

# Rubella (Acquired and Congenital)



## PROTOCOL CHECKLIST

- Enter available information into Merlin upon receipt of initial report
  - Contact the Immunizations Program for assistance as needed (850-245-4342)
  - Review background on disease, case definition, and laboratory testing
  - Contact provider
  - Interview patient or guardian
    - Review disease facts
      - Modes of transmission
      - Incubation period
      - Symptoms
    - Ask about exposure to relevant risk factors
      - Immunization history
      - Travel outside of U.S. or to areas where rubella infections have recently been diagnosed or exposure to visitors from outside of the U.S. or who come from an area where rubella has recently been documented
      - Contact with a known infected or symptomatic person(s) or those with rash illness
      - Recent visit to a healthcare setting (or other community or group settings where exposure may have occurred)
  - Ensure laboratory specimens are forwarded to Bureau of Public Health Laboratories (BPHL) for confirmatory testing
  - Identify possibly exposed/symptomatic contacts
  - Determine whether patient or symptomatic contact is in a sensitive situation (school, childcare, healthcare)
    - Ensure isolation of patient or symptomatic contacts
    - Establish enhanced surveillance
    - Provide health advisory to community, notification to schools, etc., as appropriate
    - Identify those at-risk with unknown immune status (susceptible persons) for vaccination as indicated
  - Provide education on prevention through vaccination
  - Address patient's questions or concerns
- Follow-up on special situations, including persons in sensitive situations and pregnant women
- Enter additional data obtained from interview into Merlin

## Rubella

**1. DISEASE REPORTING****A. Purpose of reporting and surveillance**

1. To prevent congenital rubella syndrome (CRS).
2. To assure that children with suspected CRS are tested to confirm or rule out the diagnosis in a timely manner in order to assure prompt treatment and prevent spread of the disease.
3. To assure that acquired rubella infections are tested to confirm or rule out the diagnosis. (As part of the Healthy People 2020 objectives, a goal was established to eliminate U.S.-acquired rubella and CRS in the United States.)
4. To identify exposed pregnant women in a timely manner, determine their susceptibility and infection status, and provide appropriate counseling about the risk of fetal infection.
5. To evaluate the effectiveness of disease prevention efforts such as immunization.

**B. Legal reporting requirements**

Laboratories and physicians are required to report rubella to the county health department (CHD) immediately by phone upon initial suspicion or laboratory test order.

**C. County health department investigation responsibilities**

1. Begin an investigation on the day of notification. Contact the Immunization Program (IP) for assistance as needed at (850-245-4342).
2. Facilitate transport of specimens to BPHL in conjunction with the Bureau of Epidemiology (DCBE) to confirm the diagnosis.
3. Isolate the patient until seven days after the rash onset (unless the diagnosis is ruled out).
4. Identify contacts of the patient and sites of potential transmission during the period of communicability.
5. Make appropriate recommendations to susceptible contacts, particularly pregnant women ([see Section 6](#)).
6. Establish enhanced surveillance for additional patients.
7. Report all confirmed, suspect and probable cases of **acquired rubella** (see definitions below) to the DCBE and IP, and report in Merlin under **Acquired Rubella** reporting code = 05690.

8. Complete the [Rubella Surveillance Worksheet](#) and **acquired rubella** extended data in Merlin
9. Report all confirmed, suspect and probably cases of **congenital rubella syndrome** (see definitions below) to the IP Congenital rubella reporting code=77100. Complete the congenital rubella investigation form available at:  
[http://serena.doh.ad.state.fl.us/servlet/nexus/preview/DOH%20Internet::latest:143136:/WebSite/Disease\\_ctrl/epi/surv/CaseReportForms/rubella\\_congenital\\_71.17.pdf](http://serena.doh.ad.state.fl.us/servlet/nexus/preview/DOH%20Internet::latest:143136:/WebSite/Disease_ctrl/epi/surv/CaseReportForms/rubella_congenital_71.17.pdf)

## 2. THE DISEASE AND ITS EPIDEMIOLOGY

### A. Etiologic agent

Rubella virus is an enveloped, positive-stranded RNA virus classified as a Rubivirus in the Togaviridae family.

### B. Description of illness

#### 1. Acquired rubella in children and adults

Up to 50% of persons with acquired rubella (historically known as German measles) have asymptomatic infections. Those with symptoms usually experience a mild febrile rash illness. Young children usually have little or no prodrome, while adolescents and adults often report 1–5 days of low grade fever, malaise, and anorexia. Mild coryza and conjunctivitis may also occur. Lymphadenopathy (usually suboccipital, postauricular, and posterior cervical) is a major clinical manifestation and may last several weeks. Fever rarely persists beyond the first day of rash.

The maculopapular rash appears first on the face and spreads down the body. Lesions are pink and rarely coalesce. The rash of acquired rubella typically lasts three days, spreading and fading more quickly than the rash caused by measles. Arthralgia and arthritis occur frequently in adults. Up to 70% of adult females with infections experience rubella joint symptoms which appear about the same time as the rash and may persist for up to one month. Fingers, wrists and knees are most commonly affected.

