Rubella

CLINICAL CASE DEFINITION

An illness that has all of the following characteristics:

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

Note: Rubella is often a mild illness and many cases may be inapparent or subclinical.

CASE CLASSIFICATION

- **Suspected:** Any generalized rash illness of acute onset.

- **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.

- **Confirmed:** A case that is laboratory-confirmed (i.e., rubella virus isolated; rubella IgM antibody positive; rubella RNA detected by PCR; or significant rise in rubella IgG antibody; see LAB CONFIRMATION, below) OR a case that meets the clinical case definition and is epidemiologically-linked to a laboratory-confirmed case.

Comment: Serum rubella IgM test results that are false-positive 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.

TRANSMISSION

Person-to-person via airborne transmission or droplets shed from the respiratory secretions of infected persons.

INCUBATION PERIOD

14-17 days, range 12-23 days. See Rubella Timeline, below.

PERIOD OF COMMUNICABILITY

Most contagious when the rash first appears, but virus may be shed from 7 days before to 5–7 days or more after rash onset; maximum infectiousness occurs during eruption of the rash.

REPORTING AND INVESTIGATION

- Health care providers should **immediately** report cases/suspect cases of rubella to local health department serving the residence of the case.

- Local health department responsibilities:

  - Contact case/guardian and health care provider;

  - Determine if case meets clinical case definition;

  - If definition met (probable or confirmed cases), investigate using report form/surveillance worksheet and control guidelines below;

- Rubella is an important public health concern and priority; if clinical presentation suggests a likely rubella case(s), notify MDCH Immunization Division by phone 517/335-8159;

- Report/ensure reporting of case to the Michigan Disease Surveillance System (MDSS). CDC Rubella Surveillance Worksheet may be helpful in field investigation to collect and record data. Obtain immunization history information from provider record or MI Care Improvement Registry (MCIR - state immunization registry);

- Update the MDSS record in a timely manner with new or additional info as it becomes available. Finalize MDSS record when case investigation is complete;

- In the event of death, obtain and send copies of hospital discharge summary, death certificate, and autopsy report to MDCH VPD Surveillance Coordinator.

LABORATORY CONFIRMATION

Laboratory confirmation is essential and should be attempted for all potential cases meeting the clinical case definition. Collect serum and viral specimen (throat swab, urine, etc). Laboratory confirmation for rubella is defined as one of the following:

- Positive serologic test for rubella-specific IgM antibody**.**

  Note: IgM antibodies may not be detectable before day 5 after rash onset. Rubella IgM tests that are negative and were collected less than 5 days after the rash onset should be repeated using sera collected 5 or more days after rash onset.

- Significant rise in rubella IgG antibody by any standard serologic assay.

  - Collection of sera for these paired assays should be appropriately spaced; ten or more days should separate the collection of the acute and convalescent sera.
  - Sera should be tested **in parallel** (i.e., run together in the same test/assay batch).

- Detection of rubella-virus specific nucleic acid by polymerase chain reaction; or

- Isolation of rubella virus from an appropriate clinical specimen (nasopharyngeal aspirate, throat swab, urine, heparinized blood). Best results come from throat swabs.

See additional information under LABORATORY SPECIMENS: PROCEDURES AND CONSIDERATIONS below.

Rubella testing is available free of charge through the MDCH Laboratory; use of this service is strongly encouraged. Arrangements must be made through the MDCH VPD Surveillance Coordinator 517-335-8159.

IMMUNITY/SUSCEPTIBILITY

Note: A history of clinical diagnosis of rubella alone, without laboratory confirmation, is unreliable and should not be considered in assessing immune status.

Individuals should be considered immune (protected against) rubella only if they meet one or more of the following conditions:

- Serologic evidence of immunity to rubella (positive serologic test for rubella IgG antibody)

- Documentation of receipt of at least 1 dose of rubella-containing vaccine;

- **Note:** Although only 1 dose of rubella-containing vaccine is the requirement for acceptable evidence of immunity to rubella, children should receive two doses of MMR/MMRV vaccine according to the routine childhood vaccination schedule.

