Measles: Information for Healthcare Providers

March 13, 2024

Interim

March 10, 2024

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MEASLES: INFORMATION FOR HEALTHCARE PROVIDERS

The Public Health Protection and Promotion Act requires any cases of measles to be reported to Communicable Disease Control by telephone as soon as measles is SUSPECTED. Following reporting via telephone, a written report is required within 24 hours.

- **Notifiable Disease and Notification Form**

ZONAL TELEPHONE NUMBERS (MONDAY-FRIDAY 8:30AM-4:30PM)				
Eastern Health (709) 752-4358	Central Health (709) 571-2183 or (709) 422-1740	Western Health (709) 643-1830	Labrador-Grenfell Health (North) (709) 897-3110	Labrador-Grenfell Health (709) 285-8410
URGENT AFTER HOURS AND WEEKENDS CONTACT MOH ON-CALL: 1-866-270-7437				

MEASLES TRANSMISSION CHARACTERISTICS

Pathogen: Measles is a highly infectious disease caused by the measles (rubeola) virus, a member of the *Paramyxoviridae* family.

Modes of transmission: Airborne precautions required for suspect or confirmed measles cases.

- airborne by aerosol and droplet spread such as when infected person breathes, coughs, sneezes or talks. Measles can persist in air or on surfaces for up to 2 hours after an infected person has left the space.
- direct contact with nasal or throat secretions of infected persons
- direct contact with articles freshly soiled with nose and throat secretions.

Incubation Period (defined as period from infection to symptom onset):

- 10 days from exposure to onset of prodromal symptoms (ranging from 7-18 days)
- Interval from infection to appearance of rash on average is 14 days (up to 21 days) or about 3 to 7 days after prodromal symptoms begin.

Communicable Period (defined as the time when an infectious agent can be transmitted directly or indirectly from an infected person to another susceptible person):

- Infected person is contagious from 1 day before onset of prodromal period (usually about 4 days before rash onset) to 4 days after rash appearance[1].

CASE DEFINITIONS

CASE STATUS	CRITERIA
Confirmed Case	Laboratory confirmation of infection in the absence of immunization with measles-containing vaccine within the last 12 days*: • isolation of measles virus from an appropriate clinical specimen **or** • detection of measles virus RNA **or** • seroconversion or a significant (e.g., fourfold or greater) rise in measles IgG titer by any standard serologic assay between acute and convalescent sera. **or** • positive serologic test for measles IgM antibody in a person who is either epidemiologically linked to a laboratory-confirmed case or has recently travelled to an area of known measles activity. **or** • Clinical illness (see **Clinical Presentation** section) in a person with an epidemiologic link to a laboratory-confirmed case
Probable Case	Clinical illness • in the absence of appropriate laboratory tests **or** • in the absence of an epidemiologic link to a laboratory-confirmed case **or** • in a person who has recently travelled to an area of known measles activity

Notes:

* The most frequent reaction to measles-mumps-rubella (MMR) immunization is malaise and fever (with or without rash) occurring 7 to 12 days after immunization. However, this should be determined for each case, as these reactions and the time frame can vary. Clinical illness is characterized by all of the following: Fever ≥38.3°C, cough, coryza or conjunctivitis and generalized maculopapular rash for at least 3 days[2]

CLINICAL PRESENTATION

Prodromal symptoms of measles begin 7 to 21 days after infection and includes:

- fever
- malaise
- cough
- coryza (runny nose)
- conjunctivitis

Koplik spots (white spots on the buccal mucosa) are a pathognomonic enanthema for measles and may appear 2 to 3 days after symptoms begin.

Image 1 on the right shows the white Koplik spots found classically in the buccal mucosa of the inner mouth.

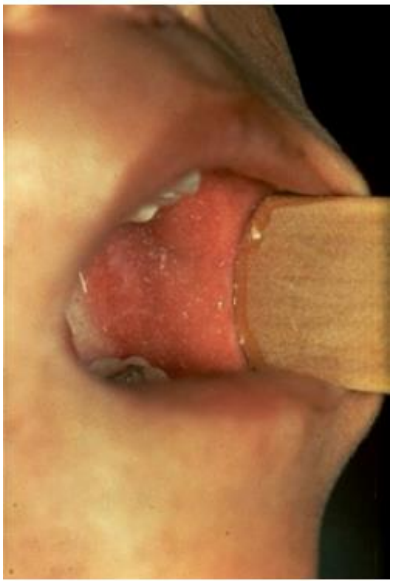
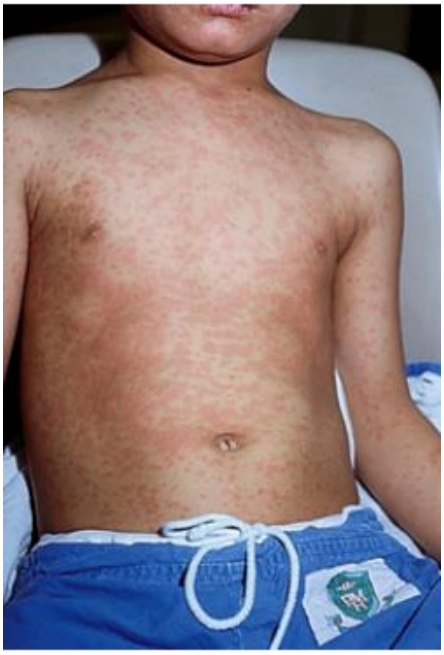


Image 1: Courtesy of the U.S. Centers for Disease Control and Prevention.



