

# Disgusting Source of the Majority of Urinary Tract Infections

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✓ Fact Checked

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## STORY AT-A-GLANCE

- › Urinary tract infections (UTIs) affect anywhere from 25% to 60% of women over the course of their lifetime, and hospitalization rates for UTIs in the U.S. rose by 52% between 1998 and 2011 as a result of increasing antimicrobial resistance
- › Researchers have found the reason UTIs tend to have such a high recurrence rate in postmenopausal women is because the infection can be caused by several different pathogens that are deeply embedded in the tissue, making them more resistant to elimination
- › In addition to E. coli, bacteria in urine samples included Klebsiella pneumoniae and Enterococcus faecalis, and species in biopsied tissue included E. coli, Staphylococcus hominis and Bacillus firmus
- › About 80% to 90% of UTIs are caused by E.coli, which is normally found in your intestinal tract. Problems only arise when this ordinary bacterium is present in high numbers in your urinary system
- › Recent studies have conclusively demonstrated that a majority of UTIs are caused by exposure to contaminated chicken: American, Canadian and European studies have all confirmed close genetic matches between drug-resistant E. coli collected from human patients and those found on poultry

**This article was previously published May 29, 2019, and has been updated with new information.**

Urinary tract infections (UTIs) affect anywhere from 25%<sup>1</sup> to 60%<sup>2,3</sup> of women over the course of their lifetime. According to research published in 2015, UTIs were responsible for 10.5 million doctor visits in the U.S. in 2007.<sup>4</sup>

A study<sup>5</sup> published in the journal *Open Forum Infectious Diseases* in 2017 noted hospitalization rates for UTIs in the U.S. rose by 52% between 1998 and 2011 – a direct result of increasing antimicrobial resistance.

According to this study, there were 400,000 UTI-related hospitalizations in 2011, with an estimated cost of \$2.8 billion. The highest rates of increase were seen in women and older patients.

In the past, recurrent UTIs were thought to be caused by reinfection by the same pathogen,<sup>6</sup> but recent research<sup>7,8,9</sup> published in the *Journal of Molecular Biology* suggests this pattern has changed, and the reason why UTIs tend to have such a high recurrence rate in postmenopausal women is because the infection can be caused by several different pathogens.

According to the authors, the data uncovered via urine and bladder biopsies "suggest that diverse bacterial species and the adaptive immune response play important roles" in recurrent UTIs.

## **Pathogenic Mechanisms of UTIs**

Women are more prone to urinary tract infections than men, in part because of their shorter urethras. Adult men have another factor going for them. The male prostate gland actually produces a bacterial growth inhibitor that is secreted directly into their urinary system.<sup>10</sup>

According to research<sup>11</sup> published in 2015, several different pathogens can trigger a UTI; most commonly *Escherichia coli* (E.coli), *Klebsiella pneumoniae*, *Proteus mirabilis*, *Enterococcus faecalis* and *Staphylococcus saprophyticus*. Of these, about 80% to 90% are caused by E.coli,<sup>12,13</sup> which is normally found in the intestinal tract.<sup>14</sup>

Problems only arise when this ordinary bacterium is present in high numbers in places where it shouldn't be, like your urinary system. When E. coli gets into your urinary tract and multiplies, you experience the usual signs and symptoms of a UTI, such as:<sup>15</sup>

- Burning with urination
- Frequent urges to urinate
- Lower abdominal pain or aching
- Blood in your urine (sometimes, but not always)
- Cloudy or foul-smelling urine

The reason your body cannot simply expel the E. coli through urination is because the bacteria are covered with tiny fingerlike projections called fimbria, made of an amino acid-sugar complex, a glycoprotein called lectin, which makes them sticky.

This stickiness allows the bacteria to adhere to the inner wall of your bladder and/or work their way upward toward your kidneys, at which point the situation can become quite serious.

Sepsis is another complication of untreated or unsuccessfully treated UTI (which can happen if the infection is caused by drug-resistant bacteria), which can be life-threatening. An infusion of intravenous vitamin C with hydrocortisone and thiamine has been shown to reduce mortality from sepsis nearly fivefold, but many health care professionals are still unaware of this revolutionary treatment.

