



Hot Tips

A Service of Ventura County Public Health Department

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Hot Tips Number #67 Date 07/19/13

Please copy and distribute to ALL physicians at your location.

Measles Alert

Ventura County has had a case of clinical measles with known measles exposure. Laboratory confirmation is pending. Per the California Department of Public Health, the history and clinical findings are sufficient evidence of measles and warrant alerting healthcare providers to remember to include measles in their differential diagnosis of any patient presenting with fever, cough, rash and or conjunctivitis. The index case originated from Germany and exposure occurred on the airplane flight. The clinical symptoms of measles developed in another passenger 14 days after the in-flight exposure. This individual is currently residing in East Ventura County and is known to have exposed other county residents.

Public Health recommends that healthcare providers post the following rash poster (web link below; use color print) at the front entrance of your facility. Patients who might be ill with measles should not enter your facility unless they can be placed in a negative pressure room. Individuals who have had the disease, or have a history of two measles immunizations, or have a positive serum measles titer, should be considered immune and may interact with the patient.

<http://www.cdph.ca.gov/programs/immunize/Documents/IMM-908.pdf>

Measles is a highly contagious, acute viral illness that can lead to serious complications and death. Endemic or sustained measles transmission has not occurred in the United States since the late 1990s, despite continued importations. During 2001--2010, a median of 60 (range: 37--140) measles cases were reported to CDC annually; in 2011, 222 cases of measles were reported, the highest number reported for this period since 1996. Of the 222 cases, 200 (90%) were associated with importation from other countries. The imported cases involved unvaccinated U.S. residents who recently traveled abroad, unvaccinated visitors to the United States, and people linked to these imported cases. In 2011, 17 outbreaks (3 or more linked cases) occurred, accounting for 50% of the 222 cases. Of the total case-patients, 86% were unvaccinated or had undocumented vaccination status. Of the 196 case-patients who were U.S. residents, 166 (85%) were unvaccinated or had unknown vaccination status. Of those 166 case-patients, 141 (85%) were eligible for MMR vaccination, 18 (11%) were too young for vaccination, six (4%) were born before 1957 and presumed immune, and one (1%) had previous laboratory evidence of presumptive immunity to measles. The increased number of measles importations into the United States underscores the importance of vaccination to prevent measles and its complications. (CDC Morbidity and Mortality Weekly. *Measles – United States, 2011*. April 20, 2012/ 61(15);253-257.)

Communicable Disease Office

2240 E. Gonzales Road, Oxnard, California 93036 (805) 981-5201 FAX (805) 981-5200

Measles infectious period

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 who is infectious with measles (4 days prior through 4 days after rash onset), e.g., same classroom, home, clinic waiting room, airplane etc., or were in these areas up to 1 hour after the infectious person was present. No minimum time period.

******Measles incubation period ****This is a change from Measles Hot Tips Number 55******

Reference: Control of Communicable Diseases Manual, David L. Heymann, 19th Ed:

Onset of prodromal symptoms is about 10 days after exposure, but may be 7–18 days from exposure to onset of fever. Rash onset typically at 14 days and rarely as long as 19-21 days after exposure (day of exposure is day 0).

Prodromal Period

Reference: 2012 Pink Book, Center for Disease Control and Prevention:

The prodrome lasts 2–4 days (range 1–7 days). It is characterized by fever, which increases in stepwise fashion, often peaking as high as 103°–105°F. This is followed by the onset of cough, coryza (runny nose), or conjunctivitis.

Measles immunity

Persons are considered immune to measles if they:

- Were born prior to 1957*; or
- Have written documentation with dates of receipt of age appropriate measles-containing vaccine
- Children aged 1-4 years: with one dose of vaccine
- Adults (except healthcare personnel, school and college students, international travelers): one dose
- Healthcare personnel, school and college students, international travelers: two doses given in 1968 or later (an ineffective killed vaccine was given to some patients prior to 1968 and doses of measles vaccine prior to 1968 should not be counted unless they are documented to be live vaccine) separated by at least 28 days, with the first dose on or after their first birthday; or
- Have a positive antibody (IgG) test for measles; or
- Have a history of physician diagnosed measles.*

* Immunity must be confirmed in exposed healthcare personnel of any age (measles IgG+ or 2 documented doses MMR).

Recommendations for follow-up of persons exposed to measles

Category	IgG test	Vaccinate	*Home quarantine	*Active symptom monitoring	Passive symptom watch
Born before 1957					
Born before 1957 (~5% will be susceptible)	No	No	No	No	Yes
Medical personnel exposed 5-21 th day after exposure should be relieved of patient contact	No%	Yes**	No	Yes	N/A
Born during or after 1957					

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2 documented doses MMR prior to measles exposure (~1% will be susceptible)	No	No	No	No	Yes
IgG positive (<1% will be susceptible)	No	No	No	No	Yes
1 documented dose MMR prior to measles exposure in children aged 1-4 years and adults who are <u>not</u> healthcare personnel, school or college students, or international travelers (~5% will be susceptible)	No	Vaccinate if <72 hours of exposure	No	Yes	N/A
1 documented dose MMR prior to measles exposure in adults for whom 2 doses are recommended, i.e., healthcare personnel, school and college students, and international travelers (~5% will be susceptible)	Yes	Yes§	No	Yes	N/A
First MMR dose given <72 hours of exposure	No	-	No	Yes	N/A
IG given within six days of exposure	No	No	No	Yes	N/A
Unknown status	Yes	Yes§	Yes	Yes	N/A
Unvaccinated/nonimmune/not given IG	Yes	Yes§	Yes	Yes	N/A
Medical personnel exposed 5-21 th day after exposure should be relieved of patient contact	No%	Yes*	No	Yes	N/A

* Daily calls to exposed person to monitor for development of measles symptoms (see below for information on time period).

