

Collection of Measles Specimens for Diagnostic Testing

Rapid laboratory confirmation of measles infection is based upon serologic and PCR testing (IgM ELISA, real-time RT-PCR). In addition to collecting a serum sample from the patient, it is recommended that health care providers collect a clinical specimen (throat swab, nasopharyngeal swab, or nasal wash; and/or urine) as soon as possible after rash onset for possible PCR testing. Specimens collected for PCR testing can also be used to characterize circulating virus and to determine the geographic origin of the virus and transmission in the United States.

The Colorado Department of Public Health and Environment (CDPHE) requires reporting of all suspected cases of measles by physicians, health care providers, and laboratories, whether or not supporting laboratory data are available. Call 303-692-2700 or 303-370-9395 after hours to report suspect or confirmed measles cases and to determine recommended testing.

CDPHE offers both measles IgM serology and measles PCR testing on a fee-for-service basis. Measles IgM serology testing is also available from commercial labs.

Serum Specimens for Measles IgM Testing:

Detection of measles-specific IgM antibodies in a serum sample collected within the first few days of rash onset can provide presumptive evidence of a current or recent measles virus infection. However, because no assay is 100% specific, serologic testing of non-measles cases using any assay will occasionally produce false positive IgM results. Thus, CDPHE recommends collection of specimens for PCR testing as well. See below for instructions.

Measles IgM ELISA specimen criteria:

- Acceptable specimen: Whole blood, serum
- Specimens should be collected aseptically by venipuncture using red-top tubes or serum separator tubes
- Hold-times and temperatures:
 - 2-8°C ≤2 days (whole blood acceptable)
 - ≤ 20°C ≥ 2 days (separated from clot)

Specimens for Measles PCR Testing

Detection of measles RNA in a clinical sample can provide rapid laboratory confirmation of infection and is available at the CDPHE laboratory. Consult CDPHE Communicable Disease Branch staff at (303) 692-2700 to obtain approval for testing.

Respiratory Samples

1. Nasal washes, throat (oropharyngeal) swabs or NP (nasopharyngeal) swabs are the preferred samples for virus isolation or detection of measles RNA by RT-PCR.
2. Synthetic swabs are recommended. Urine samples may also contain virus and collection of both samples can increase the likelihood of detecting the virus. Collect samples as soon after rash as possible. The sample should be collected at the first contact with a suspected case of measles when the serum sample for diagnosis is drawn.
3. Nasal washes, throat (oropharyngeal) swabs or NP (nasopharyngeal) swabs should be transferred to 1-3ml of viral transport medium (do not allow to dry out) or universal transport medium if viral transport medium is not available. Refrigerate the specimen and call CDPHE Branch staff at 303-692-2700 to arrange testing.

Detection of measles RNA and measles virus isolation are most successful when samples are collected on the first day of rash through the 3 days following onset of rash. Detection of measles RNA by RT-PCR may be successful as late as 10-14 days post rash onset.

Measles virus is sensitive to heat and infectivity decreases markedly when samples are not kept cold. Avoid repeat freeze-thaw cycles or freezing at -20°C (standard freezer temp).

- Hold-times and temperatures for respiratory specimens:
 - $2-8^{\circ}\text{C} \leq 2$ days
 - $\leq 70^{\circ}\text{C} \geq 2$ days

Urine Samples

1. Measles virus is present in the cells that have been sloughed off in the urinary tract. Keep the urine sample at 4°C and ship on cold packs as soon as possible in a leak-proof container.

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