Prince Edward Island
CANADA

Health and Wellness

Prince Edward Island Guidelines for the Management and Control of Measles

April 2025

Department of Health and Wellness

Chief Public Health Office

Contents

Case Definition (1)

Confirmed Case

Laboratory confirmation of infection (in the absence of identification of measles vaccine strain based on genotyping or recent immunization history[1]) using one of the following methods:

- detection of measles virus RNA by PCR from an appropriate clinical specimen;
- isolation of measles virus from an appropriate clinical specimen
- seroconversion or a significant (e.g. fourfold or greater) rise in measles IgG titre by any standard serologic assay between acute and convalescent sera
- positive serologic test for measles IgM antibody using a recommended assay (see Laboratory comments section) in a person with clinical illness who is either epidemiologically linked to a laboratory-confirmed case or is epidemiologically linked to a geographic area or community with known measles activity

Clinically confirmed case

Clinical illness (see clinical features*) in a person with an epidemiologic link to a laboratory-confirmed case.

Probable Case

Clinical illness (in the absence of appropriate laboratory tests as well as the absence of an epidemiologic link to a laboratory-confirmed case) AND one the following:

In a person who is epidemiologically linked to a geographic area or community with known measles activity

In a person with an epidemiologic link to a clinically confirmed case (not laboratory-confirmed)

*Usual clinical features of measles include all of the following:

- Fever
- One or more of cough, coryza, or conjunctivitis,
- Generalized maculopapular rash

Clinical illness may be present differently in breakthrough cases or cases who are immunocompromised, therefore clinician discretion may be required in applying clinical evidence.

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[1] Recent immunization with measles-containing vaccine can be distinguished from wild-type virus by genotyping or by specific PCR technology. In the absence of PCR diagnosis, vaccine history and clinical profile may be used to distinguish vaccine-strain. The most frequent reaction to measles-mumps-rubella (MMR) immunization is malaise and fever (with or without rash), usually occurring 6-23 days after immunization. However, this should be determined for each case, as these reactions and the time frame can vary (Canadian Immunization Guide).

Reporting Requirements [2] [3]

1. **Laboratories**
   The Provincial Laboratory shall, in accordance with the Prince Edward Island (PEI) *Public Health Act*[2], report all positive molecular tests and all serological evidence of infection by phone, and fax, or electronic transfer, as soon as the result is known, to the Chief Public Health Officer (CPHO) or designate as required by the PEI Reporting of Notifiable Diseases, Conditions, and Events Regulations[3].

2. **Health Practitioners**
   Health practitioners shall, in accordance with the PEI Notifiable Diseases and Conditions and Communicable Diseases Regulations of the (PEI) *Public Health Act* [2], report all probable and confirmed cases by phone, fax or electronic transfer, as soon as the result is known, to the CPHO (or designate). After hours notification to the CPHO (or designate) must occur by phone.

Table 1. Additional Reporting Requirements

Timeline for initiation of response by CPHO	Timeline to initiate Follow-up by PHN re: case/contacts	Timeline for Completion of Follow-up by PHN
Immediately following report of clinical/probable/lab-confirmed case	Immediately following receipt of case/contact name	~5 days

Etiology [4]

Disease is caused by the measles virus, a member of the Paramyxoviridae family, genus *Morbillivirus.*

Epidemiology [4]

1. **Reservoir**

The reservoir is humans.

2. **Transmission**

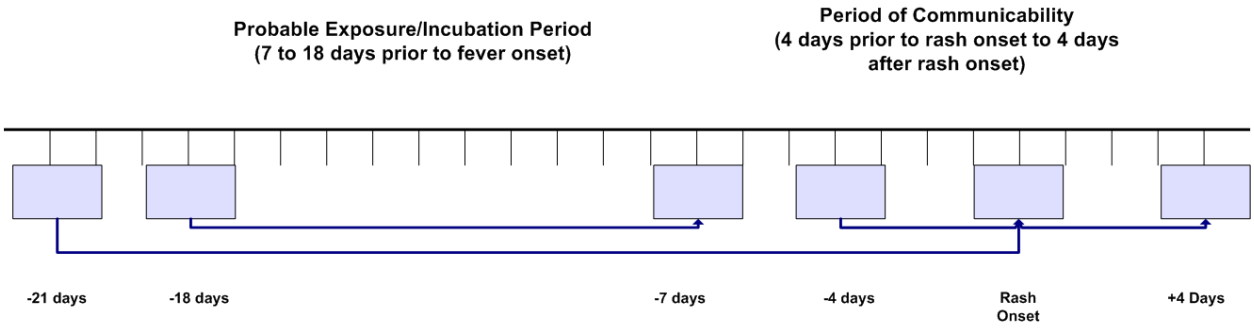
Measles is one of the most highly communicable infectious diseases. Measles is transmitted by the airborne route, direct contact with infectious droplet or, by direct contact with respiratory secretions of an infected person. The virus can remain contagious in the air or on an infected surface for up to two hours after an infected person leaves the space.

3. Incubation Period

Following exposure to measles, the incubation period from exposure to prodromal symptoms averages 10 to 12 days. The time from exposure to rash onset averages 14 days (range: 7 to 21 days). It may be longer (up to 28 days) for those who have received immunoglobulin for post-exposure prophylaxis.

4. Period of Communicability

Measles is a highly communicable viral disease. The period of communicability extends from 4 days before rash onset to 4 days after rash appearance.



5. Host Susceptibility

All individuals who have not had measles disease or been successfully immunized are susceptible. Acquired immunity after illness with the measles virus is permanent. Those receiving the first dose of vaccine before 12 months of age without receiving two subsequent doses after 12 months of age, and those receiving only one dose at any time may still be susceptible.

Infants born to mothers who have had measles are protected against the disease for the first 6 to 9 months or more, depending on maternal antibodies. Children born to mothers with vaccine-induced immunity receive less passive antibody and may become susceptible to measles at an earlier age.

Clinical Presentation [4] [5]

Measles is an acute, highly contagious respiratory viral disease that is characterized by prodromal fever, conjunctivitis, coryza, cough, and Koplik spots (clustered white or bluish-white lesions buccal mucosa). Characterized by a generalized maculopapular rash, which usually appears about 14 days after infection, or about 3 to 7 days after prodromal symptoms begin.

The prodromal stage begins 10-12 days after exposure in susceptible persons and may resemble a severe upper respiratory tract infection. This phase is characterized by malaise, fever, anorexia, conjunctivitis, and respiratory symptoms such as cough and coryza. Older children may complain of photophobia and occasionally arthralgia. Koplik spots may appear toward the end of the prodrome, just before the appearance of the rash.

