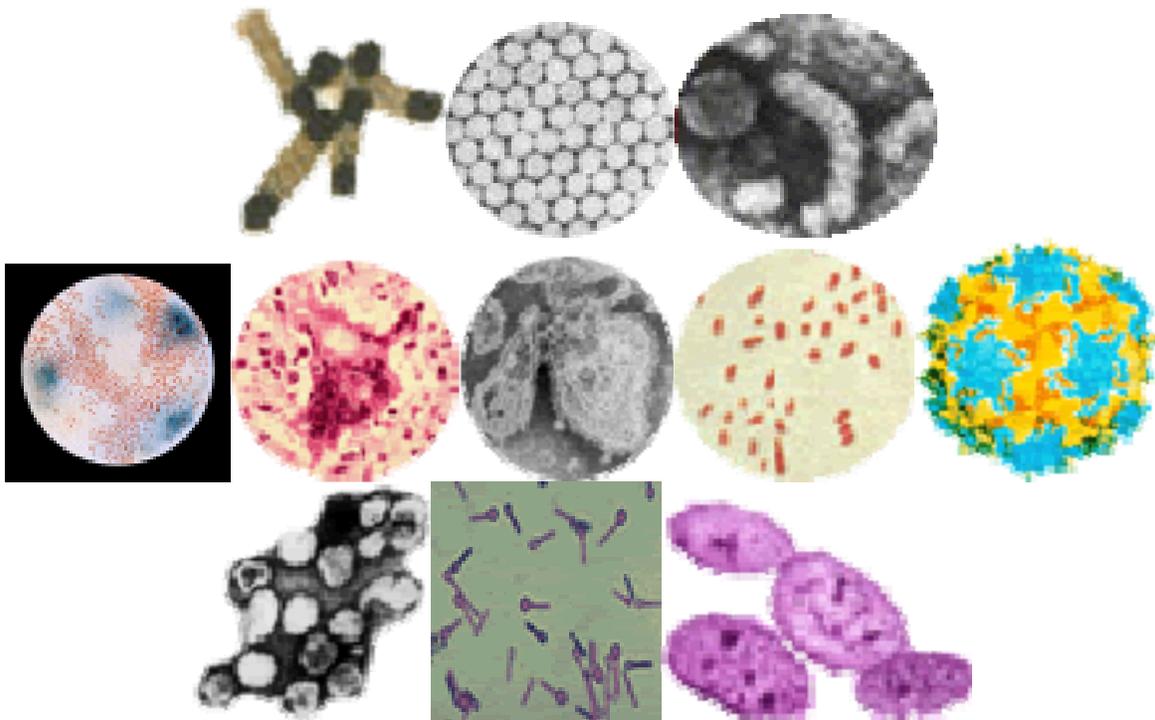


# Texas Vaccine-Preventable Disease Surveillance Guidelines



Infectious Disease Control Unit  
Infectious Disease Surveillance and Epidemiology Branch  
1100 West 49<sup>th</sup> Street  
Austin, TX 78756  
(512) 458-7676  
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## Section 1: Diphtheria

### 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.
- ◆ Histopathologic diagnosis of diphtheria.

### CASE CLASSIFICATION

- ◆ **Confirmed:** A clinically compatible case that is laboratory confirmed or is epidemiologically linked to a laboratory-confirmed case.
- ◆ **Probable:** A clinically compatible case that is not laboratory confirmed and is not epidemiologically linked to a laboratory-confirmed case.

### REPORTING

Immediately report suspected cases 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) 458-7676**.

### CASE INVESTIGATION

There is no specific case investigation form; however, the DSHS Infectious Disease Control Unit will require a detailed written report if a case is confirmed.

### 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 not less than 24 hours apart, and not less than 24 hours after cessation of antimicrobial therapy, fail to show diphtheria bacilli. If cultures are not possible, patient should be kept in isolation for 14 days following appropriate antibiotic treatment.

### **SPECIFIC LABORATORY PROCEDURES AVAILABLE**

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

- ◆ Use a cotton-tipped or polyester-tipped swab.
- ◆ Swabs should be taken from the nose, throat, membrane, and behind the membrane, if possible.
- ◆ Ship swabs in Ames or Stewarts Transport or transfer to a Loefflers Slant for transport to DSHS Labs.
- ◆ For PCR testing, ship swabs in a sterile empty container or silica gel sachets
- ◆ Use a G-2B form for specimen submission.
- ◆ Transport temperature 2-25° C
- ◆ Causes for rejection:
  - ◇ Incorrect source of specimen
  - ◇ Specimen > 24 hours not in transport medium
  
- ◆ **Ship specimen to** via an overnight courier service or overnight mail to:

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49<sup>th</sup> Street, MC-1947  
Austin, TX 78756

## Section 2: Hepatitis B Infections

### Acute, Chronic, and Perinatal Hepatitis B Infections

Note: Refer to Table 2 for hepatitis B diagnostic test definitions and abbreviations and Table 3 for interpretation of hepatitis B serological tests.

#### CLINICAL CASE DEFINITIONS

- ◆ **Acute:** An acute onset of symptoms and jaundice or elevated serum aminotransferase levels. Clinical signs and symptoms of acute hepatitis B virus (HBV) infection include anorexia, nausea, malaise, vomiting, jaundice, dark urine, clay-colored or light stools, and abdominal pain. Occasionally, extrahepatic manifestations occur and include skin rashes, arthralgia, and arthritis.
- ◆ **Chronic:** A person who is HBsAg-positive for 6 months or who is IgM anti-HBc-negative and HBsAg-positive.
- ◆ **Perinatal:** Perinatal hepatitis B in the newborn may range from asymptomatic to fulminant hepatitis.

#### CASE CLASSIFICATION AND LABORATORY CONFIRMATION

- ◆ **Confirmed hepatitis B, acute:** A clinically compatible case that is positive for IgM antibody to hepatitis B core antigen.
- ◆ **Confirmed hepatitis B, chronic:** HBsAg positive in serum for at least 6 months or IgM anti-HBc-negative and HBsAg-positive.
- ◆ **Confirmed hepatitis B, perinatal:** HBsAg positivity in any infant aged >1-24 months who was born in the United States or in U.S. territories to an HBsAg-positive mother
- ◆ **Probable hepatitis B, chronic:** HBsAg positive in serum with no clinical symptoms.

#### MODES OF 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
- ◆ Sexual activity with an infected person
- ◆ Tattooing and/or body piercing
- ◆ Perinatally (either in utero or at delivery)

#### REPORTING OF CASES

Report all acute and perinatal hepatitis B cases 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) 458-7676**.

**NOTE:** HBsAg-positive pregnant women (acute and chronic infections) should also be reported to the Texas Department of State Health Services, Infectious Disease Control Unit. 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/>.

#### CASE INVESTIGATION

A completed case investigation form must be submitted on all suspected cases of acute hepatitis B infection to the DSHS IDCU within 30 days of initial report. In the event of death, please provide copies of the hospital discharge summary, death certificate, and autopsy report. For information on the Perinatal Hepatitis B Prevention Program, please refer to the website at <http://www.dshs.state.tx.us/idcu/disease/hepatitis/hepatitis%5Fb/perinatal/>.

**CONTROL MEASURES** (Any person testing positive for HBsAg is potentially infectious.)

- ◆ **Follow universal precautions to prevent exposure to blood and body fluids.**

- ◆ **Disinfect all equipment contaminated with blood or infectious body fluids.**
- ◆ **Investigate contacts and source of infection.**

When two or more cases occur in association with a common exposure, search for additional cases. If a plasma derivative such as antihemophilic factor, fibrinogen, pooled plasma, or thrombin is implicated, withdraw lot from use and trace all recipients of the same lot to identify additional cases.
- ◆ **Counsel all household members** (applies to acute and chronically infected persons)

Members of the household should be advised to keep their personal care items (razors, manicure equipment, and toothbrushes) separate from those of others in the home. Menstruating females should be advised to clean toilet seats with a solution of bleach and water after each use and to take extra precautions when disposing of used sanitary items.
- ◆ **Determine susceptibility of 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
- ◆ **Initiate post-exposure prophylaxis of contacts**
  - ◇ **Sexual contacts:**

Susceptible<sup>1</sup> 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.
  - ◇ **Percutaneous or mucous membrane exposures:**

Determine whether or not the source and HBsAg status of the blood is known. If the HBsAg status is positive or unknown, refer to Table 1. If the blood is HBsAg-negative, no further action is necessary.

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<sup>1</sup> Susceptibility testing of sexual contacts should be considered only if it will not delay vaccination beyond 14 days.

**Table 1. Summary of Recommendations for Prophylaxis Following Percutaneous Exposure to HBsAg**

Exposed Person	Treatment When Source is Found to Be:		
	HBsAg-positive	HBsAg-negative	unknown or not tested
<b>Unvaccinated</b>	Administer HBIG 1 dose <sup>1</sup> and initiate HB vaccine series	Initiate HB vaccine series	Initiate HB vaccine series
<b>Previously vaccinated Known responder<sup>2</sup></b>	No treatment	No treatment	No treatment
<b>Previously vaccinated Known non-responder</b>	HBIG 2 doses or HBIG 1 dose <b>and</b> initiate re-vaccination <sup>3</sup>	No treatment	If known high-risk source, treat as if source were HBsAg-positive
<b>Previously vaccinated Response unknown</b>	Test exposed person for anti-HBs 1. If adequate <sup>4</sup> , no treatment 2. If inadequate, HBIG 1 dose <b>and</b> HB vaccine booster dose	No treatment	Test exposed for anti-HBs 1. If adequate <sup>4</sup> , no treatment 2. If inadequate, HB vaccine booster dose <sup>5</sup>

1 Dose of HBIG, 0.06 mL/kg, intramuscularly

2 Responder is defined as a person with documentation of adequate levels of anti-HBs post-vaccination (adequate level of anti-HBs is  $\geq 10$  mIU/mL).

