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AT A GLANCE

Measles: Post-Exposure Prophylaxis for Contacts

1st Revision: March 2025

Introduction

This document summarizes existing measles post-exposure prophylaxis (PEP) guidance for individuals who have been exposed to measles and are not expected to have measles immunity. It is intended for use by public health units (PHU) and health care providers (HCP). This document has been updated to reflect the 2025 National Advisory Committee on Immunization (NACI) recommendations on measles PEP and the Ontario Immunization Advisory Committee (OIAC) statement on Recommendations on Measles PEP for Individuals with Immunocompromise.[1,2] It is also a companion document to Public Health Ontario's (PHO) At A Glance: Measles Information for Health Care Providers.[3]

For additional information about measles, including surveillance, immunization, testing, and infection control practices, please visit PHO's Measles webpage.

Background

In Ontario, the local PHU is responsible for the follow-up of any measles case, including contact identification and management, which may include recommendations for measles PEP, and/or exclusion from work, school, and other high-risk settings for susceptible contacts.

PEP involves the timely administration of measles, mumps, and rubella (MMR) vaccine or immunoglobulin (Ig) to susceptible individuals following measles exposure. Ig may be administered intramuscularly (IMIg) or intravenously (IVIg), depending on the body weight of the contact. IVIg is generally administered in hospital settings and typically involves coordination with the local PHU and local hospital staff.

The goals of PEP are to lower the risk of infection and reduce the severity of illness if measles infection occurs. Studies examining the effectiveness of measles PEP are small in number and associated with several challenges including small sample sizes, differences in exposure intensity, variation in timing of PEP administration relative to time since exposure, and differences in anti-measles Ig titres and/or dosage of Ig products used.[4-13] Despite this, there are high quality studies demonstrating its impact. For example, a study examining the effectiveness of measles PEP among children during a measles outbreak in New York City in 2013 showed that administration of MMR vaccine within 72 hours or Ig within 6 days of exposure in susceptible children had a reported effectiveness of up to 83.4% and 100%, respectively.[4]

Contact Identification and Management

The local PHU is responsible for contact identification and management; however, PHUs may ask HCPs to help determine a patient's susceptibility to measles and to provide measles vaccine as PEP to known contacts who are patients in their practices.

In addition, PHUs may issue media advisories to inform the public about community locations where individuals may have been exposed to measles. These individuals may present to HCPs to receive advice and may be eligible for measles PEP. Please see PHO's Measles Exposures in Ontario webpage for information on places and dates of exposure to a case a measles.

If an individual presents to a HCP and identifies themselves as having been exposed to measles:

- Assess for signs and symptoms of illness and if present, manage as a suspect case and ensure appropriate infection prevention and control (IPAC) measures are put in place. Please see PHO's Measles IPAC Checklist for Clinics and Specimen Collection Centres for information on IPAC guidance for managing individuals exposed to measles.
- If asymptomatic, review the time since measles exposure, the individual's birth date, and their susceptibility using the criteria for expected measles immunity to determine whether PEP is indicated (see Table 1, Table 2, and Table 3).

  Criteria for Expected Measles Immunity[1]:

  - Immunocompetent individuals born before 1970 are considered immune (except for health care workers)
    - All health care workers require evidence of vaccination with two valid doses of measles-containing vaccine or bloodwork suggestive of immunity (measles IgG positive serology) regardless of year of birth
  - Immunocompetent individuals ≥12 months and born on or after January 1, 1970, are expected to maintain adequate protection against measles (and PEP is not indicated) if they meet any one of the following:
    - Documented evidence of vaccination with two doses of measles-containing vaccine received at 12 months of age and older, and given at least 28 days apart
    - Measles IgG positive serology
    - Documented evidence of past lab-confirmed measles infection
- Provide patient education to watch for signs and symptoms of measles for 21 days following exposure, even if they have received PEP as it is not 100% effective. PHUs may advise a longer period of monitoring of 28 days for individuals with immunocompromising conditions who have received Ig as PEP.

