

Provincial Measles Primary Care Clinical Pathway

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Screen for Suspected/Probable Measles Case:

- Suspected measles symptoms
- Recent travel or exposure to measles
- Not fully immunized to measles

To reduce exposure, whenever possible ask patient to call clinic and remain in the car for assessment. If possible, avoid patient from entering the waiting room and clinic.

History and Assessment: Always use [IPC routine practices](#).

Use [appropriate PPE](#) (fit-tested N95, gloves, gown, eye protection) and complete history and assessment at patient's car if possible (avoid patient coming into the clinic). **If not possible to complete in car, ask patient to don a procedure mask and immediately take patient to a single room with door closed.**

Assess history:

- Onset of illness
- Travel history
- Measles immunization history
- Exposure to positive case

Assess clinical symptoms:

- Prodromal Fever ≥ 38.3
- Coryza
- Cough
- Conjunctivitis
- Koplik spots
- Maculopapular rash (3-7 days after symptom onset)

Assess for Differential Diagnosis:

- Measles vaccine reaction
- Drug reaction(s)
- Other viral exanthems

No clinical signs and a differential diagnosis excludes measles

Provide appropriate care and assess need for measles vaccination.

YES: Clinical signs present, suspected or probable measles case

Notify patient they may have measles. Measles investigations and management requires coordination with Public Health. Diagnosis of measles is made based on clinical presentation, exposure history, and laboratory testing.

All suspected, probable and confirmed cases (in person or virtual assessments) are to be immediately reported to the Zone Medical Officer of Health (MOH) On Call

Calgary Zone: 403-264-5615
North Zone: 1-800-732-8981
Central Zone: 403-356-6430

Edmonton Zone: 780-433-3940
South Zone: 403-388-6111

For those living in a First Nation's community: ISC MOH: 780-218-9929

Investigations

Presentation	Samples and Orderable	
Acute illness	Nasopharyngeal swab (NP) OR throat swab OR urine	Order measles NAT [Lab 4313]
	Molecular testing (NAT) is preferred. Serum testing is a useful complementary test	
	Serum	Order measles IgM and IgG

- For measles laboratory questions contact the ProvLab Microbiologist/Virologist On-Call: Calgary 403-944-1110 or Edmonton 780-407-8822
- Notify the APL Appointment Booking line at 1-877-702-4486 **prior** to sending patients for serology and urine collection.
- When collecting **NP** or throat swab in Primary Care:
 - Use [appropriate PPE](#) (fit-tested N95, gloves, gown, eye protection) and complete in patient's car if possible (avoid patient coming into the clinic).
 - Use [universal transport media](#) (red top, white swab, pink medium).
 - Submit the NP or throat swab with the [Serology and Molecular Testing Requisition form](#), to the Provincial lab. Ensure the requisition form is filled out in detail.
- For urine sample collect about 10 mL in sterile container

Management of Measles Cases

- **Reinforce Isolation as guided by Public Health:** advise patient they need to stay out of public spaces until 4 days after a rash appears. Susceptible exposed individuals may have quarantine requirements guided by Public Health.
- **Manage complications:** complications can include pneumonia, otitis media, febrile seizures, croup, diarrhea, and encephalitis and can be life-threatening. Tends to be more severe in infants, immunocompromised individuals, and those who are pregnant. Encourage patients and families to monitor symptoms and stay connected with their primary care provider.
- **Provide education:** Provide information about disease transmission and appropriate infection control measures to minimize the possibility of transmission. Share link to patient information: [Measles \(alberta.ca\)](#).
- **Connection with Public Health:** Advise patient they will be contacted by Public Health to collect further information and explain additional next steps.
- **Support post-exposure prophylaxis recommendations:** Specific patient guidance as outlined by Zone MOH.
- **Follow Required Disinfection Practices:** To prevent spread, any room that the patient has occupied should be left unoccupied, with the door closed and should **not be used for two hours** after a suspected case has left the room to allow for adequate air changes for 99% air clearance. If unable to maintain the 2-hour window, a N95 must be worn to complete disinfections/cleaning.



EXPANDED DETAILS

Pathway Primer

This pathway is intended to be followed for all patients who have suspected or probable Measles cases in the community. The guidance in the pathway is informed by the [Alberta Public Health Disease Management Guidelines for Measles](#) (1).

