Campylobacteriosis

Revision Dates

| Case Definition                              | August 2011 |
| Reporting Requirements                      | September 2015 |
| Remainder of the Guideline (i.e., Etiology to References sections inclusive) | September 2015 |

Case Definition

**Confirmed Case**
Laboratory confirmation of infection with or without clinical illness\(^{[1]}\):
- Isolation of *Campylobacter* species from an appropriate clinical specimen (e.g., stool and blood).

*The following probable case definition is provided as a guideline to assist with case finding and public health management, and should not be reported to Alberta Health.*

**Probable Case**
Clinical illness\(^{[1]}\) in a person who is epidemiologically linked to a confirmed case.

\(^{[1]}\) Clinical illness is characterized by diarrhea, abdominal pain, malaise, fever, nausea and/or vomiting.
Reporting Requirements

1. **Physicians, Health Practitioners and others**
   A physician, health practitioner or person in charge of an institution shall in accordance with Sections 22(1) or 22(2) of the *Public Health Act*, notify the Medical Officer of Health (MOH) (or designate) of the health zone, of all cases in the prescribed form by mail, fax or electronic transfer within 48 hours (two days).

2. **Laboratories**
   All laboratories, including regional laboratories and the Provincial Laboratory for Public Health (ProvLab) shall in accordance with Section 23(a)(ii) of the *Public Health Act*, report all positive laboratory results by mail, fax or electronic transfer within 48 hours (two days) to the:
   - Chief Medical Officer of Health (CMOH) (or designate),
   - MOH (or designate) of the health zone and
   - Attending/ordering physician.

3. **Alberta Health Services and First Nations and Inuit Health Branch (FNIHB)**
   - The MOH (or designate) of the health zone where the case currently resides shall forward the preliminary Notifiable Disease Report (NDR) of all confirmed cases to the CMOH (or designate) within two weeks of notification and the final NDR (amendment) within four weeks of notification.
     - This reporting responsibility applies to Alberta residents when the infection was likely acquired within or outside Alberta. It also applies to non-Alberta residents when the infection was likely acquired within Alberta.
   - Where the MOH receives notification of a case in an Albertan that was likely acquired outside the boundaries of the health zone, the MOH shall in accordance to Section 25 of the *Public Health Act*, immediately notify the MOH of the health zone where the case was likely acquired.
   - Where the MOH receives notification of a case in an Albertan that was likely acquired outside Alberta, the MOH shall in accordance to Section 25 of the *Public Health Act*, immediately notify the CMOH.
   - Where a MOH receives notification of a case in a non-Alberta resident likely acquired outside Alberta, the MOH shall immediately forward to the CMOH the following information by fax or electronic transfer:
     - name,
     - date of birth,
     - out-of-province health care number,
     - out-of-province address and phone number,
     - attending physician (locally and out-of-province) and
     - positive laboratory report.
Etiology
Campylobacteriosis is an acute zoonotic bacterial infection that can cause both enteric and extraintestinal infections. There are 21 species within the genus *Campylobacter*, but *C. jejuni* and *C. coli* mainly cause diarrhea in humans. *C. fetus* largely causes systemic illness in neonates and debilitated hosts. Other *Campylobacter* species, including *C. upsaliensis*, *C. lari*, *C. hyointestinalis* can also cause enteric or extraintestinal illnesses.

*Campylobacter* bacteria can survive in milk, other foods or in water that is kept at 4°C for several weeks. Pasteurization effectively destroys the bacteria as does appropriate chlorination used for water disinfection. *Campylobacter* bacteria also remains viable after freezing.

Clinical Presentation
Infection with *Campylobacter* may present with variable severity of symptoms. Predominant symptoms include diarrhea (may contain visible or occult blood), malaise, fever, abdominal pain and sometimes vomiting. There may be a prodromal period with fever, headache, myalgia, and general malaise 12–24 hours before the intestinal symptoms appear. Some infected individuals may be asymptomatic. It will depend on the dose of the infective organism reaching the small intestine, the virulence of the infecting strain and the specific immunity of the exposed person. Bacteremia is uncommon but can occur in children.

Campylobacteriosis is generally self-limited and the majority of individuals fully recover. Symptoms typically resolve in less than one week, however, in about 10–20% of cases, relapses or prolonged or severe illness can occur.

Post infection complications are rare but can include such things as Guillain-Barré syndrome (GBS), reactive arthritis/Reiter’s syndrome, Miller Fisher syndrome, myocarditis, pericarditis, urticaria and erythema nodosum. Case fatality rates have been estimated to range from 0.01 to 1%.

Diagnosis
Diagnosis is made by culture of the organism from an appropriate clinical specimen (e.g., stool or blood).

