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1.0 AUTHORITY

This guidance acknowledges the inherent rights of Indigenous Peoples (First Nations, Métis, and Inuit) as outlined in the BC Declaration on the Rights of Indigenous Peoples Act (Declaration Act). The Declaration Act reaffirms the right of Indigenous Peoples to self-determination and self-government.

Medical Health Officers (MHOs) have legal authority and responsibility to determine and direct the response to local public health threats. The authority for the control of communicable diseases through case and contact management exists in British Columbia under the [Reporting Information Affecting Public Health Regulation \(B.C. Reg. 167/2018\)](#) under the Public Health Act.

MHOs work closely with First Nation communities, First Nations Health Authority (FNHA), and Indigenous partners to prevent and reduce the impact of communicable diseases in First Nations communities.

2.0 GOAL

The goal of the measles control program is to maintain the elimination of endemic measles in B.C. and prevent transmission from imported cases.

The objectives of this guideline are to provide support for:

- Rapid reporting of all suspected and confirmed measles cases.
- Conducting enhanced surveillance for measles.
- Identification of susceptible exposed contacts and immunoprophylaxis when indicated.
- Instituting prompt outbreak control measures.
- Reducing barriers faced by Indigenous peoples and supporting inherent Indigenous rights to health and wellness.

Indigenous peoples in BC often experience stigma, racism and discrimination from within the healthcare system, violence and ongoing trauma, and structural and geographic barriers to accessing health services. Reducing systematic barriers and harms, ensuring access to culturally safe care, and promoting Indigenous-led disease prevention and wellness promotion efforts are essential in reducing the impact of communicable diseases on Indigenous peoples and communities. The 2020 In Plain Sight summary report highlighted systemic, Indigenous-specific racism in BC healthcare leading to insufficient care for Indigenous people which was further amplified in the context of emergency response where jurisdictional complexities created systemic barriers for Indigenous governments in protecting the health and safety of their citizens. This guideline recognizes these barriers faced by Indigenous peoples and aims to support inherent Indigenous rights to health and wellness by highlighting areas where local relationships and shared decision-making with Indigenous rights holders can support provision of culturally safe health care.

2.1 Target immunization coverage

The Pan American Health Organization (PAHO) defines measles elimination as the lack of a circulating endemic genotype for at least one year, and member nations are:

- To achieve and maintain 95% coverage of one dose of measles-containing vaccine, with an opportunity for a second dose.

The Canadian national target is:

- To achieve and maintain 95% completion of 1 dose by the 2nd birthday and 95% completion of the 2nd dose of measles containing vaccine by the 7th birthday.

3.0 DEFINITIONS

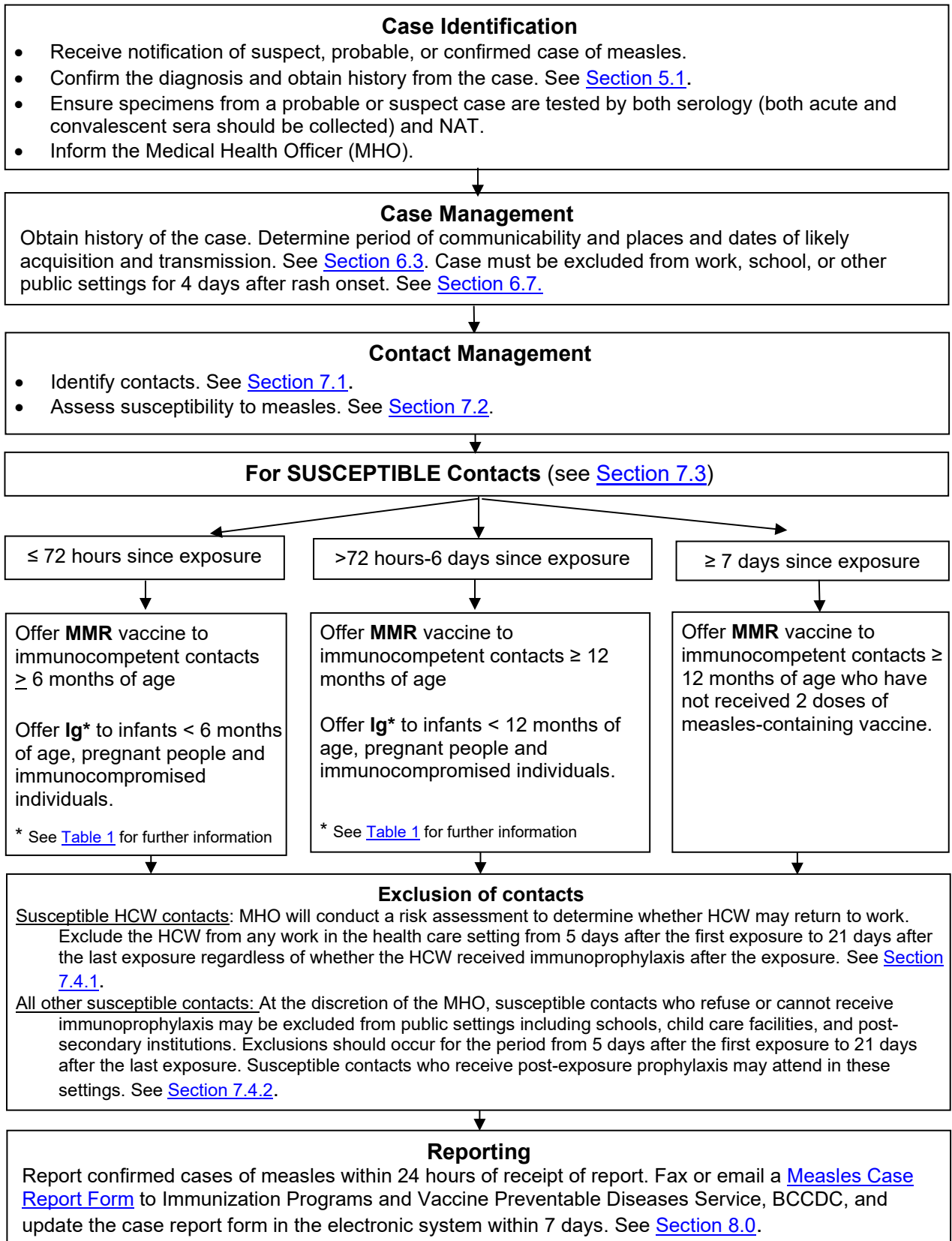
Mode of transmission: airborne by aerosol and droplet spread, direct contact with nasal or throat secretions of infected persons; less commonly by articles freshly soiled with nose and throat secretions.

Incubation period: average is 8 – 12 days with a range of 7 – 18 days, rarely may be as long as 21 days.

Period of communicability: from 1 day before the beginning of the prodromal period (usually about 4 days before rash onset) to 4 days after rash appearance in a healthy person and for the duration of measles illness in an immunocompromised person.

4.0 MEASLES FLOW CHART

The flow chart describes actions to be taken by Public Health when notified of a case of measles. A sporadic case of measles requires urgent follow-up.



5.0 CASE IDENTIFICATION

5.1 Confirm the Diagnosis

Investigate all confirmed, probable, and suspect cases of measles within 24 hours and complete the individual case report in the public health information system. Public health action, including contact management, may commence at any level of the case definition, including for a suspect case.

Inform the local MHO and initiate control measures immediately.

All categories of the surveillance case definition below are reportable.

| Case status | Criteria |
|-----------------------|--|
| Confirmed case | <p><u>Laboratory confirmed:</u> Laboratory confirmation of infection in the absence of recent immunization with measles-containing vaccine:</p> <ul style="list-style-type: none"> isolation of measles virus from an appropriate clinical specimen¹; OR detection of measles virus RNA; OR seroconversion or a significant rise in measles IgG titre between acute and convalescent sera; OR positive serologic test for measles IgM antibody using a recommended assay in a person who is either epidemiologically linked to a laboratory-confirmed case or has recently travelled to an area of known measles activity. <p><u>Epidemiologically-linked:</u></p> <ul style="list-style-type: none"> Clinical illness* in a person who is epidemiologically linked to a laboratory-confirmed case. |
| Probable case | Clinical illness* in the absence of appropriate laboratory tests and not epidemiologically linked to a laboratory-confirmed case and with recent travel to an area of known measles activity. |
| Suspect case | For public health intervention – all of the following: <ul style="list-style-type: none"> Fever of 38.3°C or greater Cough, coryza, or conjunctivitis Generalized maculopapular rash |

* Clinical illness is characterized by all of the following features:

- Fever of 38.3°C or greater
- Cough, coryza or conjunctivitis
- Generalized maculopapular rash for at least 3 days

¹ This test is not performed by BCCDC Public Health Laboratories.



