



# Clostridium difficile “C. difficle” infection (CDI)

## C. Difficile Infection (CDI) Overview

Diarrhea is a frequent side effect of antibiotics, occurring 10–20% of the time. It usually gets better when the antibiotics are stopped. *Clostridium difficile* infection (CDI) is due to a toxin-producing bacteria that causes a more severe form of antibiotic associated diarrhea. The disease ranges from mild diarrhea to severe colon inflammation that can even be fatal. CDI usually occurs when people have taken antibiotics that change the normal colon bacteria allowing the *C. difficile* bacteria to grow and produce its toxins. Since 2000, there has been a dramatic increase in the number and severity of cases of *C. difficile* infection (CDI) in the US, Canada and other countries. *C. difficile* is a gram positive bacterium. This bacterium is everywhere in the environment, and produces spores that are hard to get rid of. *C. difficile* produces two main toxins - toxins A and B - that cause inflammation in the colon.

## Risk Factors

The major risk factor for CDI is taking antibiotics in the previous several weeks, but sometimes it occurs even without prior antibiotic use. High-risk antibiotics are clindamycin, cephalosporins, and quinolones (i.e. ciprofloxacin, levofloxacin). Major risk factors are older age, weakened immune system, having other illnesses, and being in a hospital or a long-term care facility. However, even healthy individuals who have not had antibiotics can develop CDI. Patients with inflammatory bowel disease (Crohn’s disease or ulcerative colitis) are more likely to get CDI, and may be sicker than patients with IBD alone or CDI alone. Many studies have also suggested that use of acid suppressive medications (proton pump inhibitors) may increase the risk of CDI. Individuals can pick up *C. difficile* by ingesting spores that are all around in the environment, especially in hospitals. Infected individuals excrete spores, and transmission among patients in hospital has been well documented.

## Symptoms

Symptoms of CDI can vary. Diarrhea is the most common symptom; it is usually watery and, rarely, bloody, and may be associated with crampy abdominal pain. Associated symptoms are feeling poorly, fever, nausea, and vomiting. Signs of severe disease include fever and abdominal distension and/or tenderness.

## Screening/Diagnosis

The diagnosis of *C. difficile* should be considered in patients with new and unexplained diarrhea occurring more than 3 times per day. The diagnosis is confirmed based on stool testing. There are several stool tests that can be used to diagnose *C. difficile* infections. The following 3 tests are commonly used: GDH, Toxin EIA and Toxin B PCR. It is now recommended that a 2 step testing algorithm be used to confirm the diagnosis of *C. difficile*, where GDH or Toxin B PCR is used as a screening test and the Toxin EIA is used to confirm the diagnosis. Your physician can order these tests at most commercial labs.

## Treatment

First, it would be ideal to stop the antibiotic that led to the infection in the first place. This may not always be possible, however, as some infections, like severe bone or heart infections, need long-term antibiotics. Treatment for *C. difficile* is based on the severity of the infection. The current guidelines separate *C. difficile* infection into 3 categories: non-severe, severe and fulminant. Non-severe infections are usually treated in the outpatient setting. The standard of care treatment is vancomycin 125mg, four times a day for ten days or fidaxomicin 200mg, twice a day for ten days. The vast majority of patients will have resolution of symptoms after appropriate treatment. If diarrhea does not improve with appropriate antibiotics, an alternative diagnosis for diarrhea should be considered. Antidiarrheal drugs are not recommended to treat *C. difficile* infection and should only be used in consultation with your physician.

Severe infections are diagnosed based on laboratory data including elevated white blood cell count (>15,000) and worsening kidney function (Creatinine >1.5). These patients are typically very sick with fever, abdominal pain, tenderness and dehydration and are often hospitalized. Similar to non-severe infections, patients with severe *C. difficile* infection should be treated with vancomycin 125mg, four times per day for 10 days or fidaxomicin 200mg, twice a day for ten days.

Fulminant infections are defined by the presence of shock, low blood pressure, or toxic megacolon. Toxic megacolon is where the large intestine is dilated and at risk of perforating. These patients are at high risk of dying from their infection. Treatment includes higher doses of vancomycin 500mg four times per day. These patients often require intensive care monitoring and consultation with a surgeon as surgery to remove the colon may be needed to save the person’s life.

While antibiotics are effective in treating most cases of CDI, the symptoms recur after the end of treatment in 10-20% of cases. This is called recurrent CDI and usually occurs 1–2 weeks after stopping treatment. After a recurrence, the chance of further recurrences goes up to 40-60%, perhaps because one is using an antibiotic to treat a disease caused by antibiotics. We presume that the normal colonic bacteria have not had a chance to recolonize. Current recommendations for the treatment of recurrent CDI include a vancomycin taper over six to eight weeks or fidaxomicin for ten days. Bezlotuxumab is a recently approved drug to prevent recurrent infections and is given as a one-time IV infusion during a course of antibiotics for CDI. The most effective treatment, however, is [fecal microbiota transplant](#) (FMT). FMT is typically administered via colonoscopy where stool from a healthy donor is instilled into the colon of a patient with recurrent CDI. In studies, it has been effective in over 90% of patients who received the treatment, and has been proven effective with several randomized controlled trials. There are ongoing clinical trials using oral encapsulated forms of FMT, which are the future of this “drug.”

## Prevention

Wise antibiotic policies, by using narrow-spectrum agents when directed and avoiding unnecessary use of broad-spectrum antibiotics, are key in the prevention of CDI. Environmental cleaning is important – especially hand washing with soap and water, since alcohol gels do not inactivate spores. In hospitals, everyone entering the room of a patient with CDI should wear a gown, gloves, and use disposable equipment.

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## ACG Clinical Guidelines: Prevention, Diagnosis, and Treatment of *Clostridioides difficile*

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