Measles PEP

To reduce the risk of measles, MMR vaccine should be given within 72 hours of exposure to immunocompetent contacts 6 months of age and older who are not expected to have immunity to measles. If MMR vaccine is given to infants <12 months of age, two additional doses of measles-containing vaccine at least 28 days apart are still required on or after the first birthday for long-term protection. If susceptible immunocompetent contacts are identified >72 hours after exposure, MMR vaccine is no longer considered to be PEP; however, the vaccine should still be offered to susceptible contacts 12 months of age and older to provide protection for any future measles exposures.[1]Ig is recommended up to 6 days PEP to susceptible contacts who are at high risk of complications from measles, which include infants under 6 months of age, unvaccinated or under-vaccinated individuals who are pregnant, and individuals who are immunocompromised .[1]

Table 1 and Table 2 provide a summary of measles PEP guidance for immunocompetent contacts and pregnant individuals, respectively. Table 3 provides an overview of measles PEP guidance for individuals who are immunocompromised, which is categorized according to the extent of immunocompromise and the likelihood of maintaining measles immunity from past vaccination or infection. This document provides some examples but does not outline a comprehensive list of immunocompromising conditions. Please refer to NACI and OIAC guidance for further details.[1,2]

HCPs should consult with their local PHU on how to access Ig or for additional guidance.

Table 1: Summary of Measles PEP Guidance for Susceptible Non-pregnant Immunocompetent Contacts[1]

Age	Measles Immunity Status	Time Since Exposure: ≤72 hours (≤3 days)	Time Since Exposure: 73 hours to 6 days
<6 months	Considered non-immune due to age	IMIg (0.5 mL/kg) as soon as possible[a]	IMIg (0.5 mL/kg) as soon as possible[a]
6 – 11 months	Considered non-immune due to age	MMR as soon as possible	IMIg (0.5 mL/kg) as soon as possible[a]
≥12 months and born on or after 1970	Unknown history of vaccination with measles-containing vaccine 0 – 1 dose of measles-containing vaccine	MMR as soon as possible	MMR recommended[b,c]

Notes: IMIg, intramuscular immunoglobulin; IVIg, intravenous immunoglobulin; MMR, measles, mumps, rubella vaccine

[a] If injection volume is a concern, IVIg (400 mg/kg) may be considered

[b] Susceptible immunocompetent non-pregnant individuals 12 months of age and older who are born on/after 1970 are not recommended by NACI to receive Ig PEP due to lower relative risk of disease complications and practical challenges of Ig access and administration.

[c] A measles-containing vaccine is not known to provide protection after 72 hours from exposure; however, starting or completing a two-dose series should not be delayed as it provides long term protection.[1]

Table 2: Summary of Measles PEP Guidance for Susceptible Pregnant Contacts[1]

Measles Immunity Status	Considerations	Time Since Exposure: Up to 6 Days
Unvaccinated or known measles IgG negative serology	Administer measles-containing vaccine series postpartum for future protection	IVIg (400 mg/kg)[a] as soon as possible and within 6 days of exposure. Serological testing is not required.
Unknown history of vaccination or one previous dose of measles-containing vaccine	Consider serological testing if results are expected within 24h of sampling time Administer measles-containing vaccine postpartum for future protection	IVIg (400 mg/kg)[a] as soon as possible and within 6 days of exposure if serology is negative or timely measles serology testing is not available (i.e., results not expected within 24 hours of sampling)

Note: [a] IMIg is no longer recommended for individuals weighing more than 30 kg due to the lack of evidence of the efficacy/effectiveness of IMIg administered at dosages below 0.5 mL/kg. In some circumstances, such as in remote communities, there may be a preference to give IMIg instead of IVIg. More than 15 mL of IMIg can be administered using clinical judgement.[1]

Table 3: Summary of Measles PEP Guidance for Contacts with Immunocompromising Conditions[1,2]

Group	Examples[a]	Considerations	Time Since Exposure: ≤72 hours (≤3 days)	Time Since Exposure: 73 hours to 6 days
Group A: Individuals with an absence or near-absence of a functioning immune system	• Within 12 months of autologous hematopoietic stem cell transplant (HSCT) or 24 months of allogeneic HSCT • Within 12 months of chimeric antigen receptor (CAR) T-cell therapy • Within 12 months of solid organ transplant • For additional conditions, please refer to the NACI and OIAC guidance for more details[1,2]	• Offer PEP regardless of previous vaccination status as soon as possible and within 6 days of exposure • Serological testing is not required • MMR vaccine is contraindicated	IMIg (0.5 mL/kg) if bodyweight <30kg or IVIg (400 mg/kg) if bodyweight ≥30 kg[b]	IMIg (0.5 mL/kg) if bodyweight <30kg or IVIg (400 mg/kg) if bodyweight ≥30 kg[b]
Group B: Individuals who may be able to maintain adequate immunity from past infection or vaccination	• >12 months but <24 months after autologous HSCT • >12 months after solid organ transplant • For additional conditions, please refer to the NACI and OIAC guidance for more details[1,2]	• Measles immunity and need for measles PEP should be examined regardless of year of birth or measles vaccination status • Consider rapid measles serological testing • Ideally, consult the specialist responsible for the clinical care of the individual or an infectious disease expert/ immunologist • If serology is negative or timely measles serology testing is not available, administer PEP as soon as possible and within 6 days of exposure • MMR vaccine is not recommended	IMIg (0.5 mL/kg) if bodyweight <30kg or IVIg (400 mg/kg) if bodyweight ≥30 kg[b]	IMIg (0.5 mL/kg) if bodyweight <30kg or IVIg (400 mg/kg) if bodyweight ≥30 kg[b]

