can increase the suspicion index for malaria.</p> <p><b>Confirmed:</b> A case that is laboratory confirmed in any person (symptomatic or asymptomatic) diagnosed in the United States, regardless of whether the person experienced previous episodes of malaria while outside the country.</p> <p><b>Suspect:</b> Detection of <i>Plasmodium</i> species by rapid diagnostic antigen testing (RDT) without confirmation by microscopy or nucleic acid testing in any person diagnosed in the United States, regardless of whether the person experienced previous episodes of malaria while outside the country.</p> <p>Note: A subsequent attack experienced by the same person but caused by a different <i>Plasmodium</i> species is counted as an additional case.</p>	<ul style="list-style-type: none"> <li>▪ Demonstration of malaria parasites in blood films</li> <li>▪ Detection of malaria parasite (<i>Plasmodium</i> species) -specific nucleic acid by PCR</li> </ul>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>Measles (Rubeola)</b> <a href="#">10140</a>	<p>An illness characterized by all of the following: a generalized maculopapular rash lasting at least 3 days; a temperature <math>\geq 101.0^{\circ}\text{F}</math> (<math>&gt;38.3^{\circ}\text{C}</math>); and cough, coryza, or conjunctivitis.</p> <p><b>Confirmed:</b></p> <ul style="list-style-type: none"> <li>▪ A compatible illness (can or cannot meet all clinical criteria) that is laboratory confirmed <b>OR</b></li> <li>▪ A case that meets the clinical case definition <b>AND</b>: <ul style="list-style-type: none"> <li>○ Is laboratory confirmed by a positive serologic test for measles immunoglobulin M antibody* performed by a public health laboratory (regardless of epidemiologic linkage or travel).</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>○ Is epidemiologically linked to a confirmed measles case or by travel to a measles endemic/outbreak area.</li> </ul> <p>*not explained by MMR vaccination during the previous 6-45 days</p>	<ul style="list-style-type: none"> <li>▪ Significant rise in measles antibody level by any standard serologic assay *,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Isolation of measles virus from a clinical specimen,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Detection of measles-virus-specific nucleic acid by PCR</li> </ul> <p>*not explained by MMR vaccination during the previous 6-45 days</p>
<b>Meningococcal disease (<i>Neisseria meningitidis</i>)</b> <a href="#">10150</a>	<p>Meningococcal disease manifests most commonly as meningitis and/or meningococcemia that can progress rapidly to purpura fulminans, shock, and death. However, other manifestations might be observed.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible case that has one of the following:</p> <ul style="list-style-type: none"> <li>▪ <i>N. meningitidis</i> nucleic acid detected using a validated polymerase chain reaction (PCR), obtained from a normally sterile site; <b>OR</b></li> <li>▪ <i>N. meningitidis</i> antigen by immunohistochemistry (IHC) on formalin-fixed tissue; <b>OR</b></li> <li>▪ <i>N. meningitidis</i> antigen by latex agglutination of CSF; <b>OR</b></li> <li>▪ Clinical purpura fulminans in the absence of a positive blood culture; <b>OR</b></li> <li>▪ Clinically compatible case with gram negative diplococci from a normally sterile site (e.g., blood or CSF)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Neisseria meningitidis</i> from a normally sterile site</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Isolation of <i>Neisseria meningitidis</i> from purpuric lesions</li> </ul> <p>See <a href="#">Normally Sterile Site</a></p> <p><b>Note: All <i>Neisseria meningitidis</i> isolates from normally sterile sites and/or purpuric lesions must be submitted to the DSHS laboratory for typing and molecular analysis.</b></p>
MRSA - [outbreaks only] <a href="#">11661</a>	See <a href="#">Staphylococcus aureus, coagulase-positive, methicillin- or oxacillin-resistant (MRSA)</a>	
<b>Mumps</b> <a href="#">10180</a>	<p>Acute parotitis or other salivary gland swelling lasting at least 2 days, or orchitis or oophoritis unexplained by another more likely diagnosis</p> <p><b>Confirmed:</b> A case that has a positive mumps PCR result <b>OR</b> positive mumps culture <b>AND</b> either meets the clinical case definition <b>OR</b> has aseptic meningitis, encephalitis, hearing loss, mastitis, or pancreatitis</p> <p><b>Probable:</b> A case that meets the clinical case definition <b>AND</b></p> <ul style="list-style-type: none"> <li>• Has a positive test for serum anti-mumps immunoglobulin M (IgM) antibody, <b>OR</b></li> <li>• Has an epidemiologic link to another probable or confirmed case or linkage to a group/community defined by public health during an outbreak of mumps</li> </ul>	<ul style="list-style-type: none"> <li>▪ Isolation of mumps virus from clinical specimen</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Detection of mumps-virus-specific nucleic acid by PCR</li> </ul> <p>Note: An elevated serum amylase is not confirmatory for mumps</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p>Norovirus <sup>11</sup> - [outbreaks only]  <a href="#">10996</a></p>	<p>Norovirus infection usually presents as acute-onset vomiting, watery non-bloody diarrhea with abdominal cramps, and nausea. Low-grade fever also occasionally occurs, and vomiting is more common in children. Dehydration is the most common complication, especially among the young and elderly, and can require medical attention. Symptoms usually last 24 to 60 hours. Recovery is usually complete and there is no evidence of any serious long-term sequelae. Studies with volunteers given stool filtrates have shown that asymptomatic infection can occur in as many as 30% of infections, although the role of asymptomatic infection in norovirus transmission is not well understood.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p><b>Probable:</b> Norovirus can be established as the probable cause of an outbreak if:</p> <ul style="list-style-type: none"> <li>▪ The mean (or median) illness duration is 12 to 60 hours, and</li> <li>▪ The mean (or median) incubation period is 24 to 48 hours, and</li> <li>▪ More than 50% of people have vomiting, and</li> <li>▪ No bacterial agent is found.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Polymerase chain reaction (PCR) can be used to test stool and emesis samples, as well as environmental swabs in special studies. Identification of norovirus can best be made from stool specimens taken within 48 to 72 hours after onset of symptoms. Virus can sometimes be found in stool samples taken as late as 2 weeks after recovery.</li> <li>▪ Detection of norovirus by direct and immune electron microscopy of fecal specimens</li> <li>▪ Fourfold increase of norovirus antibodies in acute- and convalescent-phase blood samples</li> </ul> <p>Note: The etiology of GI outbreaks should be confirmed by submitting specimens to the DSHS Laboratory. Sequencing of norovirus strains found in clinical and environmental samples has greatly helped in conducting epidemiologic investigations.</p>
<p><b>Pertussis</b>  <a href="#">10190</a></p>	<p>For endemic or sporadic cases, a cough illness lasting at least 14 days AND at least one of the following additional symptoms and without other apparent cause (as reported by a health professional):</p> <ul style="list-style-type: none"> <li>▪ Paroxysmal coughing, <b>OR</b></li> <li>▪ Inspiratory "whoop," <b>OR</b></li> <li>▪ Post-tussive vomiting</li> </ul> <p>In outbreak settings of 3 or more cases including at least 1 that is laboratory confirmed (i.e. meets the confirmed case definition in addition to being either PCR or culture positive), the case definition used can be modified to a cough illness lasting at least 14 days.</p> <p><b>Confirmed:</b> Must meet one of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ A person with an acute cough illness of any duration who is culture positive, <b>OR</b></li> <li>▪ A person who meets the clinical case definition and is PCR positive, <b>OR</b></li> <li>▪ A person who meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case. (This does not include linkage to a patient with a positive laboratory result that does not meet the clinical criteria, i.e., classified as Not a Case.)</li> </ul> <p><b>Probable:</b> Must meet all of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ Meets the clinical case definition, <b>AND</b></li> <li>▪ Is not laboratory confirmed (not tested or tests are negative), <b>AND</b></li> <li>▪ Is not epidemiologically linked to a laboratory-confirmed case</li> </ul>	<ul style="list-style-type: none"> <li>▪ Isolation (culture) of <i>Bordetella pertussis</i> from clinical specimen <b>OR</b></li> <li>▪ Positive polymerase chain reaction (PCR) assay for <i>B. pertussis</i></li> </ul> <p>Note: Because <i>B. pertussis</i> can be difficult to culture, a negative culture result does not rule out pertussis. Negative PCR results do not require investigation unless reported as a suspected case by a healthcare provider. Direct fluorescent antibody (DFA) staining of a patient's specimen and serological laboratory results (pertussis IgG or IgM) are <b>NOT</b> considered confirmatory for pertussis.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Plague</b> <a href="#">10440</a></p>	<p>Plague is transmitted to humans by fleas or by direct exposure to infected tissues or respiratory droplets; the disease is characterized by fever, chills, headache, malaise, prostration, and leukocytosis that manifests in one or more of the following principal clinical forms:</p> <ul style="list-style-type: none"> <li>▪ Regional lymphadenitis (bubonic plague), <b>OR</b></li> <li>▪ Septicemia without an evident bubo (septicemic plague), <b>OR</b></li> <li>▪ Plague pneumonia, resulting from hematogenous spread in bubonic or septicemic cases (secondary pneumonic plague) or inhalation of infectious droplets (primary pneumonic plague), <b>OR</b></li> <li>▪ Pharyngitis and cervical lymphadenitis resulting from exposure to larger infectious droplets or ingestion of infected tissues (pharyngeal plague)</li> </ul> <p><b>Confirmed:</b> A clinically compatible case with confirmatory laboratory result:  <b>Probable:</b> A clinically compatible case with a presumptive laboratory result</p> <ul style="list-style-type: none"> <li>▪ Elevated serum antibody titer(s) to <i>Yersinia pestis</i> fraction 1 (F1) antigen (without documented fourfold or greater change) in a patient with no history of plague vaccination, <b>OR</b></li> <li>▪ Detection of F1 antigen in a clinical specimen by fluorescent assay</li> </ul> <p><b>Suspect:</b> A clinically compatible case without presumptive or confirmatory laboratory results</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Yersinia pestis</i> from a clinical specimen, <b>OR</b></li> <li>▪ Fourfold or greater change in serum antibody titer to <i>Y. pestis</i> F1 antigen</li> </ul> <p>See <a href="#">Yersiniosis</a> for other <i>Yersinia</i> isolates</p> <p><b>Note: All <i>Yersinia pestis</i> isolates must be submitted to the DSHS laboratory.</b></p>
<p><b>Poliomyelitis, paralytic</b> <a href="#">10410</a></p>	<p>Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss</p> <p><b>Confirmed*:</b> A case that meets the clinical case definition in which the patient has a neurological deficit 60 days after onset of initial symptoms, has died, or has unknown follow-up status</p> <p><b>Probable*:</b> A case that meets the clinical case definition</p> <p>*Note: All suspected cases of paralytic poliomyelitis are reviewed by a panel of expert consultants at the Centers for Disease Control and Prevention (CDC) before final case classification occurs.</p>	<p>Isolation of wild-type poliovirus type 1, 2, or 3 from a clinical specimen (stool or CSF)</p>
<p><b>Poliovirusinfection,nonparalytic</b> <a href="#">10405</a></p>	<p>Most poliovirus infections are asymptomatic or cause mild febrile disease. Poliovirus infections occasionally cause aseptic meningitis and one out of 200 infections from poliovirus type 1 results in paralytic poliomyelitis, characterized by acute onset of flaccid paralysis that is typically asymmetric and associated with a prodromal fever.</p> <p><b>Confirmed:</b> Laboratory confirmed poliovirus infection in a person without symptoms of paralytic poliomyelitis.</p>	<p>Poliovirus isolate identified in an appropriate clinical specimen, with confirmatory typing and sequencing performed by the CDC Poliovirus Laboratory</p>
<p><b>Powassan virus</b> <sup>1</sup></p>	<p>See Case Definition/Case Classification for <a href="#">Arbovirus</a>, Neuroinvasive (Encephalitis/meningitis) and Non-neuroinvasive</p>	<p>See <a href="#">Lab Confirmation Tests for Arbovirus</a>, Neuroinvasive and Non-neuroinvasive</p>
<p><b>Primary Amebic Meningoencephalitis (PAM)</b></p>	<p>See <a href="#">Amebic meningoencephalitis (PAM)</a></p>	

