Prince Edward Island
CANADA

Health and Wellness

Prince Edward Island Guidelines for the Management and Control of Campylobacteriosis

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Department of Health and Wellness
Chief Public Health Office

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Case Definition [1]

Confirmed Case

Laboratory confirmation of infection with or without clinical illness*:

- Isolation of *Campylobacter* spp. from an appropriate clinical specimen (e.g., stool, rectal swab, blood).

Probable Case[a]

Clinical illness* in a person who is epidemiologically linked to a confirmed case;
Or
Detection of *Campylobacter* spp. 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).[b]

Note: Culture may be required for public health and clinical management. Thus culture should 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 may also be required for antimicrobial susceptibility testing (AST) and/or antimicrobial resistance (AMR) predictions to guide clinical treatment and/or for AMR surveillance.

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

[a] Probable case definitions are provided as guidelines to assist with case finding and public health management and are not for national notification purposes.
[b] The use of culture independent diagnostic tests (CIDTs) in clinical settings as stand-alone tests for the direct detection of *Campylobacter* in stool is increasing. 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 practice 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.

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

Campylobacteriosis is an acute zoonotic bacterial infection of the gastrointestinal tract (enteric) or blood (extra-intestinal) caused by *Campylobacter* species. Enteric infections are most commonly associated with *Campylobacter jejuni.* Extra-intestinal infection occurs in less than 1% of cases. There are over 90 biotypes and serotypes.[c]

These bacteria are fragile. They cannot tolerate drying and can be killed by oxygen. They grow only in places with less oxygen than the amount in the atmosphere. Freezing reduces the number of Campylobacter bacteria in raw meat. Following basic food hygiene practices, such as good hand hygiene and thoroughly cooking all meat and poultry products, can effectively prevent infections.

Clinical Presentation

Infection with *Campylobacter* may present with variable severity of symptoms. Acute enteritis is the most common presentation, including diarrhea ranging from massive watery to grossly bloody stools, malaise, fever, and abdominal pain. There may be a prodromal period with fever, headache, myalgia, and general malaise 12 to 24 hours before intestinal symptoms appear.

Many *C. jejuni* infections are asymptomatic. Infection is most often self-limited, and symptoms cease within two to five days. Illness may be prolonged in adults, and relapses can occur. Guillain-Barré Syndrome (GBS) is an uncommon complication of *C. jejuni* infection occurring at a rate of approximately 1 case per 2000 infections. GBS usually occurs two to three weeks after the diarrheal illness. Additional post-infection complications include Reiter syndrome (arthritis,

[c] Further strain characterization (e.g., whole genome sequencing [WGS]) may be required for epidemiologic, public health, and clinical management.
If more than one target is positive on the gastrointestinal NAT panel, it may be indicative of a cross-reaction, co-infection and/or a single organism harbouring these genes. Reflex culture should be performed to confirm all suspect bacterial NAT signals and to meet requirements for epidemiologic, public health, and clinical management of that organism.

urethritis and bilateral conjunctivitis), hepatitis, interstitial nephritis, hemolytic uremic syndrome (HUS), meningitis, septicemia, cholecystitis, myocarditis, pericarditis, urticaria (itchy rash), erythema nodosum (painful red bumps typically on the shins), and irritable bowel syndrome[2,4,5].

Acute colitis, with symptoms of fever, abdominal cramps, and bloody diarrhea persisting for seven days or longer may present. On occasion, acute abdominal pain may be the only symptom of infection. *C. jejuni* may cause pseudo-appendicitis.

A transient fever may be the only symptom of infection that has occurred outside of the gastrointestinal tract. Additionally, systemic infection may include joint pain. It may cause bacteremia (in < 1% of cases), but this most often occurs in persons with underlying medical conditions such as diabetes or cancer.

Diagnosis

Diagnosis is made by culture of the organism from stool. Isolation of all Campylobacter species in general, including *C. jejuni* from food is difficult, as the bacteria are usually present in low numbers.

Epidemiology [6]

1. Reservoir

The reservoir for *Campylobacter* is the intestinal tract of animals, most commonly poultry and cattle, but it may also be present in sheep, swine, birds, rodents, puppies, kittens, and other domestic animals. Raw poultry or meat, often contaminated through the slaughter process, and unpasteurized milk are frequently identified as sources of infection. For travellers to developing countries, contaminated water and food are common sources. Strains acquired during travel may be antibiotic resistant.

