

Stony Brook University Hospital Treatment Guidelines: Management of Urinary Tract Infections (UTIs) in Adult Patients

1. Background

1. SBUH has incorporated national guidelines in its creation of hospital-wide treatment guidelines for the management of UTIs in adult patients in order to guide appropriate antibiotic use.

2. Definitions¹

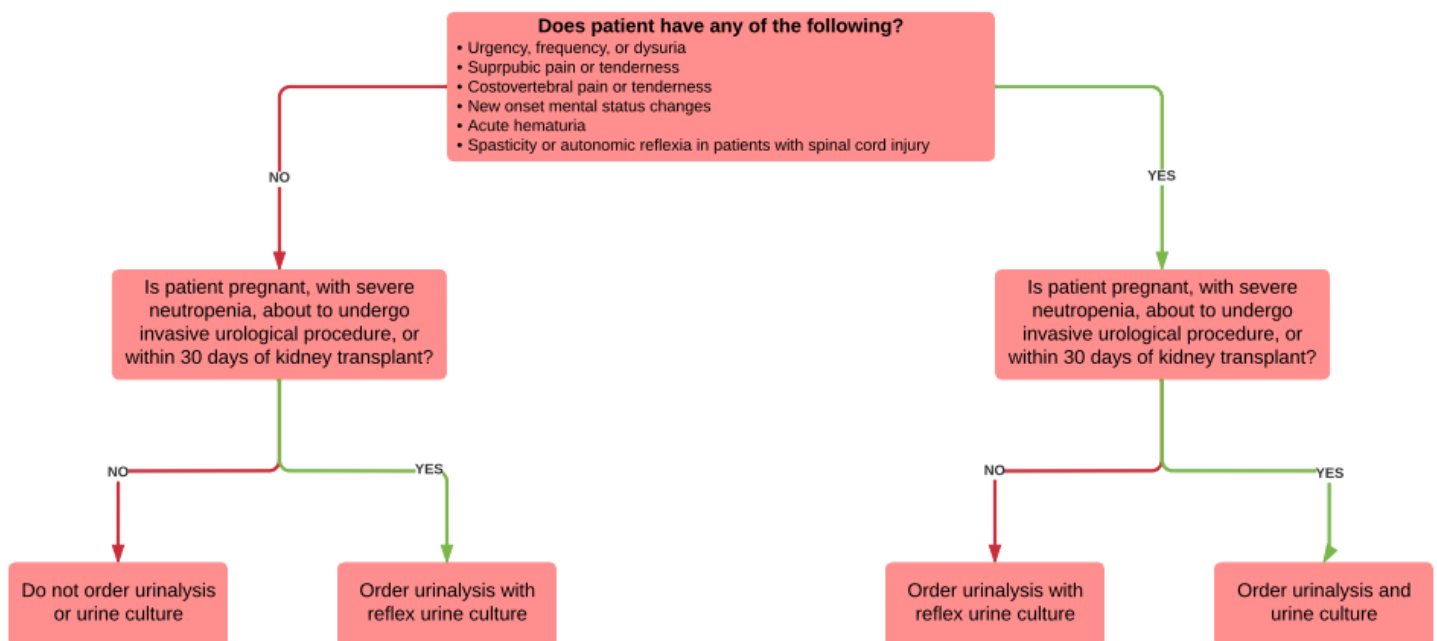
1. Uncomplicated cystitis: Infection of the lower urinary tract in otherwise healthy men and non-pregnant women
2. Complicated cystitis: Infection of the lower urinary tract associated with risk factors that increase infection virulence or the potential for antibiotic failure
 - i. Including urethritis and cystitis with bacteremia or sepsis
3. Pyelonephritis: Infection of the kidney or upper urinary tract

3. Symptoms¹

1. Cystitis: Dysuria, urinary frequency, urinary urgency, suprapubic pain or tenderness, hematuria
2. Complicated cystitis & pyelonephritis: Fever > 38°C, chills, sepsis, flank pain, costovertebral angle tenderness, nausea, vomiting

4. Diagnosis²

1. Urinalysis and urine culture should **not** be obtained for asymptomatic patients, as asymptomatic bacteriuria does not warrant treatment
 - i. Exception: Patients who are pregnant, about to undergo urological procedure, or within 30 days of kidney transplant
2. Urinalysis and urine culture should only be obtained for patients with presence of UTI symptoms



5. SBUH Antibiogram Data

1. Please consult SBUH Antibiogram for institutional susceptibility patterns when selecting therapy

6. Antibiotic Selection

1. **Table 1** lists treatment options for unknown cultures or for highly susceptible gram-negative organisms
2. If a patient presents with a known history of previous infection with multi-drug resistant organisms, please refer to **Table 2**
3. Treatment selection should be guided by antimicrobial susceptibilities
 - i. Do not use antimicrobial agent if an isolate is resistant (“R”)
4. Required treatment duration may be longer for patients with renal abscess or prostatitis

