



The Lowdown on *Clostridium difficile*

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Recent media attention around *Clostridium difficile*-associated disease makes it an ideal subject for the first **Bug of the Month**, a new feature which will highlight topical information on infection-related issues.

Clostridium difficile is a gram-positive, anaerobic bacterium, which produces spores. The spores act as an ideal means for the bacteria to spread from person to person, usually on the unwashed hands of caregivers, patients, or contaminated equipment. When swallowed, the spores germinate in the patient's bowel. Clinical features of *C. difficile* infection are broad, including:

- asymptomatic carriage of *C. difficile*,
- simple antibiotic-associated diarrhea,
- *C. difficile* colitis without pseudomembrane formation,
- pseudomembranous colitis (PMC),
- fulminant colitis, and
- relapsing infection.

The main concern surrounding *C. difficile* is its ability to spread easily from one person to another, leading to a number of serious conditions. Up to 25% of diarrhea in hospitalized patients is due to *C. difficile*.

It is important to note that *C. difficile* can occur in any person, either hospitalized or in the community, who receives antibiotic

therapy, regardless of the agent. There have been countless reports of people developing *C. difficile* disease after receiving a single dose of an antibiotic.

What are the risk factors?

Some patients develop relatively minor illness, while others develop severe *C. difficile*-related disease. This may be due in part to the patient's physical condition; those who are weakened by underlying factors, such as chronic kidney failure or chemotherapy, may have more severe symptoms. Receiving antibiotics is the major risk factor for *C. difficile*-associated disease. Healthy people are rarely at risk.

When does *C. difficile* diarrhea develop?

Some people may be carriers of *C. difficile* and never develop symptoms. In those who develop diarrhea, it usually occurs four to nine days after starting antibiotic therapy. However, some may not develop symptoms

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until six to eight weeks after the antibiotics are discontinued.

What is PMC?

A pseudomembrane is made of fibrin, bowel epithelial cells, and inflammatory cells. When the bowel is examined on endoscopy, PMC looks like raised yellow/white plaques that may be as large as 2 cm. *C. difficile* causes nearly all cases of PMC. Patients can present with nausea, vomiting, diarrhea, fever, and abdominal pain. Some patients

Fifteen to 35% of patients relapse after successful treatment for *C. difficile* diarrhea or colitis.

may develop a very serious condition called toxic megacolon. This requires immediate medical attention.

How are *C. difficile* diarrhea and colitis diagnosed?

Guidelines on diagnosing and managing *C. difficile*-associated diarrhea and colitis, created by the American College of Gastroenterology, are presented in Table 1.

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Table 1

American College of Gastroenterology guidelines for diagnosing *C. difficile* and colitis

- Suspect the diagnosis of *C. difficile* diarrhea in anyone who has been hospitalized for 72 hours and has new onset diarrhea and/or who has received antibiotics within the previous two months and developed diarrhea.
- A single diarrheal stool specimen should be sent to the microbiology lab to determine whether *C. difficile* toxins are present.
- If the results of toxin testing are negative, and diarrhea persists, one or two additional stools may be sent to the laboratory for the same, or a different, test for toxin.
- Endoscopy may be necessary when all other test results have been negative and the patient's diarrhea persists.

How is *C. difficile* diarrhea treated?

If possible, discontinue all antibiotics. When the diagnosis of *C. difficile* diarrhea is confirmed, oral metronidazole is the antibiotic of choice (250 mg, orally, four times daily, or 500 mg, orally, three times daily, for 10 days). An improvement of diarrhea is usually seen within two to three days, with complete resolution in seven to 10 days.

Oral vancomycin use for the treatment of *C. difficile* diarrhea or colitis is avoided because the drug will encourage the evolution and spread of vancomycin-resistant enterococci. If vancomycin is used, it must be given orally because therapeutic levels are not achieved when the medication is administered intravenously. If patients are too sick for oral medication, metronidazole may be given intravenously.

What if a patient relapses?

This is a difficult problem that is being faced across the country. Relapses occur in 15% to 35% of patients after successful treatment for *C. difficile* diarrhea or colitis. In these cases, the patient should be re-treated for another 10 days with oral metronidazole. There are no clear guidelines for the use of vancomycin.

While *C. difficile* remains susceptible to metronidazole, post-treatment relapses have been reported. Frequently, this represents either spores that are re-ingested from the environment, or spores which germinate in the bowel after treatment.

What about prevention?

Table 2 outlines recommended prevention techniques. [CME](#)

Table 2

Steps to prevent *C. difficile* diarrhea

- Use antibiotics only when absolutely necessary.
- Wash hands after all patient contacts.
- Wear gloves if contact with infectious material or contaminated equipment is anticipated.
- All contaminated, or possibly contaminated, equipment and rooms must be cleaned with an approved disinfectant.
- Avoid sharing potentially contaminated equipment between those suspected or confirmed to have *C. difficile*-associated disease (*i.e.*, rectal thermometers and commode chairs).