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# Measles Resource

## Purpose

To prevent transmission of Measles disease. To provide guidance to health care providers on how to:

- Identify
- Isolate
- Notify

## Definitions

**Measles (Rubeola) is** caused by a virus and is one of the most contagious of all infectious diseases, with >90% attack rates among susceptible close contacts. ***The virus is highly contagious and easily spread among people who are not immune.***

**Considered immune:** As per BCCDC Communicable Disease Manual - Measles

- Birth date before January 1, 1970 (1957 for health care workers).
- Documented evidence of vaccination with two valid doses of live measles containing vaccine on/after their 1st birthday and given at least one month apart.
- Laboratory evidence of immunity.
- Laboratory evidence of prior measles infection.

Those without evidence of immunity are considered susceptible and may require post-exposure prophylaxis (PEP) treatment if considered an exposed contact by infection prevention and control (IPAC) and Medical Health officer (MHO).

**Airborne Infection Isolation Room (AIIR)** A room that is designed, constructed and ventilated to limit the spread of airborne microorganisms from an infected occupant to the surrounding areas of the health care setting. Previously known as a negative pressure room. NOTE: The Canadian Standards Association uses the term Airborne Isolation Room, abbreviated AIR.

**Air Clearance Time:** The recommended length of time a room should remain vacant after a patient on airborne precautions has left, to allow for sufficient removal of airborne contaminants. This duration is based on the room's air exchange rate (air changes per hour) and must be determined in consultation with IPAC or facility engineering. **Entry without respiratory protection should only occur once the calculated air clearance time has passed.**

Note: in this document the term patient is inclusive of resident and client.

# Overview

## Illness Presentation

1. Fever ≥38.3°C
2. **C**ough, **C**oryza (runny nose/cold like symptoms), or **C**onjunctivitis.
3. Generalized maculopapular rash (dusky red, blotchy rash that begins on the face and spreads all over the body). Rash appears three-seven days after symptom onset then becomes more generalized.
4. Some patients may also exhibit Koplik spots ("grains of salt" next to second molar) on the inside of the mouth. Absence of Koplik spots should not exclude a clinical diagnosis of measles.

### Additional Signs, Symptoms, and Complications MAY Include:

- Ear infections
- Diarrhea

Maculopapular rash

Koplik Spots

- Severe skin infections
- Pneumonia
- Encephalitis
- Measles during pregnancy results in a higher risk of premature labor, spontaneous abortion, and low birth weight infants.
- Subacute sclerosing panencephalitis (SSPE), an exceedingly rare but fatal disease of the brain and spinal cord can also develop months to years after measles infection.

### Complications of Measles in Pregnancy

- 5% of measles infections in pregnancy lead to serious complications, such as pneumonia, hepatitis, and, in rare cases, death.
- Measles during pregnancy increases the risk of miscarriage, poor fetal growth, and preterm birth, but it does **not** cause congenital malformations like rubella.
- If infection occurs within 14 days before delivery, the newborn may become infected, which can lead to serious outcomes, including blindness, deafness, encephalitis, or death.

### Mode of Transmission

- As an airborne disease, measles is spread through the air.
- Measles can survive up to two hours in the air after the contagious person has left the space.
- Measles can also be spread through respiratory secretions (e.g., coughing, sneezing, laughing, shouting).
- Lower risk of spread through articles freshly soiled with respiratory secretions.

### Incubation Period

- From exposure to rash onset, incubation averages 8-12 days with a range of 7-18 days, rarely may be as long as 21 days.

### Period of Communicability

- Four days before onset of rash (one day before symptom onset) until four days after onset of rash.
- An immunocompromised person is considered infectious for the duration of measles illness.

### Diagnostic Testing

- Refer to IH Microbiology specimen ordering, collection, and transportation for guidance on specimen handling.
- If acute infection suspected, please collect:
  - Nasopharyngeal or throat swab for measles PCR **AND**
  - Urine specimen for measles PCR **AND**
  - Blood or serum for serology: measles specific IgM and IgG class antibodies.