Table 1. Antibiotic Selection for Empiric Therapy

Clinical Diagnosis	Treatment	Duration
Uncomplicated Cystitis	Nitrofurantoin monohydrate^a 100 mg PO BID (avoid in CrCl < 30 mL/min)	5 days
	Sulfamethoxazole/trimethoprim 1 DS tablet PO BID	3 days
	Cephalexin 250-500 mg PO BID	5-7 days
	Amoxicillin/clavulanate 500/125 mg PO BID	5-7 days
Complicated Cystitis & Pyelonephritis	Sulfamethoxazole/trimethoprim^a 1 DS tablet PO BID	7 days
	Ceftriaxone^b 1 g IV QD	5-7 days
	Amoxicillin/clavulanate 875/125 mg PO BID	7 days
	Cefepime^c 1-2 g IV Q12	5-7 days
	Piperacillin/tazobactam^c 4.5 g IV Q8	5-7 days

^a First-line therapy if oral therapy is an option

^b First-line therapy if intravenous therapy is required

^c Only used for patients with known history of previous infection with *P. aeruginosa*

7. Antibiotic Selection for Specific Organisms^{3,4,5,6,7}

1. Treatment selection should be guided by antimicrobial susceptibilities
 - i. Do not use antimicrobial agent if an isolate is resistant (“R”)
2. Required treatment duration may be longer for patients with renal abscess or prostatitis

Table 2. Antibiotic Selection for Specific Organisms

Clinical Diagnosis	Treatment	Duration
Cystitis with Ceftriaxone-Resistant Organism ^b	Nitrofurantoin monohydrate 100 mg PO BID (avoid in CrCl < 30 mL/min)	5-7 days
	Sulfamethoxazole/trimethoprim 1 DS tablet PO BID	3-5 days
	Ciprofloxacin^a <u>Uncomplicated:</u> 250 mg PO BID <u>Complicated:</u> 500 mg PO BID or 400 mg IV BID	3-5 days
	Levofloxacin^a <u>Uncomplicated:</u> 250 mg PO QD <u>Complicated:</u> 750 mg PO or IV QD	3-5 days
	Fosfomycin^c (requires ID approval) 3 g PO x 1	One-time dose
Pyelonephritis with Ceftriaxone-Resistant Organism ^b	Meropenem 1 g IV Q8	5-14 days
	Ertapenem 1 g IV QD	5-14 days
	Sulfamethoxazole/trimethoprim 1 DS tablet PO BID	7-14 days
	Ciprofloxacin^a 500 mg PO BID or 400 mg IV BID	5-7 days
	Levofloxacin^a 750 mg PO or IV QD	5-7 days
Carbapenem-Resistant <i>Enterobacteriaceae</i> (CRE) Cystitis or Pyelonephritis	ID consult recommended	
Methicillin-Resistant <i>S. aureus</i> (MRSA) Cystitis	Nitrofurantoin monohydrate 100 mg PO BID	5-7 days
	Sulfamethoxazole/trimethoprim 1 DS tablet PO BID	3-7 days
Methicillin-Resistant <i>S. aureus</i> (MRSA) Pyelonephritis	Sulfamethoxazole/trimethoprim 1 DS tablet PO BID	14 days
	Vancomycin Please see SBUH empiric dosing guidelines	7-14 days
Vancomycin-Resistant <i>E. faecalis</i> (VRE) Cystitis ^d	Nitrofurantoin monohydrate 100 mg PO BID (avoid in CrCl < 30 mL/min)	5-7 days
	Amoxicillin 500 mg PO Q8 or 875 mg PO Q12	5 days
Vancomycin-Resistant <i>E. faecalis</i> (VRE) Pyelonephritis ^d	Amoxicillin/clavulanate 875/125 mg PO BID	10-14 days
	Ampicillin 1-2 g IV Q4-6	5-14 days
	Linezolid 600 mg PO or IV Q12	7-10 days

^a Only used for patients with known history of previous infection with *P. aeruginosa*

^b If piperacillin/tazobactam or cefepime was initiated empirically and clinical improvement occurs, no change of antibiotic therapy is necessary.⁴

^c Oral fosfomycin is associated with higher clinical failure compared to nitrofurantoin for uncomplicated cystitis. Additionally, fosfomycin susceptibility can only be provided for *E. coli* or *E. faecalis*, as CLSI has not established clinical breakpoints for other organisms. Data best supports use for *E. coli*.⁵

^d Since *Enterococci* are part of the normal gastrointestinal flora and often colonize the urinary tract, treatment is not usually required.⁷

8. References

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