(Image 2: Courtesy of Dr. CW Leung, Department of Paediatrics and Adolescent Medicine, Princess Margaret Hospital, Hong Kong.)

Measles Rash:

- Begins on the face, advancing to the trunk of the body and then to the arms and legs
- Appears macular or maculopapular (fine, flat or slightly raised) and becomes confluent as it progresses, giving it a red, blotchy appearance at its peak. In mild cases, the rash tends not to be confluent. However, in severe cases, the rash is more confluent, and the skin may be completely covered.
- Lasts 4 to 7 days.
- A slight desquamation or peeling of the skin occurs as the rash clears[1].

Image 2: Measles rash: a generalized maculopapular rash on the chest and abdomen of a child.

Risk factors

All persons who have not had a previous measles infection or who are unvaccinated or under-vaccinated for measles are at risk. However, some protection can be provided to young babies because of antibody transfer during pregnancy. In Canada, adults born before 1970 are generally presumed to have acquired immunity due to infection with measles when they were younger. This is due to the high level of measles circulation before 1970. However, measles vaccination is still recommended for certain groups even if born before 1970.

Risk factors for exposure include:

- health care providers
- members of the military
- people planning travel to measles endemic regions or regions experiencing measles outbreaks.
- those who attend post-secondary educational settings.

Risk factors for complications:

- people who are pregnant
- those less than 5 years of age
- people who are immunocompromised

Complications

Common complications from measles can include:

- otitis media (1 of every 10 cases)
- bronchopneumonia (1 of every 10 cases)
- diarrhea (less than 1 of every 10 cases)

Severe complications of measles can include:

- respiratory failure
- encephalitis that may result in permanent neurologic sequelae.
    - occurs in approximately 1 of every 1,000 reported cases.
- Death mainly due to a respiratory or neurologic complication
    - estimated to occur in 1 to 3 of every 1,000 cases of measles.

Long-term sequelae of measles can include:

- blindness
- deafness
- permanent neurological sequelae
- subacute sclerosing panencephalitis (SSPE)

SSPE is a rare and fatal degenerative central nervous system disease. It is characterized by:

- behavioral and intellectual deterioration
- seizures
- these changes occur 7 to 10 years after infection with the measles virus.
- occurs at a rate of 4 to 11 in every 100,000 measles cases, with the highest rates in children infected before 2 years of age.

Measles during pregnancy results in a higher risk of:

- low birth weight
- premature labour
- spontaneous abortion[1]

DIAGNOSIS OF MEASLES

Health care providers should suspect measles in a patient presenting with a:

- febrile illness and rash
- history suggesting that they are not immune to measles, particularly if they:
    - have travelled to a measles endemic region or regions experiencing measles outbreaks.
    - are known to have had an epidemiologic link to a confirmed measles case or outbreak.

Diagnosing measles requires measles-specific testing using RT-PCR detection of measles virus RNA and/or serology testing to detect anti-measles antibodies. Please see Provincial Public Health Laboratory Network Guidance for Measles Laboratory testing. (Also on page 9)

Measles RT-PCR: Most sensitive when collected 3 days after rash onset.

Nasopharyngeal or throat swab specimens are generally more sensitive than urine specimens for the detection of measles virus RNA. **However, it is recommended to send both nasopharyngeal or throat swab and urine for measles RT-PCR to improve the likelihood of measles virus RNA detection if it is present.**

Collection of specimens for viral detection (RT-PCR) is recommended in addition to IgM testing. Viral detection is also used for genotyping, which can help determine the source of infection to support surveillance that is necessary to monitor measles elimination status.

Specimens accepted for Measles RT-PCR:

- nasopharyngeal or throat swab collected **within 7 days of rash appearance**
- urine for viral detection collected **within 14 days from rash appearance**

Measles serology: Measles IgG and IgM can be tested if it is **over 3 days from rash onset but if non-reactive will need repeat serology in 7 to 10 days**

Serological testing may be indicated to confirm the diagnosis of measles with measles IgM or to determine immune status with measles IgG. Serological testing is **not** recommended to check:

- susceptibility before measles vaccination
- response after receiving measles vaccination.