Case Definitions:

Confirmed Case (1)

- In the absence of recent immunization(A) with measles-containing vaccine:
 - Detection of measles virus by nucleic acid tests (e.g., RT-PCR) or by culture;
OR
 - Positive serologic test for measles IgM antibody(B) in a person who is either epidemiologically linked to a laboratory confirmed case or has recently travelled to an area of known measles activity;
OR
 - Seroconversion or a significant rise (e.g., fourfold or greater) in measles IgG titre by any standard serologic assay between acute and convalescent sera;
OR
 - Clinical illness(C) in a person who is epidemiologically linked to a laboratory-confirmed case.
OR
 - Detection of wild-type measles virus through genotyping, regardless of recent immunization(A) with a measles-containing vaccine.

Probable Case (1)

- In the absence of both recent immunization(A) with a measles-containing vaccine and laboratory confirmation of disease:
 - Clinical illness (C) in a person with either an epidemiologic link to a non laboratory-confirmed case or recent travel to an area of known measles activity.

Suspect Case (1) (Outbreak Only) (D)

- Regardless of recent immunization(A), clinical illness(C) in a person with rash of any duration, who does not meet the probable or confirmed case definition, and where the clinician has a high index of suspicion of measles.

(A) Immunization within 28 days prior to onset of rash or illness.

(B) See Appendix 1 of [Public Health Disease Management Guidelines Measles](#) - Specimen Collection for Potential Cases regarding possible false positive and false negative IgM results.

(C) Clinical illness, evaluated by a health care professional including public health, includes ALL of the following:
– Fever 38.3°C or greater, – Cough, coryza or conjunctivitis, AND – Generalized maculopapular rash for at least 3 days.

(D) A measles outbreak is two or more confirmed cases linked, either epidemiologically or virologically or both.

Background:

Measles is caused by the measles virus, a member of the Paramyxoviridae family, genus Morbillivirus (2). **Measles is one of the most contagious of all infectious diseases**; up to 9 out of 10 susceptible persons with close contact to a measles patient will develop measles. The virus is transmitted by direct contact with infectious droplets or by airborne spread when an infected person breathes, coughs, or sneezes. Measles virus can remain infectious in the air for up to two hours after an infected person leaves an area (2).

How this will impact you as Primary Care Providers

- Ensure that you and your staff are fully vaccinated to prevent acquiring measles.
- You are considered immune or protected against measles if you have:
 - Documentation of having received 2 doses of measles-containing vaccine (for example, MMR) **OR**
 - A documented laboratory-confirmed measles infection **OR**
 - A blood test showing proof of immunity.

Action Required to prepare for probable or suspected measles cases

- Ensure that you and your staff are fully vaccinated to prevent acquiring measles.
- Two doses of a measles-containing vaccine (given at the appropriate interval and spacing) is about 97% effective at preventing measles if you are exposed to the virus.
 - Those unsure about their immunization history can text, 'vaccine record' to 88111, call Health Link at 811, or contact their local public health office.
- Familiarize yourself with the clinical presentation of measles and this clinical pathway.
- Check that you have sufficient supplies of nasopharyngeal swabs, Universal/Viral Transport medium and sterile urine containers for sample collection, and the Transport medium has NOT expired (expiry date on container).
- Familiarize yourself and your nursing staff on how to [collect a nasopharyngeal swab](#).
- Ensure that you have sufficient supplies of personal protective equipment especially N95 respirator available.

History and Assessment

To reduce exposure, whenever possible ask patient to call clinic and remain in the car for assessment. If possible, avoid patient from entering the waiting room and clinic. If not possible to complete the assessment in the car, ask patient to don a procedure mask, and immediately take patient to a single room with door closed.

Primary Care providers should be following [IPC routine practices](#). For suspected measles cases, healthcare providers who provide service should be immune and use [appropriate PPE](#) as per the current IPC recommendations for cases or susceptible contacts found in the AHS IPC manual on the [AHS external](#) and Insite webpages, search "IPC".

- Note: Primary Care and First Nations clinics can purchase PPE from a vendor of choice and/or from AHS at cost. See the [AHS PPE price list](#) and the [AHS for-cost PPE order form](#).