3 Persons known NOT to have responded to a 3-dose vaccine series and to re-vaccination with 3 additional doses should be given 2 doses of HBIG (0.06 mL/kg), 1 dose as soon as possible after exposure and the second one 1 month later.

4 Adequate anti-HBs is  $\geq 10$  mIU/mL

5 The person should be evaluated for antibody response after the vaccine booster dose. For people who received HBIG, anti-HBs testing should be performed when passively acquired antibody from HBIG no longer is detectable (e.g., 4-6 mo.); for people who did not receive HB IG, anti-HBs testing

should be performed 1-2 mo after the vaccine booster dose. If anti-HBs is inadequate ( $< 10$  mIU/mL) after the vaccine booster dose, 2 additional doses should be administered to complete a 3 dose re-immunization series.

**RECOMMENDED PREVENTION STRATEGIES:**

- ◆ Identify HBsAg-positive pregnant women.
- ◆ Prevent hepatitis B acute and/or chronic infections in infants born to HBsAg-positive women.
- ◆ Serologically test household and sexual contacts of HBsAg-positive pregnant women.
- ◆ Vaccinate all susceptible household and sexual contacts of HBsAg-positive pregnant women.
- ◆ Vaccinate all infants, children, and adolescents.
- ◆ Vaccinate users of intravenous and illicit drugs.
- ◆ Vaccinate sexually active adults. Persons diagnosed with a sexually transmitted disease or who have had more than one sex partner in the previous six months should be vaccinated.
- ◆ Vaccinate health care workers and others at risk of exposure to blood or other body fluids.
- ◆ Vaccinate susceptible hemodialysis patients.
- ◆ Vaccinate patients who are receiving clotting factor concentrates. Pre-vaccination testing for HBsAg and anti-HBc is recommended for patients who have already received multiple infusions of clotting factors.
- ◆ Vaccinate household contacts and sexual partners of hepatitis B virus (HBV) carriers.
- ◆ Screen adoptees from countries where hepatitis B is endemic. Vaccinate susceptible family members and other household contacts if adoptee is HBsAg-positive.

- ◆ Vaccinate international travelers to areas where HBV infection is endemic.
- ◆ Vaccinate residents and staff of institutions for the developmentally disabled.
- ◆ Vaccinate inmates of long-term correctional facilities.

**Table 2. 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 <b>(not present after vaccination)</b>
<b>Anti-HBs</b>	Antibody to Hepatitis B surface antigen	Identification of persons who have resolved infection with HBV; determination of immunity after immunization
<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 3.  
Interpretation  
of Hepatitis B  
Serological  
Tests\***

Tests	Results	Interpretation
HBsAg Anti-HBc Anti-HBs	Negative Negative Negative	Susceptible (Never infected or vaccinated)
HBsAg Anti-HBc Anti-HBs	Negative Negative Positive	Immune due to vaccination
HBsAg Anti-HBc Anti-HBs	Negative Positive Positive	Immune due to past infection
HBsAg Anti-HBc IgM anti-HBc Anti-HBs	Positive Positive Positive Negative	Acutely Infected
HBsAg Anti-HBc IgM anti-HBc Anti-HBs	Positive Positive Negative Negative	Chronically Infected
HBsAg Anti-HBc Anti-HBs	Negative Positive Negative	Four interpretations possible*
<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: Centers for Disease Control and Prevention

## SPECIFIC LABORATORY PROCEDURES

### Specimen Collection

- ◆ **Do not submit whole blood, serum must be separated from the clot.** Collect serum aseptically in a tube without additives (“red-top” or tiger top tube). Serum must be separated from the presence of the blood clot within two hours of the time of collection.
- ◆ If the serum samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, they must be shipped on cold packs, between 2° and 8°C. If the serum samples will **not** be delivered to the laboratory **within 48 hours** of collection at these temperatures, then the samples must be frozen at -20°C or lower and shipped on dry ice.
- ◆ Label serum containers with the patient’s name and date of birth or social security number.
- ◆ For Hepatitis B e Ag, contact the laboratory for specimen acceptance criteria.

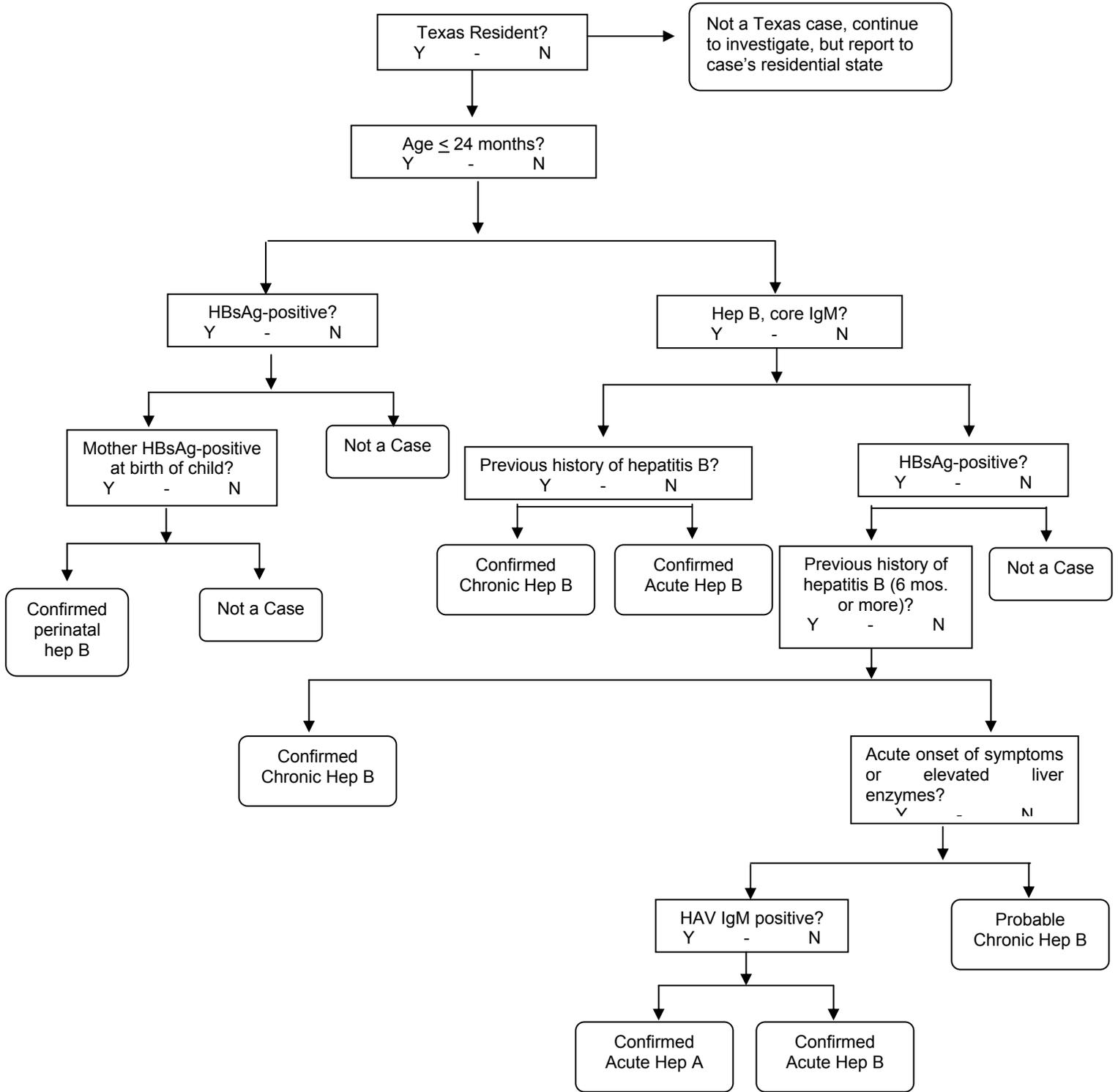
### Specimen Submission Forms

- ◆ 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 tube.
- ◆ Information and consultation on testing are available by calling the DSHS Laboratory, Microbiological Sciences Branch, Molecular and Serological Analysis Group, at (512) 458-7760 or (512) 458-7514.

### Specimen Shipping

- ◆ **Transport Temperature:**
  - ◇ If the samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, sera must be separated from the blood and shipped on cold packs, between 2° and 8°C.
  - ◇ If the serum samples will not be delivered to the laboratory within 48 hours of collection at these temperatures, then the samples must be frozen at -20°C or lower and shipped on dry ice.
  - ◇ **Do not freeze whole blood.**
- ◆ **Ship Specimens to:**
  - Laboratory Services Section
  - Texas Department of State Health Services
  - 1100 West 49th Street, MC-1947
  - Austin, TX 78756
- ◆ **Causes for Rejections:**
  - ◇ Discrepancy between name on tube and name on form
  - ◇ Insufficient quantity of serum for testing
  - ◇ Received at incorrect temperature or no date of collection

## Hepatitis B: Case Status Classification



## Section 3: Invasive *Haemophilus influenzae* type b

### CLINICAL CASE DEFINITION

*Haemophilus influenzae* type b (Hib) 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* from a normally sterile site (blood, CSF, joint fluid, or pericardial fluid).

