

# Appendix A: Disease-Specific Chapters

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

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

- Communicable  
 Virulent

**Health Protection and Promotion Act:  
Ontario Regulation 558/91 – Specification of Communicable Diseases**

**Health Protection and Promotion Act:  
Ontario Regulation 559/91 – Specification of Reportable Diseases**

<b>1) Aetiologic Agent:</b>	<p>Bacterial meningitis is caused by the following bacteria:</p> <ul style="list-style-type: none"><li>• <i>Haemophilis influenza</i> (non-b types)</li><li>• <i>Staphylococcus aureus</i></li><li>• <i>E. coli</i>, <i>Enterobacter aerogenes</i>, <i>Proteus morgani</i> and <i>Klebsiella pneumoniae</i></li></ul> <p>Viral meningitis may be caused by a variety of viruses, many of which are associated with other diseases that can cause the illness. These include:</p> <ul style="list-style-type: none"><li>• enteroviruses, coxsackievirus, echovirus, and arboviruses,</li><li>• measles, mumps, herpes simplex, varicella and</li><li>• lymphocytic choriomeningitis virus</li></ul> <p>At least half the cases of viral meningitis have no obvious causative agent (1).</p>
<b>2) Case Definition:</b>	
Surveillance Case Definition	<a href="#">See Appendix B</a>
Outbreak Case Definition	<p>The outbreak case definition varies with the outbreak under investigation. Consideration should be given to the following in establishing an outbreak case definition:</p> <ol style="list-style-type: none"><li>1. Clinical, laboratory and/or epidemiological criteria;</li><li>2. A time frame for occurrence;</li><li>3. A geographic location(s) or place(s) where cases live or became ill/exposed, and</li><li>4. Special attributes of cases (e.g. age, underlying conditions).</li></ol> <p>Cases should also be classified by levels of probability (i.e. confirmed, probable or suspect).</p>
<b>3) Identification:</b>	
Clinical Presentation	<p>Meningitis has a very sudden onset, usually with high fever, severe headache, vomiting, confusion, seizures, progressive lethargy, drowsiness, stiff neck, and skin rash especially on hands and feet (1).</p>

	<p>Petechial rashes and other types of rashes may also occur depending on causative agent (1).</p> <p>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 the soft spots on their heads bulge and a lower than normal body temperature (1).</p>
Diagnosis	<a href="#">See Appendix B</a>

#### 4) Epidemiology:

Occurrence	<p>Both bacterial and viral meningitis occurs worldwide as epidemic and sporadic cases; more common in late summer and early autumn; true incidence of viral meningitis is unknown (1).</p> <p>In Ontario, the group of conditions encompassing encephalitis and meningitis (of viral, bacterial, other, or unspecified origin) have been reported at an average of 447 cases each year from 1998-2007.</p>
Reservoir	For bacterial it is humans (1). For viral it varies depending on specific infectious agent (1).
Modes of Transmission	Depends on infectious agent, however, usually by direct contact, droplets, carrier state and discharges from nose or throat (1).
Incubation Period	Depends on causative agent for both bacterial and viral (see specific diseases) (1).
Period of Communicability	For bacterial, usually as long as organisms are present; effective antibiotic treatment reduces communicability after 24-48 hours (1). For viral, it varies according to causative agent (1).
Susceptibility and Resistance	Universal; susceptibility decreases with age; those not immunized with relevant vaccines are also susceptible (1).

#### 5) Reporting Requirements:

To local Board of Health	<p>Confirmed and suspected cases shall be reported to the medical officer of health by persons required to do so under the <i>Health Protection and Promotion Act</i>, R.S.O. 1990.</p> <p><b>Note:</b> All positive cultures/tests from normally sterile sites for any of the organisms indicated above must be reported to the local medical officer of health by the laboratory as soon as identified.</p> <p>Sensitivity results shall also be noted and reported to the medical officer of health.</p>
To Public Health Division	Report only case classifications specified in the case definition to PHD.

(PHD)	<p>Meningitis due to <i>Haemophilus influenzae</i> type b, <i>Neisseria meningitidis</i>, <i>Streptococcus pneumoniae</i> or <i>Listeria monocytogenes</i> shall be reported under the corresponding diseases.</p> <p>Cases shall be reported using the integrated Public Health Information System (iPHIS), or any other method specified by the Ministry <b>within five (5) business days of receipt of initial notification</b> as per <i>iPHIS Bulletin</i> Number 17: Timely Entry of Cases (2).</p> <p>The minimum data elements to be reported for each case is specified in the following:</p> <ul style="list-style-type: none"> <li>• <i>Ontario Regulation 569</i> (Reports) under the Health Protection and Promotion Act (HPPA)</li> <li>• The disease-specific User Guides published by the Ministry, and</li> <li>• Bulletins and directives issued by the Ministry.</li> </ul>
-------	--

## 6) Prevention and Control Measures:

Personal Prevention Measures	<p>For bacterial meningitis the following measures can apply:</p> <ul style="list-style-type: none"> <li>• Vaccination for the causative organisms listed above where there is available immunization as per the Publicly Funded Immunization Schedules for Ontario, and the Canadian Immunization Guide (CIG) recommendations (see references and resources listed below)</li> <li>• Avoid crowded living quarters whenever practical, especially in institutions and barracks (1)</li> <li>• Educate members of the public on cough etiquette, hand hygiene and the risk of sharing items contaminated with saliva, e.g. cutlery, water bottles, lipstick, etc.</li> </ul> <p>For viral meningitis there are no specific preventative measures available.</p>
Infection Prevention and Control Strategies	<p>Strategies:</p> <ul style="list-style-type: none"> <li>• Appropriate precautions depending on causative agent while in hospital including appropriate hand washing</li> <li>• For bacterial meningitis, routine practices and respiratory droplet precautions are recommended until 24 hours after the start of treatment depending on the causative organism</li> </ul>
Management of Cases	<p>Investigate the case to determine source of infection. Refer to Regulation 569 under the HPPA for relevant data to collect and include the following:</p> <ul style="list-style-type: none"> <li>• Symptoms and date of symptom onset</li> <li>• Travel history</li> <li>• History of exposure</li> <li>• Earliest and latest exposure dates</li> <li>• Occupation</li> </ul>