Note: Immunoglobulin M (IgM) for measles can be falsely negative if taken less than 3 days after onset of the rash. If results are negative, serology should be repeated 7 to 10 days after the onset of the rash. In addition, the positive predictive value of IgM testing is reduced due to the low prevalence of measles in the community[1].

PROVINCIAL PUBLIC HEALTH LABORATORY NETWORK
Dr. LA Miller Centre, 100 Forest Road, St. John's, NL A1A 3Z9 (709) 777-7233 www.publichealthlab.ca

GUIDANCE FOR MEASLES LABORATORY TESTING

Measles is a highly contagious acute febrile rash illness caused by measles virus that is a RNA virus. Measles is characterized by a generalized maculopapular rash after a prodrome of fever, malaise, cough, coryza and conjunctivitis. The rush usually appears about 14 days after a person is exposed. It typically begins on the face, advances to the trunk and then to the arms and legs. The rush lasts 4 to 7 days. Patients are considered to be contagious from 4 days before to 4 days after the rash appears.

Healthcare providers should consider measles as differential diagnosis in patients presenting with febrile rash illness and clinically compatible symptoms, especially if the person recently traveled internationally or was exposed to someone with febrile rash illness. Measles is diagnosed using the **measles-specific testing** by using PCR detection of measles virus RNA and/or serology testing of anti-measles antibodies.

Measles-Specific Testing:

Test Request	Sample Type	Collection Kit	Store and Shipping Condition
Measles qRT-PCR*	Nasopharyngeal or throat swab** (within 7 days of rash appearance)	AllTM or VTM or UTM	This is a send-out to the national microbiology laboratory (NML). Immediately after collection, store the swabs @ 2-8°C and ship on ice pack for arrival at the lab within 48 hours from collection. Otherwise, freeze at -20°C or lower and ship frozen on dry ice.
	Urine (within 14 days of rash appearance)	Sterile, leak-proof container (10-50 ml)	This is a send-out to the national microbiology laboratory (NML) after sample is processed at the PHML. Store at 4°C and ship on ice pack. Do not freeze urine.
Measles IgG and IgM***	Serum (>3 days after rash appearance)	SST (red-top tube)	This is performed at the PHML. Store @4°C and ship on ice pack for arrival at the PHML within 3 days of collection. Otherwise, freeze (-20°C or below) and ship frozen on dry ice.

*** Nasopharyngeal or throat swabs are preferred over urine specimens.**

**** Detection of measles RNA is most sensitive when specimens are collected on the first to three days of rash appearance. Detection of measles RNA may be successful as late as 10-14 days after rash onset. Collection of both a respiratory (NP or throat swab) and urine sample increases the likelihood of detecting the viral RNA.**

***** If the acute blood sample within 7 days of rash onset shows low reactive, indeterminate or non-reactive IgG and/or IgM results, a convalescent sample (7-10 days after the acute) should be collected.**

TREATMENT

There is no specific antiviral treatment for measles infection. Medical management is supportive and aimed at symptom relief and management of complications. This can include rehydration and management of secondary complications of measles, such as bacterial pneumonia.

As vitamin A deficiency is linked to delayed recovery and greater complications with measles, and because measles may precipitate a vitamin A deficiency, health care providers may consider giving vitamin A. The World Health Organization (WHO) recommends children diagnosed with measles be given 2 doses of vitamin A supplements. Dosing information can be found in the WHO position paper found here:

- **Measles vaccines: April 2017 position paper (World Health Organization)**[1]

Patient Counselling

Counsel patients to:

- Practice good hand hygiene
- Avoid sharing drinking glasses or utensils.
- Cover coughs and sneezes with tissue or forearm
- Follow public health advisories regarding exclusion policies.
    - Confirmed cases will be advised to stay home.
    - Self-isolate from childcare facilities, schools, post-secondary educational institutions, workplaces, healthcare, and other group settings and away from non-household contacts for 4 days after appearance of rash
    - These exclusion policies apply whether the individual is vaccinated or not.

MEASLES PREVENTION THROUGH VACCINATION

The live attenuated measles vaccine came into limited use in 1964 and public health programs adopted it in each province over the next 4 to 5 years[3]. Due to the high number of cases in Canada before 1970, people born before 1970 are presumed to be immune.

History of Measles-containing vaccines in Newfoundland and Labrador (NL)

Measles, plain (Lirugen)	Given to all 9-month-old infants from February 1966 to September 1970. Given to all one-year-old children from September 1970 to October 1972.
Measles and Rubella (MR)	This vaccine replaced plain measles-containing vaccine. It was given from October 1972 to December 1974 for all one-year-old children. May have been given before the first birthday.
Measles, Mumps and Rubella (MMR)	This vaccine replaced MR. Program began in December 1974 and MMR may have been given to children less than one year of age, although the recommended age is one year. In 1996 a 2nd dose was added at 18 months. People born 1983 and after should have received 2 doses of MMR because of a school catch-up that started in 1999. The MMR vaccine was no longer used for childhood programs when MMRV started in 2012.
Measles, Mumps, Rubella and Varicella (MMRV)	Starting January 2012 MMRV replaced MMR and Var at the 12-month clinic visit. On July 1 st, 2014 MMRV replaced MMR at 18-month clinic visit. Children born 2013 and after receiving MMRV at 12 and 18 mos.

