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HEALTHCARE MANAGEMENT

Urinary Tract Infection (UTI) Guidelines

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Introduction

UTI stands for Urinary Tract Infection. It is an infection that can affect any part of the urinary system, including the kidneys, bladder, ureters, and urethra. UTIs are commonly caused by bacteria, such as Escherichia coli (E. coli), entering the urinary tract and multiplying. Symptoms of a UTI may include pain or a burning sensation during urination, a frequent urge to urinate, cloudy or strong-smelling urine, and discomfort in the lower abdomen.

UTIs are more common in women than in men, and risk factors include factors such as sexual activity, urinary tract abnormalities, a weakened immune system, and the use of certain types of birth control. UTIs are typically treated with antibiotics, and in some cases, additional measures such as increased fluid intake may be recommended to help flush out the bacteria from the urinary system. If left untreated, a UTI can lead to more serious complications, such as kidney infections. It's important to seek medical attention if symptoms of a UTI are present.

Most common cases of UTI:

1. Asymptomatic bacteriuria describes an asymptomatic individual with two consecutive positive urine cultures with the same organism (> 10⁵ CFU).
2. Pyelonephritis indicates kidney, upper tract involvement.
3. Uncomplicated UTIs are infections that develop in healthy men or women with completely normal genitourinary systems.
4. Complicated UTIs involve hosts that suffer from underlying medical conditions (eg, diabetes mellitus) or various anatomic abnormalities that make them prone to infection.

UTI

Signs and symptoms

1. Dysuria
2. Urinary urgency and frequency
3. A sensation of bladder fullness or lower abdominal discomfort
4. Suprapubic tenderness
5. Flank pain and costovertebral angle tenderness (may be present in cystitis but suggest upper UTI)
6. Bloody urine
7. Fevers, chills, and malaise (may be noted in patients with cystitis, but more frequently associated with upper UTI)

Diagnostic studies for UTI consist of dipstick, urinalysis, and culture. No imaging studies are indicated in the routine evaluation of cystitis.

Management

Oral therapy with an empirically chosen antibiotic that is effective against gram-negative aerobic coliform bacteria (eg, *Escherichia coli*) is the principal treatment intervention in patients with cystitis.

The first-choice agents for treatment of uncomplicated acute cystitis in women include the following:

- Nitrofurantoin monohydrate/macrocrystals
- Trimethoprim-sulfamethoxazole (TMP-SMX)
- Fosfomycin

Considerations in antibiotic selection are as follows:

- Empiric antibiotic selection is determined in part by local resistance patterns.
- Beta-lactam antibiotics (eg, amoxicillin-clavulanate, cefdinir, cefaclor, cefpodoxime-proxetil) may be used when other recommended agents cannot be used [2, 3]
- Fosfomycin and nitrofurantoin monohydrate/macrocrystals should be avoided in patients with possible early pyelonephritis [2]
- Clinicians may wish to limit use of TMP-SMX, to reduce the emergence of resistant organisms
- Fluoroquinolones typically are reserved for complicated cystitis.

Duration of antibiotic treatment for acute, uncomplicated cystitis in women who are not pregnant is as follows:

- TMP-SMX is given for 3 days
- Fosfomycin is given in a single dose
- Nitrofurantoin monohydrate/macrocrystals is given for 5-7 days
- Beta-lactam agents are given for 3-7-days
- For cystitis in older women or infection caused by *Staphylococcus saprophyticus*, 7 days of therapy is suggested

The vast majority of women with UTI present on an ambulatory basis and can be treated as outpatients. Hospital admission may be indicated for some patients with complicated UTI. Complicating factors include the following:

- Structural abnormalities (eg, calculi, tract anomalies, indwelling catheter, obstruction)
- Metabolic disease (eg, diabetes, renal insufficiency)
- Impaired host defenses (eg, HIV infection, current chemotherapy, underlying active cancer)

Uncomplicated Cystitis in Nonpregnant Patients

First-line therapy

1. Trimethoprim/sulfamethoxazole* 160 mg/800 mg (Bactrim DS, Septra DS) 1 tablet PO BID for 3d (use when bacterial resistance is < 20% and patient has no allergy) or
2. Nitrofurantoin monohydrate/macrocrystals (Macrobid) 100 mg PO BID for 5-7d or
3. Nitrofurantoin macrocrystals (Macrochantin) 50-100 mg PO QID for 7d or
4. Fosfomycin (Monurol) 3 g PO as a single dose with 3-4 oz of water

Second-line therapy

1. Ciprofloxacin (Cipro) 250 mg PO BID for 3d or
2. Ciprofloxacin extended release (Cipro XR) 500 mg PO daily for 3d or
3. Levofloxacin (Levaquin) 250 mg PO q24h for 3d or
4. Ofloxacin 200 mg PO q12h for 3d

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Alternative therapy

1. Amoxicillin-clavulanate (Augmentin) 500 mg/125 mg PO BID for 3-7d or
2. Amoxicillin-clavulanate (Augmentin) 250 mg/125 mg PO TID for 3-7d or
3. Cefdinir 300 mg PO BID for 7d or
4. Cefaclor 500 mg PO TID for 7d or
5. Cefpodoxime 100 mg PO BID for 7d or
6. Cefuroxime 250 mg PO BID for 7-10d

