Measles (Rubeola)

Site Applicability

All PHC Acute and Long Term Care Sites.

Practice Level

Basic: Physicians, NPs, Nursing, Clinical Nurse Leader, Clinical Site Coordinator, Bed Placement Coordinator

Standards

In addition to Routine Practices, Airborne Precautions must be initiated on all patients/residents suspected or confirmed to have measles.

The patient/resident will remain on Airborne Precautions until measles has been ruled out or as directed by Infection Prevention and Control (IPAC).

Susceptible contacts of known measles cases should be placed on Airborne Precautions from 5 days after their first exposure to 21 days after their last exposure. IPAC will conduct hospital contact tracing in conjunction with public health.

IPAC and/or most responsible physician/NP must report all suspected and confirmed cases of measles to the VCH Medical Health Officer to initiate immediate public health follow-up.

Description of the Disease

Measles, also called red measles or rubeola, is an acute illness caused by the measles virus. The virus is highly contagious and easily spread through the air in respiratory aerosols, which can remain suspended in the air for hours. The virus can also be spread by contact with nose and throat secretions, including saliva, of infected persons. Complications can include ear infections, pneumonia, or more rarely encephalitis. Once recovered, persons are considered immune to subsequent measles infections for life.

Measles is vaccine preventable, with two doses of a measles-containing vaccine being 99% effective at preventing infection. While eliminated from Canada, susceptible individuals may acquire measles during travel to endemic countries or following contact with an infected individual who was recently outside of Canada. Outbreaks can occur in susceptible populations due to the highly infectious nature of the virus and airborne transmission route.

Signs & Symptoms

The signs and symptoms of measles include:

- Fever greater than 38°C
- Cough
- Coryza (runny nose)
- Conjunctivitis (red and inflamed eyes)
- Maculopapular skin rash beginning on the face and spreading down the body
- Koplik spots inside the mouth, especially the cheeks

Incubation Period

Symptoms develop between 7 to 21 days after a person is exposed, usually beginning with fever.

Period of Communicability

Individuals are infectious 5 days before onset of rash (1-2 days before symptom onset) until 4 days after onset of rash. This means patients/residents can be asymptomatic but potentially infectious and spread the virus to others.

Routes of Transmission

The virus is transmitted by airborne droplets/aerosols or by direct contact with nasal or throat secretions of infected persons. Less commonly, the virus spreads through contact with articles freshly soiled with nasal and throat secretions.

Populations at Risk

Susceptible persons (i.e., unvaccinated or without previous history of measles infection) who had direct or indirect contact with an infectious individual. Precautions should be taken with neonates born to mothers with measles infection at delivery.

Assessment and Intervention

Infection Control Precautions

- **Additional Precautions:** In addition to Routine Practices, Airborne Precautions will be initiated for patients/residents with known or suspected measles. Precautions should be maintained until 4 days after the start of rash in immunocompetent individuals or until all symptoms resolve in immunocompromised individuals.

  The most responsible nurse will ensure Airborne Precautions are ordered in Cerner and post the appropriate sign on the door.

  - Individuals with known immunity to measles may wear an N95 at their own discretion when entering the room. For all others, put on a fit-tested N95 prior to entering the room.
- **Hand Hygiene:** Hands should be cleaned before and after every patient/resident contact, as well as after touching potentially contaminated items in the environment. Using an alcohol

based hand rub solution is preferred if hands are not visibly soiled. Encourage and assist the patient to perform hand hygiene.