‡ Confirm immunity (IgG+ or 2 documented doses MMR) in all exposed healthcare personnel, including those born <1957.

§ Vaccinate at the same time blood is drawn for serology.

- Two doses MMR should be given unless there is proof of immunity
- ** One dose of MMR
- & Serology tests not recommended because time to do so would impede rapid immunization

|| Immune globulin (IG) recommended for exposed infants <1 year of age, susceptible household members who did not receive MMR <72 hours of exposure, immunocompromised persons, and susceptible pregnant women.

Mass revaccination of entire communities is not of demonstrated benefit in control of measles outbreaks.

Immune Globulin (IG)

Recommended dose is 0.25 mL/kg (maximum dose=15 mL) IM given within 6 days of exposure.

Immunocompromised persons should receive 0.5 mL/kg (maximum dose=15 mL). For persons receiving IVIG therapy, ≥100 mg/kg <3 weeks before measles exposure should be sufficient to prevent measles infection.

Immune globulin can be administered within 6 days of exposure. Immune globulin is indicated for susceptible household or other close contacts of patients with measles, particularly contacts younger than 1 year of age, pregnant women and immunocompromised persons, for whom risk of complications is highest.

Home quarantine/active symptom monitoring 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

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of rash onset is day 0). Exposed people not being quarantined or monitored should watch for symptoms and contact their local health department immediately if symptoms occur.

Symptoms

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

Measles clinical case definition

- A generalized rash lasting ≥ 3 days; and
- Temperature $\geq 101^{\circ}\text{F}$ ($\geq 38.3^{\circ}\text{C}$); and
- Cough, coryza, or conjunctivitis
- Isolation of measles virus from a clinical specimen; or
- Detection of measles virus specific nucleic acid by polymerase chain reaction (PCR); or
- Significant rise in serum measles immunoglobulin G (IgG) antibody level between acute and convalescent phase specimens, by any standard serologic assay (when the same assay is used to test both specimens); or
- Positive serologic test for measles immunoglobulin M antibody (IgM)

Laboratory Testing for Measles

The Ventura County Public Health Department encourages submission of specimens from suspected measles cases. There is no charge to the facility or the patient for this testing.

A variety of tests are available, including viral culture, detection by nucleic acid amplification (NAAT, aka RT-PCR) and serology. Choice of test method will be determined by the case history and information provided, and we may contact the ordering provider for follow-up specimens to confirm our initial results. Specimens can be submitted to:

Ventura County Public Health Laboratory
2240 E. Gonzales Rd, Suite 160
Oxnard, CA 93036
Phone: 805 981-5131

- Specimen Collection:
 - Respiratory specimens collected 4 days after rash onset are the best source for virus isolation. Specimens collected within 10 days of rash onset can be useful for PCR detection
 - Collect a nasal aspirate and place in an equal volume of viral transport medium OR
 - Collect a nose AND throat swab and place in a single vial of viral transport medium. Refrigerate and transport to the Public Health Laboratory within 48 hours.
 - Urine samples collected within 10 days of rash onset are useful for both culture and PCR detection. Collect 50-100ml and refrigerate during transport. Deliver to the Public Health laboratory within 25 hours of collection.
 - Serology – collect 10ml of whole blood at least 3 days after rash onset. Refrigerate and transport to the Public Health laboratory. For definitive detection of a rise in antibody titer,

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- collect a second specimen 10 or more days after rash illness to be tested in parallel with the first specimen.
- Capillary blood (finger or heel stick) can be used for serology if venous blood cannot be obtained. Micro collection devices consisting of a capillary tube and a serum separator microtube should be used (heparinized tubes are acceptable); a minimum of 100 µl of serum are required. Fill 2-3 capillary tubes even if 100 µl is collected in the first tube; express collected blood into serum separator microtube and cap. Keep specimens cool (not frozen) during transport (e.g., in a Styrofoam container with freeze packs). Upon receipt at the laboratory, specimens must be microfuged before processing.
 - Specimen storage and transport- contact the laboratory for guidance regarding your specific specimen type.
 - Measles virus is sensitive to heat and desiccation and viability decrease when samples are not kept cold. Transport samples with cold packs as soon as possible following collection. If samples cannot be transported immediately via courier, they can be transported at 4°C for 72 hours. Alternately, specimens (except unprocessed urine) can be frozen (-70°C is preferred) and shipped on dry ice. Shipping regulations apply to the use of Dry Ice; consult with your courier or contact the Public Health laboratory for guidance.

NOTE: vaccination status is very important in interpreting diagnostic tests, as test reliability decreases with increasing vaccination status in a population. False-positive IgM serological tests and RT-PCR tests increase with the number of vaccination doses given.

If you suspect your patient has measles, isolate the patient immediately and alert the Communicable Disease Office (805-981-5201) as soon as possible. The risk of measles transmission to others can be reduced if control measures are implemented.

Posters

For office entrance and in the waiting room:

<http://eziz.org/assets/docs/IMM-1046.pdf>

For staff:

<http://www.cdph.ca.gov/programs/immunize/Documents/IMM-908.pdf>

For more information go to:

<http://www.cdph.ca.gov/programs/immunize/Pages/default.aspx>

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6020a7.htm?s_cid=mm6020a7_w

This bulletin is intended to improve the public health in our county by keeping physicians and nurses informed of noteworthy diagnoses, disease trends and other events of medical interest. Another goal of a public health department is to educate. We hope that you will use this information to increase your awareness. Please allow us to continue in our role of speaking to the press so that we may maximize the educational message to the benefit of all citizens of Ventura County.

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