



Measles: General Information for Health Care Providers

Clinical Presentation

Measles typically presents in adults and children as an acute viral illness characterized by fever and generalized maculopapular rash. Signs and symptoms appear 7 to 21 days after initial exposure. The prodrome may include cough, coryza, and conjunctivitis. Koplik's spots (punctate blue-white spots on the buccal mucosa) are occasionally seen. The rash usually starts on the face, proceeds down the body and may include the palms and soles, appears discrete but may become confluent, and lasts several days. Symptoms may be mild, absent, or atypical in persons who had some degree of immunity to measles virus before infection (e.g., in previously vaccinated persons who had waning immunity or children aged <1 year who passively acquired maternal antibodies). Complications may include diarrhea, otitis media, pneumonia, hepatitis, encephalitis, and death.

Transmission

Measles is highly contagious. Approximately 90 percent of persons lacking immunity who are exposed to measles virus will develop the disease. The virus is transmitted by airborne particles or direct contact with the respiratory secretions of an infected person. It can live for up to 2 hours in an airspace where an infected person has coughed or sneezed. Individuals with measles are infectious from 4 days before rash onset through 4 days after rash onset (9 days total).

Measles Case Reporting and Laboratory Testing

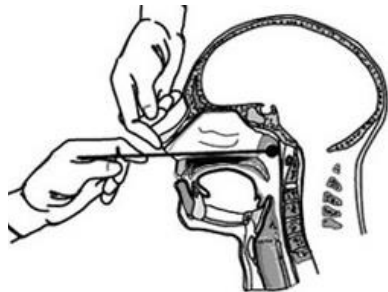
Persons suspected of having measles should be reported immediately to the New York City Department of Health and Mental Hygiene (DOHMH) at 866-692-3641. Reports should be made at time of initial clinical suspicion. Do not wait for laboratory confirmation to report. If you are considering the diagnosis of measles and are ordering diagnostic testing, then you should report the individual at that time.

Laboratory confirmation of disease is essential for all cases of measles. **For all cases of suspected measles, New York City health care providers should submit specimens for measles testing to DOHMH's Public Health Laboratory,** which reports test results more quickly than commercial laboratories (often within 24 hours). DOHMH will provide requisition forms and instructions on labeling of specimens, and will arrange pick-up and transport of specimens.

Collect the following two specimens when testing for measles:

- *Serum for serology (measles IgM and IgG)*
 - Collect blood in a serum separator tube (SST, red speckled, or gold-top blood collection tubes). If you have access to a centrifuge, spin down the blood. After collecting the blood, invert the tube gently, no more than 8 times. Then allow the blood to clot for 30 minutes to 1 hour before spinning. Spin down the specimen for at least 15 minutes (at 2200 to 2500 RPM) within 1 hour of collection. Transfer the serum to an empty sterile tube and relabel.

- Refrigerate after collection; transport the specimen to DOHMH with ice packs.
- Measles IgM results from blood specimens collected within the first 72 hours after rash onset may be falsely negative and may need to be repeated before excluding the diagnosis.
- The IgM remains positive for about 1 month after rash onset among unvaccinated individuals.
- *Nasopharyngeal or oropharyngeal swab for polymerase chain reaction (PCR) for measles ribonucleic acid (RNA)*
 - Collect a nasopharyngeal or oropharyngeal specimen, using a synthetic (non-cotton) swab (e.g., Dacron, Copan, or rayon).
 - To collect a nasopharyngeal swab, insert the swab into a nostril (the swab should reach a depth equal to the distance from nostril to outer ear opening; see illustration below). Leave the swab in place for several seconds, then slowly remove while rotating. Swab both nostrils with the same swab.
 - After collecting the specimen, place it in liquid viral transport media (the same collection kits used for influenza PCR). If the swab is not placed in liquid viral transport media it cannot be tested.
 - Refrigerate the specimen after collection, and transport to DOHMH with ice packs.



Treatment

There is no specific treatment for measles. Medical care is supportive. Vitamin A may be administered to children who are hospitalized for measles (see dosing for measles at www.redbook.solutions.aap.org).

