

Could adaptable bacteria cause repeat urinary tract infections?

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E. coli, shown with Gram stain technique. Photo: Centers for Disease Control & Prevention

Study of 4 women found *E. coli* that 'migrated' and thrived.

(HealthDay)—Women suffering from recurring urinary tract infections may carry a particularly hearty strain of *E. coli* bacteria that flourishes in both the gut and the bladder, and can migrate back and forth despite repeated treatments, a small new study finds.

Doctors believe that [urinary tract infections](#) are often caused by *E. coli* migrating from the [gut](#) to the [urinary tract](#), according to study background information. But they have assumed that when the bacteria moves to the bladder, it loses its ability to flourish in the [gastrointestinal tract](#).

Now the research published May 8 in the journal *Science Translational Medicine* suggests some strains of *E. coli* may be more adaptable than previously thought.

While studying a group of women who suffered from repeated episodes of urinary tract infection, the multinational team of researchers discovered strains of *E. coli* that can live and flourish in both the gut and the bladder.

"The idea was the ability to effectively colonize the

urinary tract was inversely correlated to the ability to effectively colonize the [gastrointestinal] tract," said Michael Hibbing, a [microbiologist](#) with Washington University in St. Louis and study co-author. "We found that dichotomy wasn't necessarily true. We found one strain of *E. coli* that is very good at colonizing both the [GI tract](#) and the urinary tract."

More than half of all women develop at least one urinary tract infection during their lifetimes, according to the study. Up to a quarter of all women have experienced [recurrent urinary tract infections](#)—two or more episodes within a six-month period.

The team uncovered the adaptable *E. coli* strains while studying 45 strains of the bacteria taken from the feces and urine of four otherwise healthy women who were experiencing successive urinary tract infection episodes.

The investigators found that two of the women were playing host to a dominant strain of *E. coli* that thrived in both the gut and the urinary tract during three urinary tract infections that occurred over the course of several months.

In the other two women, researchers found that the *E. coli* strain present in their gut and bladder changed as the patients suffered recurring urinary tract infection. The strain that caused the initial infection ended up replaced by a stronger strain that fared even better in both the urinary tract and gastrointestinal tract.

This opens the possibility that treating recurrent urinary tract infections may be more complex than previously thought, because bacteria causing the infections can move freely between the bladder and the gut, the study authors concluded.

"This is a nice high-quality piece of research that is really going to help us broaden the ideas we have about how women get and carry urinary tract infections," said Dr. Linda Brubaker, a

urogynecologist and dean of the Loyola University Chicago Stritch School of Medicine. She was not involved with the new study.

"It opens the possibility that bacteria interact with each other, and depending on how the bacteria interact may determine whether a woman gets a single or recurring urinary tract infection," she said. "The solution is probably not going to be more antibiotics, but a deeper understanding of a specific woman's risk based on the bacteria that live in her bladder or her bowel."

Another expert discussed implications of the new findings.

By better understanding the bacterial environments of the gut and bladder, doctors will be able to craft cunning treatments for suffering women, said Dr. Dee Fenner, a professor of obstetrics, gynecology and urology at the University of Michigan School of Medicine.

"I think this will open up new treatment analysis. We'll start looking at [urinary tract infections] in a much different way," Fenner said, suggesting researchers may be able to clear up recurring urinary tract infections through the use of more targeted antibiotics or by even transplanting [bacteria](#) into the gut to try and crowd out the bad E. coli with a healthier strain.

More information: The American Academy of Family Physicians has more about [urinary tract infections](#).

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