

***Campylobacter* ENTERITIS SURVEILLANCE PROTOCOL**

Public Health Action

1. Educate providers and laboratories to report stool cultures positive for *Campylobacter jejuni* or *Campylobacter coli* from patients within one week of diagnosis to the local health department in the patient's county of residence.
2. Educate laboratories to mail all *Campylobacter* isolates to the Office of Laboratory Services for pulsed field gel electrophoresis (PFGE).
3. Conduct an appropriate investigation as follows:
 - a. *For sporadic cases:* Complete the Supplemental Enteric Disease Case Report Follow-up Form and attach it to the yellow card. Laboratory results should also be attached. Use of the Supplemental Enteric Disease Case Report Follow-up Form will prompt the local health department to complete an appropriate investigation, to include: 1) a two- to five-day food history; 2) history of exposure to animals, especially poultry, cattle, swine, puppies, and kittens during the incubation period; 3) history of consumption of unpasteurized milk or untreated water; 4) identification of high-risk persons or symptomatic individuals for further investigation; and 5) identification of specific behaviors that may be associated with *Campylobacter* infection. Use an incubation period of two to five days.
 - b. *For small outbreaks (three to five epi-linked cases):* Expand the investigation to include the full incubation period of one to 10 days; consult the Infectious Disease Epidemiology Program (IDEP). Assure that all laboratory isolates are sent to OLS.
 - c. *For large outbreaks (> 5 cases):* Consult IDEP immediately. Interview the patient in detail about exposures during the one to 10 days prior to onset. Assure that all laboratory isolates are sent to OLS.
4. Identify other cases, including probable cases (symptomatic persons who are epidemiologically linked to a culture-confirmed case), and investigate completely as in 3 above.
5. Identify persons with *Campylobacter* who are employed in high-risk professions. Exclude symptomatic individuals from food handling, or care of people in hospitals, custodial institutions, and day care centers. Exclude asymptomatic convalescent stool positive individuals with questionable hygiene.
 - a. If the case works in or attends a day care facility:
 - i. Interview the manager/operator and/or check attendee records to identify suspect cases that occurred within the past month.
 - ii. Collect stool samples from all symptomatic staff members and children who have been ill in the previous two months.
 - iii. If there are any other confirmed or suspected cases, do a sanitary inspection, and check on the possibility of contact with animals or ingestion of raw milk or untreated water.
 - iv. Instruct the manager/operator to notify the local health department if new cases of diarrhea occur.

- b. If the case is a food service worker:
 - i. Interview the employee or manager to identify any potential risk to the public, including improper handwashing, or improper food handling or preparation practices (e.g., cross-contamination or incomplete cooking of food). Interview the manager/operator and/or check attendee records to identify suspect cases that occurred during the previous month. Ask if there have been any complaints from any patrons during this past month. If any specific concerns are identified, a sanitary inspection is indicated.
 - ii. Collect stool samples from all symptomatic individuals in the food service facility.
 - c. If the case works at a health care or residential care facility: Identify any abnormal incidence of diarrheal illness within the past month. If so, identify any common source outbreaks or sources of exposure, and conduct a sanitary inspection of the facility.
6. Identify symptomatic contacts of culture-confirmed cases. Culture the stools of any contacts who are symptomatic.
7. Educate providers and the public about transmission and prevention of *Campylobacter* infection.

Disease Control Objectives

Reduce the incidence of secondary cases of *Campylobacter* by:

- a. Appropriate investigation of outbreaks and clusters to identify and remove any common source of disease.
- b. Identification and exclusion of cases and probable cases (symptomatic epi-linked contacts) from high-risk settings such as daycare and food preparation.

Disease Prevention Objectives

Reduce the incidence of *Campylobacter* by:

- a. Education of the general public about proper food handling, including thorough cooking of poultry and pork, maintaining foods at the proper temperatures, and avoidance of cross-contamination, especially of food preparation surfaces.
- b. Education of the public about handwashing before eating, after handling raw meat, after contact with animals, and after use of the toilet.
- c. Education of the public to avoid unsafe foods such as unpasteurized milk and untreated water supplies.
- d. Education of poultry and animal farm owners/operators about changing boots and clothing and implementing thorough cleaning and disinfection to prevent spread through the farm.

Surveillance Objectives

1. To determine the incidence of campylobacteriosis in West Virginia.
2. To identify demographic characteristics of persons with campylobacteriosis.
3. To identify behavioral risk factors associated with campylobacteriosis.

Public Health Significance

Campylobacter jejuni and *Campylobacter coli* are an important cause of diarrheal illness in all parts of the world and in all age groups, causing 5-14% of diarrhea worldwide. They are an important cause of travelers' diarrhea. In developed countries, children under the age of five and young adults have the highest incidence of illness. In developing countries, illness is confined largely to children under the age of two, especially infants.

Common-source outbreaks have been associated with consumption of undercooked chicken, unpasteurized milk, and nonchlorinated water. Ill foodhandlers have been implicated in a few outbreaks. Most cases are sporadic.