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Q Fever, acute</b> <a href="#">10257</a></p>	<p>Q fever is a zoonotic disease caused by the rickettsia <i>Coxiella burnetii</i>. Exposure to Q fever is usually via aerosol and the source can be unknown (especially for chronic infection). Exposure can be associated with goats, sheep, or other livestock, but direct contact with animals is not required, and variable incubation periods can be dose dependent. Acute infection is characterized by acute onset of fever accompanied by rigors, myalgia, malaise, and severe retrobulbar headache. Symptoms can include fatigue, night sweats, dyspnea, confusion, nausea, diarrhea, abdominal pain, vomiting, non-productive cough, or chest pain. Severe disease can include acute hepatitis, atypical pneumonia, and meningoencephalitis. Pregnant women are at risk for fetal death and abortion. Clinical laboratory findings can include elevated liver enzyme levels, leukocytosis, and thrombocytopenia. Asymptomatic infections can also occur.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible case with a single supportive IgG-specific antibody titer to <i>C. burnetii</i> Phase II antigen of <math>\geq 1:128</math> by IFA, <b>OR</b> serological evidence of elevated IgG or IgM antibody titer to <i>C. burnetii</i> by ELISA, dot-ELISA, or LA</p>	<ul style="list-style-type: none"> <li>▪ Serological evidence of a fourfold change in IgG-specific antibody titer to <i>C. burnetii</i> Phase II antigen by IFA between paired serum samples (one taken during the first week of illness and a second 3-6 weeks later), <b>OR</b></li> <li>▪ Detection of <i>C. burnetii</i> DNA in a clinical specimen by polymerase chain reaction (PCR) assay, <b>OR</b></li> <li>▪ Demonstration of <i>C. burnetii</i> antigen in a clinical specimen by immunohistochemical (IHC) methods, <b>OR</b></li> <li>▪ Isolation of <i>C. burnetii</i> from a clinical specimen in cell culture</li> </ul>
<p><b>Q Fever, chronic</b> <a href="#">10258</a></p>	<p>Chronic Q fever is characterized by a <i>Coxiella burnetii</i> infection that persists for more than 6 months. Potentially fatal endocarditis can evolve months to years after acute infection, particularly in persons with underlying valvular disease. Infections of aneurysms and vascular prostheses have been reported. Immunocompromised individuals are particularly susceptible. Rare cases of chronic hepatitis without endocarditis, osteomyelitis, osteoarthritis, and pneumonitis have been described.</p> <p><b>Clinical evidence:</b> Chronic hepatitis, osteomyelitis, osteoarthritis, or pneumonitis (in the absence of other known etiology); suspected infection of a vascular aneurysm or vascular prosthesis; or newly recognized, culture-negative endocarditis (particularly in a patient with previous valvulopathy or compromised immune system).</p> <p><b>Confirmed:</b> A clinically compatible (meets clinical evidence criteria) case of chronic illness that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible case of chronic illness with an antibody titer to <i>C. burnetii</i> Phase I IgG antigen that is <math>\geq 1:128</math> and <math>&lt; 1:800</math> by IFA</p>	<ul style="list-style-type: none"> <li>▪ Serological evidence of IgG antibody to <i>C. burnetii</i> Phase I antigen of <math>\geq 1:800</math> by IFA (while Phase II IgG titer will be elevated, Phase I titer is higher than Phase II), <b>OR</b></li> <li>▪ Detection of <i>C. burnetii</i> DNA in a clinical specimen by polymerase chain reaction (PCR) assay, <b>OR</b></li> <li>▪ Demonstration of <i>C. burnetii</i> antigen in a clinical specimen by immunohistochemical (IHC) methods, <b>OR</b></li> <li>▪ Isolation of <i>C. burnetii</i> from a clinical specimen in cell culture</li> </ul>
<p><b>Rabies, animal</b> <a href="#">10340</a></p>	<p>All warm-blooded animals, including humans, are susceptible to rabies. In Texas, skunks, bats, coyotes, and foxes are the most commonly infected animals. Domestic dogs, cats, and livestock usually acquire rabies infections from wild animals.</p> <p>Medical authorities distinguish on the basis of clinical signs, between "furious" and "dumb" rabies. In the furious variety, the "mad dog" symptoms are pronounced. The animal is irritable and will snap and bite at real or imaginary objects. It can run for miles and attack anything in its path. The animal is extremely vicious and violent. Paralysis sets in shortly, usually affecting the hind legs first. Death follows four to seven days after the onset of clinical signs. In dumb rabies, the prominent symptoms are drowsiness and paralysis of the lower jaw. The animal can appear to have a bone lodged in its throat, sometimes causing owners to force open an animal's mouth to investigate and become unwittingly exposed to rabies. Animals with dumb rabies have no tendency to roam but will snap at movement. They are completely insensitive to pain, and usually become comatose and die from three to ten days after first symptoms appear.</p> <p><b>Confirmed:</b> A case that is laboratory confirmed</p>	<ul style="list-style-type: none"> <li>▪ A positive direct fluorescent rabies antibody test (preferably performed on central nervous system tissue)</li> <li>▪ Isolation of rabies virus (in cell culture or in a laboratory animal)</li> </ul>



Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Rabies, human</b> <a href="#">10460</a></p>	<p>Rabies is an acute encephalomyelitis that almost always progresses to coma or death within 10 days after the first symptom.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed by testing at a state or federal public health laboratory</p> <p>Note: Laboratory confirmation by all of the methods listed under “Lab Confirmation Tests” is strongly recommended.</p>	<ul style="list-style-type: none"> <li>▪ Detection of Lyssavirus antigens in a clinical specimen (preferably the brain or the nerves surrounding hair follicles in the nape of the neck) by direct fluorescent antibody test (IFA), <b>OR</b></li> <li>▪ Isolation (in cell culture or in a laboratory animal) of Lyssavirus from saliva, CSF, or central nervous system tissue, <b>OR</b></li> <li>▪ Identification of Lyssavirus specific antibody (i.e. by IFA or complete rabies virus neutralization at 1:5 dilution) in the CSF, <b>OR</b></li> <li>▪ Identification of Lyssavirus specific antibody (i.e. by IFA or complete rabies virus neutralization at 1:5 dilution) in the serum of an unvaccinated person, <b>OR</b></li> <li>▪ Detection of Lyssavirus viral RNA using reverse transcriptase-polymerase chain reaction (RT-PCR) in saliva, CSF, or tissue</li> </ul>
<p><b>Relapsing fever</b> <a href="#">10845</a></p>	<p>A systemic spirochetal disease in which periods of fever lasting 2-9 days alternate with afebrile periods of 2-4 days; the number of relapses varies from 1 to 10 or more. Each febrile period terminates by crisis. The total duration of the louseborne disease averages 13-16 days; the tickborne disease usually lasts longer. Transitory petechial rashes are common during the initial febrile period. The overall case-fatality rate in untreated cases is between 2% and 10%.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p>	<ul style="list-style-type: none"> <li>▪ Demonstration of the infectious agent (<i>Borrelia</i> spp) in dark-field preparations of fresh blood or stained thick or thin blood films, <b>OR</b></li> <li>▪ Isolation of <i>Borrelia</i> spp by: <ul style="list-style-type: none"> <li>○ Intraperitoneal inoculation of laboratory rats or mice with blood taken during the febrile period, <b>OR</b></li> <li>○ Blood culture in special media</li> </ul> </li> </ul>
<p><b>Rubella</b> <a href="#">10200</a></p>	<p>An illness that has all the following characteristics: Acute onset of generalized maculopapular rash; temperature <math>\geq 99^{\circ}\text{F}</math> (<math>37.2^{\circ}\text{C}</math>), if measured; and arthralgia/arthritis, lymphadenopathy, or conjunctivitis.</p> <p><b>Confirmed:</b> A case that is clinically compatible and is laboratory confirmed or epidemiologically linked to a laboratory-confirmed case</p>	<ul style="list-style-type: none"> <li>▪ Isolation of rubella virus, <b>OR</b></li> <li>▪ Significant rise between acute- and convalescent-phase titers in serum rubella immunoglobulin G (IgG) antibody level by any standard serologic assay, <b>OR</b></li> <li>▪ Positive serologic test for rubella immunoglobulin M (IgM) antibody, <b>OR</b></li> <li>▪ Detection of rubella-virus-specific nucleic acid by PCR</li> </ul>