### CASE CLASSIFICATIONS

- ◆ **Confirmed:** A clinically compatible case that is culture confirmed and identified specifically as 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.

### REPORTING

Immediately report suspected cases to a local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit at **(800) 252-8239** or **(512) 458-7676**. Conjunctivitis, otitis media, and bronchitis caused by *H. influenzae* are not invasive infections, and do not need to be reported.

### CASE INVESTIGATION

A completed case investigation form must be submitted on all suspected cases 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

- ◆ Reports of invasive Hib disease should be investigated **immediately**.
- ◆ In household 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.

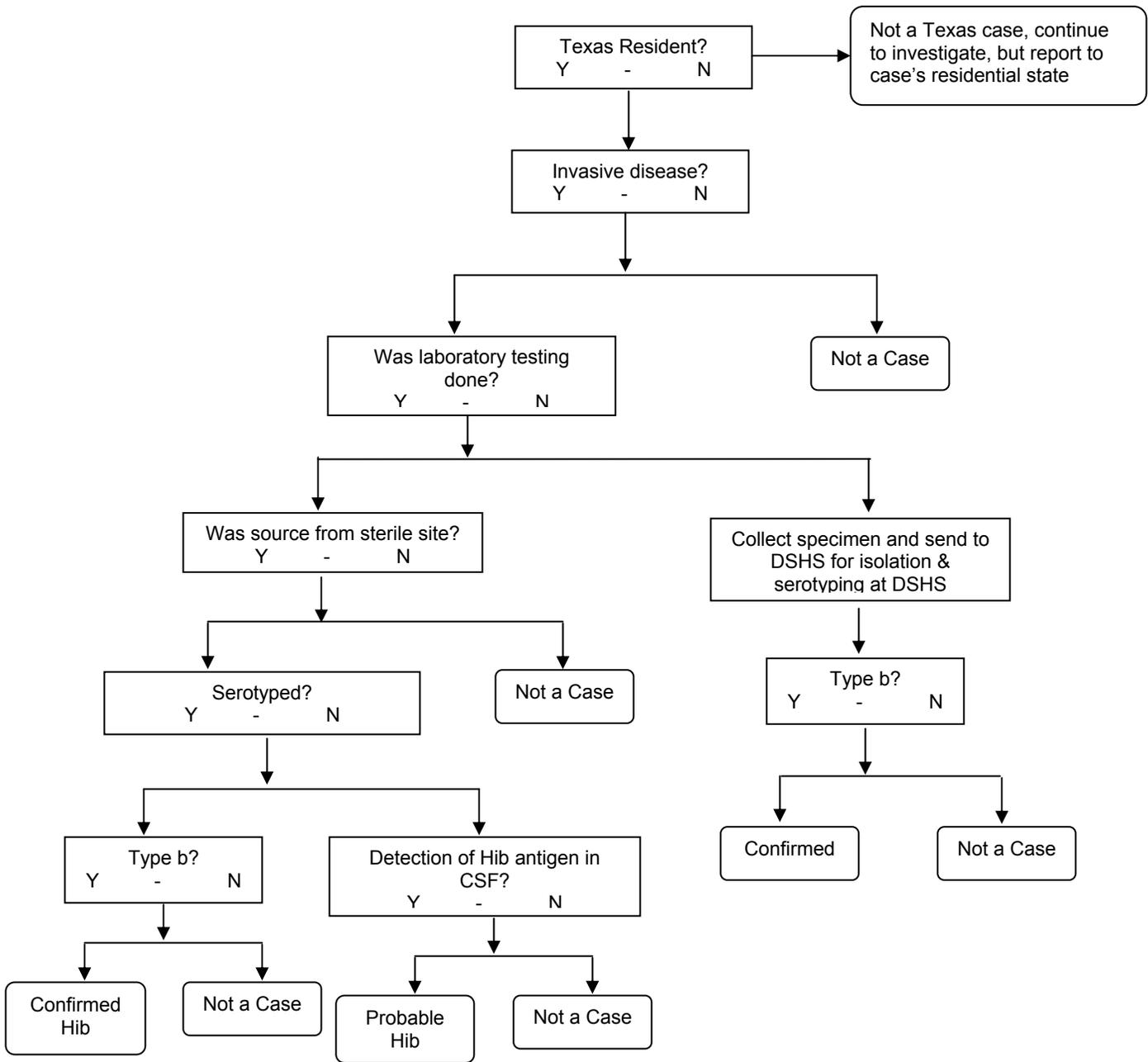
- ◆ Children <24 months of age who have had invasive Hib disease (culture confirmed) should still receive Hib vaccine, since many children of that age fail to develop adequate immunity following natural disease.

### **SPECIFIC LABORATORY PROCEDURES**

Serotyping of *H. influenzae* isolates is important in determining which cases are vaccine-preventable. **DO NOT** submit isolates from sputum for serotyping.

- ◆ Submit isolates of *H. influenzae* on chocolate agar slants (or media that has the necessary growth requirements for *Haemophilus*).
- ◆ If a delay in transport is anticipated, use a CO<sub>2</sub> generator bag.
- ◆ Use Specimen Submission form G-2B.
- ◆ Ship specimen 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 two (2) days after collection.
  
- ◆ **Ship specimens to:**  
Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756
  
- ◆ **Causes for rejection:**
  - ✧ No identifying marks on sample and/or paperwork (ask for clarification)

## Haemophilus influenzae type b (Hib): Case Status Classification



## Section 4: Measles

### CLINICAL CASE DEFINITION

An illness characterized by all of the following:

- ◆ A generalized rash lasting at least 3 days
- ◆ Temperature  $\geq 101^{\circ}$  F
- ◆ Cough, coryza, or conjunctivitis

### LABORATORY CONFIRMATION

- ◆ Positive serologic test for measles-specific IgM antibody (**preferred**), or
- ◆ Significant rise in measles antibody 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.

### CASE CLASSIFICATIONS

- ◆ **Confirmed:** A case that meets clinical case definition and is laboratory confirmed, or meets the clinical case definition AND is epidemiologically linked to a laboratory confirmed case.
- ◆ **Probable:** Meets the clinical case definition, has no or noncontributory serologic or virologic testing, AND is not epidemiologically linked to a confirmed case.

### REPORTING

Immediately report suspected cases 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) 458-7676**.

### CASE INVESTIGATION

Completed case investigation forms on all suspected cases must be submitted to the DSHS Infectious Disease Control Unit within 30 days of initial report.

### IMMEDIATE ACTION

- ◆ Treat all suspected cases as confirmed until serological testing is completed.
- ◆ Begin investigation **immediately**.
- ◆ Alert appropriate local and regional health departments as well as the DSHS, Infectious Disease Control Unit in Austin.
- ◆ Identify all susceptible contacts and initiate control measures.
- ◆ Collect serology and/or virology specimens as soon as possible.

### 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.
- ◆ 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).

**EXCLUSION:** Four (4) days from rash onset. In an outbreak, unvaccinated children should be excluded for at least 14 days after last rash onset.

**SPECIFIC LABORATORY PROCEDURES: IgM preferred**

**IgM Serology:** A single specimen collected early in the course of illness--can be done on day of rash onset to 30 days after rash onset. A negative IgM result from a specimen collected before the fifth day of rash onset may not, however, rule out the diagnosis of measles.

**IgG Serology:** Acute AND convalescent samples. Collect acute early in the course of illness and convalescent 10-14 days later.

**Specimen Collection**

- ◆ Collect a minimum of 6-8 mL of blood in a red-top tube or tiger top tube.
- ◆ Label blood tubes or serum containers 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 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.

**Specimen Shipping**

- ◆ **Transport Temperature:**
  - ◇ Samples that will be delivered to the laboratory within 8 hrs of collection may be transported at room temperature in the original blood collection tube.
  - ◇ If the samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, sera must be separated from the blood and shipped on cold packs, between 2<sup>o</sup> and 8<sup>o</sup>C.
  - ◇ If the serum samples will not be delivered to the laboratory within 48 hours of collection at these temperatures, then the samples must be frozen at -20<sup>o</sup>C or lower and shipped on dry ice. **Do not freeze whole blood.**
- ◆ To avoid specimen rejection, send serum to the DSHS laboratory via overnight delivery following the above guidelines.
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49<sup>th</sup> Street, MC-1947  
Austin, TX 78756
- ◆ **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:** The diagnosis of measles should be based on detection of measles-specific IgM antibody in serum. If, however, the suspected case has received a measles-containing vaccine in the last three months, specimens for virus isolation should be obtained to differentiate between wild and vaccine strains. Molecular epidemiologic techniques are also used to genetically type measles viruses and identify the source of wild viruses.

### **Specimen Collection**

- ◆ Collect 50-100 mL of urine (first morning voided urine is ideal).
- ◆ Specimen should be collected within four (4) days of rash onset.
- ◆ Keep specimen at 2-8°C.