The maculopapular rash first appears on the face, advancing to the trunk of the body and then to the arms and legs, including the palms and soles and lasts approximately 4-7 days. The rash fades in the same sequence it appears, from head to extremities.
Uncomplicated illness, from late prodrome to resolution of fever and rash, lasts 7 to 10 days. The disease is more severe in immunocompromised individuals.

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)

Complications are more likely in:

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

Severe complications of measles can include:

- respiratory failure
- encephalitis
    - occurs in approximately 1 of every 1,000 reported cases
    - may result in permanent neurologic sequelae
- death
    - estimated to occur in 1 to 10 of every 10,000 cases of measles in higher-income countries like Canada (Measles vaccines: WHO position paper, April 2017)
    - mainly due to a respiratory or neurologic complication

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:

- behavioural and intellectual deterioration
- seizures

These changes occur 7 to 10 years after infection with the measles virus.

SSPE 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

Disease in the immunocompromised may be severe and have a prolonged course, present without typical rash, and the person may shed virus for several weeks after the acute illness.

Diagnosis [4]

Diagnosis of measles is made on the basis of clinical presentation, exposure history, and laboratory testing (see Appendix A: Specimen Collection). If dates of likely exposure are compatible with acquisition in PEI, investigate for a source case.

If an epidemiological link to an already laboratory-confirmed case has been established, laboratory testing is not necessary to meet the confirmed case definition.

Key Investigation

- Obtain a history of illness, including date of onset, signs and symptoms.
- Determine measles immunization history including;
    - Number of doses
    - Date administered
    - Type of vaccine
    - Where the person was immunized (out of country)
- Facilitate collection of all appropriate specimens (see Appendix A)
    - Serology; Measles IgM, IgG
        - IgM is used for diagnostic testing and IgG is for immune status
        - IgM antibodies specimen collected within 3 to 7 days after rash onset. If a specimen taken ≤3 days after rash onset is negative for measles IgM, a second specimen should be obtained 3 days later.
    - Nasopharyngeal (NP) swab for Measles (PCR)
    - Urine for Measles (PCR)

Occurrence [6]

1. General

Prior to widespread immunization, measles was common in childhood, with more than 90% of people infected by age 20 and an estimated 100 million cases and 6 million measles deaths occurring each year. With effective childhood immunization programs, measles cases in many industrialized countries have dropped by 99% and generally occur in young unimmunized children or older children, adolescents, or young adults who received only 1 dose of vaccine and have a median age between 20 and 30 years.

2. Canada [6]

Canada has been free of endemic measles since 1998. However, cases continue to occur in Canada due to exposure outside of Canada, which sometimes leads to outbreaks with limited spread in Canada. The risk of measles transmission is highest when unvaccinated or non-immune populations are clustered together in particular regions or communities. Vaccination rates in Canada, while high, are currently below the necessary threshold for herd immunity in some places (NACI, 2025). From 1998 to 2023, there have been an average of 88 measles cases reported in Canada annually, with between 0 and 751 cases reported each year. In 2024 and 2025, the incidence of measles in Canada increased significantly with 146 cases reported in 2024 and 224 cases in 2025 (as of March 1st). The majority of cases have been among unvaccinated individuals.

3. Prince Edward Island

The last lab-confirmed cases of measles in PEI was reported in 2025 and was related to travel outside of the province to an area with known measles transmission.

Control [7] [8] [9]

Immunization with measles-containing vaccine is approximately 93% effective at preventing measles and after two doses is close to 100% effective. Measles, mumps, rubella and varicella vaccines[2] (MMRV) is administered in a two-dose schedule to children 12 and 18 months of age in Prince Edward Island (see Appendix B: Measles, Mumps, Rubella and Varicella Vaccine Fact Sheet). Due to the high infectivity of measles at least 95% of the population needs to be immunized to develop herd immunity. Adults born in 1970 or later who have not had measles disease or received two doses of measles vaccine should receive two doses of vaccine (measles, mumps, rubella [MMR[3]]) (see Appendix C: Measles, Mumps and Rubella Vaccine Fact Sheet).

Adults born before 1970 are considered to have acquired natural immunity to measles and are generally considered immune. Individuals born before 1970 may receive one lifetime dose of MMR vaccine especially if travelling. However, immunization with 2 doses of measles containing vaccine is recommended for some individuals born before 1970 if those individuals are at high risk of exposure and/or high risk of transmitting disease to others such as health care providers.

[2] Measles, mumps, rubella and varicella (MMRV) vaccine is indicated for children 12 months of age to 12 years.
[3] Measles, mumps, and rubella (MMR) vaccine is indicated for adolescents >13 years and older and adults.

Infants whose mothers have had measles are protected against disease for approximately 6-9 months or more. Children born to mothers with vaccine-induced immunity receive lower levels of maternal antibodies and may be susceptible at an earlier age [(4)].

MMR vaccine may cause a transient rash in approximately 5% of vaccine recipients, usually appearing 7 to 10 days post vaccination. The rash is mild, temporary, asymptomatic, noninfectious and resolves without intervention.

Management of a Case [(7)]

- Probable cases should be managed as confirmed cases until laboratory results are reported.
- All confirmed and/or probable cases are to be reported to the CPHO as soon as the cases are known (See Reporting Requirements).
- The CPHO will inform Public Health Nursing (PHN) or First Nations Health (Abegweit, Lennox Island) of cases for follow-up contact tracing and education (see Appendix D: Measles Fact Sheet).
- Airborne Precautions in addition to Routine Practices should be followed when individuals with probable measles present to a health care setting.
- All cases are advised to:
    - Stay home (self-isolate) from public places, including school, post-secondary educational institutions, childcare, workplaces and other group settings for minimum 4 days after rash onset.
    - Perform hand hygiene frequently;
    - Avoid sharing drinking glasses, eating utensils, or any object used on the nose or mouth; and
    - Cover coughs and sneezes with a tissue and/or forearm.
- Cases should be offered supportive therapy as indicated. There is no specific treatment for measles.
- There are four components for the management of a measles case;
    - Relieve common symptoms such as fever, cough, blocked nose, conjunctivitis and sore throat and/or mouth.
    - Provide nutritional support and promote breastfeeding, if applicable.
    - Provide vitamin A to children. (Refer to Appendix E: Supportive Treatment of Measles with Vitamin A for Children).
        - The World Health Organization[4] (WHO) currently recommends all children diagnosed with measles should receive two doses of vitamin A supplements, given 24 hours apart. This treatment restores low vitamin A levels during measles that occur even in well-nourished children and can help prevent eye damage and blindness. Vitamin A supplements have also been shown to be protective against measles-associated pneumonia.
    - Inform the client/patient/caregiver about the illness and what to expect in the next few days.

