

# Appendix A: Disease-Specific Chapters

Chapter: Listeriosis

## Listeriosis

- 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>	Listeriosis is an opportunistic infection caused by the agent <i>Listeria monocytogenes</i> ( <i>L. monocytogenes</i> ), an aerobic, nonspore-forming, motile, Gram-positive bacillus that produces a narrow zone of hemolysis on a blood agar medium (2). Human infections are usually caused by serovars 1/2a, 1/2b, 1/2c and 4b (1).
<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 when establishing an outbreak case definition:</p> <ol style="list-style-type: none"><li>1. Clinical, laboratory and/or epidemiological criteria;</li><li>2. The time frame for occurrence;</li><li>3. The 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) and/or of the aetiologic agent.</li></ol> <p>Cases may be classified by levels of probability (e.g. confirmed, probable and/or suspect).</p>
<b>3) Identification:</b>	
Clinical Presentation	<p>A person with Listeriosis usually has fever, muscle aches, diarrhea, and sometimes, nausea and vomiting. The bacteria may infect the brain and the membrane lining the brain causing meningoenzephalitis. The onset of meningoenzephalitis may be sudden, with fever, intense headache, nausea, and vomiting. Complications include septicemia, endocarditis (the bacteria infects the membrane lining the cavities of the heart), and internal and external abscesses. Infected pregnant women may have minimal symptoms, characterized by a mild flu-like illness.</p> <p>An infected pregnant woman may unknowingly pass on the illness to</p>

	<p>her unborn child <i>in utero</i>. Infection during pregnancy may lead to premature delivery, infection of the newborn that may lead to meningitis, spontaneous abortion or stillbirth.</p> <p>Thirty percent of infant infections are fatal. If onset of illness occurs within the first four days of life, the case-fatality rate is 50% (3).</p> <p>Note: individuals may present with mild enteric symptoms, which could progress to more severe forms of disease.</p>
Diagnosis	<p><a href="#">See Appendix B</a></p> <p>Diagnosis is confirmed by isolation of the bacterium from CSF, blood, amniotic fluid, placenta, meconium, lochia, gastric washings and other sterile sites of infection (1).</p>
<b>4) Epidemiology:</b>	
Occurrence	<p>Occurrence is worldwide. Cases usually occur sporadically; however, several outbreaks have been recognized in recent years (3).</p> <p>Listeriosis is not a common disease in Ontario. There have been an average of approximately 40 cases per year between 2003 and 2007. Between one and eight cases occur every month, with no clear seasonal pattern.</p>
Reservoir	<p>The bacteria are found in soil, water, animals and humans. Asymptomatic fecal carriage is common in humans (1). Bacteria can thrive and multiply at refrigeration temperatures.</p>
Modes of Transmission	<p>Main route of transmission is foodborne, through ingestion of contaminated food such as ready-to-eat meats, unpasteurized milk and soft cheeses, and vegetables (2). Vegetables can become contaminated from the soil or from manure used as fertilizer.</p> <p>In-utero or perinatal transmission can occur. Inhalation of the organism has been reported and papular lesions on hands and arms may occur from direct contact with infectious material. Nosocomial transmission associated with contaminated equipment have resulted in a nursery outbreak (1, 2).</p>
Incubation Period	<p>Variable; cases have occurred 3 - 70 days following a single exposure to an implicated product. Estimated median incubation is 3 weeks (1).</p>
Period of Communicability	<p>Infected persons can shed the bacteria in stool for several months; mothers of infected newborns may shed the infectious agent in vaginal discharges or urine for 7-10 days after delivery (1).</p>
Susceptibility and Resistance	<p>Those at highest risk are fetuses and neonates, the elderly, immunocompromised persons and pregnant women. Children and young adults are generally resistant; adults less so after age 40. Disease is frequently superimposed on other conditions such as</p>

