

Appendix A: Disease-Specific Chapters

Chapter: Shigellosis

Effective: February 2019

Shigellosis

Communicable

Virulent

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

1.0 Aetiologic Agent

Shigellosis is an acute bacterial disease, also known as bacillary dysentery caused by facultative anaerobic, gram-negative bacilli in the family *Enterobacteriaceae*. There are four subgroups, which have traditionally been regarded as separate species with more than 40 serotypes identified.^{1,2}

- 1) Group A: *Shigella dysenteriae*
- 2) Group B: *Shigella flexneri*
- 3) Group C: *Shigella boydii*
- 4) Group D: *Shigella sonnei*

Species A, B, and C are further classified into 15, 8, and 19 serotypes, respectively. Group D (*Shigella sonnei*) consists of a single serotype.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

An acute bacterial disease involving the distal small intestine and colon, characterized by watery, loose stools, accompanied by fever, nausea and sometimes presenting with toxemia, abdominal cramps, vomiting, and tenesmus. Stools may contain mucus and blood.^{1,2} Illness is usually self-limiting, lasting an average of 4–7 days.¹ Severity and case-fatality vary with the age of the host and the species of *Shigella*.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

Occurrence is worldwide.³ Shigellosis is endemic in both tropical and temperate climates. Reported cases represent only a small proportion of cases, even in developed areas. The geographical distribution of the four *Shigella* serogroups is different, as is their pathogenicity. *Shigella sonnei* is most common in industrialized countries where the disease is generally less severe.¹ Multi-antibiotic resistant strains have appeared worldwide, resulting from wide spread use of antibiotics.¹

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

The only significant reservoir is humans.¹

4.3 Modes of Transmission

The infectious dose for humans is low; as few as 10-100 bacteria have been shown to cause disease.¹

Primary mode of transmission is fecal-oral. Transmission occurs through person-to-person contact, contact with contaminated inanimate objects, ingestion of contaminated

food or water and through sexual contact.² Prolonged organism survival in water (up to 6 months) and food (up to 30 days) can occur with *Shigella* species.² Direct transmission is common in children and infected persons who do not thoroughly clean their hands.¹ Risk of transmission increases for individuals engaging in anal-oral sex or in settings where personal hygiene is inadequate, such as in daycare centres.^{1,2} Flies also may be vectors through physical transport of organisms from infected feces to uncovered food items.^{1,2} Foodborne outbreaks of shigellosis associated with an infected food handler have occurred in Ontario.

4.4 Incubation Period

Usually 1-3 days but may range from 12-96 hours and up to one week for *Shigella dysenteriae*.¹

4.5 Period of Communicability

During acute infection and until the infectious agent is no longer present in feces, usually within 4 weeks after illness. Secondary attack rates in households can be as high as 40%.¹ Asymptomatic carriers may transmit infection.¹ Appropriate antimicrobial treatment usually reduces duration of carriage to a few days.¹

4.6 Host Susceptibility and Resistance

Susceptibility is general. Two-thirds of cases occur in children younger than 10 years. The elderly, debilitated and malnourished individuals of all ages, and those infected with HIV are particularly susceptible to severe disease and death.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);⁴
- The iPHIS User Guides published by PHO; and
- Bulletins and directives issued by PHO.

6.0 Prevention and Control Measures

6.1 Personal Prevention Measures

Thorough and frequent hand hygiene is the most important prevention measure for decreasing the risk of transmission.

Avoid consuming food and beverages from unsafe or questionable sources.

Travelling

- Take special precautions when traveling to developing countries, such as drinking only treated or boiled water, and avoiding consumption of food and beverages from unsafe or questionable sources; eat only cooked hot foods or fruits you peel yourself.³

Food Safety at Home

- Practice good hygiene, especially hand washing, before food preparation and eating, and after using sanitary facilities;
- Ensure potentially hazardous foods are stored at either below 4°C or above 60°C;
- Thoroughly wash fresh fruits and vegetables using clean, potable running water;
- Prevent cross-contamination between raw foods and ready-to-eat foods during food preparation and storage;
- Cook and reheat food thoroughly to the appropriate temperatures. For temperatures, see the Ministry of Health and Long-Term Care (ministry) 'Food Safety: Cook' publication available at:
<http://www.health.gov.on.ca/en/public/programs/publichealth/foodsafety/cook.aspx#4>
- For more food safety measures, please see the ministry's food safety 'Frequently Asked Questions' available from:
<http://www.health.gov.on.ca/en/public/programs/publichealth/foodsafety/faq.aspx>

Caregivers

- Follow proper diapering procedures;
- Clean and sanitize baby diaper changing areas regularly;
- The use of alcohol-based hand rubs may be effective where access to soap and clean water is limited, and when hands are not soiled; and
- Ensure young children wash their hands thoroughly and frequently with adult supervision, especially after using the toilet.

Sexual Contact

- Education about safe sex practices, including the risk of sexual practices that permit anal-oral contact.

6.2 Infection Prevention and Control Strategies

Strategies:

- Contact precautions are indicated for the duration of the illness in addition to routine practices for hospitalized cases;²
- Promote and emphasize frequent and proper hand washing with soap and water; and
- Exclude infected persons from:
 1. food handling;
 2. providing care in childcare and health care settings; and

3. attending childcare settings.

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.

Educate the case regarding the risk of transmission and proper hand hygiene.

Further follow-up may be required for those with risk factors related to sexually transmitted shigellosis. For management of these cases refer to the *Sexual Health and Sexually Transmitted/Blood-Borne Infections Prevention and Control Protocol, 2018* (or as current) and the Canadian Guidelines on Sexually Transmitted Infections: Section 4, (2014, or as current). Where there is evidence of sexual transmission, referral should be made to the health unit's Sexual Transmitted Infection (STI) team for appropriate counselling and investigation.

Advise the case against attending swimming pools, hot tubs, or water spray parks until 48 hours after their symptoms have resolved.

Note: Treatment and follow up is under the direction of the attending health care provider.

Exclusion Criteria:

Exclude symptomatic cases who are food handlers, healthcare providers,* caregivers or daycare attendees pending a negative stool sample or rectal swab collected at least 24 hours after cessation of symptoms **OR** 48 hours after completion of antibiotic therapy.

6.4 Management of Contacts

Consider household members as close contacts of a case. Provide education about transmission of infection and proper hand hygiene.

Symptomatic contacts that work in high risk settings should be assessed by their health care provider to determine whether they are infected, and should be excluded as above (i.e., as per exclusion of symptomatic cases).

* If the healthcare setting is a hospital, use the “Enteric Diseases Surveillance Protocol for Ontario Hospitals” (OHA and OMA Joint Communicable Diseases Surveillance Protocols Committee, 2017 or as current) for exclusion, available at: <https://www.oha.com/labour-relations-and-human-resources/health-and-safety/communicable-diseases-surveillance-protocols>

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.

Two or more unrelated cases of the same serotype of shigellosis with a common exposure is suggestive of an outbreak.

For more information regarding specimen collection and testing, please see the Public Health Inspector's Guide to the Environmental Microbiology Laboratory Testing (2017, or as current).⁵

Refer to Ontario's Foodborne Illness Outbreak Response Protocol (ON-FIORP) 2013 (or as current) for multi-jurisdictional foodborne outbreaks which require the response of more than two Parties (as defined in ON-FIORP) to carry out an investigation. The ON-FIORP can be found here: <http://health.gov.on.ca/en/pro/programs/publichealth/enviro/>

7.0 References

1. Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.
2. Committee on Infectious Diseases, American Academy of Pediatrics. Section 3: Summaries of Infectious Diseases: *Shigella* Infections. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. Red Book: 2018 Report of the Committee on Infectious Diseases. 31 ed. Itasca, IL: American Academy of Pediatrics; 2018.
3. Public Health Agency of Canada. Fact sheet: Shigellosis [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2013 [updated May 9, 2013; cited June 21, 2016]. Available from: <http://www.phac-aspc.gc.ca/fs-sa/fs-fi/shigellos-eng.php>
4. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: <https://www.ontario.ca/laws/regulation/900569>
5. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Public Health Inspector's Guide to Environmental Microbiology Laboratory Testing. 5th ed. Toronto, ON: Queen's Printer for Ontario; 2017. Available from: <https://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/PHIGuide.aspx>

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
March 2017	General	New Template
March 2017	6.3 Management of Cases	“Enteric Diseases Surveillance Protocol for Ontario Hospitals” reference updated
March 2017	7.0 References	Updated
March 2017	9.0 Document History	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	4.1 Occurrence	Entire section revised.
February 2019	4.3 Modes of Transmission	Minor revisions to entire section. Third sentence added: “Prolonged organism survival in water (up to 6 months) and food (up to 30 days) can occur with <i>Shigella</i> species.” Second last sentence added: “Flies may also be vectors through physical transport of organisms from infected feces to uncovered food items.”
February 2019	4.6 Host Susceptibility and Resistance	Minor revisions to entire section. Added: “Two-thirds of cases occur in children younger than 10 years.”

