RUBELLA, ACUTE or POSTNATAL

(German Measles, 3-day Measles)
(See also **RUBELLA, CONGENITAL SYNDROME**)

Agent: Rubella virus.

Reservoir/ Source: Human/Via inhalation of respiratory aerosols and secretions. Transplacental transmission occurs from mother to fetus.

Symptoms: Maculopapular rash (fainter than measles rash) that starts on the face and progresses down to feet, becomes generalized in 24 hours and lasts a median of 3 days. Other symptoms such as low-grade fever, headache, conjunctivitis, rhinitis, and lymphadenopathy may occur 1-5 days before the rash.

Complications: Encephalitis and thrombocytopenia are rare. Principal concern is congenital rubella syndrome (CRS) **if disease occurs during pregnancy, especially during the first trimester.**

Differential Diagnoses: Measles, human herpesviruses 6 & 7, mononucleosis, cytomegalovirus, arboviruses (e.g. Zika, West Nile, Ross River fever, Chikungunya), and other febrile rash exanthems.

Diagnosis: Clinical diagnosis of rubella is unreliable; cases **must** be laboratory confirmed.

Incubation: From exposure to rash onset, 12-23 days with an average of 17 days.

Communicability and Transmission: People are most contagious when the rash is erupting, but they can be contagious from 7 days before to 7 days after the rash appears.

Presumption of Immunity Criteria: See **Box 2**.

Specimen Collection/Lab Testing: Throat or nasopharyngeal (NP) swab, urine, and serum, see **Box 1** for details.

Specific Treatment: Supportive care only; antiviral agent not available.

Post-Exposure Prophylaxis: There is **no** post-exposure prophylaxis for people exposed to a person who is infectious for rubella. Neither rubella vaccine nor immune globulin (IG) is effective for post-exposure prophylaxis for susceptible persons.

Recommended Vaccines: MMR and MMRV

Epidemiology: Incidence of rubella in the United States has decreased by more than 99% and has not been endemic to the U.S. since 2004.

Case Definition: See **Box 3**.

Investigation of a Suspect Rubella Case

- **Rubella Report Notification:** All providers must report suspected or confirmed rubella cases to the LA County Department of Public Health's Vaccine Preventable Disease Control (VPDC) Program within 7 calendar days of identification via the CalREDIE provider portal, secure email, fax, or telephone (17 § CCR 2500).
  - **Weekdays**: Call 213-351-7800
  - **After Hours**: Call 213-974-1234 option 8
  - **Email**: vpdc@ph.lacounty.gov
  - **Fax Number**: 213-351-2782

- **Interview Case:** VPDC should assess the suspected case within one business day of it being reported, using the Rubella Initial Assessment Form to guide the interview. Then, VPDC will review the IAF and all other available documentation to confirm the following:
  - Clinical signs and symptoms, including rash, fever, lymphadenopathy, conjunctivitis, or arthralgia/arthritis
  - Potential sources of infection, including international travel, contact with international visitors, or contact with a person with a rash illness <23 days before rash onset

  - Pregnancy status (and if pregnant, week of gestation) – **immediate medical consultation is necessary if pregnant**
  - Vaccination history, including any MMR vaccine <45 days before rash onset
  - Sites of potential exposure from 7 days before rash onset to 7 days after rash onset

- **Specimen Collection:** Ensure that appropriate infection control precautions (droplet plus standard) are taken to prevent additional exposures in healthcare settings. See **Box 1**.

- **Case Isolation:** Ensure case is isolated immediately through day 7 after rash onset or until rubella is ruled out, whichever occurs first. An Off Work Notice may be considered to enforce exclusion from work.

- **Identify Exposed Contacts:**
  - *Contagious Period*: 7 days before rash onset through 7 days after rash onset. Rash onset date is day 0.
  - *Exposure Definition*: Any direct face-to-face contact with a patient with rubella during the contagious period.
  - *Exposure Sites*: Identify sites the case visited during their contagious period.
  - Once a rubella diagnosis has been confirmed, proceed to the next section.

Investigation of Asymptomatic Contacts to a Rubella Case

1. Identify contacts and determine their immune status (refer to **Box 2**):
   - All contacts with prolonged exposure (household, co-travelers, etc.)
   - Contacts with direct face-to-face contact with a case while both case and contact were unmasked
   - Any pregnant persons who may have been exposed
2. 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.
3. 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.**
4. Susceptible contacts to rubella cases should have **no contact** with pregnant people and **no contact** with persons without adequate proof of rubella immunity for 23 days after their last rubella exposure date.

Pregnant Contacts: The primary goal of rubella case investigations is to prevent cases of CRS – this is achieved by preventing exposure of susceptible pregnant persons to rubella, assessing immune status of exposed pregnant people, and identifying rubella infections (especially those 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 premenopausal people who are able to become pregnant and are contacts to a suspected or confirmed case should be asked whether they might be 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 work from day 7 after first date of exposure through day 23 after last date of exposure. This does not change if the healthcare personnel is vaccinated after the exposure, as this has not been shown to be sufficient post-exposure prophylaxis.
- 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.

