Ministry of Health

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

Infectious Disease Protocol

Appendix 1: Case Definitions and Disease-Specific Information

Disease: Campylobacter enteritis

Effective: August 2023

Ontario

Campylobacter enteritis

☒ Communicable
☐ Virulent

Health Protection and Promotion Act **(HPPA)**[1]
Ontario Regulation (O. Reg.) 135/18 (Designation of Diseases)[2]

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.[3,4]

Type of Surveillance

Case-by-case

Case Definition

Confirmed Case

Laboratory confirmation of *Campylobacter* spp. with or without clinically compatible signs and symptoms.

Isolation of *Campylobacter* spp. by culture from an appropriate clinical specimen (e.g., stool, urine, body fluids, gastrointestinal tract, or sterile site specimen).

Probable Case

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

OR

Supportive laboratory evidence of *Campylobacter* spp. infection (with or without clinically compatible signs and symptoms):

- Detection of *Campylobacter* spp. nucleic acids by molecular methods (e.g., polymerase chain reaction) from an appropriate clinical specimen.

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.[3]

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. Clinically compatible signs and symptoms of extra-intestinal campylobacteriosis include fever, endovascular infection, meningoencephalitis, osteomyelitis, peritonitis, or other focal infections.

Clinical Presentation

Symptoms usually occur 2-5 days after exposure and may persist for one to two weeks.[1] Illness is characterized by diarrhea (with or without blood), abdominal pain, malaise, fever, nausea, sometimes with vomiting. The symptoms can vary from mild to severe, can mimic appendicitis, and cases can also be asymptomatic.[5,6] Relapses can occur.[6]

Blood and mucus may be present in liquid stools. Extra-intestinal infection is rare, usually occurring in immunocompromised patients.[5] Post-infectious complications include reactive arthritis, Guillain-Barré syndrome, myocarditis, and pericarditis.[5,6]

Laboratory Evidence

Laboratory Confirmation

- Isolation of *Campylobacter* spp. by culture from an appropriate clinical specimen (e.g., gastrointestinal tract, urine, or sterile site specimen).

Supportive Laboratory Evidence of Infection

- Detection of *Campylobacter* spp. nucleic acids by molecular methods (e.g., polymerase chain reaction) from an appropriate clinical specimen.

Indications and Limitations

- Culture is required for optimal public health management. Sites performing testing for *Campylobacter* spp. by molecular methods should reflex any positive molecular finding to culture for appropriate isolation of the organism.
- At this time, cultured *Campylobacter* spp. are not required to be sent to PHO's laboratory for routine subtyping surveillance due to their high case incidence, reduced capacity for growth at ambient conditions, lack of protracted person-to-person transmission, and a tendency for outbreaks to occur from sporadic single point sources. This status may be reviewed in the future. In the meantime, targeted subtyping may be occasionally requested on a subset of cultured *Campylobacter* spp. isolates to assist in outbreak investigations when

appropriate.

- In gastrointestinal tract specimens, the differentiation between *Campylobacter jejuni* and *C. coli* adds limited clinical value, hence their occasional reporting as *C. jejuni / C. coli* by some clinical laboratories.
- Molecular methods for *Campylobacter* spp. have superior sensitivity over traditional culture methods. However, potential cross-reactivity, co-infection, horizontal gene transfer, or loss of gene target may not be able to be ruled out solely based on molecular test results.

For further information about human diagnostic testing, contact PHO's laboratory.

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 of campylobacteriosis to determine the source of infection. Refer to Provincial Reporting Requirements above for relevant data to be collected during case investigation.[3]

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

Exclusion Criteria:

- Exclude symptomatic food handlers and healthcare providers, and daycare staff and attendees until symptom free for 24 hours, or 48 hours after completion of antibiotic or anti-diarrheal medications.
- The rationale for exclusion for 48 hours after discontinuing anti-diarrheal medication is to ensure that diarrhea does not return after the anti-diarrheal medication has been discontinued. In the event that antibiotics are used, the person should be excluded until symptom-free for 24 hours.

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

Contact Management

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

Asymptomatic contacts should be tested only to assist in the identification of the source of an outbreak.