2. Transmission

Ingestion of contaminated food, in particular, raw, or undercooked poultry or meat, unpasteurized milk and contaminated water are the most common sources of transmission. Cross-contamination from cutting boards may occur. Person-to-person transmission (fecal-oral) has been reported. Newborns of infected mothers can be infected. Infection from direct contact with infected animals and pets is also possible. The infective dose is considered to be low (500 organisms or less).

3. Incubation Period

Most infections occur two to five days after exposure, but the incubation period may be inversely related to the infective dose.

4. Period of Communicability

Campylobacteriosis is communicable during the course of the infection typically lasting several days to weeks. Persons not treated with antibiotics may excrete the organism for as long as two to seven weeks.

5. Host susceptibility

Infection with *Campylobacter* confers lasting immunity to that strain. In developing countries, the majority of the population will develop immunity in the first two years of life.

Occurrence

1. General

Campylobacter species cause approximately 5 to 14% of diarrheal illness worldwide, and it is an important cause of traveller's diarrhea. Common source outbreaks occur.

2. Canada

Campylobacteriosis rates in Canada are slightly higher than those in PEI and have been stable for the past few years. It was estimated that *Campylobacter* accounted for approximately 8% of all domestically acquired foodborne illness in Canada (145,000 cases per year).[7]

3. Prince Edward Island

Campylobacter is the most common cause of bacterial enteric illness in PEI, with *C. jejuni* representing the vast majority of cases. Cases tend to be diagnosed most often during the summer months.

Control

1. Management of a case

- All cases should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.
- Exclusion should be considered for symptomatic 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, in whom 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 until 48 hours after diarrhea has resolved.
- Asymptomatic individuals who are indicated in the above categories are generally not excluded from work or daycare, although the decision to exclude will be made by the CPHO.
- Reassignment to a low risk area may be used as an alternative to exclusion.
- 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.
- Public Health Nursing, Health PEI, will follow up all confirmed cases and environmental health officers may be consulted on cases as appropriate.

2. Treatment of a case

- Rehydration and electrolyte replacement is considered the primary treatment and should be provided when indicated.
- Anti-motility agents are not recommended.
- In most cases, infection is self-limited and treatment with antibiotics is *not* indicated.
- Treatment is recommended for persons who:
  - are immune compromised,
  - have high fever,
  - are experiencing more than eight stools per day,
  - have symptoms that are not improving or are worsening after a week of illness,
  - have bloody diarrhea, or
  - are pregnant.
- If the decision is made to treat with antibiotics, the following is the recommended regime:
  - Erythromycin for seven to 10 days or ciprofloxacin for five to seven days (adults).
  - Alternatively, azithromycin for five days.

3. Management of contacts

- Contacts should be instructed about disease transmission, appropriate personal hygiene, routine practices, and contact precautions.
- Symptomatic contacts should be assessed by a physician.
- Contacts who are symptomatic may be excluded from daycare or similar facilities or occupations involving food handling, patient care, or care of young, immunocompromised persons, elderly, or dependent persons as per public health assessment.
- Asymptomatic contacts, in general, are not excluded from work or daycare.

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.
- Thaw meat in the fridge, microwave, or in cold water changed every 20 minutes, not at room temperature.
- Thoroughly cook meat to at least the following temperatures:
  - The minimum internal temperature for poultry pieces (e.g., breast, thigh, etc.) is 74°C (165°F) and whole poultry 82°C (180°F).
  - The minimum internal temperature for other meats can be found at https://www.canada.ca/en/health-canada/services/general-food-safety-tips/safe-internal-cooking-temperatures.html
  - Do not drink unpasteurized milk or juices.
- Advise infected individuals to avoid food preparation.
- Educate about the risk of sexual practices that permit fecal-oral contact.
- Advise infected individuals to test private water supplies for the presence of bacterial contamination, if suspected.
- If unsure water is safe, bring to a rolling boil for a least two minutes before using or consuming.[8]
- Do not drink untreated surface water from a spring, stream, river, lake, pond or shallow well.
- Encourage careful hand washing after handling animals, including pets and livestock, or their feces.

References

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