Complications are rare, occurring more often in adults. They can include encephalitis, neuritis, orchitis and thrombocytopenia. Hemorrhagic manifestations can occur and are usually secondary to low platelets and vascular damage. Thrombocytopenic purpura is the most common of these, and this manifestation is seen more often in children than adults.

#### 2. Congenital Rubella Syndrome (CRS)

The importance of rubella derives not from acute disease, which is usually quite mild, but from the potentially devastating effects on the fetus that can occur when a woman who is pregnant is infected with rubella. Therefore, the main objective of rubella vaccination programs is to prevent congenital rubella. CRS is a constellation of problems that includes low birth weight, eye defects (cataracts, microphthalmia, glaucoma, retinopathy), sensorineural deafness, cardiac defects (patent ductus

arteriosus, peripheral pulmonary artery stenosis), central nervous system defects (microencephaly, mental retardation), hepatitis, thrombocytopenic purpura, splenomegaly, and bone lesions. Deafness is the most common manifestation of CRS, and is sometimes the only manifestation. In mild forms of CRS, there may be no obvious clinical manifestations at birth, and the onset of CRS-related symptoms can be delayed until two to four years.

The severity of effects on the fetus depends on the period of gestation at which the infection occurs. A fetus infected early in pregnancy (especially during the first trimester) has a high probability of developing CRS. In symptomatic women infected with rubella during the first 12 weeks (first trimester) of pregnancy, CRS-associated congenital defects occur in up to 85% of infants. The likelihood of congenital defects decreases if the woman's rubella infection occurs later in the gestational period, dropping to 25% when the woman has a rubella infection late in the second trimester.

### **C. Reservoir**

Infected humans are the only reservoir.

### **D. Modes of transmission**

Acquired rubella is transmitted person-to-person by direct or droplet contact with infectious nasopharyngeal secretions. Rubella virus can be transmitted vertically from mother to fetus during pregnancy and cause the spectrum of congenital anomalies that define CRS.

### **E. Incubation period**

The incubation period for acquired rubella ranges from 12–23 days (typically 14–18 days).

### **F. Period of communicability**

1. Virus is typically secreted in nasopharyngeal secretions of persons with acquired rubella from about seven days before until seven days after rash onset. Patients are most contagious when the rash is erupting. Persons who are asymptomatic are communicable but the period of communicability is difficult to define.
2. Infants with CRS can shed the virus in the nasopharyngeal secretions and urine for up to a year or longer. Rubella virus has been recovered from the lens of children with CRS who have congenital cataracts for several years.

### **G. Treatment**

There is no specific treatment.

### **H. Prophylaxis**

Immune Globulin (IG) does not prevent rubella infection after exposure and is not recommended for that purpose.

## I. Rubella in Florida

Since 2000, Florida has had 16 cases of rubella and one case of congenital rubella. The rubella cases included 13 confirmed, two suspect and one probable case that occurred from 2000-2008. Five confirmed cases in 2002 were outbreak associated exposure due to travel outside the U.S. Another confirmed case in 2006 was also outbreak associated exposure from a foreign cruise ship employee that resulted in the administration of 1152 MMR doses on board the ship to prevent further spread. The remaining nine cases were acquired in the U.S. and were sporadic. The only confirmed congenital rubella case during this time occurred in 2000.

## 3. CASE DEFINITIONS

### A. Acquired Rubella

#### 1. Clinical case definition

An illness that has all the following characteristics:

- Acute onset of generalized maculopapular rash
- Temperature greater than 99.0° F (greater than 37.2° C), if measured
- Arthralgia/arthritis, lymphadenopathy, or conjunctivitis

#### 2. Laboratory criteria for diagnosis

- Isolation of rubella virus from a clinical specimen,  
OR
- Detection of rubella virus-specific nucleic acid by polymerase chain reaction,  
OR
- Significant rise in serum rubella immunoglobulin G antibody level between acute- and convalescent-phase specimens, by any standard serologic assay,  
OR
- Positive serologic test for rubella immunoglobulin M (IgM) antibody.

#### 3. Case classification

Confirmed: a case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case.

Probable: a case that meets the clinical case definition, has no or noncontributory serologic or virologic testing, and is not epidemiologically linked to a laboratory-confirmed case.

Suspect: any generalized rash illness of acute onset.

#### 4. Comment

Case Classification for Import Status:

#### **Epidemiologic Classification of Internationally-Imported and U.S.-Acquired**

Internationally-imported case: An internationally imported case is defined as a case in which rubella results from exposure to rubella virus outside the United States as evidenced by at least some of the exposure period (12–23 days before rash onset)

occurring outside the United States, onset of rash within 23 days of entering the United States, and no known exposure to rubella in the U.S. during that time. All other cases are considered U.S.-acquired cases.

**U.S.-acquired case:** A U.S.-acquired case is defined as a case in which the patient had not been outside the United States during the 23 days before rash onset or was known to have been exposed to rubella within the United States.

U.S.-acquired cases are subclassified into four mutually exclusive groups:

**Import-linked case:** Any case in a chain of transmission that is epidemiologically-linked to an internationally imported case.