6.0 CASE MANAGEMENT

Consult with the MHO and initiate control measures immediately upon the identification of a case, including a clinical or suspect case, if the risk assessment is suggestive of measles. Initiation of control measures need not await laboratory confirmation of the case.

6.1 Laboratory Testing

Diagnostic work-up of probable and suspect cases should include both **virus detection** (by nucleic acid testing (NAT)) **and serology**. Specimens should be sent to the British Columbia Centre for Disease Control (BCCDC) Public Health Laboratory for testing (BCCDC PHL). The MHO may request priority testing from the medical microbiologist at BCCDC if required at tel: 604-661-7033 (24 hours, 7 days per week). For laboratory test results, contact the BCCDC PHL Results Line (1-877-747-2522) or access the information through CareConnect.

Specimen receiving hours at BCCDC PHL for Central Processing & Receiving Pre-Analytical are 0700 - 2300 Monday to Sunday.

For more information regarding laboratory programs and services including the [eLab Handbook](#), refer to the [Laboratory Services](#) page on the BCCDC website.

6.1.1 Virus Detection

Virus detection should be attempted for all sporadic cases of suspect or probable measles. In an outbreak, specimens should be collected from several cases to increase the success of virus detection and subsequent genotyping.

Samples for measles NAT detection include either **nasopharyngeal (preferred) or throat swabs** and **urine samples** (please consult the [eLab Handbook](#)). Viral detection methods (e.g., NAT followed by sequencing) enable a definitive diagnosis, allow the laboratory to distinguish vaccine virus type from wild virus type, and can determine if there are single or multiple genotypes of virus circulating in a community. Genotyping of the measles virus is helpful in understanding transmission patterns and is especially useful if there are no epidemiological links between cases because such results can indicate whether the origin of the virus is the same or different.

In order to limit potential transmission, ensure collection sites are notified prior to sending individuals for testing so that appropriate measures can be taken to prevent exposure of patients/staff.

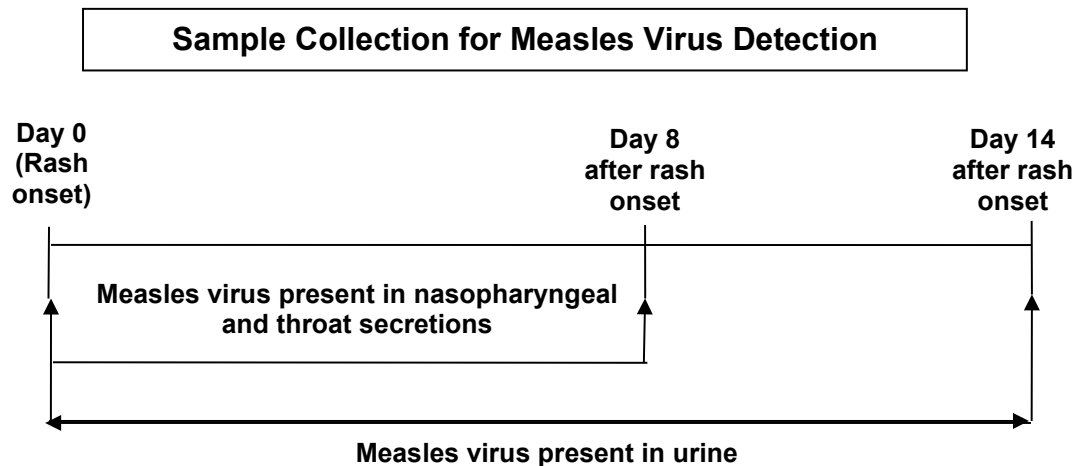
Collect a **nasopharyngeal (NP) or throat swab** and a **urine sample** at the time of presentation.



Sample Collection for Measles Virus Detection

- **Nasopharyngeal Swab:** Use a BCCDC PHL flocked swab (COPAN, red top with universal transport media is preferred). To collect the nasopharyngeal swab, insert the flexible wire shaft swab through the nares parallel to the palate (not upwards) until resistance is encountered or the distance is equivalent to that from the ear to the nostril of the patient indicating contact with the nasopharynx. Gently, rub and roll the swab. Leave the swab in place for several seconds to absorb secretions before removing.
- **Throat Swab:** Use a BCCDC PHL flocked swab (COPAN, red top with universal transport media is preferred). To collect a throat swab, swab the back of the throat near the tonsils (if present).
- **Urine Sample:** Use a sterile container.

NP and throat swabs may be collected up to 8 days after rash onset. Urine samples may be collected up to 14 days after rash onset. The yield may be lower with the longer timelines for collection of urine samples.



Place specimens on ice pack(s), and ship immediately to the BCCDC PHL. If immediate transport is not feasible, place the specimen(s) in a refrigerator (not a freezer) and transport to the laboratory on ice pack(s) within 24 hours.

NAT performed on nasopharyngeal, throat and urine specimens is a very sensitive assay for measles. Specimens that test positive by NAT will be forwarded to the National Microbiology Laboratory for genotypic analysis. Virus detection methods are also useful when serological results conflict with the epidemiological or clinical features of the case.



6.1.2 Serology

Acute measles serology includes testing for measles specific IgM and IgG class antibodies.

As the clinical presentation of measles can resemble other viral infections, request that sera from suspect or probable cases of measles be tested for antibody to parvovirus B19 and rubella. Request these tests on the initial ACUTE measles specimen.

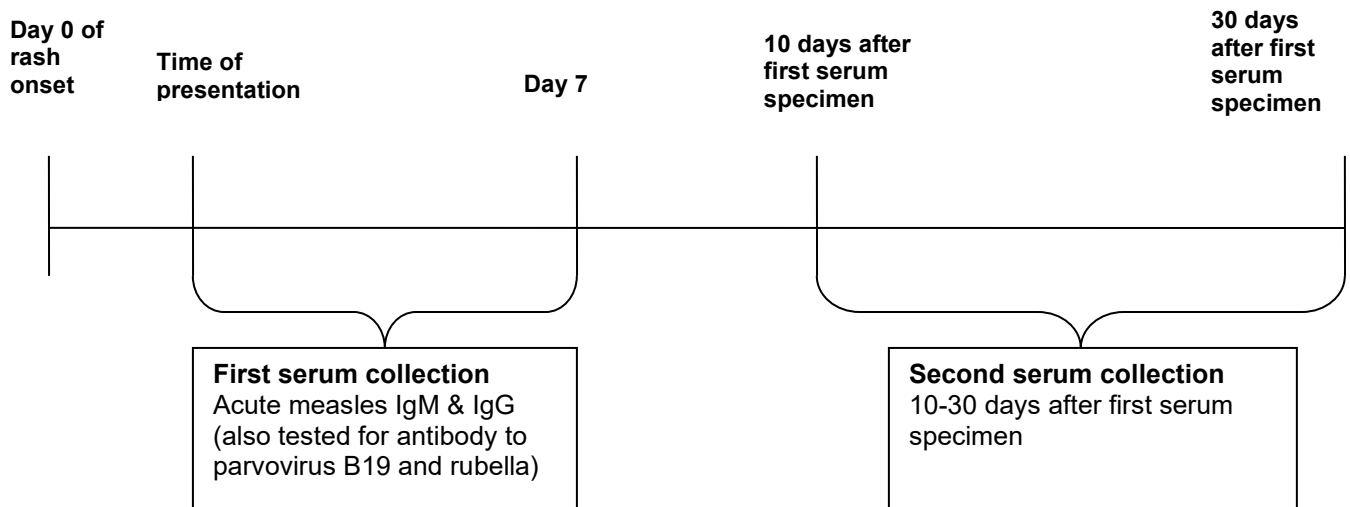
Use a BCCDC PHL SST (serum separator tube) gold top blood collection tube. Identify the specimen as “acute measles” on the lab requisition.

For IgM and IgG serology, obtain the first (acute) sample at the time of presentation and no later than day 7 following rash onset. Note that 20% of measles cases will not have a reactive IgM when blood is drawn within the first 3 days of rash. For this reason, a second blood sample is indicated if the IgM serology results from an early acute phase sample are inconclusive or negative for measles, rubella, and parvovirus B19, and the person meets the probable case definition for measles.