	<ul style="list-style-type: none"> <li>• Residency/attendance at a facility or institution</li> </ul> <p>Contact identification and tracing:</p> <ul style="list-style-type: none"> <li>• Contact history during period of communicability</li> <li>• Assessment of type of contact and probability of transmission</li> <li>• Identification of contacts for follow-up</li> <li>• Occupation of contact</li> <li>• Residency/attendance at a facility or institution</li> </ul> <p>For bacterial meningitis, treatment with the appropriate and strain sensitive antibiotic as per the direction of the attending health care provider.</p> <p>For viral meningitis, public health measures include public education, surveillance and collection of appropriate data as above.</p> <p>Provide education to the case about the illness and methods to prevent the spread of infection as listed above.</p>
Management of Contacts	<p>Contacts are those persons who live in the same household, attend the same child day care setting or have had sexual and other intimate contact, such as sharing eating utensils, or drinks, with the case (1).</p> <p>Contact management would include:</p> <ul style="list-style-type: none"> <li>• Surveillance for signs and symptoms and prophylaxis depending on the causative agent. (Refer to the specific disease as appropriate)</li> <li>• Education of contacts with regards to the signs, symptoms, what to do if symptoms do occur, and the route of transmission depending on causative agent</li> <li>• Immunization of contacts would depend on the specific infectious agent (1)</li> </ul>
Management of Outbreaks	<p>An outbreak is defined as greater than the expected number of cases that are spatially and temporally linked. The Public Health Division provides support in the management of an outbreak only if the Health Unit requires vaccine, requests assistance of the PHD or if the outbreak spans more than one Health Unit. However, please note that since there are several causative agents it may be difficult to determine the presence of an outbreak of bacterial meningitis.</p> <p>Clusters of cases of viral meningitis sometimes do occur; Advising the public and the medical community of the presence of increased incidence of cases would promote prompt assessment and diagnosis.</p> <p>Provide public health management of outbreaks or clusters in order to identify the source of illness, stop the outbreak and limit secondary spread.</p> <p>As per this Protocol, outbreak management shall comprise of but not be limited to the following general steps:</p> <ul style="list-style-type: none"> <li>• Confirm diagnosis and verify the outbreak;</li> <li>• Establish an outbreak team;</li> </ul>

	<ul style="list-style-type: none"> <li>• Develop an outbreak case definition;</li> <li>• Implement prevention and control measures;</li> <li>• Implement and tailor communication and notification plans depending on the scope of the outbreak;</li> <li>• Conduct epidemiological analysis on data collected;</li> <li>• Conduct environmental inspections of implicated premise where applicable;</li> <li>• Coordinate and collect appropriate clinical specimens where applicable</li> <li>• Prepare a written report, and</li> <li>• Declare the outbreak over in collaboration with the outbreak team.</li> </ul>
<p><b>7) References</b></p>	<p>(1) Heymann D, editor. Control of communicable diseases manual. 18th ed. Washington: American Public Health Association; 2004.</p> <p>(2) Ministry of Health and Long-Term Care. Timely entry of cases. iPHIS Bulletin. 2007 May 11;17.</p>
<p><b>8) Additional Resources</b></p>	<p>Ministry of Health Long Term-Care, Public Health Laboratories. Specimen collection guide: testing guidelines. Toronto: Queen’s Printer for Ontario; 2008. Available from <a href="http://www.health.gov.on.ca/english/providers/pub/labs/specimen_guide/testing_guidelines.pdf">http://www.health.gov.on.ca/english/providers/pub/labs/specimen_guide/testing_guidelines.pdf</a>.</p> <p>National Advisory Committee on Immunization. Canadian immunization guide. 7<sup>th</sup> ed. Ottawa: Public Health Agency of Canada; 2006. Available from: <a href="http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php">http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php</a>.</p> <p><i>Health Protection and Promotion Act</i>, R.S.O. 1990, c. H.7. Available from <a href="http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm">http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm</a>.</p> <p>Ministry of Health and Long-Term Care. Infectious diseases protocol. Toronto: Queen’s Printer for Ontario; 2009. Available from <a href="http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html">http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html</a> (or as current)</p> <p>Ministry of Health and Long-Term Care. Publicly funded immunization schedules for Ontario: January 2009. Toronto: Queen’s Printer for Ontario; 2008. Available from <a href="http://www.health.gov.on.ca/english/providers/program/immun/pdf/schedule.pdf">http://www.health.gov.on.ca/english/providers/program/immun/pdf/schedule.pdf</a>.</p> <p>Steering Committee on Infection Control Guidelines. Prevention and control of occupational infections in health care. An infection control guideline. Can Commun Dis Rep. 2002 Mar;28 Suppl 1:1-264. Available from <a href="http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02pdf/28s1e.pdf">http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02pdf/28s1e.pdf</a>.</p> <p>Gregg MB, editor. Field epidemiology. 2<sup>nd</sup> ed. New York: Oxford University Press; 2002.</p>

