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# Quality Assessment of the Efficacy and Cost-Effectiveness of Fecal Microbiota Transplant for Recurrent Clostridium *difficile* Infection

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## BACKGROUND

The annual healthcare expenditure in the United States for the management of Clostridium difficile infection (CDI) is estimated to be 3.2 billion dollars. These costs are rising with increased rate of CDI since 2000. Recurrent CDI (RCDI) occurs in 10-20% of patients after initial treatment. In this population, the rate of additional recurrences increases to 40-65%. Guidelines recommend the use of fecal microbiota transplant (FMT) after a third relapse of CDI. We evaluated the efficacy as well as the healthcare savings provided by FMT in patients with RCDI.

## METHODS

We performed a retrospective single-center study at a large tertiary care teaching hospital. A chart review of patients who had undergone FMT between October 1, 2015 and May 30, 2017 was done. Patients were eligible for FMT treatment if they had at least three recurrent episodes of CDI with at least one trial of pulsed-dose oral vancomycin. In eligible patients 250 mL of donor fecal material was endoscopically delivered in the right colon. Phone call follow up was performed one week after FMT to assess for symptom resolution.

## RESULTS

Patient characteristics are noted in Table 1. A total of 50 fecal transplants were performed on 45 patients. Two patients were lost to follow up. In a per-protocol analysis, 36 patients (83.7%) had resolution of infection after their first transplant. Five patients failed treatment and did not undergo repeat FMT. Two patients were successfully treated with a second FMT, increasing the success rate to 88.4%. Three patients were retreated after delayed recurrence more than 180 days after initial FMT. Two of those improved with a second FMT while one failed retreatment. No adverse events were noted.

Characteristic	Primary FMT Success (n=36)	Primary FMT Failure (n=7)	P-value
Age	62.6 + 15.1	64.0 + 17.6	0.8296
Male Gender	12 (33.3%)	2 (28.6%)	1.0000
Prior Fidaxomicin	6 (16.7%)	0 (0.0%)	0.5671
IBD History	3 (8.3%)	0 (0.0%)	1.0000
Immunosuppression	5 (13.9%)	1 (14.3%)	1.0000
Poor Bowel Prep	9 (25.0%)	0 (0.0%)	0.3135

## DISCUSSION

FMT is an effective modality for treating patients with RCDI with mean primary cure rates of 91%. Our primary cure rate of 83.7% represents an improvement over usual antibiotic therapy. Conservative estimates are each patient treated with successful FMT saves \$17,000 in healthcare costs. Using this, the 38 successful FMT procedures performed over a 20-month period led to \$646,000 in savings. The cost of the 60 samples used or discarded in the treatment of these patients was \$20,100. One unique finding was the association of inadequate bowel preparation and successful treatment. It is possible that patients who are unable to adequately clear their colon before a procedure may be more likely to retain the transplanted fecal material, giving it an extended period to take effect.

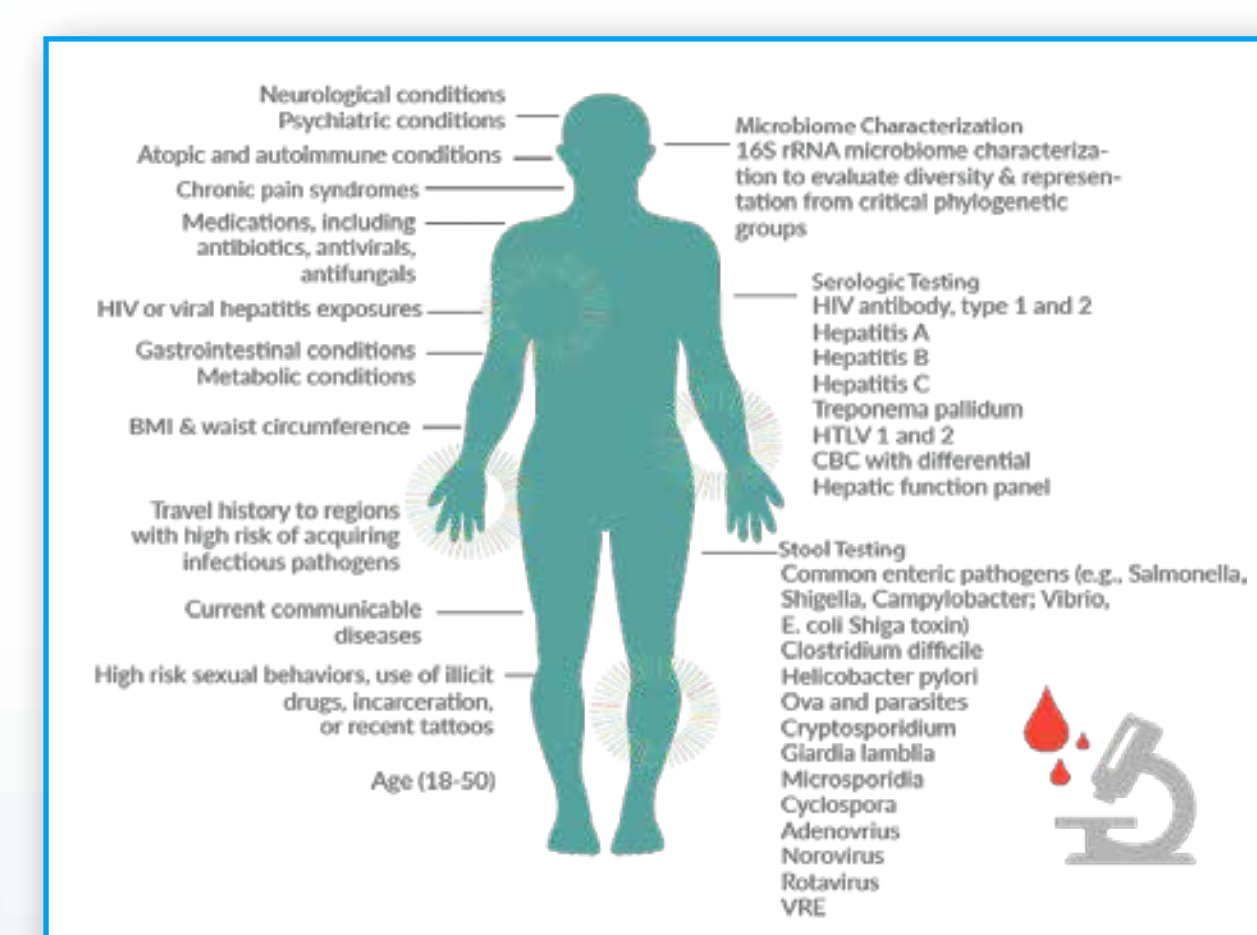


Figure 1: Serologic and stool-based infectious assessment for OpenBiome stool donors.

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