Current routine immunization schedule for children in NL

Table 1: Routine Immunization Schedule for Children Beginning Series in Early Infancy

Age	Vaccine
2 months	DTaP-IPV-Hib, Pneu C-13 and Rot-1*
4 months	DTaP-IPV-Hib, Pneu C-13 and Rot-1*
6 months**	DTaP-IPV-Hib
6 months and older***	Influenza (fall/winter season)
12 months	Pneu C-13, MMRV and Men-C
18 months	DTaP-IPV-Hib and MMRV
4-6 years	DTaP-IPV or Tdap-IPV

* **Do not give as injection**. Rotavirus vaccine is an oral vaccine.
** Children at high risk for disease should receive Pneu-C-13 as an additional dose at 6 months
*** All children 6 months & older are eligible for influenza vaccine

Table 2: Routine Immunization Schedule as part of the School Health Program:

Grade	Vaccine
Grade 4	Men-C-ACYW-135
Grade 6	HB and HPV-9
Grade 9	Tdap

DTaP-IPV-Hib:	diphtheria, tetanus, acellular pertussis, polio and Haemophilus influenza b
DTaP-IPV:	diphtheria, tetanus, acellular pertussis and polio
HB:	hepatitis B (2-dose schedule offered 6 months apart)
HPV-9:	9 strains of human papillomavirus (2-dose schedule offered 6 months apart)
Men-C:	type C meningococcal disease conjugated vaccine
Men-C-ACYW-135:	type A, C, Y, and W135 meningococcal disease conjugated vaccine
MMRV:	measles, mumps, rubella, and varicella
Pneu C-13:	13 strains of pneumococcal disease conjugated vaccine
Rot-1:	oral, monovalent rotavirus vaccine
Tdap:	tetanus, diphtheria and acellular pertussis, offered to adolescents/adults

Recommendations for Routine Immunization with MMR for Adults

All healthcare workers or military personnel should receive 2 doses of MMR or have lab-confirmed immunity to measles regardless of birth year.

Students in post-secondary educational settings:

- People born in or after 1970 should have documentation of 2 doses of measles vaccines or lab-confirmed immunity to measles.
- People born before 1970 should have documentation of 1 dose of measles vaccines or lab-confirmed immunity to measles.

Adults that are NOT healthcare workers, military personnel, travelers, or students in post-secondary educational settings:

- Adults 18 years or older **born in or after 1970** should have 2 doses of measles-containing vaccines or have lab-confirmed immunity to measles
- Adults 18 years or older born **before 1970 are considered immune and do not need MMR vaccination.**

For individuals who are traveling, please see section: MEASLES VACCINATION FOR TRAVELERS

Routine and delayed immunization schedules for infants, children, and adults can be found in the Newfoundland and Labrador Immunization Manual, Section 2: publichealth-cdc-s2-routine-imztn-schedules.pdf (gov.nl.ca)

Measles, Mumps and Rubella (MMR) Administration

- Search product monograph on Drug Product Database online query (canada.ca) for vaccine description.
- See Canadian Immunization Guide Content of Immunizing Agents Available for Use in Canada for latex and product content information.

Administration

Dose: 0.5 ml

Route: Subcutaneously

Site: Subcutaneous tissue in the upper arm

Note: This must be a different anatomical site (at least 2.5 cm or 1 inch away) than other vaccines.

Interval: Doses of MMR should be administered at least 4 weeks apart[4].

Concurrent administration with other vaccines:

- MMR can be administered concurrently with or at any time before or after other non-live vaccines, live oral vaccines or live intranasal influenza vaccine.
- MMR vaccine can be administered concurrently with other live intramuscular or subcutaneous vaccines but if not given at the same time, a minimum interval of 4 weeks is recommended between MMR and other live intramuscular or subcutaneous vaccines[4].

Not Contraindications

- Minor illness with or without a fever
- Coagulation disorder (use appropriate gauge needle)
- Contact with a case of active tuberculosis.
- History of an allergy to eggs, chicken, feathers, or egg products
- Breastfeeding
- Recently been exposed to measles.
- Uncertain immunization history of previous MMR vaccine
- History of febrile seizures or family history of seizures[4].

Contraindications and Precautions

- Allergy to a previous dose of MMR or any component of MMR except for an egg allergy (consult MOH, controlled setting may be indicated)
- Pregnancy
- Persons who are immunocompromised including primary or secondary immunodeficiency disorders.
- Measles-containing vaccines is contraindicated in individuals with active untreated tuberculosis (TB) as a precautionary measure because TB can be exacerbated by natural measles infection. Although there is no evidence measles-containing vaccines have such an effect, anti-tuberculosis therapy for active TB disease is recommended before administering measles-containing vaccines.

