Rubella Quicksheet

January 2025

Rubella Symptoms

- Many cases of rubella are subclinical (asymptomatic) and clinical disease usually is mild.
- Children usually develop few or no symptoms, but adults may experience a 1–5-day prodrome of low- grade fever, headache, malaise, mild coryza, and conjunctivitis.
- 50%–80% of infected persons develop a maculopapular rash (fainter than a measles rash) that starts on the face and progresses from head to feet, becomes generalized in 24 hours and lasts a median of 3 days.
- Postauricular, occipital and posterior cervical lymphadenopathy is characteristic and precedes the rash by 5–8 days.
- Arthralgia or arthritis may occur in up to 70% of adult women, rarely in children or males.
- Rare complications include thrombocytopenic purpura and encephalitis.

Rubella Infection During Pregnancy and Congenital Rubella Syndrome

When rubella infection occurs during pregnancy, especially during the first trimester, serious consequences can result. These include miscarriages, fetal deaths/stillbirths, and a constellation of severe birth defects known as congenital rubella syndrome (CRS). The most common congenital defects are cataracts, heart defects and hearing impairment.

Mode of Transmission

Rubella is transmitted by inhalation of respiratory aerosols emitted when an infected person sneezes, coughs, or talks. Rubella may also be spread by direct contact with respiratory secretions of infected persons.

Epidemiology

The incidence of rubella in the United States has decreased by more than 99% from the pre-vaccine era. In 2004, the United States was determined no longer to have endemic rubella. The rare cases reported in the United States since then have been imported or from unknown sources.

Incubation Period

The average incubation period is 17 days (range:12- 23 days).

Period of Communicability

The infectious period for rubella is from 7 days before onset of rash to 7 days after onset of rash (day of rash onset is day 0). People infected with rubella are most contagious when the rash is erupting. Infants with congenital rubella syndrome (CRS) are presumed infectious at least through the first year of life unless 2 cultures of clinical specimens obtained 1 month apart after 3 months of age are negative for rubella virus.

Laboratory Testing

Clinical diagnosis of rubella is unreliable; therefore, cases must be laboratory confirmed.

Detection of Virus by Real-Time Polymerase Chain Reaction (RT-PCR) at VRDL

- Rubella virus can be detected from nasal or throat swabs.
- Virus may be detected from 1 week before to 2 weeks after rash onset. However, maximum viral shedding occurs up to day 4 after rash onset.

- A urine specimen should also be collected for **measles** virus detection since testing for rubella and measles is often done concurrently.

Detection of IgM Antibody

- Enzyme immunoassay (EIA) is the preferred testing method for IgM, using the capture technique.
- Rubella-specific IgM can usually be detected 4-30 days after onset of illness, and often for longer. Sera should be collected as early as possible after onset of illness. However, IgM antibodies may not be detectable before day 5 after rash onset. In case of a rubella IgM-negative result in specimens taken before day 5, serologic testing should be repeated on a specimen collected after day 5.
- Because rubella incidence is low, a high proportion of IgM-positive tests will likely be **false positive**. False positive serum rubella IgM tests may occur due to the presence of rheumatoid factors (indicating rheumatologic disease), cross-reacting IgM, or infection with other viruses.
- If it is determined that the IgM test was ordered in error as part of a routine screen that should have involved rubella IgG (such as a preemployment physical or routine prenatal screening) then it is almost certainly a false positive and generally further public health follow up is not needed.

Detection of IgG Antibody

- To detect a significant rise in rubella-specific IgG concentration, the first serum should be obtained as soon as possible after onset of illness and the second serum sample should be collected about 7-21 days after the first specimen.
- Tests for IgG antibody should be conducted on both acute-and convalescent-phase specimens with the same test to detect a four-fold rise in IgG titer.

CSTE Definition for Case Classification

Clinical Criteria

In the absence of a more likely alternative diagnosis:

- Acute onset of generalized maculopapular rash,

AND

- Fever (measured [greater than 99.0°F] or subjective),

AND

  - Lymphadenopathy (cervical),

  OR

  - Arthralgia or arthritis,

  OR

  - Conjunctivitis.