**Imported-virus case:** A case for which an epidemiologic link to an internationally imported case was not identified but for which viral genetic evidence indicates an imported rubella genotype, i.e., a genotype that is not occurring within the United States in a pattern indicative of endemic transmission. An endemic genotype is the genotype of any rubella virus that occurs in an endemic chain of transmission (i.e., lasting  $\geq 12$  months). Any genotype that is found repeatedly in 2011 U.S.-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.

**Endemic case:** A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of rubella virus transmission continuous for 12 months or longer within the United States.

**Unknown source case:** A case for which an epidemiological or virological link to importation or to endemic transmission within the U.S. cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to assure that they do not represent a sustained U.S.-acquired chain of transmission or an endemic chain of transmission within the U.S.

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.

**Specimens from all cases must be submitted to the Bureau of Public Health Laboratories for confirmation.**

*Questions about rubella case definition or follow-up, contact the Department of Health, Bureau of Communicable Diseases, Immunization Program at (850) 245-4342.*

## **B. Rubella, Congenital Syndrome**

### **1. Clinical description**

An illness usually manifesting in infancy resulting from rubella infection in utero and characterized by signs or symptoms from the following categories:

- Cataracts/congenital glaucoma, congenital heart disease (most commonly patent ductus arteriosus, or peripheral pulmonary artery stenosis), loss of hearing, pigmentary retinopathy.

- Purpura, splenomegaly, jaundice, microcephaly, mental retardation, meningoencephalitis, radiolucent bone disease.

## 2. Clinical case definition

Presence of any defect(s) or laboratory data consistent with congenital rubella infection.

## 3. Laboratory criteria for diagnosis

- Isolation of rubella virus,  
OR
- Demonstration of rubella-specific IgM antibody,  
OR
- Infant rubella antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody (i.e., rubella titer that does not drop at the expected rate of a twofold dilution per month).  
OR
- PCR positive for rubella virus.

## 4. Case classification

Confirmed: a clinically compatible case that is laboratory confirmed

Probable: a case that is not laboratory confirmed and that has any two complications listed in paragraph a) of the clinical description or one complication from paragraph a) and one from paragraph b), and lacks evidence of any other etiology

Suspect: a case with some compatible clinical findings but not does not meet the criteria for a probable case

## 5. Comment

### Case classification for import status:

Epidemiologic classification of Internationally-Imported and U.S.-Acquired Congenital Rubella Syndrome cases will be classified epidemiologically as internationally imported or U.S.-acquired, according to the source of infection in the mother, using the definitions below, which parallel the classifications for rubella cases.

Internationally-imported case: To be classified as an internationally imported CRS case, the mother must have acquired rubella infection outside the U.S. or in the absence of documented rubella infection, the mother was outside the United States during the period when she may have had exposure to rubella that affected her pregnancy (from 21 days before conception and through the first 24 weeks of pregnancy).

U.S.-acquired case: A U.S.-acquired case is one in which the mother acquired rubella from an exposure in the United States. U.S.-acquired cases are sub-classified into four mutually exclusive groups:

**Import-linked case**: Any case in a chain of transmission that is epidemiologically linked to an internationally imported case.

**Import-virus case**: A case for which an epidemiologic link to an internationally

imported case was not identified but for which viral genetic evidence indicates an imported rubella genotype, i.e., a genotype that is not occurring within the United States in a pattern indicative of endemic transmission. An endemic genotype is the genotype of any rubella virus that occurs in an endemic chain of transmission (i.e., lasting 12 months or longer). Any genotype that is found repeatedly in U.S.-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.

**Endemic case:** A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of rubella virus transmission continuous for 12 months or longer within the United States.

**Unknown source case:** a case for which an epidemiological or virological link to importation or to endemic transmission within the U.S. cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to assure that they do not represent a sustained U.S.-acquired chain of transmission or an endemic chain of transmission within the U.S.

**Note:** Internationally imported, import-linked, and imported-virus cases are considered collectively to be import-associated cases.

- 1) A case that demonstrates laboratory evidence of infection, but without any clinical symptoms or signs is not reportable.
- 2) In probable cases, either or both of the eye-related findings (i.e., cataracts and congenital glaucoma) are interpreted as a single complication. In cases classified as infection only, if any compatible signs or symptoms (e.g., hearing loss) are identified later, the case is reclassified as confirmed.

## 4. LABORATORY TESTING

### A. Laboratory diagnosis

Diagnostic tests used to confirm either acquired or congenital rubella include serology, viral cultures, and polymerase chain reaction (PCR). Since many rash illnesses may mimic acquired rubella, laboratory testing is the only way to confirm the diagnosis. Detection of rubella-specific immunoglobulin M (IgM) antibody can confirm the diagnosis of both acquired and congenital rubella. However, these tests need to be interpreted with caution since false positive and false negative results can occur. Serum should be collected as early as possible after the onset of illness, usually at the first clinical encounter. However, IgM antibodies may not be detectable before day five, after rash onset, or during the first month of life for babies with possible CRS. If a negative result is obtained from a specimen drawn less than five days after rash onset for acquired rubella or at less than one month of age for a neonate suspected to have CRS, another specimen will be required.

