

# Measles in Ontario: Update for Clinicians

Updated June 23, 2015

## Recent activity in Ontario

Measles outbreaks have been documented in a number of countries in recent years, including Canada and the United States. There were 22 cases of measles reported in Ontario in 2014 and we have had 20 cases reported to date in 2015.

We urge you to continue to be vigilant and consider measles when a measles compatible illness occurs in both returning travellers and in individuals who have been in contact with a case of measles.

Most cases of measles occur among persons without adequate immunization. Although much less common, cases have been observed in individuals who have received two valid doses of measles-containing vaccine. Thus, a two-dose measles immunization history should not be used to rule out measles, and appropriate testing needs to occur in persons with illness compatible with measles.

Measles is a highly infectious virus that spreads easily. The measles-containing, or MMR vaccine, which also protects against mumps and rubella, is free, safe and it works. People need to ensure that their immunizations are up-to-date whether or not they are staying in Ontario or travelling outside Canada. If travelling to places where measles is a particular concern because of local outbreaks, the vaccine may be given as early as six months of age to provide protection to young infants. Under these circumstances, the routine two dose series must be completed on or after the first birthday, for a total of three doses.

## Clinical aspects of measles infection

Clinically compatible signs of symptoms include:

- Fever  $\geq 38.3$  degrees Celsius (oral);
- At least one of: cough, runny nose or conjunctivitis; and,
- Generalized maculopapular rash

Most cases of measles become apparent 10-14 days after contact with the virus (the range is 7-21 days).

## Reporting to public health

Please report suspected cases of measles **immediately** to your local public health unit. Do not wait for laboratory confirmation. Suspected cases should also be instructed to self-isolate and to remain in isolation until contacted by their local public health unit.

## 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 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:

The PHO Laboratories Measles Diagnostic PCR test information sheet provides comprehensive information on specimen collection and submission:

[http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Measles\\_Diagnostic\\_PCR.aspx](http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Measles_Diagnostic_PCR.aspx). All submissions should include date of onset and collection date, as well as symptoms and travel history, if any.

Specimens required for measles PCR testing:

- A nasopharyngeal swab/aspirate or throat swab collected using Viral Transport Media (pink liquid medium) obtained as soon as possible and within seven days after rash onset

**AND**

- Approximately 50 mL of urine collected within 14 days after the onset of rash.

A negative PCR should not be used to rule out measles and needs to be interpreted along with serology, symptoms and exposure history. In certain situations, such as when there is a high index of suspicion for measles (e.g., compatible illness in a returned traveller or contact of a laboratory confirmed case) it may be warranted to test beyond the above time periods when specimens could not be collected earlier in the illness. This can be discussed with the Public Health Ontario (PHO) Laboratory on a case by case basis.

### DIAGNOSTIC SEROLOGY

PHO Laboratories Measles Diagnostic Serology test information sheet:

[http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Measles\\_Diagnostic\\_Serology.aspx](http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Measles_Diagnostic_Serology.aspx). All diagnostic serology submissions must indicate “Diagnostic” and should include date of onset and collection date, as well as symptoms and travel history, if any.

Specimens required for measles diagnostic serology testing:

#### ACUTE SEROLOGY

- A blood specimen (5ml in serum tube) for measles antibodies (IgM and IgG) collected at the first visit (ideally within seven days after rash onset). The requisition should be clearly marked “acute measles serology”.

#### CONVALESCENT SEROLOGY

- A second blood specimen collected 7 to 10 days after the onset of rash (and a minimum of 5 days after the acute sample). The requisition should state “convalescent measles serology”. Seroconversion or a significant rise in IgG or IgM titre is indicative of recent/acute infection.

**Note:** Diagnostic laboratory testing on well persons who have recently received measles-containing vaccine as part of the routine schedule or in advance of planned travel is **not** indicated.

## Indications for serological laboratory testing of immunity

Serological testing to determine immunity in well persons is **not** recommended, regardless of exposure to measles. If an exposed person's immunization status is unknown, it is recommended to give another dose(s) of MMR vaccine or immunoglobulin if indicated (Table 1), rather than send serology to check his or her immunization status. Sending serology for this purpose often results in unnecessary visits to the healthcare provider, and potentially delays protecting the person if they are non-immune. It is safe to give additional doses of MMR vaccine to those who are already immune.

In rare instances there are mandated requirements for immunity testing, such as for healthcare workers. Where the risk of disease transmission to other individuals warrants immunity testing to meet the legislative criteria for attendance for designated individuals or settings, testing should be done. The local Medical Officer of Health has the authority to exclude individuals to reduce or eliminate the risk of disease transmission as outlined in the [Health Promotion and Protection Act](#), R.S.O. 1990, c H 7, s 22(1).

For information on testing for immunity to measles, please refer to [http://www.publichealthontario.ca/en/servicesandtools/laboratoryservices/pages/measles\\_immunity\\_serology.aspx](http://www.publichealthontario.ca/en/servicesandtools/laboratoryservices/pages/measles_immunity_serology.aspx).

Table 1: Immunity (IgG) serology advice for asymptomatic persons whose immune status is unknown or immunization is not up to date

Scenario	Do IgG serology?	Vaccine/Ig Guidance
<b>No known exposure* to measles:</b>		
1. Infant (< 12 months)	No	MMR at 1 year of age
2. Person (not HCW)	No	MMR vaccine
3. HCW	No <sup>++</sup>	MMR vaccine
<b>Exposure to measles:</b>		
4. Person (not HCW)	No	MMR vaccine
5. High risk - infant (< 6 mo.)/pregnant/immunocompromised	No	Ig if ≤ 6 days of exposure
6. High risk - infant (6 - < 12 months)	No	MMR vaccine if ≤ 3 days Ig if > 3 days and ≤ 6 days*
7. HCW	Yes <sup>‡</sup>	MMR vaccine*

Ig: Immune globulin

HCW: healthcare worker

\*See Measles [Appendix A](#) for guidance on determining measles exposure criteria, recommendations for post-exposure prophylaxis and exclusion criteria

++ Serology testing as proof of measles immunity may be a condition of employment. Consultation with employer's occupational health services recommended

‡ Serology testing to demonstrate immunity can assist in earlier return to work - to be done at same time as MMR is given

## 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 the PHO Laboratories customer service at 416-235-6556 or 1-877-604-4567, or after hours duty officer at 416-605-3113 if you have questions about specimen collection.

## Infection prevention and control practices

Patients with suspected measles should be promptly isolated in a single room with negative air flow (*airborne isolation* room) and the door closed. If you do not have an airborne infection isolation room, the patient should wear a surgical mask and be immediately placed in a single room with the door closed.

All health care providers 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 provider who can care for the patient and then a fit-tested N95 mask 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 airborne infection isolation room (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, 3<sup>rd</sup> 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 exchanges). 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.

Please refer to the PIDAC document on routine practices and additional precautions for further guidance: [http://www.publichealthontario.ca/en/eRepository/RPAP\\_All\\_HealthCare\\_Settings\\_Eng2012.pdf](http://www.publichealthontario.ca/en/eRepository/RPAP_All_HealthCare_Settings_Eng2012.pdf).