*Laboratory Criteria**

Confirmatory Laboratory Evidence:

- Detection of rubella virus (e.g., RT-PCR, culture, next generation sequencing [NGS])

OR

- Significant rise, defined as seroconversion or at least a 4-fold rise in titer, observed in paired acute and convalescent serum rubella IgG antibody levels**,

OR

- Positive serologic rubella IgM antibody**,*** AND low IgG avidity**

Presumptive Laboratory Evidence†:

- Positive serologic rubella IgM antibody***,***†*

** Note: The categorical labels used here to stratify laboratory evidence are intended to support the standardization of case classifications for public health surveillance. These categorical labels should not be used to interpret the utility or validity of any laboratory test methodology.*
*** In the absence of rubella vaccination during the previous 6-45 days.*
**** Acquired rubella was suspected, testing not conducted as part of routine immunity screening (e.g., titers for employment documentation).*
† When not superseded by more specific testing in a public health laboratory.

Epidemiologic Linkage Criteria

- Contact with a confirmed rubella case^ or congenital rubella case during the case's likely infectious period,
  OR
- Close contact (e.g., household contact) with a laboratory-confirmed^ rubella or congenital rubella case during the case's likely infectious period
  OR
- International travel during the past 23 days,
  OR
- Person who gave birth to an infant with confirmed congenital rubella.

^ *"Laboratory-confirmed" case is a case that meets confirmatory laboratory evidence.*

Other Criteria:

- Lacks presumptive evidence of rubella immunity prior to infection.

Case Classifications

Confirmed

- Meets confirmatory laboratory evidence,

OR

- Meets presumptive laboratory evidence **AND** epidemiologic linkage criteria for "contact with a laboratory-confirmed^ rubella or congenital rubella case during the case's likely infectious period",

OR

- Meets clinical criteria **AND**
  - Meets epidemiologic linkage criterion of "close contact (e.g., household contact) with a laboratory-confirmed^ rubella or congenital rubella case during the case's likely infectious period",
    OR
  - Meets presumptive laboratory evidence **AND** meets epidemiologic linkage criterion of "international travel in the 23 days prior to rash onset" **AND** lacks presumptive evidence of rubella immunity prior to infection,

OR

- Meets epidemiologic linkage criterion of "gave birth to an infant with confirmed congenital rubella."

Probable

- Meets clinical criteria **AND** meets presumptive laboratory evidence **AND** lacks presumptive evidence of rubella immunity prior to infection.

^ *"Laboratory-confirmed" case is a case that meets confirmatory laboratory evidence*

Definition of Exposure

Any direct and/or face-to face contact with a patient with rubella during the infectious period (7 days before to 7 days after rash onset) is defined as an exposure.

Postexposure Prophylaxis

There is NO postexposure prophylaxis for persons exposed to a person who is infectious for rubella. Neither rubella vaccine nor immune globulin (IG) is effective for postexposure prophylaxis for susceptible persons.

Recommended Treatment

Treatment of rubella is supportive.

Presumptive Immunity

- Documentation of vaccination with at least one dose of MMR or other live rubella-containing vaccine administered on or after the first birthday;
- Serologic evidence of immunity‡ (rubella IgG positive);
- History of laboratory-confirmed rubella disease; or
- Birth before 1957. §

Persons who have an "equivocal" serologic test result **AND** no documented doses of MMR should be considered rubella-susceptible.

‡Rubella IgG levels can wane over time resulting in falsely negative rubella IgG laboratory results. Evidence suggests that persons with 1 documented dose of MMR are likely protected against rubella infection regardless of serologic testing results.

§Birth before 1957 provides only presumptive evidence of rubella immunity and does not guarantee that a person is immune to rubella. In premenopausal persons who can become pregnant, only a positive serologic test for rubella antibody or documentation of appropriate vaccination should be accepted as evidence of immunity. Healthcare personnel born before 1957 also should not be presumed to be immune. Healthcare facilities should consider recommending at least one dose of MMR vaccine to unvaccinated healthcare personnel born before 1957 who do not have laboratory evidence of rubella immunity.