Demonstration of a significant rise in rubella antibody titer in acute and convalescent specimens collected as early in the illness as possible (within 7–10 days after onset of rash) and 7–21 days later also confirms the diagnosis of acquired rubella. Congenital rubella can be diagnosed by rubella-specific immunoglobulin G (IgG) antibody levels that persist at a high level and for a longer period than expected from passive transfer of maternal antibody. Consult with a Bureau of Epidemiology Investigations Section epidemiologist for assistance.

Isolation of rubella virus from nasal, blood, throat, urine and cerebral spinal fluid is

diagnostic for rubella infection, but is performed by very few laboratories.

#### **B. Services available at the BPHL**

BPHL performs an enzyme-linked immunosorbent assay (ELISA) for rubella-specific IgM and IgG antibodies. Viral cultures and PCR for rubella virus are not performed at BPHL, but specimens can be forwarded to CDC for testing. In addition, BPHL can forward serum to CDC for avidity testing (to distinguish between recent and past rubella infection) when appropriate. Please consult with the DCBE prior to submitting samples for testing.

#### **C. Testing requests**

Serologic tests: Please see [Section 4A](#) for information regarding the timing of serum collection for serologic tests.

Viral isolation: Specimens for viral isolation should be collected as soon as possible after rash onset, ideally within four days of rash onset. (However, rubella virus may be isolated from one week before rash onset to two weeks after rash onset.) A throat swab is the best specimen to collect for viral isolation. For additional information regarding collection, storage and shipping of specimens for viral isolation, see:

<http://www.cdc.gov/rubella/lab/lab-specimens.htm>

All specimens sent to BPHL must be accompanied by a completed BPHL clinical laboratory submission form found at:

[http://www.doh.state.fl.us/lab/PDF\\_Files/DOH\\_Form\\_DH1847\\_1009\\_v12152010.pdf](http://www.doh.state.fl.us/lab/PDF_Files/DOH_Form_DH1847_1009_v12152010.pdf)

Along with the patient and submitter names, be sure to include the date of collection, date of rash onset, and immunization history (if known) on the form.

## **5. CASE INVESTIGATION**

The goal of a rubella case investigation is to prevent transmission of rubella virus and avoid exposure of susceptible pregnant women, thereby preventing cases of congenital rubella syndrome (CRS).

#### **A. Evaluate the diagnosis**

1. Review the clinical presentation, physical exam findings, risks for exposure (e.g., travel) during the likely exposure period (12–23 days prior to the onset of rash), and immunization status of the patient to determine the likelihood of the diagnosis. Sources of immunization data might include medical records (including records of prenatal rubella screening for women who have been pregnant), immunization cards kept by parents, school/childcare certificate of immunization (CIS) forms, and Florida SHOTS.
2. Collect serum and specimens for viral isolation. Laboratory confirmation is critical for rubella since the clinical diagnosis alone is unreliable.

#### **B. Identify potential sources of infection**

Evaluate the activities of the case during the likely exposure period (12–23 days prior to the onset of rash). Identify situations where the case might have been at increased risk of

exposure to rubella. Collect the following information:

1. Contact information for any household member, playmate, or other contact who had a rash illness during the likely exposure period.
2. Any travel outside of the U.S. or to an area of the U.S. where rubella has recently occurred.
3. Any contact with visitors from outside the U.S. or an area of the U.S. where rubella has recently occurred.
4. Any visit to a doctor's office, clinic, or hospital (find out exact time[s], date[s], name of the clinic[s], duration of visit[s], and areas of the facility visited).
5. Any indoor group activities attended (e.g., church, theaters, tourist locations, public or commercial travel, parties, athletic events, family gatherings) and contact information of the person who organized the group or event.
6. Any work or volunteer activities in a healthcare setting, or attendance or work at a school, child care, college, prison, refugee center, etc.

**Note:** Since many persons with acquired rubella (20–50%) are asymptomatic, identifying the source patient is not always possible.

### C. Identify exposed contacts and potential sites of transmission

1. Identify persons who have been in contact with the patient during the period from seven days before to seven days after onset of rash. These should include household members, school or childcare classmates, playmates, and home visitors.
2. Determine public gatherings attended where identification of the individuals present may not be possible.
3. Identify (among close contacts of the case) women who are pregnant or who are sexually active and could possibly be pregnant. Determine their pregnancy status (if not known).
4. Determine the rubella immunity status of exposed contacts. Persons are considered immune\* to rubella if they:
  - a. were born before January 1, 1957 (unless there is reason to believe the woman may be or could become pregnant). Healthcare workers born before January 1, 1957 should receive a dose of measles, mumps and rubella (MMR) vaccine if there is no laboratory evidence of immunity.
  - b. have laboratory evidence of immunity to rubella.
  - c. have written documentation of vaccination with at least one dose of rubella-containing vaccine (usually in the form of MMR vaccine administered on or after the first birthday).