Vaccination

Vaccination with a measles-containing vaccine (in the United States, measles-mumps-rubella [MMR] vaccine) is the most effective way to prevent measles. One dose of MMR vaccine is approximately 93 percent effective at preventing measles; 2 doses are approximately 97 percent effective.

MMR vaccine is routinely recommended for children at age 12 months with a second dose before school entry at age 4 to 6 years. A second dose can be administered as early as 28 days after a previous dose. MMR vaccination is contraindicated in immunocompromised persons, pregnant persons, and those with a history of severe allergic reaction to a previous dose of MMR or vaccine components. Egg allergy is not a contraindication to MMR vaccine. Individuals who are breastfeeding may receive MMR vaccine. Additional information on general vaccine recommendations from the Centers for Disease Control and Prevention may be found [here](#).

Evidence of Immunity

Individuals are presumed immune to measles if at least 1 of the following is present:

- Written documentation of receipt of 2 doses of measles-containing vaccine after 11 months of age
- A positive measles IgG titer
- Birth before 1957

Self-reported vaccination does not constitute evidence of immunity.

Health care personnel are required to have documented evidence of immunity to measles. Consider administering 2 doses of MMR to unvaccinated health care personnel born before 1957 who lack laboratory evidence of measles immunity.

Post-exposure Prophylaxis

To prevent measles or reduce its severity, provide the MMR vaccine to non-immune individuals aged 6 months or older within 72 hours of initial measles exposure, unless contraindications to MMR vaccination exist. MMR given to infants aged 6 to 11 months will not count as a valid dose in the routine MMR vaccination schedule; such infants will need to be revaccinated at age 12 months (at least 28 days after the most recent dose). Persons who received only 1 dose of measles-containing vaccine before exposure should receive a second dose as post-exposure prophylaxis, if at least 28 days have passed since the first dose.

Immune globulin (IG), not MMR vaccine, should be given as post-exposure prophylaxis to non-immune individuals who are exposed to measles and at high risk for complications of measles, including: infants aged <6 months; infants aged 6 to 11 months who did not receive MMR within 72 hours of initial exposure; pregnant persons; and severely immunocompromised persons. IG should be given as soon as possible and no later than 6 days after exposure.

Additional details on post-exposure prophylaxis are available [here](#).

Exposed persons who are not immune to measles and who do not receive post-exposure prophylaxis must stay home through 21 days after last exposure – the incubation period when they could become contagious before the onset of illness. Because IG prolongs the incubation period, people who receive IG must stay home through 28 days after last exposure. Persons placed on home quarantine for either reason should receive the respective ‘Patient Instruction sheets’ [here](#).

Infection Control at Outpatient Health Care Facilities

The following steps are recommended to prevent measles transmission in outpatient health care facilities.

- If patients or their guardians call to schedule appointments for non-urgent febrile rash illnesses:
 - Arrange for the patient to come at the end of the clinic work day after all patients have left, when possible;
 - Ask the patient or their guardian to call the clinic when they arrive outside, so clinic staff can meet them before they enter the facility;
 - Place a surgical mask on the patient;
 - Have the patient use an alternative entrance into the clinic that will minimize exposure to other patients;

- Bring the patient to a negative-pressure room – if available – otherwise, to a private room; and
- When the evaluation is complete, escort the masked patient outside, using the same less-traveled route as before.
- Screen arriving patients outside the facility, when possible.
- If a potential measles patient is evaluated in a room that is not at negative pressure, do not use that room for the next 2 hours.

More information on preventing measles transmission in health care facilities can be found [here](#).

Travel Recommendations

Ensure that adults and children aged 12 months and older who are traveling outside the U.S. have documented immunity to measles. Adults who think that they received their childhood vaccinations but who do not have documented immunity to measles should be vaccinated against measles at least 2 weeks before travel. Children aged 6 to 11 months of age who will be traveling internationally should also receive a dose of MMR vaccine at least 2 weeks before travel. This dose does not count towards completion of the routine schedule.

Resources

Additional resources can be found [here](#).

Images of Measles Rash (*Photos obtained from CDC Public Health Image Library*)

