Ministry of Health and Long-Term Care

Infectious Diseases Protocol

Appendix A: Disease-Specific Chapters

Chapter: Leprosy

Effective: February 2019

Ontario

Leprosy

☒ Communicable

☒ Virulent

Health Protection and Promotion Act:
O. Reg. 135/18 (Designation of Diseases)

1.0 Aetiologic Agent

Mycobacterium leprae (*M. leprae*) is the bacterium which causes leprosy. It is an obligate intracellular, acid-fast bacillus that can be Gram-stain variable.[1]

2.0 Case Definition

2.1 Surveillance Case Definition

Refer to Appendix B for Case Definitions.

2.2 Outbreak Case Definition

The outbreak case definition varies with the outbreak under investigation. Please refer to the *Infectious Diseases Protocol, 2018* (or as current) for guidance in developing an outbreak case definition as needed.

The outbreak case definitions are established to reflect the disease and circumstances of the outbreak under investigation. The outbreak case definitions should be developed for each individual outbreak based on its characteristics, reviewed during the course of the outbreak, and modified if necessary, to ensure that the majority of cases are captured by the definition. The case definitions should be created in consideration of the outbreak definitions.

Outbreak cases may be classified by levels of probability (*i.e.* confirmed and/or probable).

3.0 Identification

3.1 Clinical Presentation

A chronic bacterial disease characterized by the involvement primarily of skin as well as peripheral nerves and the mucosa of the upper airway. Clinical forms of the disease represent a spectrum reflecting the cellular immune response to *M. leprae*.[1,2] The following characteristics are typical of the major forms of the disease:[3]

- Tuberculoid: one or a few well-demarcated, hypopigmented and anesthetic skin lesions, frequently with active spreading edges and a clearing centre; peripheral nerve swelling or thickening also may occur;

- Lepromatous: a number of erythematous papules, plaques, or nodules or an infiltration of the face, hands and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin, possible with reduced sensation;
- Borderline (dimorphous): skin lesions characteristic of both the tuberculoid and lepromatous forms; and
- Indeterminate: early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features.

3.2 Diagnosis

See Appendix B for diagnostic criteria relevant to the Case Definitions.

For further information about human diagnostic testing, contact the Public Health Ontario Laboratories or refer to the Public Health Ontario Laboratory Services webpage: http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/default.aspx

4.0 Epidemiology

4.1 Occurrence

More common in tropical and subtropical areas.[1]

Transmission within Canada has not been documented however, cases of leprosy are typically imported from areas of endemicity.[4] In Ontario, between 2013 and 2017, there were 13 cases of Leprosy reported in Ontario.[*]

Please refer to Public Health Ontario's (PHO) Reportable Disease Trends in Ontario reporting tool and other reports for the most up-to-date information on infectious disease trends in Ontario.

http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/DataReports.aspx

For additional national and international epidemiological information, please refer to the Public Health Agency of Canada and the World Health Organization.

4.2 Reservoir

Humans and armadillos.[2]

4.3 Modes of Transmission

The bacterium may be transmitted from close contact with nasal mucosa, possibly through respiratory secretions by untreated cases or individuals incubating subclinical infections, but the exact mechanism of transmission is not clearly understood.[1,2] Indirect

[*] Data included in the epidemiological summary are from January 1, 2013 to December 31, 2017. Data were extracted from Query on February 7, 2018 and therefore are considered preliminary.

transmission is unlikely, although the bacillus can survive up to 7 days in dried nasal secretions.[2]

4.4 Incubation Period

Incubation has been reported from as short as a few weeks to 30 years; however, the average incubation period is between 3 to 10 years.[2]

4.5 Period of Communicability

Clinical and laboratory evidence suggest that infectiousness is lost in most instances within a day of treatment with multidrug therapy.[2]

4.6 Host Susceptibility and Resistance

Infection among close contacts of cases is frequent. Several human genes have been identified that are associated with susceptibility to *M. leprae*, and fewer than 5% of people appear to be genetically susceptible to the infection. People with human immunodeficiency virus (HIV) infection do not appear to be at increased risk of becoming infected with *M. leprae*. However, concomitant HIV infection and leprosy can lead to worsening of leprosy symptoms. Onset of leprosy is associated increasingly with use of anti-inflammatory autoimmune therapies and immunologic senescence among elderly patients.[1] The disease is rarely seen in children younger than 3 years.[2]

5.0 Reporting Requirements

As per Requirement #3 of the “Reporting of Infectious Diseases” section of the *Infectious Diseases Protocol, 2018* (or as current), the minimum data elements to be reported for each case are specified in the following:

- *Ontario Regulation 569* (Reports) under the *Health Protection and Promotion Act* (HPPA);[5]
- The iPHIS User Guides published by PHO; and
- Bulletins and directives issued by PHO.

6.0 Prevention and Control Measures

6.1 Personal Prevention Measures

The best preventative measure is early diagnosis and treatment of cases.[2] Health education should stress the availability of effective multidrug therapy, the non-infectivity of persons under continuous treatment and the importance of completing treatment. The Ministry of Health and Long-Term Care (ministry) provides medications at no cost for the treatment of leprosy cases and contacts.

6.2 Infection Prevention and Control Strategies

If hospitalized, routine practices are indicated. Hand hygiene is recommended for all people in contact with a case.[1] Disinfection of nasal secretions, handkerchiefs and other fomites is necessary until treatment is established.

Refer to PHO's website at www.publichealthontario.ca to search for the most up-to-date information on Infection Prevention and Control.