\* *MMWR* 2001;50[No. RR-12]:1–23

- Alert all healthcare facilities visited by the patient during the contagious period and make recommendations regarding management of susceptible contacts ([see Section 6](#)).
- On rare occasions, a press release may be indicated to inform persons who may have had close contact with the patient but who cannot be identified. The press release should include information about the symptoms of acquired rubella and instructions for what possibly exposed susceptible persons are being asked to do.

#### D. Enhance surveillance for additional cases

Alert healthcare providers, hospital emergency rooms, and student infirmaries of the potential for additional patients; encourage healthcare providers to consider acquired rubella in any person(s) presenting with a rash illness, take appropriate infection control precautions, and report suspected cases to DCBE. See [Appendix A](#) for a sample health alert.

Since up to 50% of acquired rubella infections may be asymptomatic, all susceptible pregnant women exposed to rubella virus must be tested for rubella infection regardless of whether or not a rash develops ([see Section 6](#)). In addition, other susceptible persons directly exposed to respiratory secretions of a person with rubella infection can be tested for asymptomatic infection. Asymptomatic rubella infection can be diagnosed by a positive rubella-specific IgM antibody test or a significant rise in immunoglobulin G (IgG) antibody level between acute and convalescent phase tests.

#### E. Environmental evaluation

None

## 6. CONTROLLING FURTHER SPREAD

Control measures should be implemented as soon as a single case of acquired or congenital rubella is suspected, particularly if the setting is one where pregnant women might be exposed.

#### A. Infection control recommendations / case management

- Hospitalized patients confirmed or suspected to have acquired rubella should be placed on droplet precautions until seven days after the onset of the rash. Infants confirmed or suspected to have congenital rubella syndrome (CRS) should be cared for using contact precautions until one year of age or until two consecutive nasopharyngeal and urine cultures collected after the age of three months are negative.
- Persons suspected to have acquired rubella should be advised to do the following while contagious (from one week before, if applicable, and until seven days after the onset of the rash):
  - Stay home and not attend child-care, school, work, social activities or other public places.
  - Avoid all women who are, or may be, pregnant (especially those known to be potentially susceptible).
- Children suspected to have CRS should not attend childcare centers while they could be contagious. Children with CRS may be contagious until they are one year of age or

more, and rubella virus has been recovered from the lens of children with congenital cataracts for several years. This restriction may be removed by written certification by a medical doctor, public health nurse, or school nurse stating that the infection is no longer communicable only after appropriate testing has been completed (i.e., when two consecutive urine and nasopharyngeal cultures collected after three months of age have yielded negative results).

## B. Management of non-pregnant contacts

### 1. Education

- All contacts, regardless of immune status, should be educated about the symptoms of acquired rubella.
- All contacts, regardless of immune status, who develop a rash illness within 23 days of the date of last exposure should call their CHD and be evaluated for rubella infection. Symptomatic contacts should avoid pregnant women and public settings until testing for rubella has been done.
- All contacts regardless of immune status should be informed that rubella virus can be shed up to seven days prior to onset of symptoms and that up to 50% of persons with rubella infection may remain asymptomatic, but may nevertheless shed rubella virus. Therefore, contacts should be advised to minimize exposure of susceptible pregnant women until 23 days has passed since the date of last exposure to rubella, regardless of whether symptoms develop.

### 2. Vaccination and exclusion

There is no evidence that giving rubella vaccine after exposure has already occurred will prevent infection, but there is likewise no evidence that vaccinating an already infected person is harmful. Therefore, since a single exposure to rubella may not lead to infection and since immunization would provide protection in the event of future exposures, vaccination of susceptible persons is recommended, unless specifically contraindicated ([see Section 8](#)).