Collect the second (convalescent) sample 10 to 30 days after the first sample and record as such on the laboratory requisition. These paired sera are tested simultaneously to determine if seroconversion has occurred.

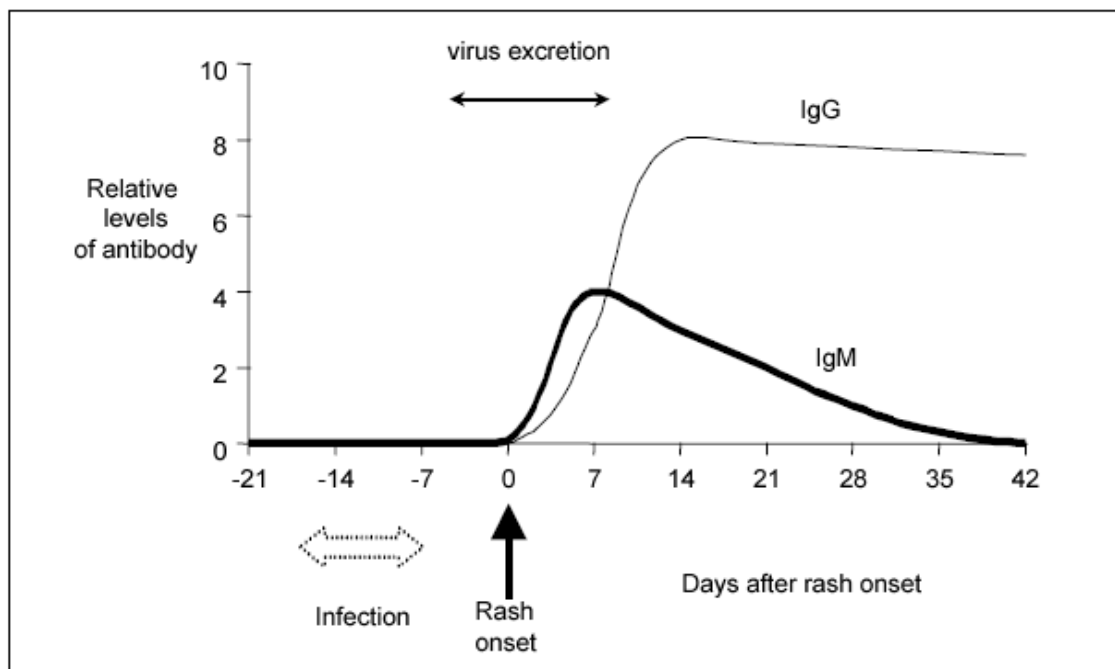
If the case is confirmed by NAT virus detection, a convalescent specimen is not necessary.

Serum Collection for Measles



The graph below depicts the antibody response to measles infection (WHO, 1999).

Figure 1: Antibody response to measles virus infection



Antibodies are first detectable when the rash appears, and life-long protection results from natural infection. IgM antibodies are produced initially, followed by IgG and IgA in serum and secretions.

Due to the very low incidence of measles in BC, an anti-measles IgM positive result in a sporadic case without links to other cases must be interpreted with caution because these may be false positives. Such sporadic cases should be confirmed by convalescent blood specimens, which will allow for demonstration of a rise in IgG titre and/or virus detection.

If the clinical and epidemiological data do not fit the picture of measles, or if results are inconclusive or inconsistent, the Medical Health Officer can consult with the medical microbiologist at BCCDC 604-661-7033 (24 hours, 7 days per week).

6.2 Interpretation of Test Results

Where serology test results are reported in international units, a significant rise between acute and convalescent serum is considered consistent with seroconversion. Where these results are not reported in international units, seroconversion may be established on consultation with the virologist/medical microbiologist.



The timing of specimen collection must always be considered in the interpretation of a laboratory result. Samples from the early acute phase (i.e., those drawn before 3 days after rash onset) may not have detectable IgM antibody compared with those drawn 3 to 28 days after rash onset. For this reason, a second blood sample is indicated if the IgM serology results from an early acute phase sample are inconclusive or negative for measles and the person meets the probable case definition for measles.

| Measles Testing Results | |
|---|---|
| Test Result | Interpretation |
| Reactive IgM antibody | Possible acute measles infection or recent immunization. False positive may occur in about 0.4%. IgM is also detected after immunization against measles. IgM may remain detectable in some individuals for years after vaccination or natural infection. |
| Non-reactive or equivocal IgM antibody | Not acute measles infection (Note: 20% of measles cases will not have a reactive IgM when blood is drawn within the first 3 days of rash). |
| Non-reactive anti-measles IgG | Susceptible to measles (no evidence of past infection or immunization). |
| Reactive anti-measles IgG | Immune to measles (evidence of past infection or immunization). |
| A significant rise in IgG titre between the acute and convalescent sera | Acute measles infection or recent immunization. |
| Positive NAT <ul style="list-style-type: none"> • Nasopharyngeal/throat swab • Urine | Confirms acute measles infection. |

Immunization against measles will result in a seroresponse of IgM and IgG measles antibodies that is indistinguishable from acute infection. Testing for virus detection should resolve such cases.

6.3 Case History

In order to properly interpret laboratory results, consider both clinical and epidemiologic information along with the laboratory information. Use the [Measles Case Report Form](#) to collect data and determine if the case report meets the case definitions for measles. Give rationale as to why the case report information is being collected.² Utilize a trauma-informed approach to promote a culture of safety, empowerment, and healing and provide reassurance regarding privacy and confidentiality. Collaboration with key

² Disaggregated data collection through voluntary Indigenous self-identification is important for revealing and reducing systemic racism, as well as inequalities in social determinants of health and access to health care, as recommended in the Office of the Human Rights Commissioner report, [Disaggregated demographic data collection in British Columbia: The grandmother perspective](#).



local partners - including but not limited to community health representatives, community health nurses, Indigenous patient navigators and outreach organizations - can help facilitate timely and supportive case and contact management.

Prior vaccination history, travel and exposure history, and timing of sample collection relative to symptom onset are all factors that must be considered in the interpretation of lab results for the purpose of confirming measles cases. If dates of likely exposure are compatible with acquisition in BC, investigate for a source case.

Using the known incubation period for measles (see [Section 3.0](#)), determine the likely source of infection. Determine the **period of communicability** - from 1 day before the beginning of the prodromal period (usually about 4 days before rash onset) to 4 days after rash appearance in a healthy person and for the duration of measles illness in an immunocompromised person. Advise the case of their period of communicability and the process involved with contact tracing. Provide education on ways to prevent transmission, see [Section 6.6](#).

If the case travelled outside of BC during their infectious period, or may have acquired their infection elsewhere in Canada, inform BCCDC and provide the case's itinerary so that the appropriate public health authorities may be notified if indicated. See [Section 8.1 Inter-jurisdictional Notifications](#) for more information.

6.4 Case Treatment

Clinical management of cases is outside the scope of this guideline.

For more information on case treatment, refer to [Measles: For health professionals](#).

6.5 Future Immunization of the Case

Defer all immunizations with live and inactivated vaccines until at least four weeks after illness onset in the case. 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 had 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.

6.6 Case Isolation

Isolation in a health care facility:

In health care facilities, initiate airborne precautions, including use of an airborne

infection isolation room (AIIR), from the onset of the catarrhal stage of the prodromal period through the 4th day of rash for otherwise healthy individuals and for the duration of illness for immunocompromised individuals. This will reduce the exposure of other patients at high risk and of health care workers. For more information refer to the [Provincial Infection Control Network of British Columbia](#).

Isolation in the community:

Public health advice to suspect, probable, and confirmed cases should include the following: education on how measles is transmitted, to stay home for at least 4 days after the rash first appeared, to practice good hand hygiene, to avoid sharing drinking glasses or utensils, and to cover coughs and sneezes with a tissue or forearm. The case should also be advised to wear a mask to avoid infecting others.

6.7 Exclusion of Cases

Probable and suspect cases should be managed as confirmed cases until laboratory evidence suggests otherwise.

6.7.1 Exclusion of health care workers

Health care workers (HCWs) include and are not limited to: nurses, physicians, physiotherapists, laboratory technicians, HCW students, volunteers, medical office assistants, home care workers, emergency responders, and support staff in acute care, long-term care, home care, and community health settings.

