



# California Department of Public Health – May 2011

## Measles Investigation Quicksheet



### Measles infectious period

From four days before rash onset through four days after rash onset (day of rash onset is day 0).

### Measles exposure

Sharing the same airspace with a person infectious with measles (during the 4 days prior through the 4 days after their rash onset), e.g., same classroom, home, clinic waiting room, airplane etc., or were in these areas up to 2 hours after the infectious person was present.

No minimum time period has been established for exposure, but it is presumed that longer exposures are more likely to result in measles transmission than brief, transient exposures.

When exposures have occurred in venues in which it is not possible to identify individuals, it is helpful to notify local health care providers so that they can be on the alert for possible cases. In addition, some local health jurisdictions have issued press releases to notify the public.

### Measles incubation period

Prodromal symptoms typically begin 8-12 days after exposure (day 0) and rash onset is typically 14 days (range 7-21 days) after exposure.

### Measles clinical case definition

- A generalized rash lasting  $\geq 3$  days; and
- a temperature  $\geq 101^\circ\text{F}$  ( $\geq 38.3^\circ\text{C}$ ); and
- cough, coryza, or conjunctivitis.

### Measles laboratory criteria for diagnosis

- Positive serologic test for serum\* measles IgM antibody; or
- significant rise in serum\* measles IgG antibody between acute and convalescent titers; or
- isolation of measles virus; or
- detection of viral RNA by reverse transcription polymerase chain reaction (RT-PCR).

\* Capillary blood (finger or heel stick) can be used for serology if venous blood cannot be obtained.

Expedite measles serologic testing at a public health lab; use of commercial labs may delay diagnosis. More information on laboratory testing for measles, including capillary blood collection, is available at:

<http://www.cdph.ca.gov/HealthInfo/discond/Documents/CDPHMeaslesLabTesting2010-11.pdf>

### Case classification

- **Suspected:** Any febrile illness accompanied by a rash.
- **Probable:** A case that meets the clinical case definition, has non-contributory or no serologic or virologic testing, and is not epidemiologically-linked to a confirmed case.
- **Confirmed:** A case that is laboratory-confirmed; or a case that meets the clinical case definition and is epidemiologically-linked to a confirmed case. A laboratory-confirmed case does not need to meet the clinical case definition.

### Immunity to measles

Non high-risk people† can be presumed to be immune to measles for the purposes of measles case investigations if they:

- were born prior to 1957; or
- have written documentation with dates of receipt of at least one dose of measles-containing vaccine given on or after the first birthday;‡ or
- have a documented positive IgG test for measles; or
- are <3 months of age and biological mother has documentation of 2 doses MMR or is IgG positive; or
- have history of physician diagnosed measles; or
- served in the U.S. armed forces; or
- were born in U.S. in 1970 or later and attended a California elementary school;§ or
- attended a California State University campus as a full-time undergraduate student in 2002 or later;§ or
- entered the U.S. in 1996 or later with an immigrant visa or have a green card.§

† Additional evidence of immunity is required during an outbreak or for high-risk exposed persons, e.g., healthcare personnel of any age, pregnant women, immunocompromised people, household contacts of a case, or persons  $\geq 4$  years of age in settings with known unvaccinated persons (e.g., childcare settings). Immunity can be presumed if they:

- have documentation of a positive measles IgG test; or
- have documentation of two doses of measles-containing vaccine separated by at least 28 days, with the first dose on or after the first birthday.‡

‡ Administered in 1968 or later.

§ Unless known to be unvaccinated for measles, e.g., having a medical contraindication to vaccination or being philosophically or religiously opposed to vaccinations.

### Postexposure prophylaxis

- MMR may be given <72 hours of exposure to persons  $\geq 12$  months of age with 1 or no documented doses of MMR, if not contraindicated.
- Immune globulin (IG) may be given to exposed susceptible people of any age  $\leq 6$  days of exposure.

The recommended dose of IG is 0.25 mL/kg (maximum dose=15 mL) IM. Immunocompromised persons should receive 0.5 mL/kg (maximum dose=15 mL) IM.

For persons receiving IVIG therapy,  $\geq 400$  mg/kg  $< 3$  weeks before measles exposure should be sufficient to prevent measles infection.

It is unknown if administration of IG prolongs the incubation period. Persons who have received IG should be advised to self-isolate and report measles symptoms that occur  $\leq 28$  days of exposure.