In addition to the symptoms already mentioned, a UTI in an older individual can also result in sudden behavioral changes such as restlessness, agitation, lethargy or social withdrawal, mental confusion and even hallucinations and delirium.<sup>16</sup>

According to Dr. Amanda Smith, medical director at the Byrd Alzheimer's Institute at the University of South Florida, symptoms of UTI in the elderly actually tend to be primarily behavioral,<sup>17</sup> which can result in delayed diagnosis and treatment. So, doctors of elderly patients exhibiting these kinds of behavioral symptoms, especially when combined with low-grade fever, should have them checked for UTI.<sup>18</sup>

# Recurrent UTIs Linked to Variety of Pathogens in Bladder Wall

What the Journal of Molecular Biology study discovered was that different types of bacteria form colonies deep in the tissue of the bladder wall, past the urothelium layer in many cases, making them very difficult to get rid of. As noted by Science Daily, which reported the Journal of Molecular Biology findings:<sup>19</sup>

*"[F]or some postmenopausal women, UTIs recur so frequently that they become a chronic condition, requiring daily doses of increasingly powerful antibiotics as the infection-causing bacteria gradually become resistant to each new drug.*

*'For older women, these infections can go on for tens of years,' said Dr. Nicole De Nisco, assistant professor of biological sciences at UT Dallas and lead author of the study. 'Eventually, a patient's last resort might be removing the bladder' ...*

*To investigate the pathogenic mechanisms and immune responses related to recurring UTIs, De Nisco and her colleagues analyzed urine and biopsies from 14 postmenopausal women ...*

*They found that in addition to the expected E. coli, bacteria in urine samples included Klebsiella pneumoniae and Enterococcus faecalis, while species in biopsied tissue included E. coli, Staphylococcus hominis and Bacillus firmus.*

*'Our findings confirm that bacteria do form communities within the bladder wall of RUTI [recurrent UTI] patients, which was not previously known,' De Nisco said. 'This research is a critical step toward better understanding the mechanisms of recurring urinary tract infection and inflammation in postmenopausal women' ...*

*Future studies will focus on determining effective techniques to remove these bacteria and chronic inflammation from the bladder, finding new strategies to enhance immune system response, and pinpointing the various bacterial pathogens involved in RUTIs."*

# Factory-farmed Chicken – The Leading Source of UTI Infections

Conventional wisdom has maintained UTIs are primarily caused by a transfer of naturally-occurring *E. coli* via sexual contact with an infected individual and/or the transfer of fecal bacteria from your anus to your urethra by poor personal hygiene. However, more recent studies have conclusively demonstrated that a majority of UTIs are actually caused by exposure to contaminated chicken.<sup>20</sup>

Importantly, factory-farmed chickens are the source of most antibiotic-resistant UTIs – a problem that can be traced back to the routine use of antibiotics for growth-promotion purposes, which has allowed resistance to develop. Drug-resistant *E. coli* strains from supermarket meat were matched to strains found in human *E. coli* infections as early as 2005.<sup>21</sup>

Research<sup>22,23</sup> published in 2006 confirmed that humans could develop antibiotic resistance by eating poultry treated with antibiotics. Bacteria from conventional chicken, and those who ate such chicken, were found to be more prone to developing resistance against Synercid (generic names: quinupristin and dalfopristin<sup>24</sup>), a strong antibiotic used to treat vancomycin-resistant *Enterococcus faecium*.<sup>25</sup>

In essence, eating antibiotic-treated chicken can cause you to develop resistance to the last lines of defense currently available in the modern medicine cabinet – a steep price for inexpensive meat! As reported by Infectious Control Today:<sup>26</sup>

*"Laboratory tests showed that the bacteria isolated from patients and vegetarians had no pre-existing resistance to Synercid. Resistance was rare among antibiotic-free poultry, but a majority of bacterial isolates from conventional poultry samples were resistant.*

*After exposure to virginiamycin, *E. faecium* from conventional poultry and from patients who consumed poultry became resistant to Synercid more often than *E. faecium* from vegetarians or from antibiotic-free poultry.*

*Some of the resistance was attributed to a specific gene, and both the gene and resistance were associated with touching raw poultry meat and frequent poultry consumption."*

## **Genetic Matching Links UTIs to Contaminated Chicken**

American, Canadian and European studies<sup>27,28,29</sup> published in 2012 all confirmed close genetic matches between drug-resistant E. coli collected from human patients and those found on poultry (chicken and turkey).