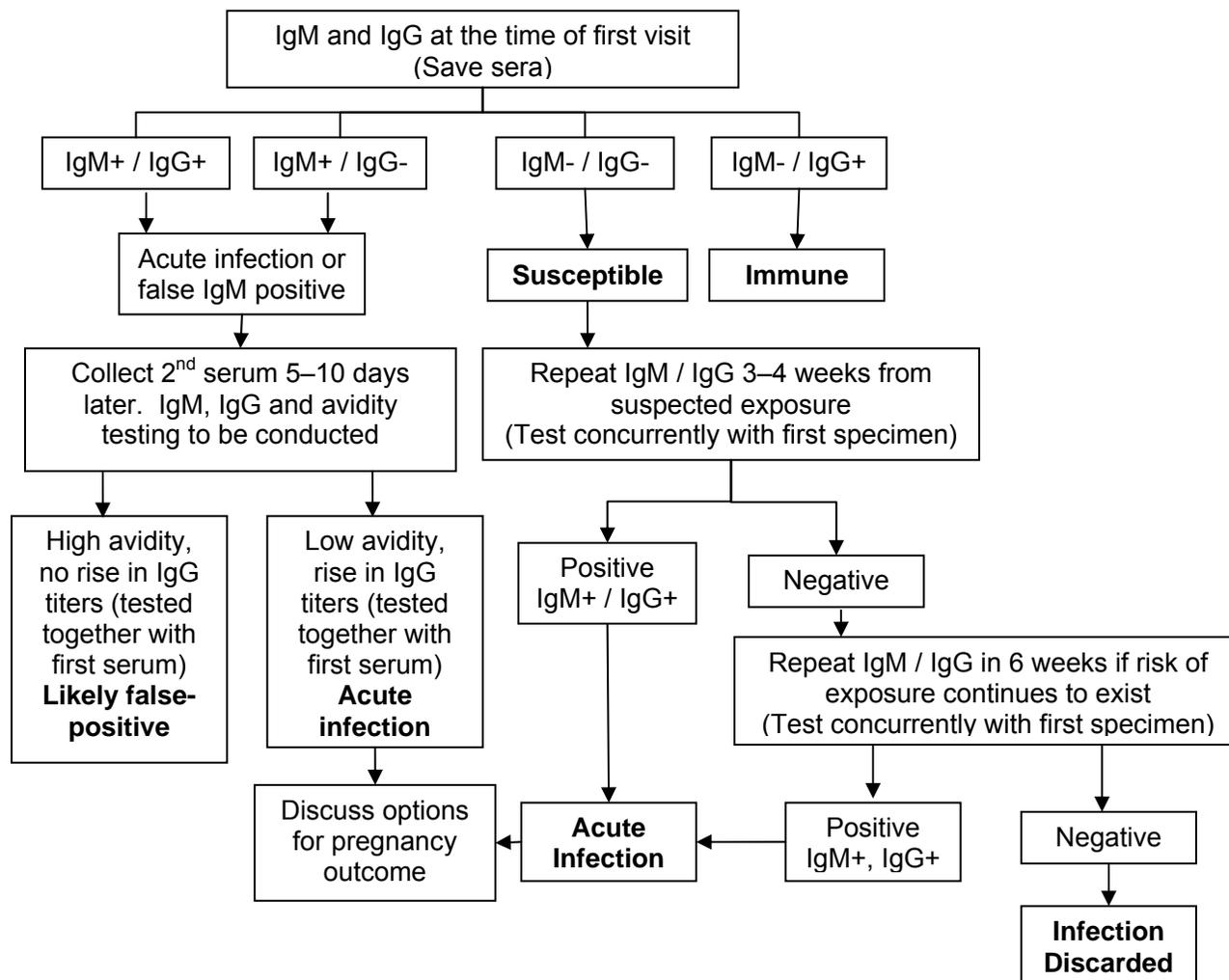
- Contacts with documented immunity to rubella do not need to be revaccinated or excluded from public settings.
- Contacts with unknown immune status (i.e., those born on or after January 1, 1957 who cannot provide laboratory evidence of immunity or a documented history of vaccination on or after their first birthday) should be vaccinated. If these persons work or spend time in a setting with pregnant women, serum should be drawn to determine rubella immune status before vaccination.
- Contact known to be susceptible (i.e., children under one year old, persons with documented negative rubella-specific immunoglobulin G (IgG) antibody, person who have been exempted from vaccination for medical, or religious reasons) should be vaccinated if no contraindications exist.
- Contacts who are vaccinated and then develop a rash illness within 23 days of the last exposure to rubella should be isolated and investigated as a suspect rubella case. Consult with DCBE to discuss diagnostic testing. Specimens for virus isolation may be necessary to determine whether the rash is due to vaccine or wild rubella virus.
- Susceptible contacts who chose to be vaccinated do not need to be excluded from public settings after vaccination but must avoid all settings where close contact with pregnant women might be possible until 23 days after the date of last exposure to

- rubella has passed.
- Susceptible contacts who chose not to (or cannot) be vaccinated should be excluded from all public settings until 23 days after the date of last exposure to rubella has passed.
  - Susceptible healthcare workers exposed to rubella should be excluded from work beginning seven days after the first exposure to rubella and continuing until 23 days after the date of last exposure, or seven days after rash appears to rubella has passed regardless of whether or not they were vaccinated after the exposure.

### C. Management of pregnant women exposed to rubella

1. Determine if the pregnant woman had a positive rubella-specific serologic test documented prior to her exposure (routinely done as part of prenatal screen). A pregnant woman with a positive serologic result prior to her exposure can discuss the need to rule out reinfection with her healthcare provider. (Reinfection with rubella occurs more frequently with vaccine-induced immunity than with natural disease; however, the risk of fetal infection is extremely rare.)
2. If the pregnant woman does not have a positive rubella-specific serologic test documented prior to her exposure, collect serum for IgM and IgG testing and follow Algorithm 1 ([Algorithm 1](#)) below for collection of follow-up specimens.
3. Consider administering immune globulin (IG) to a susceptible, pregnant woman if she is exposed to a person with confirmed rubella early in pregnancy and abortion is not an option. Though IG may reduce the likelihood of rubella symptoms in the woman, the absence of symptoms consistent with acquired rubella in a woman who has received IG does not necessarily mean that fetal infection has been prevented. Infants with CRS have been born to exposed women who received IG and remained asymptomatic. IgM antibody can be used to detect maternal infections, even after IG has been administered and testing for rubella infection should still be done.
4. Exclude pregnant women of unknown immune status from sites where the potential for transmission exists until testing is complete. Pregnant woman found to be susceptible to rubella should be excluded from potential sites of transmission until 46 days (two incubations periods) after the onset of rubella symptoms in the last patient for whom rubella cannot be ruled out (*MMWR* 2001;50[No.RR-12]:19).
5. If the pregnant woman develops a rubella infection, [see Section 7](#).