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<p><b>Rubella, congenital syndrome</b> <a href="#">10370</a></p>	<p>An illness of newborns resulting from rubella infection <i>in utero</i> and characterized by signs or symptoms from the following categories:</p> <ul style="list-style-type: none"> <li>▪ Cataracts/congenital glaucoma, congenital heart disease (most commonly patent ductus arteriosus or peripheral pulmonary artery stenosis), hearing loss, or pigmentary retinopathy</li> <li>▪ Purpura, hepatosplenomegaly, jaundice, microcephaly, developmental delay, meingoencephalitis, or radiolucent bone disease</li> </ul> <p><b>Confirmed:</b> A clinically consistent case that is laboratory confirmed</p> <p><b>Probable:</b> A case that is not laboratory confirmed; that has any two complications listed in (a) of the clinical case definition or one complication from (a) and one from (b); and lacks evidence of any other etiology</p>	<ul style="list-style-type: none"> <li>▪ Isolation of rubella virus, <b>OR</b></li> <li>▪ Demonstration of rubella-specific immunoglobulin M (IgM) antibody, <b>OR</b></li> <li>▪ Infant rubella antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody (i.e., rubella titer that does not drop at the expected rate of a twofold dilution per month), <b>OR</b></li> <li>▪ Detection of rubella-virus-specific nucleic acid by PCR</li> </ul>
<p><b>Saint Louis encephalitis virus (SLE)</b> - (see <a href="#">Arbovirus</a>)</p>	<p>See Case Definition/Case Classification for <a href="#">Arbovirus</a>, Neuroinvasive (Encephalitis/meningitis) and Non-neuroinvasive</p>	<p>See <a href="#">Lab Confirmation Tests for Arbovirus</a>, Neuroinvasive and Non-neuroinvasive</p>
<p><b>Salmonellosis</b> <a href="#">11000</a></p>	<p>An illness of variable severity commonly manifested by diarrhea, fever, abdominal pain, nausea, and vomiting. Asymptomatic infections can occur, and the organism can cause extraintestinal infections.</p> <p><b>Confirmed:</b> A case that meets the laboratory criteria for diagnosis; when available, O and H antigen serotype characterization should be reported</p> <p><b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case, i.e., a close contact of a confirmed case or member of a risk group as defined by public health authorities during an outbreak.</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Salmonella</i> (except <i>S. Typhi</i>)* from a clinical specimen</li> <li>▪ *<i>S. Typhi</i> is reportable as Typhoid Fever</li> </ul>
<p><b>Severe acute respiratory syndrome (SARS)</b><sup>12</sup> <a href="#">88730</a></p>	<p>Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a novel coronavirus. SARS was first identified in 2003 with the SARS-associated coronavirus (SARS-CoV). SARS-CoV has not been detected since the 2003 outbreak ended. However, in 2012 a new coronavirus causing an acute severe respiratory disease was detected in nine people. Symptoms of a novel coronavirus causing an acute respiratory syndrome can include fever (<math>\geq 100.4^{\circ}\text{F}</math>) and cough in addition to pneumonia or acute respiratory distress syndrome.</p> <p>Clinical criteria for the specific novel coronavirus will be determined by the Centers for Disease Control and Prevention. Case definitions for confirmed, probable and suspect can also be redefined based on the specific novel coronavirus.</p> <p><b>Confirmed:</b> A person who has a clinically compatible illness and laboratory confirmation of infection with the novel coronavirus.</p> <p><b>Probable:</b> A person that meets the criteria for a suspect case with clinical or radiological evidence of pneumonia or ARDS <b>AND</b> is a close contact with a laboratory confirmed case <b>AND</b> whose illness is not already explained by any other infection or etiology including all clinically indicated tests for community acquired pneumonia</p> <p><b>Suspect:</b> A person who meets the clinical criteria <b>AND</b> has a recent travel history to any country where a novel coronavirus virus has been recently identified in people <b>AND</b> whose illness is not already explained by any other infection or etiology including all clinically indicated tests for community acquired pneumonia</p>	<ul style="list-style-type: none"> <li>▪ Identification of a novel coronavirus that is different from currently circulating human coronaviruses as confirmed by CDC's laboratory, by public health laboratories using CDC-approved protocols for that specific strain, or by labs using FDA-approved test for specific strain.</li> <li>▪ Initial confirmation that a specific coronavirus represents a novel virus will be determined by the CDC</li> <li>▪ Other laboratory confirmation criteria as defined by the Centers for Disease Control and Prevention for the specific novel coronavirus.</li> </ul>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Shiga toxin-producing <i>Escherichia coli</i> (STEC)</b><sup>1</sup> <a href="#">11563</a></p>	<p>An infection of variable severity characterized by diarrhea (often bloody) and abdominal cramps. Illness can be complicated by hemolytic uremic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP); asymptomatic infections also can occur and the organism can cause extraintestinal infections.</p> <p><b>Confirmed:</b> A case that meets the laboratory criteria for diagnosis; when available, O and H antigen serotype characterization should be reported.</p> <p><b>Probable:</b></p> <ul style="list-style-type: none"> <li>▪ A case with isolation of <i>E. coli</i> O157 from a clinical specimen, without confirmation of H antigen or Shiga toxin-production, <b>OR</b></li> <li>▪ A clinically compatible case that is epidemiologically linked to a confirmed or probable case, <b>OR</b></li> <li>▪ Identification of an elevated antibody titer to a known Shiga toxin-producing <i>E. coli</i> serotype from a clinically compatible case, <b>OR</b></li> <li>▪ Identification of Shiga toxin in a specimen from a clinically compatible case without the isolation of the Shiga toxin-producing <i>E. coli</i></li> </ul> <p>Suspect: A case of post-diarrheal HUS or TTP (See <a href="#">Hemolytic uremic syndrome, post-diarrheal</a>).</p> <p>Note: Cases meeting confirmed or probable criteria for both STEC and <a href="#">HUS</a> should be reported under each condition.</p>	<p>Isolation of Shiga toxin-producing <i>Escherichia coli</i> from a clinical specimen</p> <ul style="list-style-type: none"> <li>▪ <i>Escherichia coli</i> O157:H7 isolates are assumed to be Shiga toxin-producing. Therefore, isolation alone qualifies a case as “confirmed.”</li> <li>▪ <i>Escherichia coli</i> non-O157:H7 isolates must also have Shiga toxin-production verified in order to qualify the case status as “confirmed.” Shiga toxin can be demonstrated by EIA or PCR testing.</li> <li>▪ EIA and/or PCR positive results for Shiga toxin-production, in the absence of an isolate, can only qualify a case as “probable.”</li> </ul> <p><b>Note: All <a href="#">E.coli 0157:H7, isolates or specimens from cases where Shiga-toxin* activity is demonstrated</a> must be submitted to the DSHS laboratory.</b></p>
<p><b>Shigellosis</b> <a href="#">11010</a></p>	<p>An illness of variable severity characterized by diarrhea, fever, nausea, cramps, and tenesmus. Asymptomatic infections can occur.</p> <p><b>Confirmed:</b> A case that meets the laboratory criteria for diagnosis. When available, O antigen serotype characterization should be reported</p> <p><b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case, i.e., a close contact of a confirmed case or member of a risk group as defined by public health authorities during an outbreak</p>	<p>Isolation of <i>Shigella</i> from a clinical specimen</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Smallpox</b>.<sup>13</sup> <a href="#">11800</a></p>	<p>An illness with acute onset of fever <math>\geq 101^{\circ}\text{F}</math> (<math>\geq 38.3^{\circ}\text{C}</math>) followed by a rash characterized by firm, deep seated vesicles or pustules in the same stage of development without other apparent cause.</p> <p><b>Confirmed:</b> A case of smallpox that is laboratory confirmed, or a case that meets the clinical case definition and is epidemiologically linked to a laboratory confirmed case</p> <p><b>Probable:</b> A case that meets the clinical case definition without laboratory confirmation <b>OR</b> epidemiological link to a confirmed case, <b>OR</b> a case with an atypical presentation of smallpox that has an epidemiological link to a confirmed case of smallpox.</p> <p>Examples of clinical presentations of smallpox that would not meet the ordinary type (pre-event) clinical case definition are: a) hemorrhagic type, b) flat type, and c) variola sine eruptione.</p> <p>For full descriptions of atypical smallpox presentations see <a href="#">Guide A: Smallpox Surveillance and Case Reporting; Contact Identification, Tracing, Vaccination, and Surveillance; and Epidemiologic Investigation.</a></p> <p><b>Suspect:</b> A case with a generalized, acute vesicular or pustular rash illness with fever preceding development of rash by 1-4 days</p> <p><b>Exclusion Criteria:</b> A case can be excluded as a suspect or probable smallpox case if an alternative diagnosis fully explains the illness or appropriate clinical specimens are negative for laboratory criteria for smallpox.</p> <p>Note: The smallpox case definition is to be used only during post-event surveillance. The case definition described in Guide A of the Smallpox Response Plan and Guidelines (Version 3) on the CDC bioterrorism preparedness website (URL: <a href="http://www.bt.cdc.gov/agent/smallpox/response-plan/index.asp">http://www.bt.cdc.gov/agent/smallpox/response-plan/index.asp</a>) includes different criteria for a suspect case than the smallpox case definition the Council of State and Territorial Epidemiologists approved for use in the National Notifiable Diseases Surveillance System (NNDSS). The smallpox case definition on the CDC bioterrorism web site is more sensitive and less specific than the case definition for the NNDSS, in that a "Suspect" case is defined as: "a case with febrile rash illness with fever preceding the development of rash by 1-4 days."</p>	<ul style="list-style-type: none"> <li>▪ Polymerase chain reaction (PCR) identification of variola DNA in a clinical specimen, <b>OR</b></li> <li>▪ Isolation of smallpox (variola) virus from a clinical specimen (Level D laboratory only; confirmed by variola PCR)</li> </ul> <p>Note: Laboratory diagnostic testing for variola virus should be conducted in a CDC Laboratory Response Network (LRN) laboratory utilizing LRN-approved PCR tests and protocols for variola virus. Initial confirmation of a smallpox outbreak requires additional testing at CDC.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Spotted Fever Rickettsiosis</b> <a href="#">10250</a></p>	<p>Spotted fever rickettsioses are a group of tickborne infections caused by some members of the genus <i>Rickettsia</i>. Rocky Mountain spotted fever (RMSF) is an illness caused by <i>Rickettsia rickettsii</i>, a bacterial pathogen transmitted to humans through contact with ticks. Disease onset averages one week following a tick bite. Age specific illness is highest for children and older adults. Illness is characterized by acute onset of fever, and can be accompanied by headache, malaise, myalgia, nausea/vomiting, or neurologic signs; a macular or maculopapular rash appears 4-7 days following onset in many (~80%) patients, often present on the palms and soles. RMSF can be fatal in as many as 20% of untreated cases, and severe fulminant disease can occur. In addition to RMSF, human illness associated with other spotted fever group <i>Rickettsia</i> species, including infection with <i>Rickettsia parkeri</i>, has also been reported. In these patients, clinical presentation appears similar to, but can be milder than, RMSF; the presence of an eschar at the site of tick attachment has been reported for some other spotted fever rickettsioses.</p> <p><i>Clinical evidence:</i> Any reported acute onset of fever and one or more of the following: rash, eschar, headache, myalgia, anemia, thrombocytopenia, or any hepatic transaminase elevation.</p> <p><b>Confirmed:</b> Clinically compatible case (meets clinical evidence criteria) that is laboratory confirmed</p> <p><b>Probable:</b> Clinically compatible case (meets clinical evidence criteria) with serological evidence of elevated IgG or IgM antibody reactive with <i>R. rickettsii</i> or other spotted fever group antigen* by IFA, enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or latex agglutination (LA). DSHS uses IFA IgG testing cutoff of &gt;1:64 for routine diagnostic testing</p>	<ul style="list-style-type: none"> <li>▪ Serological evidence of an elevation (fourfold change) in immunoglobulin G (IgG)-specific antibody titer reactive with <i>Rickettsia rickettsii</i> or other spotted fever group antigen* between paired serum specimens (one taken in the first week of illness and a second 2-4 weeks later), as measured by a standardized indirect immunofluorescence assay (IFA), <b>OR</b></li> <li>▪ Detection of <i>R. rickettsii</i> or other spotted fever group DNA* in a clinical specimen by the polymerase chain reaction (PCR assay), <b>OR</b></li> <li>▪ Demonstration of spotted fever group antigen* in a biopsy/autopsy specimen by IHC, <b>OR</b></li> <li>▪ Isolation of <i>R. rickettsii</i> or other spotted fever group rickettsia* from a clinical specimen in cell culture</li> </ul> <p>* Note: Spotted fever group species included are: <i>R. aeschlimannii</i>, <i>R. africae</i>, <i>R. akari</i>, <i>R. australis</i>, <i>R. conorii</i>, <i>R. heilongjiangensis</i>, <i>R. helvetica</i>, <i>R. honei</i>, <i>R. japonica</i>, <i>R. marmionii</i>, <i>R. massiliae</i>, <i>R. parkeri</i>, <i>R. rickettsii</i>, <i>R. sibirica</i>, <i>R. sibirica mongolotimonae</i>, <i>R. slovaca</i>.</p> <p>Spotted fever group species <b>excluded</b> from this condition are: <i>R. felis</i> and <i>R. akari</i>. See <a href="#">Rickettsia Note</a></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><i>Staphylococcus aureus</i>, coagulase-positive, methicillin-or oxacillin-resistant (MRSA)<sup>14</sup> - [outbreaks only] <a href="#">11661</a></p>	<p>Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) is a type of <i>staphylococcus</i> that is resistant to certain antibiotics called beta-lactams. These antibiotics include methicillin and other more common antibiotics such as oxacillin, penicillin, and amoxicillin.</p> <p>MRSA in healthcare settings usually causes more severe and potentially life-threatening infections, such as bloodstream infections, surgical site infections, or pneumonia. The signs and symptoms will vary by the type and stage of the infection.</p> <p>In the community, most MRSA infections are skin infections that can appear as pustules or boils which often are red, swollen, painful, or have pus or other drainage. They often first look like spider bites or bumps that are red, swollen, and painful. These skin infections commonly occur at sites of visible skin trauma, such as cuts and abrasions, and areas of the body covered by hair (e.g., back of neck, groin, buttock, armpit, beard area of men). <a href="http://www.cdc.gov/mrsa/symptoms/index.html">http://www.cdc.gov/mrsa/symptoms/index.html</a></p> <p><b>Confirmed:</b> A case that is laboratory confirmed</p> <p>Note: For epidemiological purposes, it is useful to classify MRSA cases based on the origin of the infection. (Klevens, et al. JAMA. 2007. 298(15): 1763-1771)</p> <ul style="list-style-type: none"> <li>▪ <i>Healthcare-associated, hospital-onset:</i> Cases with positive culture obtained &gt;48 hours after hospital admission (can also have risk factors)</li> <li>▪ <i>Healthcare-associated, community-onset:</i> Cases identified &lt;48 hours after admission with at least 1 of the following risk factors: invasive device at time of admission; history of MRSA infection or colonization; history of surgery, hospitalization, dialysis, or residence in a long term care facility in 12 months preceding culture</li> <li>▪ <i>Community-associated:</i> Cases with community-onset and none of the above risk factors documented</li> </ul>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Staphylococcus aureus</i> that shows resistance to oxacillin or ceftiofur by a reliable susceptibility test methodology from a clinical specimen. Resistance can be determined by <ul style="list-style-type: none"> <li>▪ ceftiofur or oxacillin disk screen test, <b>OR</b></li> <li>▪ positive latex agglutination test for broad-spectrum beta-lactam (PBP2a), <b>OR</b></li> <li>▪ growth on a plate containing 6 µg/ml of oxacillin in Mueller-Hinton agar supplemented with NaCl (4% w/v; 0.68 mol/L).</li> </ul> </li> <li>▪ Nucleic acid amplification tests, such as the polymerase chain reaction (PCR), can be used to detect the <i>mecA</i> gene, which mediates oxacillin resistance in staphylococci.</li> </ul> <p>Note: Methicillin is no longer commercially available in the United States. Oxacillin maintains its activity during storage better than methicillin and is more likely to detect heteroresistant strains. However, ceftiofur is an even better inducer of the <i>mecA</i> gene and disk diffusion tests using ceftiofur give clearer endpoints and are easier to read than tests with oxacillin. <a href="http://www.cdc.gov/mrsa/lab/lab-detection.html">http://www.cdc.gov/mrsa/lab/lab-detection.html</a></p>
<p><i>Staphylococcus aureus</i>, coagulase-positive, vancomycin resistant (VRSA)<sup>1</sup> - [see <a href="#">VRSA</a>] <a href="#">11665</a></p>	<p>See <a href="#">Vancomycin-resistant, coagulase-positive <i>Staphylococcus aureus</i> (VRSA)</a></p>	
<p><i>Staphylococcus aureus</i>, vancomycin intermediate (VISA) - [see <a href="#">VISA</a>] <a href="#">11663</a></p>	<p>See <a href="#">Vancomycin-intermediate, coagulase-positive <i>Staphylococcus aureus</i> (VISA)</a></p>	

