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## Is Re-emerging Superbug The Next MRSA?

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"She lost almost 55 pounds between July Fourth and Christmas in 2006," said Corboy, a resident of Wilmette. "She was so sick, so weak and despite the best care of her doctors, she was getting weaker. It was clear she was in big trouble."

Afraid that his mother was running out of time, Corboy called the Centers for Disease Control in Atlanta for advice. Dr. Clifford McDonald told him the infection his mother probably had was of the NAP1 type of the bacteria *Clostridium difficile*, a virulent strain of a common intestinal bacteria currently plaguing hospitals that now rivals the superbug Methicillin-resistant staphylococcus aureus (MRSA) as one of the top emerging disease threats to humans.

"Disease caused by *Clostridium difficile* can range from nuisance diarrhea to life-threatening colitis that could lead to the surgical removal of the colon, and even death," said Dr. Stuart Johnson, associate professor of medicine, division of infectious diseases, Loyola University Chicago Stritch School of Medicine. "It's a very hardy strain and it seems to persist."

C-diff, as it is better known, is a bacterium that was discovered in 1978 to be the cause of antibiotic-associated diarrhea and colitis, said Johnson, one of the world's top C-diff researchers and physicians, and who successfully treated Joan Corboy's infection. Although C-diff sickens about 500,000 Americans a year and has reached epidemic proportions in 38 states including Illinois, most people have not yet heard of it.

"I don't think that people appreciate the urgency and severity of this disease," said Dr. Dale Gerding, professor of medicine, division of infectious diseases, Stritch School of Medicine, and associate chief of staff for Research, Hines VA Hospital. "In the past, it was thought to be a nuisance illness. Now it is a fatal illness and a lot of physicians have not figured that out as yet."

Hospitals in Quebec have been particularly hard hit by C-diff. In the 12 hospitals affected, about 2,000 deaths were directly attributable to the antibiotic resistant strain between the 2003 and 2004. In the United Kingdom, deaths from C-diff leaped by 28% in 2007 to more than 8,000, according to the nation's Department of Health.

"What was surprising was not just the rates, but the number of severe cases," said Johnson, who helped treat Joan Corboy's illness.

Similar to MRSA, C-diff is an infection that is mainly acquired in a hospital or nursing home, although like MRSA there is some evidence that a community-acquired strain may be developing, according to the CDC.

"When a patient is in the hospital getting antibiotics for some type of infection, one of the potential complications is that the normal bacterium that lives in the colon is disturbed with that antibiotic. That makes you susceptible to an infection with *Clostridium difficile*," Johnson said. "The great majority of cases occur in people who have recently used antibiotics."

When C-diff is not actively dividing, it forms very tough spores that can exist on surfaces for months and years, making it very difficult to kill, Johnson said.

"Antibiotics are very effective against the growing form of the bacteria but it doesn't do anything to the spores," Johnson said. "If there are spores they can sit around like stealth bombs. Once the antibiotic is gone, these spores can germinate again and spread their toxins."

Since its discovery, C-diff has grown increasingly resistant to antibiotics, according to Johnson and Gerding, who has been studying the bacteria since 1980. Though it is appearing more often in younger people, those 65 years and older face a greater risk of developing infection from C-diff and has more severe outcomes and

higher death rates. Relapse is common with about 25 percent of patient experiencing a second bout of disease within two months after their first. Patients who have had two or more episodes of disease have a 30 percent to 65 percent risk of another bout.

Symptoms of C-diff include profuse diarrhea and abdominal pain and distention of the abdomen. An infection is also frequently accompanied by fever, nausea and dehydration. In some rare cases blood may be present in the stool. The infection is spread by spores that contaminate the hospital environment and hands of healthcare workers who can transmit the spores to patients. The resistance of the spores to hospital cleaning agents and to alcohol hand disinfectants makes it extremely difficult to eradicate.

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