- Born before 1957 (except women of childbearing age and healthcare workers);
  - **Note:** Birth before 1957 is **not** acceptable evidence of rubella immunity for women who might become pregnant or for healthcare workers; in these circumstances, proof of immunity in the form of a positive serologic test for rubella (IgG) antibody or documentation of receipt of rubella vaccination is required.

CONTROL MEASURES

- Investigate reports of possible rubella **immediately**.

- If clinical case definition is met, regard as true rubella case; implement control actions unless rubella is ruled out by laboratory testing or other information.

- Cases should be excluded and isolated from group activity settings (e.g. schools, day-care centers, work place, camps, etc.) immediately and through the 7th day after the onset of rash to limit further exposures. In health care settings, use of Droplet Precautions is recommended.

- Identify exposed contacts
  - Rubella cases are contagious starting 7 days before rash onset through the 7th day after rash onset; exposures of concern include household contact and same-room contact.

- Assess susceptibility of contacts (see IMMUNITY/SUSCEPTIBILITY above).

- Persons >1 year and < 4 years of age should have a history of at least 1 dose of MMR vaccine.

  Note: In Michigan, school entry immunization laws require persons over 4 years of age to have a history of 2 doses of MMR vaccine.

- Exclusion of susceptible, exposed contacts: Exposed persons attending group-activity settings (e.g. schools, day-care centers, work place, camps) who cannot readily provide documentation of rubella immunity (including those with medical, religious and philosophical exemptions) should be vaccinated or excluded from the setting. Exclusion should continue until 21 days after the onset of rash *of the final case of rubella in the group activity setting*. In general, persons who are vaccinated (for the first time or receiving a required second dose) may be re-admitted immediately to the activity setting; however, such a re-admittance policy may be modified depending upon the circumstances involved.

- Provide information about rubella to persons at risk and/or the general public. A Question-&-Answer rubella information sheet in **.PDF** format is available from the Immunization Action Coalition (http://www.immunize.org/catg.d/p4218.pdf)

LABORATORY SPECIMENS: PROCEDURES AND CONSIDERATIONS

Laboratory support for rubella investigations fulfills two important and distinct objectives:

- Laboratory confirmation of cases, generally by serologic methods, and
- Molecular epidemiologic characterization of circulating rubella virus strains which involve viral culture methods and/or viral nucleic acid sequencing techniques.

To obtain MDCH serology and virology specimen collection and container kits, call MDCH Laboratory Support Unit at 517-335-9867.

RUBELLA SEROLOGY

Purpose: To confirm a case of rubella.

Specimen needed: Serum, 2 ml.

MDCH lab kit: Unit 8

Specimen container: Plastic serum tube with skirted cap

MDCH test requisition form: DCH-0583

Preferred test: Rubella-specific IgM antibody (various methodologies are available commercially). This test is available at MDCH Laboratory.

Alternate tests: Paired IgG (demonstration of significant rise in rubella IgG antibody between acute and convalescent specimens).

Specimen collection/submission procedure:

- Collect at least 5 ml of whole blood in red-top or other tube without anticoagulant. Separate serum from blood by centrifugation and pour into PLASTIC serum tube, store at 2º - 8ºC, or freeze serum if it cannot be shipped and received in MDCH Laboratory within 3 days. **Do not freeze whole blood.**
- Timing:
    - **For IgM testing**: Collect serum at clinical presentation or as soon as possible after. **Note:** IgM antibodies may not be detectable before day 5 after rash onset. Rubella IgM tests that are negative and were collected less than 5 days after the rash onset should be repeated using sera collected 5 or more days after rash onset.
    - **For paired IgG testing**:
        - Acute-phase specimen: Collect as soon after rash onset as possible.
        - Convalescent-phase specimen: Collect 10-30 days (no earlier than 10 days) after acute-phase specimen.

      Test will be done when both specimens are received (specimens can be sent individually or acute can be held at 2- 8 C and sent to laboratory with convalescent specimen). If the specimens are sent to MDCH Laboratory separately, be sure to indicate on the test requisition form that this is an

acute serum and that the convalescent specimen will follow in approximately 10 -14 days.

