

4.6 Measles

Etiology

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

Case Definitions

Confirmed Case

- Laboratory confirmation of infection in the absence of recent immunization with measles containing vaccine **OR**
- Isolation of measles virus from an appropriate clinical specimen **OR**
- Detection of measles virus RNA **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**
- 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 traveled to an area of known measles activity **OR**
- Clinical illness¹ in a person who is epidemiologically linked to a laboratory confirmed case.

Probable Case

Clinical illness⁴

- In the absence of appropriate laboratory tests **OR**
- In the absence of an epidemiological link to a laboratory -confirmed case **OR**
- In a person who has recently traveled to an area of known measles activity

Clinical Presentation

Measles causes high fever, a runny nose, cough, conjunctivitis, rash and Koplik spots. Koplik spots are a prodromic viral exanthem of measles manifesting two days before the measles rash. They are characterized as clustered, white lesions on the buccal mucosa near each Stensen's duct (on the buccal mucosa opposite the maxillary 2nd molars) usually lasting from 1-2 weeks. The red blotchy rash appears on the third to seventh day, starting on the face and then becomes more generalized. Complications may result from viral replication or bacterial infections. They can include pneumonia, otitis media, laryngotracheobronchitis, diarrhea and encephalitis. Encephalitis while rare can occur with a case fatality rate of about 10% and result in permanent disability in about 25%.

⁴ Clinical Illness is characterized by all the following features:

- ☐ fever 38.3° C or greater
- ☐ cough, coryza, or conjunctivitis
- ☐ generalized maculopapular rash for at least 3 days.

Measles infection during pregnancy leads to an increased frequency of miscarriage, premature birth, and low birth weight. Birth defects have rarely been reported.

Diagnosis

Diagnosis of measles is done by serologic testing and/or culture. For confirmation on laboratory specimens go to the public health laboratory web site www.publichealthlab.ca or call 709-777-6583.

Epidemiology

Occurrence

In countries where measles vaccine has been used, there has been a marked reduction in the incidence of measles; however, cases still occur in countries where vaccination rates are low. Canada has an enhanced weekly measles reporting system; Ontario, Quebec and British Columbia have reported measles outbreaks in 2012. There have been no cases of measles in Newfoundland and Labrador since 1997.

Reservoir

Humans are the only natural hosts of measles virus.

Transmission

Measles is one of the most highly communicable infectious diseases. The virus is transmitted by the airborne route, respiratory droplets or direct contact with the nasal secretions of an infected person.

Incubation Period

The incubation period is 7-18 days, usually 10 days from exposure to fever, and 14 days from exposure until the rash appears. If immune globulin is given for passive protection later than the third day of the incubation period, the incubation period may be extended.

Communicability

Measles is communicable from one day prior to the onset of the prodromal period (about four days before rash onset) to four days after the appearance of the rash. Vaccine virus rash has not been shown to be communicable.

Control Measures

Management of Cases

Investigations

- Confirm the diagnosis
- Ensure specimens are collected from the suspect measles case as soon as possible
- Review measles immunization history

- Identify recent history of travel (8-17 days before rash onset)
- Determine if a recent contact with a confirmed or probable case of measles
- Identify contacts

Treatment

- No specific treatment, treatment should be based on the symptoms of the patient
- Hospitalization may be required if complications develop

Immunization

Defer all immunization with live and inactivated vaccine until at least four weeks after illness onset in the case.

Exclusion

- In hospitals Airborne Precautions should be taken from the onset of the catarrhal stage of the prodromal period through to the fourth day of the rash to reduce the exposure of other persons
- Immunocompromised patients should be isolated for the duration of their illness
- Cases should be excluded from childcare, school or work until four days after the onset of rash

Management of Contacts

Identify all contacts of the case and review their immunization status immediately on notification of a case. Determine if contacts are immune or susceptible to measles.

Definitions***Contact***

- A contact is someone who has shared the same airspace with the case during the infectious period

Immune contacts

- Criteria for measles immunity are included in Table 1.

Table 1: This table provides a summary of criteria for measles immunity

Routine	Health Care Workers	Travelers to destination outside North America	Students in post-secondary educational settings	Military personnel
<ul style="list-style-type: none"> Documentation of vaccination: <ul style="list-style-type: none"> Children 12 months to 17 years of age: 2 doses* Adults 18 years of age and older born in 1970 or later: 1 dose* OR History of laboratory confirmed infection OR Laboratory evidence of immunity OR Born before 1970 	<ul style="list-style-type: none"> Documentation of vaccination with 2 doses (regardless of year of birth) OR History of laboratory confirmed infection OR Laboratory evidence of immunity 	<ul style="list-style-type: none"> Documentation of vaccination: <ul style="list-style-type: none"> If born in 1970 or later: 2 doses* If born before 1970: 1 dose* OR History of laboratory confirmed infection OR Laboratory evidence of immunity 	<ul style="list-style-type: none"> Documentation of vaccination: <ul style="list-style-type: none"> If born in 1970 or later: 2 doses* If born before 1970: consider 1 dose if no documentation of receipt of measles containing vaccine* OR History of laboratory confirmed infection OR Laboratory evidence of immunity 	<ul style="list-style-type: none"> Documentation of vaccination with 2 doses (regardless of year of birth) OR History of laboratory confirmed infection OR Laboratory evidence of immunity
<p>* Measles containing vaccine For additional information go to the Canadian Immunization Guide.</p>				

Immunoprophylaxis

- Susceptible contacts should be offered the measles vaccine within 72 hours of exposure
- Susceptible contacts with a contraindication to MMR vaccine (e.g. immunocompromised, HIV+, pregnant) may be offered Immune globulin (IG)
- IG must be provided within six days of exposure

Exclusion

- Susceptible contacts that refuse or cannot receive measles containing vaccine or immune globulin may be excluded from childcare, school or work at the direction of the MOH
- The period of exclusion would be between day five (post first exposure) and day 21 (post last exposure)

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Prevention Measures

- Provide written or oral information on measles
- The prevention of measles is maintained by high coverage rates of vaccination
- Remind the public about the importance of measles vaccination
- Consider scheduling extra immunization clinics for those at risk without up to date measles immunization status
- Additional information on measles is available at web site
<http://www.phac-aspc.gc.ca/im/vpd-mev/measles-rougeole-eng.php#res>
- A fact sheet is available at the web site
<http://www.health.gov.nl.ca/health/publichealth/cdc/infectioncontrol/Measles%20May%202013.pdf>

Reporting Requirements and Procedures

- The laboratory (hospital or public health laboratories) report case/s to the attending physician, the Chief Medical Officer of Health and the Medical Officers of Health (MOH)
- MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease control nurses (CDCNs) and Infection control practitioners (ICP), in the particular region as required for follow-up and case investigation
- The CDCN in collaboration with the ICP (if necessary) will collect case details
- The CDCN will enter the case details into the electronic reporting system and use the Canadian Network for Public Health Information (CNPHI) tool for alerts and/or outbreak summaries

Provincial Disease Control

- Reports the aggregate case data to Public Health Agency of Canada via the Measles, Rubella and CRS/CRI Surveillance (MARS).
- Provides an analysis of the case/s with reports in the Quarterly Communicable Disease Report (CDR), also posted on the Public Health website
<http://www.health.gov.nl.ca/health/publichealth/cdc/informationandsurveillance.html>

- Coordinates the response if an outbreak occurs across RHAs

Measles IG is obtained by calling 709-729-3430 during working hours or the MOH after hours 1-866-270-7437.

References

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