- **Patient Placement:** Patients with measles should be placed in a private, negative pressure airborne infection isolation room. The door must remain closed.
- **Equipment:** Dedicate equipment whenever possible. Clean and disinfect shared patient equipment routinely and between different patients/residents.
- **Environment:** All high-touch surfaces in the patient's room must be cleaned and disinfected at least daily. Following discharge of the patient, the room should have a terminal clean carried out prior to the next patient being admitted.
- **Visitors:** Only family and visitors who are immune to measles should visit. If immunity is not known, assume the individual is non-immune. Education should be provided regarding hand hygiene, and visitors must perform hand hygiene before entry and on leaving the room. Assist visitors to wear an N95 respirator (use the 1870+ model).
- **Patient Transport:** Transport outside of the room should be limited. When the patient is required to leave the room for diagnostic purposes:
    - Notify receiving department prior to transport of the precautions in place.
    - Encourage and/or assist patient to clean their hands.
    - If the patient's condition allows for it, the patient should wear a medical mask during transport. If patient can tolerate an N95 and wishes to wear one, this can be accommodated by offering the 1870+ model (note this will not be fit tested for patient).
- **Management of Susceptible Contacts:** Contacts are individuals who have spent any length of time in a room or enclosed space while the patient/resident with measles was present or for up to 2 hours after the infectious patient/resident left the room/space. IPAC will identify contacts who are susceptible to measles in collaboration with VCH Public Health/Medical Health Officer (MHO). Any exposed visitors or discharged patients will be followed by public health. Health care worker contacts will be identified and follow up by Occupational Health and Safety.

  For patients/residents identified as susceptible contacts:
    - Initiate Airborne Precautions starting 5 days after first exposure and continue up to 21 days after the last exposure and place in a private, negative pressure airborne infection isolation room with door closed during this period.
    - Follow additional infection control precautions as specified above for patients/residents with confirmed measles.
    - Collect specimens for measles testing should symptoms develop and inform IPAC.
    - Eligibility for post-exposure prophylaxis will be determined by the VCH MHO.

Lab Testing

- A nasopharyngeal or throat swab and urine for measles virus detection and blood for serologic testing.
- Serologic testing should be used to confirm the clinical diagnosis of measles or to assess immunity. Measles-specific IgM antibodies may not be present until 72 hours after the onset of the rash.

Treatment

- No treatment is available but supportive therapies may be offered (e.g., antipyretics for fever).

Transfer/Discharge Planning

- Notify the receiving facility, hospital, nursing home or community agency involved in the patient's care of their status.
- On discharge or transfer, keep room on Airborne Precautions with door closed until per air clearance/settle time (see Appendix A).
- Patients with measles should wear a medical mask during transport.

Documentation

- Ensure order for Airborne Precautions is in patient's Cerner chart.

Patient and Family Education

Patient Health Education Materials:

- Measles (Emergency Department)

HealthLinkBC Files:

- Measles

Related Documents

- B-00-07-13028 - Airborne Precautions - Infection Control
- Occupational Health and Safety guide for staff infected with or exposed to measles

References

BC Centre for Disease Control. (2014). Communicable Disease Control: Chapter 1 - Management of Specific Diseases: Measles. Retrieved from http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%201%20-%20CDC/MeaslesSeptember2014.pdf

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Government of Canada. (2020). Diseases and Conditions: Measles. Retrieved from https://www.canada.ca/en/public-health/services/diseases/measles.html

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Definitions

"Susceptible contacts" are individuals who are ≥ 6 months of age born on or after January 1, 1970 (1957 for health care workers) who:

- **Do not have** at least one of the following:
    - Documented evidence of vaccination with 2 valid doses of live measles-containing vaccine 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.
- **Have** certain immune-suppressive conditions (e.g. hematopoietic stem cell or solid organ transplant recipients, taking immunosuppressive therapy).

Appendix A: Air Settle/Clearance Times

When room air exchanges per hour are unknown:

Acute Care:

- Do not admit a new patient into a room after a patient with an airborne infection has been discharged for 1 hour. If entering room before 1 hour, wear an N95 respirator.

Long Term Care:

- Do not admit a new resident into a room after a resident with an airborne infection has been discharged for 2 hours. If entering room before 2 hours, wear an N95 respirator.

When room air exchanges per hour are known:

Table 1*: Time in minutes needed to reduce airborne contaminants by 99% or 99.9% depending on room air exchanges per hour.

Air exchanges per hour	99% Clearance	99.9% Clearance
2	138	207
4	69	104
6	46	69
12	23	35
15	18	28
20	14	21

*This table was adapted from CDC recommendations

In general, 99% clearance is considered adequate for a room prior to allowing another patient to enter or staff to enter without an N95 respirator.

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