### **Submission Form**

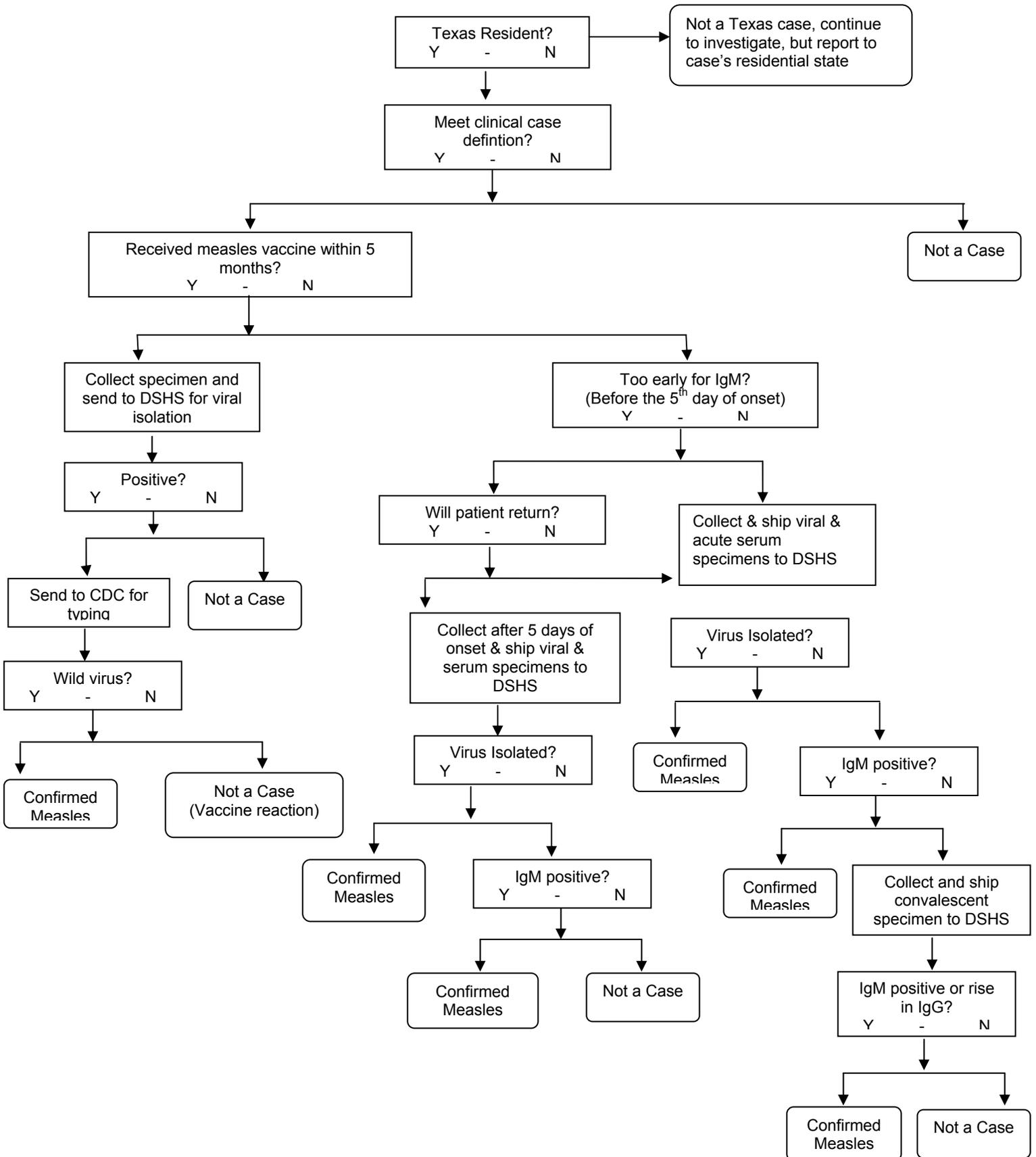
- ◆ Use Specimen Submission Form G-2A.
- ◆ Make sure the patient's name and date of birth / social security number match exactly what is written on the specimen container.
- ◆ Mark the laboratory test requested (virus isolation), disease suspected (measles), date of onset, and date of collection.

### **Specimen Shipping**

- ◆ **Transport Temperature:**
  - ✧ Ship specimen immediately via overnight delivery on wet ice.
  - ✧ If specimen cannot be shipped immediately, it may be shipped stored at -70°C and shipped on dry ice.
  
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49<sup>th</sup> Street, MC-1947  
Austin, TX 78756
  
- ◆ **Causes for Rejection:**
  - ✧ Specimens submitted on a preservative, such as formalin
  - ✧ Insufficient quantity of urine for testing

## Measles: Case Status Classification





## Section 5: Mumps

### CLINICAL CASE DEFINITION

An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting  $\geq 2$  days, and without other apparent cause.

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 be confirmed only through mumps-specific laboratory testing.

### LABORATORY CONFIRMATION

- ◆ Positive serologic test for mumps IgM antibody (**preferred**), or
- ◆ Significant rise in mumps antibody level by any standard serologic assay, or
- ◆ Isolation of mumps virus from a clinical specimen.
- ◆ An elevated serum amylase is **not** confirmatory for mumps

### CASE CLASSIFICATIONS

- ◆ **Confirmed:** A case that meets the clinical case definition and is laboratory confirmed OR a case that meets the clinical case definition AND is epidemiologically linked to a confirmed or probable case.
- ◆ **Probable:** A case that meets the clinical case definition, has no serologic or virologic testing, AND is not epidemiologically linked to a confirmed or probable case.
- ◆ Two probable cases that are epidemiologically linked are considered confirmed.

### REPORTING

Immediately report suspected cases 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) 458-7676**.

### 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

- ◆ Although vaccination after exposure to mumps may not prevent disease, the vaccine will protect persons from subsequent exposures; therefore, susceptible contacts should be vaccinated.
- ◆ Persons who are unsure of their mumps disease history or mumps vaccination history should be vaccinated.
- ◆ IG is not effective and not recommended.

**EXCLUSION:** Nine (9) days after onset of swelling.

## SPECIFIC LABORATORY PROCEDURES

**IgM Serology:** Single specimen collected  $\geq 3$  days following onset of symptoms--can be collected up to 30 days after parotid swelling, **OR**

**IgG Serology:** Acute AND convalescent samples. Collect acute early in course of illness and convalescent 10-14 days later.

### Specimen Collection

- ◆ Collect a minimum of 6-8 mL of blood in a red-top tube or tiger top tube.
- ◆ Label blood tubes or serum containers 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 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.

### Specimen Shipping

- ◆ **Transport Temperature**
  - ◇ Samples that will be delivered to the laboratory within 8 hours of collection may be transported at room temperature in the original blood collection tube.
  - ◇ If the samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, sera must be separated from the blood and shipped on cold packs, between 2° and 8°C.
  - ◇ If the serum samples will not be delivered to the laboratory within 48 hours of collection at these temperatures, then the samples must be frozen at -20°C or lower and shipped on dry ice.
  - ◇ **Do not freeze whole blood**
- ◆ To avoid specimen rejection, send serum to the DSHS laboratory via overnight delivery following the above guidelines.
- ◆ **Ship specimens to:**
  - Laboratory Services Section
  - Texas Department of State Health Services
  - 1100 West 49th Street, MC-1947
  - Austin, TX 78756
- ◆ **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:** Specimens should be obtained early in the course of illness when the quantity of virus shed is highest. Respiratory specimens (nasopharyngeal swab, Stensen's duct swab, or nasal aspirate) are preferred, although references indicate that mumps virus can be isolated from blood, urine, and cerebrospinal fluid.

### Specimen Collection

- ◆ **Nasopharyngeal swab and Stensen's duct specimens:** The oropharynx or Stensen's duct 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.



- ◆ **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.

**Submission Form**

- ◆ Use specimen submission for G-2A.

**Specimen Shipping**

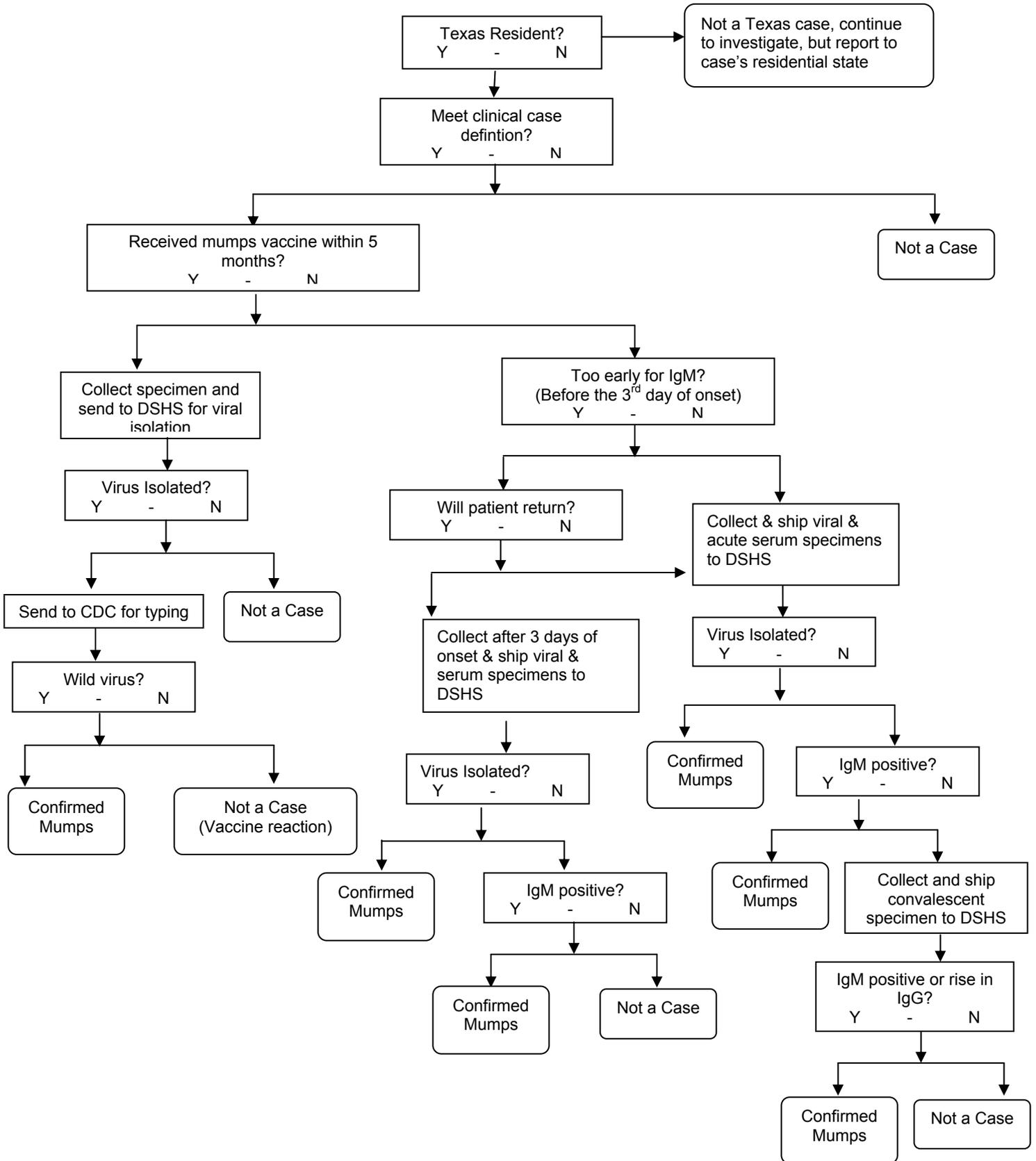
- ◆ All clinical specimens for virus isolation should be kept at 2-8°C during storage and shipment. Ship specimens on ice via overnight delivery.
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756