More recently, a study<sup>30</sup> published in the journal mBio in 2018 found 79.8% of chicken, pork and turkey samples purchased from large retail stores in Flagstaff, Arizona, were contaminated with E. coli. The researchers also tested blood and urine samples from people who visited a major medical center in the area, finding E. coli in 72.4% of those diagnosed with a UTI.

In particular, a strain of E. coli known as E. coli ST131 showed up in both the meat samples (particularly poultry) and the human UTI samples. Most of the E. coli in the poultry was a variety known as ST131-H22, which is known to thrive in birds. This specific strain was also found in the human UTI samples.

"Our results suggest that one ST131 sublineage – ST131-H22 – has become established in poultry populations around the world and that meat may serve as a vehicle for human exposure and infection," the researchers noted, adding that this E. coli lineage is just one of many that may be transmitted from poultry and other meat sources to people.

## **Make Sure Your Chicken and Eggs Are Organic and Free-Range**

While findings such as these are a potent reminder to use caution when handling raw chicken and to cook poultry thoroughly, another option – and perhaps the most sensible and rational approach is to avoid factory-farmed chicken altogether.

It's easily among the most contaminated foods in the U.S., as a recent lawsuit against the U.S. Department of Agriculture for failing to address high rates of fecal bacteria on chicken can attest to. Factory-farmed chicken also has a weak nutritional profile compared to other protein sources, including pasture-raised chicken (which is also less likely to carry harmful contaminants).

For example, a study<sup>31,32,33</sup> by the American Pastured Poultry Producers Association (APPPA), which compared the nutrient value of pastured chickens with the USDA's National Nutrient Database for Standard Reference values for CAFO chicken, found pasture-raised chickens contained:

- 406.8% more vitamin E (1.86 IUs per 100 grams compared to 0.367 IUs)
- About half the fats of CAFO chicken (saturated, monounsaturated and polyunsaturated)
- An average omega-3-to-6 ratio of 1-to-5, which is near ideal, compared to the USDA's value of 1-to-15<sup>34</sup>

Considering the hazards associated with raw chicken, if you're going to eat it, I recommend making sure it's organic and free-range, pasture-raised. Ditto for eggs, as CAFO eggs are also far more prone to pathogenic contamination than organic pastured eggs.

Your best bet is to find a local source of organic, free-range eggs and chicken meat. The Cornucopia Institute's egg report and scorecard ranks 136 egg producers according to 28 organic criteria, is an excellent resource if no local producers are available.

In June 2017, Cornucopia also began working on a chicken report and scorecard. Considering the egg report took six years to produce, it may still be a while before the chicken scorecard is ready. You can contribute to this report by following the simple instructions listed in their June 13 Action Alert.<sup>35</sup>

## **How to Treat a UTI at Home**

As mentioned earlier, the fimbria (fingerlike projections) of *E. coli* are made of a sticky glycoprotein called lectin, which is why the bacteria are so hard to flush out. It's not impossible however, even without an antibiotic. While antibiotics are typically the go-to treatment, you may be better off starting out with a D-mannose supplement.<sup>36</sup>

Mannose is produced by your cells and covers the internal lining of your urinary organs. The lectin on the bacteria's fimbria binds to mannose, which is why the bacteria adhere to the walls of your urinary system.

When you take D-mannose, the *E. coli* adheres to the mannose present in your urine, which is then flushed out when you urinate. As the bacterial load on epithelial cells lessens, they're more easily overtaken by agents of your immune system.

Infections caused by a bacterium other than *E. coli* may be eliminated by taking a saturated solution of potassium iodide (SSKI). Both of these treatments are recommended by Dr. Jonathan Wright, medical director of Tahoma Clinic in Tukwila, Washington, and the author of the book, "D-Mannose and Bladder Infection: The Natural Alternative to Antibiotics."

For UTIs caused by bacteria or fungi other than *E. coli*, Wright suggests taking 15 drops of SSKI in water every three to four hours for two days (three days maximum).<sup>37</sup> In order to know which of these treatments would work best, you'd need to perform a culture test to identify the bacteria responsible for your infection.