Assess history

Ensure patients are screened and assessed for the following:

- Onset of illness
 - Determine date and associated symptoms.
- Travel history
 - See [Measles Cases and Outbreaks | CDC](#) for awareness of current countries experiencing measles outbreaks.
- Measles immunization history
 - Individuals born in or after 1970 and Healthcare workers regardless of year of birth are required to have one of the following to be considered immune:
 - Documentation of **2 doses** of measles containing vaccine where the first dose was given AFTER 12 months of age and the second dose was given at least 28 days after the first dose.
 - Documentation of laboratory-confirmed measles disease in the past.
 - Documentation of serological proof of immunity on file prior to exposure.
 - Serological [pre-exposure testing](#) to determine immunity in healthy individuals including health care workers **is not** routinely recommended.
 - If a person's immunization records are unavailable, it is preferable to offer the MMR (measles, mumps and rubella) vaccine on a [schedule appropriate](#) for their age and risk factors rather than ordering serological testing.
 - For further information, please refer to measles [Alberta Health Notifiable Disease guidelines algorithm](#) Page 11 regarding assessing measles contact susceptibility and management for (1) public and (2) healthcare workers.
- Exposure to positive case
 - Determine if the patient has been in contact with any probable, suspected or confirmed measles cases.

Assess clinical symptoms

Measles is an acute, highly contagious viral disease that is characterized by:

- Prodromal fever (≥ 38.3)
- Coryza
- Conjunctivitis
- Cough
- Koplik spots (clustered blue-white lesions on the buccal mucosa)



Koplik spots on palate on day 3 of the illness in the pre-eruptive phase of measles.
Koplik Spots: Source: Centers for Disease Control and Prevention/Heinz F. Eichenwald. (3)

- Maculopapular rash usually appears 3–7 days after symptom onset. This rash begins on the face and spreads to the rest of the body and may last 4–7 days. It clears in the same direction it appeared and sometimes ends in brawny desquamation. Serum vitamin A levels are often decreased and leukopenia is common. Atypical measles presentation can occur in vaccinated persons or those with prior exposure.(1)



Measles Rash: Source: U.S. Centers for Disease Control and Prevention (CDC). All rights reserved. Available online: www.cdc.gov (3)

- Other Supportive Resource: [Rash Algorithm.](#)

Assess for Differential Diagnosis

- Measles vaccine reaction
 - Assess if patient has recently received their MMR vaccine
- Drug reaction
 - Determine if the patient has started any new medications or if they have had any recent changes to what they are ingesting (medications, supplements, food, etc)

- Viruses that commonly cause exanthem rash include (4):
 - Varicella-zoster virus
 - COVID-19 (coronavirus)
 - Fifth disease (parvovirus B19)
 - Hand, foot and mouth disease (coxsackievirus A16)
 - Roseola (human herpesvirus 6)
 - Rubella (rubella virus)

Red Flag: Reporting Cases

- Notify patient they may have measles.
- Measles investigations and management requires coordination with Public Health. Diagnosis of measles is made based on clinical presentation, exposure history, and laboratory testing.
- All healthcare providers shall notify the Medical Officer of Health (MOH) (or designate) of the zone, of all confirmed and probable cases in the prescribed form by the Fastest Means Possible (FMP).
- **All suspected, probable and confirmed cases (in person or virtual) are to be immediately [reported to the Zone Medical Officer of Health \(MOH\) On Call](#)**
 - Calgary Zone: 403-264-5615
 - Central Zone: 403-356-6430
 - Edmonton Zone: 780-433-3940
 - North Zone: 1-800-732-8981
 - South Zone: 403-388-6111
 - For those living in a First Nation's community: ISC MOH: 780-218-9929

Investigations

- Diagnosis of measles is made based on clinical presentation, exposure history, and laboratory testing.
- Follow the [APL Laboratory Testing for Suspected measles](#) bulletin for collection guidance.
- For measles laboratory questions contact the ProvLab Microbiologist/Virologist On-Call:
Calgary 403-944-1110 or Edmonton 780-407-8822
- Molecular testing (NAT) has many advantages over serological testing:
 - Allows earlier case confirmation because detection is possible prior to a serological response.
 - Permits genotyping which can distinguish between vaccine and wild-type strains.
 - Eliminates the need for convalescent serology if measles is confirmed
- Molecular testing (NAT) is preferred. Serum testing can be ordered in addition to molecular testing (NAT) and may be needed when molecular testing (NAT) is not possible.