**Algorithm 1: Algorithm for serologic evaluation of pregnant women**



Source: Centers for Disease Control and Prevention. *Manual for the surveillance of vaccine-preventable diseases*. Centers for Disease Control and Prevention, Atlanta, GA, 2012. Available at: <http://www.cdc.gov/vaccines/pubs/surv-manual/chpt14-rubella.html>.

**D. Management of other exposed persons**

Persons potentially exposed to the same source as the case or present in the same high-risk setting during the likely exposure period should have their rubella immunity status assessed. They should be told to watch for symptoms of acquired rubella during the 12 to 23 days following their exposure regardless of immunization status.

For additional information regarding case and contact management, see:

Centers for Disease Control and Prevention. *Manual for the surveillance of vaccine-preventable diseases*. Centers for Disease Control and Prevention, Atlanta, GA, 2012. Available at: <http://www.cdc.gov/vaccines/pubs/surv-manual/index.html>.

Centers for Disease Control and Prevention. Control and prevention of rubella: evaluation and management of suspected outbreaks, rubella in pregnant women, and surveillance for congenital rubella syndrome. *MMWR* 2001;50(No.RR-12):1–23.

## 7. MANAGING SPECIAL SITUATIONS

### A. Infection of a pregnant woman

When rubella infection has been confirmed in a pregnant woman, she should be counseled regarding the risk of congenital rubella syndrome (CRS). The effects of rubella infection on the fetus depend on gestational age.

- In symptomatic women infected with rubella during the first 12 weeks (first trimester) of pregnancy, CRS-associated congenital defects occurs in up to 85% of infants.
- The likelihood of congenital defects decreases if the woman's rubella infection occurs later in the gestational period, dropping to 25% when the woman has a rubella infection late in the second trimester.

After initial assessment and counseling, and if the gestational age of the fetus is such that abortion remains an option, pregnant women with confirmed rubella infection should be offered the opportunity to receive additional counseling in order to decide whether to have an abortion.

### B. Outbreak control—healthcare, school or child care facilities

Measures implemented for the purpose of rubella outbreak control may interrupt disease transmission and will increase vaccination coverage among persons who might not otherwise be protected from the disease. Outbreak control strategies should include defining at-risk populations, ensuring prompt vaccination of susceptible persons or if a contraindication to vaccination exists, excluding them from settings where exposure could occur, and maintaining active surveillance. Control measures may need to be modified if additional cases are identified.

During an outbreak the following response measures should be considered:

- **Active Surveillance:** Search for all potential cases of rubella. Daily health surveys of staff, students, parents, etc., may be indicated.
- **Case Management:** Minimize exposure of susceptible contacts in health care facilities by placing all persons with suspected or confirmed rubella under droplet precautions. Evaluate patient flow patterns to minimize transmission. Restrict confirmed cases to home until seven days have passed since the date of rash onset. Travel should be postponed until the person is no longer contagious or, if absolutely necessary, conducted in such a way as to prevent or minimize transmission.
- **Vaccination and Exclusion of Susceptible Contacts:** In an outbreak setting, it is important to identify the at-risk population and immunize all non-pregnant susceptible individuals within that population as quickly as possible. Ideally, exposed susceptible contacts should be excluded until 23 days have elapsed since the last date of exposure. Unvaccinated persons who receive MMR vaccine as part of the outbreak control may be immediately readmitted to school provided all persons without documentation of immunity or who refuse vaccination have been excluded. Such individuals must be

excluded from any setting where their readmission creates a potential for exposure of a pregnant woman to rubella.

Pregnant women found to be susceptible to rubella should be excluded from potential sites of transmission until 46 days (two incubations periods) after the onset of symptoms of rubella in the last patient for whom rubella cannot be ruled out (*MMWR* 2001;50[No.RR-12]:19).

## 8. ROUTINE PREVENTION

### A. Immunization recommendations

Routine immunization with at least one dose of rubella-containing vaccine during childhood is recommended. At least 95% of susceptible persons develop rubella antibodies after a single dose of vaccine. However, rubella vaccination is given in the United States as part of the measles, mumps, rubella (MMR) vaccine, and two doses of the measles, mumps, and rubella antigens are now recommended for disease prevention and are required for school attendance. The first dose of MMR should be given at 12–15 months of age and the second dose should be administered when the child is 4–6 years of age. Persons born in 1957 or later should receive at least one dose of MMR if they do not have evidence of immunity to all three of these diseases.

