



Health and
Wellness

Prince Edward Island Guidelines for the Management and Control of Shigellosis

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Department of Health and Wellness
Chief Public Health Office

Shigellosis

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Case Definition¹

Confirmed Case

Laboratory confirmation^a of infection with or without clinical illness*:

- Isolation of *Shigella* spp. from an appropriate clinical specimen (e.g., stool, blood, rectal swab, deep tissue wounds, other sterile site, vomit, urine).

Probable Case^b

- Clinical illness* in a person who is epidemiologically linked to a confirmed case;
OR
- Detection of *Shigella* spp./Enteroinvasive *E. coli* (EIEC) nucleic acid with or without clinical illness, in an appropriate clinical specimen (dependent on the test used), using a nucleic acid test (NAT), such as a polymerase chain reaction (PCR).

Note: Culture is required for public health and clinical management. Thus, culture must be performed on NAT-positive (NAT+) specimens to enable molecular typing (e.g., whole genome sequencing) for surveillance, outbreak detection and response, as per [Canadian Public Health Laboratory Network \(CPHLN\) guidance](#). An isolate is required for antimicrobial susceptibility testing (AST) and/or antimicrobial resistance (AMR) predictions to guide clinical treatment and/or for AMR surveillance, which is increasingly important due to substantial multidrug resistance among *Shigella*.

Note: NAT-positive (NAT+) and culture-negative (culture–) results would still be considered a probable case.

*Clinical illness may be characterized by the following signs or symptoms: Diarrhea (watery and often bloody), fever, nausea, vomiting, abdominal pain and/or tenesmus. The severity of illness may vary. While not considered clinical illness, asymptomatic infections may occur.

^a The use of culture independent diagnostic tests (CIDTs) in clinical settings as stand-alone tests for the direct detection of *Shigella* spp./Enteroinvasive *E. coli* (EIEC) in stool is increasing. Note that EIEC is genetically very similar to *Shigella* and **may** be detected in most nucleic acid tests (NATs) that detect *Shigella*. Common CIDTs include antigen-based tests and molecular nucleic acid tests (NATs). Canada has used the terms NAT and PCR in their case definitions to exclude antigen-based CIDTs, which currently are not readily used or available for most enteric bacterial pathogens. It is best practise to culture the NAT positive specimen as soon as possible, such as performing culture in the laboratory that generated the NAT positive signal. When a specimen is positive using a NAT, it is strongly advised to collect and document information on all culture results for the specimen (i.e., NAT+/culture+ versus NAT+/culture– versus NAT+/culture not done); this information is helpful to inform the development and implementation of CIDT and associated case definitions at the provincial, territorial, and national levels.

^b Probable case definitions are provided as guidelines to assist with case finding and public health management and are not for national notification purposes.

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Reporting Requirements

Laboratories

The Provincial Laboratory shall in accordance with the Prince Edward Island *Public Health Act*², report all positive laboratory results by phone and mail, fax, or electronic transfer as soon as the result is known to the Chief Public Health Officer (CPHO) (or designate).

Etiology

Shigellosis is an acute infectious bacterial disease caused by gram negative bacilli in the family Enterobacteriaceae. Some strains produce enterotoxin and shigatoxin (much like the verotoxin of *E. coli* O157:H7). Shigellosis is unique among bacterial enteropathogens in that a very low dose of the organism readily produces disease in humans. This may account for the high secondary attack rate in families. The severity of the presentation and case fatality rates are functions of the host.

Clinical Presentation

Shigellosis involves the distal small intestine and the colon. Disease is most commonly characterized by diarrhea (may contain blood and mucus or be watery) accompanied by fever, nausea, and tenesmus. It may be biphasic with an initial period of watery diarrhea and cramps followed by the development of dysentery (blood and mucus). Febrile convulsions may be a significant complication in young children. The illness is usually self-limited lasting on average four to seven days. Some individuals have mild or asymptomatic infections.

Infection with *S. sonnei* often results in a short clinical course. Infection may be fatal in immunocompromised individuals. This is the most common strain in developed countries, including Canada.

S. flexneri can cause Reiter's syndrome (reactive arthropathy) in persons who are genetically predisposed; however, Reiter's syndrome can occur with any of the *Shigella* strains. This is a common strain in developing countries and is the 2nd most common in Canada.

Infection with *S. dysenteriae* is often associated with serious disease and more severe complications. This can include toxic megacolon and hemolytic-uremic syndrome (HUS). It is one of the most common *Shigella* species to occur in developing countries and least common in developed countries.

S. boydii is not a common isolate in North America but widespread in developing countries.

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Diagnosis

Diagnosis is made by the isolation of *Shigella* from an appropriate clinical specimen (e.g., sterile site, deep tissue wound, stool, vomit, or urine). The infection is generally associated with a high number of leukocytes (pus cells) in the fecal matter.

Shigella remains viable outside the human body for only a short period of time hence, specimens must be processed rapidly after collection, preferable within 24 hours. Use of appropriate media increases the likelihood of organism isolation.

Serological testing is not generally helpful.

Epidemiology

1. Reservoir

Humans and primates are the reservoir for *Shigella*. The source is most often the feces of infected individuals who have diarrhea. Outbreaks in primates such as monkeys and chimpanzees have occurred.

2. Transmission

Organisms are spread directly through the fecal-oral route, and indirectly through: ingestion of contaminated foods (washed with water contaminated with fecal matter, or handled with poor hygiene, commonly found in tossed salads, chicken, and shellfish)⁵; drinking contaminated water (or in swimming pools). Spread of infection linked to flies has also been recorded. Certain sexual practices particularly among men who have sex with men (MSM) also increase transmission.

3. Incubation Period

The general range of incubation for *Shigellosis* is from 1 – 3 days but may range from 12-96 hours and up to a week for *S. dysenteriae* type 1.

4. Period of Communicability

Shigellosis is communicable during the course of the infection and up to 4 weeks after symptoms resolve. Treatment with appropriate antibiotics reduces carriage to one to two days.

5. Host Susceptibility

Infection is most common in children less than 10 years of age. Infection for children under 6 months is uncommon as breast feeding is protective for infants and young children. The elderly, malnourished of all ages, and those with HIV are particularly susceptible to severe disease and death.

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Occurrence

1. General

It is estimated that 125 million illnesses and 14,000 deaths per year are caused by shigellosis world-wide. Reported cases represent only a small proportion of all cases. Secondary attack rates in households have been shown to be as high as 40%.

2. Canada

The rates of Shigellosis in Canada have been stable in recent years, with approximately 880 cases reported annually. Increased trends have been noted in the MSM population.

3. Prince Edward Island

From 2006-2016 the number of cases has ranged from 0-3 cases per year.

Control

1. Management of a case

- The CPHO is involved with the investigation of all Shigellosis cases. Public Health Nursing, Health PEI, will follow-up all lab confirmed cases and Environmental Health Officers may be consulted on cases as appropriate. Advice on the management of cases will be provided by the CPHO.
- Notification of test results and prescription of treatment (if required) will be carried out by the primary health care provider.
- All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.
- Exclusion is required for symptomatic and asymptomatic persons who are:
 - food handlers whose work involves:
 - touching unwrapped food to be consumed raw or without further cooking and/or
 - handling equipment or utensils that touch unwrapped food to be consumed raw or without further cooking.
 - healthcare, daycare or other staff who have contact through serving food with highly susceptible patients or persons, who, in an intestinal infection would have particularly serious consequences,
 - involved in patient care or care of young children, elderly or dependent persons,
 - children attending daycares or similar facilities who are diapered or unable to implement good standards of personal hygiene, and
 - older children or adults who are unable to implement good standards of personal hygiene (e.g., mentally, or physically challenged).
- Exclusion applies to symptomatic and asymptomatic cases until **2 consecutive fecal samples** have tested negative for Shigella (lab requisitions should note “test for clearance”).

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- Two stool specimens should be taken no less than 24 hours apart and be taken at least 48 hours after diarrhea has resolved.
- If treated with antibiotics, samples should not be taken until 48 hours after treatment with appropriate antibiotics has been completed.
- Contact precautions should be used in healthcare settings where children or adults have poor hygiene or incontinence that cannot be contained. Otherwise, routine practices are adequate.

2. Treatment of a case⁶

- Fluids and electrolyte replacement may be required if there is excessive fluid loss through diarrhea or vomiting.
- Antimotility agents are not recommended as they may prolong the course of disease.
- Use of antibiotics will shorten the period of fecal excretion of the infecting strain and appears to slightly shorten the duration and severity of illness.
- Antibiotics for adults are dependent on the susceptibilities of the strain.
- Treatment for infants, children, and adolescents less than 18 years of age is Azithromycin. It is the suggested **first-line** oral treatment of shigellosis in children less than 18 years of age if the antibiotic susceptibility of the isolate is unknown.
- Antibiotic resistance may develop after treatment.

3. Management of contacts

- Contacts should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.
- Contacts that are symptomatic should be assessed by a physician.
- Contacts that are symptomatic should be excluded from daycare or similar facilities or occupations involving food handling (touching unwrapped food to be consumed raw or without further cooking), patient care or care of young, elderly or dependent persons as per CPHO assessment.
- One stool specimen or culture may be requested from symptomatic contacts and must be reported as negative prior to returning to daycare or similar facilities, or occupations involving food handling, patient care or care of young, elderly or dependent persons.

4. Preventative measures

- Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation and sexual contact, and before preparing or eating food.
- Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products, and thorough hand washing.
- Advise infected individuals to avoid food preparation.

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- Educate about the risk of sexual practices that permit fecal-oral contact.
- Advise persons to sample water from a private water supply on a routine basis to ensure it is safe to use.
- Advise persons to avoid bathing with others. Bathwater may be a source of infection.
- Encourage breastfeeding of infants.

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References

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