Alternatively, Wright suggests taking D-mannose first, and if significant improvement doesn't occur, move on to SSKI. A culture test is also advisable to rule out a drug-resistant infection, as this will require close medical supervision to avoid serious complications.

## **UTI Prevention 101**

Prevention is, of course, your best option, and as a woman, there are some specific hygiene steps you can take to maintain a healthy urinary tract:



Drink plenty of pure, filtered water every day	Urinate when you feel the need; don't resist the urge to go
Wipe from front to back to prevent bacteria from entering your urethra	Take showers instead of tub baths; avoid hot tubs/Jacuzzis
Cleanse male and female genital areas prior to sexual intercourse	Avoid using feminine hygiene sprays, which may irritate your urethra
Use a bidet	

Fermented foods such as kefir, sauerkraut and other fermented vegetables are great for your overall health, including your urinary system.

## **The Case Against CAFO Chicken**

Lastly, but perhaps most importantly, consider ditching all factory-farmed chicken from your menu. At this point, there's little doubt that chicken raised in concentrated animal feeding operations (CAFOs) are a core component of the growing problem that is antibiotic resistance in general, and UTI infections in particular.

Essentially, by using antibiotics, CAFO birds end up driving a cycle of antibiotic use in human medicine as well, as UTIs are typically treated with antibiotics. But aside from being a source of antibiotic-resistant bacteria, and a primary route of UTI infections, there are other reasons to avoid CAFO chicken as well.

In my interview with Maryn McKenna, author of "Big Chicken: The Incredible Story of How Antibiotics Created Modern Agriculture and Changed the Way the World Eats" (embedded above for your convenience), she discusses many of the aspects of the chicken industry that many are still unaware of.

As explained by McKenna, chickens were historically rather scrawny little birds that no one thought to consume as a primary meal on a regular basis. The chicken we eat today

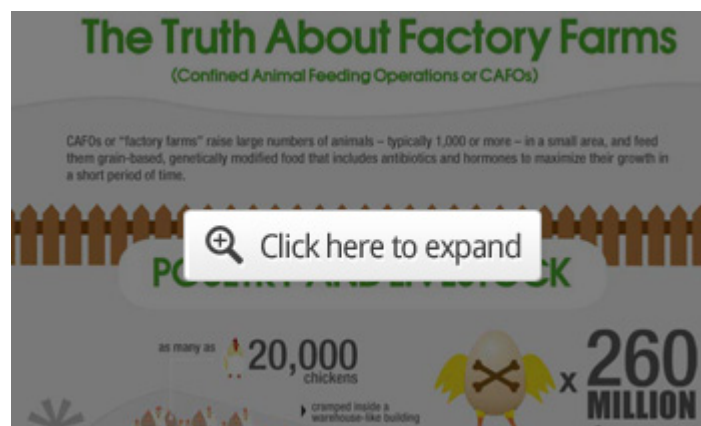
bear almost no resemblance to the backyard chickens of old, as they've been specifically bred for meat.

A nationwide contest called "The Chicken of Tomorrow Contest," which took place in the 1940s into the early '50s, led to breeders reshaping the scrawny barnyard chicken into the breast-heavy bird we're familiar with today, and a Republican campaign ad for Herbert Hoover, carrying the slogan "A Chicken for Every Pot," eventually turned chicken meat into a household staple.

Today, chicken production in the U.S. has become an industry that places profits over just about everything else, including animal welfare and farmer's rights. Precision breeding turned the boisterous barnyard chicken into an exceptionally docile animal that didn't (indeed couldn't) move much. These new traits allowed farmers to cram the animals together in tight spaces.

Today, commercial chickens are raised in giant warehouses the length of a football field, which can house 25,000 to 35,000 chickens at a time. There, they live in artificial daylight, with an artificially shortened night. Lack of space prevents them from moving about much and, on average, they only live 42 days. So, avoiding CAFO chicken not only protects your own health, it also encourages the humane treatment of animals.

In contrast, organic, free-range chickens are allowed to engage in their natural behavior in a natural environment (outdoors), and can serve an important role in regenerative agriculture and holistic land management. The lack of stress, access to a natural diet, fresh air and sunshine, makes for healthier birds that don't need antibiotics.



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