

Fecal transplants successful for treating *C. difficile* infection

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Distasteful though it sounds, the transplantation of fecal matter is more successful for treating *Clostridium difficile* infections than previously thought.

The research, published in the open access journal *Microbiome*, reveals that healthy changes to a patient's microbiome are sustained for up to 21 weeks after [transplant](#), and has implications for the regulation of the treatment.

Clostridium difficile infections are a growing problem, leading to recurrent cases of diarrhea and severe abdominal pain, with thousands of fatalities worldwide every year. The infection is thought to work by overrunning the intestinal microbiome - the ecosystem of microorganisms that maintain a healthy intestine.

Fecal microbiota transplantation was developed as a method of treating *C. difficile* infection, and is particularly successful in patients who suffer repeat infections. Fecal matter is collected from a donor, purified, mixed with a saline solution and placed in a patient, usually by colonoscopy.

Previous research has shown that the fecal microbiota of patients resembles that of the donor, but not much is known about the short and long term stability of fecal microbiota transplanted into recipients.

In this research, Michael Sadowsky and colleagues at the University of Minnesota collected [fecal samples](#) from four patients before and after

their [fecal transplants](#). Three patients received freshly prepared microbiota from fecal matter and one patient received fecal microbiota that had previously been frozen. All received fecal microbiota from the same pre-qualified donor.

The team compared the pre- and post-transplant fecal microbial communities from the four patients, as well as from 10 additional [patients](#) with recurring *C. difficile* infections, to the sequences of normal subjects described in the Human Microbiome Project. In addition, they looked at the changes in fecal bacterial composition in recipients over time, and compared this to the changes observed within samples from the donor.

Surprisingly, after transplantation, patient samples appeared to sustain changes in their microbiome for up to 21 weeks and remained within the spectrum of fecal microbiota characterized as healthy.

Michael Sadowsky says: "Our study shows that there are both short and long term changes in the fecal microbiome following transplantation. The diversity and types of microbes present fall into a cloud of possibilities represented by those of 'normal fecal microbiota'. While we have many similarities in fecal microbiota amongst humans in general, there are individual differences that make us all unique, but do not effect apparent gut functioning."

The authors say that the research could have regulatory implications for fecal transplantations. This is because the US Food and Drug Administration has determined that fecal microbiota constitutes a 'drug', and has stated that compositional certainty is going to be important. The dynamic nature of fecal microbiota seen in both the donor and the recipients suggest that this framework of regulation may not be applicable for fecal transplantations.

More information: Alexa Weingarden, Antonio Gonzalez, Yoshiaki Vazquez-Baeza, Sophie Weiss, Gregory Humphrey, Donna Berg-Lyons, Dan Knights, Tatsuya Unno, Aleh Bobr, Johnthomas Kang, Alexander Khoruts, Rob Knight and Michael J Sadowsky, Dynamic Changes in Short- and Long-Term Bacterial Composition Following Fecal Microbiota Transplantation for Recurrent *Clostridium difficile* Infection, *Microbiome* 2015, [DOI: 10.1186/s40168-015-0070-0](https://doi.org/10.1186/s40168-015-0070-0)

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