[4] https://www.who.int/news-room/fact-sheets/detail/measles

Defer all immunizations with live and inactivated vaccines until at least four weeks after illness onset in the case. Delay varicella-containing vaccines for 6 weeks (a minimum of 4 weeks delay can be applied if needed). This is because measles infection is accompanied by marked and prolonged abnormalities of cell-mediated immunity (CMI). CMI is measurably suppressed for several weeks after infection, during which time new immune responses are impaired (Karp 1996; Amanna 2007). People who have laboratory confirmed measles need not be immunized against measles as they are considered immune. Measles immune individuals, however, may be safely immunized with MMR vaccine for rubella and/or mumps protection.

Management of Contacts [7][8]

Prince Edward Island Public Health Nursing (PHN) or First Nations Health (Abegweit, Lennox Island) will obtain the names of exposed contacts during the initial interview with the case and create a list of those who would be susceptible to infection. Examples of exposure situations include home, school, childcare facility, school bus, workplace, physician's office, and emergency department. Airline passengers who have been exposed to a confirmed measles case on the same flight should be considered for notification (see Appendix F -Measles on a flight contact tracing (September 2024).

Contacts should be counselled regarding the signs and symptoms of measles and the need to report to their health care provider should they occur.

Health care workers should be advised to notify Occupational Health & Safety and/or Employee Health to determine immunization status (see Appendix G: Assessing Health Care Worker Susceptibility to Measles Pre-Exposure) and susceptibility to disease following exposure (see Appendix H: Post-Exposure Management of Susceptible Health Care Workers).

Definitions:

Contact: Someone who shared the same airspace (no minimum length of time) with a case during the infectious period[5] or were present in the airspace for up to 2 hours after the case left.

Susceptible Contact: A contact (defined above) born during or after 1970 and **does not meet** one of the following criteria:

- Documented evidence of vaccination with two doses of measles-containing vaccine after their first birthday;
- Laboratory evidence of immunity;
- History of laboratory-confirmed measles.

High-Risk Susceptible Contact: A susceptible contact (as defined above) meeting one or more of the following criteria;

- Immunocompromised;
- Pregnant;
- Infant < 12 months of age; or

[5] The infectious period is 4 days prior to and 4 days after rash appears.

- Other valid contraindication to the receipt of measles vaccine (e.g. allergy to a vaccine component).

Breakthrough Measles [11]; Breakthrough measles is an attenuated infection that occurs in patients with pre-existing measles immunity (either via wild-type disease or vaccination). It is similar to classic measles except the clinical manifestations are generally milder and the incubation period is longer (17 to 21 days). Individuals with modified measles are not highly contagious.

Management of Susceptible Contacts (see Appendix J)

- Susceptible contacts of a measles case should receive either MMR vaccine or Immune Globulin (Ig) depending on the time lapse from exposure, age, and health status (see Appendix J: Summary of Measles Post-Exposure Prophylaxis Recommendations for Susceptible Contacts).
- Susceptible contacts who are ≥ 6 months of age AND do not have any contraindications to measles-containing vaccine should be immunized with MMR vaccine as soon as possible. Immunization within 72 hours of exposure may prevent disease. Two additional doses of measles-containing vaccine must be administered after the child is 12 months old (and at least 28 days from the previous dose) to ensure long lasting immunity to measles.
- A second dose of MMR should be administered 28 days following the first dose to contacts >12 months of age who have received no doses of measles-containing vaccine prior to exposure.
- Immune Globulin (Ig) should be considered for susceptible contacts presenting more than 72 hours but within 6 days of exposure (see Appendix J: Summary of Measles Post-Exposure Prophylaxis Recommendations for Susceptible Contacts).

Management of High-Risk Susceptible Contacts

In February 2025, the National Advisory Committee on Immunization updated its recommendations for measles post-exposure prophylaxis (NACI, 2025). Immune Globulin (Ig) should be administered as soon as possible to high-risk susceptible contacts, preferably within three days but as long as six days after exposure (see Appendix I: Summary of Measles Post-Exposure Prophylaxis Recommendations for Susceptible Contacts). Recommended measles PEP strategies for immunocompromised contacts are grouped by the extent of immunocompromise, the likelihood of maintaining measles antibody mediated protection from past vaccination or infection, and the ability to safely receive a measles containing vaccine. Additional considerations are provided within the updated 2025 document, assessment of immunocompromise is best determined by consultation with appropriate treating care providers.

Human immune globulin (Ig) (see Appendix I)

Prophylactic use of Human Immune Globulin (Ig)[6] [7] has been shown to be effective in modifying or preventing disease if administered within 6 days after exposure to measles; however, when indicated, it should be given as soon as possible after exposure. Immune Globulin should be considered for the following groups of individuals if they are contacts of measles:

- Susceptible pregnant women
- Susceptible individuals who are immunocompromised
- Susceptible infants < 6 months of age
- Susceptible immunocompetent infants 6 to under 12 months of age and who present between 73 hours and 6 days after exposure

In individuals who are already receiving Ig replacement therapy (as IVIg or SCIg), Ig for measles PEP is not required if the last dose of IVIg (at least 400 mg/kg) was received within three weeks prior to measles exposure, or if SCIg (at least 200 mg/kg) was received for 2 consecutive weeks prior to measles exposure. If outside of these parameters, administer the patient's usual dose as soon as possible.

Immunization after Immune Globulin Administration [8]

If clinical measles does not develop in a person administered Ig, measles-containing vaccine should be given 6 to 8 months later depending on the Ig dose used provided the individual is greater than one year of age and there are no contraindications to the vaccine[11].

Exclusions (7)

All susceptible contacts must be excluded from the 5th day after the first exposure (Day 0) to the 21st day after the last exposure. Most exclusions apply to all public settings including but not limited to schools, childcare facilities, post-secondary institutions, and employment.

Susceptible contacts who refuse or cannot receive immunoglobulin within 6 days of exposure or MMR vaccine within 3 days of exposure must be excluded. Susceptible contacts who receive timely post-exposure prophylaxis may attend public settings. The exception to this is HCWs who must be excluded from any work in the health care setting regardless of whether they received timely post exposure immunoprophylaxis. Regardless of whether vaccine was administered within 72 hours of exposure,

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[6] Intramuscular Immune Globulin (IMIg) (Gama STAN®) should be provided to susceptible infants at a concentration of 0.5mL/kg, to a maximum dose of 15mL. IMIG is no longer recommended for individuals weighing more than 30 kg due to lack of evidence of efficacy/effectiveness of IMIG administered at dosages below 0.5mL/kg.

