

Appendix A: Disease-Specific Chapters

Chapter: Legionellosis

Legionellosis

- 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**

1) Aetiologic Agent:	<i>Legionellae</i> species are fastidious aerobic bacilli that stain gram negative after recovery on artificial media. More than 35 species have been recognized of which <i>Legionella pneumophila</i> (<i>L. pneumophila</i>) is most commonly associated with disease in humans (1, 2).
2) Case Definition:	
Surveillance Case Definition	See Appendix B
Outbreak Case Definition	The outbreak case definition varies with the outbreak under investigation. Consideration should be given to the following in establishing an outbreak case definition: <ol style="list-style-type: none">1. Clinical, laboratory and/or epidemiological criteria2. The time frame for occurrence3. The geographic location(s) or place(s) where cases live or became ill/exposed4. Special attributes of cases (e.g. age, underlying conditions) Cases may be classified by levels of probability (i.e. confirmed, probable or suspect)
3) Identification:	
Clinical Presentation	There are two clinically and epidemiologically distinct clinical syndromes: Legionnaires' disease (pneumonia) and Pontiac fever (1, 2). Legionnaires' Disease varies in its presentation, clinical manifestations and severity between individuals. A typical clinical presentation includes subacute onset of malaise, anorexia, headache, fever and myalgia. Fever may be high and rise rapidly; there may also be a non-productive cough, abdominal pain and diarrhoea. The illness progresses to pneumonia and other multi-system involvement (1, 2). Pontiac fever is an acute, self-limiting influenza-like illness with the

	initial symptoms of Legionnaire's disease, but without pneumonia or progression to multi-system involvement. Rapid recovery without sequela may represent reaction to inhaled antigen rather than bacterial invasion (1, 2).
Diagnosis	<p>See Appendix B</p> <p>Note:</p> <ul style="list-style-type: none"> • Seroconversion requires up to eight weeks for antibody levels to peak • A four fold increase in antibody levels requires two samples taken 3-6 weeks apart • Positive urinary antigen for <i>L. pneumophila</i>. <p>Urinary antigen testing is the most rapid and sensitive test however only detects infection with <i>L. pneumophila</i> (1). Cases with positive urine antigen are recommended to have confirmatory cultures.</p> <p>Consider the diagnosis of legionellosis infection in any cluster of respiratory illness with pneumonia, or individual presenting with a respiratory illness and pneumonia.</p>

4) Epidemiology:

Occurrence	<p>The earliest documented case of legionellosis occurred in 1947. The first documented outbreak was in Minnesota in 1957. The legionella bacterium was first identified in 1976 when 34 members of the American Legion died following a conference in Philadelphia (1).</p> <p>Cases have been reported in Canada, the US, Europe, Australia, Africa and South America. In Ontario, cases, outbreaks and clusters are typically observed in late summer and the fall. Outbreaks of legionellosis in the USA usually occur with low attack rates in the population at risk (1). In Ontario, the experience has been similar.</p>
Reservoir	<i>Legionellae</i> are ubiquitous in nature, especially in aquatic environments; outbreaks and sporadic cases have been linked to air-conditioning cooling towers, evaporative condensers, humidifiers, whirlpool spas, respiratory therapy devices, ponds and soil from their banks, decorative fountains and potable water systems which can be found in hospitals and among other places (1, 2).
Modes of Transmission	<i>Legionella</i> are opportunistic pathogens most commonly associated with water-droplet transmission to humans through inhalation of aerosolized infected water (2).
Incubation Period	<p>For Legionnaire disease it is 2-10 days, most often 5-6 days (1).</p> <p>For Pontiac fever it is 5-66 hours, most often 24-48 hours (1).</p>
Period of Communicability	Person-to-person transmission has not been documented (1).
Susceptibility and Resistance	Illness occurs most frequently with increasing age (most cases are at

	least 50 years of age). Persons who smoke, have diabetes, lung, or renal disease are at most risk. The disease is rare in persons under 20 years of age. Outbreaks have occurred among institutionalized patients/residents (1).
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5) Reporting Requirements:

To local Board of Health	Laboratory confirmed and suspect cases shall be reported to the medical officer of health by persons required to do so under the <i>Health Protection and Promotion Act, R.S.O. 1990</i> .
To Public Health Division (PHD)	<p>Report only case classifications specified in the case definition to PHD.</p> <p>Cases shall be reported using the integrated Public Health Information System (iPHIS), or any other method specified by the Ministry within one (1) business day of receipt of initial notification as per <i>iPHIS Bulletin</i> Number 17: Timely Entry of Cases (3).</p> <p>The minimum data elements to be reported for each case is specified in the following:</p> <ul style="list-style-type: none"> • <i>Ontario Regulation 569</i> (Reports) under the Health Protection and Promotion Act (HPPA), • The disease-specific User Guides published by the Ministry, and • Bulletins and directives issued by the Ministry.