Tuberculin skin testing (TST) or Interferon Gamma Release Assay (IGRA)

- Measles-containing vaccines can suppress tuberculin reactivity and cause false-negative results. If TST or IGRA is required, it should be done on the same day as immunization or delayed at least 4 weeks after measles vaccination.
- After a TST or IGRA has been performed and read, measles vaccination can occur at any time unless contraindicated[4].

Drug Interactions

- Systemic antiviral therapy such as acyclovir, valacyclovir, and famciclovir should be discontinued, if possible, at least 24 hours before MMR vaccination and should not be restarted until 14 days after vaccine administration.

- Passive immunization with human immunoglobulin or receipt of most other blood products can interfere with immune response to MMR, MMRV and univalent varicella vaccines. These vaccines should be given at least 14 days before administration of an immunoglobulin preparation or blood product or delayed until antibodies in immunoglobulin preparation or blood product have degraded. See: Blood Products, Human Immunoglobulin and Timing of Immunization in Part 1 for additional information[4].

Screening Guidelines:

See Section 1.5 of Newfoundland and Labrador Immunization Manual for additional screening information

See Appendix A: MMR Vaccination Screening Questions

Immunization with Measles, Mumps and Rubella & Varicella (MMRV)

Policy
The Newfoundland and Labrador provincial immunization schedule provides two doses of MMRV for children born on or after January 1st, 2013, given at age 12 and 18 months. The first dose of MMRV must be given on or after the first birthday.

Description of Vaccine
The combined measles, mumps, rubella, and varicella vaccine is a live attenuated lyophilized preparation. MMRV is not licensed for use for individuals 13 years of age and over is only available for routine childhood immunization through public health.
Section-3-Routine-Immunization-Products-Sept-15.pdf (gov.nl.ca)

MEASLES VACCINATION FOR TRAVELERS

- **It is highly recommended travelers to measles endemic countries ensure they are fully vaccinated against measles.**
- **Measles vaccination should also be up to date for all travel outside Canada.**
- **Protection from measles vaccination is optimal if given at least 2 weeks before departure but there are still benefits if given less than 2 weeks before traveling.**
- There has been a significant increase in measles cases globally since 2023.
- This global surge in cases combined with declined measles vaccination rates in Canada has led to an increase in imported measles cases along with the risk of transmission in communities.
- It is recommended to speak to a healthcare provider at least 6 weeks prior to traveling to provide time to implement additional travel advice and vaccinations as needed.

Criteria for measles immunity in travelers for travel outside Canada:

1. Infants 6-12 months old should receive 1 dose of MMR and will also need MMRV at 12 and 18 months of age as per the routine immunization schedule to achieve long-term immunity.
2. People born in or after 1970 should have documentation of 2 doses of measles-containing vaccine.
3. People born before 1970 should have documentation of 1 dose of measles-containing vaccine[4].

   Note: Checking measles immunity before providing MMR to travelers is not recommended.

For more information:

- Government of Canada Global Measles Notice
- **For a list of measles endemic countries:** CDC Global Measles
- **For reports of measles cases in Europe:** European Centre for Disease Prevention and Control - Monthly measles and rubella monitoring reports
- **Measles epidemiology in the United Kingdom:** Measles epidemiology 2023 and 2024 - GOV.UK (www.gov.uk)
- **Measles cases in the United States:** Measles Cases and Outbreaks | CDC

CONTACT MANAGEMENT

Health care providers should contact their local public health unit and/or occupational health unit to report suspect or confirmed case of measles and for more direction. T**his section is provided for educational purposes only as contact tracing and management will be conducted by public health authorities.**

Persons infected with measles should be isolated for 4 days after the appearance of the rash to prevent transmission to others.

Public health authorities will determine the extent of contact tracing required. A measles contact is any susceptible person who shared the same air space for any length of time during the period of communicability, including two hours after the case left the air space[5]. The following groups and individuals could be considered contacts:

- Household contacts
- In a daycare or education facility: All employees, volunteers, students, bus drivers, members of a sports team or club
- In a workplace: Individuals who share the same schedule and/or office location as the case.
- In a health care facility: Individuals who shared the same room, waiting room or exam room without appropriate protection.

Exclusion of susceptible contacts

- Susceptible contacts that refuse or cannot receive MMR vaccine or immunoglobulin may be excluded from childcare facilities, schools, post-secondary educational institutions, workplace, travel, or other group settings at the discretion of the Medical Officer of Health.
- **Exclusion period may extend from 5 days after first exposure to up to 21 days from last exposure or until the individual is:**
    - Adequately immunized (having had documentation of at least one recent dose of measles-containing vaccine) OR
    - Demonstrates serological confirmation of immunity OR
    - Has received immunoglobulin (Ig) (see section Measles Post-exposure Prophylaxis)[6]

MEASLES POST-EXPOSURE PROPHYLAXIS (PEP)

There are 3 types of measles post-exposure prophylaxis: MMR vaccination, intramuscular immunoglobulin (IMIg, GammaSTAN®), and intravenous immunoglobulin (IVIG). The choice of measles PEP depends on age, susceptibility to complications, and when exposure to the confirmed case of measles occurred[7].