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.[3]

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 Principles and Practices of Environmental Microbiology.[7]

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.[8]

Prevention and Control Measures

Personal Prevention Measures

Preventive measures:

- Minimize cross-contamination by washing (wash, rinse, and sanitize) cutting boards and utensils with warm soapy water after contact with raw poultry, and avoiding contact between fruits, vegetables and ready-to-eat foods with the juices of raw poultry.

- Practice good hand hygiene: after using sanitary facilities, after assisting others with personal care (e.g., diapering or toileting), after touching or handling pets and other animals, and before, during, and after food handling.
- Ensure thorough cooking and safe handling of meats. For proper cooking temperatures, see the ministry's publication "Food Safety: Cook".[9]
- Follow manufacturer's directions for cooking and re-heating high-risk food items (such as raw or frozen poultry and processed poultry products).
- Treat or boil non-potable water intended for consumption.
- Avoid consuming raw or undercooked eggs and dirty or cracked eggs. Use pasteurized eggs or egg products in recipes that call for or may result in the consumption of raw or undercooked eggs (e.g., Hollandaise sauce).
- Avoid consuming raw or unpasteurized milk and unpasteurized milk products.
- Limit storage of hazardous food at room temperature to a maximum of 2 hours.
- Provide food safety education to food handlers about safe food and equipment handling, and personal and hand hygiene.

For more food safety prevention measures, please see the ministry's food safety frequently asked questions.[10]

Infection Prevention and Control Strategies

Routine practices and contact precautions are indicated.[5]

Refer to PHO's website to search for the most up-to-date information on Infection Prevention and Control.

Disease Characteristics

Aetiologic Agent – Campylobacteriosis is caused by a bacteria of the genus *Campylobacter*. The genus *Campylobacter* includes 24 species, with 10 species reported to cause infection in humans to date. Of those, *C. jejuni*, *C. coli*, *C. upsalensis*, *C. lari,* and *C. hyointestinalis* are most often associated with intestinal disease, but

may present as an extraintestinal disease in immunocompromised individuals. *C. fetus* is most often associated with extraintestinal disease in immunocompromised individuals.[5,6]

Modes of Transmission - Ingestion of the organisms in undercooked meat and poultry, contaminated food and water, unpasteurized (raw) dairy products, or from direct contact with infected pets (especially puppies and kittens) and farm animals.[5] Contamination of milk usually occurs from intestinal carrier cattle. Food can become contaminated from food handlers who do not properly wash their hands after touching raw/undercooked poultry; or raw/undercooked poultry can contaminate other foods or surfaces, like cutting boards and knives. The infective dose is often low. Person-to-person transmission appears to be uncommon.[5]

Incubation Period – Usually 2-5 days, with a range of 1-10 days depending on the dose ingested.[5]

Period of Communicability - Several days to several weeks. Individuals without antibiotic treatment may shed *Campylobacter* bacteria in their feces for 2-7 weeks.[5]

The temporary carrier state is probably of limited epidemiological risk, except for individuals who are incontinent of stool.[5,6]

Reservoir - Animals, most frequently poultry and cattle. Puppies, kittens, other pets, swine, sheep, rodents and birds may also be sources of human infection. In many countries, raw poultry meat is commonly contaminated with *C. jejuni*.[5]

Host Susceptibility and Resistance - Persons with immunocompromised conditions have an increased risk of infection, severe or invasive disease, and relapse or recurrence. Decreased stomach acidity is a risk for infection. Immune mechanisms are not well understood, but lasting immunity to serologically related strains follows infection. In developing countries, most people develop some degree of immunity in the first two years of life.[5]

Please refer to PHO's Infectious Disease Trends in Ontario (IDTO) interactive 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.

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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.
April 2022	ICD Codes	Removed.
August 2023	Title	Updated nomenclature.
August 2023	Case Definition	Technical updates to confirmed case and probable case.
August 2023	Clinical Information	Technical updates to clinical evidence.

Revision Date	Document Section	Description of Revisions
August 2023	Laboratory Evidence	Rewording updates to laboratory confirmation. Technical updates to supportive laboratory evidence of infection, indications and limitations. Updated hyperlink. Technical updates and rewording to exclusion criteria.
August 2023	Prevention and Control Measures	Rewording to personal prevention measures.
August 2023	Disease Characteristics	Technical updates to aetiologic agent and rewording to period of communicability.