

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

Infectious Disease Protocol

Appendix 1:

Case Definitions and Disease-Specific Information

Disease: Yersiniosis

Effective: May 2022

Yersiniosis

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;#
- The [iPHIS User Guides](#) published by Public Health Ontario (PHO); and
- Bulletins and directives issued by PHO.

Type of Surveillance

Case-by-case

Case Definition

Confirmed Case

Laboratory confirmation of infection with or without clinically compatible signs and symptoms:

- Isolation of *Yersinia* spp. by culture (except pestis and biotype 1A) from an appropriate clinical specimen (e.g. stool, blood, urine)

Probable Case

- Clinically compatible signs and symptoms in a person with an epidemiologic link to a laboratory-confirmed case.

OR

- Positive/detection of *Yersinia enterocolitica* by a nucleic acid amplification test (NAAT) Laboratory Evidence

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

Clinically compatible signs and symptoms are characterized by diarrhea, abdominal pain, malaise, fever, nausea, and/or vomiting.

Clinical Presentation

Y. enterocolitica infections typically manifest as fever and diarrhea in young children. Stool often contains leukocytes, blood and mucus. Pseudo-appendicitis syndrome, with fever, abdominal pain, tenderness in the right lower quadrant of the abdomen

and leukocytosis occur especially in older children and adults.²

Yersinia pseudotuberculosis presents with symptoms that may include fever, scarlatiniform rash, acute gastroenteritis, abdominal symptoms, and acute pseudo-appendicitis. Clinical features can mimic those of Kawasaki disease.²

Complications include post-infectious arthritis and systemic infections.²

Laboratory Evidence

Laboratory Confirmation

The following will constitute a confirmed case of Yersiniosis:

- Positive culture for *Yersinia* spp.

Approved/Validated Tests

- Standard culture for *Yersinia* spp.
- Biotyping and serotyping
- Nucleic acid amplification test (NAAT) (which includes polymerase chain reaction [PCR] and multiplex molecular tests) for *Yersinia enterocolitica*

Indications and Limitations

- Further strain characterization is indicated for public health purposes.
- Serology titres $\geq 1:50$ to $\leq 1:200$ may be due to non-specific cross reactions or past infection.

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 on illness and how to prevent re-infection and secondary spread (as Personal Preventive Measures).

Exclude symptomatic food handlers and healthcare providers, and day care staff and attendees until symptom free for 24 hours, or 48 hours after completion of antibiotic or anti-diarrheal medications.⁷

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

Contact Management

Assess household and other contacts for symptoms and if symptomatic advise to seek medical care. Management of symptomatic contacts is the same as for cases.

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.

Two or more cases linked by time, common exposure, and/or place 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](#) (2021, or as current).⁷

⁷ 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, (last updated 2017, or as current) for exclusion.

Refer to [Ontario's Foodborne Illness Outbreak Response Protocol \(ON-FIORP\) 2020](#) (or as current) for multi-jurisdictional foodborne outbreaks which require the response of more than two Partners (as defined in ON-FIORP) to carry out an investigation.

Prevention and Control Measures

Personal Prevention Measures

Preventive measures:

- Ensure thorough cooking and safe handling of meats, especially pork. For proper cooking temperatures, see the Ministry of Health's (ministry) publication "[Food Safety: Cook](#)".⁵
- Use proper hand hygiene after using sanitary facilities, toileting and diapering, handling pets, and before and after handling food.
- Consume only pasteurized milk and milk products.
- Separate food preparation and child care responsibilities in relevant settings.

For more food safety prevention measures, please see the ministry's food safety "[Frequently Asked Questions](#)".⁶

Infection Prevention and Control Strategies

Routine and contact precautions are indicated.²

Refer to [PHO's website](#) to search for the most up-to-date information on Infection Prevention and Control (IPAC).

Disease Characteristics

Aetiologic Agent - Yersiniosis is caused by a gram-negative bacillus of the genus *Yersinia*. Two species, *Yersinia enterocolitica* (*Y. enterocolitica*) (most common in Canada) and *Yersinia pseudotuberculosis* are the causative agents of yersiniosis.¹ *Y. enterocolitica* and *Y. pseudotuberculosis* should not be confused with *Y. pestis*, the causative agent of the plague.

Globally, *Y. enterocolitica* is the species of *Yersinia* most commonly associated with human infection.¹ *Y. enterocolitica* can multiply under refrigeration and low oxygen conditions.¹ Non-pathogenic strains of *Y. enterocolitica* also occur and can be isolated from asymptomatic carriers, food and environmental samples.

Modes of Transmission - Fecal-oral transmission via contaminated food and water or by contact with infected people or animals, such as puppies and kittens; raw pork and pork products are known sources of infection.¹

Strains of *Y. enterocolitica* can be found in meats (pork, beef, lamb, etc.), oysters, fish, and raw milk. There are many opportunities for *Yersinia* to enter the food supply due to the prevalence of this bacterium in soil, water, and animals. Poor sanitation, improper storage, or poor sanitizing practices by food handlers may also be a source of contamination.³

Y. enterocolitica persists longer in cooked foods than in raw foods, due to increased nutrient availability. *Y. enterocolitica* can grow easily at refrigeration temperatures in vacuum-packed meat, boiled eggs, boiled fish, pasteurized liquid eggs, pasteurized whole milk, cottage cheese, and tofu. Growth of the microorganism also occurs in refrigerated seafood – oysters, raw shrimp, and cooked crab meat.³ Outbreaks, worldwide, have been associated with milk, tofu and pork chitterlings.¹

Nosocomial transmission of *Y. enterocolitica* has occurred, as has transmission by transfusion of stored blood from donors who were asymptomatic or had mild gastrointestinal illness.¹

Incubation Period – Usually between 3-7 days, generally less than 10 days.¹

Period of Communicability - Secondary transmission appears rare. Fecal shedding occurs as long as symptoms persist, usually 2-3 weeks. If untreated, persons may shed 2-3 months. Prolonged asymptomatic carriage has been reported in both children and adults.¹

Reservoir - The principal reservoir of *Y. enterocolitica* is swine.² *Y. enterocolitica* has been isolated from environmental sources, such as soil and water.³

Y. pseudotuberculosis is widespread among avian and mammalian hosts, particularly rodents and other small mammals.¹

Both *Y. enterocolitica* and *Y. pseudotuberculosis* have also been isolated from birds, beavers, cats, and dogs, and, in the case of *Y. enterocolitica*, frogs, flies, and fleas.³

Host Susceptibility and Resistance - Diarrhea is more severe in children.

Complications in adolescents and older adults are more severe and septicemia occurs more often in people with iron overload or immunosuppression.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.

Comments

Y. enterocolitica and *Y. pseudotuberculosis* can be recovered from stool, throat swabs, mesenteric lymph nodes, peritoneal fluid, and blood. *Y. enterocolitica* also has been isolated from synovial fluid, bile, urine, cerebrospinal fluid, sputum, pleural fluid and wounds.² Stool cultures generally are positive during the first two weeks of illness.²

See Laboratory Evidence section for diagnostic criteria relevant to the Case Definitions.

References

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Case Definition Sources

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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. |
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