- ◆ **Causes for Rejection:**

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

## Mumps: Case Status Classification



## Section 6: Pertussis

### CLINICAL CASE DEFINITION

For endemic or sporadic cases, a cough illness lasting at least two (2) weeks with one of the following without other apparent cause:

- ◆ Paroxysms of coughing
- ◆ Inspiratory whoop
- ◆ Post-tussive vomiting

### OUTBREAK SETTINGS

In outbreak settings, including household exposures, the case definition used can be modified to a “cough illness lasting at least 14 days”.

### LABORATORY CONFIRMATION

- ◆ Isolation of *Bordetella pertussis* from a clinical specimen, or
- ◆ Positive polymerase chain reaction (PCR) assay for *Bordetella pertussis*, or
- ◆ Because *B. pertussis* can be difficult to culture, a negative culture result does not rule out pertussis.

### CASE CLASSIFICATIONS

- ◆ **Confirmed:**
  - ◇ A person with an acute cough illness of any duration who is culture positive, or
  - ◇ A person who meets the case definition and is PCR positive, or
  - ◇ A person who meets the clinical case definition and is epidemiologically linked to a laboratory confirmed case.
- ◆ **Probable:** Meets the clinical case definition (or outbreak definition for close contacts of cases), is not laboratory confirmed (not tested or tests are negative), and is not epidemiologically linked to a laboratory-confirmed case.

### REPORTING

Immediately report suspected cases 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) 458-7676**.

### CASE INVESTIGATION

Notify the DSHS, Infectious Disease Control Unit of the initial report, and submit a completed case investigation form on all suspected cases within 30 days. In the event of a death, include a pertussis death investigation form and copies of the hospital admission and discharge summaries, death certificate, and autopsy report.

### CONTROL MEASURES

- ◆ Investigate reports of suspected pertussis promptly.
- ◆ A close contact is defined as being within close proximity (2 feet) for a duration of 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 and coughing or sneezing.
  - ◇ The following are examples of pertussis exposures of close contacts:
    - ◆ Direct face-to-face contact for an undefined time period with an infectious pertussis case (case coughing < 21 days and has not completed 5 days of antibiotic treatment).
    - ◆ Shared confined space in close proximity for a prolonged period of time of at least ≥ 2 hours with an infectious pertussis case.

- ◆ Direct contact with respiratory, oral, or nasal secretions from a symptomatic case (e.g. an explosive cough or sneeze in the face, sharing food, sharing eating utensils during a meal, kissing, mouth-to-mouth resuscitation or performing a full medical exam including examination of the nose and throat).
- ◆ 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 who may benefit from antibiotic prophylaxis up to 6 weeks after exposure.
- ◆ Health Service Regions and Local Health Departments should coordinate antibiotic treatment and prophylaxis to patients and contacts including providing prescriptions and/or furnishing antibiotics for those who do not have a regular medical provider or who are unable to purchase it.
- ◆ 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.

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
Infants (aged ≥6 months) and children	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
Adults	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*

**EXCLUSION:** Until completion of five (5) days of antibiotic therapy if cough onset is within 21 days.

## **SPECIFIC LABORATORY PROCEDURES**

Isolation of the organism by culture is ideal; however, it is not readily available. Culture is highly specific, but relatively insensitive. 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. A negative PCR does not rule out a case of pertussis.

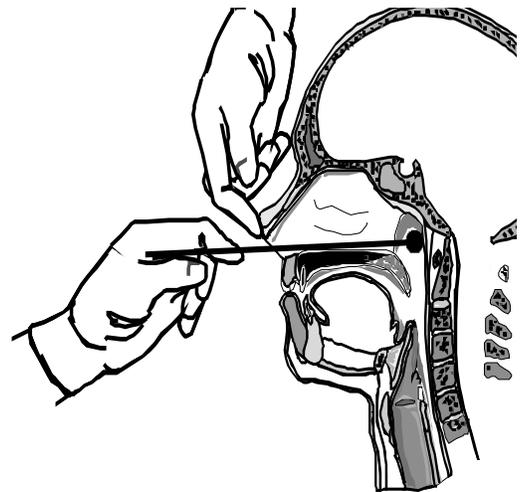
To obtain pertussis kits, contact the DSHS Laboratory at **(512) 458-7661**.

### **Specimen Collection**

#### **Nasopharyngeal Swab for PCR Testing**

- ◆ Use a Rayon or Dacron swab with aluminum or plastic handles are acceptable.
- ◆ 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 in to the dry transport tube. Store at 2-8° C until shipment at refrigerated temperature (2-8° C).

#### *Appropriate positioning of a nasopharyngeal swab*



#### **Submission Form**

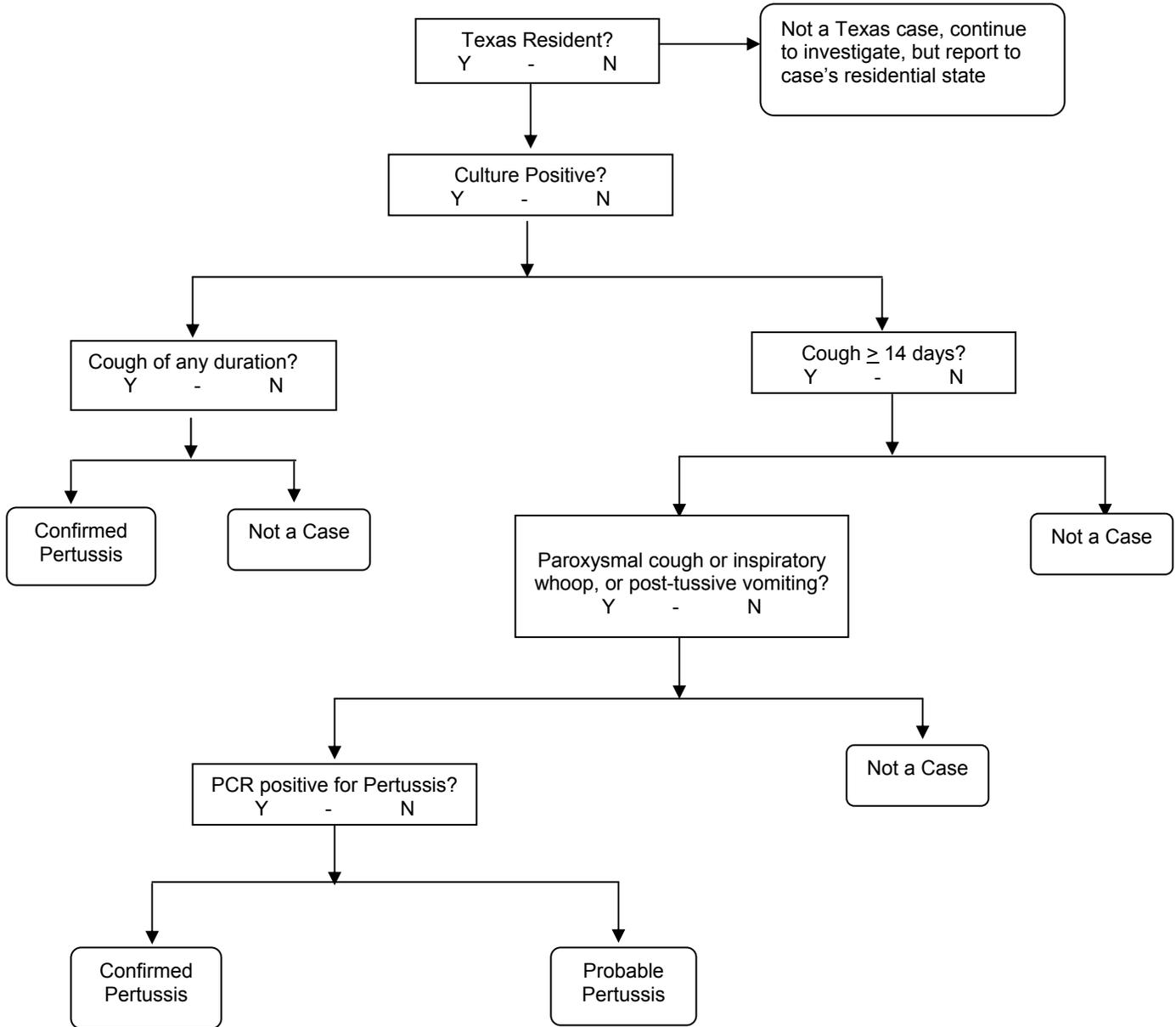
- ◆ Use a **Texas Department of State Health Services G-2B Specimen Submission Form**.
- ◆ Make sure the patient's name and date of birth or social security number match exactly what is written on the transport tubes.
- ◆ On the TDSHS Specimen Submission Form G-2B, in section 7: Molecular Studies, check PCR for and write in Pertussis ( **PCR for: Pertussis**)
- ◆ Fill in the date of collection, date of onset, and diagnosis/symptoms.