Measles PEP recommendations will be made by the Medical Officer of Health and healthcare providers are expected to follow these recommendations. If you have concerns or questions, please direct them to the Medical Officer of Health on-call.

For more information on measles PEP, see the following resources:

- Updated NACI recommendations for measles post-exposure prophylaxis (2018): ccdrv44i09a07-eng.pdf (canada.ca)
- Measles vaccines: Canadian Immunization Guide: Measles vaccines: Canadian immunization guide - Canada.ca

IMIg

GammaSTAN® is the only IMIg preparation available in Canada. GammaSTAN is stocked at the Canadian Blood Services in St. John's, NL and can be ordered by any physician. Please contact your hospital's blood bank for questions on how to access GammaSTAN. If ordered STAT, GammaSTAN may take 1 to 24 hours to be dispensed depending on health zone and flights presuming Canadian Blood Services have GammaSTAN in stock.

Dose: 0.5ml/kg IM x1 dose (maximum volume 15mL)

Notes on administration:

- Anyone weighing ≥ 30kg will not receive an optimal dose.
- Volumes >2mL for children or 3-5mL for adults should be divided and injected at 2 or more sites.
- Therefore, anyone receiving 15mL will require multiple injections, which may not be acceptable for the patient.
- IMIg is the only measles PEP available to infants <6 months old (ref: NACI)

IVIG

All hospitals with a blood bank stock IVIG and more are available from the Canadian Blood Services from St. John's if required. Any hospital that does not have a blood bank can request IVIG from the Canadian Blood Services STAT. Given IVIG is administered intravenously, infusions occur in a health care facility where appropriate monitoring can be conducted. All IVIG orders complete a review process once the pre-printed order (Appendix B) is received. If a request is received outside of regular hours (8am-4pm), the review may take 30 to 60 minutes from receipt of pre-printed order.

IVIG Dose: 400mg/kg

Administration of IVIG requires the use of ideal body weight, appropriate infusion rates and monitoring for adverse effects. Please see Atlantic Clinical Indications and Criteria for Intravenous and subcutaneous immunoglobulin (IVIG/SCIG)

Resources:

- IVIG is a blood product and requires informed consent: See Consent or refusal to administration of blood components and plasma protein and related products policy: bloodservices-pdf-informed-consent-blood-comp.pdf (gov.nl.ca)
- Pre-printed order form for IVIG Infectious Disease for Adult and Pediatrics must be completed to order IVIG for Measles PEP. A fillable pdf form should be located where NLHS forms are located at your healthcare facility (See Appendix B)
- Ideal Body Weight Calculator with IVIG Dosing
- IVIG Infusion Rate Tables
- Orders for IVIG must meet indications for its use to be dispensed. Measles PEP is one of the indications.
    - Review and Approval of Requests for IVIG for Adults Policy

Summary of the updated measles PEP recommendations for susceptible contacts[4]

Populations	Time since exposure to measles *	
	≤ 72 hours	73 hours - six days
Susceptible infants 0 to 6 months old [8]	IMIg (0.5mL/kg) [2]	
Susceptible immunocompetent infants 6 to 12 months old	MMR vaccine [1]	IMIg (0.5mL/kg) [2] [7] [8]
Susceptible immunocompetent individuals 12 months and older	MMR vaccine series [3] [7]	
Susceptible pregnant individuals [4]	IVIg (400mg/kg) or IMIg (0.5mL/kg), limited protection if 30kg or more [5]	
Immunocompromised individuals 6 months and older	IVIg (400mg/kg) or IMIg (0.5mL/kg), limited protection if 30kg or more [5] [6]	
Individuals with confirmed measles immunity	N/A	

1 Two additional doses of MMR vaccine provided after 12 months of age are required for long-term protection.

2 If injection volume is a major concern, IVIg can be provided at a dose of 400mg/kg.

3 Susceptible immunocompetent individuals 12 months of age and older are not a priority to receive Ig following measles exposure due to low risk of disease complications and the practical challenges of administration contact management.

4 Provide MMR vaccine series postpartum for future protection.

5 For individuals 30kg or more, IMIg will not provide complete protection but may prevent some symptoms.

6 In HIV-infected individuals, measles antibody titer is known to decline more rapidly over time as compared to those who are not HIV-infected. A dose of Ig should be considered in HIV-infected individuals with severe immunosuppression after a known exposure to confirmed measles, even with documented previous MMR immunization. Regardless of vaccination status pre-transplant, Ig should be considered for hematopoietic stem cell transplantation (HSCT) recipients, unless vaccinated post-HSCT and known to have an adequate measles antibody titre.