Notify Occupational Health and/or Infection Control for the facility in which the case works, if applicable. HCWs who are diagnosed with measles or suspected to have measles must follow the direction provided by the MHO regarding exclusion and return to work guidance.

MHO should exclude HCWs from work for 4 days after the appearance of a rash. Exclusion of immunocompromised HCW may be extended until they fully recover as they may be infectious for longer and may shed virus for extended periods.³

6.7.2 Exclusion from public settings (Workplace, school, or child care settings)

The MHO should exclude cases from public settings including but not limited to school, child care settings, post-secondary institutions and the workplace for at least 4 days after the appearance of the rash if there are susceptible individuals present in that setting.

³ [CDC: Measles-Infection Control in Healthcare Personnel: Epidemiology and Control of Selected Infections Transmitted Among Healthcare Personnel and Patients](#) (2024)

When the case is in a school setting, notify the appropriate school administrator.

7.0 CONTACT MANAGEMENT

7.1 Contact Identification

Definition: Contacts are individuals who have spent any length of time in a room or enclosed space while the infectious measles case was present or for up to 2 hours after the case left the room/space.

The highest attack rates are among susceptible household contacts with secondary household cases experiencing more serious disease. Therefore, these should be prioritized for contact identification and management.

The 2-hour timing recommendation is consistent with Canadian and US infection control guidelines. It is based on documented transmission events related to such exposures in medical waiting rooms after the index case has left the room (Bloch AB, 1985; Remington, PL, 1985). It is recognized that transmission of this type may be a relatively uncommon event; however, a risk assessment should be undertaken that considers the respiratory symptoms, speed of isolation of the case after arrival in that setting, and the contacts' susceptibility.

Priorization of contacts should take into account the transmission risk and the risk of susceptibility and serious complications among exposed individuals. The following should receive priority for contact identification and management:

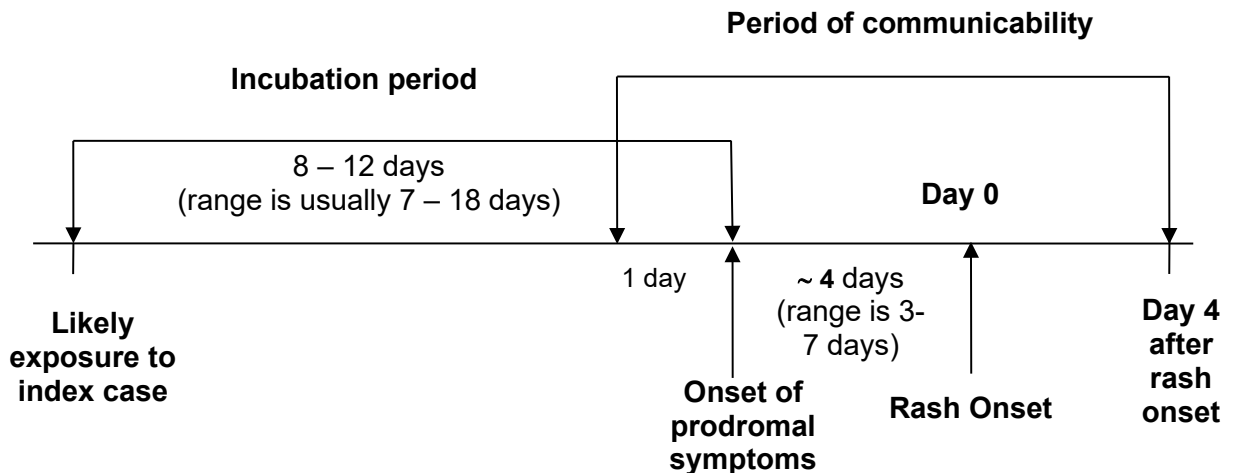
- immunocompromised individuals
- children under one year of age
- pregnant women and pregnant people
- household-type contacts
- residents of Indigenous or remote/isolated communities ⁴
- health care workers

The [Measles Case Report Form](#) may be used to collect data. Give rationale as to why the information is being collected.⁵ Utilize a trauma-informed approach to promote a culture of safety, empowerment and provide reassurance regarding privacy and confidentiality. Collaboration with key local partners - including but not limited to community health

⁴ Some Indigenous communities may be at higher risk for measles outbreaks and may be disproportionately affected because of longstanding inequities related to the social determinants of health due to the impacts of colonization, including underlying challenges such as overcrowding, poor housing ventilation and access to care. Remote/isolated communities may have significant barriers accessing timely care (e.g., geographical and transportation barriers).

⁵ Disaggregated data collection through voluntary Indigenous self-identification is important for revealing and reducing systemic racism, as well as inequalities in social determinants of health and access to health care, as recommended in the Office of the Human Rights Commissioner report, [Disaggregated demographic data collection in British Columbia: The grandmother perspective](#).

representatives, community health nurses, Indigenous patient navigators and outreach organizations - may help facilitate timely and supportive case and contact management. Occupational Health and Infection Control are responsible for follow-up of exposed staff and inpatients exposed in the health care facility. Follow up of patients discharged from emergency rooms occurs in collaboration with institutional infection control staff.



7.2 Assess Susceptibility of Contacts and Risk Factors for Measles Complications

Conduct a risk assessment for each identified contact with respect to susceptibility to measles and likelihood of measles complications using the principles outlined below.

Investigate the possibility of additional suspect cases among the contacts. Refer all identified suspect and probable cases to a physician for assessment and diagnosis. Refer to [Section 7.5 Contact Education](#) for more information.

Consider as **immune** those persons who have any of the following:

- birth date before January 1, 1970 (1957 for health care workers).⁶
- documented evidence of vaccination with 2 valid doses⁷ of live measles-containing vaccine on/after their 1st birthday and given at least one month apart.
- laboratory evidence of immunity (i.e., “reactive” or “positive” anti-measles IgG antibody or a previous measles antibody level of ≥ 200 mIU per mL). While serological testing (anti-measles IgG antibody) can be applied on a case-by-case

⁶ These persons are assumed to have acquired immunity to measles from natural infection. Those without a history of measles disease should be considered susceptible and offered vaccine.

⁷ Primary vaccine failure (lack of seroconversion) occurs in 5-7% of infants following a single dose of measles vaccine; for the purpose of contact management, those who have received a valid single dose of measles-containing vaccine should be considered immune, and offered measles immunity testing following exposure and/or a 2nd dose of measles-containing vaccine if born in/after 1970. For management of exposed healthcare workers, see [Section 7.4.1](#).

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- basis to determine susceptibility, it is not appropriate for mass testing in the follow-up of potential exposures of large numbers of people e.g., a high school. If an immunization record is not readily available, such individuals should be managed as susceptible.
- laboratory evidence of prior measles infection. Physician diagnosis of measles without laboratory confirmation is not considered proof of immunity in the current Canadian epidemiologic context.

Consider as potentially **susceptible** contacts ≥ 6 months of age born on or after January 1, 1970 (1957 for health care workers)^{8, 9} who:

- **do not have** at least one of the following:
 - documented evidence of vaccination with 2 valid doses¹ of live measles-containing vaccine on/after their 1st birthday and given at least one month apart; **OR**
 - laboratory evidence of immunity (i.e., “reactive” or “positive” anti-measles IgG antibody or a previous measles antibody level of ≥ 200 mIU per mL); **OR**
 - laboratory evidence of prior measles infection. Physician diagnosis of measles without laboratory confirmation is no longer considered proof of immunity in the current Canadian epidemiologic context.
- **have** certain immunosuppressive conditions (see [Table 1](#), footnotes 8 and 9 for more information).

7.3 Immunoprophylaxis of Susceptible Contacts at High Risk of Measles Related Complications

In September 2018, the National Advisory Committee on Immunization updated its recommendations for measles post-exposure prophylaxis (Tunis MC, 2018). The BC guidelines have been updated accordingly.

Passive immunization (immunoglobulin [Ig]) is not recommended for immunocompetent non-pregnant individuals aged 12 months and older, even those suspected or known to be susceptible to measles (e.g., those who have not been previously immunized). Such individuals should be offered MMR vaccine regardless of the time elapsed since exposure, and should complete a series of two doses, given 4 weeks apart, in order to provide protection against future measles exposures. Post exposure MMR vaccine is

⁸ There are exceptions to this and infants less than 6 months of age may be susceptible. See [Table 1](#), footnote 1.