Presentation	Samples and Orderable		Comments
Acute illness	Nasopharyngeal OR throat* swab OR Urine	Order Measles NAT [Lab 4313]	Collect nasopharyngeal & throat swabs at the <u>Clinic/Office</u> , as the APL PSC staff cannot collect them. Note: When possible, collect a urine together with EITHER a nasopharyngeal OR throat swab and serum to improve the detection of a measles infection.
	Serum	Order measles IgM & IgG	Send a convalescent serum 7 to 10 days after the acute blood if measles IgM antibody is negative and measles is still strongly suspected
Immunity Testing	Serum	Order Measles IgG ONLY [LAB657]	Do NOT order measles IgM for immunity status as it is inappropriate and can result in a false-positive result

* There are no studies directly comparing the sensitivity of nasopharyngeal versus throat swabs, but various studies suggest the sensitivity for both sample types is similar. Consequently, throat swabs will be accepted for testing but reported as non-validated sample type as the ProvLab measles assay was validated for nasopharyngeal swabs.

- **Notify the APL Appointment Booking line at 1-877-702-4486 prior to sending patients for serology or urine testing.**
- If collecting [Nasopharyngeal swab](#) or throat swab in primary care, complete in patient's car if possible (avoid patient coming into the clinic)
 - Use [appropriate PPE](#) (fit tested N95, gloves, gown and eye protection).
 - Use [universal transport media](#) (red top, white swab and pink medium). Product number: UT-317 oracle 398170. Follow collection instructions given in the collection insert or on the [ProvLab website](#)
 - Submit the specimen with the [Serology and Molecular Testing Requisition form](#) to the Provincial lab. **Ensure the requisition form is filled out in detail.**
 - If the patient is already a Home Care client, you may consider urgent home care services for NP swabbing if needed.
- **Urine sample**
 - You will need about 10 mL in sterile container, preferably the first void of the day (morning sample)
- **Serum**
 - Order measles IgM **and** IgG. Send a convalescent serum 7 to 10 days after the acute blood measles IgM antibody is negative and measles is still strongly suspected.

Management

Reinforce Isolation:

- Individuals considered to be cases should stay out of public spaces until 4 days after a rash appears. Those who are not immune (based on immunization history) and have been exposed are requested to stay out of public spaces up to 21 days after last exposure if it's outside of the time frame for serology or access to post-exposure prophylaxis. (This would include not being able to work at places of employment where other people are present).

Manage complications:

- Approximately 30% of reported measles cases have one or more complications which are most often seen in children under 5 years of age and adults 20 years of age and older (1).
- Complications of measles infection may include (1):
 - Pneumonia, otitis media, febrile seizures, croup, diarrhea, and encephalitis.
 - In developed countries, the case-fatality rate is estimated to be less than 1%. The most common causes of measles related deaths are acute encephalitis in adults and pneumonia in children. (1) In addition, subacute sclerosing panencephalitis (SSPE) a rare, fatal degenerative central nervous system disease may occur many years later in hosts with a history (often before two years of age) of primary measles infection (1).
 - Measles infection during pregnancy results in a higher risk of spontaneous abortion, premature labour, and infants with low birth weight. Birth defects have rarely been reported; however, measles could not be confirmed as the cause.
 - Disease in the immunocompromised may be severe and have a prolonged course, present without the typical rash, and the person may shed virus for several weeks after the acute illness.
- Encourage patients and families to monitor symptoms and stay connected with their primary care provider.
- If the patient needs to be seen in an Emergency Department or Urgent Care, ensure the facility is notified in advance of arrival to prepare for airborne isolation.

Provide education:

- Provide information about disease transmission and appropriate infection control measures to minimize the possibility of transmission.
- The following resources can be shared with patients:
 - [Measles \(alberta.ca\)](#)
 - [AHS HEAL resource for patients and families](#)
- Provide education on Measles, mumps & rubella (MMR) Immunization:
 - See [tips for dealing with vaccine-hesitant patients](#).
 - Immunization eligibility: [Measles, mumps, rubella \(MMR\) vaccine \(alberta.ca\)](#)
 - Two doses of a measles-containing vaccine (given at the appropriate interval and spacing) is about 97% effective at preventing measles if you are exposed to the virus.
 - Those unsure about their or their child's immunization history can text, 'vaccine record' to 88111, call Health Link at 811, or contact their local public health office.
 - First Nation Health Centres are another resource for immunization history. First Nation Health Centres may have additional immunization records, particularly historic records that are not on Netcare.
 - Publicly funded (free of charge) measles-containing vaccine is available through Public Health by appointment.

