

## CAMPYLOBACTERIOSIS

### REPORTING INFORMATION

- **Class B:** Report by the close of the next business day after the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Reporting Form(s) and/or Mechanism: The Ohio Disease Reporting System (ODRS) should be used to report lab findings to the Ohio Department of Health (ODH). For healthcare providers without access to ODRS, you may use the [Ohio Confidential Reportable Disease Form](#) (HEA 3334).
- Key fields for ODRS reporting include: import status (whether the infection was travel-associated or Ohio-acquired), date of illness onset, and all the fields in the Epidemiology module. In the lab module, please specify if the test was Culture or Antigen.

### AGENT

*Campylobacter jejuni* and, less commonly, *C. coli* are the usual causes of *Campylobacter* diarrhea in humans. Other *Campylobacter* organisms, including *C. laridis* and *C. fetus ssp.* have also been associated with diarrhea in normal hosts. As of 1989, *C. pylori* was reclassified as *Helicobacter pylori*, which is not a reportable disease in Ohio.

#### Infectious Dose

A very small number of *Campylobacter* organisms (fewer than 500) can cause illness in humans.

### CASE DEFINITION

#### Background

Campylobacteriosis is a bacterial illness that generally causes a self-limited clinical illness typically characterized by diarrhea (frequently with bloody stools), abdominal cramps, malaise, fever, nausea, and vomiting; asymptomatic infection also occurs frequently. Severe symptoms and invasive infections can also occur, and persons with *Campylobacter* infections are at increased risk for three post-infectious complications: Guillain-Barre syndrome (GBS), reactive arthritis, and irritable bowel syndrome.

#### Clinical Criteria

An illness of variable severity commonly manifested by diarrhea, abdominal pain, nausea and sometimes vomiting. The organism may also rarely cause extra-intestinal infections such as bacteremia, meningitis or other focal infections.

#### Laboratory Criteria

Probable: Detection of *Campylobacter* spp. in a clinical specimen using a culture-independent diagnostic test (CIDT). The antigen test is a culture-independent diagnostic test.

Confirmed: Isolation of *Campylobacter* spp. from a clinical specimen.

#### Case Classification

Probable: A case that meets the probable laboratory criteria for diagnosis or a clinically compatible case that is epidemiologically linked to a probable or confirmed case of campylobacteriosis.

Confirmed: A case that meets the confirmed laboratory criteria for diagnosis.

Not a Case: This status will not generally be used when reporting a case, but may be used to reclassify a report if an investigation revealed that it was not a case.

### **Criteria to Distinguish a New Case from an Existing Case**

A case should not be counted as a new case if laboratory results were reported within 30 days of a previously reported infection in the same individual.

### **Comment**

Campylobacteriosis was made a nationally notifiable disease in 2015.

The use of CIDTs as stand-alone tests for the direct detection of *Campylobacter* in stool is increasing. Data regarding their performance indicate variability in the sensitivity, specificity, and positive predictive value of these assays depending on the manufacturer (CDC unpublished data). It is therefore useful to collect information on the laboratory conducting the testing using the laboratory's unique Clinical Laboratory Improvement Amendments (CLIA) number, and when possible, type and manufacturer of the CIDT used to diagnose each case. Culture confirmation of CIDT-positive specimens is ideal, but not practical to achieve in most jurisdictions. Examples of CIDT are: antigen testing, DNA (PCR) testing.

## **SIGNS AND SYMPTOMS**

Symptoms can be mild to severe. Fever, headache, myalgia and malaise can occur 12-24 hours before onset of intestinal symptoms, which include diarrhea (stool might contain blood or mucus), abdominal pain, vomiting and nausea. Symptoms last from one day to one week or longer.

## **DIAGNOSIS**

Campylobacteriosis is diagnosed by means of stool culture; see case definition above. Most hospital laboratories have the ability to identify *Campylobacter*. ODH Laboratory performs testing for campylobacteriosis. In some circumstances testing can be done at the ODH Laboratory without charge. To arrange for testing at ODH Lab, contact the ODH Outbreak Response and Bioterrorism Investigation Team (ORBIT) at 614-995-5599.

