

Prescribing for urinary tract infection: Avoid fluoroquinolones?

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Principal Source: Johnson L, Sabel A, Burman WJ, et al. Emergence of fluoroquinolone resistance in outpatient urinary *Escherichia coli* isolates. *Am J Med.* 2008;121:876-884.

More than 8 million urinary tract infections (UTIs) are diagnosed annually in the United States¹ and UTI is thought to be the most common bacterial infection.² Half of all women report having a UTI at some time in their lives.^{2,3} UTI is rare in men, occurring in an estimated 5 to 8 of every 10,000 young to middle-aged men,⁴ but increases with age such that UTI rates in men age >70 are approximately one-third the rates in women.²

Up to 85% percent of UTIs are attributed to *Escherichia coli*.³ The hallmark symp-

toms of bacterial cystitis are dysuria and urinary frequency; additional symptoms include urgency, suprapubic pain, and hematuria.⁵

Being familiar with UTI symptoms can help expedite diagnosis and treatment because you might be a psychiatric patient's primary contact with the healthcare system. Also, psychiatric inpatients could test positive for UTIs during routine medical screening. A 1-day urinalysis study of psychiatric inpatients without urinary catheters detected UTIs in approximately 5% of patients.⁶ In addition, UTI is a common cause of delirium.



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Screening

The utility of routine screening urinalysis is under debate, and testing is best used in cases of suspected UTI. However, medical

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Table

Antibiotic resistance among levofloxacin-resistant and levofloxacin-susceptible strains of *E coli**

Antibiotic	Percent of levofloxacin-resistant strains of <i>E coli</i> resistant to antibiotic	Percent of levofloxacin-susceptible strains of <i>E coli</i> resistant to antibiotic
Amoxicillin/clavulanate	9.8%	0%
Ampicillin	78.0%	40.2%
Cefazolin	26.8%	9.8%
Ceftriaxone	4.9%	0%
Gentamicin	24.4%	1.2%
Nitrofurantoin	4.9%	1.2%
TMP/SMZ	65.9%	29.3%

*41 patients with levofloxacin-resistant *E coli* compared with 81 matched controls with levofloxacin-susceptible *E coli*
 TMP/SMZ: trimethoprim/sulfamethoxazole
 Source: Reference 1

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disorders frequently are not recognized in psychiatric patients, especially in older patients⁷ or those with risk factors for UTI. Sexually transmitted diseases (STDs) are not major contributors to UTI risk; however, they may share common symptoms and urinalysis findings. If patients report symptoms of UTI (urgency, dysuria, frequency), urinalysis is indicated. In a urinalysis, >2 to 5 leukocytes per high-powered field in an uncontaminated centrifuged urine specimen without a high number of squamous epithelial cells suggest UTI.

In patients with abnormal urinalysis, ask about dysuria, urinary frequency, history of UTIs, and use of antibiotics. Antibiotic use in the preceding 12 months is associated with increased risk of bacterial resistance.¹ Assess for symptoms of complicated UTI such as fever, flank pain, nausea, and vomiting. Urine culture is not recommended for uncomplicated UTI but may be necessary when symptoms do not resolve or signs of complicated UTI emerge. Consider possible STDs in patients with sterile pyuria.⁵

Treatment and antibiotic resistance

For patients with uncomplicated UTI, a short course of empiric antibiotics is appropriate even in the absence of confirmatory culture data. Fluoroquinolones (FQs), such as ciprofloxacin and levofloxacin, have been used as a first-line treatment. However, FQs are associated with:

- QTc-prolongation, a concern when co-administered with antipsychotics⁸
- delirium
- increased risk of tendinitis and tendon rupture⁹
- antibiotic resistance.

A study of a comprehensive urban public health system in Denver, CO, showed that rates of FQ-resistant *E coli* increased after levofloxacin was established as first-line therapy for UTIs. This occurred after *E coli* strains developed high resistance to an earlier first-line therapy, trimethoprim/sulfamethoxazole (TMP/SMZ).¹ Using pharmacy and laboratory databases, investigators found that as levofloxacin prescriptions increased, rates of FQ-resistant

E coli rose almost 10-fold, from 1% in 1999 to 9.4% in 2005. A detailed analysis of 2005 *E coli* isolates showed that previous levofloxacin prescription was strongly associated with FQ resistance (odds ratio 5.6, 95% confidence interval: 2.1 to 27.5). Levofloxacin-resistant strains of *E coli* also were more likely than levofloxacin-sensitive strains to be resistant to other antibiotics—90% compared with 43% for control specimens (Table, page 49).

The use of FQs as first-line treatment of UTIs also is leading to resistant strains of *Streptococcus pneumoniae*,¹⁰ *Salmonella*,^{11,12} *Neisseria meningitidis*,¹³ and other bacteria. From an individual and public health perspective, it is important that psychiatrists monitor local resistance patterns and treatment recommendations.

In areas without widespread bacterial resistance to TMP/SMZ, a 3-day course of TMP/SMZ could be considered first-line treatment for uncomplicated UTI in patients without allergies or contraindications. However, in areas where resistance to TMP/SMZ is high, a 7-day course of nitrofurantoin is recommended for uncomplicated cystitis. Resistance patterns can vary from hospital to hospital and even among units in the same hospital;¹⁴ therefore, refer to local microbiology labs for “antibiograms” or information regarding resistance patterns.

Related Resource

- National Guideline Clearinghouse. Urinary tract infection. www.guidelines.gov/summary/summary.aspx?doc_id=7407.

Drug Brand Names

Ampicillin • Principen
Cefazolin • Ancef
Ceftriaxone • Rocephin
Ciprofloxacin • Ciloxan, Cipro, Cipro XR, ProQuin XR
Gentamicin • Garamycin
Levofloxacin • Levaquin
Nitrofurantoin • Furadantin, Macrochantin, Macrobid, Urotoin
Trimethoprim/Sulfamethoxazole • Bacter-Aid DS, Bactrim, Septra, Sulfatrim, Sultrex
Tobramycin • Nebcin

Disclosure

Dr. Gagliardi reports no financial relationship with any company whose products are mentioned in this article or with manufacturers of competing products.

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Clinical Point

Hallmark symptoms of UTI are dysuria and urinary frequency; additional symptoms include urgency, suprapubic pain, and hematuria

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Practice Points

- Widespread use of FQs to treat UTIs has been associated with **increasing bacterial resistance** to FQs and other antibiotics.
- **FQs are associated** with tendonitis and tendon rupture, QTc prolongation—a concern when coadministered with antipsychotics—and delirium.
- **For uncomplicated UTI** in the absence of contraindications, consider treating nonpregnant patients in areas with low TMP/SMZ resistance with TMP/SMZ for 3 days or nitrofurantoin for 7 days, but consider nitrofurantoin as a first-line treatment in areas with high resistance to TMP/SMZ.
- **Refer patients** with symptoms of complicated UTIs to a primary care physician for treatment.

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