

SHC Clinical Pathway: Management of Urinary Tract Infections – Adult Patients

I. Definitions:

- **Asymptomatic bacteriuria (ASB):** positive urine culture in the absence of urinary or systemic symptoms.
- **Uncomplicated UTI:** infection confined to the bladder alone (*i.e.* cystitis) regardless of sex, comorbidities (including immunocompromise), or anatomic abnormalities of the urinary tract.
 - **Lower urinary tract symptoms:** dysuria, urinary frequency or urgency, suprapubic pain.
- **Complicated UTI:** pyelonephritis/upper tract involvement, concomitant fever or bacteremia, or catheter-associated UTI (CAUTI).
 - **Upper tract/systemic symptoms:** flank pain, costovertebral angle tenderness.

II. Diagnostic Considerations

- Urine culture is indicated in patients with clinical symptoms of UTI, and should not be done in asymptomatic patients.
- UA should be done prior to urine culture to assess for infection. Absence of pyuria (≤ 10 WBCs/hpf) strongly suggests against UTI in non-neutropenic patients. Urinalysis results (*i.e.* elevated urine WBCs/nitrites or bacteria) are not diagnostic of UTI in the absence of compatible symptoms.
- Many other signs or symptoms (*e.g.* new-onset hematuria, nausea/vomiting, altered mental status, change in urine odor or color, etc.) may be associated with UTI, though also have numerous alternative explanations. Any of these symptoms alone should not prompt a urine culture without associated urinary symptoms.
- Avoid urine cultures from an indwelling catheter in place >4 days, as these are highly likely to be colonized. See [SHC Policy for Urinary Catheters](#) and [SHC Policy for CAUTI Prevention](#).

- III. **Exclusion:** Prostatitis and complicated pyelonephritis (including abscess or infected stone) are outside of the scope of this guideline; please consider Infectious Disease or Urology consult as appropriate. For kidney transplant patients, please see [SHC Asymptomatic Bacteriuria and Urinary Tract Infection in Renal Transplant Guideline](#).