## **EPIDEMIOLOGY**

### **Source**

*Campylobacter* is commonly found in healthy wild and domestic animals. The most important sources to humans are poultry, cattle, puppies, kittens, swine, sheep, rodents and birds. The majority of human cases probably result from consumption of contaminated food (especially chicken) and water. *Campylobacter* can survive for months in surface water at 4°C (40°F).

### **Occurrence**

Campylobacteriosis occurs worldwide. In developed countries, the incidence is at least as high as that of *Salmonella*. The majority of cases occur from July through October. Most recognized cases occur in children <5 years of age, adults 20-39 years of age and adults >60 years of age. All ages are at risk.

### **Mode of Transmission**

Campylobacteriosis is acquired via the fecal-oral route from undercooked meat (especially poultry), contaminated food or water or raw milk, as well as from direct contact with infected pets, livestock or infected infants. Foods can become cross-

contaminated from poultry via raw meat juice or misuse of cutting boards. Person-to-person transmission is uncommon.

### **Period of Communicability**

Throughout the acute phase (several days to several weeks), the organism is present in the stool and is communicable. In the absence of antimicrobial therapy, the organism can be excreted for two to seven weeks postinfection. Convalescent excretion does not usually extend beyond three months postinfection. The chronic carrier state in humans is rare.

### **Incubation Period**

The incubation period is 1-10 days, usually 2-5 days.

## **PUBLIC HEALTH MANAGEMENT**

### **Case**

#### Investigation

All cases reported to the local health department should initially be followed up with a telephone call to obtain demographic and epidemiologic data. No further work-up is recommended if neither the case nor any household member is employed in a sensitive occupation (direct food handling, direct patient care, employee in a child care center who handles food or directly cares for children) or attends a child care center, unless there is evidence that the case is part of an outbreak.

#### Treatment

Antimicrobial treatment for *Campylobacter* infection is usually not indicated. *Campylobacter* organisms are susceptible in vitro to the following: erythromycin, tetracyclines and quinolones. Antimicrobial agents can reduce the duration of symptoms if given early in the illness and are indicated in invasive cases.

#### Isolation and Follow-up Specimens

Ohio Administrative Code (OAC) 3701-3-13 (B) states:

"Campylobacteriosis: a person with campylobacteriosis who attends a child care center or works in a sensitive occupation shall be excluded from the child care center or work in the sensitive occupation and may return when the following conditions are met:

- (1) A child may return to a child care center after his or her diarrhea has ceased,
- (2) A person may return to work in a sensitive occupation after diarrhea has ceased, provided the person's duties do not include food handling.
- (3) A food handler may return to work only after diarrhea has ceased and one of the following conditions are met:
  - (a) Forty-eight hours of effective antimicrobial therapy; or
  - (b) Two consecutive follow-up stool specimens are negative for *Campylobacter*."

Obtain the first stool specimen no sooner than 48 hours after cessation of diarrhea or, if being treated, at least 48 hours after completion of antibiotic therapy. Obtain the remaining specimen(s) at least 24 hours apart.

### **Contacts**

If a household contact (of a confirmed case) is employed in a sensitive occupation or is a child care center attendee, all household members with diarrhea should be tested for *Campylobacter* and treated if positive.

### **Prevention and Control**

Meat, especially poultry, should be thoroughly cooked. Avoid cross contamination of other foods, especially fruits and vegetables, with raw meat juices. Avoid unpasteurized

milk and untreated water. Hand washing after contact with animals can also help prevent campylobacteriosis.

Thorough hand washing should be emphasized, especially after bowel movements, changing diapers and before eating or preparing food.

#### Food Handlers

Symptomatic persons should be excluded from work. As detailed in Isolation, above, food handlers may only return to work after diarrhea has ceased, and either 48 hours of effective antimicrobial therapy, or 2 consecutive follow-up stool specimens are negative for *Campylobacter*.

Food Service Operation rules also pertain to this situation. Campylobacteriosis is a disease which can be transmitted through food. Persons infected with a disease that is communicable by food are not permitted to work as food handlers. For additional information, refer to [Ohio Administrative Code \(OAC\) Chapter 3717-1 \(Ohio Uniform Food Safety Code\) Section 02.1](#), Management and Personnel: Employee Health.