6.3 Management of Cases

In addition to the requirements set out in the Requirement #2 of the "Management of Infectious Diseases – Sporadic Cases" and "Investigation and Management of Infectious Diseases Outbreaks" sections of the *Infectious Diseases Protocol, 2018* (or as current), the board of health shall investigate cases to determine the source of infection. Refer to Section 5: Reporting Requirements above for relevant data to be collected during case investigation.

Public health intervention is minimal especially after initiation of treatment when communicability is low; no restrictions in employment or attendance at school are indicated for persons whose disease is regarded as non-infectious.

Treatment should be under the direction of an infectious disease specialist, refer to World Health Organization (WHO) treatment recommendations. As above, medications are provided at no cost in Ontario through the ministry, Population and Public Health Division, Infectious Disease Policy and Programs Unit.

6.4 Management of Contacts

Contacts are defined as persons who have been in close, continuous household contact with a new patient up to 3 years prior to diagnosis or during any period of inadequate treatment. Persons residing with cases in areas of endemicity are particularly vulnerable.[6]

Initial examination of contacts should take place, but long-term follow-up of asymptomatic contacts is not warranted.[1]

6.5 Management of Outbreaks

Please see the *Infectious Diseases Protocol, 2018* (or as current) for the public health management of outbreaks or clusters in order to identify the source of illness, manage the outbreak and limit secondary spread.

7.0 References

1. Committee on Infectious Diseases, American Academy of Pediatrics. Section 3: Summaries of Infectious Diseases: Leprosy. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. Red Book: 2018 Report of the Committee on Infectious Diseases. 31 ed. Itasca, IL: American Academy of Pediatrics; 2018.
2. Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.
3. Centers for Disease Control and Prevention. National Notifiable Disease Surveillance System: Hansen's Disease / Leprosy (Mycobacterium leprae) - 2013 Case Definition [Internet]. Atlanta, GA: U.S. Department of Health & Human Services; 2013 [cited May 1, 2018]. Available from: https://wwwn.cdc.gov/nndss/conditions/hansens-disease/case-definition/2013/
4. Boggild AK, Correia JD, Keystone JS, Kain KC. Leprosy in Toronto: an analysis of 184 imported cases. Canadian Medical Association Journal. 2004;170(1):55-9.
5. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: https://www.ontario.ca/laws/regulation/900569
6. County of Los Angeles, Department of Public Health. Acute Communicable Disease Control Manual (B-73) - Part IV: acute communicable diseases, Leprosy (Hansen disease). Los Angelos, CA: County of Los Angeles, Department of Public Health; 2018.

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
January 2014	General	New template. Title of Section 3.6 changed from “Susceptibility and Resistance” to “Host Susceptibility and Resistance” Title of Section 4.2 changed from “To Public Health Division (PHD)” to “To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry” Section 8.0 Document History added.
January 2014	1.2 Outbreak Case Definition	Entire section revised.
January 2014	2.1 Clinical Presentation	First paragraph, second bullet changed from “Lepromatous: a number of erythematous papules and nodules or an infiltration of the face, hands and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin” to “Lepromatous: a number of erythematous papules, **plaques**, or nodules or an infiltration of the face, hands and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin”
January 2014	2.2 Diagnosis	Addition of the second paragraph: “For further information…”
January 2014	3.1 Occurrence	First paragraph, removed “Leprosy is rare in Ontario with few cases having been reported over the past decade.” Second paragraph, addition of second and third sentence “Transmission within Canada has not been documented however, cases of leprosy are imported from areas of endemicity regularly. In Ontario between 2008 and 2012, an average of three leprosy cases was reported each year.” Addition of second paragraph “For more information…”

Revision Date	Document Section	Description of Revisions
January 2014	3.3 Modes of Transmission	First paragraph changed from “The mode of transmission remains unclear but it is not highly communicable.” to “The mode of transmission remains unclear.”
January 2014	3.6 Host Susceptibility and Resistance	Addition of second sentence “It is important to understand that…”
January 2014	5.2 Infection Prevention and Control Strategies	Addition of second paragraph “Refer to…”
January 2014	5.3 Management of Cases	First paragraph, removed second sentence and bullet points. Third paragraph changed from “Treatment recommended by World Health Organization (WHO) for lepromatous leprosy is triple therapy with rifampin, dapsone and clofazimine for twelve months and should be under the direction of an infectious disease specialist. As above, medications are provided at no cost in Ontario.” To “Treatment should be under the direction of an infectious disease specialist, refer to World Health Organization (WHO) treatment recommendations. As above, medications are provided at no cost in Ontario through the ministry, Public Health Division, Pubic Health Policy and Programs Branch.”
January 2014	5.5 Management of Outbreaks	Entire section revised.
January 2014	6.0 References	Updated.
January 2014	7.0 Additional Resources	Updated.

Revision Date	Document Section	Description of Revisions
February 2019	General	Minor revisions were made to support the regulation change to Diseases of Public Health Significance. Common text included in all Disease Specific chapters: Surveillance Case Definition, Outbreak Case Definition; Diagnosis; Reporting Requirements; Management of Cases, and Management of Outbreaks. The epidemiology section and references were updated and Section 8.0 Additional Resources was deleted.
February 2019	4.2 Reservoir	Added: armadillos.
February 2019	4.3 Modes of Transmission	Entire section revised.
February 2019	4.4 Incubation Period	Entire section revised.
February 2019	4.6 Host Susceptibility and Resistance	Entire section revised.
February 2019	6.4 Management of Contacts	Revised definition of contact in first sentence. Changed from “continuous household contact for a month or more within 5 years prior to diagnosis…” to “continuous household contact with a new patient up to 3 years prior to diagnosis…”


Ontario