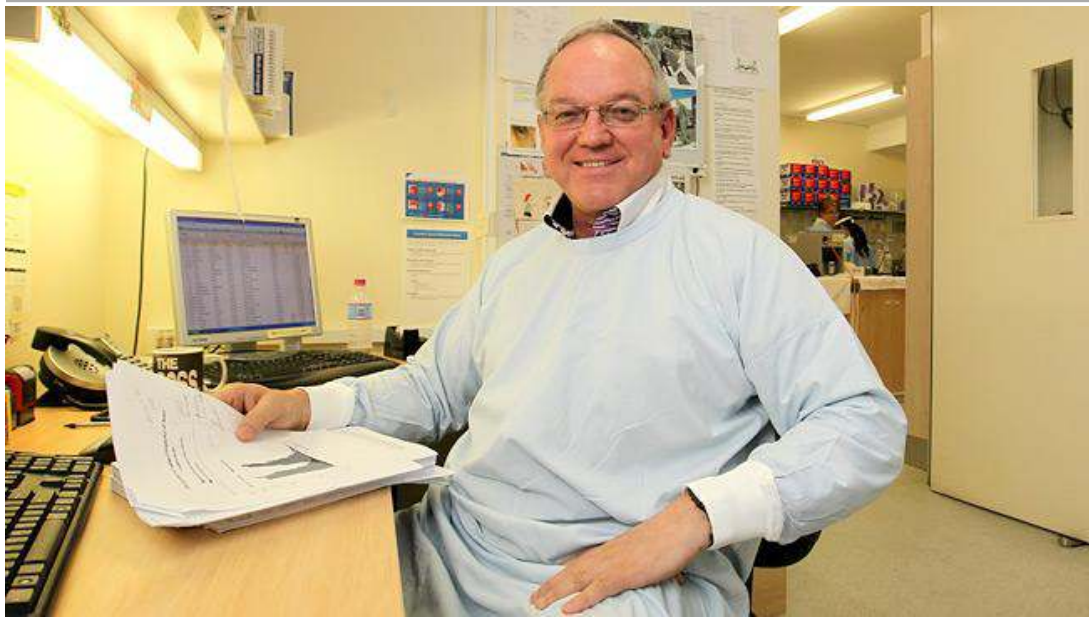


## Stool solution for deadly colitis

6-7 minutes



Gastroenterologist Thomas Borody warns that Australia is next in line for a wave of infections. Picture: Tim Hunter

ELLEN Blackwell was close to death. The Baltimore woman was spending about \$US7000 a month on antibiotics to treat a year-long *Clostridium difficile* infection, yet was unable to stomach anything other than crackers and water.

She had lost a significant amount of weight and rarely left the house. It appeared the only means of eradicating the antibiotic-resistant bacteria was through the removal of her colon.

But Sudhir Dutta, at Baltimore's Sinai Medical Hospital, had another idea. He suggested a procedure whereby Blackwell's colon would be treated with the healthy fecal matter of a compatible donor - in this case, her daughter Catherine - via an orally inserted tube.

Dutta explained that the "super-probiotic" in Catherine's stool sample would reintroduce "good" bacteria into Blackwell's gut, which would then destroy the *C. difficile* colonies.

Blackwell agreed. Within 24 hours of the procedure, she felt like eating.

"I felt normal," she says.

Fecal microbiota transplantation, formerly known as fecal bacteriotherapy, and informally as a stool transplant, has been known for more than 50 years.

The earliest instances of the treatment, dating to the late 1950s, were as last-resort attempts to halt the spread of life-threatening ulcerative colitis.

In 2003, gastroenterologist Thomas Borody, founder and medical director of the Centre for Digestive Diseases in Sydney, published a report demonstrating that FMT can have significant positive clinical effects on patients with a range of gastrointestinal conditions, including inflammatory bowel disease, irritable bowel syndrome and constipation.

Despite countless success stories, FMT remains a non-standard, eleventh-hour procedure for patients with debilitating and otherwise unresponsive gastrointestinal disorders.

Its effectiveness is still something of a medical mystery. There are no published randomised controlled trials, considered among the most reliable and authoritative pieces of medical evidence, to support its usage; all of the evidence for its benefits stems from observational studies.

The US is moving towards rectifying this, however; the procedure should be covered by the US Medicare scheme by about 2013. But in Australia, Borody laments, "there's not even a committee set up to pursue this".

Part of the reason for this, he admits, is that *C. difficile* colitis, which has reached epidemic levels in the US, has yet to gain a significant foothold in Australia.

"It's very difficult to comprehend how huge the American situation is," he says.

"*C. difficile* kills more people there each year than all the soldiers who died in Vietnam - 100,000 v 76,000.

"I was talking to one of the gastroenterologists at Mount Sinai Hospital in Miami, and he said that *C. difficile* infection is the second most common reason for colectomy in all of Florida."

The first *C. difficile* colitis case in Australia was diagnosed in 2009, in Perth, although it was determined the patient had acquired the bacteria while travelling in the US. This year, though, the first locally acquired *C. difficile* infection was discovered, in a 83-year-old Latvian man in Melbourne, prompting suggestions that the colitis epidemic may soon reach our shores.

As the epidemic accounts for about \$US3.2 billion (\$3bn) in medical costs annually in North America, Dutta is of the opinion that FMT will become cheaper and more practical before the disease spreads.

"Right now we're asking ourselves: what is the cheapest method to deliver this therapy?" Dutta elaborates. "Can we do it with a simple enema? Does it work just as well?"

"We use the endoscopic method, which we know works, but I realise the costs associated with it are quite high, so it's never going to become popular in less wealthy countries, for instance.

"So if we're going to develop this bacteriotherapy, we need to pursue other routes. The best option is what we're looking into at the moment: if we come to conclude which bacteria are really needed for the recovery, if we can identify a few species, I would be very much interested in encapsulating those bacteria and administering them as a tablet like a probiotic.

"That would surely be the final solution to the problem."

But Borody cautions that a cultured probiotic alternative to FMT is still a long way off.

This is, he argues, primarily because of the complexity of human fecal matter - it contains nine times more living cells than the entire human body.

"It's a zoo," he says. "There's a lot of interaction - metabolic co-operation between the microbes. It's a community. It's actually now being considered another organ of the human body.

"And probiotic alternatives just don't stick. They've been damaged by the process of culturing. Fecal flora has 'wild types', which are bacteria that haven't been disturbed by being placed in an artificial environment.

"There are also so many different bugs in the flora that we still haven't cultured - we've identified maybe 10 per cent at most.

"There are those who claim that you can take the whole poo and culture it in one go, but as I said, it's not just a sum of various bugs - it's an environment. It's about how they interact with each other."

While gastroenterologists worldwide search for a less expensive approach to FMT, Borody hopes the Australian government will direct its attention towards the potentially looming *C. difficile* crisis.

Fortunately, it would appear we already have the solution inside our bodies.