[7] Intravenous Immune Globulin (IVIg) can be considered in susceptible individuals who are pregnant or immunocompromised and weigh 30 kg or more. IVIg can be considered for infants for whom Ig is indicated when IMIg injection volume is a concern. IVIg requires in-hospital administration and active patient monitoring over several hours of infusion, performed by appropriately trained staff.

[8] The recommended interval between administration of Ig preparation or blood product and subsequent vaccination varies, depending on the Ig preparation or blood product. Refer to the Canadian Immunization Guide Part 1, Blood Products, Human Immune Globulin and Timing of Immunization.

maintain work exclusion. If HCW had no prior documentation of receiving measles containing vaccine, administer a second dose 4 weeks later.

Individuals who are contacts of a case but are without evidence of immunity who have been exempted from measles vaccination for medical, religious, or other reasons and who do not receive appropriate post-exposure prophylaxis within the appropriate timeframe should be excluded from affected institutions in the outbreak area until 21 days after the onset of rash in the last case of measles.

Outbreak Management

Two or more confirmed cases of measles in a one month period, linked either epidemiologically or virologically, or both, constitute an outbreak. During a measles outbreak, the Chief Public Health Officer or designate may recommend the following:

- Immunize children 6-11 months of age inclusive, with MMR vaccine. Two additional doses of measles-containing vaccine must be administered after the child is 12 months old to ensure long lasting immunity.
- Offer an early second dose of measles-containing vaccine, respecting the minimum interval between doses.
- Provide MMR vaccine or immunoglobulin (Ig) for measles post-exposure management in persons who are susceptible depending on the time since exposure and the risks of the individual who was exposed.
- Communicate guidance to the public as to when to seek medical care, including calling ahead to health care providers to advise them of the possibility of measles before going to a health care setting so that appropriate infection control precautions can be taken.
- Communicate regular updates and direction to health care providers.

Preventative Measures

- Provide public education about the risks of measles disease and the importance of immunization.
- Immunization of all eligible residents according to the PEI schedule for children and adults.
- Ensure long-term immunity, in all adult residents born in 1970 or later by giving a second dose of measles-containing vaccine (see Appendix B: MMRV Fact Sheet; Appendix C: MMR Fact Sheet), even if post-immunization serology following the first dose showed protection.

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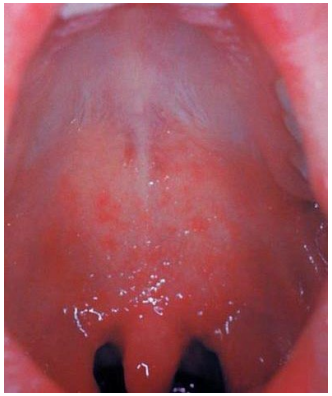
Appendix A: Specimen Collection

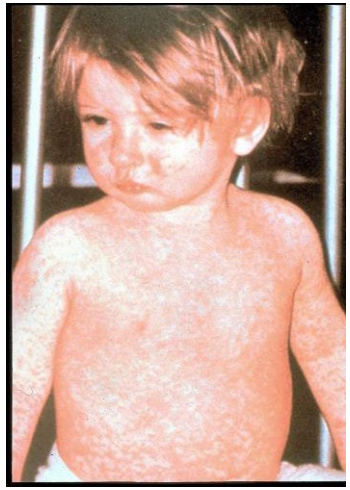


White spots inside the mouth are common with measles (Koplik's spots). Source: CDC

Measles Testing
Specimen Collection Algorithm

Prince Edward Island CANADA Health and Wellness

Health PEI



Measles rash covering child's arms and stomach. Source: CDC

Days Since Rash Onset

No rash yet	0 to 7 days since rash onset	8 to 14 days since rash onset	2 weeks to 4 weeks since rash onset	> 4 weeks since rash onset
Contact CPHO or the Medical Microbiologist before collecting specimens	• NP Swab[1] • Urine[2] • Serology (IgM)[3] • Serology (IgG)[4] • Parvovirus IgG/IgM • Rubella IgG/IgM • Other tests as directed by CPHO/ Micro Lab	• Urine[2] • Serology (IgM)[3] • Serology (IgG)[4]	• Serology (IgM)[3] • Serology (IgG)[4] • If patient was tested earlier in infection, please indicate on the request form that this sample is a "convalescent sample" and add the date of the previous test	Contact CPHO or the Medical Microbiologist before collecting specimens

1 NP swab for measles is tested by PCR. Optimal test time is 0-4 days post-rash onset. Viral load declines between 5 and 7 days post-rash onset. Testing occurs at QEII each week.
2 Urine samples for measles are tested by PCR. Optimal test time is 0-7 days post-rash onset.
3 Serology testing (IgM) for measles is optimal between 4 and 28 days post-rash onset. False negatives are likely between 0-3 days and 29-42 days post-rash onset. Testing occurs every 2nd Tuesday at the QEII.*Note: If the clinical presentation is inconsistent with measles or in the absence of recent travel/exposure history, positive IgM antibody results must be confirmed by either paired IgG serology or virus detection (NP swab or urine testing).
4 Serology testing (IgG) for measles is optimal at 0-7 days post-rash onset (acute case) and 10-27 days post-rash onset (convalescent case). IgG can also be used to determine measles vaccine immune status. Testing occurs each Thursday at the QEH.

Prince Edward Island CANADA
Health and Wellness

Health PEI

Appendix B - Fact Sheet:

Measles, Mumps, Rubella (German Measles) and Varicella (Chickenpox) Vaccine (MMRV)

1. **What are Measles, Mumps, Rubella and Varicella and what are the complications of these diseases?** These four diseases are caused by viruses. Measles, mumps and rubella are spread by contact with nose and throat secretions such as by coughing and sneezing. Varicella can be spread this way or by direct contact with fluid from an infected skin lesion.

Measles (red measles or rubeola) is a very contagious disease which causes a red blotchy rash beginning on the face and spreading down the body, high fever, cough, runny nose and watery eyes. It can cause swelling of the brain leading to permanent brain damage and seizures, hearing loss, pneumonia, and death. Measles is highly communicable spreading from person to person in households, classrooms, and areas of large gatherings of people. Measles is the leading cause of vaccine preventable death in children.

Mumps continues to occur worldwide with epidemics every two to five years. Mumps is an acute infectious illness with about 40% of cases developing parotitis or painful swelling below the cheek in the neck area. Complications can include hearing loss, sterility and viral meningitis (infection of the lining around the spinal cord and brain). Pregnancy associated concerns include spontaneous abortion or congenital malformations in the fetus.

Rubella infection is contagious and its symptoms of fever, lymph swelling, rash, aches and joint discomfort may be mistaken for other viral infections. Rubella is of particular concern in pregnancy as it can result in miscarriage, stillbirth and/or malformations in the newborn including heart defects, cataracts, hearing loss, and brain damage. It is important for women to receive the vaccine at least one month before becoming pregnant if they do not have immunity to rubella virus.

