

# Appendix A: Disease-Specific Chapters

Chapter: *Campylobacter* enteritis

Effective: February 2019

# ***Campylobacter* enteritis**

Communicable

Virulent

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

## **1.0 Aetiologic Agent**

The bacterium *Campylobacter jejuni* (*C. jejuni*) and less commonly *Campylobacter coli* (*C. coli*) are the usual causes of campylobacteriosis.<sup>1</sup>

*Campylobacter* species are motile, comma-shaped, microaerophilic gram-negative bacilli that cause gastroenteritis.<sup>2</sup>

## **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**

Symptoms usually occur 2-5 days after exposure and may persist for one to two weeks.<sup>1</sup> 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.<sup>1,2</sup> Relapses can occur.<sup>2</sup>

Blood and mucus may be present in liquid stools. Extraintestinal infection is rare, usually occurring in immunocompromised patients.<sup>1</sup> Post-infectious complications

include reactive arthritis, Guillain-Barré syndrome, irritable bowel syndrome, myocarditis and pericarditis.<sup>1,2</sup>

## 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

*Campylobacter* enteritis is one of the leading causes of enteric disease in Ontario and occurs primarily in the summer months. Between 2013 and 2017, an average of 3,585 cases of *Campylobacter* enteritis occurred per year in Ontario.\*

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

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*.<sup>1</sup>

### 4.3 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.<sup>1</sup> 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 uncommon.<sup>1</sup>

### 4.4 Incubation Period

Usually 2-5 days, with a range of 1-10 days, depending on dose ingested.<sup>1</sup>

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\* Data included in the epidemiological summary are from January 1, 2013 to December 31, 2017. Data were extracted from Query on February 7, 2018 and therefore are considered preliminary.

## 4.5 Period of Communicability

Several days to several weeks, individuals without antibiotic treatment may shed *Campylobacter* bacteria in the feces for 2-7 weeks.<sup>1</sup>

The temporary carrier state is probably of little epidemiological importance, except for infants and others who are incontinent of stool.<sup>1,2</sup>

## 4.6 Host Susceptibility and Resistance

Persons with immunocompromised conditions have 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 immunity in the first two years of life.<sup>1</sup>

## 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);<sup>3</sup>
- 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

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.
- Use proper hand hygiene after using sanitary facilities and diapering, contacting pet’s feces; and before and after handling food.
- Ensure thorough cooking and safe handling of meats. For proper cooking temperatures, see the Ministry of Health and Long-Term Care’s (ministry) publication “Food Safety: Cook” available at <http://www.health.gov.on.ca/en/public/programs/publichealth/foodsafety/cook.aspx#4>.<sup>4</sup>
- Consume treated water or boil private or non-municipal drinking water when intended for consumption.
- Consume only pasteurized milk and milk products.
- 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 available from <http://www.health.gov.on.ca/en/public/programs/publichealth/foodsafety/faq.aspx#11>.<sup>5</sup>

## 6.2 Infection Prevention and Control Strategies

Routine practices and contact precautions are indicated.<sup>1</sup>

Refer to PHO's website at [www.publichealthontario.ca](http://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 of campylobacteriosis to determine the source of infection. Refer to Section 5: 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 (see Personal Preventive Measures).

Exclusion Criteria:

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

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

## 6.4 Management of Contacts

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.

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

## 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 cases linked by time, common exposure, and/or place is suggestive of an outbreak.

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<sup>†</sup> 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 criteria: <https://www.oha.com/labour-relations-and-human-resources/health-and-safety/communicable-diseases-surveillance-protocols>

For more information regarding specimen collection and testing, please see the Public Health Inspector's Guide to the Principles and Practices of Environmental Microbiology.<sup>6</sup>

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.

## 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: *Campylobacter* 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. 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. Food Safety: Cook [Internet]. Toronto, ON: Queen's Printer for Ontario; 2008 [updated April 2, 2015; cited May 31, 2018]. Available from: <http://www.health.gov.on.ca/en/public/programs/publichealth/foodsafety/cook.aspx#4>
5. Ontario, Ministry of Health and Long-Term Care. Food Safety: Frequently Asked Questions [Internet]. Toronto, ON: Queen's Printer for Ontario; 2008 [updated December 24, 2015; cited May 31, 2018]. Available from: <http://www.health.gov.on.ca/en/public/programs/publichealth/foodsafety/faq.aspx#11>
6. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Public Health Inspector's Guide to Environmental Microbiology Laboratory Testing. 5<sup>th</sup> ed. Toronto, ON: Queen's Printer for Ontario; 2017. Available from: <https://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/PHIGuide.aspx>

