

# Campylobacteriosis

**Campylobacteriosis** also known as **Food poisoning**, **Infectious diarrhea**, **Dysentery**, or **Infectious colitis** is an infectious disease caused by a bacterium that is spread by eating or handling contaminated food or drinking contaminated beverages. The bacterium usually causes infection in the gut, leading to diarrhea.

## Symptoms

Some people who are infected with *Campylobacter* have no symptoms. In the majority of people however, campylobacter infection causes a clinical syndrome, which can include the following:

- Diarrhea (often bloody)
- Abdominal cramping and pain
- Nausea and vomiting
- Fever
- Tiredness

There is a time lag (incubation period) of usually about three days between ingestion of the bacteria in infected food and the onset of illness. Once present, the illness from Campylobacteriosis usually lasts for 2 to 5 days, but in some cases as long as 10 days. Symptoms of mild illness usually resolve in healthy people without antibiotic therapy. Relapse (recurrence of symptoms) can occur in 5% to 10% of cases not treated with antibiotics. In severe illness, people appear very ill and toxic. This usually occurs in the very young or the elderly, or those with weakened immune systems. Some people can present with severe belly pain that looks like appendicitis; a few of these cases have gone to surgery only to find that the appendix is normal.

## Causes

Campylobacteriosis is caused by bacteria in the group called *Campylobacter*. These bacteria are often found in the gut of domesticated and wild animals including cattle, sheep, swine, goats, rodents, and fowl. Other animals such as the dog and cat have also been reported to carry the organism.

People become infected when they ingest undercooked or raw meat, water, or raw milk that has been contaminated with the bacterium. The bacteria make their way to the gut and cause an infection in the intestines (the gut).

*Campylobacter jejuni*, *C. fetus*, and *C. coli* are the specific bacteria that usually cause the disease in people. *C. jejuni* causes most cases of this food borne disease—mild to severe cases of diarrhea. *C. fetus* tends to spread from the gut to the bloodstream and cause more severe illness. *C. coli* typically causes diarrhea, but the illness is milder. There are other, rarer, bacteria that cause campylobacteriosis, but most of these occur in people with weakened immune systems.

## Diagnosis

Campylobacteriosis is diagnosed using laboratory test. These include detection of the *Campylobacter* microbe in a stool specimen by microscopic methods, or more commonly by taking a culture of the stool. In cases where the bacterium has spread from the gut to the blood stream, a blood culture will usually be positive. Although most stool cultures in people with Campylobacteriosis will be positive for the *Campylobacter* organism, the culture must be processed by the clinical laboratory in a special way. The organism is fragile outside of the body, and other bacteria in a stool culture may crowd out the *Campylobacter*, making it difficult to detect.<sup>[1]</sup> Stool culture can also distinguish campylobacter infections from other bacterial causes of diarrheal illness, such as *E. coli*, *Salmonella*, *Shigella* and *Cholera*.

## Treatment

Most healthy people who develop Campylobacteriosis will get better on their own, without specific treatment. Although the illness can be treated with antibiotic medications, not everyone with Campylobacteriosis should receive antibiotics.<sup>[2][3]</sup> In more serious cases antibiotics are necessary.

## Medications

Antibiotics are used to treat people who have Campylobacteriosis with any of the following conditions:

- high fever
- blood in the stool
- more than eight stools a day
- symptoms are worsening at the time of diagnosis
- symptoms have persisted for more than a week

Several different antibiotics can be used to effectively treat the illness.

For *Campylobacter jejuni* infections:

- Erythromycin and related antibiotics (azithromycin, clarithromycin)
- Doxycycline, a type of tetracycline
- Clindamycin
- Some fluoroquinolones, although there have been reports of increasing resistance of *C. jejuni* to this class of drugs

For *Campylobacter fetus* infections:

- Gentamicin given by vein
- Ampicillin
- Chloramphenicol
- Erythromycin and related antibiotics (azithromycin, clarithromycin)
- Certain antibiotics in the class called Cephalosporins (used rarely as second-line treatment)