Case Investigation

1. Assess the suspected case:
   - Confirm clinical signs and symptoms (at a minimum: rash, fever, arthralgia/arthritis, conjunctivitis, or lymphadenopathy).
   - Verify that suspected case could be susceptible to rubella (vaccination history),
   - Determine history of international travel or contact with international visitors <23 days of rash onset.
   - Determine if suspected case had contact with a person known to be infected with rubella, CRS, or a person with rash illness.
2. Ensure case is isolated immediately through day 7 after rash onset or until rubella is ruled out.
3. Report case to CDPH.
4. In consultation with CDPH, collect appropriate specimens and arrange for laboratory testing of suspected case at a public health laboratory.
5. If a pregnant woman is infected with rubella, immediate medical consultation is necessary.
6. Ensure that appropriate infection control precautions (droplet plus standard) are taken to prevent additional exposures in healthcare settings.

7. Identify contacts and determine their immune status (refer to definitions of immunity in prior section):
   - Identify all household contacts and determine their immune status to rubella.
   - Identify all other potentially exposed contacts from settings where neither the case nor contact were masked and determine their immune status to rubella.
   - Determine whether case was on a flight while infectious; collect flight information.
8. Refer exposed susceptible pregnant persons to their prenatal care provider for consultation. Ensure that prenatal care providers receive rubella infection control guidance before an exposed pregnant person presents for care.
9. Refer susceptible contacts for vaccination. Postexposure vaccination will not prevent or alter the clinical severity of rubella infection. However, if the current exposure to rubella does not cause infection, vaccination should induce protection against infection from subsequent exposures. **Note that MMR vaccine is contraindicated during pregnancy.**
10. Local health departments should recommend that rubella cases and susceptible contacts have no contact with pregnant women and persons without adequate proof of rubella immunity for 7 days after rash onset (cases) or from 7 days after the first exposure to 23 days after the last exposure to rubella (contacts).

Exposed Pregnant People

The primary goals of rubella case investigations are to prevent exposure of susceptible pregnant people to rubella (and thereby prevent cases of CRS), to assess the immune status of exposed pregnant people, and to identify rubella infections, particularly infections in pregnant people.

Every effort should be made to identify all pregnant people who might have been exposed to a case and evaluate these contacts serologically for rubella-specific IgG antibodies if their immune status is not known (e.g., no prior serologic testing for rubella during prenatal or healthcare worker testing). In addition, all women of childbearing age who are contacts to a suspected or confirmed case should be asked about the possibility of being pregnant.

If an unvaccinated pregnant person is IgG-negative, precautions should be taken to prevent any type of exposure to persons infected with rubella; these precautions may include restricting such pregnant persons from settings where rubella infection has been identified and advising against travel to areas where rubella is circulating.

Exposures in Healthcare Settings

- Exposed healthcare personnel without adequate evidence of immunity should be excluded from duty beginning 7 days after first exposure to rubella through either 23 days after last exposure or 7 days after rash appears.
- Exposed healthcare personnel who are vaccinated as part of control measures for a rubella exposure should be excluded from direct patient care for 23 days after the last exposure to rubella because effectiveness of postexposure vaccination in preventing rubella infection has not been shown.
- Because birth before 1957 does not guarantee rubella immunity, if an exposure occurs in a healthcare setting, healthcare facilities should recommend one dose of MMR vaccine for unvaccinated personnel born before 1957 who lack laboratory evidence of rubella immunity or laboratory confirmation of infection or disease.
- Exposed susceptible persons who are hospitalized should be discharged <7 days after exposure, if possible. If they cannot be discharged, they should be isolated in Droplet Precautions for 23 days after last exposure to rubella.

Exposures in Schools or Childcare Centers

- In schools and childcare settings, exclusion of exposed persons without acceptable evidence of rubella immunity may limit disease transmission.
- All exposed persons who have been exempted from rubella vaccination for medical reasons or personal beliefs should also be excluded from attendance.
- Exclusion should continue until 23 days after the onset of rash of the last reported case-patient in the setting.
- Exposed unvaccinated persons who receive MMR vaccine may be immediately readmitted to school provided all persons without documentation of immunity have been excluded.

For More Information

Contact the CDPH Immunization Branch at VPDReport@cdph.ca.gov or 510-620-3737.