Epidemiology
Reservoir
The gastrointestinal tracts of domestic and wild birds and animals are reservoirs of *Campylobacter* infections. Animals most commonly affected include poultry and cattle, but other potential sources of infection include puppies, kittens, other domestic animals, swine, sheep, rodents and all types of fowl. *C. jejuni* and *C. coli* have been isolated from feces in 30–100% of healthy chickens, turkeys and water fowl. Raw poultry or meat, often contaminated through the slaughter process, and unpasteurized milk have been frequently identified as sources of infection. Soil and water can be contaminated by excreta from infected animals.

Transmission
The most common modes of transmitting *Campylobacter* bacteria include ingesting contaminated food (particularly raw or undercooked poultry or meat), drinking unpasteurized milk or contaminated/untreated water and having close contact with fecal material from infected animals and pets or infected people. It has been estimated that 50–70% of sporadic *Campylobacter* infections in developed countries are as a result of consuming undercooked poultry. Cross-contamination from cutting boards may cause infections especially when raw poultry is cut on
them. Although person-to-person transmission is uncommon, it may occur and the risk is greatest during the acute phase of the illness. Newborns of infected mothers have become infected. The infective dose for *Campylobacter* is considered to be low (as few as 500 organisms).

**Incubation Period**
Usually 2–5 days, but can range from 1–10 days depending on the dose ingested.

**Period of Communicability**
Campylobacteriosis is communicable throughout the course of the infection typically lasting several days to several weeks. Persons not treated with antibiotics may excrete the organism for as long as 2–7 weeks.

**Host Susceptibility**
The immune mechanisms are not well understood but lasting immunity to serologically related strains follows infection. In developing countries, the majority of the population will develop immunity in the first two years of life. Immunocompromised hosts have an increased risk for prolonged, relapsing or extraintestinal infections. Decreased stomach acidity has also been reported as a risk for infection.

**Occurrence**

**General**
Campylobacter is a leading cause of bacterial diarrheal disease worldwide and it is an important cause of traveller’s diarrhea. Common source outbreaks have occurred, most often associated with foods.

**Canada**
In 2012, Campylobacter infections accounted for about 43% of all reported cases of enteric, food and waterborne diseases in Canada (for both sexes, including unknown, and for all ages). The rates for *Campylobacter* infections in Canada since 2000 have been generally decreasing with a slight upward trend in 2009–2012. The rates ranged from 40.66 per 100,000 (2000) to 29.3 per 100,000 in 2012.

**Alberta**
The overall trend of rates in Alberta between 2000 and 2014 were similar to those in Canada as a whole, and also showed a general downward trend. The peak was in 2002 with a rate of 45 cases per 100,000 (1390 cases) and has been steady since 2007 with a rate between 23 and 26 per 100,000.

**Cases and Rate of Campylobacteriosis Cases in Canada, 1998 to 2014**

*Source: Communicable Disease Reporting System (CDRS), 2015*
Key Investigation

Single Case/household cluster

- Confirm the diagnosis.
- Obtain a history of illness including the date of onset, signs and symptoms.
- Identify any underlying medical conditions that may increase host susceptibility.
- Identify any cases in sensitive occupations or situations (SOS*) – Refer to Table 1.

Table 1: Sensitive Occupations or Situations (SOS)

<table>
<thead>
<tr>
<th>Occupation/Setting</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td>Food handlers</td>
<td>Whose work involves:</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>NOTE: Generally, food handlers who do not touch food, equipment or utensils in this way are not considered to pose a transmission risk however, circumstances for each case should be assessed on an individual basis.</td>
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<td>Healthcare, childcare or other staff</td>
<td>• Who have contact through serving food to highly susceptible persons.</td>
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<td></td>
<td>• Who provide direct patient care and are involved in the care of young children, elderly or dependent persons.</td>
</tr>
<tr>
<td>Children attending a childcare facility or similar facilities</td>
<td>• Who are diapered or unable to implement good standards of personal hygiene.</td>
</tr>
<tr>
<td>Any individual (child or adult)</td>
<td>• Unable to implement good standards of personal hygiene (e.g., those with disabilities/challenges that may impact ability to perform good hand hygiene).</td>
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- Determine the possible source of infection taking into consideration the incubation period, reservoir, and mode of transmission. Assessment may include:
  o obtaining a detailed food history including recent consumption of potentially contaminated food (especially poultry, beef, pork), contaminated water, or unpasteurized milk,
  o assessing for possible cross contamination (e.g., cutting boards),
  o assessing for exposure to domestic or wild animals or fowl including identifying recent illness in pets or acquisition of a puppy, kitten, etc. into the household,
  o determining occupational exposure (e.g., animal or meat handling),
  o identifying history of high-risk sexual practices especially contact with feces,
  o identifying history of recent travel,
  o assessing for history of residing in areas with poor sanitation including improper water treatment and sewage disposal either in Canada, or abroad and
  o assessing for history of similar symptoms in other member of the household.
- Suspected contaminated food may be held to prevent consumption, tested at the ProvLab or destroyed.
- Identify contacts, especially those that are SOS* contacts (Refer to Table 1):
  o Persons living in the household,
  o Children and childcare workers at a childcare facility (daycare, dayhome, or other childcare site), and
  o Individuals exposed to the same source where the source is identified.
Control