Varicella is a common and highly infectious disease which causes an irritating blister-like rash. The rash or fluid filled lesions break out in stages on all areas of the body including the scalp and mucous membranes of the mouth and throat. Following initial varicella illness, the varicella virus becomes inactive and establishes itself in the body's nerve endings, allowing it to reactivate later in life as shingles.

The complications of varicella infection include viral infections in the heart, lungs, joints, brain and blood, as well as secondary bacterial infection such as invasive group A streptococcal infection. A

serious complication is the development of Reye's Syndrome, a brain disease which can occur when a child who has varicella is given a medication containing **salicylates** (acetylsalicylic acid, ASA). Varicella in pregnancy can result in birth defects in the baby and if a woman develops varicella just before or after delivery, the newborn is at increased risk of developing severe varicella disease.

2. What are the contents of the MMRV vaccine?

The vaccine contains live but weakened particles from Measles, Mumps, Rubella, and Varicella viruses from which the body develops protection. Traces of non-medicinal ingredients that keep the vaccine stable, sterile and help it to be more effective are also present. All vaccine contents are licensed for use by the Biologics and Genetics Therapies Directorate within Health Canada. A complete listing of contents is included in the product insert which is available from the nurse.

3. What are the possible reactions after receiving the vaccine and how should they be managed?

The most serious but rare side effect is a severe allergic reaction (anaphylaxis) which can be life-threatening and which usually occurs within 15 to 20 minutes of receiving the vaccine. Procedures are in place for the nurse to quickly respond to anaphylaxis by administering adrenaline.

Pain and redness at the injection site and/or low-grade fever and rash may occur. These reactions are generally mild and tend to be delayed. The rash may be red, blotchy or blister-like and may appear up to a few weeks after the immunization is given.

It is not necessary to give acetaminophen after immunization. If discomfort or fever occurs acetaminophen can relieve these symptoms. **Salicylates (such as aspirin) should not be given to a person who has received MMRV vaccine for at least 6 weeks after vaccination** due to the increased risk of Reye's Syndrome.

Please remain in the waiting room for 15 minutes after immunization. See a doctor or seek medical attention if any serious side effect occurs. Report any serious reaction to the public health nurse.

4. What are the situations in which MMRV vaccine should not be given?

The vaccine should not be given to anyone who has had an anaphylactic (severe or life threatening) reaction to a previous dose of MMRV vaccine or to any component of the vaccine including neomycin. Those who have a reaction to eggs (including an anaphylactic reaction) can be immunized with MMRV vaccine.

Persons presenting with significant acute fever and illness should return later for the vaccine.

Precautions: Assessment of a person's health status is required by the Chief Public Health Office in the following situations:

- Persons with impaired immune function should not normally receive live vaccines without consultation from their attending physician and possibly an immunologist.
- Persons on chronic salicylate therapy may be able to receive this vaccine pending consultation with their attending physician.
- Passive immunization with human immune globulin or receipt of most blood products can interfere with the immune response to live vaccines. The administration of vaccine may have to be delayed for a period of time, usually between three to 11 months.

5. What are the alternatives to not receiving the MMRV vaccine?

Measles, Mumps & Rubella: A person who does not receive the Measles, Mumps, & Rubella vaccine is at increased risk for becoming sick if he/she is exposed to these diseases. At times of disease outbreaks, the non-immunized person should remain at home, avoiding day care or school, until advised to return.

Chickenpox: The chance of acquiring chickenpox is very high in the non-immunized person. The disease is more serious for persons with decreased immunity (including cancer, leukemia or lymphoma or an inherited disease of immunity), on high doses of steroids, or in pregnant women without immunity. In these cases, it is recommended that persons avoid exposure in times of known outbreaks. If exposure occurs, persons should see their doctor. A person who is non-immune to chickenpox and is exposed to a person with chickenpox disease may receive the vaccine up to five days after being exposed and thus decrease the chance of acquiring the disease.

Since the use of these vaccines in routine immunization programs the incidence of these illnesses and their damaging effects has been significantly reduced.

Prince Edward Island CANADA
Health and Wellness

Health PEI

Appendix C - Fact Sheet:

Measles, Mumps and Rubella (German Measles) Vaccine (MMR)

1. What is Measles, Mumps and Rubella and what are the complications of these diseases?

These three diseases are caused by viruses. Measles, mumps and rubella are spread by contact with nose and throat secretions such as by coughing and sneezing.

Measles (red measles or rubeola) is a very contagious disease which causes a red blotchy rash beginning on the face and spreading down the body, high fever, cough, runny nose and watery eyes. It can cause swelling of the brain leading to permanent brain damage and seizures, hearing loss, pneumonia, and death. Measles is highly communicable, spreading from person to person in households, classrooms, and areas of large gatherings of people. Measles is the leading cause of vaccine preventable death in children.

Mumps continue to occur worldwide with epidemics every two to five years. Mumps is an acute infectious illness with about 40% of cases developing parotitis or painful swelling below the cheek in the neck area. Complications can include hearing loss, sterility and viral meningitis (infection of the lining around the spinal cord and brain). Pregnancy-associated concerns include spontaneous abortion or congenital malformations in the fetus.

Rubella infection is contagious and its symptoms of fever, lymph swelling, rash, aches and joint discomfort may be mistaken for other viral infections. Rubella is of particular concern in pregnancy as it can result in miscarriage, stillbirth and/or malformations in the newborn including heart defects, cataracts, hearing loss, and brain damage. It is important for women to receive the vaccine at least four weeks before becoming pregnant if they do not have immunity to rubella virus.

2. What are the contents of the MMR vaccine?

The vaccine contains live but weakened particles from Measles, Mumps and Rubella viruses from which the body develops protection. Traces of non-medicinal ingredients that keep the vaccine stable, sterile and help it to be more effective are also present.

All vaccine contents are licensed for use by the Biologics and Genetics Therapies Directorate within Health Canada. A complete listing of contents is included in the product insert which is available from the public health nurse.

3. What are the possible reactions to the vaccine and how should they be managed?

The most serious but rare side effect is a severe allergic reaction (anaphylaxis) which can be life-threatening and which usually occurs within 15 to 20 minutes of receiving the vaccine. Procedures are in place for the nurse to quickly respond to anaphylaxis by administering adrenaline.

The most common reactions are pain, swelling and/or redness at the injection site, fever, irritability and rash. These reactions may occur up to 2 weeks after the immunization is given. The rash may be red and blotchy and it may appear between the fifth and twelfth day after immunization.