- Label specimen(s) with patient's name, date of birth, and date of specimen collection.
- Complete *MDCH Microbiology/Virology Test Requisition*, form DCH-0583; complete all information in the Patient Information and Specimen Information sections. **Request rubella IgM and measles IgM in the other section of the Test Requested area.**

  NOTE: Testing for measles is encouraged for all suspected rubella cases (likewise, testing for rubella is encouraged for all suspected measles cases).

- Be sure MDCH Immunization Division has been notified of the case investigation.
- Ship specimens on a cold pack by overnight delivery if possible.

Mail specimens to:

Michigan Department of Health and Human Services
Bureau of Laboratories DASH Unit
3350 N. Martin Luther King Blvd.
Building 44, Room 155
Lansing MI 48909

RUBELLA VIROLOGY/MOLECULAR EPIDEMIOLOGY STUDIES

Purpose: Viral isolates are important for molecular epidemiologic surveillance, specifically to help determine:

- the geographic origin of the virus;
- the viral strains circulating in the U.S.; and
- whether these strains have become endemic in the U.S.

Isolation of rubella virus is not recommended as a routine method to diagnose and confirm rubella.

Note: Specimens for rubella virology should be routinely collected along with serum when investigating potential rubella cases. **Do <u>not</u> delay collection of viral specimens until serologic confirmation is obtained**, since the success of virus isolation is most likely with specimens collected within 7 days of rash onset. Do not collect viral specimens if more than 10 days has elapsed since rash onset.

Note: Viral isolates are sent to CDC for molecular analysis.

Specimens: Throat swabs, urine

MDCH lab kit: Unit 45

Specimen container(s): **For throat swabs:** Viral Transport Media test tube
For urine: 50 ml centrifuge tube or other sterile container

Specimen collection/submission procedure:

- Throat swabs:
  - Collect within 4 days of rash onset.

- Use sterile swabs to wipe the back of throat; try to collect epithelial cells.

- Place swab in a tube containing 2-3 ml of viral transport medium; submerge swab in transport medium and express the swab against the inside wall of the specimen container. Discard swab, or leave in tube but make sure tube cap is securely screwed on; swab shaft may need to be cut down in order to fit if swab is to be left in tube.

- Keep specimens at 4 C (refrigerated).

- Ship specimens on a cold pack by overnight delivery if possible.

If immediate, cold shipment (within 48 hours) cannot be arranged or is not convenient: Throat swab can be removed from the transport medium after allowing 1 hour for elution of virus. The specimen can then be frozen at -70C and shipped on dry ice.

- Urine specimens:
  - Collect within 4 days of rash onset.
  - Collect 50-100 ml of urine in a clean urine specimen container (50 ml centrifuge tubes work well).
  - First morning void is preferable. Collect urine clean catch mid-stream.
    - If centrifugation is available: Centrifuge at 500xg (approximately 1500 rpm) for 5 to 10 minutes to pellet the sediment. The supernatant should be discarded; re-suspend the sediment in 2-3 ml of viral transport medium or any cell culture medium. Ship frozen at -70°C on dry ice. If dry ice is not available, store at 4°C and ship on cold pack within 48 hours.
    - If centrifugation is not available, do not freeze the urine sample. The entire urine specimen should be stored at 4°C and shipped to the lab on cold pack.

- Label all specimen containers with patient's name, date of birth, and date of specimen collection.

- Complete a *MDCH Microbiology/Virology Test Requisition*, form DCH-0583 for each specimen. Complete all information in the Patient Information and Specimen Information sections. **Indicate rubella virus by culture/PCR in the other section of the Test Requested area.**

- Mail specimens to:

  Michigan Department of Health and Human Services
  Bureau of Laboratories DASH Unit
  3350 N. Martin Luther King Blvd.
  Building 44, Room 155
  Lansing MI 48909