### **Home quarantine/symptom watch period**

Day 5 after first exposure through day 21 after last exposure (day of exposure is day 0). If symptoms consistent with measles develop, patient should be immediately isolated through day 4 after rash onset (day of rash onset is day 0). Exposed people should be instructed to isolate themselves and notify their local health department immediately if symptoms occur.

### **The course of measles infection**

Measles typically begins with a mild to moderate fever accompanied by cough, coryza, and conjunctivitis. Two to three days later, Koplik's spots, a characteristic sign of measles, may appear. At this time the fever spikes, often as high as 104-105°F. At the same time, a red blotchy maculopapular rash appears, usually first on the face, along the hairline and behind the ears.

This slightly itchy rash rapidly spreads downward to the chest and back and, finally, to the thighs and feet. In approximately one week, the rash fades in the same sequence that appeared.

### **Measles symptoms**

- Fever
- Dry cough
- Runny nose
- Inflamed eyes (conjunctivitis)
- Sensitivity to light
- Koplik's spots (tiny red spots with bluish-white centers inside mouth on the lining of the cheek)
- An erythematous maculopapular rash - large, flat blotches that often flow into one another

### **Measles treatment**

No specific treatment is available for measles, but administration of vitamin A on two consecutive days has been associated with reduced risk of mortality in children  $< 2$  years of age. WHO recommends vitamin A for all children with acute measles, regardless of their country of residence. Vitamin A for treatment of measles is administered once daily for two days, at the following doses:

- 50,000 IU for infants  $< 6$  months of age
- 100,000 IU for infants 6 to  $\leq 11$  months of age
- 200,000 IU for children  $\geq 12$  months of age

### **Recommendations for follow-up of persons exposed to measles**

Category	IgG testing	MMR vaccine	Home quarantine	Symptom watch
<b>People born before 1957¶</b> (5% will be susceptible)	No	No	No	Yes
<b>People born during or after 1957 or high-risk people who were born before 1957, who:</b>				
Have 2 documented doses of MMR (~1% will be susceptible)	No	No	No	Yes
Are measles IgG positive ( $< 1\%$ will be susceptible)	No	No	No	N/A
Have 1 documented dose of MMR (5% will be susceptible) or no documented doses of MMR but are presumed to be immune to measles** and <b>are not</b> a high-risk person¶	If desired	If desired	No (unless tested and found to be susceptible)	Yes
Have no or 1 documented dose of MMR, but are presumed to be immune to measles** and <b>are</b> a high-risk person¶	Yes	Yes††	Work exclusion until immunity confirmed	Yes
First MMR dose given $< 72$ hours of exposure	No	N/A	No	Yes
Immune globulin (IG) given $\leq 6$ days of exposure‡‡	No	No	No	Yes
Unknown immune status, no presumption of immunity	Yes	Yes††	Yes	Yes
IgG negative/not vaccinated $< 72$ hours of exposure/not given IG/known to be unvaccinated for measles	N/A	Yes††	Yes	Yes

|| If symptoms consistent with measles develop, person should be isolated. If there is concern about whether measles symptoms will be reported or compliance with quarantine or, periodic calls to the exposed person to monitor for development of measles symptoms are recommended (see above for symptom watch time period and additional guidance).

¶ Ensure documentation of immunity (documented IgG+ or 2 documented doses MMR) in all high-risk persons, e.g., exposed healthcare personnel (including those born  $< 1957$ ), pregnant women, immunocompromised persons, and persons  $\geq 4$  years of age in settings with known unvaccinated persons, e.g., childcare settings (children aged 1-3 years should have 1 dose MMR).

\*\*Immunity may be presumed in persons who have served in the U.S. armed forces, or were born in the U.S. in 1970 or later and attended a California elementary school; or attended a California State University campus as a full-time undergraduate student in 2002 or later; or entered the U.S. in 1996 or later on an immigrant visa or have a green card (unless known to be unvaccinated).

††Vaccinate persons  $\geq 1$  year of age at the same time blood is drawn for serology unless IG is given.

‡‡IG may be administered  $\leq 6$  days of exposure to susceptible contacts of any age who did not receive MMR  $< 72$  hours of exposure. MMR should not be given until 5 months after IG in healthy people and until 6 months after IG in immunocompromised people.