⁹ This change to BC policy was made in 2014 from use of birth years prior to 1957 for assumption of immunity for those who are not health care workers, and is reflective of recommendations made by the National Advisory Committee on Immunization in the [Canadian Immunization Guide](#) and the Canadian Guidelines for the Prevention and Control of Measles in Canada (2012). This age criterion is supported by results of a BC pre-natal blood specimen survey conducted in 2010 which demonstrated that 95% of people born prior to 1970 and 88% born 1970-79, respectively, were immune to measles (data on file at BCCDC).



effective if given within 3 days of the exposure. There are no known adverse effects of vaccine given to people incubating measles. However, when given later than 3 days following exposure, immunoprophylaxis may not prevent or modify disease. Infants aged 6 to <12 months whose exposure was ≤ 3 days previously should be given 1 dose of MMR vaccine; such infants will require 2 more doses of MMR vaccine after the first birthday, given on the routine schedule.

The only exposed contacts recommended to receive passive protection (Ig) are those known to be susceptible to measles and at high risk of measles-related complications and within 6 days of measles exposure. These are: immunocompromised people; pregnant women and pregnant people; infants under 6 months old; infants aged 6 to <12 months whose exposure was >72 hours to 6 days previously. Ig may also be considered for other susceptible individuals for whom MMR vaccine is contraindicated or those with recent receipt of an immunoglobulin preparation or blood product.

Passive immunizing agents (IMlg and IVlg) should only be provided within 6 days of measles exposure. Those already receiving replacement IVlg (400 mg/kg of body weight or higher) to treat other conditions do not require Ig if the last dose of IVlg was received within three weeks prior to measles exposure.

Intravenous immunoglobulin (IVlg) is the product of choice for those who cannot receive MMR vaccine (see table below) and weigh 30 kg or more. Intramuscular immunoglobulin (IMlg), which is given in a dose of 0.5 mL/kg (to a maximal volume of 15 mL), administered by multiple injections, does not contain sufficient anti-measles antibody to provide complete protection. IVlg can be offered to those weighing less than 30 kg if the number of injections required for its administration is unacceptable.

In cases where IVlg cannot be accessed because of logistical issues such as distance to a health care facility able to administer IVlg by infusion, IMlg can be offered but is not expected to provide sufficient protection. IVlg is used for a number of indications and facilities with a transfusion medicine laboratory would most likely have IVlg readily available should it be needed. Connect with local partners (e.g., FNHA, local community health nurse) to support timely access to IVlg (if indicated) for those living in remote/isolated areas. Contact the [BC Provincial Blood Coordinating Office](#) for support with IVlg inquiries as needed.

All exposed individuals should be informed about signs and symptoms of measles and to seek medical attention should symptoms arise. They should be told to inform the health care provider prior to arrival at the clinic for assessment, in order that appropriate infection control measures can be put into place to avoid infecting others in the clinical setting.

Table 1. Summary of updated measles PEP recommendations for contacts

| Immune/susceptible status by age, pregnancy, and immunocompetency | Time since exposure to measles | |
|---|--|---|
| | ≤ 72 hours (3 days) | >72 hours – 6 days |
| Individuals with measles immunity | No post-exposure prophylaxis required. If only a single dose of measles-containing vaccine has been received on or after the 1 st birthday, and born in/after 1970 (1957 for healthcare workers), administer a 2 nd dose of measles regardless of the time elapsed since the measles exposure. | |
| Susceptible infants 0-6 months old ¹ | IMlg (0.5 mL/kg) ^{2,3,4} | |
| Susceptible immunocompetent infants aged between 6 and <12 months | MMR vaccine ^{5,6} | IMlg (0.5 mL/kg) ^{2,3,4} |
| Susceptible immunocompetent individuals 12 months of age and older ⁷ | MMR vaccine ⁵ (To protect against current exposure) | MMR vaccine ⁵ (To protect against future exposures) |
| Immunocompromised individuals 6 months of age and older ^{8,9} Susceptible pregnant women and pregnant people ^{1,8} | IVlg (400 mg/kg) or IMlg (0.5 mL/kg) ⁴ , limited protection for those weighing 30 kg or more | |

LEGEND:

IMlg: Intramuscular immunoglobulin, GamaSTAN®

IVlg: Intravenous immunoglobulin. There are four IVlg products available in Canada through Canadian Blood Services. One or more of these will be available at the hospital blood bank. These are: Gammagard®, Gamunex, IGIVnex and Privigen®.

¹ For infants under 6 months of age and pregnant women and pregnant people: Ig may be offered to infants younger than 6 months of age if maternal immunity to measles is lacking, uncertain, or measles-vaccine acquired and the exposure occurred in a household-like setting. Maternal immunity to measles can be verified usually the same day on banked prenatal specimens, if antenatal care was provided in BC. The MHO can call the medical microbiologist at BCCDC to request immediate testing at tel: 604-661-7033 (24 hours, 7 days per week). Pregnant susceptible people managed for measles exposure during pregnancy should receive 2 doses of MMR vaccine post-partum, with due attention to the interval following immunoglobulin receipt. See [Part 4 – Biological Products, Immune Globulin Preparations or Blood: Timing Intervals for Vaccines Containing Live Measles, Mumps, Rubella or Varicella Virus.](#)

² For immunocompetent susceptibles given Ig, and without contraindications to MMR vaccine: When clinical measles does not develop in a contact given one dose of Ig, MMR vaccine should be provided at the recommended interval. If Ig was given in infancy, MMR vaccine should be postponed until ≥ 12



months of age. See [Part 4 – Biological Products, Immune Globulin Preparations or Blood: Timing Intervals for Vaccines Containing Live Measles, Mumps, Rubella or Varicella Virus](#).

- ³ If injection volume exceeds the recommended volume for all the available injection sites combined, IVIg can be provided at a concentration of 400 mg/kg, and is expected to provide effective protection. For those weighing 30 kg or more, IMIg will not provide complete protection but may prevent some symptoms.
- ⁴ See [Immune Globulin Preparations \(HBIG, Ig, TIg, VarIg, RabIg\)](#) for administration information and maximum volume to be administered per site according to age.
- ⁵ Two doses of measles-containing vaccine are required after the first birthday for high levels of long-term protection. While MMR vaccine will not provide post-exposure protection if given >3 days after exposure, it should still be offered and a 2-dose series completed in those without a contraindication. Individuals with a contraindication to MMR vaccine or recent receipt of immunoglobulin or blood products may receive Ig.
- ⁶ For infants who receive MMR at age 6 to <12 months: such infants should receive two additional doses of MMR vaccine according to the routine schedule.
- ⁷ 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 contact management.
- ⁸ For immunocompromised or pregnant: On a case-by-case basis, consider serological testing for immunity for immunocompromised individuals who are likely to have pre-existing immunity from prior vaccination or measles disease as well as for pregnant people (as prenatal sera may be stored at the BCCDC Public Health Laboratory for two years and readily available for retrieval for testing).
- ⁹ Individuals with immunosuppressive conditions that significantly alter immune status, including HSCT or CART therapy recipients within the past 24 months and severe primary immunodeficiency, should be offered immunoglobulin. Special consideration should be given to individuals with prior immunity, but with immunosuppressive conditions that may result in a loss of/or reduced protective antibody level. Such individuals should be managed on the basis of IgG obtained at the time of exposure (or since the diagnosis or treatment completion):
- chemotherapy for acute lymphoblastic leukaemia (ALL)
 - lymphoproliferative disorders (e.g., haematological malignancies)
 - solid organ transplant recipients
 - HSCT or CART therapy recipients
 - individuals receiving, or within six months of completing, biological therapies (i.e., monoclonal antibodies and cytokine inhibitors)
 - advanced HIV infection
- See [Appendix A - Classification for Immunosuppression](#) for further information.

Both measles vaccine, given as MMR vaccine, and human serum immune globulin (Ig) have a role in measles post-exposure prophylaxis for susceptible individuals. One or the other of these should be considered for this circumstance; both products are not to be used concurrently as immune globulin will interfere with the response to the live attenuated vaccine.

Ensure that all clients who receive immunoglobulin are informed of the potential risks associated with receipt of a blood-derived product and provided with a written record. This is a requirement of the Canadian Standards Association for Blood and Blood Products.

Available efficacy data on the use of Ig for post exposure measles prophylaxis is from studies dating as far back as the 1940s, indicating levels of efficacy around 70-80%

(Endo 2001; Janeway 1945; Ordman 1944). The efficacy of measles vaccine post exposure is less well studied, with estimates ranging from as low as 4% and as high as 100%.