#### Health Care Workers, Child Care Workers and Children who Attend Child Care Centers

Symptomatic persons should be excluded from work. As detailed in Isolation above, persons in these sensitive occupations and children who attend child care centers may return when diarrhea has ceased, provided their duties do not include food handling.

#### Child Care Center Outbreak Control

Whenever a case of campylobacteriosis has been identified in a child care center attendee or worker, staff and children who are symptomatic and in the same classroom as the case should be cultured for *Campylobacter*. Arrangements to have this testing performed at ODH Laboratory can be made by contacting ODH ORBIT at 614-995-5599.

#### **Special Information**

Persons with diarrhea of infectious or unknown cause (e.g. confirmed or suspect cases of campylobacteriosis) are not permitted to work in sensitive occupations, according to OAC 3701-3-13 (H) which states: "Diarrhea, infectious or of unknown cause: a person with diarrhea, of infectious or unknown cause, who attends a child care center or works in a sensitive occupation shall be excluded from the child care center or work in the sensitive occupation and may return only after diarrhea has ceased. A person with infectious diarrhea of known cause shall be isolated in accordance with the provisions of the rule set forth for the specified disease."

" 'Sensitive occupation' means direct food handling, direct patient care, the handling of food or provision of direct care to children in a child care center, or any other occupation which provides significant opportunity for an infected individual to transmit infectious disease agents" per OAC 3701-3-01 (Y).

**What is campylobacteriosis?**

Campylobacteriosis is an infectious disease caused by bacteria of the genus *Campylobacter*. Most people who become ill with campylobacteriosis get diarrhea, cramping, abdominal pain and fever within 2 to 5 days after exposure to the organism. The diarrhea may be bloody and can be accompanied by nausea and vomiting. The illness typically lasts 1 week. Some persons who are infected with *Campylobacter* do not have any symptoms at all. In persons with compromised immune systems, *Campylobacter* occasionally spreads to the bloodstream and causes a serious life-threatening infection.

**How common is *Campylobacter*?**

*Campylobacter* is the second-most common bacterial cause of diarrheal illness in the United States. Most cases are isolated and sporadic, not part of large outbreaks. Over 46,000 cases were reported to the Centers for Disease Control and Prevention (CDC) in 2015, equaling approximately 14 cases for each 100,000 persons in the population. Many more cases go undiagnosed or unreported, and campylobacteriosis is estimated to affect over 1.3 million persons every year. Campylobacteriosis occurs much more frequently in the summer months than in the winter. The organism is isolated from infants and young adults more frequently than from other age groups and from males more frequently than females. Although *Campylobacter* does not commonly cause death, it has been estimated that approximately 76 persons with *Campylobacter* infections may die each year. In Ohio, between 2012 and 2016, a median of 1,129 cases were reported (range 923-2,015).

**What sort of germ is *Campylobacter*?**

The *Campylobacter* organism is actually a group of spiral-shaped bacteria that can cause disease in humans and animals. Most human illness is caused by one species, called *Campylobacter jejuni*, but 1% of human *Campylobacter* cases are caused by other species. *Campylobacter jejuni* grows best at the body temperature of a bird, and seems to be well adapted to birds, which carry it without becoming ill. The bacterium is fragile. It cannot tolerate drying and can be killed by oxygen. It grows only if there is less than the atmospheric amount of oxygen present. Freezing reduces the number of *Campylobacter* bacteria present on raw meat.

**How is the infection diagnosed?**

Many different kinds of infections can cause diarrhea and bloody diarrhea. Doctors can look for bacterial causes of diarrhea by asking a laboratory to culture a sample of stool from an ill person. Diagnosis of *Campylobacter* requires special laboratory culture procedures, which doctors may need to specifically request.

**How can campylobacteriosis be treated?**

Virtually all persons infected with *Campylobacter* will recover without any specific treatment. Patients should drink plenty of fluids as long as the diarrhea lasts. In more severe cases, antibiotics such as azithromycin or a fluoroquinolone can be used, and can shorten the duration of symptoms if they are given early in the illness.

**Are there long-term consequences?**

Most people who get campylobacteriosis recover completely within 2 to 5 days, although sometimes recovery can take up to 10 days.

