Rubella rev Jan 2021

BASIC EPIDEMIOLOGY

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

Transmission
Rubella is spread from person to person via direct or droplet contact shed from nasopharyngeal secretions of infected persons. Rubella may be transmitted by persons with subclinical or asymptomatic cases (up to 50% of all rubella virus infections). Perinatal transmission also occurs, see next chapter (CRS).

Incubation Period
From 14-18 days with a range of 12-23 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 unapparent. 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 adult women 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 ≥99°F, if measured, **AND**
    - Arthralgia/arthritis **OR**
    - Lymphadenopathy **OR**
    - Conjunctivitis

Laboratory Criteria for Diagnosis

- Isolation of rubella virus, **OR**
- Significant rise between acute-and convalescent-phase titers in serum rubella immunoglobulin G (IgG) antibody level* by any standard serologic assay, **OR**
- Positive serologic test for rubella-specific IgM antibody* not otherwise ruled out by more specific testing in a public health laboratory, **OR**
- Detection of rubella-virus-specific nucleic acid by PCR.

* Not explained by MMR vaccination during the previous 6-45 days.

Case Classification

- **Confirmed**: A case that is clinically compatible and is:
    - Laboratory confirmed, **OR**
    - Epidemiologically linked to a laboratory-confirmed case.
- **Probable**: There is no probable case definition.

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.

Note: IgM results from specimens collected within 45 days of MMR vaccination do not count as laboratory confirmation.

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should promptly investigate all reports of congenital rubella. For infants exposed in utero, see the Congenital Rubella Section.

Case Investigation Checklist

- ☐ Ensure isolation is in place if within 7 days of rash onset.
- ☐ 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.
    - The Rash-Fever Illness Case Track Record should be used to record information collected during the investigation.
- If a pregnant woman is infected with rubella, immediate medical consultation is necessary.
- ☐ Determine vaccination status of the case. Sources of vaccination status that should be checked include:
    - Case (or parent), ImmTrac, school nurse records, primary care provider, etc.
- ☐ 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, see the control measures in the Congenital Rubella section.
- ☐ 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 completed the Rash-Fever Illness Case Track Record to DSHS.
- ☐ All confirmed case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Control Measures

- Identify contacts:
    - Any direct contact with a patient with rubella during the infectious period is defined as an exposure.
    - Every effort should be made to identify all pregnant women who may have been exposed to a patient and evaluate them serologically for rubella-specific IgM and IgG antibodies.
    - All women of childbearing age who are contacts of a person with a suspected or confirmed case should have their pregnancy status determined. (Refer to Managing Special Situations)
- Determine vaccine status of exposed contacts
    - If not up-to-date with vaccination, vaccinate with MMR according to the recommended immunization schedule.
    - Persons ≥1 year of age should have a history of 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.

- Acceptable presumptive evidence of immunity against rubella includes at least one of the following:
  - Written documentation of vaccination with one dose of live rubella virus-containing vaccine administered on or after the first birthday,
  - Laboratory evidence of immunity,
  - laboratory confirmed of rubella disease, or
  - birth before 1957
  - Healthcare providers should not accept verbal reports of vaccination without written documentation as presumptive evidence of immunity.
- If vaccination of exposed contact is contraindicated, exclude exposed contact from school or child-care facility for at least 3 weeks after last rash onset.

- **Isolation**
  - Patients with rubella should be isolated for 7 days after they develop rash.
  - In settings where pregnant women may be exposed, outbreak control measures should begin as soon as rubella is suspected and should not be postponed until laboratory confirmation of cases.
  - People at risk who cannot provide acceptable evidence of rubella immunity should be considered susceptible and should be vaccinated.
  - People without evidence of immunity who are exempt from rubella vaccination should be excluded.
  - Unvaccinated people who receive MMR vaccine as part of rubella outbreak control may immediately return to school provided all people without documentation of rubella immunity have been excluded.

Treatment
No specific treatment for rubella infection is available.

Exclusion
According to the Texas Administrative Code (TAC), children in school and childcare settings shall be excluded for seven days after onset of rash. In an outbreak, unvaccinated children and pregnant women should be excluded for at least three weeks after the onset of the last rash.

MANAGING SPECIAL SITUATIONS

Pregnant Women or Women of Childbearing Age

- If a pregnant woman is infected with rubella, immediate medical consultation is necessary.
- All women of childbearing age who are contacts of a person with a suspected or confirmed case should have their pregnancy status determined.
- Every effort should be made to identify all pregnant women who might have been exposed to a patient and evaluate them serologically for rubella-specific IgM and IgG antibodies.
    - 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 next section: CRS).
- If a pregnant woman lacks laboratory evidence of rubella immunity, precautions should be taken to prevent any type of exposure to persons infected with rubella. Precautions may include isolating women from settings where rubella virus has been identified and ensuring household contacts are immune.

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

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School & Child-Care Facilities, and General Public Reporting Requirements
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** cases to DSHS within 30 days of receiving a report of confirmed 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 a 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** , securely emailed to VPDTexas@dshs.texas.gov or mailed to:

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

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

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDU at (800) 252-8239 or 512-776-7676.

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 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 (throat swab, nasal swab, or nasal aspirate) swab or a urine sample within 4 days of rash onset. If possible, collecting both a pharyngeal swab and urine sample can increase the likelihood of detecting the virus.
- Label the 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 specimen tube.

Write in rubella PCR or check virus isolation-rubella, disease suspected, date of onset, and date of collection.

Specimen Shipping

- Transport temperature:
  - 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 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°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 serum separator tube (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
- Two patient identifiers such as patient first and last name AND date of birth not included on the tube
- Insufficient quantity of serum for testing specimens received with extended transit time
- Received at incorrect temperature or no date of collection

UPDATES

January 2021

- Added a section about managing pregnant women and women of childbearing age to Managing Special Situations section.
- Updates to laboratory specimen collection.
- Updated flow chart.

FLOW CHART rev Apr 2017