SAINT JOSEPH MERCY HEALTH SYSTEM
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Guidelines for Treatment of Urinary Tract Infections (UTIs) in Adults – July 2019

Infection	Antimicrobial Therapy§	Duration	Comments
Asymptomatic Bacteriuria	**National guidelines recommend against testing for asymptomatic bacteriuria except in select circumstances (pregnancy, prior to urologic procedures)**		

When to Order a Urine Culture: Recommendations for when to order a urinalysis or urine culture based on Signs/Symptoms of a UTI

- Fever >38° C or rigors without alternative cause
- Urgency, frequency, dysuria
- Suprapubic pain or tenderness
- Costovertebral pain or tenderness
- New onset mental status changes with leukocytosis (WBC >10,000 cells/mm^3) or hypotension (SBP < 90 mmHG) or ≥ 2 SIRS criteria
- Acute hematuria
- Spinal cord injury spasticity or autonomic dysreflexia
- Severe sepsis
  - ≥ 2 SIRS criteria
    - T > 38 C or < 36 C,
    - HR > 90,
    - RR >20 or PaCO2< 32 mm Hg,
    - WBC >12 K/mm3 or <4 K/mm3 or > 10% bands

  AND
  - Evidence of organ dysfunction (≥ 1 of below)
    - SBP <90 mmHg
    - Lactate >2mmol/L
    - INR >1.5
    - Platelet count <100,000
    - Bilirubin > 2 mg/dL
    - Creatinine > 2 mg/dL

Do not send urine culture if none of these symptoms are present or there is an alternative cause

No Antibiotic Treatment for ASB Recommendation **in the absense of signs or symptoms** attributable to a urinary tract infection, patients with a positive urine culture, and/or pyuria **should not** be treated with antibiotics

Treatment of Uncomplicated Lower UTI or Cystitis HMS Recommendation of antibiotic treatment and duration

In the **absence of signs or symptoms*** (see above) attributable to a urinary tract infection, patients with a positive urine culture **should not be treated** with antibiotics irrespective of whether there is pyuria, high bacterial colony count, or a multi-drug resistant organism. *Exceptions to this recommendation include pregnant patients and patients with asymptomatic bacteriuria prior to a urologic procedure.*

Uncomplicated Lower Tract Infections or Cystitis • females without catheters • females without co-morbid conditions listed under complicated UTIs	Trimethoprim-Sulfamethoxazole[1] PO	3 days	• Empiric antibiotic choice should take into consideration recent previous culture results, prior antibiotic use, antibiotic allergies, and severity of presenting illness • Fluoroquinolones should be used for only when other oral antibiotic options are not feasible because of their propensity for collateral damage (antibiotic resistance, *C.difficile* infection, and other adverse effects). When a fluoroquinolone is used for uncomplicated cystitis, the duration of treatment is 3 days.
	Nitrofurantoin	5 days	
	Alternatives		
	Fosfomycin[1*]	1 dose	
	Cephalexin[1] (or other oral β-lactam)	3-7 days	

§ Prior to confirmation of pathogen

1. Refer to SJMHS antibiotic dosing tables for dose adjustments in renal dysfunction.

References

- Gupta K et al. International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update from the IDSA and ESCMID. *Clin Infect Dis*. 2011;52(5):e103-e120.
- Hooton et al. Diagnosis, Prevention, and Treatment of Catheter Associated UTI in Adults: 2009 International Clinical Practice Guidelines from the IDSA. *Clin Infect Dis*. 2010;50:625-663.
- Nicolle LE et al. Infectious Diseases Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults. *Clin Infect Dis*. 2005;40:643-54.

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Contributors: Curtis Collins, PharmD, Anu Malani, MD

- Nitrofurantoin should be avoided in patients with CrCl < 30 mL/min
- If susceptibility available at 48-72 hrs, de-escalate treatment to susceptible narrow-spectrum antibiotic
- *Fosfomycin is restricted to patients with suspected or confirmed multi-drug resistant organisms. Susceptibilities only established for *E. coli* and *Enterococcus* species, but there is data and clinical experience supporting the use of the same susceptibility breakpoints for other members of the *Enterobacteriaceae* group

Complicated Lower Tract Infections or Cystitis

Includes patients with catheter associated-urinary tract infections (CA-UTI) and patients not meeting the definition for uncomplicated lower UTI/cystitis: Male, urinary catheter present or removal within the last 48 hrs., GU instrumentation, anatomic abnormality or obstruction, significant co-morbidities, such as:

- Nephrolithiasis
- Urologic surgery
- Urinary obstruction
- Urinary retention
- Spinal cord injury
- Asplenia
- Receiving chemotherapy for a malignancy or malignancy not in remission
- Moderate/severe liver disease
- Hemiplegia
- CHF
- Cardiomyopathy
- Moderate/severe CKD or on HD
- Sickle cell disease
- Chronic anti-coagulation
- Bedridden or using a wheelchair
- Diabetes mellitus with Hgb A1C>8%
- Immunodeficiency or immunosuppressive treatments
- Structural lung disease (moderate-severe COPD, bronchiectasis, home oxygen)