7 MMR vaccine will not provide PEP protection after 72 hours of exposure, however, starting and completing a two dose series should not be delayed to provide long term protection.

8 Two doses of measles-containing vaccine are still required after the first birthday for long-term protection.

**Ig should only be provided within 6 days of measles exposure; unless it is contraindicated, individuals who receive Ig should receive measles-containing vaccine after a specified interval once the measles antibodies administered passively have degraded. For more information, refer to Blood Products, Human Immunoglobulin and Timing of Immunization in Part 1 (CIG).

INFECTION PREVENTION AND CONTROL (IPAC) PRACTICES

Any suspect or confirmed measles case requires routine and airborne precautions.

The measles virus particles can remain suspended and contagious in the air for **up to two hours after the case has left a room**, depending on the number of air exchanges. The following may help minimize the risk of transmission:

- All health care workers (HCW) and staff entering the room should ensure they are immune to measles. Only HCWs immune to measles should be assigned to care for patients with confirmed/suspected measles. Evidence of immunity in HCWs is two documented doses of measles-containing vaccine on or after the first birthday (regardless of year of birth) or laboratory evidence of immunity.
- Non-immune, susceptible staff should only enter the room in exceptional circumstances and must wear a fit-tested, seal-checked N95 respirator.
- Schedule the patient visit to minimize exposure of others (e.g., at the end of the day).
- Upon arrival at the entry to the facility, instruct the patient to perform hand hygiene and put on a surgical mask if it can be tolerated and there are no contraindications.
- Immediately, place the patient in a single room with negative air flow (airborne infection isolation room or AIIR) with the door closed. If an AIIR is not available, the patient should be immediately placed in a single room with the door closed.
- Additional personal protective equipment (PPE) such as gloves, gowns and eye protection may be added as required based on a point of care risk assessment as per Routine Practices and would be recommended as part of Droplet and Contact precautions for individuals presenting with respiratory symptoms and/or undifferentiated viral symptoms.
- Patient movement should be curtailed unless absolutely necessary and then only conducted with the patient wearing a surgical mask (e.g., arrange for investigations to be done in patient room where possible).
- Following the patient's visit, the exam room door must remain closed with signage to indicate that the room is not to be used. Allow sufficient time for the air to change in the room and be free of respiratory particles before using the room for non-immune individuals (two hours is a conservative estimate if air exchanges are not known). The time required may be minimized if the patient has worn a surgical mask consistently. For institutional settings, this time can be reduced depending on the number of room air changes per hour.
- Conduct routine cleaning of the room and equipment once sufficient time has elapsed to ensure adequate air exchange has occurred in the room as described above.

For more information:

- **Department of Health and Community Services: Routine Practices and Additional Precautions,** page 35 "Airborne Precautions Elements" publichealth-cdc-routine-practices-and-additional-precautions.pdf (gov.nl.ca)

APPENDIX A: MMR VACCINATION SCREENING QUESTIONS

Screening Questions

Is the child between 12 months of age to <13 years old?

- **Yes:** Give MMRV at 12 and 18 months of age. Please advise the caregiver and child to contact their local public health unit for MMRV immunization.
- **No:** Give MMR for persons ≥ 13 years old.

Is the child between 6 – 12 months old and travelling abroad to a high-risk area of measles transmission?

- **Yes:** Give one dose of MMR and then MMRV at 12 and 18 months of age
- **No:** immunization with MMR is not recommended for infants 6-12 months of age that are not traveling to endemic areas.

Was the person born prior to January 1, 2013?

- **Yes:** Give MMR as per age & eligibility.
- **No:** Give MMRV if <13 years old.

Is the person allergic to any component of the vaccine, as listed in the product monograph?

- Defer immunization and consult with the MOH/designate. It may be necessary to immunize in a controlled setting.

Did the person have an anaphylactic reaction to a previous dose of MMR vaccine?

- Determine the nature and severity of the reaction. If required defer immunization and complete an AEFI for MOH/designate consult.

Did the person have a moderate to severe acute illness with or without a fever?

- Defer MMR until person is well.

Is the person immunocompromised?

- MMR should not be given to any person who has severe immunodeficiency. See Canadian Immunization Guide and defer MMR and consult with the MOH/designate as required.

Did the patient's birthing parent take immunosuppressant therapy during pregnancy?

- Administer MMR vaccine to the child when indicated and age appropriate. Immune responses to live vaccines that are administered at or after one year of age (e.g., MMR or MMRV vaccine) are not considered to be affected by exposure to monoclonal antibodies in the womb. Infants who receive measles-containing vaccine before 12 months of age still require MMRV at 12 months and 18 months as per the routine immunization to achieve long-term immunity.