### **Specimen Shipping**

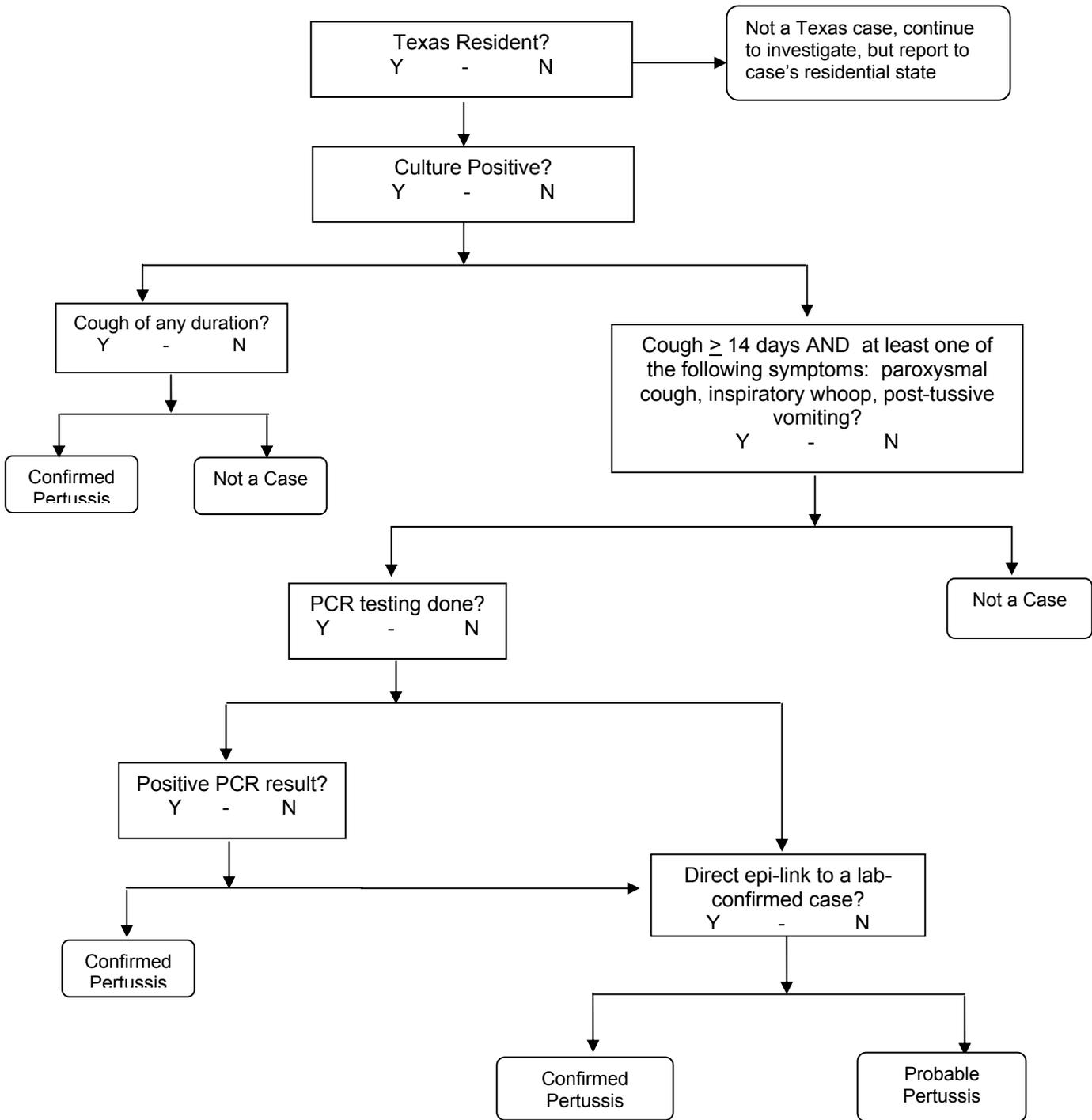
- ◆ **Transport Temperature: Keep at 2 - 8° C (refrigerated)**
- ◆ Ship specimens via overnight delivery on cold packs or wet ice (double bagged) within 48 hours of collection.
- ◆ Mark Saturday delivery if shipped on Friday and label mailer "Refrigerate Upon Arrival".
- ◆ **Ship specimens to:      Contact:**

Laboratory Services Section	Tamara Baldwin, Team Lead
Texas Dept. of State Health Services	Clinical Bacteriology
1100 West 49th Street, MC-1947	(512) 458-7582
Austin, TX 78756	
(512) 458-7211	
  
- ◆ **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

### Pertussis: Case Status Classification for Sporadic Cases

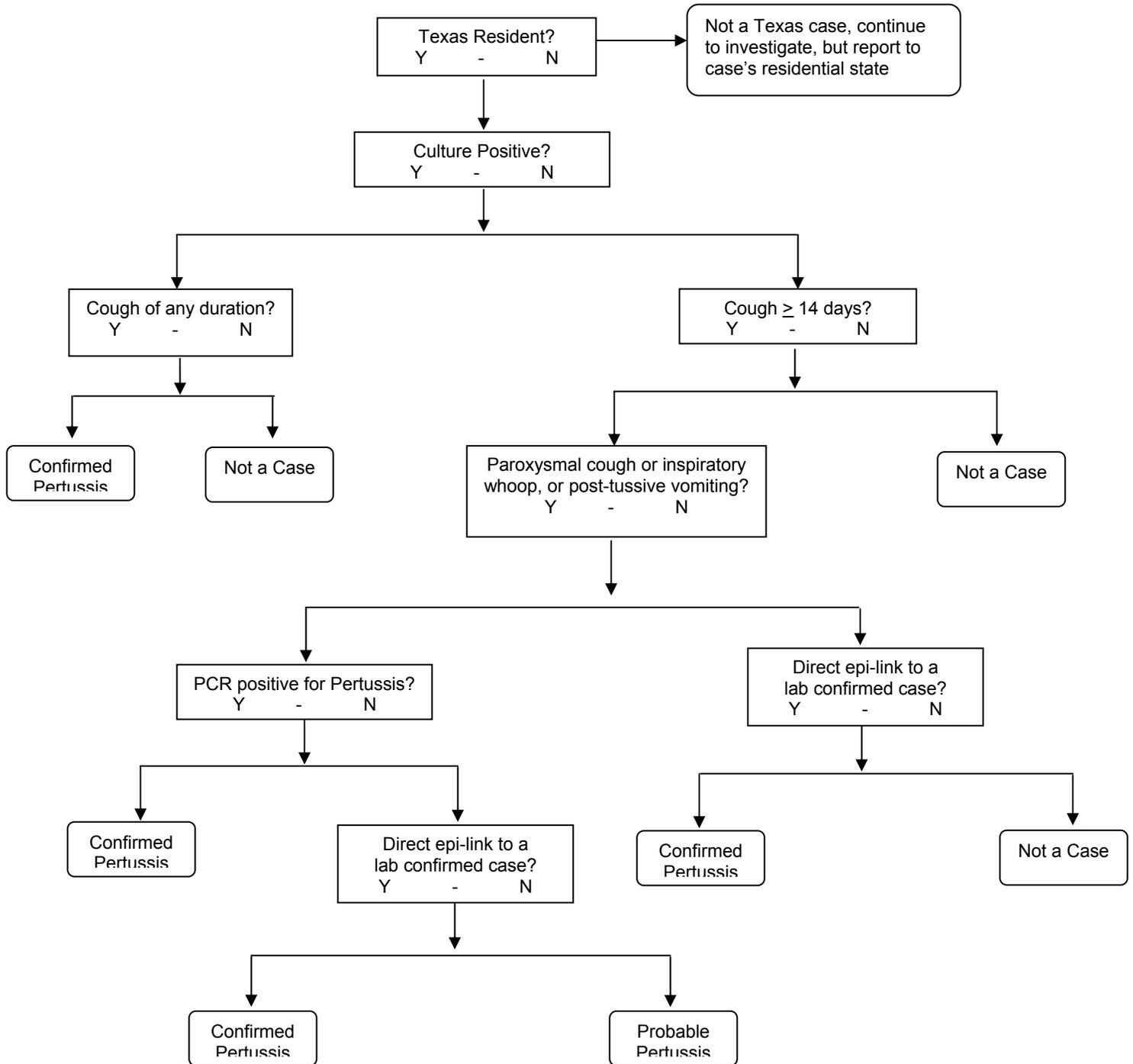


## Pertussis: Case Status Classification for Epi-linked Cases



## Pertussis: Case Status Classification for Cluster Cases

Note: Assuming you have at least two cases with at least one lab-confirmed case and this is your third case to investigate



## Section 7: Paralytic Poliomyelitis (including VAPP)

### 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 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.

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.

