Ontario

Ministry of Health

Measles Qs and As for Public Health Units

April 4, 2024

This document provides information to accompany the Measles Appendix 1 under the Infectious Diseases Protocol of the Ontario Public Health Standards.

Contents

A. Measles Overview, Symptoms and Treatment

Q1. What is measles?

A1. Measles is a highly contagious virus that spreads through the air when an infected person breathes, coughs, sneezes or talks. The measles virus can remain in the air or on surfaces for up to 2 hours. People can become infected if they breathe the contaminated air or touch the infected surface, then touch their eyes, nose, or mouth.

Q2. Are there any specific populations in Ontario that are considered high-risk for serious complications from measles infections?

A2. Those at the highest risk of complications include children younger than 5 years of age and immunocompromised persons. In addition, measles infection during pregnancy results in a higher risk of premature labour, spontaneous abortion, and low birth weight infants.

Q3. What are the symptoms of measles?

A3. Measles symptoms begin 7 to 21 days after exposure to the virus and include fever, runny nose, cough, drowsiness, irritability, red eyes, small white spots on the inside of the mouth and throat (but are not always present).

About 3 to 7 days after symptoms begin, a red blotchy rash appears on the face and then spreads down the body. People who have measles can spread it to others up to 4 days before they get a rash and up to 4 days after they get a rash.

Most people fully recover from measles within 2 to 3 weeks, but measles can sometimes cause complications, such as pneumonia, ear infections, diarrhea, hearing and vision loss, brain swelling (encephalitis), seizures or even death.

Q4. What should individuals do if they have been exposed to the measles virus?

A4. Individuals who have been exposed to measles should stay home and call their health care provider or local public health unit immediately.

Q5. What should individuals do if they have symptoms of measles?

A5. Individuals with symptoms of measles who have been exposed to measles should stay home and call their health care provider or Health811. Individuals who are severely unwell should seek care at the nearest emergency department.

If you have been exposed to measles and develop symptoms, be sure to contact the health care provider or healthcare facility prior to arrival so that the appropriate precautions can be taken to prevent the spread of measles.

Q6. What is a breakthrough measles case? How does this happen?

A6. A breakthrough infection happens when an individual who has been vaccinated against measles still contracts the virus. Although the vaccine is highly effective, it is not 100% and individuals will respond differently to the vaccine.

Breakthrough infections are typically milder than infections occurring in a person who is not vaccinated. Vaccination protects against hospitalization and death. An individual with a breakthrough infection is also less likely to transmit measles to others.

Because a large proportion of people in Ontario are vaccinated against measles, we can expect mild cases to occur in this population.

Q7. If vaccinated individuals are still getting sick, why should people continue to get immunized?

A7. Immunization is the best way to protect individuals against measles. Vaccination can prevent illness, including acute severe illness, hospitalization and death, as well as serious and long-term complications from vaccine-preventable diseases, including measles.

Being immunized not only protects the person getting the vaccine, but also helps to protect others who are unable to receive vaccination due to age, pregnancy or immunocompromised.

Q8. What is the treatment for measles?

A8. There is no specific treatment for persons with measles. However, some measures may be taken to reduce the risk of infection among people who have been exposed.

Unimmunized persons over 6 months of age or persons who have received only one dose of measles-containing vaccine and who have been exposed to measles may be protected if they receive a dose of MMR vaccine within 72 hours from exposure.

People who are at high risk (young infants, pregnant people and immunocompromised) can receive immunoglobulin (a substance made from human blood plasma that contains protective antibodies) within 6 days of exposure.

B. Measles Cases in Ontario

Q9. Where can I find the latest information on measles cases in Ontario?

A9. For the most up-to-date case counts and epidemiological summary in Ontario, please visit Public Health Ontario's Measles webpage.

Q10. How is Ontario testing for measles?

A10. Public Health Ontario (PHO) conducts diagnostic testing for measles. Diagnostic laboratory testing is essential for all suspected measles cases and should include both measles virus detection by polymerase chain reaction (PCR) in nasopharyngeal/throat swab **AND** urine as well as diagnostic serology (acute and convalescent whole blood or serum specimens). In preparation for the potential increase in measles cases under investigation across the province, Public Health Ontario's laboratory has taken measures to expand testing capacity to ensure efficient and timely reporting of results. For more information, refer to PHO's Test Information Index webpage.