Contraindications to MMR vaccine include:

- a history of a severe allergic reaction (i.e., hives, swelling of the mouth or throat, difficulty breathing, low blood pressure, shock) following a previous dose or vaccine components (e.g., neomycin, gelatin) (MMR can be given to egg-allergic persons);
- pregnancy (women should avoid getting pregnant for four weeks after vaccination with MMR);
- significant immunosuppression; and
- recent receipt of antibody-containing blood products.

An acute illness that is moderate to severe is a precaution, but not a contraindication, and vaccination can be considered during an outbreak.

For more information about MMR vaccine schedules, adverse reactions and contraindications, please see the most recent ACIP recommendations. These recommendations are available at: <http://www.cdc.gov/vaccines/pubs/ACIP-list.htm>.

### B. Prevention recommendations

Routine childhood immunization and vaccination of adults without documented immunity is the best way to prevent rubella.

## ACKNOWLEDGMENTS

This document is a revision of the *Washington State Guidelines for Notifiable Condition Reporting and Surveillance* published in 2002 which were originally based on the *Control of Communicable Diseases Manual (CCDM)*, 17<sup>th</sup> Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

**APPENDIX A: SAMPLE PROVIDER ALERT**

Health Advisory: Rubella in a 14 y.o. from [city]  
[date] May 7, 1998

Action requested:

- Increase your index of suspicion for rubella.
- Take measures to prevent exposure of pregnant women to rubella should a person with a rash illness present to your office. Ideally, a suspect rubella case should bypass other patient waiting areas.
- Report all suspected cases of rubella to [LHJ] by calling XXX-XXX-XXXX immediately. Do not send specimens to a commercial lab and wait for serologic confirmation in order to report.

Background: A confirmed case of rubella has occurred in a 14-year-old male who lives in Xxxxxxx and attends Xxxxxxx Middle School. The student had recently traveled to Costa Rica where he was likely exposed. He could have been contagious from 04/24/98 through 05/05/98. Rash onset was 05/01/98. School mates and their families have been notified by letter of possible exposure, and parents of unimmunized children at the school have been contacted by phone and asked to have their children vaccinated, or keep their children home from school and away from others during the incubation period.

Symptoms: Rubella is a mild viral illness consisting of low-grade fever, upper respiratory symptoms, lymphadenopathy (often post-auricular), body aches and maculopapular rash. The red rash usually begins on the face and spreads to the rest of the body. Unfortunately, up to 50% of rubella case can be asymptomatic.

Incubation period: 12–23 days. If susceptible persons were exposed to this individual in the community, we expected to see resultant cases become ill 05/06/98 through 05/28/98.

Diagnostic testing: Rubella can be confirmed by serologic tests. [LHJ] can assist you with collection of specimens and rapid testing at a public health laboratory.

Treatment: Largely supportive

**APPENDIX B: SAMPLE LETTER TO SCHOOL**

[date] May 7, 1998

Dear Parent, Guardian, or Staff Member:

We have just been notified of a case of rubella in your child's school. The student was present at school and would have been contagious on all school days from [date] 4/24/98 through [date] 05/03/98. Rubella is a contagious viral illness also known by the names of German measles and 3-day measles. Rubella is usually mild and characterized by swollen glands, low-grade fever, and a rash that lasts from 1 to 3 days. It is possible to have the infection but not have any symptoms at all. The time between being exposed and developing symptoms is 12 to 23 days (typically 14 to 18 days).

We urge you to check your child's (or your own, if a staff member) immunity against rubella. Immunization with rubella vaccine (MMR) or having had the disease provides immunity. All children attending grades should have documentation of two MMRs. If your child has had two MMR immunizations, you do not need to do anything at this time. If your child has had only one MMR immunization, he or she should receive a second MMR immediately. This immunization can be obtained through your physician or any health department clinic.

**THIS INFORMATION IS ESPECIALLY IMPORTANT FOR FEMALES WHO MAY BE PREGNANT.** Pregnant women who have not been immunized against rubella nor had the disease should consult a physician for advice. Rubella is of particular concern for pregnant women exposed during their first 12 weeks of pregnancy since this disease can damage the developing fetus in the mother's womb. This damage can only occur when the pregnant woman has neither been immunized nor had the disease previously.

In an effort to avoid spread of rubella in the community, we have asked the school to review immunization records. Any child with no documented MMR should not attend school between [date] 05/06/98 and [date] 05/28/98. If another case of rubella occurs, this time may be extended. If your child has no school record of immunization (MMR) an effort is being made to contact you by telephone today. If you signed an exemption but you know that your child was immunized, your child may return to school if you provide a copy of a medical record showing proof of MMR prior to [date] 04/24/98 or a copy of a blood test showing immunity to rubella.

If your child (or you, if a staff member) develops a rash illness between [date] 5/06/98 and [date] 5/28/98, please consult a physician. Let the clinic know by phone before going to the waiting room that your child may have rubella. Also please notify the health department at XXX-XXXX if your child develops a rash during this time. Your child should stay at home for 7 days after the rash begins to avoid exposing other people.

If you have further questions about this disease or your possible exposure, please call the health department at (XXX) XXX-XXXX.

Sincerely,  
Ruby Ola, MD  
Epidemiologist