Management of a case
- Provide information about disease transmission and the appropriate infection prevention and control measures to be implemented to minimize the possibility of transmission including strict hand hygiene especially after using the washroom, changing diapers and before preparing/handling and serving food.
- For hospitalized children or adults unable to maintain appropriate hygiene habits or who have incontinence that cannot be contained, additional precautions (i.e., contact precautions) should be implemented. Consultation with facility Infection Control staff would be appropriate.
- Advise the case about proper food handling practices and to refrain from preparing food for others while ill.
- Refer to Table 2 for case exclusion criteria.

Table 2: Summary of Case Exclusion Criteria Based on Risk Assessment:

<table>
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<tr>
<th>Cases</th>
<th>Category</th>
<th>Exclusion Criteria</th>
</tr>
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| Symptomatic| SOS*     | Exclusion applies until 48 hours after stools return to normal (regardless of whether antibiotics, if prescribed, are still being completed). **NOTE:** The case must be symptom free for 48 hours after stopping any antidiarrheal medication (if taken).  
  - Lifting of exclusions is not conditional upon submission of stool specimens to demonstrate clearance of the organism.  
  - If possible, consideration may be given to temporary redeployment away from activities that involve increased risk of transmission. |
| Symptomatic| Non-SOS  | Advise to remain off work until 48 hours after they have recovered clinically and their stools have returned to normal.  
  - These individuals must refrain from participating in other sensitive activities/settings outside their primary occupation (e.g., volunteering to prepare or serve food at functions) while they are symptomatic.  
  - If they must return to work sooner than recommended, review the importance of strict hand hygiene, proper food handling practices and advise them not to prepare food for others. |
| Asymptomatic| SOS*     | Generally not required unless otherwise recommended on a case-by-case basis by the MOH (e.g., case is unable to follow appropriate hand hygiene practice). |
| Asymptomatic| Non-SOS  | No Exclusion required                                                              |

*Persons who are involved in sensitive occupations or situations.

Treatment of a case
- In most cases, infection is self-limited and treatment with antibiotics is not indicated. Rehydration and electrolyte replacement are considered the primary treatment. antibiotics, if required, shorten the duration of illness and excretion of organisms and prevent relapse when given early in gastrointestinal tract infection.
- Treatment with appropriate antibiotics (e.g., azithromycin, erythromycin) will usually eradicate the organism from the stool within 2–3 days.

Management of Contacts
- Provide information about disease transmission and appropriate infection prevention and control measures. Stress the measures that need to be taken to minimize possible transmission including strict hand hygiene, especially after using the washroom, changing diapers and before preparing/handling and serving food.
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diapers, and before eating and preparing/handling foods. Refer symptomatic contacts to their physician for assessment, as indicated.

- Refer to Table 3 for Contact Exclusion Criteria.

### Table 3: Summary of Contact Exclusion Criteria Based on Risk Assessment:

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| Symptomatic      | SOS*     | • Exclusion applies until 48 hours after stools return to normal (regardless whether antibiotics, if prescribed, are still being completed).  
  **NOTE:** The case must be symptom free for 48 hours after stopping any antidiarrheal medication (if taken).  
  - Lifting of exclusions is not conditional upon submission of stool specimens for clearance of the organism. |
| Symptomatic      | Non-SOS  | • Refer to their physician for assessment, as indicated.                                             |
| Asymptomatic     | All      | • No exclusion - contacts should monitor themselves for gastrointestinal symptoms, maintain good hand hygiene and food handling practices and seek medical attention if symptoms develop. If symptoms develop, exclusions would apply as for a case. |

*Persons who are involved in sensitive occupations or situations.

### Preventive Measures (1,2)

- Educate the public about good personal hygiene and safe food handling practices, such as:
  - exercising good hand hygiene to prevent cross-contamination with other foods after handling raw poultry,
  - washing cutting boards, counter tops and utensils with soap and water after contact with raw poultry (and other foods of animal origin),
  - cooking poultry and other meats thoroughly,
  - washing hands after contact with farm animals, pets, animal feces, and animal environments, especially where the animals/pets are ill with diarrhea,
  - avoid drinking unpasteurized (raw) milk and foods made from unpasteurized milk, and
  - accessing and drinking safe water supplies.
References


