

# Urinary Tract: Non-Catheter Associated Urinary Tract Infection/Cystitis

CLASSIFICATION	CLINICAL FINDINGS	RECOMMENDED EMPIRIC REGIMENS	CLINICAL CONSIDERATIONS
<b>Asymptomatic Bacteriuria</b>	<ul style="list-style-type: none"> <li>Pyuria (urinalysis &gt; 5- 10 WBC)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>Positive urine culture (<math>\geq 100,000</math> cfu/mL)<sup>†</sup></li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>No sign or symptoms (see below)</li> </ul>	<p><b>No antibiotics unless the patient is:</b></p> <ul style="list-style-type: none"> <li>Scheduled for urologic procedure</li> <li>Pregnant</li> </ul> <p><b>Scheduled Urologic Procedure:</b> SMX/TMP 1 DS tablet PO Q12H</p> <p><b>OR</b> Ciprofloxacin 500 mg PO</p> <p><b>OR</b> Ciprofloxacin 400 mg IV Q12H</p> <p>Initiate within 24 hours prior to procedure and until foley removed</p> <p><b>Pregnant:</b> Amoxicillin 500 mg PO Q8H for 3 to 7 days</p> <p><b>OR</b> Cephalexin 500 mg PO Q6H for 3 to 7 days</p> <p><b>OR</b> Nitrofurantoin (MacroBID)<sup>‡</sup> 100 mg PO Q12H for 5 days</p>	<ul style="list-style-type: none"> <li>Obtaining routine cultures in asymptomatic patients is <b><u>NOT</u></b> recommended</li> <li>Antibiotics do <b><u>NOT</u></b> decrease asymptomatic bacteriuria or prevent subsequent UTI</li> </ul>
<p><b>Symptomatic: Complicated</b></p> <p><b>≥ 1 of the following:</b></p> <ul style="list-style-type: none"> <li>Male</li> <li>Pyelonephritis</li> <li>Antibiotic use in previous 90 days</li> <li>History of infection with MDRO</li> <li>Immuno-compromised</li> <li>Functional or anatomic urologic abnormality</li> <li>Severe sepsis</li> </ul>	<ul style="list-style-type: none"> <li>Pyuria (Urinalysis <math>\geq 5</math> WBC)</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>Positive urine culture (<math>\geq 100,000</math> cfu/mL)<sup>†</sup></li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>Presence of symptoms: <ul style="list-style-type: none"> <li>Dysuria</li> <li>Urgency</li> <li>Frequency</li> <li>Suprapubic pain</li> </ul> </li> </ul> <p><b>AND/OR</b></p> <ul style="list-style-type: none"> <li>Presence of signs: <ul style="list-style-type: none"> <li>Fever (<math>\geq 100.4^{\circ}\text{F}</math>)</li> <li>Altered mental status</li> <li>Leukocytosis</li> </ul> </li> </ul>	<p><b>Outpatient:</b> SMX/TMP 1 DS tablet PO Q12H</p> <p><b>OR</b> Nitrofurantoin (MacroBID)<sup>‡</sup> 100 mg PO Q12H</p> <p><b>OR</b> Ciprofloxacin 250 - 500 mg PO Q12H</p> <p><b>Inpatient:</b> Cefazolin 2 gm IV Q8H</p> <p><b>OR</b> Cefepime 1 gm IV Q12H</p> <p><b>OR</b> Ceftriaxone 1 gm IV Q24H</p> <p><b>OR</b> Ampicillin/sulbactam 1.5 gm IV Q6H</p> <p><b>Known or suspected ESBL bacteria:</b> Meropenem 1 gm IV Q8H</p> <p><b>OR</b> Ertapenem 1 gm IV Q24H</p> <p><b>Duration of Treatment:</b> <b>7 to 14 days</b></p>	<ul style="list-style-type: none"> <li>Narrow antibiotic therapy when organism and susceptibilities are known</li> <li>Follow-up urine cultures or urinalysis are only warranted for on-going symptoms. They should <b><u>NOT</u></b> be obtained routinely to monitor response to therapy</li> </ul>

cfu= colony forming units; ESBL= extended spectrum beta-lactamase; H= hour(s); IV= intravenous; MDRO= multi-drug resistant organism; PO= by mouth; Q= every; SMX/TMP= sulfamethoxazole/trimethoprim; UTI= Urinary Tract Infection; WBC= white blood cell count

**†Positive urine culture:**

**For Women:** 2 consecutive voided urine specimens with isolation of  $>10^5$  cfu/mL of the same bacterial strain

**For Men:** A single, clean-catch, voided urine specimen with isolation of  $>10^5$  cfu/mL from 1 bacterial species

**‡Nitrofurantoin:** