Ministry of Health and Long-Term Care

Infectious Diseases Protocol

Appendix A: Disease-Specific Chapters

Chapter: Pneumococcal disease, invasive

Effective: February 2019

Ontario

Pneumococcal disease, invasive

☒ Communicable

☐ Virulent

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

1.0 Aetiologic Agent

Streptococcus pneumonia (S. pneumonia), also known as pneumococcus, is a gram-positive encapsulated coccus of which there are 90 known capsular serotypes.[1]

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).

3.0 Identification

3.1 Clinical Presentation

Invasive pneumococcal disease (IPD) most often presents as bacteremic pneumonia, bacteremia, and meningitis.[1,2]

Persons with pneumococcal meningitis generally present with high fever, headache, lethargy or coma, vomiting, irritability, nuchal rigidity, seizures and signs of meningeal irritation.[1]

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

Endemic throughout the world; occurrence is highest in infants, young children, the elderly, and persons with underlying medical conditions.[1,2] It occurs in all climates and seasons, but the incidence is highest in winter and spring.[1]

Invasive pneumococcal disease (IPD) is relatively common in Ontario. Between 2013 and 2017, there were an average of 1,069 cases of IPD per year in the province.[*]

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.

4.2 Reservoir

Pneumococci are ubiquitous; reservoir is humans; usually colonized in upper respiratory tract of healthy persons (carriers).[1] Children carry *S. pneumoniae* more often than adults.[1]

4.3 Modes of Transmission

Transmission is person-to-person by contact with the respiratory droplets of an infected person or asymptomatic carrier.[1] Illness among casual contacts is infrequent.[1] Pneumococcus often asymptomatically colonizes the human nasopharynx; duration of carriage varies, although generally longer in children than adults.[1]

4.4 Incubation Period

Incubation period may be as short as 1-3 days.[1]

[*] 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.

4.5 Period of Communicability

Presumably until discharges from mouth and nose no longer contain virulent pneumococci in significant numbers.[1] Usually no longer communicable after 24 hours of initiating effective antibiotic therapy.[1]

4.6 Host 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 IPD.[2]

Although serotype-specific immunity may last for several years following infection, persons previously infected with pneumococcal disease should still receive immunization due to the number of known pneumococcal serotypes.[1]

5.0 Reporting Requirements

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

Immunize as per the current *Publicly Funded Immunization Schedules for Ontario* for both routine immunizations and according to the high risk eligibility criteria.[4]

In Ontario, the *Child Care and Early Years Act, 2014* (CCEYA) is the legislation that governs licensed child care settings. Pursuant to *Ontario Regulation 137/15* under the CCEYA, children who are not in school and who are attending licensed child care settings must be immunized as recommended by the local medical officer of health prior to being admitted. Under the CCEYA parents can provide a medical reason as to why the child should not be immunized or object to immunization on religious/conscience grounds.[5]

6.2 Infection Prevention and Control Strategies

Routine practices are recommended, including respiratory isolation and the use of personal protective equipment by health care workers.[1,6]

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.

Provide education about IPD and promote/facilitate timely immunization in the future. Treatment is under the direction of the attending health care provider.

6.4 Management of Contacts

No special management required.

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.

Offer immunization to high risk individuals as per the current *Publicly Funded Immunization Schedules for Ontario*.[4]

For outbreaks in institutions, information can be found in Recommendations for the Control of Respiratory Infection Outbreaks in Long-Term Care Homes (2018, or as current).[6]

7.0 References

1. Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.
2. National Advisory Committee on Immunization, Public Health Agency of Canada. Part 4- Active Vaccines: Pneumococcal Vaccine. 2016. In: Canadian Immunization Guide [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada, [cited March 7, 2018]. Available from: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines.html
3. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: https://www.ontario.ca/laws/regulation/900569