	cancer, organ transplantation, diabetes and AIDS. There is little evidence of acquired immunity, even after prolonged severe infection (1).
<b>5) Reporting Requirements:</b>	
To local Board of Health	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
To Public Health Division (PHD)	<p>Report only case classifications specified in the case definition to PHD using the integrated Public Health Information System (iPHIS), or any other method specified by the Ministry <b>within one (1) business day of receipt of initial notification</b> as per <i>iPHIS Bulletin Number 17: Timely Entry of Cases</i> (4).</p> <p>The minimum data elements to be reported for each case is specified in the following sources:</p> <ul style="list-style-type: none"> <li>• <i>Ontario Regulation 569 (Reports)</i> 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>
<b>6) Prevention and Control Measures:</b>	
Personal Prevention Measures	<p>Preventative measures (1, 2):</p> <ul style="list-style-type: none"> <li>• Education of pregnant women and immunocompromised persons to avoid high risk foods such as ready-to-eat foods, smoked fish, soft cheeses and unpasteurized dairy products</li> <li>• Thoroughly cook raw foods from animal sources</li> <li>• Thoroughly wash raw fruits and vegetables before eating</li> <li>• Keep uncooked meats separate from prepared foods and foods that are not cooked before consumption</li> <li>• Wash hands, utensils and food preparation surfaces after contact with raw or uncooked foods</li> </ul>
Infection Prevention and Control Strategies	<p>Strategies:</p> <ul style="list-style-type: none"> <li>• Routine precautions for hospitalized cases</li> <li>• Patients with invasive listeriosis do not require isolation</li> <li>• Proper cleaning and disinfection of equipment in neonatal units</li> </ul>
Management of Cases	Investigate cases of listeriosis to determine the source of infection. Refer to Section 5: <i>Reporting Requirements</i> above for relevant data to be collected during case investigation. The following disease-specific information should also be obtained during case management:

	<ul style="list-style-type: none"> <li>• Symptoms and date of symptom onset</li> <li>• History of out-of-province or international travel including earliest and latest exposure dates</li> <li>• Food history for the 3 weeks prior to onset of symptoms</li> <li>• Occupation</li> <li>• Resident of an institution and history of multiple institutional admissions</li> </ul> <p>Treatment: Listeriosis is treated with antibiotics. Depending on the form of the disease, treatment may take up to six weeks or more. Antibiotics given to pregnant women with Listeriosis can often reduce the risk of infection in the newborn or the unborn child. There is no vaccine to prevent Listeriosis.</p> <p>Refer to the resources listed below for more information.</p> <p>Exposure investigation:</p> <ul style="list-style-type: none"> <li>• Collect samples of suspected food sources for laboratory analysis</li> <li>• Conduct appropriate inspections of implicated potential sources of infection</li> </ul> <p><b>No testing is recommended for asymptomatic exposed individuals.</b></p> <p>Case counselling:</p> <ul style="list-style-type: none"> <li>• Provide information on listeriosis and how to prevent further spread (refer to the MOHLTC fact sheet listed below)</li> </ul>
Management of Contacts	<p>Listeriosis is rarely spread person to person; persons exposed to same source should be investigated particularly if at risk such as elderly, immunocompromised and pregnant women.</p>
Management of Outbreaks	<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><b>Two or more unrelated cases of the same serotype of listeriosis with a common exposure is suggestive of an outbreak.</b></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> <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> </ul>

	<ul style="list-style-type: none"> <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) Pickering LK, Baker CJ, Long SS, McMillan JA, editors. Red book: 2006 report of the Committee on Infectious Diseases. 27<sup>th</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006. Section 3, Summaries of infectious diseases; p. 426-28.</p> <p>(3) Notifiable Diseases On-Line [Internet]. Ottawa: Public Health Agency of Canada; 2003. Listeriosis; 2003 Dec 11 [cited 2009 Feb 12]. Available from <a href="http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/list_e.html">http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/list_e.html</a>.</p> <p>(4) 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>Ontario Public Health Laboratories. Labstract. Listeria monocytogenes testing: specimen collection for foodborne illness. Toronto: Ministry of Health and Long-Term Care; 2008. Available from <a href="http://www.cpso.on.ca/uploadedFiles/OPHL_Labstract_08.pdf">http://www.cpso.on.ca/uploadedFiles/OPHL_Labstract_08.pdf</a>.</p> <p>Ontario Agency for Health Protection and Promotion. Listeria monocytogenes: a clinical practice guideline. Toronto: Ontario Agency for Health Protection and Promotion; 2008. Available at <a href="http://www.oahpp.ca/Documents/clinical%20guidelines_full%20version_updated%20FINAL_030908.pdf">http://www.oahpp.ca/Documents/clinical%20guidelines_full%20version_updated%20FINAL_030908.pdf</a>.</p> <p>Ministry of Health and Long-Term Care. Food safety protocol. Toronto: Queen's Printer for Ontario; 2008. Available from <a href="http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/protocols/food_safety.pdf">http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/protocols/food_safety.pdf</a>. (or as current)</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. Diseases: Listeria [Internet]. Toronto: Queen's Printer for Ontario; 2008 [cited 2009 Feb 4]. Available from <a href="http://www.health.gov.on.ca/english/public/pub/disease/listeria.html">http://www.health.gov.on.ca/english/public/pub/disease/listeria.html</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>