In contacts who have received measles vaccine post-exposure and develop symptoms of measles including fever and rash (occurring within 7-12 days of immunization), specimens must be collected for virus detection to confirm the diagnosis of measles as serology will not distinguish between wild type infection and measles vaccine seroresponse with IgM and IgG. Virus isolation and typing will distinguish wild from vaccine strain virus.

7.4 Exclusion of Susceptible Contacts

At the discretion of the MHO, susceptible contacts who refuse or cannot receive immunoglobulin within 6 days of exposure or MMR vaccine within 3 days of exposure may be excluded. Exclusions should occur for the period from 5 days after the first exposure to 21 days after the last exposure.¹⁰ Susceptible contacts who receive timely post-exposure prophylaxis may attend public settings. See [Section 7.4.2](#). The exception to this is HCWs who, at the discretion of the MHO, may be excluded from any work in the health care setting regardless of whether they received timely post exposure immunoprophylaxis. See [Section 7.4.1](#).

7.4.1 Health care settings

Assess the measles susceptibility status of all health care workers (HCWs) who were exposed to a case of measles. When a suspect case of measles is identified within a health care setting, attempt to have only staff known to be immune to measles entering the patient's room. Ensure all patients suspected or confirmed to have measles are placed on airborne precautions, for more information refer to the [Provincial Infection Control Network of British Columbia](#).

When a susceptible HCW (including a HCW with history of 1 dose of measles vaccine) is exposed to a case of measles, order measles serology for any HCW who could have immunity and administer one dose of MMR vaccine immediately. If HCW had no prior documentation of receiving measles-containing vaccine, administer a second dose 4 weeks later. If MMR vaccine is contraindicated for medical reasons (e.g., immunocompromised or pregnant), offer immunoglobulin. Measles vaccine or immunoglobulin given after the exposure does not guarantee protection and infectiousness can precede symptom onset.

¹⁰ The rationale for the 5 to 21 day time period is as follows: if the individual became infected with measles as a result of the exposure, shedding of the measles virus can occur as early as 5 days following the exposure; 21 days is the longest possible incubation period. The incubation period ends with the onset of prodromal symptoms (e.g., fever, cough, coryza, conjunctivitis, Koplik spots). The person is infectious 1 day before the onset of prodromal symptoms.

Exclusion of susceptible HCW contacts will be determined by the MHO. Considerations for exclusion may include, but are not limited to, the following:

- history of measles vaccination
- IgG serology
- birth cohort
- health care profession (e.g., those providing direct patient care)
- continuity of health care services
- the patient group(s) for whom the HCW cares

An algorithm outlining post-exposure management of susceptible HCWs that can support MHO decision-making can be found in [Appendix B](#).

HCWs who develop a measles-like illness following exposure should be tested (by serology and nucleic acid testing) to confirm the diagnosis, and be excluded from work until no longer infectious (i.e., on or after 5th day after rash onset and clinically recovered).

7.4.2 Public Settings (Workplace, school, or child care settings)

Susceptible contacts from the above settings who refuse or cannot receive MMR vaccine or immunoglobulin per timeline indicated in [Table 1](#) may be excluded from that setting at the discretion of the MHO. If exclusions occur, the period of exclusion should extend from 5 days after the first exposure to 21 days after the last exposure. Consideration should be given to: the number of susceptibles in that setting; the presence of high risk individuals, susceptible infants, or immunocompromised individuals; and the reliability of and feasibility for the incubating individual to comply with early recognition and self-isolation. Exposed individuals who are age eligible to receive 2 doses of MMR vaccine and who have not received their 2nd dose would typically be offered the 2nd dose immediately post exposure but not be excluded, as the likelihood of immunity after 1st dose is high ($\geq 90\%$).

Susceptible contacts including HCWs who have received post-exposure prophylaxis within the appropriate timelines may attend in these types of settings at the discretion of the MHO. See [7.3 Immunoprophylaxis of Susceptible Contacts at High Risk of Measles Related Complications](#).

Notify the appropriate school administrator of the respective school board when contacts are excluded from the school setting.

7.5 Contact Education

Advise susceptible contacts:

- about the signs and symptoms of measles, how it is transmitted, and to isolate themselves at home immediately if any symptoms of measles develop and for four days after the onset of rash.
- to observe for signs and symptoms of measles beginning 7 to 21 days after the first contact with a case or longer if the contact received immune globulin.
- to avoid other measles susceptible people and immunocompromised persons 5 to 21 days after exposure to a case.
- to rapidly report any symptoms compatible with measles to their doctor/health care provider. Advise them to call ahead before going to any health care facility, including laboratories, to inform the staff of measles symptoms so that they can be isolated on arrival to avoid exposing any susceptible persons.
- to inform their local public health unit should they develop symptoms of measles.
- that post-exposure prophylaxis is not 100% effective. Advise clients to avoid unnecessary contact with individuals at high risk for complications until 21 days after their last exposure.

7.6 Contacts Aboard Commercial Flights and at Other Public Venues

If the case travelled outside of BC during the infectious period, inform BCCDC and provide sufficient details about the case's itinerary to enable the affected public health jurisdiction to receive the notification and take appropriate action for contact identification and management.

The recognition of a case of measles that was infectious while aboard a commercial flight warrants an assessment to consider the likelihood of exposure of flight crew and passengers. While most passengers on airplanes should be immune to measles through either vaccination or prior infection, measles transmissions to flight crew and airport contacts has been documented in recent years in Canada. In order to take a risk-based approach and balance public health resources with timely notification, the Public Health Agency of Canada (PHAC) 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. The public advisory should be posted in the public domain (e.g., BCCDC website and/or the regional health authority [RHA] website). In addition to this, at their discretion based on risk assessment and available resources, BCCDC in collaboration with the RHA may choose to request the flight manifest to directly notify passengers on the flight of potential exposure. Flight manifest information is requested through BCCDC (Immunization Programs and Vaccine Preventable Diseases Service during working hours, and BCCDC on call physician after hours). BCCDC will request this information from the airline and disseminate direct messaging to passengers. It's recommended the direct messaging is through a single email containing public health recommendations to all passengers on the flight, instead of contacting each passenger individually. Additional information can be found through the PHAC website on [Process for contact](#)



[management for measles cases communicable during air travel.](#)

In large social and/or public events (i.e., repeated aggregate settings and one-time events), where the case was known to be, assess the degree of exposure in order to determine those who can reasonably be considered susceptible contacts and thus eligible and accessible for further assessment and intervention, including potential immunization. For those who cannot be individually identified but who may have been present in the general area, consider the need to provide notices, a letter, or a media release informing them of their possible exposure.

Individual follow-up may not be possible in these settings and broad community notification through a media release to newspapers, radio and television outlets may be considered, as outlined for commercial flights above (e.g., BCCDC website or the RHA website). Translation of the information may be essential. Accessibility needs may also need to be factored in, for example eyesight or hearing. Consider collaboration with local community partners to support communication as needed e.g., Indigenous communities, faith-based communities, etc.

The occurrence of additional cases, particularly among individuals who were not initially identified as contacts, may indicate the need for reassessment of control measures and the need to issue additional communications to health care providers, hospitals, and the public.

8.0 REPORTING

Complete the [Measles Case Report Form](#) and send by fax 604-707-2515 or email: VPD.epi@bccdc.ca to the Immunization Programs and Vaccine Preventable Diseases Service, BCCDC within 24 hours of the case report.

In addition, complete the individual case report in the electronic public health information system within 7 days following identification of a suspect, probable, or confirmed case of measles. Update the information if more or new information becomes available. Update the case status item if the case changes from confirmed, probable or suspect status.

The BCCDC will notify other Canadian/Pacific Northwest public health jurisdictions about the occurrence of measles via the Canadian Network for Public Health Intelligence (CNPHI), if this information has not been posted on CNPHI by the RHA.

BC participates in the [Canadian Measles & Rubella Surveillance System](#) (CMRSS) which includes real time reporting of epidemiologic and laboratory parameters to the Public Health Agency of Canada (PHAC) including National Microbiology Laboratory.

8.1 Inter-jurisdictional Notification

Inter-jurisdictional notification (IJN) to other provinces, territories, or countries may be required in some situations, including but not limited to:

- Investigating a case with a home address in another jurisdiction; or
- Identifying a contact from another jurisdiction; or
- Flight notification if case investigation and contact tracing determine that a significant exposure has occurred.

