

Appendix A: Disease-Specific Chapters

Chapter: Pneumococcal disease, invasive

Pneumococcal disease, invasive

- 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>Streptococcus pneumoniae</i> , also known as pneumococcus, is a Gram-positive encapsulated coccus of which 90 serotypes are known to cause disease (1, 2, 3). Current data suggest that the 11 most common serotypes cause at least 75% of invasive disease (1).
2) Case Definition:	
Surveillance Case Definition	See Appendix B
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">1. Clinical, laboratory and/or epidemiological criteria;2. A time frame for occurrence;3. A geographic location(s) or place(s) where cases live or became ill/exposed, and4. Special attributes of cases (e.g. age, underlying conditions). <p>Cases should also be classified by levels of probability (i.e. confirmed, probable or suspect).</p>
3) Identification:	
Clinical Presentation	<p>Invasive pneumococcal disease (IPD) most often presents in adults as bacteremic pneumonia, meningitis and other clinical manifestations such as endocarditis, or septic arthritis (1, 3). In children, IPD usually occurs as bacteraemia without a clinical focus, pneumonia and meningitis (3).</p> <p>Symptoms of pneumonia in adults may include: a sudden onset with shaking chills, fever, shortness of breath or rapid breathing, chest pain and a productive cough. In infants and young children symptoms may not be specific and may include fever, cough, rapid breathing and grunting (1, 3).</p> <p>Meningitis due to pneumococcus in persons over 2 years of age presents with high fever, headache and stiff neck, which can develop over several</p>

	hours or in 1-2 days. Other symptoms include nausea, vomiting, discomfort with bright lights, confusion and sleepiness. In newborns and small infants the above symptoms may be absent but they could present with irritability, feeding poorly, vomiting and inactivity (1).
Diagnosis	See Appendix B
4) Epidemiology:	
Occurrence	<p>Endemic throughout the world and it occurs particularly in infancy, old age and in persons with underlying medical conditions (1). It occurs in all climates and seasons, but the incidence is highest in winter and spring (1).</p> <p>In the last two years, outbreaks of serotype 5 have been reported in Western Canada amongst illicit drug users. Ontario has had an average of 912 cases reported each year from 1998-2007.</p> <p>Immunization of all children < 2 years old has been shown to decrease the incidence of invasive pneumococcal disease - in the US since the program was implemented - for the vaccine serotypes (6).</p>
Reservoir	Pneumococci are ubiquitous; reservoir is humans; usually colonized in upper respiratory tract of healthy persons (carriers) (1). Children carry <i>S. pneumoniae</i> more often than adults do.
Modes of Transmission	Transmission is mostly through the spread of respiratory droplets from the nose or mouth, by direct oral contact or indirectly through articles freshly soiled with respiratory discharges from infected persons; it can also spread from persons not ill who are carriers. Illness among casual contacts is infrequent (1). Both children and adults may be asymptomatic carriers for variable lengths of time because pneumococcal are common inhabitants of the respiratory tract (2, 3).
Incubation Period	Incubation period may be as short as 1-3 days (1).
Period of Communicability	Presumably until discharges from mouth and nose no longer contain virulent pneumococci in significant numbers. Antibiotic treatment will stop communicability within 24-48 hours (1).
Susceptibility and Resistance	The risk of disease is highest in persons 65 years of age and older, children less than 2 years of age, and those persons with certain medical conditions that put them at increased risk for invasive pneumococcal disease (see the Canadian Immunization Guide).
5) Reporting Requirements:	
To Local Board of Health	<p>All positive cultures/tests for <i>Streptococcus pneumoniae</i> obtained from specimens from normally sterile sites as indicated above 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>Sensitivity and antibiotic resistance results shall also be reported to, and noted by, the medical officer of health.</p>

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 five business days of receipt of initial notification as per <i>iPHIS Bulletin</i> Number 17: Timely Entry of Cases (7).</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.
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6) Prevention and Control Measures:

Personal Prevention Measures	<p>Measures:</p> <ul style="list-style-type: none"> • Immunization as per the Canadian Immunization Guide (CIG) recommendations, the NACI recommendations (see references and resources listed below) and the Publicly Funded Immunization Schedules for Ontario, is key to the prevention of invasive pneumococcal infection (4) • Avoid crowding in living quarters whenever practical, especially in institutions and barracks (1, 3) • Educate members of the public about the risk of sharing items contaminated with saliva, e.g. cutlery, water bottles, lipstick, etc • Educate mothers about the benefits of breast feeding their infants in order to pass on the protective antibodies <p>In Ontario, the pneumococcal 23 valent polysaccharide vaccine was introduced in 1999 for all persons who are residents of long-term care homes; all persons 2 to 64 years of age with specified medical conditions; and all persons 65 years and older. The pneumococcal 7 valent conjugate (pneu-C-7) vaccine was introduced into the routine immunization program in January 2005. All children less than 2 years of age and all children less than 5 years of age with specified high risk medical conditions are eligible to receive the pneu-C-7 vaccine.</p>
Infection Prevention and Control Strategies	<p>Strategies:</p> <ul style="list-style-type: none"> • Routine practices are recommended, including for cases with infections caused by drug resistant <i>S. pneumoniae</i> for hospitalized cases (5). • Educate physicians and other health care professionals about the risks of pneumococcal disease for individuals with specified underlying medical conditions and others identified as at risk and remind them of the Pneumococcal Immunization Programs.
Management of Cases	<p>Refer to Regulation 569 under the HPPA for relevant data to collect. Case investigation should include the following:</p>