Q11. Is there risk of increasing measles activity in Ontario?

A11. Measles cases in Ontario have primarily been associated with travel (often referred to as "measles importations"), meaning measles was acquired outside of Canada.

The contagious nature of the measles virus combined with increased global travel, the decrease in childhood measles immunization coverage during the pandemic and increased vaccine hesitancy, may increase the risk of measles spread in Ontario.

Public Health Ontario is monitoring measles cases in Ontario, and outbreaks in other jurisdictions. All measles cases in Ontario are thoroughly investigated to identify the likely source of infection (such as travel or linkages with recent cases).

Q12. How could the rising rates of measles internationally impact people in Ontario?

A12. Although measles has been eliminated (i.e., no longer circulates on a regular basis) in Canada, travel-related cases continue to occur. In Canada, measles is most common in people without immunity who travel to countries where measles is circulating and then are diagnosed when they return home.

The increased level of measles activity currently in the U.S., U.K., Europe and elsewhere is an important reminder of the risk of measles and the importance of vaccination in preventing infection.

People in Ontario who are planning to travel outside of Canada are encouraged to review their family's immunizations now to ensure they are fully protected against measles before their travel. Please refer Table 2: Eligibility Criteria for Publicly Funded Measles Vaccine in Ontario in Q15 for recommendations for measles immunizations.

Q13. How many measles cases were reported in Ontario in 2023?

A13. In 2023, there were seven laboratory-confirmed cases of measles reported in Ontario. You can find data on 2023 measles cases in Ontario in Public Health Ontario's Diseases of Public Health Significance Cases Surveillance Report.

C. Ontario's Publicly Funded Measles Immunization Program (General)

A14. What is the history of the publicly funded immunization schedule for measles vaccine in Ontario?

A14. In Ontario, publicly funded measles vaccine program eligibility has changed over time. The number of doses of measles vaccine that an individual may have received is generally dependent on their birth year. Individuals born:

- Between 1967 and 1976, would have received one dose of measles containing vaccine (given on or after the first birthday).
- On or after 1977, would have received two doses of measles containing vaccine (given on or after the first birthday.)

Generally, adults born before 1970 are presumed to have acquired immunity from past exposure to the measles virus. See Q16 for additional information.

Table 1 below details the history of the publicly funded measles immunization program in Ontario and can be used to determine how many doses of measles vaccine an individual may have received.

Table 1: Historical Publicly Funded Measles Immunization Program in Ontario

Program Year	Measles Vaccine and Immunization Schedule
1967-1969	• 1 dose of killed (combined) measles vaccine followed by 1 dose of live attenuated measles vaccine, both given at less than 1 year of age • 1 dose of live attenuated measles vaccine given at 1 to 6 years of age
1970-1972	• 1 dose of live attenuated measles vaccine given at 1 to 6 years of age
1972-1975	• 1 dose of live attenuated MR vaccine given at 1 to 6 years of age
1975-1996	• 1 dose of live attenuated MMR vaccine given at 1 to 6 years of age
Feb-Jun 1996	• 2nd dose of live attenuated measles vaccine was given to individuals born from 1977 to 1992 (catch-up program)

Program Year	Measles Vaccine and Immunization Schedule
1996-2004	• 1st dose of MMR vaccine given at 1 year of age • 2nd dose of MMR vaccine introduced for children 4 to 6 years of age
2005-2011	• 1st dose of MMR vaccine given at 1 year of age • 2nd dose of MMR vaccine changed to 18 months of age
2011-current	• 1st dose of MMR vaccine given at 1 year of age • 2nd dose with MMRV vaccine changed to 4 to 6 years of age

MR = combined measles and rubella vaccine
MMR = combined measles, mumps and rubella vaccine
MMRV = combined measles, mumps, rubella and varicella vaccine

Q15. Who is eligible to receive publicly funded measles vaccine in Ontario?