BC RHAs are responsible for notifying other RHAs of cases or contacts identified in their area. BCCDC will facilitate IJN communication between provinces/territories and other countries about measles cases and contacts. If an out of province case or contact is identified, an IJN should be provided (with timing in keeping with any required public health management) to the BCCDC Immunization Programs and Vaccine Preventable Diseases Service (during working hours, fax 604-707-2515 or e-mail VPD.epi@bccdc.ca and call 604-707-2519; after hours, call the switchboard at 604-875-2161 or 1-888-300-3088 and ask for public health physician).

9.0 OUTBREAK MANAGEMENT

Measles is considered under elimination in Canada and a single case warrants attention.

The main components of measles outbreak management are:

- Identify the population affected by the outbreak.
- Identify the population at risk of infection.
- Determine where transmission is occurring.
- Identify individuals at potential risk of infection.
- Identify and vaccinate susceptible individuals in the identified population who do not have a contraindication to MMR vaccine. Depending on the epidemiology of the outbreak, administration of the 2nd dose of MMR earlier than at age 4 years may be considered for children.
- Increase awareness about measles in the population and in the medical community.

9.1 Intensify Surveillance

When a case occurs, attempt to identify the source of infection and all related cases. Institute surveillance measures to identify cases prospectively and retrospectively. Where possible, identify the source of all cases, particularly the index case. Consult BCCDC Immunization Programs and Vaccine Preventable Diseases Service about assistance with an outbreak investigation or other control strategies.

If the index case is a student, ascertain the reason for absenteeism of other students from the schools attended or in the area of the confirmed case for the 2 week period

prior to the identified case. This is to help identify earlier unreported cases. Continue active surveillance until 4 weeks after the last case occurs.

9.2 Mass Gatherings

Cancelling or restricting athletic events and other school programs or community events has not been shown to be effective for controlling measles outbreaks.

First Nations have the authority to make decisions about their communities. MHOs work closely with First Nations leadership and the First Nations Health Authority to support community-driven decisions and additional measures within their communities in the best interest of their community members.

In the context of a measles outbreak, public health and event organizers should advise participants:

- of the potential for exposure and measures to take to reduce risk of spreading the disease (e.g., check that immunization is up-to-date, use good hand hygiene, avoid sharing food/drink/utensils, cough or sneeze into crook of elbow, stay home if ill);
- about measles symptoms and prevention; and
- that if they become ill with a fever and rash, to call ahead about possible measles before visiting their health-care provider.

Refer individuals to [HealthLink BC](#) for more information:

- Phone 8-1-1.

9.3 Immunization

Remind the public about the recommendations for measles immunization.

Consider the scheduling of extra immunization clinics for those at risk without up-to-date measles immunization status.

Notify the Immunization Programs and Vaccine Preventable Diseases Service at the BCCDC of the outbreak and provide an estimate of the number of extra doses of vaccine required if expanded immunization services are being planned. This will ensure that adequate supplies of vaccine can be secured for both the outbreak intervention and routine immunization programs.

9.4 Communication

Contact physicians, laboratories, hospitals and urgent and primary care centres in the area to alert them of the outbreak and request reports of suspect cases. This is to ensure diagnosis and reporting of cases but also to ensure health care worker



immunization and infection control policies are fully implemented.

9.5 Analyze the Outbreak

A descriptive analysis in the course of and at the conclusion of the outbreak (person, place and time) provides a useful local reference of the outbreak.

Review the effectiveness of control procedures, and revise as necessary.

10.0 CLINICAL DESCRIPTION

Measles (rubeola) is one of the most contagious of all infectious diseases, with >90% attack rates among susceptible close contacts. The infection is characterized by a 2 – 4 day prodrome of fever, coryza, cough, conjunctivitis and Koplik spots (i.e., small spots with white or bluish centers on an erythematous base on the buccal mucosa). The prodrome is followed by a characteristic maculopapular rash appearing on the 3rd to 7th day. The rash may be subtler on darker skin tones. The rash begins on the face, then becomes generalized, lasts 4 – 7 days. A slight desquamation or peeling of the skin occurs as the rash clears, which can be more pronounced on darker skin tones.

Complications such as otitis media and bronchopneumonia occur in about 10% of reported cases, even more commonly in those who are poorly nourished, chronically ill, and in infants < 1 year of age. Measles encephalitis occurs in approximately 1 of every 1,000 cases and may result in permanent brain damage. Very rarely (~1/100,000 cases), subacute sclerosing panencephalitis (SSPE) develops several years after measles infection. In developed countries, such as Canada, death (predominantly resulting from respiratory and neurologic complications) is estimated to occur once in 3,000 cases.

Case fatality rates are increased in children younger than 5 years of age and in immunocompromised children, including children with leukaemia, HIV infection, and severe malnutrition. Measles during pregnancy results in a higher risk of premature labour, spontaneous abortion, and low birth weight infants.

11.0 EPIDEMIOLOGY

Measles is now uncommon in British Columbia and the incidence has declined dramatically since the measles elimination campaign in 1996. Sustained transmission has not been observed since 1997. Sporadic cases occur typically in under or unvaccinated persons with travel compatible with acquisition of measles out of country. Most clusters and outbreaks are in association with imported cases, although not all index cases are recognized or reported, with occasional cases reported among individuals without history of travel and without known exposure to cases of febrile rash illness. BC has experienced a few small outbreaks and three larger outbreaks (2010, 2014 and 2019) in recent years, typically lasting not more than two to three months. For

details please refer to the BCCDC [Reportable Diseases Data Dashboard](#), the [Annual Summary of Reportable Diseases](#) and for periodic updates about measles activity at Data & Reports - [Vaccine Preventable Diseases](#). Indigenous peoples may be disproportionately affected by measles outbreaks because of longstanding inequities related to the social determinants of health due to the impacts of colonization.¹¹

12.0 IMMUNIZATION AGAINST MEASLES IN B.C.

In 1969, measles (rubeola) live vaccine was recommended for infants at 12 months of age, preschool and susceptible school children. MMR vaccine began to be used in the publicly funded immunization program in 1981 for children aged 12 months, preschoolers, and susceptible school children. In 1985, an MMR campaign was conducted over a 1 to 2 year period for school children in grades K to 12, with immunizations given by public health nurses in the schools.

In 1996 as part of the national and Pan American Health Organization measles elimination strategy, BC conducted a measles elimination campaign targeting children aged 19 months of age through to those attending post-secondary (college/university) educational institutions. This campaign utilized measles-rubella (MR) vaccine, and did not deliver a second dose of mumps vaccine.

In the same year, a policy of second dose of MMR vaccine at 18 months of age was recommended in addition to the first dose given at 12 months of age.

BCCDC immunization guidelines also recommended a second dose of measles vaccine given as MMR vaccine to health care workers born after 1956 and to students of colleges and universities; public funding for these groups was effected in 2006 and 2007, respectively.

In 1996 and 1997 every province and territory in Canada added a second dose of measles-containing vaccine to its routine schedule and most conducted catch-up programs in school-aged children. These interventions achieved vaccine coverage for the second dose in excess of 85%, reducing the proportion of vulnerable children to such a negligible level that measles virus transmission could not be sustained.

The efficacy of a single dose of live measles vaccine given at 12 or 15 months of age is estimated to be 85% to 95%. With a second dose, almost 100% of children are protected.

¹¹ Truth and Reconciliation Committee of Canada. [Honouring the Truth, Reconciling the Future. Summary of the Final Report of the Truth and Reconciliation Commission of Canada](#) [Internet]. 2015.



12.1 Summary of MMR vaccine recommendations

The following tables summarize the number of doses of MMR vaccine recommended for BC residents based on its constituent components:

Health care workers

| Year of birth | Measles | Mumps ^② | Rubella ^① | MMR vaccine |
|---------------|---------|--------------------|----------------------|-------------|
| Prior to 1957 | 0 doses | 0 doses | 1 dose | 1 dose |
| 1957 – 1969 | 2 doses | 1 dose | | 2 doses |
| 1970+ | | 2 doses | | 2 doses |

All others

| Year of birth | Measles | Mumps ^② | Rubella | MMR vaccine |
|---------------|---------|--------------------|---------|-------------|
| Prior to 1957 | 0 doses | 0 doses | 0 doses | 0 dose |
| 1957 – 1969 | | | 1 dose | 1 dose |
| 1970+ | 2 doses | 1 or 2 doses | | 2 doses |

① One dose of MMR for rubella protection is recommended for all health care workers regardless of age, and for adults born after 1956 who do not have documentation of receiving 1 dose of rubella containing vaccine on/after their first birthday or laboratory evidence of immunity or laboratory confirmed rubella.

