# Campylobacteriosis

This is a notifiable disease in the UK. See the **Notifiable Diseases** article for more detail.

## What is campylobacteriosis?

Campylobacteriosis is an infectious disease caused by bacteria of the genus *Campylobacter* and is the most common reported bacterial cause of infectious intestinal disease in England and Wales [1] .

## Pathogenesis [2] [3]

17 species and 6 subspecies exist, many of which are considered pathogenic to humans, causing enteric and extra-intestinal illnesses. Two species are responsible for most cases of enteric campylobacteriosis: *Campylobacter jejuni* and *Campylobacter coli*. They both produce a similar illness.

Campylobacteriosis is a zoonosis - that is, a disease transmitted to humans from animals or animal products.The usual route of campylobacteriosis transmission is foodborne, through eating undercooked meat and meat products. Other sources of *Campylobacter* spp. include raw or contaminated milk and contaminated water or ice. Some cases of campylobacteriosis occur following contact with contaminated water during recreational activities. There may be person-to-person transmission (faeco-oral route) with poor personal hygiene. Campylobacter enteritis outbreaks occasionally occur in nurseries and institutions.

97% of sporadic campylobacteriosis can be attributed to animals farmed for meat and poultry[4] . During 2007-2009 a UK-wide, three-year stratified randomised survey of UK chicken broiler flocks was conducted to estimate the prevalence of campylobacter-infected batches of birds at slaughter. Of thirty-seven abattoirs, 79·2% were found to be colonised with *Campylobacter* spp., the majority of isolates being *C. jejuni.* Previous partial depopulation of the flock, slaughter in the summer months or autumn months, increasing bird age and higher recent mortality level in the flock were all identified as significant risk factors for *Campylobacter* spp. colonisation of the birds at slaughter. Time in transit to the slaughterhouse of more than 2·5 hours was identified as a protective factor[5] .

The incubation period of campylobacteriosis can be between 1 and 11 days but is usually 2-5 days. There is limited information on the period of infectiousness but patients are probably not infectious if treated and diarrhoea has resolved.

## Campylobacteriosis epidemiology[3]

*Campylobacter* spp. is the most commonly reported bacterial gastrointestinal (GI) pathogen. *Campylobacter* spp. reporting showed a marginal overall increasing trend from 2015 to 2019, with a peak in reporting of 102.3 cases per 100,000 population in 2018[6] .

Campylobacteriosis has increased particularly in the older population and incidence has reduced in infants and children. A number of factors could contribute to these increased numbers - eg, an ageing population, increased travel, more eating out, changes in health-seeking behaviour[7] . One study suggests that the rise is in fact an artefact caused by more stool samples being taken from older people[8] .

### Risk factors

- Undercooked meat, especially poultry.
- Pets with diarrhoea.
- Raw and inadequately pasteurised milk.
- Contaminated water supplies.
- Occupational exposure when processing poultry in abattoirs.

- Traveller's diarrhoea, particularly in Southeast Asia.

# Campylobacteriosis symptoms

### History

- The incubation period of campylobacteriosis can be from 1 to 11 days but is usually 2 to 5 days.
- There is a prodromal illness of fever, headache and myalgia lasting up to 24 hours. The fever may be as high as 40°C and, whether high or low, may persist for a week.
- There are abdominal pains and cramps and profuse diarrhoea with up to 10 stools a day. The stool is watery and often bloody.
- There may be localised tenderness.
- There may be tenesmus.
- In some cases, campylobacteriosis symptoms are mild.

### Examination

- The person often looks ill.
- Temperature may be high or low but pyrexia is present in the majority.
- The abdomen is diffusely tender; however, tenderness may be more localised as right iliac fossa pain or left iliac fossa pain.

Assessment for dehydration is covered in the separate Gastroenteritis in Adults and Older Children and Gastroenteritis in Children articles.

# Investigations

A sample of faeces sent for culture will usually isolate *Campylobacter* spp.. A stool culture is not always necessary. It is advisable to send a stool culture for a person with diarrhoea if [9] :

- When the clinician requires a microbiological diagnosis:
    - When there is persistent diarrhoea/malabsorption.
    - When there is blood, mucus or pus in the stool.
    - When there is a history of diarrhoea and/or vomiting, and the patient is systemically unwell.
    - When there is a history of recent hospitalisation or for inpatients as soon as infective diarrhoea is suspected.
    - When there is a history of antibiotic therapy.
- When a public health situation requires sampling to be carried out. For example:
- When investigating outbreaks of diarrhoea and/or vomiting in contacts of patients infected with organisms such as STEC (including O157) or *S. Typhi*:
    - When there is a suspected public health hazard (for example, if a patient with diarrhoea is a food handler).
    - Where a patient requires microbiological clearance for their occupation following past infection or contact with a case of gastrointestinal infection.
    - When an outbreak is suspected (eg, petting farm, swimming pool).
- When the patient is immunocompromised.
- When the patient has travelled within 14 days of symptoms onset.

When sending a stool sample include the following information[9] :

- Specimen date and time of collection.
- Acute/outbreak case.
- Immune status.
- Healthcare or community acquired. If patient is hospitalised, date of admission and date of symptom onset should be included.
- Recent overseas travel including location and dates.

- Recreational/untreated water exposure.
- Farm animal exposure/animal contact.
- Food intake, for example shellfish and chicken.
- Recent antibiotic use.
- Other relevant information such as suspected food poisoning, contact with cases, food handler and occupation.

