

Measles (Rubeola)

1. What are the clinical characteristics of measles?

Prodrome: Characterized by mild to moderate fever, which gradually increases, often peaking as high as 103°F - 105°F. This is followed by the onset of cough, coryza (runny nose), and conjunctivitis. Koplik spots, a rash present on mucous membranes, are considered to be characteristic of measles. It occurs 1-2 days before the rash to 1-2 days after the rash and appears as blue-white spots in the mouth.

Rash Onset: Occurs 2-4 days after prodrome, 14 days after exposure. It starts as a maculopapular eruption and may become confluent. The rash typically begins at the hairline, moves to the face and spreads rapidly down the body and may persist for 5-6 days. It will fade in the order of appearance.

Be vigilant and prompt in reporting:

- Act immediately if you suspect measles. Suspect measles in patients with history of international travel or contact with international visitors in the last 3 weeks.
- Implement airborne infection control precautions immediately – mask and isolate the patient in a negative pressure room if one is available. Do not use the exam room that the suspect measles patient was in for at least an hour.
- Permit only staff immune to measles to be near the patient.
- Notify your local health department immediately.
- Expedite measles serologic testing (IgM and IgG) at a public health lab; use of commercial labs may delay diagnosis.

2. What vaccines are recommended to prevent measles?

2 doses of MMR vaccine are recommended for children.

- Children should receive the first dose of MMR vaccine at 12-15 months of age and the second dose at 4-6 years of age (or no earlier than 28 days after the first dose). Older children who have not been vaccinated should receive 2 doses of MMR at least 28 days apart. MMRV is also available for use in children 12 months – 12 years of age.
- Children who are 6-11 months of age should receive a MMR vaccine if traveling internationally. If a child received a dose of MMR at 6-11 months of age, they should receive MMR according to the regular schedule at 12-15 months and 4-6 years, for a total of three doses.

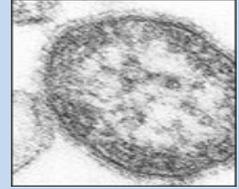
MMR vaccine is recommended for adults.

- All U.S. adults born during or after 1957 should also receive at least one dose of MMR vaccine unless they can show they have either received the vaccine or had a blood test that showed they were immune to measles.
- Healthcare workers should receive two doses of MMR vaccine.

3. What are possible complications from measles?

About three out of every ten people who get measles will develop one or more complications. Common complications can include ear infections or diarrhea. Severe complications include pneumonia and encephalitis. Complications are more common in children younger than 5 years and adults older than 20 years of age.

The Basics



The Agent

Morbillivirus, a paramyxovirus.

Transmission

Primarily person to person via large respiratory droplets. Airborne transmission has been documented in closed areas (e.g. exam rooms) after a person with measles occupied the room.

Incubation

From exposure to prodrome average is 10-12 days; from exposure to rash is 14 days (range 7-18 days).

Communicability

Highly communicable with >90% secondary attack rates among susceptible persons. May be transmitted from 4 days before to 4 days after rash onset.

Vaccination is the best way to prevent measles.

Timely reporting is the key to preventing the spread of measles.

4. What laboratory tests should be done to confirm a diagnosis of measles?

Serum: Efforts should be made to obtain a serum sample and throat swab (or nasopharyngeal swab) from suspected cases at first contact. There are two serologic tests available, IgM and IgG. If possible, both tests should be performed on the acute sample. Although IgM antibody is generally detectable from 2-3 days to 2-3 weeks after rash onset, the currently recommended IgM EIA is often positive at the time the patient first presents for medical evaluation. With some test kits that still might be in use, serum collected earlier than 3 days after rash onset can be falsely negative; in such instances when measles is suspected, the test should be repeated.

Nasopharyngeal or Throat Swab: Nasopharyngeal (NP) or throat swabs are the preferred samples for virus isolation or detection of measles RNA by RT-PCR. Synthetic swabs are recommended. Collect samples as soon after rash onset as possible. The sample should be collected at the first contact with a suspected case of measles when the serum sample is drawn.

Urine: Measles virus is present in the cells that have been sloughed off in the urinary tract. When feasible to do so, collection of both respiratory and urine samples can increase the likelihood of detecting virus.

Contact the Immunization Program (213-351-7800) or Public Health Lab (562-658-1310) if technical assistance is needed. A detailed protocol for collection of specimens for viral isolation is available on the [CDC](#) website.

5. What treatment is recommended for persons exposed to measles?

Immunize susceptible contacts to limit the spread of disease. Persons 6 months of age and older with one or no documented doses of MMR, should receive a dose of MMR within 72 hours of exposure (if the vaccine is not contraindicated). No harm has been noted if vaccine is given later in incubation period; however, vaccination at a time when it will not prevent measles, can complicate the diagnosis of measles if adverse events to the vaccination occur (i.e., rash, fever).

If MMR vaccine is contraindicated, [immune globulin \(IG\)](#) given in the first 3 days after exposure will usually prevent disease; given within 6 days of exposure, may prevent or modify disease. IG should be used as post-exposure prophylaxis to protect susceptible persons who are at risk for severe complications if they develop measles. It should **not** be used in an attempt to control measles outbreaks. Persons for whom the vaccine is contraindicated, or more than 72 hours have passed since exposure, and are still within 6 days of exposure, immune globulin (IG) is indicated. IG should not be administered with measles vaccine.



Report Cases Promptly to Prevent Spread

Under the California Code of Regulations, Title 17, Section 2500, all confirmed and suspected cases of measles should be reported to the local health department immediately by telephone.

Do not wait for lab confirmation to report.

For Riverside County residents, report to Disease Control by phone during normal business hours to 951-358-5107 or 951-782-2974 after-hours.

Indications	Measles IG Dose/Route	Interval before vaccine administration
Person without immunity	0.5 mL/kg (max dose 15 mL) IM	5 months
Infants <12 months of age	0.5 mL/kg (max dose 15 mL) IM	
Pregnant women without evidence of immunity	400 mg/kg IV (intravenously)	
Severely immunocompromised	400 mg/kg IV (intravenously)	8 months