② One dose of mumps vaccine is recommended for any susceptible adult born in 1970 and later. The following should receive two doses: children as per routine schedule; students of post-secondary educational settings and those who are traveling outside of North America. Health care workers should receive 1 dose if born between January 1, 1957-December 31, 1969; 2 doses if born on or after 1970.



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Appendix A - Classification for Immunosuppression

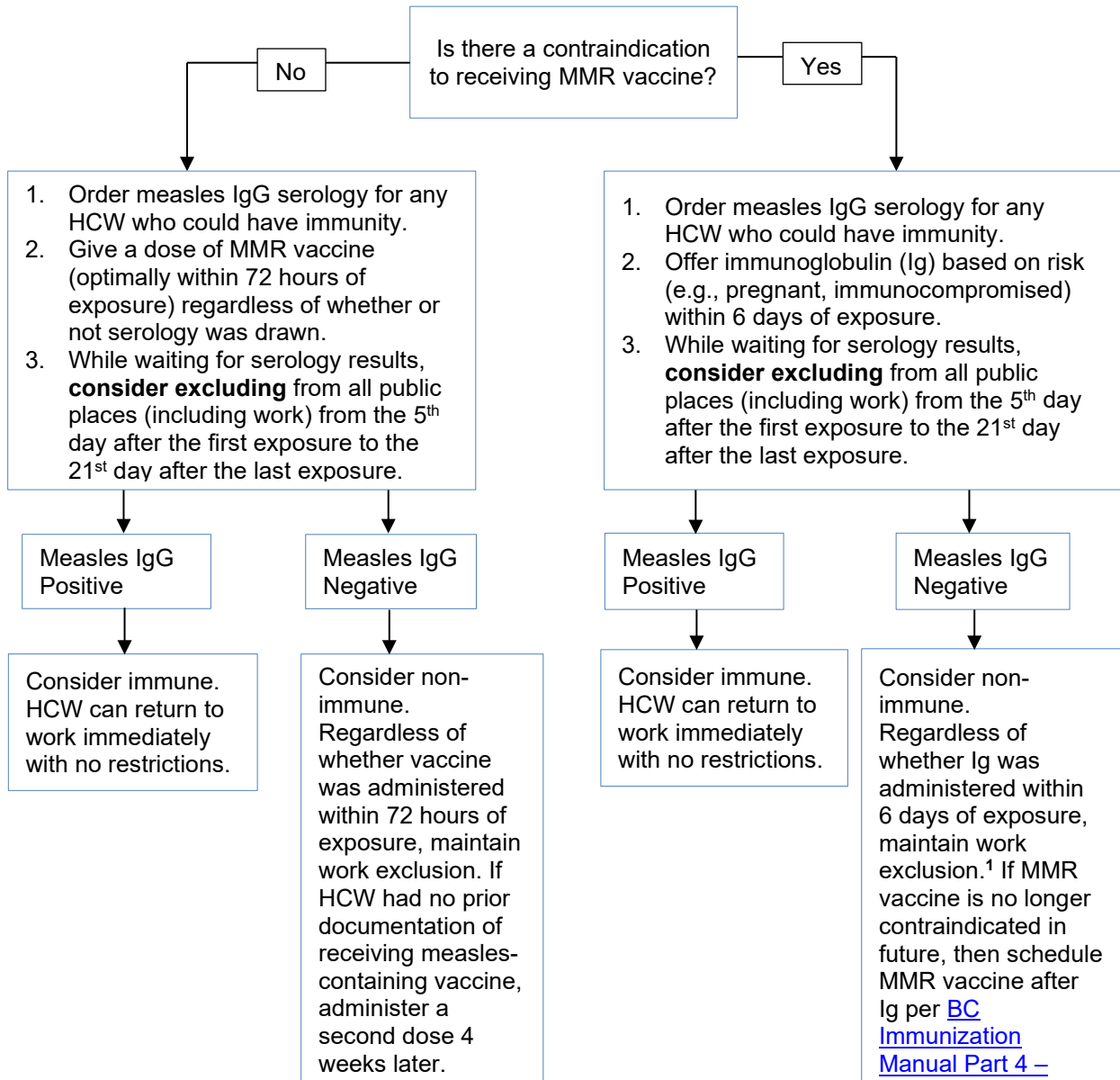
| Group A - Individuals who should develop and maintain adequate antibody from past infection or vaccination | |
|---|--|
| Manage on basis of evidence of protection at any time (prior to or since the diagnosis or treatment end) | <ul style="list-style-type: none"> • Patients receiving or within 6 months of completing immunosuppressive chemotherapy or radiotherapy for malignant disease (other than those with acute lymphoblastic leukemia (ALL), a lymphoproliferative disorder or who have had Hematopoietic Stem Cell Transplantation (HSCT) or Chimeric Antigen Receptor T-cell (CART) Therapy) • Patients with human immunodeficiency virus (HIV) infection: <ul style="list-style-type: none"> ○ i) >5 years of age and with a CD4 count <200 cells/μl (but without a diagnosis of AIDS) or ○ ii) aged 5 years or less, with a CD4 count <500 cells/μl • Patients with chronic immune mediated inflammatory disease who are receiving or have received immunosuppressive therapy: <ul style="list-style-type: none"> ○ moderate to high dose corticosteroids (equivalent \geq20 mg prednisone per day; children one mg/kg/day) for more than 10 days in the previous month ○ long term moderate dose corticosteroids (equivalent to \geq10 mg prednisone per day or children 0.5 mg/kg/day for more than 4 weeks) in the previous 3 months ○ adults on non-biological oral immune modulating drugs, for example, methotrexate >20 mg per week (oral and subcutaneous), azathioprine >3 mg/kg/day; 6-mercaptopurine >1.5 mg/kg/day, mycophenolate >1 g/day, in the previous 3 months ○ children on any dose of non-biological oral immune modulating drugs ○ certain combination therapies at individual doses lower than stated above, including those on \geq7.5 mg prednisone per day in combination with other immunosuppressants (other than hydroxychloroquine or sulfasalazine) and those receiving methotrexate (any dose) with leflunomide in the previous 3 months • Individuals who have received a short course of high dose steroids (equivalent >40 mg prednisone per day or children 2 mg/kg/day for more than a week) for any reason in the previous month. <p>Individuals who had received brief immunosuppression (\leq40 mg prednisone per day) for an acute episode (for example, asthma, COPD or COVID-19) and individuals on replacement corticosteroids for adrenal insufficiency are not considered severely immunosuppressed and can be treated with the standard post exposure treatment.</p> |



| Group B – Individuals who lose or may not maintain adequate antibody levels from past infection or vaccination | |
|--|--|
| B (i): Manage on basis of measles IgG test obtained at the time of exposure (or since the diagnosis or treatment end) | <ul style="list-style-type: none">• Patients on or after completion of immunosuppressive chemotherapy for ALL• Patients with lymphoproliferative disorders (including haematological malignancies such as indolent lymphoma, leukaemia and plasma cell lymphoma).• Patients who have received a solid organ transplant• Patients more than 12 months after receiving HSCT or CART therapy• Patients receiving or within 6 months of completing biological therapies (alone or in combination with steroids). These include:<ul style="list-style-type: none">○ monoclonal antibodies, for example alemtuzumab, ofatumumab○ rituximab cytokine inhibitors, for example etanercept• Patients with a diagnosis of acquired immunodeficiency syndrome (AIDS) |
| B (ii): Offer PEP regardless of status | <ul style="list-style-type: none">• Patients who have received HSCT or CART therapy within the past 12 months• Patients with persistent agammaglobulinaemia (IgG less than 3 g/L) due to primary immunodeficiency (for example, common variable immunodeficiency) or secondary to disease or therapy (this group may already be on long term IVIG replacement, which should provide equivalent protection to post exposure immunoglobulin) |

Appendix A is adapted from the UK Health Security Agency [National measles guidelines](#) (July 2024)

Appendix B - Post-Exposure Management of Susceptible HCWs



¹ An exclusion period up to 28 days following exposure may be considered for individuals receiving immunoglobulin as the immunoglobulin may prolong the incubation period. This may be considered for HCWs working with very high risk populations (e.g., transplant recipients or neonates).