



# Rubella

## Colorado Communicable Disease Manual

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Revised:

### 24-Hour Reportable Disease

## The Disease and Its Epidemiology

### A. Etiologic Agent

Rubella is caused by rubella virus (genus *Rubivirus*, family *Togaviridae*).

### B. Clinical Description

Rubella is usually a mild disease characterized by a generalized maculopapular rash, generalized lymphadenopathy (commonly suboccipital, postauricular, and cervical) and slight fever. In children the rash is usually their first sign and a prodrome is rare. Older children and adults, often have a 1 to 5 day prodrome with low-grade fever, malaise, lymphadenopathy, and cold symptoms. The rash usually occurs initially on the face and progresses downward. The rash lasts about 3 days, is fainter than a measles rash and does not coalesce. Twenty to 50% of rubella infections are asymptomatic or have minimal symptoms. Complications are uncommon and include: encephalitis, hemorrhagic manifestations, orchitis, neuritis, arthritis or arthralgia.

Prevention of congenital rubella syndrome (CRS) is the primary purpose of rubella investigation and control activities. Up to 90% of infants born to mothers infected in the first trimester will develop congenital rubella syndrome. CRS is characterized by any number of complications, including blindness, heart defects, deafness, behavioral disorders, mental retardation, growth retardation, bone disease, enlarge liver and spleen, thrombocytopenia and purple skin lesions. Manifestations of CRS may be delayed from 2 to 4 years.

### C. Reservoirs

Humans are the only host.

### D. Modes of Transmission

Rubella is transmitted person-to-person by droplet or direct contact with the nasopharyngeal secretions of an infected person. An infant with CRS can transmit rubella via nasopharyngeal secretions or urine.

### E. Incubation Period

The incubation period for rubella is usually 16 to 18 days and can range from 12 to 23 days.

### F. Period of Communicability or Infectious Period

Rubella is only moderately contagious, it is most contagious when the rash is erupting, but virus may be shed from 7 days before until 7 days after rash onset.

### G. Epidemiology

Rubella occurs worldwide. In the temperate zones, peak incidence is in late winter and early spring. Before widespread use of rubella vaccine, which was licensed in 1969, peaks of rubella incidence occurred in the United States every 6 to 9 years, and most cases occurred in children.

In recent years, rubella outbreaks in the U.S. and Colorado have occurred among immigrant populations from Mexico and Central America. From 2003 through 2013, only one rubella case was reported. The last case of CRS reported in Colorado was during 1999.

## Case Definition

### Case Classification

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A case with or without symptoms who has laboratory evidence of rubella infection confirmed by one or more of the following laboratory tests:

- Isolation of rubella virus; or
- Detection of rubella-virus specific nucleic acid by polymerase chain reaction; or
- IgG seroconversion<sup>†</sup> or a significant rise between acute- and convalescent-phase titers in serum rubella IgG antibody level by any standard serologic assay; or
- Positive serologic test for rubella IgM antibody<sup>†\*</sup>

Confirmed:                   -OR-

An illness characterized by all of the following:

- Acute onset of generalized maculopapular rash; and
- Temperature greater than 99.0°F or 37.2°C; and
- Arthralgia, arthritis, lymphadenopathy, or conjunctivitis; and
- Epidemiologic linkage to a laboratory-confirmed case of rubella.

† Not explained by MMR vaccination during the previous 6 to 45 days.

\*Not otherwise ruled out by more specific testing in a public health laboratory.

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In the absence of a more likely diagnosis, an illness characterized by all of the following:

- Probable:
- Acute onset of generalized maculopapular rash; and
  - Temperature greater than 99.0° F or 37.2° C, if measured; and
  - Arthralgia, arthritis, lymphadenopathy, or conjunctivitis; and
  - Lack of epidemiologic linkage to a laboratory-confirmed case of rubella; and
  - Noncontributory or no serologic or virologic testing.

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Any generalized rash illness of acute onset that does not meet the criteria for probable or confirmed rubella or any other illness.