It is not necessary to give acetaminophen after immunization. If discomfort or fever does occur acetaminophen can relieve these symptoms.

Please remain in the waiting room for 15 minutes after immunization.
See a doctor or seek medical attention if any serious side effect occurs.
Report any serious reaction to the public health nurse.

4. What are the situations in which MMR vaccine should not be given?

The vaccine should not be given to anyone who has had an anaphylactic (severe or life threatening) reaction to a previous dose of MMR vaccine or to any component of the vaccine including neomycin. Those who have had a reaction to eggs (including an anaphylactic reaction) can be immunized with MMR vaccine.

Pregnant women should not receive this vaccine. Women who are contemplating pregnancy and who receive this vaccine should wait at least four weeks before becoming pregnant.

Persons presenting with significant acute fever and illness should return later for their vaccine.

Precautions: Assessment of a person's health status is required by the Chief Public Health Office in the following situations:

Persons with impaired immune function should not normally receive live vaccines without consultation from their attending physician and possibly an immunologist.

Passive immunization with human immune globulin or receipt of most blood products can interfere with the immune response to live vaccines. The administration of vaccine may have to be delayed for a period of time, usually between three to 11 months.

Post-partum women who receive Rh Immune Globulin and who are non-immune to measles, mumps and/or rubella should generally wait 3 months before receiving the vaccine, based on risk assessment.

5. What are the alternatives to not receiving the MMR vaccine?

A person who does not receive the Measles, Mumps and Rubella vaccine is at increased risk for becoming sick if he/she is exposed to these diseases. Measles, mumps and rubella illness can be more serious in persons with decreased immunity.

At times of disease outbreaks, the non-immunized person should remain at home, avoiding day care or school, until advised to return.

This vaccine is very effective in preventing measles, mumps and rubella illness and since the use of these vaccines in routine immunization programs; the incidence of these illnesses and their damaging effects has been significantly reduced.

Prince Edward Island CANADA Health and Wellness

Health PEI

Appendix D - Fact Sheet – Measles

1. What is Measles?

Measles is a serious and very contagious disease caused by a virus.
The **symptoms** include:

- Fever
- Runny nose
- Red watery eyes
- Cough
- Red blotchy rash that begins on the head and spreads down to the trunk, arms and legs.

Measles usually starts with illness for 3-4 days before the rash appears. The fever tends to be high (at least 104 degrees F).
The fever and rash usually disappear in 3-5 days.

2. Complications

Complications of measles include ear infection, viral meningitis or brain infection or pneumonia.
About 2 out of 1,000 people with measles will die.

3. Spread

Measles spreads through air by breathing in air in a room where someone with measles is coughing.

Period of Being Contagious

A person is contagious 4 days before and 4 days after the rash appears in a person with measles.

Incubation Period

The time between exposure to measles and coming down with the disease is 7 to 21 days.

4. Treatment

There is no treatment for a person who has measles. All children diagnosed with measles should receive two doses of vitamin A supplements (Appendix E), given 24 hours apart. This treatment restores low vitamin A levels during measles that occur even in well-nourished children and can help prevent eye damage and blindness. Vitamin A supplements have also been shown to reduce the number of measles deaths.

5. Prevention of Measles

Two doses of measles vaccine (MMRV or MMR) given at least 4 weeks apart after 12 months of age will prevent measles in almost all who get the vaccine.

Persons born before 1970 on PEI are considered to be immune because measles was very common before 1970 and it was very unusual for a person not to get measles.

6. Age of People with Measles

Both children and adults can catch measles if they have not had measles before 1970 or if born after 1970 and have not received 2 doses of measles vaccine (MMRV or MMR).

7. MMRV or MMR Safety

MMRV and MMR, which contains measles vaccine, has had an excellent safety record.
Common reactions to the vaccine are mild and include pain, tenderness or redness at the injection site.
Serious reactions are rare and include rare severe allergic reactions.
Some people who receive the vaccine are noted to have a fever and rash that looks like measles 7-12 days after immunization. This occurs in about 2 of 100 children immunized.

A seizure or fever seizure can occur after the vaccine and occurs in about 1 in every 200 children.

Inflammation of the brain (encephalitis) after measles vaccine is rare and occurs in about 1 in 1000 who receive the vaccine.

Protection from Measles if Immunized

One dose of measles vaccine gives 93% protection from measles and two doses 97% protection.

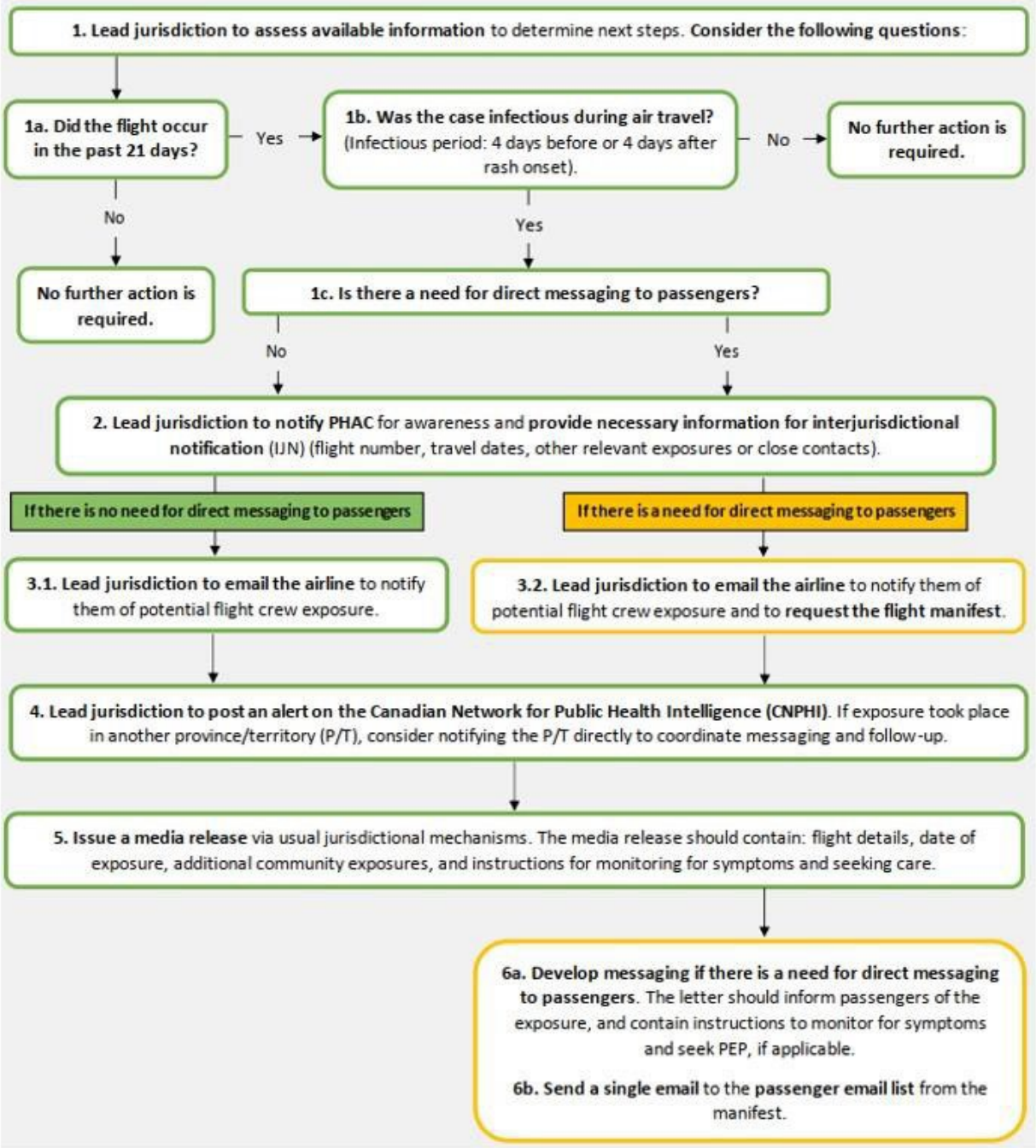
Appendix E - Supportive Treatment of Measles with Vitamin A for Children Diagnosed with Measles

