### Executive Summary

This guideline is intended for patients who can tolerate oral therapy and do NOT require hospitalization.

### Category

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<th>Severity</th>
<th>Asymptomatic Bacteriuria</th>
<th>Acute Cystitis</th>
<th>Acute Pyelonephritis</th>
<th>Complicated UTI / Catheter-Associated UTI (CAUTI)</th>
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<td></td>
<td>Isolation of a specific quantity of bacteria in an appropriately collected urine specimen ($\geq 10^5$ cfu/mL) or from a catheter; $\geq 10^6$ cfu/mL from an individual WITHOUT signs or symptoms of infection.</td>
<td>General symptoms: acute onset dysuria, frequency or urgency. <strong>Risk factors for resistance</strong>&lt;br&gt;• Antibiotic exposure within 90 days&lt;br&gt;• Hospitalization within 90 days&lt;br&gt;• Presence of invasive device(s)</td>
<td>Upper UTI is frequently associated with general symptoms PLUS back/flank pain, fever &amp; chills.</td>
<td>Complicated UTI: infection in the presence of an anatomic or functional abnormality (e.g., enlarged prostate, calculi, obstruction, catheter or stent, neurogenic bladder, renal transplant, neutropenia). Lower UTI classically presents with suprapubic pain, increased frequency, and dysuria.</td>
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<td>Culture &amp; Susceptibility (C&amp;S) Investigation</td>
<td>Routine C&amp;S is NOT indicated in asymptomatic patients unless screening for pregnancy or urologic procedure with mucosal bleeding.</td>
<td>Routine C&amp;S is NOT indicated unless risk factor(s) for resistance exist; consider if prescribing 2nd line therapy</td>
<td>Urine C&amp;S are critical in order to optimize treatment. Urine collection from freshly placed catheter or if discontinued, a voided midstream prior to antibiotics.</td>
<td><strong>Note: if indwelling catheter or urinary stent, contact lab to identify all species since multiple isolates or &quot;skin flora&quot; may be discarded as contaminants.</strong></td>
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### Recommended Treatment and Duration

**Pregnant women:**
1. **Cephalexin** 500mg BID x 3d
2. **Nitrofurantoin** 100mg BID x 5d

**Urologic procedure:**
Direct treatment based on pre-procedure screening C&S. Treatment is NOT appropriate for women (premenopausal, non-pregnant), diabetics, elderly, nursing home residents, spinal cord injury or indwelling urethral catheters.

**First Line:**
1. **Nitrofurantoin** 100mg BID x 5d
2. **Cephalexin** 500mg BID x 7d

**Fluoroquinolone FDA Safety Alert:**
Disabling & potentially permanent adverse effects outweigh benefit in cystitis. Only use when no other alternatives exist.
3. **Ciprofloxacin** 250mg BID x 3d

**Note:** If STD risk w/ symptoms of urethritis, consider treatment for chlamydia.

**Base empiric treatment on prior culture data.** If stable vitals & afebrile, provide definitive therapy when new C&S result.

**Duration:**
- Stop antibiotics 3-5 days after either defervescence or elimination of complicating factor (e.g. catheter, stone)
- If female and < 65 years of age, a 3-day regimen may be considered for CAUTI with catheter removal.
- If CAUTI and NOT severely ill, a 5-day regimen of levofloxacin 750mg may be considered.
- Shorter courses (7 days) are reasonable, if symptoms promptly resolve.
- Longer courses (10-14 days) if delayed response, regardless if catheterized or not.

- **Nitrofurantoin** is 1st line for most patients without fever. Toxicity is minimized by short course therapy, which can be safe and effective with a CrCl as low as 30mL/min. Contraindicated in pregnancy at term (38-42wks)
- 3rd generation cephalosporins (e.g. cefpodoxime) provide no additional coverage for E.coli or K. pneumoniae over cephalexin.
- Per ACOG/IDSA, TMP/SMX 1 DS tab BID x 3d may be used during the 2nd and 3rd trimester if needed as an alternative for nitrofurantoin or cephalexin in pregnancy.
- E. coli susceptibility to TMP/SMX is <80% and should be avoided as empiric therapy but may be considered if confirmed by C&S for complicated UTI or pyelonephritis (2 week duration).
- For ESBL (Extended Spectrum Beta-lactamase) producing organism, treat according to reported susceptibility with nitrofurantoin, TMP/SMX or FQ. If resistant to all tested antibiotics or multiple allergies, consult Infectious Diseases for potential alternatives: (ex. Fosfomycin). ESBL pyelonephritis may require IV carbapenem.
- Antibiotic prophylaxis for most patients with risk factors for recurrent, complicated UTI is NOT recommended. Risk of resistance outweighs the slight reduction in infection rate.
- Methenamine salts or cranberry products should NOT be used routinely to reduce CA-bacteriuria or CA-UTI.

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