CDPHE recommends a second specimen be obtained if:

- Suspect:
- original rubella IgM specimen is negative and clinical suspicion is high
  - original sera was obtained fewer than 5 days after rash onset
  - case meets clinical case definition

False positive rubella IgM tests have been reported in persons with other viral infections and from testing performed at commercial laboratories. Additional IgM rubella testing using rubella IgM capture is available through the CDPHE lab.

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## Reporting Criteria

What to Report to the Colorado Department of Public Health and Environment (CDPHE) or local health agency

- Any suspect, probable or confirmed rubella case.
- Rubella cases should be reported within 24 hours of diagnosis or a positive laboratory test.

- Cases should be reported using the Colorado Electronic Disease Reporting System (CEDRS), fax or telephone. See section below for phone and fax numbers.

## Purpose of Surveillance and Reporting

Prompt identification and reporting of suspected, probable, or confirmed cases of rubella is important to avoid exposure of susceptible pregnant women. Rapid case identification and investigations are also important so that control measures can be initiated to prevent spread of the disease.

## Important Telephone and Fax Numbers

CDPHE Communicable Disease Epidemiology Branch

- Phone: 303-692-2700 or 800-866-2759
- Fax: 303-782-0338
- After hours: 303-370-9395

CDPHE Microbiology laboratory: 303-692-3480

Communicable Disease (CD) Manual website: <https://www.colorado.gov/pacific/cdphe/communicable-disease-manual>

## State Laboratory Services

### Laboratory Testing Services Available

- CDPHE Serology Laboratory will test suspected cases of rubella using a capture IgM test. Additional tests are available through CDC Laboratory.
- Please consult with your state or regional epidemiologist to determine if testing at CDPHE or CDC is appropriate.

### Laboratory Testing Recommendations

#### Serology

- 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.
- False-positive serum rubella IgM tests may occur due to the presence of rheumatoid factors, cross-reacting IgM, or infection with other viruses. Avidity testing (available at CDC) can be used to resolve uncertainties in the serologic evaluation of suspected cases.
- If rubella test results are IgM-positive for persons who have no or low risk of exposure to rubella, additional laboratory evaluation should be conducted to rule out the possibility of acute disease.
- Detection of IgG antibody (significant rise or avidity) may also be help for diagnostic testing.
- To detect a significant rise in rubella-specific IgG concentration, one serum specimen should be obtained as soon as possible after onset of illness and a second serum sample should be collected about 7 to 21 days after the first specimen. Tests for IgG antibody should be conducted on both acute-and convalescent-phase specimens at the same time with the same test.

#### Virus detection

- Rubella virus can be detected from nasal, throat, urine, blood, and cerebrospinal fluid specimens from persons with rubella. The best results come from throat swabs. Cerebrospinal fluid specimens should be reserved for persons with suspected rubella encephalitis.
- Efforts should be made to obtain clinical specimens for virus detection from all case-patients at the time of the initial investigation.
- Specimens for virus detection may be collected from 1 week before to 2 weeks after rash onset but optimal collection time is within 4 days after rash onset.

## Case Investigation

All suspect cases of rubella should be interviewed and specimens collected for rubella IgM testing and sent to CDPHE Laboratory.

### A. Case Investigation / Forms

Interview patient and health care provider

- The CDC Rubella Surveillance Worksheet can be used as a guideline for the case investigation. <http://www.cdc.gov/vaccines/pubs/surv-manual/appx/appendix16-2-rubella-wrsh.pdf>
- If not already done, obtain specimens for rubella testing. See State Laboratory Services section above for testing recommendations.
- Obtain immunization history (patient may have a positive IgM for rubella if recently vaccinated.)
- Verify onset dates of symptoms.
- Determine if case had any recent travel, especially to/from Latin America.
- Determine if patient is in a high-risk occupation; such as health care worker, daycare provider, or teacher.
- Identify exposed contacts (7 days prior and 7 days after rash onset).

### B. Identify and Evaluate Contacts

Identify Susceptible Contacts

The following groups have acceptable presumptive evidence of rubella immunity:

- Persons who have written documentation of adequate vaccination with at least one dose of live rubella virus-containing vaccine on or after age 12 months,
- Persons with laboratory evidence of rubella immunity,
- Persons with laboratory confirmation of disease,
- Persons born before 1957 (birth before 1957 is not acceptable evidence of rubella immunity for women who could become pregnant.)