Age	Dose PO	Clinical Comment
< 6 months	50,000 units/day x 2days	If clinical manifestation of Vitamin A deficiency is present, repeat dose after 2-4 weeks.
6-11 Months	100,000 units/day x 2days	
>11 months	200,000 units/day x 2days	

World Health Organization[9]

[9] Measles vaccines: WHO position paper – April 2017

Appendix F -Measles on a flight contact tracing (September 2024)



Measles on a flight - Contact tracing (September 2024)

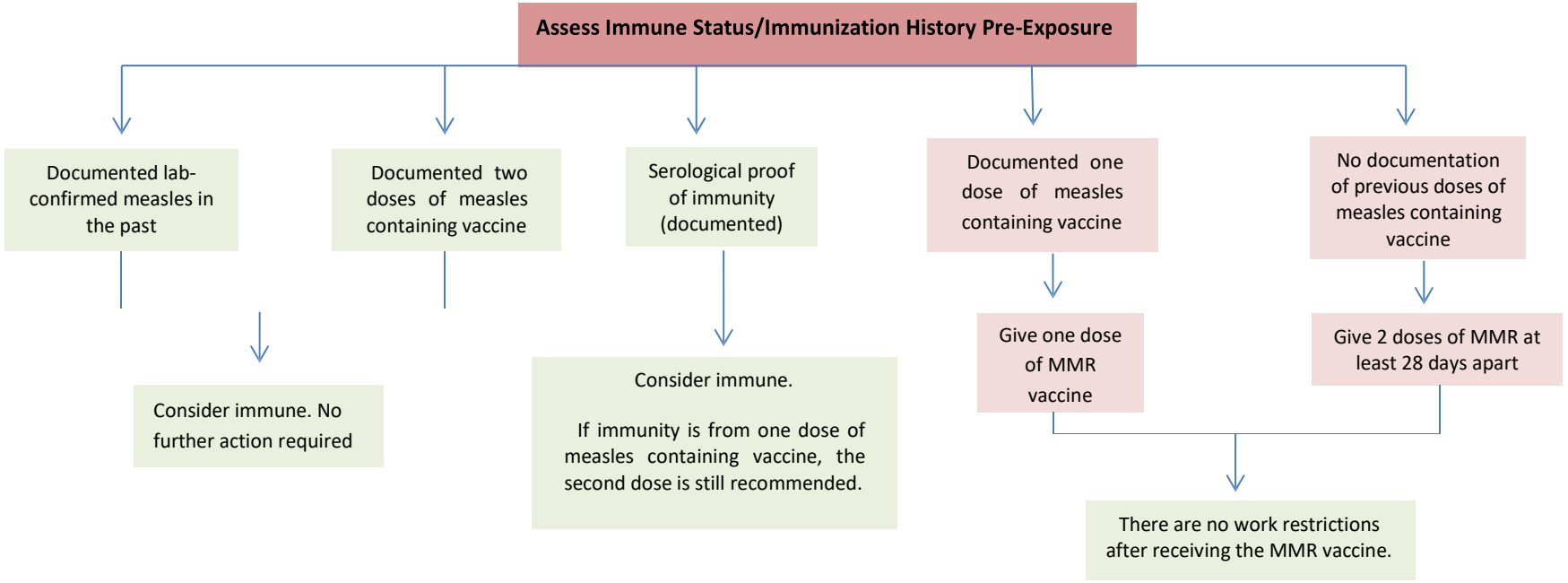
When a measles case travels by plane while they are infectious, there is the potential for measles transmission to susceptible contacts on the plane. Evidence suggests that transmission can occur on flights of all durations and can be spread to passengers seated outside of the case's immediate proximity, including the cabin crew. The administration of post-exposure prophylaxis (PEP) to susceptible individuals may be possible in some instances where susceptible contacts are identified within the timeline for administration (within 6 days of exposure).

Previous guidance for measles cases that were infectious during air travel focused on the timeline for PEP administration to guide public health action. PHAC now recommends issuing a public advisory in all instances where the case was infectious during air travel (four days before and after rash onset). This strategy allows for timely notification and has the added benefit of potentially notifying individuals that were not on the flight but may have been exposed at the airport. In addition to this, at their discretion based on risk assessment and available resources, public health authorities may choose to request the flight manifest to directly notify passengers on the flight of potential exposures. In this instance, it's recommended that the lead public health authority send a single email containing public health recommendations to all passengers on the flight, instead of contacting each passenger individually.

In most instances, the provincial or territorial public health authority that diagnoses the measles case will be responsible for public health follow-up, including interviewing the case, contact management (including determining if a flight manifest for contact management is required), determining public health actions, issuing a public advisory, and notifying PHAC.