Is the person is taking steroids or corticosteroid therapy?

- Defer MMR and consult with the MOH/designate as required. Depending on the route, dose, and duration of therapy, there may be no need to delay administration of MMR. Low to moderate doses of steroid therapy has not been associated with compromised immunity. See the Canadian Immunization Guide for further information.

Does the person have a recent history of blood transfusion or immunoglobulin therapy?

- Defer MMR. There is a requirement for an interval of at least 3 months between the administration of immune globulins or blood and live measles vaccination. See the Canadian Immunization Guide for additional information.

Does the person have a febrile respiratory or active febrile illness (including TB)?

- Defer MMR until person is well.

Is there is a possibility that the person may be pregnant?

- Defer MMR until the postpartum. Advise that pregnancy should be avoided for **one** month following immunization. See The Canadian Immunization Guide for further information.

If the child received a dose of MMR prior to the first birthday, should they still be given MMRV at 12 and 18 months of age?

- **Yes:** Give MMRV at 12 and 18 months of age. A dose given prior to the first birthday may not provide long lasting immunity, therefore must be given to the child on or after their first birthday.

The person requires a tuberculosis skin test, can they receive MMR?

- **Yes:** Can be done on the same day as the administration of the TST. MMR can suppress a positive TB skin test, therefore if TB testing is required it should be done the same day or delayed for 4 weeks after the MMR is given. Refer to the Canadian Immunization Guide or Section 3 of the Newfoundland and Labrador Tuberculosis Guideline for more information.

APPENDIX B: IVIG NL INFECTIOUS DISEASES PRE-PRINTED ORDER FORM FOR ADULTS AND PEDIATRICS

Newfoundland Labrador

PRE-PRINTED ORDER
Intravenous Immunoglobulin (IVIG)
INFECTIOUS DISEASE - Adult and Pediatric

HCN:
Province/Territory: Expiry:
Name:
Date of Birth: Sex: ☐ M ☐ F ☐ UN
Mailing Address:
City:
Province/Territory: Postal Code:
Telephone: (Indicate Preferred) ☐ Home
☐ Cell ☐ Work

Items preceded by a checkbox (☐) are only to be carried out if checked.
Any change to indication, dose, duration or frequency requires a new order
Note: IVIG dose is calculated using the patient's DOSING BODY WEIGHT (DBW) for all indications. To obtain the DBW calculator, refer to http://www.health.gov.nl.ca/health/bloodservices/resources/dosage_calculator.html

Allergies:	Has titration of dose been attempted? (for renewals only) ☐ Yes ☐ No
Frequency (number of weeks between treatments):	Height (cm): Weight (kg):
Duration (number of days per treatment):	Sex: ☐ Male ☐ Female
Intended treatment start date:	DBW (kg): Daily Infusion : g/kg
PPO expiry (completed by Lab):	**Calculated Dose (rounded down):** g (For Pediatrics: down to the nearest 2.5g)

g X day(s). If indicated, repeat this regimen every week(s) for a total of treatments.

Indicated Conditions	Prerequisites – Checkboxes must be checked/completed as appropriate. Missing information will result in delays or denial of product PATIENT MUST MEET THE FOLLOWING:	Dose
☐ **Group A Streptococcus (GAS) Necrotizing Fasciitis or Toxic Shock Syndrome***	☐ Must be treated with a combination therapy of antibiotics in addition to IVIG	1 g/kg on day 1 and 0.5 g/kg/day on days 2 and 3 OR 0.15 g/kg /day for 5 days
☐ **Staphylococcus Aureus Toxic Shock Syndrome (TSS)***	☐ Must be treated with a combination therapy of antibiotics in addition to IVIG	1 g/kg on day 1 and 0.5 g/kg/day on days 2 and 3 OR 0.15 g/kg /day for 5 days

*May be considered URGENT if notified by ordering physician

Possibly Indicated Conditions are approved for a 3 month period only at which time a clinical outcome questionnaire must be provided for the patient to continue treatment.

Please provide fax or e-mail for Outcome Questionnaire to be sent for completion.
Email: Fax:

Possibly Indicated Conditions	Prerequisites - Checkboxes must be completed PATIENT MUST MEET THE FOLLOWING:	Dose
☐ **Chronic Parvovirus Infection with Anemia**	☐ Immunocompromised patient with parovirus B19 causing Pure Red Cell Aplasia	**Initial:** 0.4 to 1 g/kg for 5 to10 days **Maintenance:** 0.4 g/kg every 4 weeks
☐ **Measles Post-Exposure Prophylaxis**	☐ Susceptible pregnant OR immunocompromised individuals 6 months of age or older AND ☐ IVIG should only be provided within 6 days of measles exposure	0.4 g/kg given once

Authorized Prescriber (Print): **Date(YYYY/MMM/DD):**
Authorized Prescriber's Signature:

Reset Form Print Form D0016FEB23

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