Because of its effectiveness, ease of use, and lack of serious side effects, azithromycin is the recommended antibiotic for treatment. The dose is 500 mg by mouth once a day for three days in mild to moderate illness. Alternative medications include erythromycin 500 mg by mouth taken four times a day for five days, or ciprofloxacin 500 mg by mouth taken twice a day for five days. There are reports of *Campylobacter* bacteria becoming resistant to ciprofloxacin (a fluoroquinolone antibiotic). Up to 10% resistance has been seen in the United States and up to 84% in other areas of the world.<sup>[4]</sup> In cases where resistance may be suspected, tests can be done on *Campylobacter* bacteria isolated from stool or blood cultures to determine which alternate antibiotic would be useful; this is referred to as antimicrobial susceptibility testing.

The use of antibiotic medication to treat *Campylobacter* infection does not lead to what is known as a carrier state. A carrier state can occur in some people who have been infected with a bacterium called *Salmonella*. Using antibiotics to treat *Salmonella* can sometimes lead to a person carrying the *Salmonella* bacterium for a long period of time (although usually without symptoms). This carrier state has not been reported in *Campylobacter* infections.

## Other Therapies

Serious illness and occasionally death can occur from the dehydration that results from severe infections with *Campylobacter*. Therefore, an important part of treatment of *Campylobacteriosis* is to ensure that the symptomatic person is well-hydrated. In people who are sicker with the infection, they may need to be admitted to a hospital so that they can receive fluids by vein. In those who are less ill, rehydration can be accomplished by mouth.

## Prevention

Infection with *Campylobacter* bacteria is a preventable disease. Simple, safe handling of food can reduce the chance of becoming infected and include the following methods:

- Wash your hands well with warm, soapy water before and after handling or preparing food. Use hot, soapy water to wash the utensils, cutting board and other surfaces you use.
- Keep raw foods separate from cooked or ready-to-eat foods. Keep raw meat, poultry, fish and shellfish away from other foods to prevent contamination.
- Cook foods to a safe temperature (see Table below). The best way to tell if foods are cooked to a safe temperature is to use a food thermometer. Most foods should be cooked to temperatures between 145°F and 180°F. The U.S. Department of Agriculture (USDA) has a guide to safe cooking: [Is it done yet? PDF](#).
- Refrigerate or freeze perishable foods promptly. If the room temperature is particularly hot, refrigerate perishable foods as soon as possible. Freeze food if you don't expect to eat it within two days.
- Defrost food safely. Do not thaw foods at room temperature. The safest way to thaw foods is to defrost them in the refrigerator or to microwave the food using the "defrost" or "50 percent power" setting. Running cold water over the food also safely thaws the food.
- Throw it out if you have any doubt of the safety of the food. Food left at room temperature too long may contain bacteria or toxins that can't be destroyed by cooking. Don't taste food that you're unsure about—just throw it out. Even if it looks and smells fine, it may not be safe to eat.

Some people need to be more careful, since food poisoning is potentially life-threatening for young children, pregnant women, the elderly, and people with weakened immune systems. These individuals should take extra precautions by avoiding the following foods:

- Raw or rare meat and poultry
- Raw or undercooked fish or shellfish
- Raw or undercooked eggs or foods that may contain them
- Raw sprouts, such as alfalfa, bean, clover or radish sprouts
- Unpasteurized juices and ciders
- Unpasteurized milk and milk products
- Soft cheeses (such as feta, brie and Camembert), and unpasteurized cheese
- Uncooked hot dogs, luncheon meats and deli meats

Table: Safe Cooking Temperatures	
Food	USDA Recommended Safe Minimum Internal Temperatures
<b>Ground meat</b>	
Beef, pork, veal, lamb	160°F
Poultry	165°F
<b>Beef, veal, lamb (whole cuts)</b>	
Medium rare	145°F
Medium	160°F
Well-done	170°F
<b>Poultry</b>	
Whole birds	180°F
Breasts	170°F
Legs, thighs, wings	180°F
<b>Pork (fresh)</b>	
Medium	160°F
Well-done	170°F
<b>Ham</b>	
Fresh	160°F
Cooked	140°F
Leftover cooked ham	165°F
<b>Other Foods</b>	
Fish and shellfish	145°F
Egg dishes	160°F
Casseroles, combination dishes, stuffing, stews, leftovers	165°F