Trimethoprim-Sulfamethoxazole[1] PO	7 days
Nitrofurantoin	7 days
Fosfomycin[1*]	Q 48 h X 3 doses
Cephalexin[1]	7 days
IV Ceftriaxone OR IV β-lactam followed by other oral agent	≤ 7 days

Treatment of Complicated Lower UTI Without Sepsis/Bacteremia
HMS Recommendation of antibiotic treatment and duration

- Empiric antibiotic choice should take into consideration recent previous culture results, prior antibiotic use, antibiotic allergies, and severity of presenting illness
- Final choice depends upon confirmation of specific pathogen, the susceptibility pattern, and patient allergies
- Nitrofurantoin should be avoided in patients with CrCl < 30 mL/min
- A 3-dose fosfomycin treatment course can be used for women ≤ 65 years who develop a CA-UTI without upper tract symptoms after the indwelling catheter has been removed
- Fluoroquinolones should be used for only when other oral antibiotic options are not feasible because of their propensity for collateral damage (antibiotic resistance, *C.difficile* infection, and other adverse effects). When a fluoroquinolone is used for

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complicated lower UTIs, the duration of treatment is 7 days.

- *Fosfomycin is restricted to patients with suspected or confirmed multi-drug resistant organisms. Susceptibilities only established for *E. coli* and *Enterococcus* species, but there is data and clinical experience supporting the use of the same susceptibility breakpoints for other members of the *Enterobacteriaceae* group

Pyelonephritis and Urinary Tract Infections Associated with Bacteremia

Uncomplicated Pyelonephritis: female pts without catheters or any of the co-morbid conditions listed in the definition for complicated lower UTI

Complicated Pyelonephritis: patients with pyelonephritis not meeting definition for uncomplicated pyelonephritis

Treatment of Pyelonephritis and UTI with Bacteremia
HMS Recommendation of antibiotic treatment and duration

Uncomplicated Pyelonephritis	
Trimethoprim-Sulfamethoxazole[1] PO	7-14 days
Fluoroquinolones[1]	5-7 days
β-lactams (Ceftriaxone)	IV therapy: 7 days IV to PO β-lactam/other susceptible PO agent: 7-14 days (combined IV+PO)
Complicated Pyelonephritis and UTI with Bacteremia	
Complicated Pyelonephritis	7-14 days
β-lactams (Ceftriaxone or cefepime[1]; may be followed by oral antibiotic therapy)	
UTI with Bacteremia	7-14 days
β-lactams (Ceftriaxone or cefepime[1]) **	Shorter courses of therapy (7-days) with a fluoroquinolone or IV β-lactam can be considered in female patients without co-morbid conditions who are bacteremic secondary to pyelonephritis or cystitis/lower UTI who have rapid clinical response

- Empiric antibiotic choice should take into consideration recent previous culture results, prior antibiotic use, antibiotic allergies, and severity of presenting illness
- Final antibiotic choice should be based on antibiotic susceptibilities of the pathogen and take into consideration antibiotic allergies of the patient
- Nitrofurantoin and fosfomycin should not be used for pyelonephritis, upper urinary tract infection, or patients with bacteremia
- Oral β-lactams are associated with lower efficacy and higher relapse rates compared to trimethoprim-sulfamethoxazole and fluoroquinolones. If a β-lactam is used then initial therapy should be IV therapy followed by oral β-lactam (assuming uropathogen is susceptible)
- **Due to potential complications from PICC lines (e.g. DVT, CLABSI), oral fluoroquinolones are preferred at discharge over PICC line placement for IV antibiotics when the urinary pathogen is susceptible and there are no contraindications to fluoroquinolones

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Guidelines for Treatment of Urinary Tract Infections (UTIs) in Adults Dosing Recommendations

Antibiotic	Dose*
Trimethoprim-sulfamethoxazole (160 mg/800 mg) [1]	1 DS tablet po BID
Nitrofurantoin[1]	100 mg po BID
Fosfomycin	3 g dose (see tables for complicated and uncomplicated lower UTI)
Amoxicillin-clavulanate[1]	875mg po BID Uncomplicated Cystitis: 500 mg po BID
Cephalexin[1]	500 mg po BID-QID Uncomplicated Cystitis: 500 mg po BID
Cefdinir[1]	300 mg po BID
Cefazolin[1]	1-2g IV q 8 hr
Cefuroxime[1]*	500 mg po BID 750 mg-1.5g IV q 8 hr Uncomplicated Cystitis: 250 mg po BID
Piperacillin-tazobactam[1]	3.375 g IV q 6 hr or 4.5 g IV q 6-8 hr
Ceftriaxone	1-2 g IV once daily
Cefepime[1]	1-2 g IV q 8-12 hr
Levofloxacin[1]	250-750 mg QD Uncomplicated Cystitis: 250 mg po QD Uncomplicated Pyelonephritis: 7-day duration: 500 mg po QD 5-day duration: 750 mg po QD
Ciprofloxacin[1]	250-750 mg po BID 400 mg IV q12 hr Uncomplicated Cystitis: 250 mg po BID Uncomplicated Pyelonephritis: 500 mg po BID

* Dose depends on disease state (Uncomplicated UTI, Complicated UTI, Pyelonephritis), severity of presentation (e.g. septic shock, severe sepsis), presence of bacteremia, and susceptibilities of the pathogen

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