



Small Doses.....

by

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C-diff

Clostridium difficile, (usually referred to as *C diff*) is a bacterium that can cause symptoms ranging from diarrhea to life-threatening inflammation of the colon. Illness from *C diff* most commonly affects older adults in hospitals or in long term care facilities and typically occurs after use of antibiotics. In fact, more than 90% of cases happen after antibiotic use, when the healthy flora of the gut are destroyed and *C diff* can proliferate. In recent years, *C diff* infections have become more frequent, more severe and more difficult to treat. A study of 28 hospitals in the southeast published earlier this year demonstrated that *C diff* infections were 25% more common than methicillin-resistant *Staphylococcus aureus* (MRSA). Nationwide, rates of MRSA infections have been falling as hospitals have increased infection control efforts. In contrast, *C diff* infections in hospitals have doubled between 1996 and 2003.

According to the Centers for Disease Control and Prevention (CDC), more than 28,000 people die of *C diff* each year. The breakdown is:

- Hospital-acquired, hospital-onset cases: 165,000 patients, 9,000 deaths
- Hospital-acquired, post-discharge (up to 4 weeks): 50,000 patients, 3,000 deaths
- Nursing home-onset cases: 263,000 patients, 16,500 deaths.

Mild *C diff* disease starts with mild to moderate diarrhea with no blood in the stool. Sometimes there's cramping in the lower abdomen. Severe *C diff* disease starts with profuse watery diarrhea and abdominal pain. Patients often have fever, nausea, and dehydration. There may be a little blood in the stool, but very bloody stool is rare. These symptoms usually signal colitis. The diarrhea stopping does not necessarily mean the situation is improving. It may signal the development of toxic megacolon. Most patients that develop toxic megacolon need surgery; and 32% to 50% of patients who undergo surgery for *C diff* disease die.

Patients that develop early symptoms of *C diff* infection should seek immediate medical attention. Mild *C diff* disease can progress quickly to severe disease.

Relapse is common after *C diff* infection. 12% to 24% of patients develop a second episode of *C diff* disease within two months. Patients who have two or more relapses have a 50% to 65% chance of yet another recurrence.

C diff is expensive to treat. Each case of hospital-acquired *C diff* is estimated to cost between \$4,000 and \$9,000. *C diff* is especially difficult to stop because in addition to being a bacterium,

it can exist in a dormant spore form, which can survive for weeks or months on hard surfaces. Alcohol-based hand foams that are commonly used in hospitals don't kill the spores, nor does soap and water hand washing.

There are many different *C diff* strains circulating in the US. But since 2000, one of these strains has gone from one only seen occasionally to the most frequently isolated *C diff* strain. CDC calls this strain NAP1 (referring to its genetic fingerprint). In Europe and Canada, it's often called the 027 or BI strain. The NAP1 strain of *C diff* took off shortly after it acquired resistance to fluoroquinolone antibiotics. There's also some evidence it may also have acquired some resistance to metronidazole (Flagyl^R) and vancomycin.

Antibiotic resistance isn't the only worrisome thing about the NAP1 strain. *C diff* normally makes two toxins. The NAP1 strain makes 16 times more toxin A and 23 times more toxin B than other strains of *C diff*. And most importantly, there's evidence it causes more severe disease than other strains. To date, the NAP1 strain has been reported in 37 states.

Doctors will almost always treat *C diff* infections with antibiotics. Metronidazole (Flagyl^R) is the first-line treatment of choice for mild disease. Vancomycin is usually reserved for moderate or severe disease. There is evidence that treatment with probiotics makes antibiotic treatment more effective and prevents relapse. *Saccharomyces boulardii* appears to be particularly effective, although good results have been seen with *Lactobacillus* species as well.

C diff infections are preventable. There are two main means of prevention:

- Hand washing. Frequent and careful hand washing can keep *C diff* spores from spreading.
- Judicious use of antibiotics. Most respiratory infections are caused by viruses, so don't demand antibiotics from your doctor every time you get the sniffles or a cough.

Please sign and date for pharmacy nursing in-service.

Sign

Date