Persons who do not have acceptable presumptive evidence of rubella immunity should be monitored for symptoms and receive one dose of MMR vaccine to prevent against future rubella exposures.

Identify Pregnant Contacts

- Every effort should be made to identify all pregnant women who might have been exposed to a patient and evaluate them 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.
- If a pregnant woman is infected with rubella, refer her to her medical provider for immediate medical consultation.

Symptomatic Contacts

- Conduct case investigation and specimen collection for all symptomatic contacts that meet clinical case definition.
- Determine if symptomatic individuals are pregnant.
- Verify immunization status.
- Notify CDPHE Communicable Disease Program (303-692-2700) if an outbreak is suspected.

Asymptomatic Contacts

- Determine if any exposed contacts are pregnant and if pregnant verify their immune status.
- Determine immunization status.
- Provide information about symptoms, incubation period and preventive measures.

### C. Conduct Enhanced Surveillance

- Active surveillance for rubella should be maintained for at least two incubation periods (46 days) following rash onset of the last case.

- Surveillance for CRS should be implemented when confirmed or probable rubella cases are documented in a setting where pregnant women might have been exposed.
- Women who contract rubella infection while pregnant should be monitored for birth outcome, and appropriate testing should be performed on the infant after birth.

## Disease Control Measures

### A. Treatment

Treatment for rubella is supportive only.

### B. Prophylaxis

No prophylactic treatment of close contacts is recommended.

### C. Vaccination

- Rubella vaccine is incorporated with mumps and measles as a combined vaccine (MMR) or with mump, measles, and varicella (MMRV).
- The Advisory Committee on Immunization Practices (ACIP) recommends a first dose at 12 to 15 months of age with a second dose at school entry (4 to 6 years) for routine vaccination.

### D. Education

- Advise contacts of the signs and symptoms of rubella.
- A Health Alert Network (HAN) Advisory or Alert about rubella may be sent to health care providers and hospitals. Sending a measles HAN should be discussed with CDPHE staff that can assist you in developing the notice.

### E. Managing Special Situations

#### Childcare and School

Children with postnatal rubella should be excluded from school or childcare for 7 days after onset of rash. During an outbreak, children without evidence of immunity should be immunized or excluded. Children with CRS should be considered contagious until they are at least 1 year of age, unless two cultures of clinical specimens obtained 1 month apart are negative for rubella virus after 3 months of age.

#### Healthcare Workers

- In healthcare settings, exposed healthcare personnel without adequate presumptive evidence of immunity should be excluded from duty beginning 7 days after exposure to rubella and continuing through either 23 days after last exposure or 7 days after rash appears.
- Exposed healthcare personnel who are vaccinated as part of control measures 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.
- Since because birth before 1957 does not guarantee rubella immunity, during outbreaks in healthcare settings, 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.

#### Patients in Health Care Facilities (Hospitals and Long Term Care Facilities)

- In addition to standard precautions, droplet precautions are recommended for 7 days after onset of the rash.
- Contact isolation is indicated for children with CRS until they are at least 1 year of age or have two cultures of clinical specimens obtained 1 month apart after 3 months of age test negative for rubella virus.

## F. Environmental Measures

There are no specific environmental measures.

## References

Centers for Disease Control and Prevention. Manual for the surveillance of vaccine-preventable diseases. Centers for Disease Control and Prevention, Atlanta, GA, 2008.

American Academy of Pediatrics. *2012 Red Book: Report of the Committee on Infectious Diseases, 29<sup>th</sup> Edition*. Illinois, Academy of Pediatrics, 2012.

Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Disease. Atkinson W, Hamborsky J, Wolfe S, eds. 12<sup>th</sup> ed., second printing. Washington DC: Public Health Foundation, 2012.

Case Definitions for Infectious Conditions Under Public Health Surveillance.  
<http://stacks.cdc.gov/view/cdc/7562/>

CDC Website: [www.cdc.gov](http://www.cdc.gov) (click on "Diseases and Conditions")