

Clostridium difficile Colitis

Clostridium difficile (or ***C. diff***) is a gram-positive, spore-forming bacteria that converts to a vegetative form in the colon. Some bacteria can exist in a spore form or a vegetative form. The vegetative form is the state where the bacterial cell can grow, divide, and form more spores. Normally *C. difficile* is non-invasive. In fact, it is suspected that *C. diff* is found in the colons of 2-5% of the healthy adult population. However, the gut flora of humans tends to prevent extensive germination of *C. diff* spores and the resulting extensive invasion of *C. diff* colonies. Some humans have *C. diff* bacteria that have germinated to form some bacterial colonies, but infection and symptoms do not occur. This is likely due to the ability of a person's normal gut flora and immune system to keep the bacteria in check.

If *C. diff* colonies invade the gut and are not kept in check, then *C. difficile* colitis can develop. This occurs because *C. diff* bacteria produce several toxins. Two of the most well-known toxins are called toxin A and toxin B. These toxins work together to target enterocytes and lead to their death while also stimulating a massive inflammatory response. Over time, this inflammatory response can produce symptoms of watery diarrhea, abdominal cramping and pain, fever, blood or pus in the stool, dehydration, and loss of appetite. Another characteristic found with the most serious forms of *C. difficile* colitis is pseudomembranous colitis due to the severe inflammatory response. Pseudomembranous colitis is so named because of the appearance of a "membrane" of inflammatory cells, fibrin, and necrosis that can cover the luminal surface of the colon. This membrane is yellowish in color and appears like converging plaques.

C. difficile colitis develops in most cases after heavy antibiotic use that disrupted the protective normal flora of the colon. This disruption allows colonization, growth, and development of *C. diff* colonies in the colon. *C. difficile* infections have started to become a major problem as the use of broad spectrum antibiotics has increased. Other factors like gastrointestinal surgery, prolonged stay at a healthcare facility, serious underlying diseases, immunocompromising conditions, and aging can also lead to *C. difficile* colitis.

Two important diagnostic findings that are consistent with a *C. difficile* infection include a history of antibiotic use and lab tests that confirm *C. difficile* toxins in the stool. *C. difficile* is transmitted from person to person through the fecal/oral route. When in contact with patients with *C. difficile* infections, it is very important to adhere to contact isolation precautions. These precautions are used for infections, diseases, or germs that are spread by touching the patient or items in the room. Healthcare workers should always wear a gown and gloves while in the patient's room.

The first important step in the treatment of *C. difficile* is immediate discontinuation of the antibiotics that the patient is on. However, if symptoms are severe, **metronidazole** and **vancomycin** are two antibiotics that may be used to try and eradicate the *C. difficile*. Vancomycin is the primary antibiotic treatment for *C. difficile* because it is not absorbed very well by the gut, so its effects are more localized to the colon. This antibiotic works by disrupting bacterial cell wall synthesis. Metronidazole disrupts the synthesis of genetic material in anaerobic bacteria, but is readily absorbed by the gut and is thus less effective in treating the gut-localized *C. difficile*.

Another possible option for treating recurrent *C. difficile* infections is a fecal transplant. This procedure is performed by transferring the stool of a healthy donor into the gastrointestinal tracts of the patient. Its purpose is to restore normal gut flora that can then compete with the *C. diff*. The following link discusses this curious treatment more:

<https://books.byui.edu/-zNs>



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