Reference Protocols/Tools:

- **CDPH Report Form:** Rubella (German Measles) Case Report Form (PM 358)

Box 1: Rubella Specimen Collection & Lab Testing

Collect all specimens for suspected cases in consultation with VPDC - call at 213-351-7800 from 8:30 am to 5:00 pm Monday to Friday, or 213-974-1234 (option 8) after hours. VPDC will provide guidance on whether specimen testing should be done at PHL or at a commercial lab. If VPDC approves testing at PHL, follow steps below for collecting each sample. VPDC will assist in coordinating a courier if needed.

A. Rubella Real-Time Polymerase Chain Reaction (RT-PCR)

PCR of oropharyngeal/throat or nasopharyngeal (NP) swab is the preferred method for laboratory confirmation of rubella. Urine should also be collected if measles is also suspected.

Throat or Nasopharyngeal (NP) Swab for Rubella RT-PCR

- **Laboratory Form** (*two forms per specimen)*:
  - **Oropharyngeal/Throat Swab:** LAC PHL Rubella Throat Swab - PCR **and** VRDL General Purpose Specimen Submittal Form
  - **Nasopharyngeal (NP) Swab:** LAC PHL Rubella NP Swab - PCR **and** VRDL General Purpose Specimen Submittal Form
- **Specimen Type:** Throat *or* NP swab
- **Timing of Specimen Collection:** 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.
- **Minimum Volume Required:** At least 2-3 mL of Viral Transport Media (VTM) or Universal Transport Media (UTM).
- **Collection/Transport Container:** Use Dacron or synthetic tip with aluminum or plastic shaft. After collection, place swab from throat or NP in liquid Viral Transport Media (VTM) or Universal Transport Media (UTM).

- **Storage and Transport:** Store specimens refrigerated at 2-8°C. Transport refrigerated on cold packs to the laboratory as soon as possible. Swabs should be submitted on cold packs within 24 hours of collection. If transit time is longer, freeze specimen and transport frozen on dry ice (-20°C or lower).

Urine for RT-PCR if Measles is Also Suspected

- **Laboratory Form** *(one form per specimen)***:** LAC PHL Measles Urine - PCR
- **Specimen Type:** Urine
- **Timing of Specimen Collection:** Collect within 2 weeks of rash onset. Collect 10-50 ml urine in a sterile container midstream, clean-catch. The first morning void is ideal.
- **Minimum Volume Required:** 10-50 mL urine
- **Collection/Transport Container:** Use screw cap, leakproof, sterile container without preservatives. Urine must be fresh, **never frozen**.
- **Storage and Transport:** Store specimens refrigerated at 2-8°C. Transport refrigerated on cold packs to the laboratory as soon as possible. **Do not freeze urine.**

B. Rubella Antibody Tests (IgM, IgG)

IgM detected through EIA 4-30 days after rash onset can be used to confirm infection if not ruled out by more specific testing, and if coupled with epidemiologic linkage to a laboratory-confirmed case *or* international travel in the 23 days before rash onset *or* low IgG avidity.

IgG is most often used to assess a person's immunity to rubella. If the person is asymptomatic, IgG can be requested on its own. If the patient is symptomatic, IgG, IgM and PCR (one for throat or NP swab; one for urine if measles is suspected) can all be run simultaneously.

Serum for Symptomatic Patients (IgM and IgG Tests or IgM Test Only) or Asymptomatic Contacts (IgG Test Only)

- **Laboratory Form** *(one form per specimen)***:**
  - Symptomatic Patients:
    - LAC PHL Serum - IgM Only OR
    - LAC PHL Serum - IgG and IgM
  - Asymptomatic Contacts:
    - LAC PHL Serum - IgG Only
- **Specimen Type:** Serum
- **Timing of Specimen Collection:**
  - Symptomatic Patients: At least four (4) days after rash onset.
  - Asymptomatic Contacts: As needed to assess immunity.
- **Minimum Volume Required:** 2 mL of whole blood/1 mL of serum
- **Collection/Transport Container:** Collect blood in SST tube (red-top or gold-top, plastic). If possible, separate serum from clot by centrifuging it within one hour of phlebotomy or as soon as possible. If specimen transport is delayed for longer than 5 days, aseptically transfer serum to a screw cap, sterile, leak-proof container.
- **Storage and Transport:** Blood specimens should be stored at 2-8°C. Transport refrigerated on cold packs to the laboratory as soon as possible. If testing is delayed longer than 5 days, the specimens should be frozen at -20°C or colder. Specimens should be submitted in a biohazard specimen bag with absorbent material. Transport specimens in an insulated container on cold packs.

Box 2: Presumption of Immunity Criteria

Contacts may be presumed immune if they meet any of the following criteria:

- Documentation of vaccination with at least one dose of MMR or other live rubella-containing vaccine administered on or after first birthday
- A positive IgG test for rubella*,‡
- Laboratory confirmation of previous rubella disease**
- Born prior to 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.

Box 3: Case Definition (CSTE, 2025-Present)

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

- Contact with a laboratory-confirmed^ rubella 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 in the 23 days prior to rash onset, **OR**
- Gave birth to an infant with confirmed congenital rubella^^

^ *"Laboratory-confirmed" case is a case that meets confirmatory laboratory evidence.*
^^ *When residency criteria are met for pregnant woman at time of presumed illness*

Case Classification

Probable:

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

Confirmed

- Meets confirmatory laboratory evidence, **OR**
- Meets presumptive laboratory evidence **AND** epidemiologic linkage criterion of "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."

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