**Table 1: History of Revisions**

| <b>Revision Date</b> | <b>Document Section</b>      | <b>Description of Revisions</b>   |
|----------------------|------------------------------|---|
| January 2014         | General                      | <p>New template.</p> <p><b>Section 9.0 Document History Added.</b></p> <p>Title of Section 4.5 changed from “Susceptibility and Resistance” to “Host Susceptibility and Resistance”</p> <p>Title of Section 5.2 changed from “To Public Health Division (PHD)” to “To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry”</p>          |
| January 2014         | 2.2 Outbreak Case Definition | <p>Addition of first paragraph:</p> <ul style="list-style-type: none"> <li>• Consideration should be given to the provincial surveillance case definition (Appendix B) and the following criteria when...</li> </ul> <p>Additional bulleted criteria:</p> <ul style="list-style-type: none"> <li>• Further strain typing (e.g. serotype) as appropriate, which may be used to support linkage.</li> </ul> |

| Revision Date | Document Section          | Description of Revisions   |
|---------------|---------------------------|--|
| January 2014  | 3.1 Clinical Presentation | <p>First paragraph changed from “Symptoms usually occur 2-5 days after exposure and may persist for one. Illness is characterized by diarrhea, abdominal pain, malaise, fever, nausea and vomiting.” to “Symptoms usually occur 2-5 days after exposure and may persist for one to two weeks. Illness is characterized by diarrhea (with or without bloody stool), abdominal pain, malaise, fever, and nausea and vomiting.”</p> <p>Second paragraph changed from “Blood and mucus may be present in liquid stools. The illness can also mimic acute appendicitis. Less common presentations include typhoid-like syndrome, febrile convulsions, or meningitis (the bacteria infects the membrane which lines the surface of the brain); post-infectious complications include reactive arthritis, febrile convulsions or Guillain-Barre syndrome.” to “Blood and mucus may be present in liquid stools. Less common presentations include typhoid-like syndrome, febrile convulsions, or meningitis; post-infectious complications include reactive arthritis, febrile convulsions or Guillain-Barré syndrome.”</p> |
| January 2014  | 3.2 Diagnosis             | Addition of the second paragraph:<br>“For further information...”  |
| January 2014  | 4.1 Occurrence            | Entire section revised.  |
| January 2014  | 4.2 Reservoir             | Last sentence changed from “Most raw poultry meat is contaminated with <i>C. jejuni</i> .” to “In many countries, raw poultry meat is commonly contaminated with <i>C. jejuni</i> .”   |
| January 2014  | 4.3 Modes of Transmission | <p>Second sentence removed “or infected infants.”</p> <p>Third sentence added “...raw/undercooked poultry...”.</p>   |

| <b>Revision Date</b> | <b>Document Section</b>                         | <b>Description of Revisions</b>   |
|----------------------|---|---|
| January 2014         | 4.5 Period of Communicability                   | Entire section revised.   |
| January 2014         | 6.1 Personal Prevention Measures                | Entire section revised.   |
| January 2014         | 6.2 Infection Prevention and Control Strategies | Entire section revised.   |
| January 2014         | 6.3 Management of Cases                         | Entire section revised.   |
| January 2014         | 6.4 Management of Contacts                      | Entire section revised.   |
| January 2014         | 6.5 Management of Outbreaks                     | <p>Addition of second sentence “Two or more cases linked by time, common exposure, and/or place is suggestive of an outbreak.”</p> <p>Third bullet in third paragraph added: “...- These definitions should be reviewed during the course of the outbreak, and modified if necessary, to ensure that the majority of cases are captured by the definitions...”.</p> <p>Addition of the fourth paragraph: “For more information regarding specimen collection and testing, please see to the Public Health Inspector’s Guide to the Principles and Practices of Environmental Microbiology.”</p> <p>Addition of the fifth paragraph: “Refer to Ontario’s Foodborne Illness Outbreak Response Protocol (ON-FIORP) for multi-jurisdictional foodborne outbreaks which require the response of more than two Parties (as defined in ON-FIORP) to carry out an investigation.”</p> |
| January 2014         | 7.0 References                                  | Updated.  |
| January 2014         | 8.0 Additional Resources                        | Updated.  |

| <b>Revision Date</b> | <b>Document Section</b>                | <b>Description of Revisions</b>  |
|----------------------|--|--|
| 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        | 3.1 Clinical Presentation              | Second paragraph updated.  |
| February 2019        | 4.3 Modes of Transmission              | Entire section updated.  |
| February 2019        | 4.6 Host Susceptibility and Resistance | Entire section updated.  |

