

MEASLES

Information for Clinicians

Summary

- Measles remains endemic in many parts of the world, and several high profile outbreaks are occurring in parts of North America.
- Immunization is the best way to protect against measles. Individuals travelling outside of North America, and to areas of known measles activity within North America, should ensure they are adequately protected prior to travelling.
- If an individual's immunization records are unavailable, immunization with measles-containing vaccine is preferable to ordering serology to determine immune status.
- Clinicians should consider measles in patients presenting with fever and rash and other measles symptoms (cough, runny nose, conjunctivitis), among those with recent travel or those who have had known contact with a case of measles.

Note for Clinicians

If you are investigating a suspect case of measles please contact your [local public health unit](#)—**do not wait** for [laboratory confirmation](#).

This document outlines information related to measles immunization and case investigation for clinicians and public health unit staff, covering the following topics:

1. [Measles immunization](#)
2. [Serological laboratory testing of immunity](#)
3. [Measles case investigation](#)
 - a. [Clinical Aspects of Measles Infection](#)
 - b. [Diagnostic Laboratory Testing](#)
 - c. [Specimen Documentation and Transport](#)
 - d. [Contact management](#)
4. [Infection prevention and control practices](#)

Measles Immunization

All individuals, whether or not they are travelling, should ensure they are immunized according to the [Publicly Funded Immunization Schedules for Ontario](#).

Travel Immunization

Individuals travelling outside of North America, and to areas within North America currently experiencing outbreaks, should ensure adequate protection against measles (unless they have a history of laboratory confirmed infection or laboratory evidence of immunity). Eligibility for publicly funded vaccine before travel is outlined in the [Ontario schedules](#).

As per the [Canadian Immunization Guide](#) (CIG), the following is recommended prior to travel:

- Infants 6 to 11 months of age: one dose of measles, mumps, rubella (MMR) vaccine (two additional doses are required at ≥ 1 year of age).
- Individuals born **in or after** 1970: two doses of MMR.
- Adults born **before** 1970: one dose of MMR.

To ensure two doses of MMR before travel, children < 4 years of age who have received one dose (according to the routine schedule) should be considered for an early second dose of MMR.

Note: The minimum interval between doses of measles-containing vaccine is 28 days.

Advice regarding immunization for travelers should be personalized based on the individual's health history and travel itinerary.

The Public Health Agency of Canada provides updated [travel health notices](#) and information on [measles cases reported in Canada for 2019](#).

Serological Laboratory Testing of Immunity

Serological testing to determine immunity in well individuals is **not** recommended. If a patient's immunization records are unavailable, immunization with measles-containing vaccine is preferable to ordering serology to determine immune status. This avoids the potential for false positive results, reduces the risk of missed opportunities for immunization and is consistent with advice from the CIG. It is safe to give additional doses of MMR vaccine to those who are already immune.

Note: This does not apply to specific occupational groups such as healthcare workers who require either documentation of immunization or serologic proof of immunity (for information on serologic testing for immunity see PHO's laboratory [Measles Immunity Serology Test Information Sheet](#)).

Measles Case Investigation

Clinical Aspects of Measles Infection

Measles is a highly infectious virus that spreads easily. Clinically compatible signs or symptoms include fever (≥ 38.3 degrees Celsius-oral) and at least one of: cough, runny nose or conjunctivitis. These symptoms are followed by a generalized maculopapular rash.

Most cases of measles become apparent 10-14 days after exposure to the virus (the range is 7-21 days). Cases are considered to be infectious from one day before the start of the prodromal period, which is usually about four days before rash onset, to four days after the onset of rash.

Diagnostic Laboratory Testing

Diagnostic laboratory testing is suggested for individuals who have a clinical syndrome and history compatible with measles (e.g., travel or exposure to a case) and should include both measles virus detection by Polymerase Chain Reaction (PCR) (nasopharyngeal/ throat swab and urine) and diagnostic serology (acute and convalescent). For details on specimen requirements please see below.

MEASLES VIRUS DETECTION BY PCR

PHO's laboratory [Measles Diagnostic PCR Test Information Sheet](#) provides comprehensive information on specimen collection and submission.

DIAGNOSTIC MEASLES SEROLOGY:

PHO's laboratory [Measles Diagnostic Serology Test Information Sheet](#) provides information on specimen collection and submission.

Specimen Documentation and Transport

On each laboratory requisition for virus detection (PCR) or diagnostic serology clearly mark "Suspect case of measles." All requisitions should contain the following information: patient's symptoms, date of onset of symptoms, exposure history, travel history (if any) and vaccination history. The "diagnostic" tick box should also be marked. Specimens must be stored and shipped cold.

Please contact [PHO's laboratories Customer Service Centre](#) at 416-235-6556 or 1-877-604-4567 (Monday to Friday, 7:30 a.m. to 7 p.m. and Saturday, 8 a.m. to 3:45 p.m.), or after-hours duty officer at 416-605-3113 if you have questions about specimen collection.

Contact Management

Please refer to the Ontario Public Health Standards, Infectious Diseases Protocol: [Appendix A](#) (section 6.4) for information on the management of contacts.

For information about post-exposure prophylaxis (PEP) for measles, see [Appendix A](#) of the Infectious Diseases Protocol and the [Canadian Immunization Guide](#). **Please note:** the CIG contains updated National Advisory Committee on Immunization advice regarding PEP that has not yet been incorporated within Appendix A.

Infection Prevention and Control Practices

The measles virus is spread by airborne droplet nuclei, close personal contact, or direct contact with the nasal or throat secretions of infected persons, and can remain active and contagious in the air, depending on the number of air changes, for up to two hours. Patients with suspected measles should be promptly isolated in a single room with negative air flow (*airborne infection isolation* room or AIIR) and the door closed. If you do not have an AIIR, the patient should wear a surgical mask and be immediately placed in a single room with the door closed.

All health care workers should ensure they are immune to measles. Only immune staff should be allowed to enter the patient room - evidence of immunity is two documented doses of measles-containing vaccine on or after the first birthday or laboratory evidence of immunity. Non-immune staff may only enter the room in very exceptional circumstances, i.e., they are the only available health care worker who can care for the patient and then a fit-tested N95 respirator must be worn.

Additional personal protective equipment (PPE) such as gloves and gowns may be added as required based on risk assessment as per Routine Practices.

The room door must remain closed and negative airflow maintained after patient discharge until all air in the room has been replaced; this will vary based on the number of room air changes per hour; consult facility plant engineers to determine the air changes per hour for each AIIR (refer to Appendix D, Time Required for Airborne Infection Isolation Room to Clear *M. tuberculosis* in PIDAC's [Routine Practices and Additional Precautions in All Health Care Settings, 3rd edition, November 2012](#)).

Because measles virus can remain airborne for two hours, no further patients should be placed within the room for a two hour period (this could be sooner dependent on the number of air changes). Appropriate room cleaning is also required. Patient movement should be curtailed unless absolutely necessary and then only conducted with the patient wearing a surgical mask.

Public Health Ontario

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Public Health Ontario provides expert scientific and technical support to government, local public health units and health care providers relating to the following:

- communicable and infectious diseases
- infection prevention and control
- environmental and occupational health
- emergency preparedness
- health promotion, chronic disease and injury prevention
- public health laboratory services

Public Health Ontario's work also includes surveillance, epidemiology, research, professional development and knowledge services. For more information, visit publichealthontario.ca.

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