4. Ontario, Ministry of Health and Long-Term Care. Publicly Funded Immunization Schedules for Ontario: December 2016. Toronto, ON: Queen's Printer for Ontario; 2016. Available from: http://www.health.gov.on.ca/en/pro/programs/immunization/schedule.aspx
5. Child Care and Early Years Act, 2014, S.O. 2014, c. 11, Sched. 1, (2018). Available from: https://www.ontario.ca/laws/statute/14c11
6. Ontario, Ministry of Health and Long-Term Care. Recommendations for the Control of Respiratory Infection Outbreaks in Long-Term Care Homes. Toronto, ON: Queen's Printer for Ontario; 2018. Available from: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/reference.aspx

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
December 2014	General	New template. Title of Section 5.2 changed from "To Public Health Division (PHD)" to "To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry". Section 9.0 Document History added.
December 2014	1.0 Aetiologic Agent	Changed from "…which 90 serotypes are known to cause disease. Current data suggest that the 11 most common serotypes cause at least 75% of invasive disease" to "…which there are 90 known capsular serotypes."
December 2014	2.2 Outbreak Case Definition	Entire section revised.
December 2014	3.1 Clinical Presentation	Entire section revised.
December 2014	3.2 Diagnosis	Addition of "for diagnostic criteria relevant to the Case definition." Addition of direction to contact Public Health Ontario Laboratories or PHO website for additional information on human diagnostic testing.

Revision Date	Document Section	Description of Revisions
December 2014	4.1 Occurrence	First paragraph changed from: "…and it occurs particularly in infants, old age and in persons…" to "…occurrence is highest in infancy, young children, the elderly, and persons…." Two paragraphs deleted. Addition of paragraph: "Invasive pneumococcal disease is relatively common in Ontario. In 2011, 1,238 cases of IPD were reported in Ontario, representing an incidence rate of 9.3 cases per 100,000 population during that year." Addition of reference to Public Health Ontario Infectious Diseases Surveillance Reports.
December 2014	4.3 Modes of Transmission	Entire section revised.
December 2014	4.5 Period of Communicability	Sentence removed: "Antibiotic treatment will stop communicability within 24-48 hours". Sentence added: "Usually no longer communicable after 24 hours of initiating effective antibiotic therapy."
December 2014	4.6 Susceptibility and Resistance	Reference to Canadian Immunization Guide removed and "invasive pneumococcal disease" changed to "IPD". New paragraph added: "Although serotype-specific immunity may last for several years following infection, persons previously infected with pneumococcal disease should still receive immunization due to the number of known pneumococcal serotypes."

Revision Date	Document Section	Description of Revisions
December 2014	5.1 To Local Board of Health	The following was deleted: "All positive cultures/test for *Streptococcus pneumonia* 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 *Health Protection and Promotion Act*, *R.S.O. 1990*." And replaced with: "Individuals who have or may have invasive disease caused by S. pneumoniae shall be reported to the Medical Officer of Health (MOH) by persons required to do so under the *Health Protection and Promotion Act, R.S.O. 1990* (HPPA)." Addition to beginning of second paragraph: "Serotype..."
December 2014	5.2 To the Ministry of Health and Long-Term Care (the Ministry) or Public Health Ontario (PHO), as specified by the Ministry	The following removed from the end of the first paragraph: "to PHD". Under the third paragraph the end of the second and third bullets changed from: "...by the Ministry" to "…by PHO".
December 2014	6.1 Personal Prevention Measures	Entire section revised.
December 2014	6.2 Infection Prevention and Control Strategies	Entire section revised.
December 2014	6.3 Management of Cases	Entire section revised.
December 2014	6.4 Management of Contacts	End of sentence removed "…unless the contact is in the setting of an institutional outbreak."
December 2014	6.5 Management of Outbreaks	*Publicly Funded Immunization Schedule for Ontario* capitalized and italicized.

Revision Date	Document Section	Description of Revisions
December 2014	7.0 References	Updated.
December 2014	8.0 Additional Resources	Updated.
February 2019	General	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 and Section 8.0 Additional Resources was deleted.
February 2019	6.0 Prevention and Control Measures	Updates regarding the ordering of publicly funded vaccines for case and contact management.
February 2019	6.1 Personal Prevention Measures	Updates to information on *Immunization of School Pupils Act* and *Child Care and Early Years Act.*


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