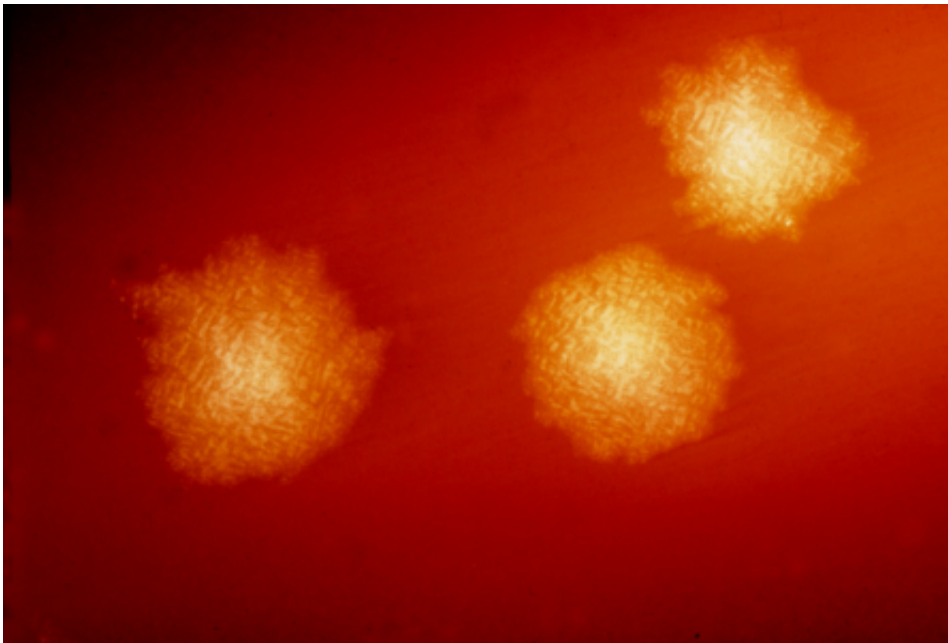


# Capsule research paves way for simpler C. difficile treatment

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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

An Alberta-led clinical trial has shown Fecal Microbiota Transplant (FMT) is as effective in treating *Clostridium difficile* (*C. difficile*) infections whether delivered by colonoscopy or by swallowing capsules.

The finding, published Nov. 28 in the *Journal of the American Medical*

*Association*, could revolutionize and broaden the use of FMT, which restores the healthy balance of bacteria living in the intestine by transferring a healthy donor's stool to the gut of a person with *C. difficile*.

"This will transform the way people think about how we deliver Fecal Microbiota Transplant," says Dr. Dina Kao, the lead author of the study, an associate professor with the University of Alberta's Faculty of Medicine and Dentistry, and an Alberta Health Services (AHS) gastroenterologist.

"Capsules have numerous advantages over colonoscopy. They are non-invasive, they're less expensive, they don't have any of the risks associated with sedation and they can be administered in a doctor's office."

Capsules containing frozen donor bacteria taken orally were shown in Dr. Kao's study to be 96 per cent effective in treating *C. difficile*, the same success rate as those receiving transplant by colonoscopy. The pills have no scent or taste.

Humans are host to hundreds of different species of [gut bacteria](#), which together help the digestive and immune systems to function properly. However, when a harmful infection requires treatment with antibiotics, those same antibiotics can disrupt the healthy balance of the gut bacteria, allowing opportunistic microorganisms such as *C. difficile* to move in and cause illness.

People with *C. difficile* infections suffer from diarrhea, cramping and other gastrointestinal difficulties. In advanced cases, it may be necessary to remove the large intestine. Although rare, *C. difficile* can be extremely debilitating and resistant to treatment by antibiotics. In some cases, it can be fatal. In Alberta, there are about 200 *C. difficile* cases

every year, of which between 20 and 40 are fatal.

Karen Shandro of Ardrossan, 30 kilometres east of Edmonton, came down with what was thought to be a routine sinus infection early in 2015. After a course of antibiotics, a tenacious *C. difficile* infection set in and knocked her off her feet. Further courses of antibiotics did little to help.

"I felt awful. My health deteriorated. I had unbearable diarrhea, no appetite, chills and fever, and I couldn't keep any food in me," say Shandro, whose condition became so grave her husband phoned an ambulance and she was taken to the emergency department at the Fort Saskatchewan Community Hospital.

Shortly after, Shandro learned about Dr. Kao's study on FMT and agreed to be enrolled in the trial. She was selected at random to receive the transplant via capsules.

Although Shandro says there was no unpleasant taste or aftertaste to the pills, the sheer number she had to take was a bit of a challenge. Each participant had to take 40 capsules within an hour.

"Afterwards I went home and slept for four hours, then woke up starving, which was something new to me at that point," she recalls. Her health continued to improve and within two days, she felt upbeat and like her normal self. Today, she considers her *C. difficile* infection conquered.

Dr. Kao says a unique feature of the two-year research study is that this is the first to compare different delivery methods using the same amount of donor stool. It is also unique in that it looks at patient preference and experience. She says on the strength of the research, she can now begin offering patients a choice between delivery methods for FMT. Work is

also underway within AHS to examine ways to offer FMT by capsule more broadly.

Dr. Kao notes the oral method of FMT would likely save the health system a minimum of \$1,000 per patient.

**More information:** *Journal of the American Medical Association* (2017). [DOI: 10.1001/jama.2017.17077](https://doi.org/10.1001/jama.2017.17077)

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