Rarely, some long-term consequences can result from a *Campylobacter* infection. Some people may have arthritis following campylobacteriosis; others may develop a rare disease that affects the nerves of the body beginning several weeks after the diarrheal illness. This

disease, called Guillain-Barré syndrome, occurs when a person's immune system is "triggered" to attack the body's own nerves, and can lead to paralysis that lasts several weeks and usually requires intensive care. It is estimated that approximately one in every 1000 reported campylobacteriosis cases leads to Guillain-Barré syndrome. As many as 40% of Guillain-Barré syndrome cases in this country may be triggered by campylobacteriosis.

### **How do people get infected with this germ?**

Campylobacteriosis usually occurs in single, sporadic cases, but it can also occur in outbreaks, when a number of people become ill at one time. Most cases of campylobacteriosis are associated with handling raw poultry or eating raw or undercooked poultry meat. A very small number of *Campylobacter* organisms (fewer than 500) can cause illness in humans. Even one drop of juice from raw chicken meat can infect a person. One way to become infected is to cut poultry meat on a cutting board, and then use the unwashed cutting board or utensil to prepare vegetables or other raw or lightly cooked foods. The *Campylobacter* organisms from the raw meat can then spread to the other foods. The organism is not usually spread from person-to-person, but this can happen if the infected person is a small child or is producing a large volume of diarrhea. Larger outbreaks due to *Campylobacter* are not usually associated with raw poultry but are usually related to drinking unpasteurized milk or contaminated water. Animals can also be infected, and some people have acquired their infection from contact with the infected stool of an ill dog or cat.

### **How does food or water get contaminated with *Campylobacter*?**

Many chicken flocks are silently infected with *Campylobacter*; that is, the chickens are infected with the organism but show no signs of illness. *Campylobacter* can be easily spread from bird to bird through a common water source or through contact with infected feces. When an infected bird is slaughtered, *Campylobacter* can be transferred from the intestines to the meat. More than half of the raw chicken in the United States market has *Campylobacter* on it. *Campylobacter* is also present in the giblets, especially the liver.

Unpasteurized milk can become contaminated if the cow has an infection with *Campylobacter* in her udder or the milk is contaminated with manure. Surface water and mountain streams can become contaminated from infected feces from cows or wild birds. This infection is common in the developing world, and travelers to foreign countries are also at risk for becoming infected with *Campylobacter*.

### **What can be done to prevent the infection?**

There are some simple food handling practices for preventing *Campylobacter* infections. Physicians who diagnose campylobacteriosis and clinical laboratories that identify this organism should report their findings to the local health department. If many cases occur at the same time, it may mean that many people were exposed to a common contaminated food item or water source which might still be available to infect more people. When outbreaks occur, community education efforts can be directed at proper food handling techniques, especially thorough cooking of all poultry and other foods of animal origin, and common sense kitchen hygiene practices.

Some data suggest that *Campylobacter* can spread through a chicken flock in their drinking water. Providing clean, chlorinated water sources for the chickens might prevent *Campylobacter* infections in poultry flocks and thereby decrease the amount of contaminated meat reaching the market place.

### **Some tips for preventing campylobacteriosis**

- Cook all poultry products thoroughly. Make sure that the meat is cooked throughout (no longer pink), any juices run clear, and the inside is cooked to 165°F (74°C).
- If you are served undercooked poultry in a restaurant, send it back for further cooking.
- Wash hands with soap before handling raw foods of animal origin.
- Wash hands with soap after handling raw foods of animal origin and before touching anything else.
- Prevent cross-contamination in the kitchen:
- Use separate cutting boards for foods of animal origin and other foods.
- Carefully clean all cutting boards, countertops and utensils with soap and hot water after preparing raw food of animal origin.
- Avoid consuming unpasteurized milk and untreated surface water.
- Make sure that persons with diarrhea, especially children, wash their hands carefully and frequently with soap to reduce the risk of spreading the infection.
- Wash hands with soap after having contact with pet feces.

For further information:

<http://www.fda.gov/downloads/Food/FoodborneIllnessContaminants/UCM297627.pdf>

<https://www.cdc.gov/foodsafety/diseases/campylobacter/index.html>