Source: U.S. Department of Agriculture: Food Safety and Inspection Service

## How Campylobacteriosis is Spread

The bacteria that cause Campylobacteriosis can be transmitted to humans by handling raw poultry, eating undercooked poultry and meat, drinking non-chlorinated water or raw milk, or handling infected human or animal feces. Most frequently, poultry and cattle waste are the sources of the bacteria, but feces from puppies, kittens, and birds also may be contaminated with the bacteria. Meat for human consumption can become contaminated during the slaughtering process or through cross-contamination. Surface water (streams) can become infected from the feces of animals that carry the bacterium. Unpasteurized milk can become contaminated if the cow has an infection with Campylobacter in her udder or the milk is contaminated with manure. In developed countries, probably 50% to 70% of sporadic cases occur from eating undercooked poultry. There have also been rare cases of transmission from person to person (though contact with infected feces), from mother to baby,<sup>[5]</sup> and through blood transfusions.<sup>[6]</sup>

## Related Problems

### Complications

Campylobacter infection can also cause illness outside the gut. Most notably it can cause a reactive arthritis called Reiters syndrome, and the bacterium can spread from the gut to the brain (meningitis) or the lining of the heart (endocarditis).<sup>[7]</sup>

Infection with Campylobacter bacterium is also the most common cause of an illness of the nerves and muscles called Guillain-Barré syndrome (GBS). According to data from the Centers for Disease Control and Prevention (CDC), it can occur in about 1 person in every 1,000 who has Campylobacteriosis. This rare condition develops from 2 to 4 weeks after Campylobacter infection and usually after diarrheal symptoms have disappeared. People with GBS suffer from increasing paralysis of the limbs which lasts for several weeks. In more severe cases, they can develop breathing problems requiring very long hospital stays.<sup>[8]</sup>

In the developed world, death from Campylobacteriosis is rare. In the United States there are about 100 fatal cases each year. These are usually cases in people who are very young, very old, or who have a weakened immune system.

## Research

Basic research is helping scientists to better understand how microbes that are spread by contaminated food or water cause disease in humans. Researchers are studying the bacterial genes that help pathogens (germs) establish themselves in the human body and cause disease. For example, scientists have identified genes that appear to be involved in signaling certain immune system cells to cause inflammation and may contribute to the development of diarrhea in Campylobacteriosis. Other research focuses on methods by which the organism grows and interacts in cells. Scientists have discovered that some intestinal bacteria recognize when they are in a human and respond by activating a particular set of powerful genes that enable the organism to live in the body and cause disease. Future studies will define new ways to intervene, whether by prevention or treatment, in the disease process. More research is also being carried out to find newer antibiotics that are effective against resistant Campylobacter.

## Epidemiology

According to the CDC, *Campylobacter jejuni* is the leading cause of bacterial diarrheal illness in the United States, affecting about 2.4 million people every year. In addition, these bacteria cause between 5% and 14% of all diarrheal illness worldwide. *C. jejuni* primarily affects children less than 5 years old and young adults 15 to 29 years old. All age groups, however, are at risk from catching Campylobacter from contaminated food or water. The illness tends to be more severe in the very young, the elderly and those with weakened immune systems.

## Incidence

U.S. health care providers report more than 10,000 cases to the CDC yearly. CDC also estimates that about 100 people die of the disease each year. Although commonly called food poisoning, Campylobacteriosis is a food infection, requiring live bacteria to be ingested, in contrast to a food intoxication like botulism. Campylobacteriosis occurs much more frequently in the summer and early fall in the United States. In tropical parts of the world, the disease tends to occur more commonly during rainy months.

## Public Health

Goals of public health in the area of Campylobacteriosis include the following:

- Reduce the contamination of poultry and other meats with the bacterium.
- Reduce the development of Campylobacter resistant to antibiotics.
- Prevent the sale of raw milk.
- Educate the consumer on safe ways to handle food.

## References

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## External links

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