

## ***Clostridium difficile* antibiotic-associated diarrhea**

Antibiotic-associated diarrhea is diarrhea that develops in someone who has recently or is currently taking antibiotics. Diarrhea can occur as a common side-effect of antibiotics such as amoxicillin-clavulanate (Augmentin®) and the diarrhea resolves when the antibiotic is stopped. However when the bacterium, *Clostridium difficile*, is the cause of the diarrhea, it is a more serious problem. The type of *C. difficile* circulating in the United States today produces such a powerful toxin that it can cause a truly deadly diarrhea.

According to recent data released by the Centers for Disease Control and Prevention (CDC), *Clostridium difficile* caused nearly half a million infections and was associated with about 29,000 deaths in 2011.

### **What is Clostridium difficile?**

*C. difficile* is a bacterium that can infect the colon and cause colitis which is an inflammation of the colon. Our intestinal tracts contain millions of bacteria. This is referred to as “normal flora” which has a role in protecting the body from infection. Some *C. difficile* bacteria and spores can be found in the colon at any time however it is not bothersome until the other bacteria that are also “colonizing” the colon become reduced in numbers. When antibiotics kill those good bacteria in the colon, *C. difficile* multiplies and releases toxins that damage the cells lining the intestine thus causing an infection.

*C. difficile* can also be found as spores on the surfaces of tables, door knobs, counters, etc. especially in hospitals. It can be spread from person to person via contact with contaminated objects or by hand to hand contact.

*C. difficile* infections are becoming more frequent, more severe, more difficult to treat, and more likely to recur after treatment. It has become more common to see these infections in the community rather than predominantly in hospitalized patients.

### **Risk factors**

Risk factors for becoming infected with *C. difficile* include:

1. Current or recent antibiotic use - especially broad-spectrum antibiotics (those that cover a large number of different bacteria) such as Levaquin and Clindamycin.
2. Current or recent hospitalization
3. Older age
4. Severe illness which causes a weakened immune system
5. Recent infection with *C. difficile* as this infection can recur after stopping treatment

## Symptoms

Some people (called carriers) shed the bacteria in their feces but have no signs or symptoms of the infection but can still spread it to others. Usual symptoms of mild infection include:

1. Watery diarrhea (runny or watery bowel movements, 3 or more times daily for 2 or more days)
2. Abdominal cramping

With more severe infections, symptoms can include:

1. Abdominal tenderness and pain
2. Blood or pus in bowel movements
3. Fever
4. Nausea
5. Loss of appetite
6. Dehydration

Life-threatening complications can develop. Signs and symptoms of severe infection include abdominal distention, severe lower abdominal pain, fever usually over 101°F and profuse diarrhea. Sepsis, organ failure, and death can occur especially in rare cases of bowel rupture.

## Diagnosis

The diagnosis is made by testing a sample of stool. The stool must be brought to the lab within an hour of collecting the sample. There are a few different tests that can be done to confirm that *C. difficile* is present.

## Treatment

Oral antibiotics, metronidazole or Vancomycin, are used to treat the infection. Studies have shown that probiotics can reduce the risk of antibiotic-associated diarrhea in general but their ability to prevent *C. difficile* infection is not yet known and they are not recommended for use at this time.

For severe infections and illness, hospitalization and the use of intravenous fluids may be necessary.

## Prevention

Antibiotics should only be taken when absolutely warranted. They should not be taken for viral infections. Their heavy use is a significant factor in the number of *C. difficile* cases seen today.

Anyone who develops diarrhea while receiving antibiotics should be tested for *C. difficile*. Also, if someone develops severe diarrhea within months of taking antibiotics, testing for *C. difficile* should be considered.

Washing hands frequently with soap and water with vigorous scrubbing and rinsing is the best way to prevent spread of the infection though this may be insufficient. Therefore gloves and gowns should always be worn when caring for someone with *C. difficile*. Alcohol-based hand rubs do not prevent the spread of *C. difficile* as they do not eradicate the spores which are how the infection is spread.

Hospitalized patients are placed on contact precautions which means that gloves and gowns are put on prior to entering the patient's room and removed when leaving the room.

Environmental cleaning is important as *C. difficile* spores can survive on dry surfaces for up to several months and resist being killed by standard cleaners. A mixture of one part bleach to ten parts water should be used to help prevent the spread of infection.