

Lab Testing for Measles at the MDH Public Health Laboratory

Clinical case definition

A clinical diagnosis of suspect measles must be confirmed with laboratory testing. Consider lab testing for patients who meet the clinical case definition for measles:

- Fever of 101°F (38.3°C) or higher and
- Cough, coryza, or conjunctivitis and
- A generalized, maculopapular rash lasting three days or more

Providers should ask about exposure, travel (past month), and MMR history. This helps us assess suspicion level, but providers should not rule-out a suspect diagnosis based on those factors.

Specimen collection

Specimens for PCR¹ (preferred):

- Collect specimens for PCR as soon as possible after rash onset (maximum 9 days after rash onset). Consider day 0 as rash onset date:
 - Day 0-5 of rash: throat swab
 - Day 6-9 of rash: throat swab and urine
- Send PCR specimens to the MDH Public Health Laboratory (MDH-PHL).

Serum for measles IgM:

Measles IgM can be done in addition to PCR but should not be the only method used as false positives are common.

- Collect serum as soon as possible after onset.²
- Send serum for measles IgM to your facility's usual reference lab.

Measles IgM is not available at the MDH-PHL. However, for highly suspect or indeterminate cases, MDH may request a serum sample to forward to CDC for testing. Refer to collection instructions: serum section.

Specimen submission to MDH

Complete a "Clinical Testing and Submission Form" from [Forms for the Infectious Disease Laboratory \(www.health.state.mn.us/diseases/idlab/forms.html\)](http://www.health.state.mn.us/diseases/idlab/forms.html).

- Each specimen requires its own form.
- Completely fill out the form and indicate which test is requested.

Label all tubes/containers with:

- Patient name/date of birth
- Date specimen collected
- Specimen type

Notify MDH that specimens are being sent. Call 651-201-5414 or toll-free at 1-877-676-5414 and provide suspect case details:

- Patient name/date of birth
- Address/phone number
- Clinical presentation
- Known exposure, travel, or MMR history

Keep specimen(s) cold: Store/ship specimens at refrigeration temperature (2-8°C) on ice packs.

Send via overnight shipping to arrive Monday-Friday between 8 a.m. and 4:30 p.m. to:

MDH Public Health Laboratory
Attn: Biological Accessioning
601 Robert St. N.
St. Paul, MN 55155-2531

For help with packaging and shipping, call MDH-PHL Biological Accessioning at 651-201-4953.

Note: Patient should be sent home and isolated until measles is ruled out, and exam room should be closed for at least 2 hours after patient has left.

Swabs and media

For measles PCR, a swab in viral transport media should be sent. Dry swabs are not acceptable.

Appropriate swabs and media:

- BBL Culture Swab, Cultiures, Dacron swabs
- Viral transport medium (VTM), Universal transport medium (UTM), M5, M4, Minimum Essential Medium (MEM), Saline, Balanced salt solutions (BSS), Sterile isotonic solutions, Phosphate buffered salines (PBS), Liquid Stuart's Medium

Inappropriate swabs and media:

- Wood-tipped applicators, Cotton-tipped swabs, Calcium-alginate tipped swabs, Charcoal swabs, Gel swabs
- Anaerobic media

Collection instructions: PCR

A throat swab is preferred. Nasal/NP swabs or washes are acceptable but not preferred.

Throat swab: Vigorously swab tonsillar areas. Use tongue blade to depress tongue to prevent contamination of swab with saliva. Place swab into 2-3 ml of transport media.

Nasal or nasopharyngeal swab: Swab the nasal passage or the nasopharynx. Place swab into 2-3ml of transport media.

Nasal wash: Use a syringe attached to a small plastic tube and 500 µl of transport media. After placing transport media in the nostril, aspirate as much of the material as possible and rinse the tube with the original (500 µl) of transport media.

Urine specimen: Collect 10-40 ml of urine in a sterile urine specimen container. Have patient void directly into container, collecting from the first part of the urine stream if possible. First-morning voided specimens are ideal, but any urine collection is adequate.

Shipping: Ship at refrigeration temperature or store and ship frozen.

Collection instructions: serum

- If sending to your reference lab, follow their instructions for collection and submission.
- If sending to MDH-PHL, collect 7-10 ml of blood in a red top or serum separator tube. Capillary blood (finger or heel stick) can be used for pediatric patients: 3-5 capillary tubes are needed.
 - Tubes containing whole blood should not be stored frozen (-20°C or lower).
 - Centrifuge blood collection tubes (10 minutes at 1000 – 1300 g) to separate serum from clot. Gel separation tubes should be centrifuged no more than 2 hours after collection. Aseptically transfer serum to a sterile tube that has an externally threaded cap with an o-ring seal.
 - Refrigerate serum (2-8°C) within 8 hours of collection. Serum samples should not be stored at room temperature (15-25°C) for longer than 8 hours after collection. If samples will be stored for more than 48 hours, freeze specimens (-20°C or lower).

Results and turnaround

- Results for testing done at MDH-PHL will be sent via fax to the submitting laboratory.
- Turnaround time for PCR results is typically 1-2 business days after receipt of specimen(s).
- Culture may be done on a specimen with negative PCR results. Turnaround time for culture is a minimum of 3 weeks.
- The submitting facility is responsible for relating results to patients. MDH cannot provide results to patients.

Additional information

For more information about clinical features, post-exposure prophylaxis, and vaccine information, visit [Measles Information for Health Professionals \(www.health.state.mn.us/diseases/measles/hcp/\)](http://www.health.state.mn.us/diseases/measles/hcp/).

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Footnotes

1. PCR: At MDH-PHL, reverse transcriptase polymerase chain reaction (RT-PCR) is used to detect viral RNA in a sample.
2. The optimal time to collect serum is at least 72 hours after rash onset (so IgM has time to rise); however, it is crucial to get PCR specimens as soon as possible after rash onset, so collect both serum and PCR specimens at the same time. IgM can be run again after infectious period ends.

Minnesota Department of Health
Vaccine Preventable Disease Section
651-201-5414
www.health.state.mn.us/immunize

9/21/22

*To obtain this information in a different format, call:
651-201-5414.*