- Immunizations can be booked through Health Link at 811 between 8 a.m. and 6 p.m. if you live in Edmonton or Calgary Zone.
- For other zones and patients living on First Nations, contact your local public community health centre at www.albertahealthservices.ca/info/Page17791.aspx.
- **Reminder:** Measles-containing vaccines are live vaccines. It is not recommended for usage in pregnant women and those with weakened immune systems. Consult the Zone MOH as this group may be offered [post-exposure prophylaxis within 6 days of exposure \(Appendix 5\)](#), which may modify or prevent measles disease.
- AHS has services to provide more culturally safe care and the below resources can be considered:
 - [The Indigenous Support Line | AHS](#)
 - [Indigenous Languages Interpretation & Translation Services | AHS](#)

Connection with Public Health:

- Advise patient they will be contacted by Public Health to collect further information and explain additional next steps which may include further guidance on isolation and post exposure prophylaxis where relevant.
- Contact tracing will occur based off Public Health Management and as defined in: [Measles \(alberta.ca\)](#).

Support post-exposure prophylaxis recommendations:

- Specific patient guidance is recommended and will be outlined by Zone MOH.
- With MOH guidance, non-Health Care Workers (such as individuals who are immunocompromised, pregnant and infants) can be managed as per the algorithm in **Appendix 4** on page 17 of the Alberta Health measles notifiable disease guidelines: [Measles \(alberta.ca\)](#).
 - They may require:
 - STAT serology **and/or**
 - Urgent measles-containing vaccine for post-exposure prophylaxis **and/or**
 - Immune Globulin (Ig) therapy

Follow Required Disinfection Practices:

- Any room that the patient has occupied should be left unoccupied, with the door closed and should **not be used for two hours** after a suspected case has left the room to allow for adequate air changes for 99% air clearance.
- **If unable to maintain the 2-hour window, a N95 must be worn to complete disinfections/cleaning.** Disinfectants must have DIN details and an achievable contact time. See information on [Environmental Cleaning Guidance](#).

BACKGROUND

About this pathway

- This pathway was developed in collaboration with Primary Care Physicians, AHS Primary Health Care, AHS Public Health, Alberta Precision Laboratories and AHS Medical Officers of Health.
- Condition-specific clinical pathways are intended to offer evidence-based guidance to support primary care providers in caring for patients with a range of clinical conditions.
- This pathway includes hyperlinks and is intended to be used as an electronic tool.

Authors and conflict of interest declaration

- Names of the content creators and their conflict-of-interest declarations are available on request by emailing AlbertaPathways@ahs.ca.

Pathway review process, timelines

- Primary care pathways undergo scheduled review every two, or earlier if there is a clinically significant change in knowledge or practice. The next scheduled review is May 2026. However, we welcome feedback at any time. Please email comments to AlbertaPathways@ahs.ca.

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DISCLAIMER

This pathway represents evidence-based best practice but does not override the individual responsibility of healthcare professionals to make decisions appropriate to their patients using their own clinical judgment given their patients' specific clinical conditions, in consultation with patients/alternate decision makers. The pathway is not a substitute for clinical judgment or advice of a qualified healthcare professional. It is expected that all users will seek advice of other appropriately qualified and regulated healthcare providers with any issues transcending their specific knowledge, scope of regulated practice or professional competence.

PROVIDER RESOURCES

Alberta Public Health Disease Management Guidelines: Measles (AB Gov)	Measles (alberta.ca)
Measles Summary Guide	www.ahs.ca/assets/info/ppih/if-ppih-measles-primary-care-summary-guide.pdf
IPC Recommendations for Measles (Alberta Health Services)	www.ahs.ca/assets/healthinfo/ipc/hi-ipc-emerging-issues-measles.pdf

PATIENT RESOURCES

AHS Measles Webpage (MyHealth Alberta)	https://myhealth.alberta.ca/topic/immunization/pages/Measles.aspx
AHS Health Education and Learning Website	www.ahs.ca/HEAL

REFERENCES

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