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Measles Clinical Guidance: Identification and Testing of Suspect Measles Cases April 2019

Measles continues to circulate in much of the world, including Europe, Asia and Africa. International travel, domestic travel through international airports, and contact with international visitors can pose a risk for exposure to measles. When measles is imported into the United States, additional transmission can occur locally.

While providers should consider measles in patients with fever and a descending rash, measles is unlikely in the absence of confirmed measles cases in your community or a history of travel or exposure to travelers. This guidance discusses which patients should be prioritized for measles testing.

Testing for measles can be based on:

A) Measles symptoms

- *Fever*, including subjective fever (see page 2 for a more detailed description).
- *Rash that starts on the head and descends* (see page 2 for a more detailed description).
- Usually 1 or 2 of the “3 Cs” – *cough, coryza and conjunctivitis*.

B) Risk factors increasing the likelihood of a measles diagnosis

- In the prior 3 weeks: travel outside of North America, transit through U.S. international airports, or interaction with foreign visitors, including at a U.S. tourist attraction.
- Confirmed measles cases in your community.
- Never immunized with measles vaccine and born in 1957 or later.

Recent MMR vaccine recipients

Fever and rash occur in ~5% of MMR vaccine recipients, typically 6-12 days after immunization. Such reactions can be clinically identical to measles infection, and result in positive laboratory testing for measles. However, this reflects exposure to measles vaccine virus rather than the wild virus, and such patients are not infectious for measles. If a recently vaccinated patient has fever and rash but none of the risk factors for measles described above, measles is extremely unlikely and testing is usually unnecessary. If you have questions, please consult your [local health department](http://tinyurl.com/y2pdczrx) (<http://tinyurl.com/y2pdczrx>).

If after consideration of symptoms and risk factors, you suspect measles, **please contact your [local health department](http://tinyurl.com/y2pdczrx) (<http://tinyurl.com/y2pdczrx>) immediately. Polymerase chain reaction (PCR) is the preferred testing method for measles, and can only be performed in public health laboratories.** Measles IgM testing is frequently falsely positive and is not preferred. See below for more specific testing guidance.

- **With measles, FEVER typically**
 - Precedes the rash;
 - Is high;
 - Persists after the rash erupts; and
 - Peaks on day 2 or 3 after rash onset, but can persist with secondary infection.
- **With measles, the RASH typically**
 - Starts on the forehead at the hairline and behind the ears and then spreads downwards to the rest of the body; in vaccinated people the rash may be less intense and not spread to the entire body.
 - Is erythematous and maculopapular, progressing to confluence in the same order as the spread of the rash. Confluence is most prominent on the face.
 - Clears on the third or fourth day in the same order it appeared; duration is usually 6-7 days, but sometimes less in vaccinated people.
 - Is initially red and blanches with pressure, then fades to a coppery appearance, and finally to a brownish discoloration that does not blanch with pressure.
 - Not itchy until at least the fourth day after onset.
 - Consider taking a photo of the rash to share with the local public health department.
 - See page 3 for possible alternative diagnoses, including drug reactions.
- **Other symptoms may include**
 - At least one of the prodromal 3 Cs- cough, coryza and conjunctivitis.
 - White (Koplik) spots in the mouth early in illness.
 - Feeling miserable; especially for children.
 - In previously vaccinated persons, symptoms may be milder and all 3 Cs may not be present.

Laboratory testing for suspect measles patients (see: <http://tinyurl.com/ydhh9u85>)

→ **If you suspect measles, please immediately contact your local health department** (<http://tinyurl.com/y2pdczrx>) per California reporting laws.

- PCR is the preferred testing method for measles, and can only be performed at public health laboratories. Serologic testing for measles infection can result in falsely positive IgM test results, and serologic testing performed at commercial laboratories may not provide timely results.
- **Specimen collection for measles testing**
 - For patients presenting ≤ 7 days of rash onset:
 - **PCR testing, rather than serologic testing, is recommended**
 - Obtain a Dacron throat swab (rather than NP swab) and place in viral transport media.
 - Collect 10-50 ml of urine in a sterile container.
 - For patient presenting > 7 days after rash onset:
 - Obtain a Dacron throat swab (rather than NP swab) and place in viral transport media.
 - Collect 50-100 ml of urine for PCR testing in a sterile centrifuge tube or urine specimen container.
 - Serology: Draw 7-10 ml blood in a red-top or serum separator tube; spin down if possible.
 - Note:** capillary blood (approximately 3 capillary tubes to yield 100 μ l of serum) may be collected in situations where venipuncture is not preferred, such as children < 1 year of age.

Isolate suspect measles patients

If measles is suspected please isolate the patient according to public health guidance. See complete infection control guidance at: <http://tinyurl.com/yxes3amk>.

Alternative diagnoses to consider for patients with fever and rash

- **Drug eruption:** history of current or recent medication, especially an antibiotic
- **Other non-infectious rashes:** hives or atopic dermatitis with coincidental febrile illness
- **Varicella (chickenpox):** vesicular lesions on erythematous base
- **Enteroviruses (e.g., hand-foot-and-mouth disease):** oral ulcers, rash on hands, feet, buttocks
- **Mononucleosis syndrome (EBV, CMV, HIV):** risk factors (young adulthood, MSM, IDU), sore throat or tonsillitis, prominent adenopathy, splenomegaly, atypical lymphocytosis
- **Parvovirus B-19 (also known as erythema infectiosum, or 5th disease):** slapped cheek appearance in children, arthritis and diffuse rash in adults
- **HHV-6 (also known as roseola infantum, exanthem subitum, or 6th disease):** disease of very young children (usually under 2 years of age), high fever followed by defervescence and the appearance of rash on trunk
- **Rubella (German measles):** history of international travel; mild illness with low-grade fever; arthralgias prominent in adults; prominent postauricular, posterior cervical, and suboccipital adenopathy
- **Group A streptococcal infection (with scarlet fever rash):** sore throat, “sandpapery” rash, circumoral pallor, strawberry tongue, positive strep test
- **Meningococcemia:** abrupt onset of flu-like illness with marked myalgias (especially the legs); skin evolves from pallid or mottled with cold hands to petechial then hemorrhagic rash, severe headache and mental status change if meningitis present
- **Kawasaki disease:** children <5 years, fissured lips, strawberry tongue, erythema and edema of hands and feet, periungual desquamation, adenopathy
- **Travel-, animal-, and tick-related:** broad differential diagnoses of fever and rash
- **Influenza:** influenza cases with rash have been reported