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p>Streptococcal Toxic-shock syndrome<sup>1</sup> – (also see <a href="#">Streptococcus, invasive Group A</a>) <a href="#">11700</a></p>	<p>Streptococcal toxic-shock syndrome (STSS) is a severe illness associated with invasive or noninvasive group A strep (<i>Streptococcus pyogenes</i>) infection. STSS can occur with infection at any site but most often occurs in association with infection of a cutaneous lesion. Signs of toxicity and a rapidly progressive clinical course are characteristic, and the case fatality rate can exceed 50%.</p> <p>An illness with the following clinical manifestations:</p> <ol style="list-style-type: none"> <li>1) Hypotension defined by a systolic blood pressure less than or equal to 90 mm Hg for adults or less than the fifth percentile by age for children aged less than 16 years</li> </ol> <p><b>AND</b></p> <ol style="list-style-type: none"> <li>2) Multi-organ involvement characterized by <u>two or more</u> of the following: <ul style="list-style-type: none"> <li>○ <i>Renal Impairment</i>: Creatinine greater than or equal to 2 mg/dL (greater than or equal to 177 µmol/L) for adults or greater than or equal to twice the upper limit of normal for age. In patients with preexisting renal disease, a greater than twofold elevation over the baseline level</li> <li>○ <i>Coagulopathy</i>: Platelets less than or equal to 100,000/mm<sup>3</sup> (less than or equal to 100 x 10<sup>6</sup>/L) or disseminated intravascular coagulation, defined by prolonged clotting times, low fibrinogen level, and the presence of fibrin degradation products</li> <li>○ <i>Liver Involvement</i>: Alanine aminotransferase, aspartate aminotransferase, or total bilirubin levels greater than or equal to twice the upper limit of normal for the patient's age. In patients with preexisting liver disease, a greater than twofold increase over the baseline level</li> <li>○ <i>Acute Respiratory Distress Syndrome</i>: Defined by acute onset of diffuse pulmonary infiltrates and hypoxemia in the absence of cardiac failure or by evidence of diffuse capillary leak manifested by acute onset of generalized edema, or pleural or peritoneal effusions with hypoalbuminemia</li> <li>○ A generalized erythematous macular rash that can desquamate</li> <li>○ Soft-tissue necrosis, including necrotizing fasciitis or myositis, or gangrene</li> </ul> </li> </ol> <p><b>Confirmed:</b> A case that meets the clinical case definition and is laboratory confirmed</p> <p><b>Note:</b> Enter all confirmed and probable STSS cases as a confirmed <a href="#">group A Streptococcus, invasive disease, code 11710</a>.</p>	<p>Isolation of group A <i>Streptococcus</i> (<i>S. pyogenes</i>) (GAS)</p>
<p><a href="#">Streptococcus, invasive Group A (GAS), (<i>Streptococcus pyogenes</i>)</a><sup>1</sup> <a href="#">11710</a></p>	<p>Invasive group A streptococcal infections can manifest as any of several clinical syndromes, including pneumonia, deep soft-tissue infection (e.g., myositis or necrotizing fasciitis), meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis, and bacteremia.</p> <p><b>Confirmed:</b> A case that is laboratory confirmed</p>	<ul style="list-style-type: none"> <li>▪ Isolation of group A streptococci (<i>Streptococcus pyogenes</i>) by culture from a normally sterile site (e.g., blood, cerebrospinal fluid, or less commonly, joint, pleural, or pericardial fluid).</li> <li>▪ Isolation of group A streptococci (<i>Streptococcus pyogenes</i>) by culture from any site when Toxic Shock Syndrome or Necrotizing Fasciitis is present</li> </ul> <p>Note: See <a href="#">Normally Sterile Site</a> and <a href="#">Streptococcus Classification</a></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b><i>Streptococcus</i>, invasive Group B (GBS), (<i>Streptococcus agalactiae</i>)</b> <sup>15</sup> <a href="#">11715</a>	<p>Group B <i>Streptococcus</i> is the most common cause of life-threatening infections, sepsis (blood infection) and meningitis (infection of the fluid and lining around the brain) in newborns. In infants, group B <i>Streptococcus</i> is characterized by sepsis, respiratory distress, apnea, shock, pneumonia and meningitis, is acquired in utero or during delivery, and occurs more frequently in low birth weight infants.</p> <p>Group B <i>Streptococcus</i>, invasive disease can present in a number of different ways in adults. The most common problems in adults are: bloodstream infections, pneumonia, skin and soft-tissue infections, and bone and joint infections. Rarely in adults, group B <i>Streptococcus</i> can cause meningitis.</p> <p><b>Confirmed:</b> A case that is laboratory confirmed</p>	<ul style="list-style-type: none"> <li>▪ Isolation of group B streptococci (<i>Streptococcus agalactiae</i>) by a culture from a normally sterile site (e.g., blood, cerebrospinal fluid, or less commonly, joint, pleural, or pericardial fluid).</li> <li>▪ Isolation of group B streptococci (<i>Streptococcus agalactiae</i>) species by a culture from placenta or amniotic fluid</li> </ul> <p>Note: See <a href="#">Normally Sterile Site</a> and <a href="#">Streptococcus Classification</a></p>
<b><i>Streptococcus pneumoniae</i>, invasive disease (IPD)</b> <a href="#">11723</a>	<p><i>Streptococcus pneumoniae</i> causes many clinical syndromes, depending on the site of infection (e.g., pneumonia, bacteremia, or meningitis).</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p> <p>*Note: In Texas, since 2003, invasive <i>Streptococcus pneumoniae</i> has been reportable for all ages and cases were entered in NBS utilizing code 11717.</p> <p>The code changed in 2010, when invasive <i>Streptococcus pneumoniae</i> became a nationally reportable condition for all ages. Code 11723 was added by CDC for '<i>Streptococcus pneumoniae</i>, invasive disease (IPD) (all ages)' to replace event code 11720, '<i>Streptococcus pneumoniae</i>, invasive, drug-resistant (DRSP), all age groups' and code 11717, '<i>Streptococcus pneumoniae</i>, invasive disease non-drug resistant (IPD), in children less than 5 years of age'.</p>	<p>Isolation of <i>S. pneumoniae</i> from a normally sterile site (e.g., blood, cerebrospinal fluid, or less commonly, joint, pleural, or pericardial fluid).</p> <p>Note: See <a href="#">Normally Sterile Site</a> and <a href="#">Streptococcus Classification</a></p>
<b><i>Taenia solium</i> and undifferentiated <i>Taenia</i> infection</b> <sup>6</sup> (also see <a href="#">Cysticercosis</a> ) <a href="#">12031</a>	<p>Taeniasis is an intestinal infection with the adult stage of the pork (<i>Taenia solium</i>) or beef (<i>Taenia saginata</i>) tapeworms. Clinical manifestations of infection with adult worm, if present, are variable and can include nervousness, insomnia, anorexia, weight loss, abdominal pain and digestive disturbances; many infections are asymptomatic. Taeniasis is usually a nonfatal infection, but the larval stage of <i>T. solium</i> can cause fatal cysticercosis.</p> <p><b>Confirmed:</b> Laboratory confirmation of the presence of <i>T. solium</i> proglottids, eggs, or antigens in a clinical specimen</p> <p><b>Probable:</b> Laboratory confirmation of the presence of undifferentiated <i>Taenia</i> spp. tapeworm proglottids or eggs in a clinical specimen</p> <p>Note: Also see <a href="#">Cysticercosis</a></p>	<p>Infection with an adult tapeworm is diagnosed by identification of proglottids (segments), eggs or antigens of the worm in the feces or on anal swabs. Eggs of <i>T. Solium</i> and <i>T. saginata</i> cannot be differentiated morphologically. Specific diagnosis is based on the morphology of the scolex (head) and/or gravid proglottids.</p>
<b>Tetanus</b> <a href="#">10210</a>	<p>Acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck) and generalized muscle spasms without other apparent medical cause</p> <p><b>Probable:</b> A clinically compatible case, as reported by a health-care professional</p>	
<b>Trichinellosis (Trichinosis)</b> <a href="#">10270</a>	<p>A disease caused by ingestion of <i>Trichinella</i> larvae. The disease has variable clinical manifestations. Common signs and symptoms among symptomatic persons include eosinophilia fever, myalgia, and periorbital edema.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed</p>	<p>Demonstration of <i>Trichinella</i> larvae in tissue obtained by muscle biopsy <b>OR</b> positive serologic test for <i>Trichinella</i>.</p>



Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Tuberculosis</b> <a href="#">10220</a></p>	<p>A chronic bacterial infection caused by <i>Mycobacterium tuberculosis</i>, usually characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs can be involved.</p> <p>Clinical Case Criteria: A case that meets <b>ALL</b> of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ A positive tuberculin skin test result or positive interferon gamma release assay for <i>M.tuberculosis</i>, <b>AND</b></li> <li>▪ Other signs and symptoms compatible with tuberculosis (TB) (e.g., abnormal chest radiograph, abnormal chest computerized tomography scan or other chest imaging study, or clinical evidence of current disease), <b>AND</b></li> <li>▪ Treatment with two or more anti-TB medications, <b>AND</b></li> <li>▪ A completed diagnostic evaluation</li> </ul> <p>Provider Diagnosis Criteria: A case that belongs to a high population or medical risk group and meets at least one of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ A negative tuberculin skin test result and considerable improvement on a abnormal chest radiograph after started on at least two anti-TB medications, <b>OR</b></li> <li>▪ Considerable clinical improvement based on symptoms from onset after started on at least two anti-TB medications, <b>OR</b></li> <li>▪ Child that has had recent contact to an active case, <b>OR</b></li> <li>▪ Active TB disease based on autopsy, <b>OR</b></li> <li>▪ Active TB disease based on consult with TB Expert</li> </ul> <p><b>Confirmed:</b> A case that meets the clinical case criteria, or is laboratory confirmed, or that meets the provider diagnosis criteria</p> <p><b>Multidrug-resistant TB (MDR):</b> TB that is resistant to at least two of the best anti-TB drugs, isoniazid and rifampin. These drugs are considered first-line drugs and are used to treat all persons with TB disease.</p> <p><b>Extensively drug resistant TB (XDR):</b> TB that is resistant to isoniazid and rifampin, plus resistant to any fluoroquinolone and at least one of three injectable second-line drugs (i.e., amikacin, kanamycin, or capreomycin).</p> <p>Note: For cases to be counted for annual incidence in Texas, they must be verified by an authorized TB surveillance designee as meeting both the confirmed case definition and Texas residence status.</p> <p>Although “Provider Diagnosis” is not a component of the TB case definition published by CDC for public health surveillance, CDC’s national morbidity reports include all TB cases that are considered “verified” without a requirement that cases solely meet the published case definition.</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>M. tuberculosis</i> complex from a clinical specimen,*</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Demonstration of <i>M. tuberculosis</i> complex from a clinical specimen by nucleic acid amplification test<sup>†</sup>,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained or is falsely negative or contaminated</li> </ul> <p>* Use of rapid identification techniques for <i>M. tuberculosis</i> (e.g., DNA probes and mycolic acid high-pressure liquid chromatography performed on a culture from a clinical specimen) is acceptable under this criterion.</p> <p>† Nucleic acid amplification (NAA) tests must be accompanied by culture for <i>Mycobacteria</i> species for clinical purposes. A culture isolate of <i>M. tuberculosis</i> complex is required for complete drug susceptibility testing and also genotyping. However, for surveillance purposes, CDC will accept results obtained from NAA tests approved by the Food and Drug Administration (FDA) and used according to the approved product labeling on the package insert, or a test produced and validated in accordance with applicable FDA and Clinical Laboratory Improvement Amendments (CLIA) regulations.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Tularemia</b> <a href="#">10230</a></p>	<p>The signs and symptoms of tularemia vary depending on how the bacteria enter the body. Illness ranges from mild to life-threatening. All forms are accompanied by fever, which can be as high as 104 °F. Clinical diagnosis is supported by evidence or history of a tick or deerfly bite, exposure to tissues of a mammalian host of <i>Francisella tularensis</i>, or exposure to potentially contaminated water. Illness is characterized by several distinct forms, including the following:</p> <ul style="list-style-type: none"> <li>▪ Ulceroglandular: cutaneous ulcer with regional lymphadenopathy</li> <li>▪ Glandular: regional lymphadenopathy with no ulcer</li> <li>▪ Oculoglandular: conjunctivitis with preauricular lymphadenopathy</li> <li>▪ Oropharyngeal: stomatitis or pharyngitis or tonsillitis and cervical lymphadenopathy</li> <li>▪ Intestinal: intestinal pain, vomiting, and diarrhea</li> <li>▪ Pneumonic: primary pleuropulmonary disease</li> <li>▪ Typhoidal: febrile illness without early localizing signs and symptoms</li> </ul> <p><b>Confirmed:</b> A clinically compatible case with confirmatory laboratory results  <b>Probable:</b> A clinically compatible case with laboratory results indicative of presumptive infection:</p> <ul style="list-style-type: none"> <li>▪ Elevated serum antibody titer(s) to <i>F. tularensis</i> antigen (without documented fourfold or greater change) in a patient with no history of tularemia vaccination, <b>OR</b></li> <li>▪ Detection of <i>F. tularensis</i> in a clinical specimen by fluorescent assay</li> </ul>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>F. tularensis</i> in a clinical specimen,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Fourfold or greater change in serum antibody titer to <i>F. tularensis</i> antigen</li> </ul> <p><b>Note: All <i>Francisella tularensis</i> isolates must be submitted to the DSHS laboratory.</b></p>
<p><b>Typhoid fever</b> (caused by <i>Salmonella Typhi</i>) <a href="#">10240</a></p>	<p>An illness caused by <i>Salmonella Typhi</i> that is often characterized by insidious onset of sustained fever, headache, malaise, anorexia, relative bradycardia, constipation or diarrhea, and nonproductive cough. However, many mild and atypical infections occur. Carriage of <i>S. Typhi</i> can be prolonged.</p> <p><b>Confirmed:</b> A clinically compatible case that is laboratory confirmed  <b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case in an outbreak</p>	<p>Isolation of <i>S. Typhi</i> from blood, stool, or other clinical specimen</p> <p>Note: See <a href="#">Salmonellosis</a> for other <i>Salmonella</i> isolates</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Typhus fever, (endemic fleaborne, Murine)</b>  <a href="#">10260</a></p> <p>See <a href="#">Rickettsia Note</a></p>	<p>Murine typhus is a rickettsial disease, whose course resembles that of louseborne typhus, but is milder. Variable onset, often sudden and marked by headache, chills, prostration, fever and general pains. A macular eruption appears on the fifth to sixth day, initially on the upper trunk, followed by spread to the entire body, but usually not to the face, palms or soles. Toxemia is usually pronounced, and the disease terminates by rapid defervescence after about 2 weeks of fever. The case-fatality rate for all ages is less than 1% but increases with age. Absence of louse infestation, geographic and seasonal distribution and sporadic occurrence of the disease help to differentiate it from louseborne typhus.</p> <p><b>Confirmed:</b> Clinically compatible case that is laboratory confirmed</p> <p><b>Probable:</b> Clinically compatible case with supportive laboratory results:</p> <ul style="list-style-type: none"> <li>▪ IFA serologic titer of &gt;1:64, <b>OR</b></li> <li>▪ A single CF of <math>\geq 16</math>, <b>OR</b></li> <li>▪ Other supportive serology (single titer &gt;1:64 by an LA, IHA, or MA test)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fourfold or greater rise in antibody titer to <i>Rickettsia typhi</i> or <i>Rickettsia felis</i> antigen by IFA, complement fixation (CF), latex agglutination (LA), microagglutination (MA), or indirect hemagglutination antibody (IHA) test in acute – and convalescent – phase specimens ideally taken at least 3 weeks apart, <b>OR</b></li> <li>▪ Positive PCR assay to <i>R. typhi</i> or <i>R. felis</i>, <b>OR</b></li> <li>▪ Demonstration of positive <i>R. typhi</i> or <i>R. felis</i> IF of skin lesion (biopsy) or organ tissue (autopsy), <b>OR</b></li> <li>▪ Isolation of <i>R. typhi</i> or <i>R. felis</i> from clinical specimen, <b>OR</b></li> <li>▪ In South Texas and Travis County where murine typhus is endemic, clinically compatible cases with <i>R. typhi</i> or <i>R. felis</i> IgM titers of <math>\geq 1:1024</math> are considered confirmed cases</li> </ul> <p>Note: The IF test is most commonly used for laboratory confirmation, but it does not discriminate between louse-borne and murine typhus unless the sera are differentially absorbed with the respective rickettsial antigen prior to testing.</p>
<p><b>Typhus fever, (epidemic louseborne, <i>R. prowazekii</i>)</b>  <a href="#">10265</a></p> <p>See <a href="#">Rickettsia Note</a></p>	<p>A rickettsial disease with variable onset; often sudden and marked by headache, chills, prostration, fever and general pains. A macular eruption appears on the 5th to 6th day, initially on the upper trunk, followed by spread to the entire body, but usually not to the face, palms or soles. The eruption is often difficult to observe on black skin. Toxemia is usually pronounced, and the disease terminates by rapid defervescence after about 2 weeks of fever.</p> <p><b>Confirmed:</b> Clinically compatible case that is laboratory confirmed</p> <p><b>Probable:</b> Clinically compatible case with supportive laboratory results:</p> <ul style="list-style-type: none"> <li>▪ IFA serologic titer of &gt;1:64, <b>OR</b></li> <li>▪ a single CF of <math>\geq 16</math>, <b>OR</b></li> <li>▪ other supportive serology (single titer &gt;1:64 by an LA, IHA, or MA test)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fourfold or greater rise in antibody titer to <i>Rickettsia prowazekii</i> antigen by IFA, complement fixation (CF), latex agglutination (LA), microagglutination (MA), or indirect hemagglutination antibody (IHA) test in acute – and convalescent – phase specimens ideally taken at least 3 weeks apart, <b>OR</b></li> <li>▪ Positive PCR assay to <i>R. prowazekii</i>, <b>OR</b></li> <li>▪ Demonstration of positive <i>R. prowazekii</i> IF of skin lesion (biopsy) or organ tissue (autopsy), <b>OR</b></li> <li>▪ Isolation of <i>R. prowazekii</i> from clinical specimen</li> </ul> <p>Note: The IF test is most commonly used for laboratory confirmation, but it does not discriminate between louse-borne and murine typhus unless the sera are differentially absorbed with the respective rickettsial antigen prior to testing.</p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b>Vancomycin-intermediate <i>Staphylococcus aureus</i> (VISA)</b> <sup>1</sup> <a href="#">11663</a></p>	<p><i>Staphylococcus aureus</i> can produce a variety of syndromes with clinical manifestations including skin and soft tissue lesions, empyema, pyarthrosis, bloodstream infection, pneumonia, osteomyelitis, septic arthritis, endocarditis, sepsis, and meningitis.</p> <p><b>Confirmed:</b> A clinically compatible case of vancomycin-resistant <i>Staphylococcus aureus</i> that is laboratory-confirmed (MIC: 4-8 µg/ml)</p> <p>Note: The DSHS laboratory uses the ETest for confirmation of resistance. ETest generates MIC values from a continuous scale and can give results in-between conventional two-fold dilutions. According to manufacturer's protocol, a value which falls between standard two-fold dilutions is rounded up to the next upper two-fold value before categorization so that a MIC of 3 µg/ml is reported as intermediate resistance.</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Staph aureus</i> from any body site, and</li> <li>▪ Intermediate-level resistance (MIC: 4-8 µg/ml) of the <i>Staphylococcus aureus</i> isolate to vancomycin, detected and defined according to CLSI approved standards and recommendations</li> </ul> <p><a href="http://www.cdc.gov/ncidod/dhqp/ar_visavrsa_labFAQ.html">http://www.cdc.gov/ncidod/dhqp/ar_visavrsa_labFAQ.html</a></p> <p><b>Note: All <i>Staphylococcus aureus</i> isolates with a vancomycin MIC greater than 2 µg/mL must be submitted to the DSHS laboratory.</b></p>
<p><b>Vancomycin-resistant <i>Staphylococcus aureus</i>, coagulase-positive (VRSA)</b> <a href="#">11665</a></p>	<p><i>Staphylococcus aureus</i> can produce a variety of syndromes with clinical manifestations including skin and soft tissue lesions, empyema, pyarthrosis, bloodstream infection, pneumonia, osteomyelitis, septic arthritis, endocarditis, sepsis, and meningitis.</p> <p><b>Confirmed:</b> A clinically compatible case of vancomycin-resistant <i>Staphylococcus aureus</i> that is laboratory-confirmed (MIC: ≥ 16 µg/ml)</p> <p>Note: Texas has never identified a VRSA and as of September 2010, only 12 cases have been identified in the USA since 2002. Thus, identification of a VRSA is highly unusual and should be treated as a highly unusual event with <b>immediate notification</b> of public health, <b>immediate submission</b> of the isolate to the DSHS lab, and <b>institution of appropriate control measures</b>.</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Staphylococcus aureus</i> from any body site, and</li> <li>▪ High-level resistance of the <i>Staphylococcus aureus</i> isolate to vancomycin (MIC: ≥16 µg/ml), detected and defined according to CLSI approved standards and recommendations</li> </ul> <p><a href="http://www.cdc.gov/HAI/settings/lab/visa_vrsa_lab_detection.html">http://www.cdc.gov/HAI/settings/lab/visa_vrsa_lab_detection.html</a></p> <p>Note: <b>All <i>Staphylococcus aureus</i> isolates with a vancomycin MIC greater than 2 µg/mL must be submitted to the DSHS laboratory.</b></p>
<p><b>Varicella (chickenpox)</b> <sup>7</sup> <a href="#">10030</a></p>	<p>An illness with acute onset of diffuse (generalized) maculopapulovesicular rash without other apparent cause. In vaccinated persons who develop varicella more than 42 days after vaccination (breakthrough disease), the disease is almost always mild with fewer than 50 skin lesions and shorter duration of illness. The rash can also be atypical in appearance (maculopapular with few or no vesicles).</p> <p><b>Confirmed:</b> A case that meets the clinical case definition <b>AND</b> is either laboratory confirmed <b>OR</b> epidemiologically linked to another probable or confirmed case</p> <p><b>Probable:</b> A case that meets the clinical case definition <b>without</b> epidemiologic linkage <b>OR</b> laboratory confirmation</p> <p>Note: Two or more patients that meet clinical case definition and are epidemiologically linked to one another meet the confirmed case definition.</p>	<ul style="list-style-type: none"> <li>▪ Isolation of varicella-zoster virus (VZV) from a clinical specimen, <b>OR</b></li> <li>▪ Varicella antigen detected by direct fluorescent antibody (DFA), <b>OR</b></li> <li>▪ Varicella-specific nucleic acid detected by polymerase chain reaction (PCR), <b>OR</b></li> <li>▪ Significant rise in serum varicella immunoglobulin G (IgG) antibody level by any standard serologic assay</li> </ul>
<p><b><i>Vibrio parahaemolyticus</i></b> <sup>1,8</sup> <a href="#">11541</a></p>	<p>An intestinal disorder characterized by watery diarrhea and abdominal cramps in the majority of cases, and sometimes with nausea, vomiting, fever and headache. Occasionally, a dysentery-like illness is observed with bloody or mucoid stools, high fever and high WBC count. Typically, it is a disease of moderate severity lasting 1-7 days; systemic infection and death rarely occur.</p> <p><b>Confirmed:</b> A case that meets the laboratory criteria for diagnosis</p> <p><b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Vibrio parahaemolyticus</i> from a clinical specimen,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ For <i>Vibrio cholerae</i> isolates, see <a href="#">Cholera</a></li> </ul> <p><b>Note: All <i>Vibrio species</i> isolates must be submitted to the DSHS laboratory.</b></p>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<p><b><i>Vibrio vulnificus</i></b><sup>1</sup> <a href="#">11542</a></p>	<p>Infection with <i>Vibrio vulnificus</i> produces septicemia in persons with chronic liver disease, chronic alcoholism or hemochromatosis, or those who are immunosuppressed. The disease appears 12 hours to 3 days after eating raw or undercooked seafood, especially oysters. One third of patients are in shock when they present for care or develop hypotension within 12 hours after hospital admission. Three quarters of patients have distinctive bullous skin lesions; thrombocytopenia is common and there is often evidence of disseminated intravascular coagulation. <i>V. vulnificus</i> can also infect wounds sustained in coastal or estuarine waters; wounds range from mild, self-limited lesions to rapidly progressive cellulitis and myositis that can mimic clostridial myonecrosis in the rapidity of spread and destructiveness.</p> <p><b>Confirmed:</b> A case that meets the laboratory criteria for diagnosis</p> <p><b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case</p>	<ul style="list-style-type: none"> <li>▪ Isolation of <i>Vibrio vulnificus</i> from a clinical specimen,</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ For <i>Vibrio cholerae</i> isolates, see <a href="#">Cholera</a></li> </ul> <p>Note: All <a href="#">Vibrio species</a> isolates must be submitted to the DSHS laboratory.</p>
<p><b>Vibriosis, other or unspecified</b><sup>1,8</sup> <a href="#">11540</a></p>	<p>An infection of variable severity characterized by diarrhea and vomiting, primary septicemia, or wound infections. Asymptomatic infections can occur, and the organism can cause extraintestinal infections</p> <p><b>Confirmed:</b> A case that meets the laboratory criteria for diagnosis</p> <p><b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case</p> <p>Note: <i>V. hollisae</i> has recently been reclassified as <i>Grimontia hollisae</i> and <i>V. damsela</i> has been reclassified as <i>Photobacterium damsela</i>. Please continue to report these infections.</p>	<p>Isolation of a species of the family <i>Vibrionaceae</i> (other than <a href="#">Vibrio parahaemolyticus</a>, <a href="#">Vibrio vulnificus</a>, and toxigenic <a href="#">Vibrio cholerae</a>) from a clinical specimen. Genera in the family <i>Vibrionaceae</i> currently include <i>Aliivibrio</i>, <i>Allomonas</i>, <i>Catenococcus</i>, <i>Enterovibrio</i>, <i>Grimontia</i>, <i>Listonella</i>, <i>Photobacterium</i>, <i>Salinivibrio</i>, and <i>Vibrio</i>.</p> <p><b>Note: All <a href="#">Vibrio species</a> isolates must be submitted to the DSHS laboratory.</b></p>
<p><b>Viral Hemorrhagic Fever</b> <a href="#">11647</a></p>	<p>An illness with acute onset of fever &gt; 40° C (104°F), <b>AND</b> one or more of the following clinical findings: severe headache, muscle pain, erythematous maculopapular rash on the trunk with fine desquamation 3–4 days after rash onset, vomiting, diarrhea, abdominal pain, bleeding not related to injury, or thrombocytopenia, or for arenavirus, pharyngitis, retrosternal chest pain, or proteinuria</p> <p><b>Confirmed:</b> A clinically compatible illness that is laboratory confirmed</p> <p><b>Probable:</b> A clinically compatible illness epidemiologically-linked to a confirmed case</p> <p><b>Suspect:</b> A clinically compatible illness that meets one of the following :</p> <ul style="list-style-type: none"> <li>▪ One or more of the following exposures within 3 weeks before onset of symptoms: <ul style="list-style-type: none"> <li>▪ Contact with blood or other body fluids of a patient with ebola, <b>OR</b></li> <li>▪ Residence in—or travel to—an ebola endemic area, <b>OR</b></li> <li>▪ Work in a laboratory that handles ebola specimens, <b>OR</b></li> <li>▪ Work in a laboratory that handles primates from endemic areas</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>▪ Exposure within the past 3 weeks to semen from a confirmed acute or convalescent case of ebola within the 10 weeks of onset of symptoms</li> </ul>	<ul style="list-style-type: none"> <li>▪ Detection of VHF* viral antigens in blood by enzyme-linked immunosorbent assay (ELISA) antigen detection, <b>OR</b></li> <li>▪ Isolation of VHF virus in cell culture for blood or tissues, <b>OR</b></li> <li>▪ Detection of VHF viral genes using reverse transcriptase with polymerase chain reaction amplification (RT-PCR) from blood or tissues, <b>OR</b></li> <li>▪ Detection of VHF viral antigens in tissues by immunohistochemistry</li> </ul> <p>*Viral hemorrhagic fever (VHF) agents include:</p> <ul style="list-style-type: none"> <li>▪ Ebola virus</li> <li>▪ Marburg virus</li> <li>▪ Crimean-Congo hemorrhagic fever viruses</li> <li>▪ Lassa virus</li> <li>▪ Lujo virus</li> <li>▪ New world arenaviruses (Guanarito, Machupo, Junin, Sabia viruses)</li> </ul>