6) Prevention and Control Measures:

Personal Prevention Measures	<p>Prevention Measure:</p> <ul style="list-style-type: none"> • Avoidance of exposure to aerosolized contaminated water.
Infection Prevention and Control Strategies	<p>Strategies:</p> <ul style="list-style-type: none"> • Total eradication of <i>legionellae</i> from all artificial systems is not possible because of the high prevalence of the organism in water; however, the risk can be minimized by appropriate maintenance and disinfection of water cooling towers and adequate treatment of water supplies where these sources have been implicated. • If hospitalized, routine practices are recommended.
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 make sure to inquire about the following in the epidemiological investigation:</p> <ul style="list-style-type: none"> • Symptoms and date of symptom onset • Travel history • History of exposure to air conditioners, humidifiers, water fountains or spas and other high risk area during the 10 days

	<p>prior to illness</p> <ul style="list-style-type: none"> • Any risk factors such as smoking or any medical conditions • Earliest and latest exposure dates • Occupation • Residency or attendance at a facility or institution <p>Exposure investigation:</p> <ul style="list-style-type: none"> • Determine if the case was community or institutionally acquired and whether a common source of exposure has occurred • Environmental sampling should be reserved for investigations involving disease clusters or an outbreak where there is a potential common exposure • Provide education about the illness and how it is acquired <p>Determine who should be notified and how often and if a media release is required.</p> <p>Treatment is under the direction of the attending health care provider.</p>
Management of Contacts	Not applicable: Person to person transmission of legionellosis has not been documented.
Management of Outbreaks	<p>When two or more cases are linked in time and place an investigation should be conducted to determine if a cluster or outbreak is occurring.</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"> • Confirm diagnosis and verify the outbreak; • Establish an outbreak team; • Develop an outbreak case definition; • Implement prevention and control measures; • Implement and tailor communication and notification plans depending on the scope of the outbreak; • Conduct epidemiological analysis on data collected; • Conduct environmental inspections of implicated premise where applicable; • Coordinate and collect appropriate clinical specimens where applicable; • Prepare a written report, and • Declare the outbreak over in collaboration with the outbreak team. <p>For more information on outbreak investigations in the community and special settings such as health care facilities, refer to the following resources:</p> <p>Recommendations of CDC and Healthcare Infection Control Practices Advisory Committee (HICPAC) on guidelines for environmental infection control in healthcare facilities – See additional resources.</p>

	Investigation of Legionnaire disease in a long-term care facility-Quebec – See Additional resources.
7) References	<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. 27th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006. Section 3, Summaries of infectious diseases; p. 417-418.</p> <p>(3) Ministry of Health and Long-Term Care. Timely entry of cases. iPHIS Bulletin. 2007 May 11;17.</p>
8) Additional Resources	<p>Sehulster L, Chinn RY; CDC; HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR Recomm Rep. 2003; 52(RR-10):1-42. Available from: http://www.cdc.gov/MMWR/preview/mmwrhtml/rr5210a1.htm</p> <p>Pilon P, Tremblay M, Valiquette L, Bernier F. Investigation of Legionnaire disease in a long-term care facility-Quebec. Can Commun Dis Rep. 1998; 24(14):113-6. Available from: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98vol24/dr2414e.html</p> <p>Ministry of Health and Long-Term Care. Infectious diseases protocol. Toronto: Queen’s Printer for Ontario; 2009. Available from http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html (or as current)</p> <p><i>Health Protection and Promotion Act</i>, R.S.O. 1990, c. H.7. Available from http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm.</p> <p>Gregg MB, editor. Field epidemiology. 2nd ed. New York: Oxford University Press; 2002.</p>