A15. Table 2 below outlines current eligibility criteria for publicly funded measles-containing vaccines for those who are unimmunized or without documentation of immunization:

Table 2: Eligibility Criteria for Publicly Funded Measles Vaccine in Ontario

Age	Recommended doses	Eligibility criteria
6 to 11 months	1 dose	• Travelling to areas with increased measles transmission. • Two additional doses are required on or after the first birthday, see row below.
1 to 17 years	2 doses	• Routinely given at: o 1 year of age (1st dose as MMR) and o 4 to 6 years of age (2nd dose as MMRV)
18 years+	1 or 2 doses	• A 2nd dose can be given: o based on the health care provider's clinical judgement o to health care workers o to post-secondary students o to individuals travelling to areas with increased measles transmission

Q16. What is the optimal timing of the 4 to 6 year dose of MMRV vaccine?

A16. The optimal timing for the 4 to 6 year booster dose is at 4 years of age. This is especially important if a child is attending child care or school.

Q17. Why are individuals born prior to 1970 considered immune to measles? Can they safely receive MMR vaccine?

A17. Prior to 1970, measles was widely circulating and therefore most individuals would have been naturally exposed to the virus and developed antibodies against measles. However, some of these people may still be susceptible.

As per Table 2: Eligibility Criteria for Publicly Funded Measles Vaccine in Ontario in Q15 above, all adults, even those born before 1970, are eligible for a dose of publicly funded MMR vaccine, and on a case-by-case basis, possibly a second dose.

Q18. How can individuals locate their immunization record?

A18. Individuals who are unable to locate their personal immunization record (yellow card) can contact either:

The local public health unit where they attended elementary and/or secondary school. Public health units are required to retain immunizations records for approximately 10 years after students have left secondary school.

The health care provider(s) who administered their vaccines. For adult patients, health care providers are required to retain medical records for 10 years from the date of the last entry in the medical record. For patients who were children at the date of last entry in the medical record, health care providers are required to retain medical records until 10 years after the day on which the individual reaches 18 years of age.

Q19. What should individuals do if they are unsure if they are immunized and unable to locate their immunization record?

A19. If the immunization record cannot be retrieved, individuals who lack documentation of immunization may be considered unimmunized and be started on an immunization schedule that is appropriate for their age and risk factors as indicated in Q15 above, per discussion and advice from a health care provider.

It is safe to give an additional dose(s) of MMR vaccine to those who are already immune. Adverse effects of repeated immunization with combined measles-mumps-rubella (MMR) vaccine with or without varicella vaccine have not been demonstrated, regardless of prior disease or receipt of the vaccine. People who develop a serious reaction after administration of a specific vaccine, should be assessed by their health care provider before they receive additional doses of those vaccines.

Q20. Should an individual get serologic testing to determine immunity?

A20. In general, serologic testing is not recommended either before or after receiving measles-containing vaccine. This avoids the potential for false positive results and reduces the risk of missed opportunities for immunization. There is no evidence that giving a dose of

measles-containing vaccine to an immune individual is harmful (adverse events occur less frequently after the second dose), thus there is no need to perform serologic testing prior to administering the vaccine.

Q21. If an individual is fully immunized, do they need a "booster" dose?

A21. The National Advisory Committee on Immunization (NACI) does not recommend re-immunization with measles-containing vaccine after age and risk appropriate vaccination. Furthermore, NACI indicates that the efficacy of a single dose of measles vaccine given at 12 or 15 months of age is estimated to be 85% to 95%. With a second dose, efficacy is almost 100%.

MMR and MMRV vaccines are very effective at protecting people against measles and preventing the complications caused by this disease. The US Center for Disease Control and Prevention (CDC) indicates that people who have received age-and risk-appropriate measles vaccinations, given at minimum vaccine intervals between doses, are usually considered protected for life against measles.

Q22. What should be the focus of vaccination activities at this time?

A22. The focus of vaccination should be on children, especially those younger than 5 years of age as they are at highest risk of measles complications. As indicated in Q16, children should optimally receive their second dose of measles containing vaccine at 4 years of age. As a result, children 4 years of age and older who have not received their second dose should be immunized as soon as possible so they can be protected. According to the Publicly Funded Immunization Schedules for Ontario, children are considered overdue for measles vaccination at 7 years of age and older.

As a secondary focus, measles containing vaccines should be offered to individuals at higher risk for measles exposure including those travelling to areas with increased measles transmission, health care workers and post-secondary students.

Q23. How long after receiving the 1st dose of MMR vaccine does it take to develop protective immunity?

A.23. In general, as with other vaccines, immunity following MMR vaccination takes approximately two weeks.

