Congenital Rubella Syndrome (CRS) rev Jan 2021

BASIC EPIDEMIOLOGY

Infectious Agent
Rubella virus (family Togaviridae; genus *Rubivirus)*

Transmission
Rubella 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. In the case of CRS, rubella virus may also be transmitted from mother to fetus during pregnancy.

Incubation Period
CRS is contracted 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:

- Cataracts/congenital glaucoma, congenital heart disease (most commonly patent ductus arteriosus, peripheral pulmonary artery stenosis), hearing loss, pigmentary retinopathy
- Purpura, hepatosplenomegaly, jaundice, microcephaly, developmental delay, meningoencephalitis, or radiolucent bone disease

Laboratory Criteria for Diagnosis

- Isolation of the rubella virus, **OR**
- Demonstration of rubella-specific immunoglobulin M (IgM) antibody, **OR**
- 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 two-fold dilution per month), **OR**
- Detection of rubella-virus-specific nucleic acid by PCR

Case Classification

- **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

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation
Local and regional health departments should investigate all reports of congenital rubella immediately.

Case Investigation Checklist

- ☐ Ensure isolation of case and droplet precautions are in place.
- ☐ Confirm that the laboratory results meet the case definition.
- ☐ Request that the laboratory forward viral isolation specimens to the DSHS laboratory. See Laboratory Procedures.
- ☐ Review medical records or speak to an infection preventionist or physician to verify case definition, clinical picture, treatment history, and vaccination status of both mom and baby.
    - The Rash-Fever Illness Case Track Record can be used to record information collected during the investigation.
- ☐ Identify and follow-up with all exposed contacts.
    - Determine their susceptibility (fully vaccinated or lab evidence of rubella specific IgG).
    - If susceptible, give vaccination as appropriate for age and vaccination status.
    - See control measures below for infants and in the Rubella section for adults and older children.
- ☐ In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be faxed to DSHS EAIDU.

- Fax the hospital records, labs and completed the Rash-Fever Illness Case Track Record 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

- Patients with congenital rubella syndrome should be considered contagious until they are 1 year of age or until two cultures or PCR samples of clinical specimens obtained 1 month apart after the infant is older than 3 months of age are negative for rubella virus.
- Health officials should consider excluding infants with CRS from child-care facilities until he or she is no longer considered infectious.
- Parents and caregivers should be made aware of the potential hazard of their infants to susceptible, pregnant contacts.
- Persons having contact with infants with CRS should have documented evidence of immunity to rubella.

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 or PCR samples of clinical specimens obtained 1 month apart are negative for rubella virus after infant is older than 3 months of age.

MANAGING SPECIAL SITUATIONS

Outbreaks

If an outbreak of rubella or CRS is suspected, notify EAIDU at **(800) 252-8239 or (512) 776-7676**.

REPORTING AND DATA ENTRY REQUIREMENTS

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

Confirmed, probable and clinically suspected cases are required to be reported **within 1 work day** to the local or regional health department or to DSHS EAIDU at **(800) 252-8239 or (512) 776-7676.**

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **confirmed and probable** cases to DSHS within 30 days of receiving a report of a confirmed or probable case.
    - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
    - A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completing the investigation.
- Fax, send secure email, or mail a completed investigation form within 30 days of completing the investigation.
    - **In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be sent to DSHS EAIDU.**

- Investigation forms may be faxed to **512-776-7616,** emailed securely to VPDTexas@dshs.texas.gov or mailed to:

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

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

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDU at 512-776-7676.

LABORATORY PROCEDURES

Please submit specimens for viral isolation (culture or PCR) to the DSHS laboratory in Austin. Specimens may be submitted for serology if serology is not available from a commercial lab.

Virus Isolation/PCR Specimen Collection and Submission (preferred)
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 1 year) so specimens obtained later may also yield rubella virus. Specimens for virus isolation (pharyngeal swabs) should be obtained monthly until cultures or PCRs 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-2V.
- 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 2-8ºC and ship overnight on wet ice within 48 hours.
- If the specimen must be held longer, freeze at -70ºC 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

Serology Specimen Collection and Submission (if needed)
IgM Serology: Single specimen collected soon after birth or soon after suspected diagnosis of CRS is made. Note: IgG is not useful in CRS as baby may have maternal antibodies. Do not use cord blood.

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°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 (SST) 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 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 Monday through Thursday 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

UPDATES

January 2021

- Updated Control Measures