Condition/Code	Case Definition/Case Classification	Laboratory Confirmation Tests
<b>West Nile neuroinvasive disease (WNND)</b> - (see <a href="#">Arbovirus</a> ) <a href="#">10056</a>	See Case Definition/Case Classification for <a href="#">Arbovirus</a> , Neuroinvasive (Encephalitis/meningitis)	See <a href="#">Lab Confirmation Tests for Arbovirus</a> , Neuroinvasive (Encephalitis/meningitis)
<b>West Nile fever</b> <sup>1</sup> - (see <a href="#">Arbovirus</a> ) <a href="#">10049</a>	See Case Definition/Case Classification for <a href="#">Arbovirus</a> , Non-neuroinvasive	See <a href="#">Lab Confirmation Tests for Arbovirus</a> , Non-neuroinvasive
<b>Western equine encephalitis virus (WEE)</b> - (see <a href="#">Arbovirus</a> ) <a href="#">10052</a>	See Case Definition/Case Classification for <a href="#">Arbovirus</a> , Neuroinvasive (Encephalitis/meningitis) and Non-neuroinvasive	See <a href="#">Lab Confirmation Tests for Arbovirus</a> , Neuroinvasive and Non-neuroinvasive
<b>Yellow fever</b> <a href="#">10660</a>	A mosquito-borne viral illness characterized by acute onset and constitutional symptoms followed by a brief remission and a recurrence of symptoms, fever, hepatitis, albuminuria, and, in some instances, renal failure, shock, and generalized hemorrhages. <b>Confirmed:</b> A clinically compatible case that is laboratory confirmed <b>Probable:</b> A clinically compatible case with supportive serology: <ul style="list-style-type: none"> <li>▪ Stable elevated antibody titer to yellow fever virus, e.g. <ul style="list-style-type: none"> <li>▪ Greater than or equal to 32 by complement fixation, <b>OR</b></li> <li>▪ Greater than or equal to 256 by immunofluorescence assay, <b>OR</b></li> <li>▪ Greater than or equal to 320 by hemagglutination inhibition, <b>OR</b></li> <li>▪ Greater than or equal to 160 by neutralization, <b>OR</b></li> </ul> </li> <li>▪ Positive serologic result by immunoglobulin M-capture enzyme immunoassay</li> </ul> Cross-reactive serologic reactions to other flaviviruses must be excluded, and the patient must not have a history of yellow fever vaccination.	<ul style="list-style-type: none"> <li>▪ Fourfold or greater rise in yellow fever antibody titer in a patient who has no history of recent yellow fever vaccination and cross-reactions to other flaviviruses have been excluded, <b>OR</b></li> <li>▪ Demonstration of yellow fever virus, antigen, or genome in tissue, blood, or other body fluid</li> </ul>
<b>Yersiniosis</b> <sup>8</sup> - (also see <a href="#">Plague</a> ) <a href="#">11565</a>	An illness characterized by diarrhea (sometimes bloody), fever, and abdominal pain; an appendicitis-like syndrome and systemic infections can occur <b>Confirmed:</b> A case that meets the laboratory criteria for diagnosis <b>Probable:</b> A clinically compatible case that is epidemiologically linked to a confirmed case	Isolation of <i>Yersinia</i> (except <i>Y. pestis</i> )* in a clinical specimen <b>ALL <i>Yersinia pestis</i> isolates must be submitted to the DSHS laboratory.</b>  * <b>Report <i>Y. Pestis</i> in NBS as Plague</b> (Please refer to <a href="#">Plague</a> section for reporting purposes)
<b>Outbreaks, exotic diseases, and unusual expression of disease</b> <a href="#">(Table of Contents - link)</a>	In addition to specified reportable conditions, <b>any outbreak, exotic disease, or unusual group expression of disease that may be of public health concern should be reported</b> by the most expeditious means available.	