### REPORTING

**Immediately** report suspect cases 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) 458-7676**.

### CASE INVESTIGATION

There is no specific case-investigation form, however, a detailed written report will be required by DSHS.

### SPECIMEN COLLECTION

To increase the probability of poliovirus isolation at least two specimens should be obtained 24 hours apart from patients with suspected poliomyelitis as early in the course of disease as possible (ideally within 15 days of onset):

- ◆ 5-gram specimen of stool (transport media not needed for stool).
- ◆ 2 mL of CSF; freeze at -70°C and ship on dry ice.

### INVESTIGATION OF SUSPECTED CASES (collect the following information)

- ◆ Demographic data (name, age, sex, race, complete address, and occupation of patient).
- ◆ Complete immunization history (the number, dates, and lot numbers of all previous doses of polio vaccine).
- ◆ 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 immunoglobulins, 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.
  - ◇ 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).
- ◆ 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.

## Poliovirus Isolates

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.

### SPECIFIC LABORATORY PROCEDURES

#### Enterovirus Culture - Isolation

##### Specimen Collection:

- ◆ Preferred Specimen and Quantity:
  - ◇ CSF- 2-5 mL;
  - ◇ Stool- 2-4g;
  - ◇ NP Swab – in 2-4 mL of viral transport media; or
  - ◇ Tissue in enough viral transport media to prevent drying.

##### Submission Form

- ◆ Use a **Texas Department of State Health Services 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.
- ◆ Fill in the date of collection, date of onset, and diagnosis/symptoms.

##### Specimen Shipping

- ◆ **Transport Temperature**
  - ◇ If specimen will arrive at lab between 3-4 days, store and ship at 2-8° C
  - ◇ If specimen will arrive at lab >3-4 days, store at -70° C and send on dry ice
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756
- ◆ **Causes for Rejection:**
  - ◇ Specimen submitted on a preservative, such as formalin
  - ◇ Discrepancy between name on tube and name on form

## Section 8: Rubella

### CLINICAL CASE DEFINITION

An illness characterized by all of the following symptoms:

- ◆ Generalized maculopapular rash, and
- ◆ Temperature  $\geq 99^{\circ}\text{F}$ , if measured
- ◆ Arthralgia/arthritis, lymphadenopathy, or conjunctivitis.

**Note:** Fifty percent of infected persons do not have symptoms.

### LABORATORY CONFIRMATION

- ◆ Positive serologic test for rubella-specific IgM antibody (**preferred**), 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.

### CASE CLASSIFICATIONS

- ◆ **Confirmed:** A case that is laboratory confirmed, or meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case.
- ◆ **Probable:** Meets the clinical case definition, has no or noncontributory serologic or virologic testing, and is not epidemiologically linked to a confirmed case.

### REPORTING

Immediately report suspected cases 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) 458-7676**.

### 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.
- ◆ Person's  $\geq 1$  year of age should have 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.

**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.

**SPECIFIC LABORATORY PROCEDURES:** IgM 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.

**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**

- ◆ If the samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, sera must be separated from the blood and shipped on cold packs, between 2° and 8°C. If the serum samples will not be delivered to the laboratory within 48 hours of collection at these temperatures, then the samples must be frozen at -20°C or lower and shipped on dry ice.
- ◆ Collect a minimum of 6-8 mL of blood in a red-top tube or tiger top tube.
- ◆ Label blood tubes or serum containers 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 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.

**Specimen Shipping**

- ◆ Transport Temperature:
  - ◇ Samples that will be delivered to the laboratory within 8 hours of collection may be transported at room temperature in the original blood collection tube.
  - ◇ If the samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, sera must be separated from the blood and shipped on cold packs, between 2° and 8°C.
  - ◇ If the serum samples will not be delivered to the laboratory within 48 hours of collection at these temperatures, then the samples must be frozen at -20°C or lower and shipped on dry ice.
  - ◇ **Do not freeze whole blood.**
- ◆ To avoid specimen rejection, send serum to the DSHS laboratory via overnight delivery following the above guidelines.
- ◆ **Ship specimens to:**
  - Laboratory Services Section
  - Texas Department of State Health Services
  - 1100 West 49th Street, MC-1947
  - Austin, TX 78756
- ◆ **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**

Rubella virus isolates can be useful in the diagnosis of acute rubella and CRS, and are needed to establish the molecular epidemiology of rubella. To submit a specimen to the DSHS laboratory for rubella viral isolation:

### **Specimen Collection**

- ◆ Use a viral culturette (collection and transport system).
- ◆ Obtain a pharyngeal swab within 4 days of rash onset.
- ◆ Label the culturette 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.
- ◆ Mark the laboratory test requested (virus isolation-rubella), disease suspected, date of onset, and date of collection.

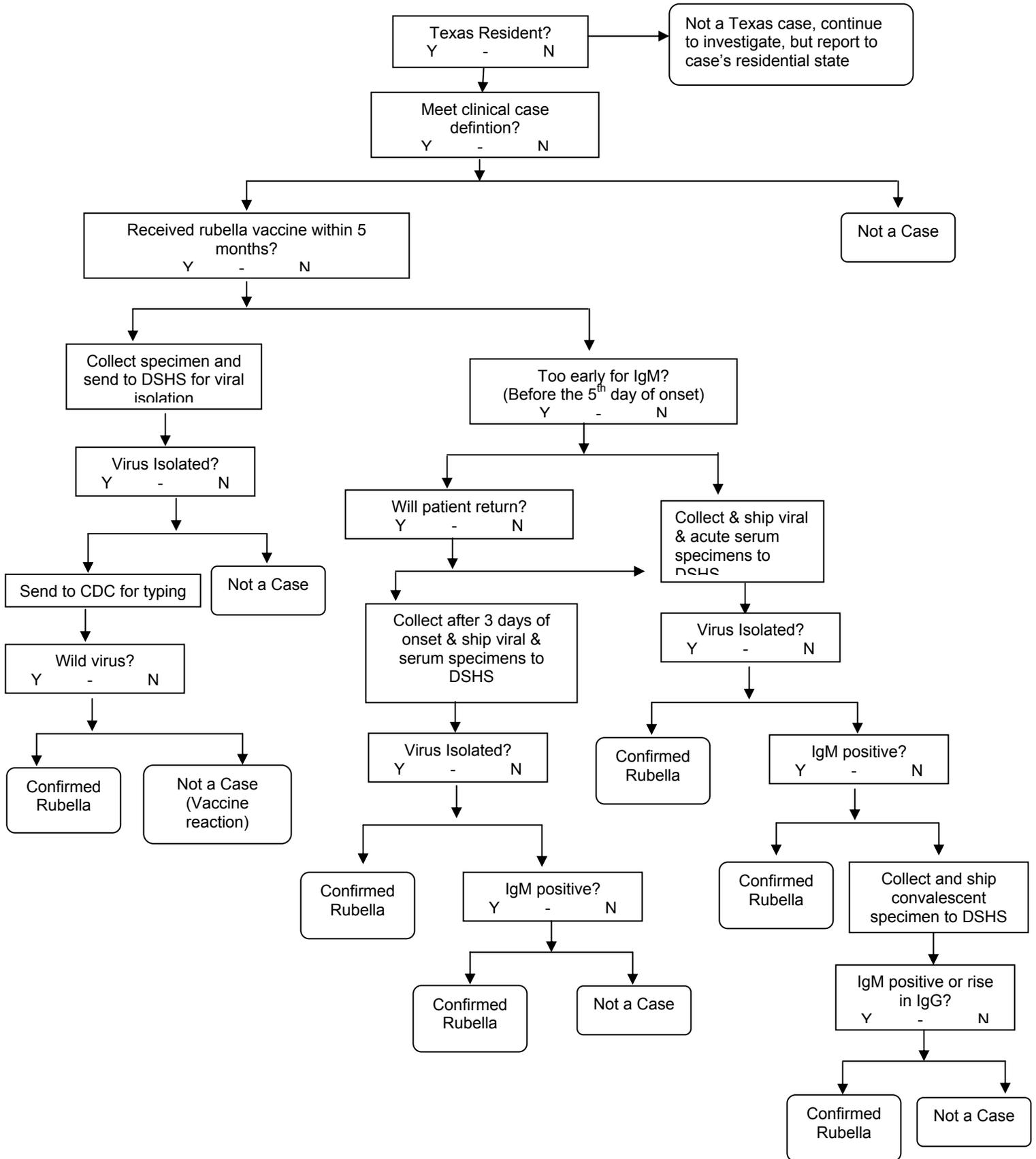
### **Specimen Shipping**

- ◆ 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.
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756



## Rubella: Case Status Classification



## Section 9: Congenital Rubella Syndrome (CRS)

### 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,
- ◆ Serologic evidence of rubella-specific IgM antibody, or
- ◆ An infant's rubella antibody level that persists above and beyond that 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).

### CASE CLASSIFICATIONS

- ◆ **Confirmed:** A clinically compatible case that is laboratory confirmed.
- ◆ **Probable:** A case that is not laboratory confirmed and that has any two complications listed in (A) above, or one complication from (A) and one from (B) and lacking evidence of any other etiology.

### REPORTING

Immediately report suspected cases 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) 458-7676**.

