# Measles (Rubeola)

## Why is Measles Important?
Measles is one of the most contagious of all infectious diseases; up to 9 out of 10 non-immune persons with close contact to a measles patient will develop measles. Measles virus can remain infectious in the air for up to two hours after an infected person leaves an area. There continue to be widespread global outbreaks of measles with importation to LA County. The best ways to prevent measles transmission are timely vaccinations and quick reporting to Public Health.

## Measles Overview

**Communicability**
- Infectious 4 days before to 4 days after rash onset (day 0).
- Secondary attack rate: >90% among non-immune persons.

**Postexposure Prophylaxis**
Administration of MMR or IG to exposed contacts depends upon time of exposure and contact’s age and risk status.

**Measles Symptoms**

**Prodome:**
- Mild to moderate fever and cough, coryza, and conjunctivitis (*the 3 “C’s”*)

**Rash and fever:**
Classic presentation
- Maculopapular rash - rash begins at the hairline, then face, upper neck, and behind ears. Then progresses downward and outward ending at hands and feet. Lesions are generally discrete, but may become confluent. Initially, lesions blanch with pressure. Fades in order of appearance
- Fever continues with spikes – can exceed 104°F

Classic presentation is seen in non-immune, immunocompetent persons and variably in vaccinated patients. If vaccinated or immunocompromised, fever and rash occur but can vary in presentation and timing. Consider atypical measles if patient vaccinated between 1963-1967. See CDC Pink Book Measles for information on presentations.

**Testing**
Laboratory confirmation is essential. If measles is suspected the following tests should be performed:
- PCR: Throat swab & urine sample
- IgM and IgG serology
See Lab Testing below

**Clinical Presentation**
Measles should be considered in patients of any age who have febrile rash.

**Complications**
Complications include otitis media, bronchopneumonia, dehydration, convulsions, laryngotracheobronchitis and diarrhea. Subacute sclerosing panencephalitis (SSPE), is a rare but fatal degenerative disease that develops 7-10 years after measles infection.

**Suspect Measles if any of the following exist:**
- Patient with fever (subjective or documented) AND rash (especially if started on face, hairline, neck, or behind ears)
- Positive measles IgM antibody result

**The following factors increase the probability of measles:**
- Lacking immunity: unvaccinated or unknown vaccination, immunocompromised, or IgG negative.
- Reporting an exposure risk-factor for measles. Have they had, in the past 4 weeks:
  - contact to a known measles case or with an ill international visitor
  - traveled internationally or through an international airport
  - visited an outbreak community or venues where a confirmed measles exposure occurred.

**Report Cases Promptly**
Under the California Code of Regulations, Title 17, Section 2500, medical providers are mandated to report all patients suspected of having measles to the local health department immediately by telephone.

**Do not wait for lab confirmation to report.**
8:30am – 5:00pm Monday-Friday: Call (213) 351-7800 and ask to speak to the Epidemiologist on duty
After business hours and on weekends: (213) 974-1234, Option 8 - Administrative Officer on Duty
Laboratory Testing

Timing of specimen collection in relation to clinical presentation is important to yield reliable results. Do not test asymptomatic patients.

<table>
<thead>
<tr>
<th>Test</th>
<th>Timing of specimen collection</th>
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<tbody>
<tr>
<td><strong>Serology IgM / IgG</strong></td>
<td>• Test for IgG to confirm immunity and test for IgM to diagnose acute infection. False negative IgM results can occur if serum is collected within 72 hours of rash onset but collection still recommended. • Collect 7-10ml in gold top serum separator tube</td>
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<tr>
<td><strong>Throat Swab for PCR</strong></td>
<td>• Obtain ideally within 3 days of rash onset, however still recommend collecting at time patient presents – can be held in your lab or at PHL. • Collect with sterile synthetic swab and place swab into liquid viral or universal transport medium</td>
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<tr>
<td><strong>Urine for PCR</strong></td>
<td>• Collect 10-50 ml midstream, clean-catch</td>
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For more details: https://www.cdc.gov/measles/lab-tools/
For local guidance on specimen collection, labeling and storage instructions, and laboratory forms: http://publichealth.lacounty.gov/ip/VPDspecimen_collection.htm

Treatment

There’s no specific antiviral agent available. Children who are hospitalized, should be treated with vitamin A. https://www.cdc.gov/measles/hcp/indic.html.

Prevention

Vaccination is the best way to prevent measles.

- Two doses of MMR are ~97% effective.
- Patients suspected to have measles should be isolated from non-immune persons.
- If MMR documentation is missing, a positive serum IgG indicates presumed immunity.
- Measles virus can remain infectious in the air for up to two hours after an infected person leaves an area.

Postexposure Prophylaxis (PEP)

MMR vaccine for PEP

MMR: Administered ≤ 3 days of first exposure. Giving MMR after 3 days may not protect against the current exposure.
- Anyone ≥ 6 months of age (for whom MMR is not contraindicated) who has not had 2 documented doses of MMR
- MMR should not be given for at least 6 months after the administration of IGIM or 8 months after IGIV

Immune globulin (IG) for PEP

IG: Administered ≤ 6 days of first exposure

- Only for persons known to be at risk of developing complications regardless of prior measles vaccination:
  - Infants <12 months of age: 0.5 mL/kg of body weight of intramuscular IG (IGIM); max dose of 15mL
  - Persons with high-level immunosuppression: 400 mg/kg of intravenous IG (IGIV)
  - Susceptible pregnant women (i.e., < 2 doses of MMR or no documented positive measles IgG test): 400 mg/kg of IGIV
- Only for susceptible persons <66 lbs (30 kg) with a priority to those with an intense measles exposure who cannot be vaccinated with MMR (i.e., non-immune health care workers, household contacts): IGIM 0.5 mL/kg of body weight, max dose of 15 mL

Contraindications:

- Do not give IG to persons with immunoglobulin A deficiency or history of anaphylactic reaction to IG
- Do not give IGIM to persons with severe thrombocytopenia or coagulation disorder that would contraindicate IM injections

IG recipient can have longer incubation period, so isolation might be extended to 28 days after initial exposure.

Questions

Call the Los Angeles County Department of Public Health Vaccine Preventable Disease Control Program at 8:30am – 5:00pm Monday-Friday: (213) 351-7800 and ask to speak to the Epidemiologist on duty.
After business hours, weekends, holidays: Call (213) 974-1234, Option 8 Administrative Officer on Duty
For more information visit http://publichealth.lacounty.gov/ip/VPD_measles.htm