

# Section 11: Rubella

## BASIC EPIDEMIOLOGY

### Infectious Agent

Rubella virus (family togaviridae; genus *rubivirus*).

### Transmission

Rubella is spread from person to person via airborne transmission or droplets shed from the respiratory secretions of infected persons. Rubella may be transmitted by persons with subclinical or asymptomatic cases (up to 50% of all rubella virus infections).

### Incubation Period

From 14-17 days with a range of 14-21 days.

### Communicability

Rubella is only moderately contagious. The disease is most contagious when the rash first appears, but virus may be shed from 7 days before rash to 5–7 days or more after rash onset.

### Clinical Illness

Symptoms are often mild, and up to 50% of infections may be subclinical or inapparent. In children, rash is usually the first manifestation and a prodrome (early symptom indicating onset of disease) is rare. In older children and adults, there is often a 1 to 5 day prodrome with low-grade fever, malaise, lymphadenopathy (disease of the lymph nodes), and upper respiratory symptoms preceding the rash. The rash of rubella is maculopapular (rash characterized by flat, red on the skin that is covered with small confluent bumps) and occurs 14 to 17 days after exposure. The rash usually occurs initially on the face and then progresses from head to foot. It lasts about 3 days and is occasionally pruritic (intensely itchy). The rash is fainter than measles rash and does not come together to form one massive rash. The rash is often more prominent after a hot shower or bath. Lymphadenopathy may begin a week before the rash and last several weeks. Postauricular, posterior cervical, and suboccipital nodes are commonly involved.

Arthralgia (joint pain) and arthritis (inflammation and stiffness of joints) occur so frequently in adults that they are considered by many to be an integral part of the illness rather than a complication. Other symptoms of rubella include conjunctivitis (pink eye), testalgia (testicular pain), or orchitis (inflammation of the testicles). [Forschheimer spots](#) may be noted on the soft palate but are not diagnostic for rubella. A rubella rash may be confused or mistaken to be parvovirus B19 (Fifth's disease) because the rashes are similar in appearance.

## DEFINITIONS

### Clinical Case Definition

An illness that has all of the following characteristics:

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

### Laboratory Confirmation

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

### Case Classification

- **Confirmed:** A case that meets one of the following:
  - Meets clinical case definition and is laboratory confirmed, or
  - Meets clinical case definition and is epidemiologically linked to a laboratory-confirmed case.

Serum rubella IgM test results that are false positives have been reported in persons with other viral infections (e.g., acute infection with Epstein-Barr virus [infectious mononucleosis], recent cytomegalovirus infection, and parvovirus infection) or in the presence of rheumatoid factor. Patients who have laboratory evidence of recent measles infection are excluded.

## CASE INVESTIGATION & TREATMENT

### Case Investigation

A completed case investigation form on all suspected cases must be submitted to the DSHS Infectious Disease Control Unit within 30 days of initial report. In the event of death, please provide copies of the hospital discharge summary, death certificate, and autopsy report.

### Control Measures

- All reports of suspected rubella should be investigated promptly. Treat all cases as confirmed until laboratory testing or other information rules out rubella.
- Identify all exposed contacts.
- Determine vaccine status of exposed contacts. If not up-to-date with vaccination, vaccinate with MMR according to the recommended immunization schedule.
- Persons  $\geq 1$  year of age should have a history of one (1) dose of MMR or serologic evidence of immunity to rubella.
- Persons who cannot readily provide laboratory evidence of rubella or a documented history of vaccination on or after their first birthday should be considered susceptible and should be vaccinated if there are no contraindications.

- If vaccination of exposed contact is contraindicated, exclude exposed contact from school or child-care facility for at least three (3) weeks after last rash onset.
- If a pregnant woman is exposed to rubella, evidence of rubella immunity should be obtained as soon as possible. If rubella IgG antibodies are not detected, a second specimen should be obtained 3-4 weeks later and tested again for rubella IgM and rubella IgG antibodies. If IgG is present, infection is assumed to have occurred and precautions will need to take place at delivery as the infant may be infectious (see Section 12: CRS).

**Exclusion:** Seven (7) days after onset of rash. In an outbreak, unvaccinated children and pregnant women should be excluded for at least three weeks after rash onset.

## REPORTING AND DATA REQUIREMENTS

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

Cases of rubella are required to be reported within 1 work day to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

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

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

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

### Data Entry

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

## LABORATORY PROCEDURES

**SPECIFIC LABORATORY PROCEDURES:** Culture and PCR testing is preferred.

**IgM Serology:** Single specimen collected early in the course of illness. Because rubella IgM antibodies rise more slowly in some individuals, a negative rubella IgM result on a

specimen collected within 5 days of rash onset will NOT rule out a diagnosis of rubella; the only exception to this is when the specimen is IgG positive, indicating prior immunity. Therefore if the patient is an unvaccinated infant, a specimen for IgM testing should be collected at least 5 days post rash onset. All other specimens should be collected as soon as possible. Rubella IgM may cross-react with other viruses, especially parvovirus.

**IgG Serology:** Acute AND convalescent samples required. Collect acute early in course of illness and convalescent 10-14 days later. Evidence of rubella immunity by measuring IgG antibody (e.g. in an exposed pregnant woman) can be determined with a single blood specimen.

### **Specimen Collection**

#### **Option 1:**

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

#### **Option 2:**

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

### **Submission Form**

- Use the DSHS Laboratory current version of G-2A form (Dec 2011, Rev 4) for specimen submission.

- Make sure the patient's first and last name and date of birth / social security number match exactly what is written on the tube.
- Mark the laboratory test requested, date of onset, and date of collection. Be certain that the names on acute and convalescent sera match exactly.
- Call DSHS Laboratory at 512-776-7138 if needing information for specimen submission.

### **Specimen Shipping**

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

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

### **Causes for Rejection:**

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

### **Virus Isolation**

Rubella virus isolates are critical in the diagnosis of acute rubella and CRS, and are needed to establish the molecular epidemiology of rubella and to distinguish rubella from other viral rash illnesses.

### **Specimen Collection**

- Use a synthetic swab such as polyester or rayon swab. Flocked synthetic swabs are acceptable. Do not use cotton swabs. Place the swab in 2-3 mL of viral transport media.
- Obtain a pharyngeal swab within 4 days of rash onset.
- Label the specimen tube with the patient's name and date of birth or social security number.

### **Submission Form**

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

### **Specimen Shipping**

- Transport temperature:
  - Keep the specimen at 2-8°C and ship overnight on wet ice within 48 hours.
  - If the specimen must be held longer, freeze at -70°C and ship on dry ice.
  - Send the specimen to the laboratory via overnight delivery on wet or dry ice as noted above.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- Ship specimens to:

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Attn. Walter Douglass (512) 776-7569  
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