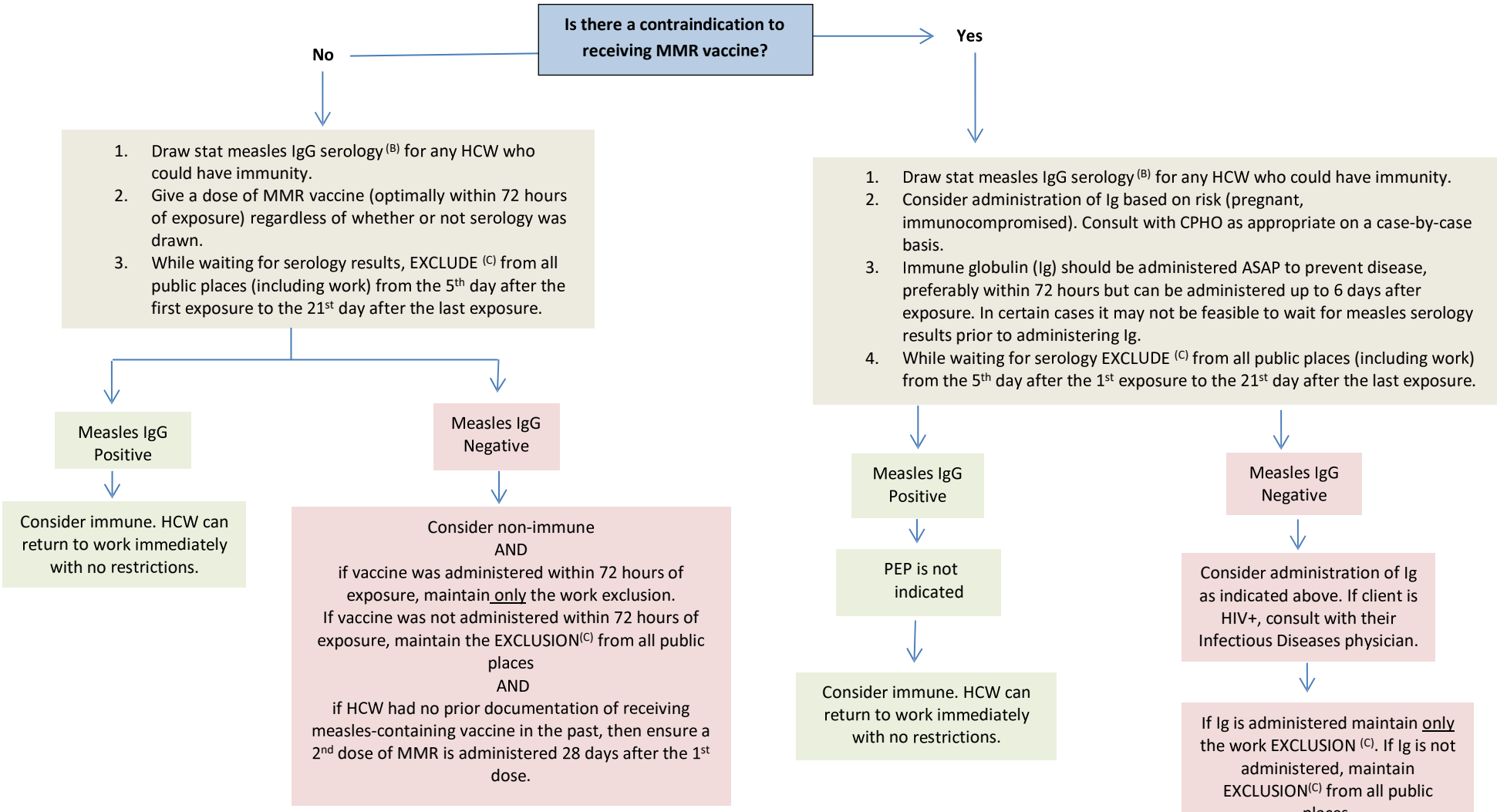
In instances where a jurisdiction identifies a measles case that resides in another province or territory, interjurisdictional notification mechanisms should be followed in order to ensure rapid public health follow up, including case and contact management (including determining if a flight manifest for contact management is required), determining public health actions, issuing a public advisory, and notifying PHAC.

Appendix G - Measles Pre-Exposure[A] Assessment of Health Care Worker (HCW) Susceptibility



[A] *Pre-exposure is defined as the use of MMR vaccine to prevent disease in health care workers who have not yet been exposed.*

Appendix H - Post-Exposure Management of Susceptible Health Care Workers (HCW)[A]



[A] Health care workers are individuals who provide health care or health care support services that have been exposed to a case of confirmed measles e.g. nurses, physicians, dentists, allied HCPs, paramedics, students, etc. Refer to Appendix G to determine HCW susceptibility.
[B] A positive IgG result in any asymptomatic contact can be considered proof of immunity.
[C] EXCLUDE from all public places from the 5th day after the first exposure to the 21st day after the last exposure.

Appendix I - Measles Post Exposure Prophylaxis Recommendations for Susceptible Contacts

Population	Time Since Exposure to Measles	
	≤ 72 Hours	73 Hours-6 days
Susceptible infants 0-6 months of age	Intramuscular Immune Globulin (IMIg) (0.5 mL/kg)[10] [11] Maximum 15 mL[12]	
Susceptible immunocompetent infants 6 to under 12 months of age	MMR Vaccine[13]	IMIg (0.5 mL/kg) [17] [14]
Susceptible immunocompetent older than 12 months of age	MMR Vaccine[15] [16] *A second dose of MMR is given >28 days after the first dose in susceptible contacts who received no doses prior to exposure.*	
Susceptible pregnant individuals	Intravenous Immune Globulin (IVIg) (400 mg/kg)[17] [17] Or	
Immunocompromised individuals 6 months of age and older	If > 30 kg IVIg (400 mg/kg) Or If ≤ 30 kg IMIg (0.5 mL/kg)	

Intramuscular Immune Globulin (IMIg) GamaSTAN® and IVIg are obtained through Blood Services at Prince County Hospital and Queen Elizabeth Hospital.

[10] If injection volume is not a major concern IM immunoglobulin (IMIg) should be provided at a dose of 0.5 mL/kg to a maximum dose of 15 mL over multiple injection sites to infants weighing less than or equal to 30 kg.
[11] 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.
[12] Large volumes (greater than 2mL for children or 3-5 mL for adults) should be divided and injected at 2 or more sites
[13] When MMR vaccine is provided prior to 12 months of age, 2 additional doses of measles-containing vaccine must be administered after the child is 12 months old (and at least 4 weeks after the previous dose) to ensure long lasting immunity.
[14] Infants 6-12 months of age who are identified after 72 hours and within 6 days of measles exposure should receive IMIg (0.5 mL/kg) to a maximum of 15 mL administered over multiple sites if injection volume if not a major concern.
[15] 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.
[16] National Advisory Committee on Immunization (NACI) does not recommend that susceptible immunocompetent individuals older than 12 months of age receive Ig PEP for measles exposure due to low risk of disease complications and the practical challenges of administration for case and contact management.
[17] In cases where injection volume is a concern and for recipients weighing 30 kg or more, IVIg can be considered