### CASE INVESTIGATION

A completed case investigation form on all suspected cases 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, unless nasopharyngeal and urine cultures are negative for rubella.
- ◆ Mothers 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 pharyngeal and urine cultures are negative for virus after age 3 months

### SPECIFIC LABORATORY PROCEDURES

**IgM Serology:** Single specimen collected soon after birth or soon after suspected diagnosis of CRS is made.

### **Specimen Collection:**

- ◆ Collect a minimum of 6-8 mL of blood in a red-top tube or tiger top tube.
- ◆ Label blood tubes or serum containers 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 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.

### **Specimen Shipping**

#### **◆ Transport Temperature**

- ◇ Samples that will be delivered to the laboratory within 8 hours of collection may be transported at room temperature in the original blood collection tube.
  - ◇ If the samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, sera must be separated from the blood and shipped on cold packs, between 2° and 8°C.
  - ◇ If the serum samples will not be delivered to the laboratory within 48 hours of collection at these temperatures, then the samples must be frozen at -20°C or lower and shipped on dry ice.
  - ◇ **Do not freeze whole blood.**
- ◆ To avoid specimen rejection, send serum to the DSHS laboratory via overnight delivery following the above guidelines.
  - ◆ **Ship specimens to:**
    - Laboratory Services Section
    - Texas Department of State Health Services
    - 1100 West 49th Street, MC-1947
    - Austin, TX 78756
  - ◆ **Causes for Rejection:**
    - ◇ Discrepancy between name on tube and name on form, or
    - ◇ Insufficient quantity of serum for testing specimens received with extended transit time, or
    - ◇ Received at incorrect temperature, or
    - ◇ 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 (collection and transport system) to obtain a pharyngeal swab.
- ◆ Label the culturette 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.
- ◆ 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.
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756

## Section 10: Invasive *Streptococcus pneumoniae*

### CLINICAL CASE DEFINITION

*Streptococcus pneumoniae* causes many clinical syndromes, depending on the site of infection (e.g., acute otitis media, pneumonia, bacteremia, or meningitis). However, only invasive manifestations are reportable, defined as *S. pneumoniae* isolated from a normally sterile site.

### REPORTING

Report suspected cases to a local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit at **(800) 252-8239 or (512) 458-7676**. Conjunctivitis, otitis media, and bronchitis caused by *S. pneumoniae* are not invasive infections, and do not need to be reported.

### CASE INVESTIGATION

- ◆ Any *S. pneumoniae* from a sterile site should be reported using Invasive Streptococcal Disease Case Report (stock no. E59-11574).
- ◆ For children less than 5 years-of-age, A DSHS *Streptococcus pneumoniae* Case investigation form must be completed and submitted by the local health department 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.

### CASE CLASSIFICATIONS

- ◆ **Confirmed:** A clinically compatible case caused by laboratory-confirmed culture of *Streptococcus pneumoniae* from a normally sterile site.

### LABORATORY CONFIRMATION

Isolation of *S. pneumoniae* from a normally sterile site (e.g., blood, cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid)

- ◆ *S. pneumoniae* isolates from sterile sites in vaccinated children <5 years-of-age should be serotyped.

### SPECIFIC LABORATORY PROCEDURES

- ◆ Submit isolates of *S. pneumoniae* on agar slants (or media that has the necessary growth requirements for *S. pneumoniae*).
- ◆ Use Specimen Submission form G-2B.
- ◆ Ship specimen 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 four (4) days after collection.
- ◆ If a delay in transport is anticipated, use a CO<sub>2</sub> generator bag.
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756

## Section 11: Tetanus

### 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**

### CASE CLASSIFICATION

- ◆ **Confirmed:** A case that meets the clinical case definition as reported by a healthcare professional.

### REPORTING

Immediately report suspect cases 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) 458-7676**.

### INVESTIGATION FORM

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 and autopsy report.

### CONTROL MEASURES

- ◆ None (tetanus is not directly transmitted from person to person).
- ◆ The best method for controlling tetanus is preventing tetanus through active immunization with adsorbed tetanus toxoid; combined tetanus-diphtheria toxoid is recommended.
- ◆ Tetanus toxoid 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, policemen, firefighters, and others with greater than usual risk of traumatic injury; the elderly; and international travelers.

### SPECIFIC LABORATORY PROCEDURES

#### Culture-

#### Specimen Collection

- ◆ By biopsy, collect a small piece of tissue.
- ◆ Place in a sterile leak-proof anaerobic environment container.

#### Submission Form

- ◆ Use Specimen Submission Form G-2B.
- ◆ 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, date of onset, and date of collection.

#### Specimen Shipping

- ◆ Store and ship specimen at 2-8°C.
- ◆ **Ship specimens to:**  
Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756

#### Causes for Rejection:

- ◇ Aerobic environment used for shipment.

## Section 12: Varicella (Chickenpox)

### 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

### CASE CLASSIFICATION

- ◆ **Confirmed:** A case that meets the clinical case definition or is laboratory confirmed.

### REPORTING

Effective January 1, 2001, suspected cases of varicella (chickenpox) are reportable weekly by name, date of birth, sex, race and ethnicity, address, date of onset, and varicella vaccination history to local or regional health departments or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit at **(800) 252-8239** or **(512) 458-7676**. The Varicella Reporting Form can be found at [http://www.dshs.state.tx.us/idcu/health/vaccine\\_preventable\\_diseases/forms/](http://www.dshs.state.tx.us/idcu/health/vaccine_preventable_diseases/forms/).

### CASE INVESTIGATION

No individual case investigation is required, however, in the event of death, include a varicella death investigation worksheet, copies of the hospital admission and discharge summaries, death certificate, and autopsy report, and submit to the DSHS Infectious Disease Control Unit.

### CONTROL MEASURES

- ◆ **Healthy Persons**  
Varicella vaccine is recommended for post-exposure administration for unvaccinated persons without other evidence of immunity. The varicella vaccine should be administered at least within 3 to 5 days in order to be effective. Persons who have received 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.
- ◆ **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.

- ◆ **Child-care facility setting:**  
Varicella vaccine (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:**  
The current VZIG product used in the United States is VariZIG and is available under an investigational New Drug Application Expanded Access Protocol (available at <http://www.fda.gov/cber/infosheets/mphvzig020806.htm>). VariZig can be obtained 24 hours a day from the sole authorized distributor FFF Enterprises at (800) 843-7477 or online at <http://www.fffenterprises.com>. VZIG must be administered within 96 hours.
- ◆ **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 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  $\geq 28$  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  $<28$  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 infection.

## EXCLUSION

- ◆ Until vesicles become dry.
- ◆ Avoid contact with susceptibles.
- ◆ In the hospital, strict isolation is appropriate because of the risk of serious varicella complications in immunocompromised susceptible patients.

## SPECIFIC LABORATORY PROCEDURES

**IgG Serology:** Acute AND convalescent samples. Collect acute early in the course of illness and convalescent 10-14 days later.

### Specimen Collection

- ◆ Collect a minimum of 6-8 mL of blood in a red-top tube or tiger top tube.
- ◆ Label blood tubes or serum containers 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 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.

### Specimen Shipping

- ◆ **Transport Temperature**
  - ◇ Samples that will be delivered to the laboratory within 8 hrs of collection may be transported at room temperature in the original blood collection tube.
  - ◇ If the samples are going to be shipped and will be delivered to the laboratory within 48 hours of collection, sera must be separated from the blood and shipped on cold packs, between 2<sup>o</sup> and 8<sup>o</sup>C.
  - ◇ If the serum samples will not be delivered to the laboratory within 48 hours of collection at these temperatures, then the samples must be frozen at -20<sup>o</sup>C or lower and shipped on dry ice.
  - ◇ **Do not freeze whole blood.**
- ◆ To avoid specimen rejection, send serum to the DSHS laboratory via overnight delivery following the above guidelines.
- ◆ **Ship specimens to:**

Laboratory Services Section  
Texas Department of State Health Services  
1100 West 49th Street, MC-1947  
Austin, TX 78756
- ◆ **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.

## **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.

### **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, date of onset, and date of collection.

### **Specimen Shipping**

- ◆ Maintain specimens at 2-8°C immediately after collection. Ship with the least possible delay. If storage is necessary, freeze at -70°C.
- ◆ Ship specimen overnight at 2-8°C.
- ◆ **Ship specimens to:**
  - Laboratory Services Section
  - Texas Department of State Health Services
  - 1100 West 49th Street, MC-1947
  - Austin, TX 78756
- ◆ **Causes for Rejection:**
  - ✧ Specimen submitted on a preservative such as formalin

## Section 13: List of Case Investigation Forms

<u>Name</u>	<u>DSHS Stock Number</u>	<u>Revision Date</u>
Hepatitis B Case investigation form	F11-10866	12/2007
<i>Haemophilus influenzae</i> Case investigation form	F11-10871	12/2007
Mumps Case investigation form	F11-10869	12/2007
Pertussis Case investigation form	F11-10870	12/2007
CDC Pertussis Death Worksheet		12/2007
Rash-Fever Illness Case investigation form	F11-10868	12/2007
Tetanus Case investigation form	F11-10867	12/2007
Varicella Report Form	F11-11046	12/2007
CDC Varicella Death Investigation Worksheet		05/09/2005
<i>Streptococcus pneumoniae</i> , Invasive Case investigation form	E59-11574	05/16/2007

Forms can be downloaded from the Surveillance and Epidemiology Section, Infectious Disease Control Unit, Texas Department of State Health Services website at [http://www.dshs.state.tx.us/idcu/health/vaccine\\_preventable\\_diseases/](http://www.dshs.state.tx.us/idcu/health/vaccine_preventable_diseases/). If you have questions or need more information please call **(800) 252-8239** or **(512) 458-7676**.