# Best Practices

## Additional Precautions

1. In addition to Routine Practices, patient must be immediately placed on Airborne, Droplet & Contact Precautions in an appropriately ventilated Airborne Infection Isolation Room ( AIIR) with appropriate signage posted outside the patients' door.

### Patient Placement and Accommodation

In addition to patient placement and accommodation outlined in Airborne, Droplet & Contact Precautions, the following measles-specific considerations apply:

- In ambulatory care/outpatient areas (including the Emergency Department), shared bathrooms are common. It is preferrable to have patient use a commode or urinal in their room rather than sharing a bathroom.
- If a shared bathroom must be used, patient on Airborne, Droplet & Contact Precautions must wear procedure mask when using a shared bathroom. If a mask is not worn, a two-hour air clearance or "settle time" may be required. Consult IPAC as air clearance times vary based on air exchanges per hour for a facility (or for particular rooms within a facility).
- **Emergency Departments**: Follow Emergency Department see, Think, Do- Approach to Suspect Measles.
- **Primary Care:** Follow Primary Care Approach to Suspect Measles Case.

- Perinatal: Follow Perinatal Measles IPAC Management and Additional Precaution Recommendations.

## Cohorting Recommendations

- Patients on Airborne, Droplet & Contact Precautions are **NOT** candidates for cohorting, as outlined in IPAC Recommendations for Cohorting Patients
- There may be exceptions for households with confirmed measles where there are limited airborne isolation rooms. This is a larger discussion that includes Medical Health, Infection Prevention and Control (IPAC), Medical Microbiology and Clinical Operations.

## Patient Flow and Transport

In addition to patient transport and flow outlined in Airborne, Droplet & Contact Precautions, the following measles-specific considerations apply:

- Sites should have a clearly documented process for transporting patients on Airborne, Droplet & Contact Precautions
- Patients require medical mask during transport. For patients who cannot tolerate a mask, e.g., neonates, infants, toddlers, cover stroller/car seat with blanket and explain to care provider this is being done to prevent spread of infection to others. This is required until placement in AIIR.
- A team member or security clears the transport path and elevator, (if used)
- Provide an escort for the patient using predetermined transport routes to minimize exposure to HCPs, patients, and visitors.
- If patient requires transportation in elevator, decision to close elevator will be done following an individual exposure assessment by MHO.
- Transport the patient directly into a negative pressure capable room in the receiving area. Bypass any holding areas.
- Avoid performing aerosol-generating medical procedures (AGMP) enroute.

## Air Clearance

After patient discharge or transfer, or if Airborne, Droplet & Contact Precautions are discontinued:

- Keep room vacant, door closed, and additional precaution signage posted until air clearance time is completed, and cleaning and disinfection done completed by Environmental Services.

If air exchange rate for room is unknown:

- For air exchange unknown in private rooms wait two hours.
- For negative pressure rooms – wait 45 minutes.
- A two-hour settle time is not required after a patient leaves a temporary non-negative air space following a medical procedure, provided the patient was continuously monitored and wore a procedure or surgical mask for the entire duration of their stay.
- HCP who are required to entre the room prior to air clearance time being completed are to don an N95 Respirator, and keep door closed.
- Environmental Services to remove signage after Additional Precautions Discharge Cleaning and Disinfection is completed.

### Personal Protective Equipment (PPE)

- Follow PPE practices outlined in Airborne, Droplet & Contact Precautions.

### Waste, Laundry, Dishes, and Cutlery

- Use Routine Precautions.

### Cleaning and Disinfection

- Follow practices outlined in Airborne, Droplet & Contact Precautions.

## Visitors

- Caregivers and visitors should be restricted to essential persons and should also wear respirators (or an equivalent or higher protection).
- Essential visitors are encouraged to stay in the patient's immediate care area/room at all times.