D. Measles Immunization Requirements

Q24. What are the measles immunization requirements for children attending licenced child care facilities and schools?

A24. The measles immunization requirements for children attending licenced child care facilities and schools are outlined below:

Children attending licenced child care facilities: Immunization recommendations made by local medical officers of health follow, at minimum, the Publicly Funded Immunization Schedules for Ontario. Specifically pertaining to measles, this means that children are required to have received one dose of measles-containing vaccine on or shortly after their first birthday, and a second dose between 4-6 years of age.

Children attending schools: Two doses of measles-containing vaccine are required to attend school. The first dose must be given on or shortly after their first birthday, and the second dose given when the child is between 4-6 years of age, or in the context of a high-risk scenario (i.e., travel to areas with increased measles transmission or following measles exposure) at least 4 or 6 weeks (depending on vaccine) following the first dose.

However, a parent/guardian can submit an exemption if they object to the immunization on the grounds that the immunization conflicts with the sincerely held convictions of the parent/guardian based on their religion or conscience beliefs or a legally qualified medical practitioner gives medical reasons in writing as to why the person should not be immunized.

Q25. Are parents/caregivers required to report their child's immunization records?

A25. Parents/caregivers are required to report their child's updated immunization records to the local public health unit.

After their child receives any immunization, parents/caregivers should ensure the personal immunization record, or "Yellow Card", is updated, and report the updated immunization records using the Immunization Connect Ontario (ICON) tool, accessed through their local public health unit's website.

Vaccination records in ICON can be accessed at any time, and an electronic "Yellow Card" can be generated when proof of vaccination is required.

Q26. What are the measles immunization requirements for child care workers and teachers?

A26. The measles immunization requirements for child care workers and teachers are outlined below:

Child care workers: The *Child Care and Early Years Act*, section 57 stipulates that every operator of a child care centre must ensure that, before commencing employment, each person employed has a health and immunization assessment as recommended by the local medical officer of health. For private-home child care agencies, operators must ensure that each person in charge of a location and each person who is ordinarily a resident of the premises or regularly at the premises and every volunteer or student who is on an educational placement at the premises has a health assessment and immunizations as recommended by the local medical officer of health. This, however, does not apply where the person objects in writing to the immunization on the ground that the immunization

conflicts with the sincerely held convictions of the person based on the person's religion or conscience beliefs or a legally qualified medical practitioner gives medical reasons in writing to the operator as to why the person should not be immunized.

Teachers: There are no legal immunization requirements for teachers under the *Education Act*, although individual schools or school boards may have their own workplace immunization policies.

The local medical officer of health can impose exclusion orders under the *Health Protection and Promotion Act* for teachers and child care employees if there is an outbreak, or an immediate risk of an outbreak of a designated disease in the school/child care at which the child attends. See Section G (Exclusions) below.

Q27. What are the measles immunization requirements for health care workers?

A27. Many health care facilities, such as hospitals and long-term care homes, have an immunization policy requirement regarding health care worker and staff vaccinations. Healthcare workers within health care facilities may already be required to show proof of immunization or evidence of immunity for certain diseases such as measles, rubella and varicella. Individuals should speak with their employer to determine immunization requirements.

It is recommended that all health care workers be immune to measles. Health care workers, regardless of their year of birth, who do not meet the definition of measles immunity (refer to NACI's Table 1 for Criteria for measles immunity) should receive 2 doses of MMR.

Q28. Where can I find information regarding travel immunization recommendations for measles?

A28. Travel Health Notices can be found on the Government of Canada's website.

Individuals travelling to areas outside of Canada where there is increased measles transmission and who are unimmunized, or do not have documentation of immunization, are eligible to receive MMR vaccine. Please see Q15 (Table 2: Eligibility Criteria for Publicly Funded Measles Vaccine in Ontario) above.

E.Case and Contact Management

Q29. Why is measles contact management complex?

A29. Contact management is complex as there are a number of factors that need to be considered, including whether the exposed individual is high or low risk (e.g., high risk are those who are more likely to have complications from measles, including individuals who are under one year of age, immunocompromised or pregnant), the contact's susceptibility (e.g., vaccination history, laboratory evidence of immunity, past history of disease), the

intensity of exposure (e.g., a household member would have highest intensity) and the exposure environment (e.g., a mall versus an emergency department). For more information on measles case and contact management, see Measles Appendix 1: Case Definitions and Disease Specific Information,.