Group	Examples[a]	Considerations	Time Since Exposure: ≤72 hours (≤3 days)	Time Since Exposure: 73 hours to 6 days
Group C: Susceptible individuals with only low-level immunosuppression or only mild immunocompromising conditions	• >24 months following HSCT with no chronic graft-versus-host disease • Minor B cell deficiency with intact T cell function not requiring Ig therapy, partial T cell defects, and other primary immune deficiencies or inborn error of immunity for which live viral vaccines are not contraindicated • For additional conditions, please refer to the NACI and OIAC guidance for more details[1,2]	• For HSCT recipients, assume individual is susceptible unless vaccinated post HSCT and have adequate measles antibody titres • For all others, assess susceptibility using the criteria for expected measles immunity • If susceptible, provide PEP as soon as possible • PEP is not recommended for those who are expected to have measles immunity	MMR[c]	MMR recommended[d]

Notes: CAR, chimeric antigen receptor; HIV, human immunodeficiency virus; HSCT, hematopoietic stem cell transplant; IL, interleukin; IMIg, intramuscular immunoglobulin; IVIg, intravenous immunoglobulin; JAK, Janus kinase; MMR, measles, mumps, rubella vaccine; PEP, post-exposure prophylaxis

[a] This guidance document does not provide a comprehensive list of immunocompromising medical conditions or therapies. Please refer to NACI and OIAC guidance for more details.[1,2]

[b] Please refer to NACI guidance for additional details regarding the use and administration of IMIg as measles PEP.[1]

[c] Individuals with low-level immunosuppression are managed similarly to immunocompetent contacts who are not recommended to receive Ig as measles post-exposure prophylaxis unless they are under the age of 12 months or susceptible pregnant individuals.

[d] A measles-containing vaccine is not known to provide protection after 72 hours from exposure; however, starting or completing a two-dose series should not be delayed as it provides long term protection.[1]

Other Considerations Regarding the Use of Ig as Measles PEP

Contraindications to Ig

Ig is contraindicated in people who have any of the following:

- A hypersensitivity to Ig or to any ingredient in the formulation of the product.
- Isolated immunoglobulin A (IgA) deficiency. These people have the potential for developing antibodies to IgA and may have anaphylactic reactions to subsequent administration of blood products that contain IgA.
- Severe thrombocytopenia or any coagulation disorder that would contraindicate IM injections.
- A history of anaphylactic reaction to a previous dose of Ig.[15,16]

Vaccinations Following Ig as PEP

Vaccination with live attenuated vaccines (MMR, MMRV, and monovalent varicella) should be delayed after the receipt of Ig preparations using an interval of 6 months following IMIg at 0.5 ml/kg and using an interval of 8 months following IVIg at 400 mg/kg.[17]

There is no need to delay other routine vaccinations, including oral rotavirus vaccine, following the receipt of Ig for measles PEP.[17]

Infants who receive Ig PEP require two doses of measles-containing vaccine for long-term protection. Doses should be at least 28 days apart, given after the first birthday, and after the appropriate interval following receipt of Ig.[17]

Susceptible immunocompetent pregnant individuals given Ig PEP should start or complete their MMR vaccine series postpartum to ensure long-term protection, after the appropriate interval following receipt of Ig.[1]

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Summary of Revisions

Changes in this revision are summarized in the table below.

Date of Implementation	Description of Major Changes	Page
March 18, 2025	Updated summary of measles PEP guidance for susceptible pregnant contacts	4
March 18, 2025	Updated and expanded summary of measles PEP guidance for contacts with immunocompromising conditions	5

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Measles: post-exposure prophylaxis for contacts. 1st revision. Toronto, ON: King's Printer for Ontario; 2025.

ISBN: 978-1-4868-8243-4

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Publication History

Published: 2024

1st Revision: March 2025

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