

# Probiotics useful in the fight against infection prevention

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Probiotics may be a relatively safe, simple, and low-cost solution for preventing *Clostridium difficile* infections (CDI) in hospital settings, according to two studies published today in *Infection Control & Hospital Epidemiology*, the journal of the Society for Healthcare Epidemiology of America. Both studies show that treating patients who received antibiotics with multi-strain probiotics, cut down on CDI incidence rates over time.

"While it's not a perfect solution for a bacterium that has proven very difficult to prevent and treat, probiotics could offer patients another line of defense," said Bradley Johnston, PhD, associate professor of epidemiology at Dalhousie University in Canada and lead author of one of the studies. "We worked with clinical trialists from 12 countries that willingly shared their data with us to conduct what is known as an individual patient data meta-analysis and we demonstrated that we should be considering probiotics as a viable strategy for preventing CDI in patients."

The research led out of Dalhousie University in Canada conducted a synthesis of [randomized controlled trials](#) to determine whether probiotics reduced the odds of CDI in adults and children. It found that probiotics reduced the odds of CDI by about two-thirds in both their non-adjusted and adjusted models (adjusting for age, sex, hospitalization status, use of multiple antibiotics, and exposure to high-risk antibiotics). Additionally, they found that compared to no probiotics, multi-species probiotics were more beneficial than single-species probiotics.

This study analyzed 18 eligible randomized controlled trials that included [patient data](#) for 6,851 participants comparing probiotics to placebo or no treatment and that reported CDI as an outcome. Probiotics were especially effective among participants taking two or more antibiotics and in settings where the risk of CDI was greater than five percent.

A second project conducted by Cook County Health & Hospitals System at a separate tertiary care medical center, in which a single-center before-after quality improvement intervention was evaluated, found that probiotics provided a delayed benefit in reducing CDI. During the intervention period, there was a trend toward a lower incidence in CDI in the second six months, compared to the first six months. The authors speculate that the postponed benefit could be attributed to the time required for environmental contamination with spores of *C. difficile* to be brought under control.

"There is an expanding number of options to prevent or treat the often serious and costly infections caused by *C. difficile*," said William Trick, MD, a clinician at Cook County Health & Hospitals System and lead author of the study. "Probiotics are one option that is low cost, relatively safe, and likely beneficial in the long-run."

Trick and his team compared 12-month baseline and intervention periods. Patients in the study received capsules containing a three-strain [probiotic](#) mixture, to be taken within 12 hours of their antibiotics. The primary outcome of the study was the incidence of hospital-onset CDI among participants.

While this study showed the benefits of implementing probiotics as a strategy against CDI, it also highlighted the limitations in this approach. For instance, during a real-world quality improvement intervention, getting a probiotic agent to the right [patients](#) at the right time was challenging and led to incomplete use of the intervention. Also, the

beneficial results are unlikely to match those reported in randomized controlled trials (RCTs). It is critical that interventions are tested in routine practice settings to uncover implementation challenges and to evaluate the replicability of results from RCTs in different settings.

**More information:** William E. Trick, MD; Stephen Sokalski, DO; Stuart Johnson, MD; Kristen Bunnell, PharmD; Joseph Levato, PharmD; Michael Ray, MPH; Robert A. Weinstein, MD. Effectiveness of Probiotic for Primary Prevention of Clostridium difficile Infection: A Single Center Before-After Quality Improvement Intervention at a Tertiary Care Medical Center. Web (April 26, 2018).

Provided by Society for Healthcare Epidemiology of America

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