Where food poisoning with *Campylobacter* spp. is confirmed, the local health protection team should be notified [10] .

In more severe illness, U&E and creatinine may show evidence of dehydration.

## Differential diagnosis

- Other infections - for example:
    - Escherichia coli
    - Salmonella
    - Shigella
    - Amoebic dysentery
    - Listeria monocytogenes
- Appendicitis.
- Inflammatory bowel disease.
- Pseudomembranous enterocolitis secondary to Clostridium difficile.
- Intussusception in infants.

## Campylobacteriosis treatment and management [1]

The basis of management is rehydration. Assess for features of rehydration or shock and, where present, consider hospital admission. This is not usually required for campylobacteriosis.

### Rehydration

This can usually be achieved by the oral route but, in more severe cases of campylobacteriosis, intravenous fluids may be needed. Age-specific information on advice regarding rehydration is covered in the separate Gastroenteritis in Adults and Older Children and Gastroenteritis in Children articles.

### Antimotility medication

These should not be used routinely but may be occasionally considered for adults:

- Who need to return to work or attend a special event.
- Who have difficulty reaching the toilet quickly.
- Who need to travel.

When used, loperamide is the antimotility agent of choice. It should not be used if features suggest a possible differential diagnosis of:

- Dysentery
- *E. coli* 0157
- Shigella
- Inflammatory bowel disease
- Pseudomembranous colitis

### Antibiotics

Antibiotic treatment is not usually required for campylobacteriosis, as most cases are self-limiting.

If:

- Symptoms are severe - high fever, blood in stools or more than eight stools per day.
- There is immune compromise.
- Symptoms are worsening.
- Diarrhoea has lasted for more than a week.

Consider early prescribing with clarithromycin 250-500 mg twice daily for 5-7 days, within three days of onset of illness.

Antibiotic resistance is known to be increasing [11] .

Lactobacilli and probiotics may have a place in the prevention and treatment of campylobacteriosis and other forms of gastroenteritis. Further studies are needed before recommendations may be made. See the separate Probiotics and Prebiotics article.

### Preventing spread of infection

For work or school the exclusion period should be 48 hours from the last episode of diarrhoea.

Advise about other hygiene methods to help prevent spread such as:

- Meticulous attention to hand-washing (after going to the toilet, before preparing meals or eating, after assisting a child or elderly person clean themself following diarrhoea, etc).
- Not sharing towels and flannels.
- Washing soiled bed linen and clothes at 60°C or higher.
- Cleaning and disinfecting toilet seats, flush handles, taps and bathroom door handles regularly

## Complications [1]

- Dehydration and electrolyte disturbance may occur. Occasionally where not rectified, this can have fatal consequences. Infants, the elderly and those with immunological compromise are more likely to have more severe disease and to require admission to hospital for rehydration. Pregnant women are also more at risk of dehydration.
- Unusual complications include haemolytic uraemic syndrome and thrombotic thrombocytopenic purpura.
- Other rare complications include Guillain-Barré syndrome and reactive arthritis.
- Toxic megacolon is a rare but serious complication.

- Acute bacterial gastroenteritis has been linked with the onset of irritable bowel syndrome (IBS) symptoms in approximately 15% of patients [12] . These cases have been called postinfectious IBS. *Campylobacter* spp. is commonly associated with postinfectious IBS, as are *E. coli* O157, *Salmonella* spp. and *Shigella* spp.
- Severe diarrhoea may interfere with absorption of regular medication required for control of chronic disease.

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## Prognosis

The campylobacteriosis is usually self-limiting. Occasionally, death may occur from dehydration in the elderly and vulnerable, especially if immunocompromised. *C. jejuni* can produce bacteraemic illness in people with AIDS.

## Campylobacteriosis prevention

Prevention requires measures at all stages of the food chain, from agricultural production to domestic preparation of food. National strategies include ongoing research, reduction of *Campylobacter* spp. prevalence at the food source, reduction of cross-contamination with other food products, control of imported sources, water treatment, etc.

Heating by cooking destroys *Campylobacter* spp., so at a domestic level adequate cooking of meat (particularly poultry) prevents infection. Uncooked meats should be kept separately from cooked and ready-to-eat foods in order to avoid cross-contamination. Hands should be washed after handling raw meat.

Other precautions the general public can take include:

- Milk should be pasteurised and drinking water chlorinated. When travelling to areas where tap water has not been treated to make it safe to drink, water should be boiled and/or sterilised. Ice cubes made from tap water should be avoided, as should salad washed in tap water.
- Those who are ill should not prepare or handle food.

- Cutting boards for cooked and uncooked meats and knives and other utensils must be kept apart.
- Hands should be washed before handling different food items, before eating or drinking, after going to the toilet and also after contact with animals, particularly pets and their bedding.
- Infected healthcare workers should not work. Antibiotics may reduce spread by curtailing the duration of excretion.

## Further reading


- Ty M, Taha-Abdelaziz K, Demey V, et al; Performance of distinct microbial based solutions in a Campylobacter infection challenge model in poultry. Anim Microbiome. 2022 Jan 3;4(1):2. doi: 10.1186/s42523-021-00157-6.
- Merrick B, Tamilarasan AG, Luber R, et al; Recurrent Campylobacter jejuni Infection in an Immunodeficient Patient Treated with Repeated Faecal Microbiota Transplant (FMT)-A Case Report. Infect Dis Rep. 2022 Jan 12;14(1):56-62. doi: 10.3390/idr14010007.





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