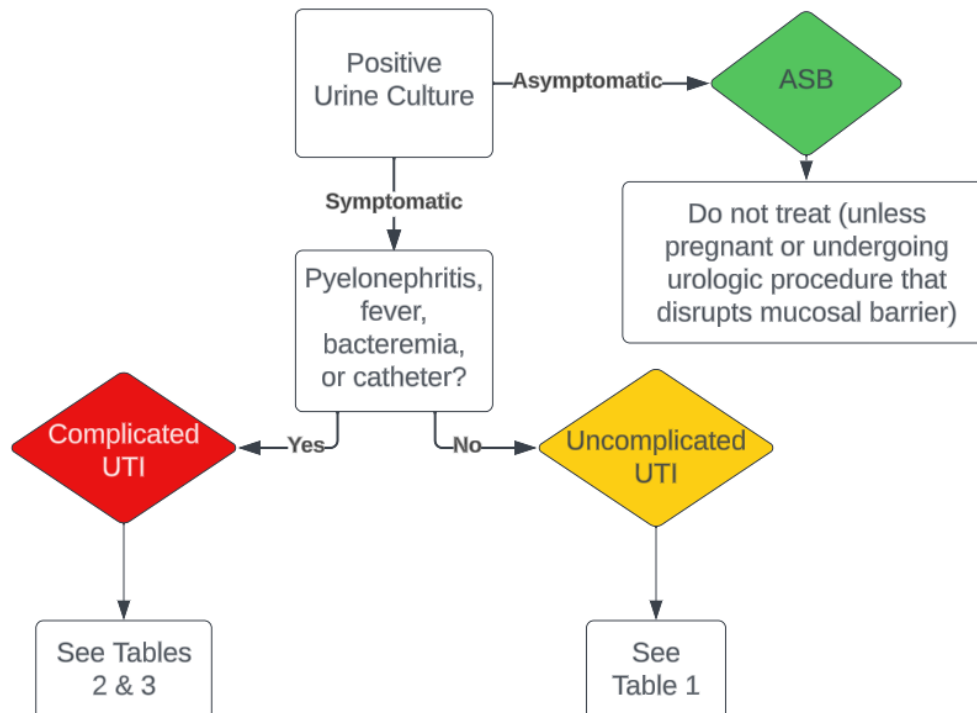


Table 1. Treatment of Uncomplicated UTI

Drug and Dose [#]	Duration	Comments
Preferred		
Nitrofurantoin (Macrobid) 100 mg PO BID	5 days	<ul style="list-style-type: none"> 98% of SHC <i>E. coli</i> isolates are susceptible (including ESBL). Avoid with CrCl <30. Avoid in pregnant women at term; caution in 1st trimester. For <i>Enterococcus</i> - SHC Enterococcus in Urine Tip Sheet.
Alternative		
Cephalexin 500 mg PO BID	5 days	<ul style="list-style-type: none"> If in-vitro susceptibility to cefazolin is confirmed.
Amoxicillin-clavulanate 500/125 mg PO BID	5 days	<ul style="list-style-type: none"> Avoid use for ESBL isolates, even if tests susceptible in vitro.
TMP/SMX 1 DS tablet PO BID	3 days	<ul style="list-style-type: none"> Avoid empiric use due to increasing resistance in <i>E. coli</i>. Caution in pregnant women, especially in 1st trimester.
Ciprofloxacin 250 mg PO BID OR Levofloxacin 250 mg PO daily	3 days	<ul style="list-style-type: none"> Avoid empiric use due to increasing resistance in <i>E. coli</i> ADRs: tendinitis, peripheral neuropathy, CNS effects, <i>C. difficile</i>, QTc prolongation, etc. Available data suggests low fetal risk in pregnant women but is inconclusive. Use caution, especially 1st trimester.
Fosfomycin 3 g PO once	Once	<ul style="list-style-type: none"> Avoid empiric use. May be considered for <i>E. coli</i> isolates with no other oral options if susceptibility confirmed (must ask micro lab to add on testing). See SHC Restriction Criteria.

Table 2. Empiric Treatment of Complicated UTI

Drug and Dose [#]	Duration	Comments
Preferred		
Ceftriaxone 1g IV daily (2g IV daily if bacteremic)	7 days	<ul style="list-style-type: none"> In cases of septic shock, refer to SHC Sepsis ABX Guidelines
If risk factors for resistant organisms: 1) blood or urine cultures with resistant organisms in past 12 months 2) fluoroquinolone exposure within past 12 months		
Cefepime 2g IV q8h extended infusion	7 days	<ul style="list-style-type: none"> Assessment of prior cultures (within 12 months) for past infection/colonization with resistant organisms is paramount. See Table 4 below.
Piperacillin-tazobactam 3.375g IV q8h extended infusion		
Ertapenem 1g IV daily		
Meropenem 1g IV q8h		
Alternative		
Ciprofloxacin 500 mg PO or 400 mg IV BID	7 days	<ul style="list-style-type: none"> <i>Pseudomonas</i> dosing: 750 mg PO BID or 400 mg IV q8h
Levofloxacin 750 mg PO or IV daily		

Table 3. PO Step Down for Complicated UTI (if organism susceptible, patient stabilized and tolerating PO)

Drug and Dose [#]	Duration	Comments
Cephalexin 1g PO TID	7 days (including prior IV therapy)	<ul style="list-style-type: none"> Alternative agent for ease of dosing in patient being discharged: cefadroxil 1g PO BID (not on SHC formulary)
Amoxicillin/clavulanate 875/125 mg PO BID		<ul style="list-style-type: none"> Avoid in ceftriaxone-resistant (<i>i.e.</i> ESBL) gram negative isolates, even if susceptible in vitro.
Ciprofloxacin 500 mg PO BID		<ul style="list-style-type: none"> <i>Pseudomonas</i> dosing: 750 mg PO BID
Levofloxacin 750 mg PO daily		
TMP/SMX 1-2 DS PO BID		
Bacteremic – see SHC Gram-Negative Bacteremia De-Escalation Guide		

[#]Adjust all dosing accordingly for impaired renal function or obesity; see [SHC Abx Renal Dosing Guide](#) and [SHC Abx Obesity Dosing Guide](#).

Table 4. MDRO Considerations (see Tables 1-3 for dosing and duration based on clinical syndrome)

Organism	Uncomplicated UTI	Complicated UTI
Ceftriaxone-resistant (<i>i.e.</i> ESBL) <i>E. coli</i> , <i>K. pneumoniae</i> , or <i>P. mirabilis</i>	<u>PO options if susceptibility confirmed</u> Nitrofurantoin (Macrobid) TMP/SMX <u>Alternative</u> Fluoroquinolones Fosfomycin (<i>E. coli</i> only) Single dose IV aminoglycoside*	<u>IV therapy (initial)</u> Ertapenem <u>PO step down (if susceptible)</u> Fluoroquinolones TMP/SMX
<i>Klebsiella aerogenes</i> , <i>Citrobacter freundii</i> , and <i>Enterobacter</i> spp (<i>i.e.</i> high risk of clinically significant AmpC production)	<u>PO options if susceptibility confirmed</u> Nitrofurantoin TMP/SMX <u>Alternative</u> Fluoroquinolones	<u>IV therapy (initial)</u> Cefepime Ertapenem <u>PO step down (if susceptible)</u> Fluoroquinolones TMP/SMX
Carbapenem-resistant Enterobacteriaceae (CRE)	<u>PO options if susceptibility confirmed</u> Nitrofurantoin TMP/SMX Fluoroquinolones Fosfomycin (uncomplicated <i>E. coli</i> UTI only)	ID consult recommended
Vancomycin-resistant <i>Enterococcus</i> (VRE)	<ul style="list-style-type: none"> • See SHC Enterococcus/VRE in Urine Tip Sheet. • Nitrofurantoin is an optimal PO choice for uncomplicated UTI if susceptibility confirmed. 	

*If susceptibility confirmed, though robust clinical trial data are lacking.

IV. References

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