

Evaluating a patient presenting with rash when there is no local measles transmission¹

Suspected Measles cases should be reported to the ND HHS Disease Control and Forensic Pathology Section Immediately at 701-328-2378

START HERE

Needs ALL 3:

- Fever²
- Generalized, maculopapular rash
- No vesicular lesions / vesicles³

No

Measles unlikely. If vesicular rash, consider varicella or alternative cause of rash.

Yes

Epidemiologic risk for measles in the 21 days before rash?
ANY of the following:

- International travel in last 21 days
- Domestic travel in last 21 days to an area with known measles transmission
- Known exposure to measles

No

Measles clinical criteria?⁴

- Fever² and rash AND
- Cough, runny nose, OR conjunctivitis

No

Measles unlikely. If measles still suspected, contact state or local health department for guidance.

Yes

Received MMR vaccine in the last 21 days?

Yes

Likely a reaction to MMR vaccination⁵

No

Prior measles vaccination?

- Age ≤6 years: 1 dose MMR*
- Age >6 years: 2+ doses MMR

Yes

Measles uncommon among people with age-appropriate vaccination. Measles can occur among vaccinated people, but generally during intense exposure (e.g., daycare or household exposure).

No

Suspect measles. Immediately contact local or state health department to discuss testing options. See Testing Recommendations.

*or other measles-containing vaccine

Notes

1. This testing algorithm is intended to be used by bedside providers in settings where there is not local measles transmission. This assumes that the pre-test probability for most people without known epidemiologic risk for measles and who do not meet case criteria will be low. In settings with active measles transmission, the threshold at which to pursue testing may be lower, and a more permissive algorithm could be considered.
2. Either a measured or patient/family-reported fever is adequate; fever may not be measured at the time of healthcare evaluation due to normal fluctuation or to use of antipyretics (e.g., ibuprofen).
3. A vesicular rash is not consistent with measles, and should prompt consideration for other causes of rash (e.g., varicella/chickenpox)
4. Measles clinical criteria (per CSTE* case definition) include ALL of the following:
 - Generalized maculopapular rash
 - Fever
 - Cough, coryza (runny nose), or conjunctivitis (also known as the "3 C's")
5. Up to 5% of MMR recipients will get a short-lived, mild febrile rash. This is more common with the first dose of MMR. People who experience this vaccine reaction are not contagious to others around them. If a person has received MMR within 21 days before rash onset, but also has epidemiologic risk for measles, then specialized testing may be required and should be discussed with local or state public health authorities.

Testing Recommendations

- ❑ Immediately contact ND HHS Disease Control and Forensic Pathology Section at 701-328-2378
- ❑ Collect a nasopharyngeal (NP) or oropharyngeal/throat (OP) swab for measles* RT-PCR
 - Follow laboratory [guidance](#) for specimen collection (e.g., type of swab, media).
 - If directed by public health authorities, urine can also be obtained for measles PCR.
 - At least 50cc of urine should be voided into a sterile container and stored refrigerated (not frozen).
- ❑ Obtain serum for measles* IgM and IgG

Measles Characteristics

- Classic symptoms
 - Fever (up to 105F) + generalized maculopapular rash + one of the "3 C's"
 - 3 C's: Cough, coryza (runny nose), conjunctivitis
 - Clues to measles:
 - Prodrome of fever and at least 1 of 3 C's often starts 2–4 days before rash
 - Rash starts on head or face and spreads downwards
 - Fever continues through onset of rash, often peaking around the time when the rash starts
- Measles is rare in vaccinated people, especially with 2 prior doses of MMR
 - 1 dose generally provides 93% protection, and 2 doses provides 97% protection from measles infection

Other common causes of febrile rash in children

- **Parvovirus B-19 (“Fifth Disease”)**
 - Classic “slapped cheek” rash
 - More common in school-aged children than infants
- **Human Herpesvirus 6 (HHV-6, “Sixth Disease”, “Roseola”)**
 - Common cause of febrile rash in infants
 - Rash commonly starts on trunk (measles rash starts on face/hairline)
 - Fever often resolves before start of rash (measles fever peaks around time of rash onset)
- **Enteroviruses**
 - Common cause of Hand/Foot/Mouth, rash can involve hands/feet which are generally spared in measles
 - Rash can be urticarial, which is not typical for measles



“Slapped Cheek” rash



HFM