Ministry of Health and Long-Term Care

Infectious Diseases Protocol

Appendix A: Disease-Specific Chapters

Chapter: Meningitis, acute: i) bacterial; ii) viral, and iii) other

Effective: February 2019

Ontario

Meningitis, acute i) bacterial; ii) viral, and iii) other

☒ Communicable

☐ Virulent

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

1.0 Aetiologic Agent

Meningitis is defined as “any infection or inflammation of the membranes covering the brain and spinal cord”; it can be caused by various organisms including bacteria, fungi and viruses.[1,2]

Some common causes of bacterial meningitis are *Neisseria meningitidies*, *Haemophilis influenzae* type b (Hib) and *Staphlococcus pneumonia*.[2]

Viral meningitis (aseptic meningitis, nonbacterial meningitis) may be caused by a variety of viruses, many of which are also associated with other manifestations.[2] These include enteroviruses, coxsackievirus, echovirus, arboviruses and herpes simplex virus. Many of the cases of viral meningitis have no obvious causative agent.[2]

Other infectious agents and conditions may also cause the clinical presentation of meningitis, including pyogenic meningitis, tuberculosis, fungi and cerebrovascular syphilis.[2]

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).

An outbreak under the category of “Meningitis, i) bacterial; ii) viral, and iii) other” would be defined as more than the usual number of cases meeting the case definition as defined in Appendix B.

3.0 Identification

3.1 Clinical Presentation

Meningitis usually has a very sudden onset, with symptoms that include high fever, severe headache, vomiting, confusion, seizures, progressive lethargy, drowsiness, stiff neck, and skin rash which may be on the hands and feet depending on the causative agent. Petechial rashes and other types of rashes may also occur depending on causative agent.[2]

Newborns and infants may not have all the classic symptoms above. They may present with irritability, may refuse meals, have unusual sleep patterns and constant crying; newborns and infants may also have bulging of the soft spots on their heads (frontonelle) and a lower than normal body temperature.[2]

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

Both bacterial and viral meningitis occurs worldwide as epidemic and sporadic cases; true incidence of viral meningitis is unknown.[2]

In Ontario, the group of conditions encompassing encephalitis and meningitis (of viral, bacterial, other, or unspecified origin) has been reported at an average of 170 cases annually between 2012 and 2016. Meningitis has been reported at an average of 156 cases during the same time period.[*]

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.

[*] 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.

4.2 Reservoir

For bacterial causes, the reservoir is humans and for viral causes, the reservoir varies depending on specific infectious agent.[2]

4.3 Modes of Transmission

Depends on causative infectious agent, however, transmission is usually by direct contact, or droplets, originating from respiratory secretions from the nose or throat.[2]

4.4 Incubation Period

Depends on causative agent for both bacterial and viral meningitis.[2]

4.5 Period of Communicability

For bacterial, usually as long as organisms are present; effective antibiotic treatment reduces communicability after 24-48 hours. For viral, it varies according to the causative agent.[2]

4.6 Host Susceptibility and Resistance

Depends on the causative agent.

5.0 Reporting Requirements

"Meningitis, i) bacterial; ii) viral, and iii) other" should be used to report only cases that meet the case definition (see Appendix B).

Cases of meningitis that are due to specific diseases of public health significance should be reported under that disease. This includes meningitis due to a reportable organism such as:

- *Haemophilus influenzae*,
- *Neisseria meningitidis*,
- *Streptococcus pneumonia*,
- *Listeria monocytogenes*,
- West Nile virus,
- Measles virus, or
- Mumps

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);[3]
- The iPHIS User Guides published by PHO; and
- Bulletins and directives issued by PHO.

6.0 Prevention and Control Measures

In the event that publicly funded vaccine doses are needed for case and contact management, the board of health should contact the Ministry of Health and Long-Term Care's (ministry) immunization program at vaccine.program@ontario.ca as soon as possible.

6.1 Personal Prevention Measures

Personal prevention measures depends upon the causative agent.

6.2 Infection Prevention and Control Strategies

Appropriate precautions depending on causative agent while in hospital including appropriate hand washing.

For bacterial meningitis, routine infection prevention and control practices, as well as contact and droplet precautions should be in effect until at least 24 hours after beginning and complying with appropriate antimicrobial therapy although this may be dependent on the causative organism.

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.

6.4 Management of Contacts

Contact identification and tracing is dependent on the causative organism. For viral meningitis, contact tracing is generally not indicated.

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. O'Toole MT, editor. Mosby's Dictionary of Medicine, Nursing & Health Professions. 9 ed. St. Louis, MO: Elsevier; 2013.

2. Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.
3. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: https://www.ontario.ca/laws/regulation/900569

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
February 2019	General	New layout and format. Revisions made throughout entire document. 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.
February 2019	4.0 Epidemiology	Section updated.
February 2019	6.0 Prevention and Control Measures	Section updated.
February 2019	8.0 Additional Resources	Section deleted.


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