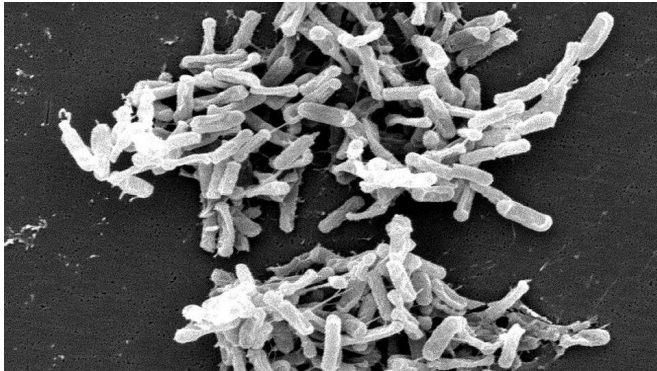


Stewardship program helps hospitals reduce antibiotic use and prevent bacterial infections

18 March 2021, by Michael E. Newman



Scanning electron micrograph of *Clostridioides difficile* bacteria. Johns Hopkins Medicine researchers have demonstrated that stewardship programs established and conducted at hospitals can help reduce the amount of antibiotics used without sacrificing prevention of infections by bacteria like *C. difficile*. Credit: U.S. Centers for Disease Control and Prevention

The overuse of antibiotics in hospitals can lead to the emergence of drug-resistant strains of bacteria or outbreaks of infections by bacteria such as *Clostridioides difficile*. Over the past decade, efforts to combat the overuse problem have included antibiotic stewardship programs (ASPs) that ensure patients only receive antibiotics when needed, and then, only in the correct amounts and for the prescribed dosage period. However, ASPs have not been established in all medical facilities, particularly smaller and rural hospitals where access to experts in the use of antibiotics may not be available.

Researchers at Johns Hopkins Medicine and NORC at the University of Chicago developed a comprehensive stewardship intervention, the Safety Program for Improving Antibiotic Use, which is applicable for all types of hospitals and enables

frontline clinicians to make informed and responsible decisions about prescribing antibiotics. In a recent study, the researchers evaluated the effectiveness of the [program](#) over a year's time at 402 hospitals across the nation—the largest project of its kind to date. As a measure of success, they looked at overall antibiotic use and *C. difficile* infection rates in the hospitals during the study period.

Their findings were published Feb. 26, 2021, in *JAMA Network Open*.

According to the U.S. Centers for Disease Control and Prevention, *C. difficile* is a bacterium that causes severe diarrhea and colitis (an inflammation of the colon), and is estimated to cause nearly 500,000 infections in the United States each year. Most cases occur in people taking antibiotics during or just after hospitalization. This is because antibiotics may destroy some of the intestinal bacteria that normally keep *C. difficile* at bay.

"The Safety Program for Improving Antibiotic Use was designed to reduce the harm associated with antibiotic overuse by making stewardship part of the decision-making process for clinicians," says study lead author Pranita Tamma, M.D., M.H.S., director of the Pediatric Antimicrobial Stewardship Program at Johns Hopkins Children's Center and associate professor of pediatrics at the Johns Hopkins University School of Medicine. "We wanted to see how much of a difference an ASP could make in a one-year period," she says.

The ASP used in the study consisted of 17 webinars—each repeated three times, as well as recorded for online viewing—over a 12-month timespan (January to December 2018). Conducted by Tamma and her colleague, Sara Cosgrove, M.D., M.S., professor of medicine at the Johns

Hopkins University School of Medicine, the webinars focused on how to establish and maintain an ASP at a [hospital](#), methods for improving teamwork and communication, and best practices for diagnosing and managing infections without overusing antibiotics.

Provided by Johns Hopkins University School of Medicine

Participants in the program received additional coaching and tools to enhance their ASP activities.

The 402 hospitals that completed the one-year study program included 28 academic medical centers, 122 mid-level teaching hospitals, 167 community hospitals and 85 critical access hospitals. Compliance with the four key components of antibiotic stewardship (interventions before and after prescribing of [antibiotics](#), availability of local antibiotic guidelines, ASP leads with dedicated salary support, and quarterly reporting of antibiotic use) improved from 8% to 74% overall during the 12 months. Antibiotic use (measured by days of antibiotic therapy per 1,000 patient days) decreased 30% and C. difficile infections decreased 20%.

"These results are particularly remarkable as a large proportion of the hospitals in the study were under-resourced and did not have access to infectious disease specialists," says Cosgrove. "They show that no matter their size, all hospitals can develop, establish and conduct good stewardship practices with the proper resources—and remind us of the importance of organized strategies to assist hospitals and clinicians in implementing medical care [best practices](#)."

Hospitals wanting more information can access the ["Toolkit Implementation Guide for Acute Care Antibiotic Stewardship Programs."](#)

More information: Pranita D. Tamma et al. Association of a Safety Program for Improving Antibiotic Use With Antibiotic Use and Hospital-Onset Clostridioides difficile Infection Rates Among US Hospitals, *JAMA Network Open* (2021). DOI: [10.1001/jamanetworkopen.2021.0235](https://doi.org/10.1001/jamanetworkopen.2021.0235)

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