Q30. If an individual is born prior to 1970 and is a contact of a measles case, should any public health action be considered?

A30. Note that health care workers, regardless of the year they are born, should have two documented doses of measles-containing vaccine or serological confirmation of immunity to continue working. See Q36 for further details regarding health care workers as a contact of measles.

Although adults born before 1970 are generally presumed to have acquired natural immunity to measles, the type of exposure, the timing of the exposure, the susceptibility of the contact (if known), the health status of the contact, and their occupation should be considered to determine if they should receive publicly funded vaccine.

In some circumstances a dose of MMR vaccine would be warranted (e.g., an immunocompetent household contact of a measles case with unknown vaccine history and identified within 72 hours of exposure). There is no harm in giving these individuals a dose of MMR vaccine.

Q31. What instruction should be provided regarding self-isolation of cases, such as staying away from unimmunized (especially pregnant) women, babies, or people with impaired immunity?

A31. Individuals diagnosed with measles should be advised to stay home (self-isolate from: child care settings, schools, post-secondary educational institutions, work places, places of worship, sporting events, health care and other group settings; and away from non-household contacts) for 4 days after the appearance of the rash. This applies to all cases, regardless of their vaccination history. Self-isolation will help to prevent further transmission of the virus.

Persons under investigation may also be asked to self-isolate from all public places during the period of communicability if there is a high degree of suspicion for measles. Initiation of control measures do not need to await laboratory confirmation of the case.

F.Post-Exposure Prophylaxis (PEP)

Q32. Who should receive immunoglobulin (Ig) as part of PEP?

A32. The timely administration of immunoglobulin (Ig) can be used to reduce the risk of infection in susceptible individuals exposed to measles. Ig is indicated for

immunocompromised people, susceptible pregnant women and infants less than 6 months of age as MMR vaccine is contraindicated in these individuals. Please refer to the Measles Appendix 1: Case Definitions and Disease Specific Information, of the Infectious Diseases Protocol for guidance with respect to administration of Ig for PEP.

Q33. Should serology be done prior to providing immunoglobulin (Ig) to susceptible contacts?

A33. The routine ordering of measles serology prior to the administration of Ig to susceptible contacts is currently not recommended in Ontario. However, in the case of pregnant women, measles serology may have been completed as part of prenatal care and if so, may assist with decision making.

Q34. Can any measles-containing vaccine be used for post exposure prophylaxis?

A34. We recommend the use of MMR vaccine as there is evidence to show that when it is given within 72 hours of exposure it can modify/prevent measles disease. Although there is no evidence for the use of MMRV vaccine for PEP, MMRV vaccine is also likely to provide protection.

G. Exclusion of Contacts

Q35. When should a child be excluded from school (elementary, secondary, private) or child care?

A35. At the discretion of the medical officer of health, susceptible contacts may be excluded from licensed child care settings and schools when they have been in contact with a case of measles AND they have no history of being immunized (prior to exposure) with MMR vaccine.

If exclusions occur, the period of exclusion should extend from the 5th day after the first exposure to the 21st day after the last exposure.

Some children will receive their first dose of MMR vaccine as PEP. In general, contacts with 1 dose of vaccine should be excluded from school or licensed child care settings (at the discretion of the medical officer of health) until they receive a second dose of measles-containing vaccine. Children can return to school/child care setting immediately following the receipt of their second dose, even if it is more than 72 hours after exposure.

Children who are completely unimmunized and do not receive a dose of MMR vaccine as PEP, should be excluded from 5 days after the first exposure to 21 days after the last exposure.

School closures due to outbreaks of infectious diseases are exceedingly rare. Masking in schools to prevent the spread of measles is not recommended.

Q36. When should post-secondary school students be excluded from their learning institution?

A36. Optimal protection against measles occurs with two doses of measles containing vaccine. Individuals with fewer than two doses of vaccine can be infected with measles and transmit it to others. Students who have been in contact with a case of measles AND who have no history of being immunized (prior to exposure) with MMR vaccine should be offered MMR vaccine and advised of their risk of spreading infection and can be excluded at the discretion of the medical officer of health.

Q37. When should a teacher or child care centre employee be excluded from the classroom?

