

Ontario Public Health Standards:
Requirements for Programs, Services and Accountability

Infectious Disease Protocol

Appendix 1:

Case Definitions and Disease-Specific Information

Disease: Pneumococcal disease, invasive

Effective: May 2022

Pneumococcal disease, invasive

Communicable

Virulent

[Health Protection and Promotion Act \(HPPA\)](#)

[Ontario Regulation \(O. Reg.\) 135/18 \(Designation of Diseases\)](#)

Provincial Reporting Requirements

Confirmed case

Probable case

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:

- [O. Reg. 569](#) (Reports) under the HPPA;³
- The Case and Contact Management (CCM) software guides;
- For certain vaccines, information to be entered into the applicable provincial inventory system; and
- Bulletins and directives issued by Public Health Ontario (PHO).

Type of Surveillance

Case-by-case

Case Definition

Confirmed Case

Clinical evidence of invasive disease (see Clinical Evidence section) with laboratory confirmation of infection:

- Isolation of *Streptococcus pneumoniae* (*S. pneumoniae*) from a normally sterile site (e.g., blood, cerebrospinal fluid [CSF]), excluding the middle ear

OR

- Detection of *S. pneumoniae* deoxyribonucleic acid (DNA) by nucleic acid amplification test (NAAT) from a normally sterile site (e.g. blood, CSF), excluding the middle ear

Probable Case

Clinical evidence of invasive disease and no other apparent cause with non-confirmatory laboratory evidence:

- Demonstration of *S. pneumoniae* antigen from a normally sterile site (e.g., blood CSF), excluding the middle ear

Note: Probable case definitions are provided as guidelines to assist with case finding and health management and are not for provincial notification purposes.

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).

Clinical Information

Clinical Evidence

Clinical illness associated with invasive disease manifests itself mainly as pneumonia with bacteremia, bacteremia without a known site of infection, and meningitis.

Pneumonia without bacteremia is not reportable.

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

Laboratory Evidence

Laboratory Confirmation

Any of the following will constitute a confirmed case of invasive pneumococcal disease:

- Positive *S. pneumoniae* culture from a normally sterile site excluding the middle ear
- Positive NAAT for *S. pneumoniae* from a normally sterile site excluding the middle ear

Approved/Validated Tests

- Standard culture for *S. pneumoniae*
- NAAT for *S. pneumoniae* (includes polymerase chain reaction [PCR])
- *S. pneumoniae* antigen test
- Consult with laboratory about appropriate tests and specimens

Note: Isolates should be sent to the Public Health Ontario Laboratories for serotype determination and further characterization. Isolates are also submitted by the Public Health Ontario Laboratories to the National Microbiology Laboratory for national surveillance.

Indications and Limitations

- Sputum and bronchial lavages are not considered sterile specimens
- Detection of *S. pneumoniae* antigen does not allow case confirmation or determination of serotype

- Detection from sterile site specimens by NAAT can be attempted by Public Health Ontario Laboratories when cultures at the initial testing laboratory are negative and invasive pneumococcal disease is suspected – contact Public Health Ontario Laboratories prior to submitting sample to obtain Public Health Ontario Medical/Clinical Microbiologist approval

Note: CSF is the only sterile site current commercial kits are verified for use on.

Determination of serotype from a sterile site isolate and further characterization by a reference laboratory are important in monitoring changes in disease epidemiology, including the impact of vaccination programs, potential serotype replacement, and antibiotic resistance.

For further information about human diagnostic testing, contact the [Public Health Ontario Laboratories](#).

Case Management

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 Provincial 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.

Contact Management

No specific management required.

Outbreak Management

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

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's (ministry) immunization program at vaccine.program@ontario.ca as soon as possible.

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 [O. Reg. 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

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](#) to search for the most up-to-date information on Infection Prevention and Control (IPAC).

Disease Characteristics

Aetiologic Agent - *Streptococcus pneumoniae* (*S. pneumoniae*), also known as pneumococcus, is a gram-positive encapsulated coccus of which there are 90 known capsular serotypes.¹

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 asymptotically colonizes the human nasopharynx; duration of carriage varies, although generally longer in children than adults.¹

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.¹ Usually no longer communicable after 24 hours of initiating effective antibiotic therapy.¹

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

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

Please refer to [PHO's Reportable Disease Trends in Ontario reporting tool](#) for the most up-to-date information on infectious disease trends in Ontario.

For additional national and international epidemiological information, please refer to the Public Health Agency of Canada and the World Health Organization.

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

Case Definition Sources

Public Health Agency of Canada. Invasive Pneumococcal Disease. In: Case Definitions for Communicable Diseases under National Surveillance. Canada Communicable Disease Report. 2009; 35S2.

Document History

Revision Date	Document Section	Description of Revisions
April 2022	Entire Document	New template. Appendix A and B merged. No material content changes
April 2022	Epidemiology: Occurrence section	Removed.
April 2022	ICD Codes	Removed.