	<ul style="list-style-type: none"> • Investigate to determine if the case received immunization as recommended; • Determine risk factors for infection; • Determine the serotype; • Provide education about the illness and ways to prevent spread and provide vaccine information, and • Treatment is under the direction of the attending health care provider.
Management of Contacts	No special management required unless the contact is in the setting of an institutional outbreak.
Management of Outbreaks	<p>An outbreak is defined by the usual epidemiological principles of a greater than expected number of cases that are spatially and temporally linked.</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. Offer immunization to high risk individuals as per the publicly funded immunization schedules for Ontario.</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 outbreaks in institutions refer to the ministry resources listed below.</p>
7) References	<p>(1) Heymann D, editor. Control of communicable diseases manual. 18th ed. Washington: American Public Health Association; 2004.</p> <p>(2) Ruoff K, Whiley R.A., and Beighton. Streptococcus. In: Murray PR, Baron JH, Jorgenson M, Pfaller A, Tenover FC, Tenover FC, editors. Manual of clinical microbiology. 8th ed. Washington: ASM Press; 2003. p. 405-421.</p> <p>(3) Plotkin SA, Orenstein WA, Offit PA, editors. Vaccines. 5th ed. Philadelphia: Saunders; 2008.</p> <p>(4) Pickering LK, Baker CJ, Long SS, McMillan JA, editors. Red book: 2006 report of the Committee on Infectious Diseases. 27th ed. Elk Grove</p>

	<p>Village, IL: American Academy of Pediatrics; 2006. Section 3, Summaries of infectious diseases; p. 525-37.</p> <p>(5) Steering Committee on Infection Control Guidelines. Prevention and control of occupational infections in health care. An infection control guideline. Can Commun Dis Rep. 2002 ;28 Suppl 1:1-264. Available from http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02pdf/28s1e.pdf.</p> <p>(6) Whitney CG, Farley MM, Hadler J, Harrison LH, Bennett NM, Lynfield R et al. Decline in invasive pneumococcal disease after the introduction of protein-polysaccharide conjugate vaccine. N Engl J Med. 2003 ;348(18):1737-46.</p> <p>(7) Ministry of Health and Long-Term Care. Timely entry of cases. iPHIS Bulletin. 2007 May 11;17.</p>
<p>8) Additional Resources</p>	<p>Ministry of Health and Long-Term Care, Public Health Division & Long-Term Care Homes Branch. A Guide to the control of respiratory infection outbreaks in long-term care homes. Toronto, ON: Queen's Printer for Ontario; 2004. Available from http://www.health.gov.on.ca/english/providers/pub/pubhealth/ltc_respoutbreak/ltc_respoutbreak.pdf. Retrieved February 3, 2009. (or as current)</p> <p>Provincial Infectious Diseases Advisory Committee (Ontario). Preventing Febrile Respiratory Illnesses: Protecting patients and staff: Best practices in surveillance and infection prevention and control for Febrile Respiratory Illness (FRI), excluding Tuberculosis, for all Ontario health care settings. Rev.ed. Toronto: Queen's Printer for Ontario; 2006. Available from http://www.health.gov.on.ca/english/providers/program/infectious/diseases/best_prac/bp_fri_080406.pdf</p> <p>Ministry of Health and Long Term Care. Institutional/facility outbreak prevention and control protocol. Toronto: Queen's Printer for Ontario; 2008. Available from http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/protocols/institutional_facility_outbreak.pdf (or as current)</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>Ministry of Health Long Term-Care, Public Health Laboratories. Specimen collection guide: testing guidelines. Toronto: Queen's Printer for Ontario; 2008. Available from http://www.health.gov.on.ca/english/providers/pub/labs/specimen_guide/testing_guidelines.pdf.</p> <p>Gregg MB, editor. Field epidemiology. 2nd ed. New York: Oxford University Press; 2002.</p> <p><i>Health Protection and Promotion Act</i>, R.S.O. 1990, c. H.7. Available from http://www.e-</p>

laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm.

National Advisory Committee on Immunization. Statement on the recommended use of pneumococcal conjugate vaccine: addendum. Can Commun Dis Rep. 2003; 29(ACS-7,8):14-5. Available from <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/03pdf/acs-dcc-29-7-8.pdf>

National Advisory Committee on Immunization. Canadian immunization guide. 7th ed. Ottawa: Public Health Agency of Canada; 2006. Available from: <http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php>.

Ministry of Health and Long Term Care. Publicly funded immunization schedules for Ontario- January 2009. Toronto: Queen's Printer for Ontario; 2009. Available from <http://www.health.gov.on.ca/english/providers/program/immun/pdf/schedule.pdf>

Romney MG, Hull MW, Gustafson R, Sandhu J, Champagne S, Wong T et al. Large community outbreak of Streptococcus pneumonia serotype 5 invasive infection in an impoverished, urban population. Clin Infect Dis. 2008 ;47(6):768-74.