Complicated Cystitis in Nonpregnant Women

I. First line therapy

Oral:

1. Patients with complicated cystitis who can tolerate oral therapy may be treated with the following options:
2. Ciprofloxacin (Cipro) 500 mg PO BID for 7-14d or
3. Ciprofloxacin extended release (Cipro XR) 1 g PO daily for 7-14d or
4. Levofloxacin (Levaquin) 750 mg PO daily for 5d

Parenteral:

Patients who cannot tolerate oral therapy as outlined above or patients with infection that is suspected to be due to resistant organisms should be treated with parenteral therapy, as follows:

1. Ciprofloxacin (Cipro) 400 mg IV q12h for 7-14d or
2. Levofloxacin (Levaquin) 750 mg IV daily for 5d or
3. Ampicillin 1-2 g IV q6h plus gentamicin 2 mg/kg/dose q8h for 7-14d or
4. Piperacillin-tazobactam (Zosyn) 3.375 g IV q6h or
5. Doripenem 500 mg (Doribax) IV q8h for 10d or
6. Imipenem-cilastatin (Primaxin) 500 mg IV q6h for 7-14d or
7. Meropenem (Merrem) 1 g IV q8h for 7-14d

Duration of therapy: Shorter courses (7d) are reasonable if patient improves rapidly; longer courses (10-14d) are reasonable if patient has a delayed response or is hospitalized.

Parenteral therapy can be switched to oral therapy once clinical improvement is observed.

II. Second-line therapy

1. Cefepime (Maxipime) 2 g IV q12h for 10d or
2. Ceftazidime (Fortaz, Tazicef) 500 mg IV or IM q8-12h for 7-14d

Duration of therapy: Shorter courses (7d) are reasonable if patient improves rapidly; longer courses (10-14d) are reasonable if patient has a delayed response or is hospitalized.

Fungal Infection

In catheterized patients, removal of the catheter is essential for clearance of funguria. If the catheter is still needed, replace it (preferably a day later).

- Treatment options vary from topical treatment to systemic therapy. A regimen of amphotericin-B bladder washes for 7 days provides a prompt but nonsustained response. It does not treat systemic mycoses and is inconvenient to administer. Amphotericin B, 0.3 mg/kg IV for 1 dose, is an option that provides a more sustained and systemic response.
- Fluconazole 200 mg orally, followed on subsequent days by 100 mg orally once a day for 4-7 days, is a simpler option. This drug is effective against azole-responsive *Candida* organisms. Generally, azole resistance is observed only in *C. krusei* and *C. glabrata*. Fluconazole provides a good long-term effect but takes a few days to clear the urine.

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Urinary Tract Infection (UTI) and Cystitis (Bladder Infection) in Females Guidelines

Asymptomatic bacteriuria

Only for pregnant women and nonelderly men (other range of patients does not require treatment)

Treatment includes the first line highlighted above.

Laboratory investigations:

There is no monitoring for UTI only lab tests upon symptoms:

No.	Description	Frequency
81003	Urinalysis Procedures	To be repeated after the course of treatment
87086	Culture, bacterial, urine; quantitative, colony count	To be repeated after the course of treatment
85025	CBC	To be repeated after the course of treatment
36251	Diagnostic renal catheterization	Only in recurrent and resistant cases

ICD codes

Category	ICD-10 Code	Description
N39.0	N39.0	Urinary tract infection, site not specified
N30.0	N30.0	Acute cystitis with hematuria
N30.00	N30.00	Acute cystitis without hematuria
N30.01	N30.01	Acute cystitis with hematuria, unspecified
N30.9	N30.9	Cystitis, unspecified
N34.1	N34.1	Urethritis
N39.3	N39.3	Stress incontinence (female) (male)
N36	N36	Other disorders of urethra
R31	R31	Hematuria, unspecified
R39.15	R39.15	Frequency of micturition
R39.16	R39.16	Urgency of urination
R30.0	R30.0	Dysuria
Z87.442	Z87.442	Personal history of urinary (tract) infection
Z87.741	Z87.741	Personal history of urinary calculi
Z87.742	Z87.742	Personal history of recurrent urinary tract infections
Z87.743	Z87.743	Personal history of urinary (tract) procedures

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Reference:

1. Gupta, K., Hooton, T. M., Naber, K. G., Wullt, B., & Colgan, R. (2011). International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: A 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. *Clinical Infectious Diseases*, 52(5), e103-e120.
2. Nicolle, L. E. (2005). Uncomplicated urinary tract infection in adults including uncomplicated pyelonephritis. *Urologic Clinics*, 32(1), 1-12.
3. Foxman, B. (2002). Epidemiology of urinary tract infections: incidence, morbidity, and economic costs. *The American Journal of Medicine*, 113(Suppl 1A), 5S-13S.
4. Wagenlehner, F. M., Weidner, W., Naber, K. G., & Wagenlehner, C. M. (2014). Cranberry and urinary tract infections. *Antibiotics*, 3(2), 174-187.
5. Albert, X., Huertas, I., Pereiró, I. I., Sanfélix, J., & Gosalbes, V. (2004). Antibiotics for preventing recurrent urinary tract infection in non-pregnant women. *Cochrane Database of Systematic Reviews*, (3), CD001209.