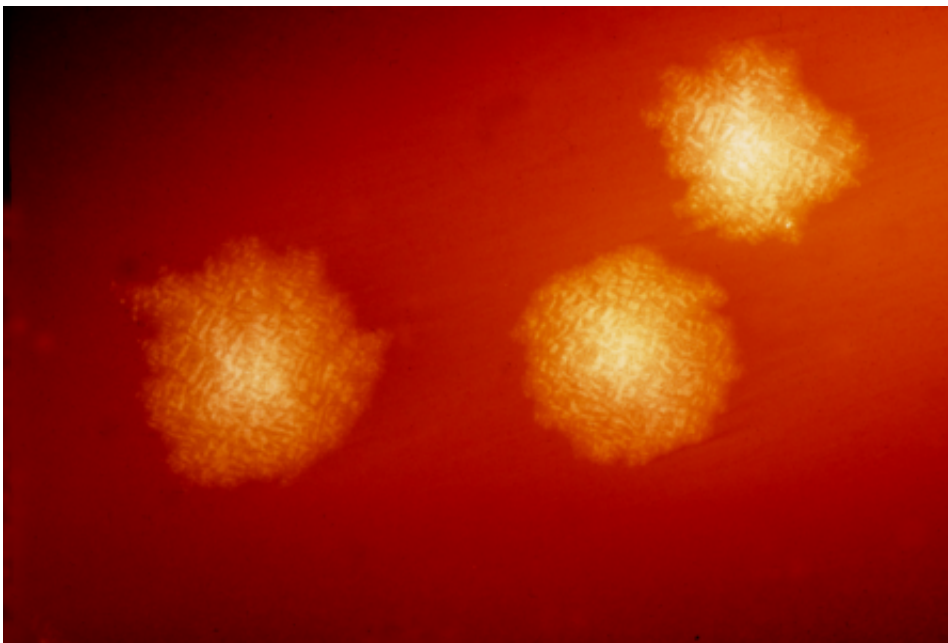


Does using same hospital bed as prior patient who received antibiotics increase risk of Clostridium?

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This photograph depicts *Clostridium difficile* colonies after 48hrs growth on a blood agar plate; Magnified 4.8X. *C. difficile*, an anaerobic gram-positive rod, is the most frequently identified cause of antibiotic-associated diarrhea (AAD). It accounts for approximately 15–25% of all episodes of AAD. Credit: CDC

Antibiotics are a risk factor for *Clostridium difficile* infection, the most common cause of diarrhea in the hospital that is responsible for about 27,000 deaths annually in the United States. Exposure to *C. difficile* is

common in hospitals because spores can persist in the environment for months. Antibiotics are one of many factors that increase a host's susceptibility to *C. difficile*.

In a new study published online by *JAMA Internal Medicine*, Daniel Freedberg, M.D., M.S., of the Columbia University Medical Center, New York, and coauthors examined whether the receipt of antibiotics by prior occupants of a hospital bed was associated with increased risk for *C. difficile* infection in subsequent patients who used the same bed.

The study at four affiliated hospitals in the New York City metropolitan area used patients admitted from 2010 to 2015 if they had spent 48 hours in their first hospital bed after being admitted. The study required the prior patient to have spent at least 24 hours in the bed and to have left the bed less than one week before the next patient's admission.

Because the study focused on incident cases of *C. difficile* infection, subsequent patients with a known history of CDI were excluded and they also were excluded if they tested positive for *C. difficile* infection within the first 48 hours after admission. The receipt of antibiotics by prior patients was assessed using data from a computerized clinician order entry system.

The study reports that among 100,615 pairs of patients who sequentially occupied a given hospital, there were 576 pairs where the subsequent patients developed *C. difficile* infection within two to 14 days after arriving at their bed. The median time from bed admission to *C. difficile* infection in the subsequent patients was 6.4 days. Subsequent patients who developed incident were more likely to have traditional *C. difficile* infection risk factors, including old age, increased creatinine, decreased albumin and the receipt of antibiotics.

The cumulative risk of *C. difficile* infection in subsequent patients was

0.72 percent when the prior occupant of the hospital bed received antibiotics compared with 0.43 percent when the prior occupant of the bed did not receive antibiotics, according to the results.

While the association was modest it remained significant after adjusting for other potential mitigating factors. Aside from antibiotics, no other factors related to the prior bed occupants were associated with increased risk for *C. difficile* infection in subsequent patients, according to the study. The association between receipt of antibiotics and risk for *C. difficile* infection in subsequent patients remained when the analysis excluded 1,497 patient pairs in which the prior patient had recent *C. difficile*.

In patients colonized by *C. difficile*, antibiotics may promote the proliferation of *C. difficile* and the number of *C. difficile* spores shed into the local environment. Antibiotics also may affect the gastrointestinal microbiome to decrease bacterial species protective against *C. difficile*. The authors suggest future research on the mechanisms underlying the herd effects of antibiotics, according to the study.

Limitations of the study include its observational nature and that it was conducted in a single health care system, which may affect its generalizability.

"Our results show that antibiotics can potentially cause harm to patients who do not themselves receive the antibiotics and thus emphasize the value of antibiotic stewardship. ... The increase in risk was small but is of potential importance given the frequency of use of [antibiotics](#) in the hospital," the study concludes.

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