Clinical Description

Campylobacteriosis is an acute bacterial enteric disease of variable severity characterized by diarrhea, abdominal pain, malaise, fever, nausea, and vomiting. The illness is frequently over within a week and usually lasts no more than 10 days. Prolonged illness may occur in adults; relapses can occur. Gross or occult blood in association with mucus and WBCs is often present in liquid stools. A typhoid-like syndrome or reactive arthritis may occur, as well as septicemia, and rarely, febrile convulsions, Guillain-Barré syndrome, or meningitis. Some cases mimic acute appendicitis. Many infections are asymptomatic.

Etiologic Agent

Campylobacter jejuni, and less commonly *Campylobacter coli*, are the usual causes of *Campylobacter* diarrhea in humans. A variety of 20 or more biotypes and serotypes occur, identification of which can be useful in epidemiological investigations.

Campylobacter organisms are small, curved, gram negative bacilli which require selective media, reduced oxygen tension and an incubation temperature of 42°C to grow.

Reservoir

While the most common source of infection is poultry, *Campylobacter* is commonly found in the intestines of healthy wild and domestic animals including cattle, sheep, swine, goats, dogs, cats, rodents, and fowls. Early in life, the animal may develop diarrhea; however, in most colonized animals, a life-long carrier state results. Thus, there is a huge natural reservoir for *Campylobacter* which is the ultimate source of infection in humans. During slaughter, meat may become contaminated with the contents of the animal's intestines. Contamination of unpasteurized milk or untreated surface water may also occur easily. *C. jejuni* has a very varied reservoir. *C. coli* and *intestinalis* are most commonly isolated from swine. *C. upsaliensis* is associated with dogs. *C. fetus fetus* has been isolated from sheep, cattle, poultry, reptiles, and swine.

Mode of Transmission

Campylobacter is transmitted through ingestion of the organisms in undercooked chicken and pork, contaminated food and water, or raw milk. It can also be contracted through

contact with infected pets (especially puppies and kittens), farm animals, or infected infants. Infected foodhandlers have rarely been implicated as a source of infection. Contamination of milk most frequently occurs from fecal carrier cattle. Food can be contaminated from poultry, especially from common cutting boards that have not been adequately cleaned and disinfected. Person-to-person transmission is uncommon.

Incubation Period

Usually two to five days (range of one to ten days), depending upon the dose ingested.

Infectious Period

Campylobacter is communicable throughout the course of infection, usually from several days to several weeks. Individuals not treated with antibiotics may excrete organisms for as long as two to seven weeks. This temporary carrier state is probably important only in infants and those who are incontinent.

Outbreak Recognition

Outbreak recognition and investigation requires timely and complete epidemiological investigation (risk factors, food history, history of exposure to animals, etc.) paired with timely and complete laboratory investigation. The Office of Laboratory Services now offers pulsed field gel electrophoresis (PFGE) for *Campylobacter*, and all outbreak isolates should be referred to OLS for analysis.

Common source outbreaks have occurred, most often associated with foods, especially undercooked chicken, unpasteurized milk, and nonchlorinated water. Outbreaks have also been associated with infected food handlers.

Case Definition for Campylobacteriosis

Clinical Description

An infection that may result in diarrheal illness of variable severity.

Laboratory Criteria for Diagnosis

Isolation of *Campylobacter* from any clinical specimen.

Case Classification

Probable: A clinically compatible case that is epi-linked to a confirmed case.

Confirmed: A case that is laboratory confirmed.

Comment

If laboratory confirmed, a diagnosis of campylobacteriosis is considered a confirmed case that should be reported to the local health department in the patient's county of residence within one week of the diagnosis.

Laboratory Notes

Stool specimens may be collected and placed into modified Cary Blair Transport Media for culturing for *Campylobacter*. Transport media with stool specimens may then be submitted to the West Virginia Office of Laboratory Services, 167 11th Avenue, South Charleston, WV 25303. Modified Cary Blair media is available by contacting the Office of Laboratory Services at (304) 558-3530.

Campylobacter isolated in a clinical laboratory should be shipped to the Office of Laboratory Services for pulsed field gel electrophoresis on a blood slant.

Preventive Interventions

Share these prevention messages:

- Wash hands well after using the toilet, cleaning the toilet, after changing diapers, and after handling soiled towels or linens.
- Wash hands well before, during, and after fixing food.
- Thoroughly cook all poultry products, making sure the meat is cooked throughout, and any juices run clear.
- After preparing raw meat, thoroughly wash and rinse all utensils, bowls, counters, and hands.
- Use separate cutting boards for foods of animal origin and other foods.
- Never return cooked meat to the same plate used for raw meat.
- Marinade or barbeque sauce used on raw meat should not be used on cooked meat.
- Avoid consuming unpasteurized milk and untreated surface water.
- Wash hands with soap after contact with pets and pet feces.

Treatment

No treatment is generally indicated for *Campylobacter* infection except for rehydration and electrolyte replacement. *Campylobacter* is susceptible to a number of antibiotics, including erythromycin, tetracyclines, and quinolones, but these agents are only of value early in the infection if the identity of the organism is known, in serious illness, and in elimination of the carrier state. Experienced microscopists may be able to detect the possible presence of *Campylobacter* via Gram Stain smear of stool prior to culture.

Surveillance Indicators

- Proportion of investigations with complete demographic information.
- Proportion of investigations with complete information on high-risk occupations.
- Proportion of confirmed cases with known campylobacteriosis.
- Proportion of cases with complete risk factor investigation including a food history.
- Proportion of isolates that have had PFGE.