The case definitions and criteria are partially or fully taken from the following sources as noted:

<sup>1</sup> Centers for Disease Control and Prevention web ([http://www.cdc.gov/osels/ph\\_surveillance/nndss/casedef/case\\_definitions.htm](http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm))

<sup>2</sup> Centers for Disease Control and Prevention web <http://www.cdc.gov/parasites/chagas/>

<sup>3</sup> Texas Administrative Code, Chapter 96, Bloodborne Pathogen Control [http://info.sos.state.tx.us/pls/pub/readtac\\$ext.ViewTAC?tac\\_view=4&ti=25&pt=1&ch=96&rl=Y](http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=4&ti=25&pt=1&ch=96&rl=Y)

<sup>4</sup> Texas DSHS, IDCU, *Creutzfeldt Jakob Disease (CJD)* FAQ at <http://www.dshs.state.tx.us/idcu/disease/creutzfeldt-jakob/faqs/>

<sup>5</sup> CDC Diagnostic Criteria [http://www.cdc.gov/ncidod/dvrd/cjd/diagnostic\\_criteria.html](http://www.cdc.gov/ncidod/dvrd/cjd/diagnostic_criteria.html) and [http://www.cdc.gov/ncidod/dvrd/vcjd/diagnostic\\_criteria.html](http://www.cdc.gov/ncidod/dvrd/vcjd/diagnostic_criteria.html)

<sup>6</sup> CDC, Parasitic Disease Information at <http://www.cdc.gov/parasites/cysticercosis/index.html>

<sup>7</sup> *Vaccine-Preventable Disease Guidelines*: [http://www.dshs.state.tx.us/idcu/health/vaccine\\_preventable\\_diseases/resources/](http://www.dshs.state.tx.us/idcu/health/vaccine_preventable_diseases/resources/)

<sup>8</sup> Heymann DL. *Control of Communicable Diseases Manual*, 19th ed. Washington, DC: American Public Health Association; 2008

<sup>9</sup> *Perinatal Hepatitis B appendix* in the *DSHS Perinatal Hepatitis B Prevention Manual*, Chapter 5, p 71, [http://www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis\\_b/perinatal/manual/](http://www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis_b/perinatal/manual/)

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<sup>10</sup> CDC, *Key Facts about Influenza and the Influenza Vaccine* at <http://www.cdc.gov/flu/keyfacts.htm>

<sup>11</sup> National Center for Infectious Diseases Respiratory and Enteric Viruses Branch, *Norovirus* at <http://www.cdc.gov/norovirus/hcp/index.html>

<sup>12</sup> *Severe Acute Respiratory Syndrome (SARS)*, <http://www.cdc.gov/coronavirus/ncv/case-def.html>

<sup>13</sup> CDC Emergency Preparedness and Response Smallpox Case Definitions <http://www.bt.cdc.gov/agent/smallpox/diagnosis/casedefinition.asp>

<sup>14</sup> CDC MRSA home page <http://www.cdc.gov/mrsa/index.html>

<sup>15</sup> CDC, *Group B Strep Prevention, General Public, FAQs and Adult Disease*, <http://www.cdc.gov/groupbstrep/index.html>