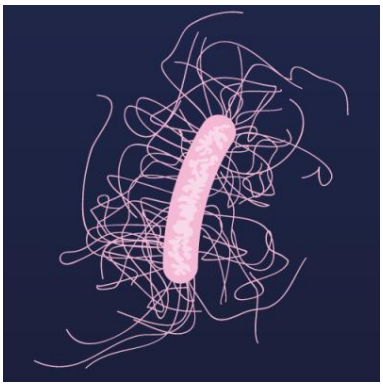
A Fresh Look at *C. Diff* Infection in the US

By the Water Quality and Health Council



Bacterial superbug "*C. diff*" infected nearly one-half million people in the US in 2011, causing inflammation of the colon and deadly diarrhea. The infection killed over 15,000, but was found associated with an estimated 29,000 deaths[1], according to a new study published in *The New England Journal of Medicine*.[2] The director of the Centers for Disease Control and Prevention (CDC), Dr.Tom Frieden, said the study underscores two critical strategies for controlling *C. diff*: smarter use of antibiotics and improved infection control in healthcare environments (see CDC Newsroom article).

C. diff, formally known as "*Clostridium difficile*," is the most common cause of health care-associated infections in the US. It is an antibiotic-resistant germ, which is how it earned its "Superbug status." Most patients infected with *C. diff*, say the study authors, "had either inpatient or outpatient health care exposures before disease onset." The authors note that a person's risk of *C. diff* infection increases with age, afflicting thousands of residents of US nursing homes every year. Additionally, one in five patients who are infected with *C. diff* experience at least one repeat infection. Not good news for our aging population.

According to *Web MD*, two things must happen for *C. diff* infection to occur:

- There must be a disturbance of the ecological balance of the colon's normal bacteria, and
- Spores of the bacterium must be ingested.

Smarter Use of Antibiotics

Antibiotics are prescribed to destroy disease-causing bacteria, but they also may destroy some of the normal, protective microorganisms present in the human gastrointestinal tract. Antibiotic resistant bacteria, such as *C. diff*, if ingested, may proliferate when gut bacteria are disturbed. CDC notes that people on antibiotics are 7-10 times more likely to develop *C. diff* infections. As we discussed in previous articles, excessive and unnecessary use of antibiotics exacerbates antimicrobial resistance.

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[1] Lessa et al. state that in 2011, 29,300 patients died within 30 days after being diagnosed with *C. diff*. These are *C.diff*-associated deaths. They also indicate that deaths attributed to *C. diff* infection directly are estimated at about 50% of this figure, or approximately 15,000.`

[2] Lessa, F.C. et al. (2015). "Burden of Clostridium difficile Infection in the United States," *The New England Journal of Medicine*, Feb. 26, 2015, On-line. Available: http://www.nejm.org/doi/full/10.1056/NEJMoa1408913

Improved Infection Control

C. diff forms hardy spores that can survive on dry surfaces *for months* according to *Web MD*. People infected with *C. diff* have millions of spores of the bacterium in their feces. Infection control in healthcare settings is critical to controlling *C. diff*, which can be transmitted via the fecal to oral route through improper hand washing and insufficient surface disinfection.

Among the CDC recommendations for controlling infection:

- ✓ Clean room surfaces with EPA-approved, spore-killing disinfectant (such as chlorine bleach)
- ✓ Wear gloves and gowns when assisting persons with *C. diff*
- ✓ Wash hands thoroughly and often when interacting with persons with *C. diff*
- ✓ Notify healthcare facilities when patients with *C. diff* are transferred from one facility to another so that proper precautions can be taken to avoid the spread of infection.

Introducing CARB

CDC is taking an aggressive approach to reducing *C. diff* and other antibiotic-resistant bacterial infections through its National Strategy to Combat Antibiotic Resistant Bacteria ("CARB"). The CARB program will work to:

1. *Slow the development of resistant bacteria and prevent the spread of resistant infections.*
2. *Strengthen national one-health surveillance efforts to combat resistance.*
3. *Advance development and use of rapid and innovative diagnostic tests for identification and characterization of resistant bacteria.*
4. *Improve international collaboration and capacities for antibiotic resistance prevention, surveillance, control and antibiotic research and development.*