## Discontinuing Precautions

- For both Measles cases and exposures, if patients are discharged PRIOR to isolation period being completed. **Notify CD unit and follow their recommendations at discharge.**

| Measles status | Recommendations |
|---|---|
| Measles Negative | Additional Precautions can be discontinued without IPAC consultation if measles tests (urine, PCR, and serology) are negative, **measles is no longer suspected**, and the Most Responsible Provider (MRP) has confirmed another diagnosis. |
| Measles Confirmed | Contact Infection Preventionist and/or Medical Microbiologist on-call (MMOC) PRIOR to discontinuing precautions.<br><br>Confirmed measles cases should remain on Airborne Droplet, and Contact precautions for four days after the onset of rash (with onset of rash to be considered day 0)<br><br>Immunosuppressed patients with measles should remain on additional precautions for the duration of illness due to the prolonged virus shedding in these individuals |
| Exposed contacts – No IMIG Received | Susceptible exposed contacts to be placed on Airborne, Droplet, and Contact Precautions from **five days after their first exposure to 21 days after their last exposure.**<br><br>Observe signs and symptoms of measles for 21 days after last exposure. If no signs and symptoms occur during this period, additional precautions can be discontinued MRP. If requiring support for discontinuing precautions consult IP/MMOC. |

| Measles status | Recommendations |
|---|---|
| Exposed immunosuppressed contacts – IMIG Received | Susceptible exposed contacts to be placed on Airborne, Droplet, and Contact Precautions from **five days after their first exposure to 28 days after their last exposure.**<br><br>Observe signs and symptoms of measles for 28 days after last exposure. If no signs and symptoms occur during this period, additional precautions can be discontinued MRP. If requiring support for discontinuing precautions consult IP/MMOC. |

# Notification

## Most Responsible Provider:

Cases with a high clinical suspicion for measles must ***immediately*** be reported to:

- **Business hours**: the Communicable Disease Unit (CDU) at 1-866-778-7736 Monday to Friday 0830-1630 or
- **After hours**: the Medical Health Officer (MHO) On-call at 1-866-457-5648 after hours, weekends, and statutory holidays.

## Infection Prevention and control:

- Infection Control Professional (ICP) to investigate all suspect and confirmed Measles cases in acute care, and complete the follow Communicable Disease Notification Tool, as established in IPAC procedures.

# Management of Susceptible Exposed Contacts in the Healthcare Setting

**Exposed Contact:** As defined by Medical Microbiologist (MM) and Medical Health Officer (MHO)

- Infection Preventionist to identify all exposed contacts in the healthcare setting within 24 hours of identification of the case and complete follow-up for admitted patients.
- Communicable Disease Unit to follow-up with any exposed contacts that have been discharged
- Susceptible exposed contacts to be placed on Airborne, Droplet & Contact Precautions at **five days** after their last known exposure.
- Medical Microbiologist (MM) and Medical Health Officer (MHO) will determine Post Exposure Prophylaxis (PEP treatment for any susceptible exposed contacts and ensure serology is ordered by the MRP.
- Most Responsible Person will order PEP for patients identified by the MM/MHO

## Management of Exposed Health Care Provider

- Follow up provided by Medical Health Officer and/or Provincial Workplace Health Contact Centre (PWHCC) – See BCCDC Communicable Disease Manual-Measles
- Individuals who believe they have had a breach in PPE or exposure to a communicable disease should contact the PWHCC for an assessment 1-866-922-9464 or email OHN@WHcallcentre.ca.
- Exposed HCPs may be excluded from work by the MHO and/or PWHCC- See BCCDC Communicable Disease Control chapter 6 for more information.
- Additional information regarding exposure management for employees and the expectation to report vaccine and immunity status is outlined in Management of Occupational Exposure to Communicable Diseases policy AV0900 and Occupational Health and Safety Measle Resources.