A37. Teachers or child care centre employees should be excluded from school or child care when they have been in contact with a case of measles AND they are born in 1970 or later with no history of being immunized (prior to exposure) with any doses of MMR vaccine. If exclusions occur, the period of exclusion should extend from 5 days after the first exposure to 21 days after the last exposure, or until the individual is immunized as detailed below.

If a teacher or child care centre employee contact has only received one dose of MMR vaccine in the past, they can go back to work as soon as they have received a second dose.

Some teachers or child care centre employees will receive their first dose of MMR vaccine as PEP after they have been in contact with a measles case. In general, they should be excluded from school or child care until their incubation period of 21 days is over or after they have received a second dose of MMR vaccine (28 days after the first dose), whichever period is shorter, at the discretion of the medical officer of health.

Teachers or day care employees who are completely unimmunized and do not wish to have a dose of MMR vaccine as PEP, should be excluded from 5 days after the first exposure to 21 days after the last exposure and there are no more suspected measles cases in their school or day care. Serological testing can be offered at the discretion of the medical officer of health.

Q38.When should health care workers, regardless of year of birth, be excluded from work? When can they return to work?

A38. Health care workers, regardless of year of birth, should be excluded from work if:

- They have measles. They may return to work after they are no longer infectious (4 days after rash onset).
- They are a contact to a measles case and are unimmunized or have no proof of immunity. These individuals should be excluded from 5 days after the first exposure to 21 days after the last exposure. They should also be offered an MMR vaccine series.
- They are a contact to a measles case, have only received one dose of MMR

vaccine and do not wish to have a second dose of MMR vaccine. These individuals should be excluded from 5 days after the first exposure to 21 days after the last exposure.

- They have just received a second dose of MMR vaccine and their serology does not indicate immunity to measles. These individuals should be excluded from day 5 after exposure to 21 days after exposure or until proof of immunity is demonstrated.

H. Immunoglobulin (Ig)

Q39. How can immunoglobulin (Ig) be accessed?

A39. If Ig is indicated for an individual, the usual process is that hospitals order the product through Canadian Blood Services (CBS) and it is administered by the health care provider, as opposed to the health unit. CBS carries multiple manufacturers brands of Ig available for IMIg and intravenous infusion (IVIg). Both products are available through local hospitals' Transfusions Medicine Laboratories. IVIg can only be ordered by hospital-based providers using the appropriate (non-Neurology) Ministry of Health Ig Request form, as it requires in-hospital administration and active patient monitoring over several hours of infusion. ORBCoN and the Ministry of Health are aware of NACI's recommendation for the use of IVIg for measles PEP and plans to add measles PEP to Ontario's IG Utilization Management Guidelines in a future update.

Hospitals that have questions can refer to the Hospital Services section on the CBS website at https://www.blood.ca/en/hospital-services. Public health units that have questions regarding the supply of Ig in relation to measles, should contact their local hospital blood bank.

I. Personal Protective Equipment

Q40. Are there masking requirements to protect individuals and prevent the spread of measles?

A40. Health care workers should use Airborne Precautions, including wearing a fit-tested, seal-checked N95 respirator (or equivalent) when evaluating suspected measles patients or caring for patients with a confirmed case of measles, regardless of their vaccination status.

Individuals who have symptoms of measles or have been exposed to the virus should isolate themselves and call a health care provider immediately. If it is recommended, they be seen in person, they should wear a tight-fitting, well-constructed mask and limit contact with others, if possible.

Q41. How can health care providers order N95 respirators or other Personal Protective Equipment (PPE)?

A41. N95 respirators and other Personal Protective Equipment (PPE) in the provincial stockpile are available to health care providers through the Supply Ontario PPE Supply Portal. For access to the PPE Supply Portal, please contact SupplyChain.Inquiries@ontario.ca. Note that orders placed in the PPE Supply Portal are monitored and orders are processed Monday-Friday during regular business hours.

Q42. Is masking recommended for the general population to protect against measles?

A42. No. The best protection against measles is vaccination per the Publicly Funded Immunization Schedules for Ontario.

Individuals who have symptoms of measles or have been exposed to the virus should isolate themselves and call a health care provider immediately. If it is recommended, they be seen in person, they should wear a tight-fitting, well-constructed mask and limit contact with others, if possible.