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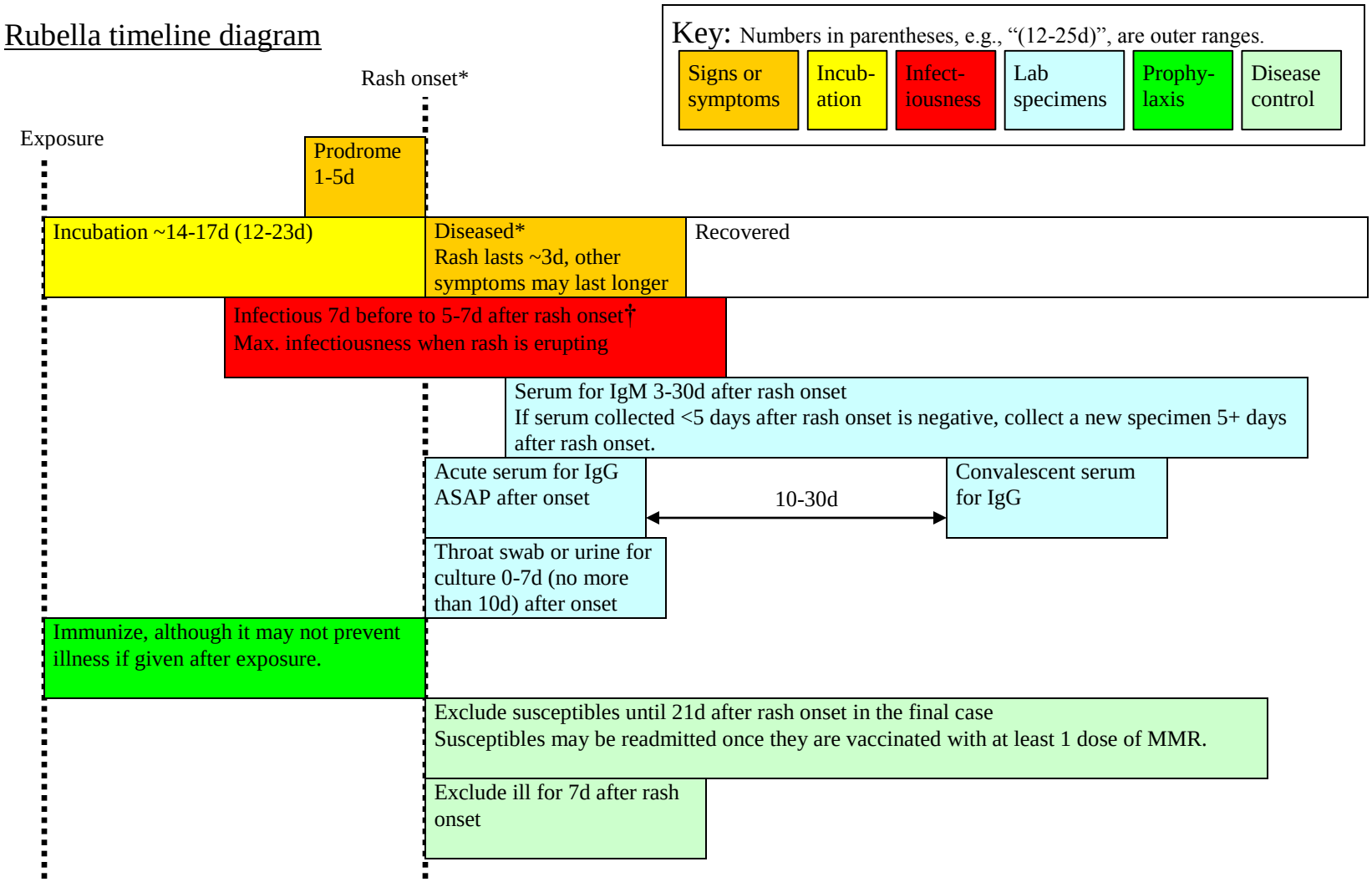
Rubella timeline diagram



* Up to 50% of rubella cases may be asymptomatic. Such cases can still transmit disease. All references to 'onset' above are to rash onset. If the case lacked a rash, use onset of other symptoms if possible (e.g., fever, lymphadenopathy, arthralgia in adult females).
† Some infants with congenital rubella may remain infectious for 1 year or more.

Sources: APHA Control of Communicable Diseases Manual, AAP Red Book, CDC Pink Book, CDC VPD surveillance manual