## Special Populations

### Perinatal and Infants

*The following recommendations are adapted from BC Women's and Children's Measles*

### Management of Exposed infants and birthing persons:

- **Infant is a measles contact:**
  - Perinatal Exposure: Airborne, Droplet, and Contact precautions immediately after birth/resuscitation.
  - Postnatal Exposure: Airborne, Droplet, and Contact precautions five days after first exposure to 21 days after last exposure.
- **Birthing Person is a susceptible measles contact:**
  - Follow process above for *Management of Susceptible Exposed Contacts in the Healthcare Setting.*
- **Birthing Person is susceptible measles contact with healthy term infant:**
  - Follow process above for Management of Susceptible Exposed Contacts in the Healthcare Setting.
  - Breast feeding permitted.
  - Birthing person/infant contact and rooming in permitted.
- **Birthing Person is susceptible measles contact with infant in NICU:**
  - Mother not permitted in NICU at any time if symptomatic or from five days after exposure until 21 days after last exposure.
  - Breast feeding permitted from expressed breast milk.

### Management of suspect and/or confirmed measles in infants and birthing persons:

- **Infant suspect and/or Measles case:**
  - In addition to Routine Practices, infant must be immediately placed on Airborne, Droplet & Contact Precautions in an appropriately ventilated Airborne Infection Isolation Room ( AIIR) with appropriate signage posted outside the patients' door.
  - **Birthing person considered immune:** follow family and visitor guidelines outlined in Airborne, Droplet, and Contact Precautions Guide. Contact for and

breast feeding, and skin-to-skin permitted. N95 must continue to be worn while in patient room.
    - **Birthing person susceptible:** Follow family and visitor guidelines outlined in Airborne, Droplet, and Contact Precautions Guide. Breast feeding permitted from expressed breast milk.
- **Birthing person is a suspect and/or confirmed measles case:**
    - In addition to Routine Practices, birthing person must be immediately placed on Airborne, Droplet & Contact Precautions in an appropriately ventilated Airborne Infection Isolation Room ( AIIR) with appropriate signage posted outside the patients' door.
- **Birthing Person is a suspect and/or confirmed measles with healthy term infant:**
    - Birthing person/infant contact and room in permitted. Infant is considered already exposed if birthing person in period of communicability during pregnancy or symptoms developed after before but, before case identified.
    - Breast feeding permitted.
- **Birthing Person is a susceptible measles contact with infant in NICU:**
    - Mother not permitted in NICU until no longer considered infectious and cleared by IPAC (if inpatient), or CD Unit/MHO (outpatient).
    - Breast feeding permitted from expressed breast milk.

# References

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| Revision History | Date | Section | Revision |
| | October 2024 | Additional Precautions | Updated links to new AP signs and resources. |
| | March 2025 | Incubation Period<br>Resources | Updated incubation period days.<br>Updated Airborne, Droplet & Contact Precautions. |
| | April 2025 | All | Updated to table format.<br>Updated all sections. |
| | May 12, 2025 | New Sections Added | Accommodation, Air Clearance, Handling Patient Items, Management of Susceptible Exposed |
| | May 29, 2025 | New Sections Added | Transport<br>Visitors |
| | June 24, 2025 | Updates | Management of Susceptible Exposed Contacts in Healthcare Settings<br>Visitors |
| | July 2, 2025 | Updates | Transport |
| | July 3, 2025 | New Section Added | Treatment |
| | July 10, 2025 | Updates; New Section Added | Accommodation;<br>Removal of Management of Susceptible Exposed Contacts in Healthcare Settings and Exclusion of HCP case of measles; new section Workplace Health and Safety Recommendations |
| | July 17, 2025 | Updates | Removed duplicate Section: Management of measles cases, and EVS<br>Updated format and clarified language in all sections.<br>Added: Definitions<br>Added: Discontinuing Precautions |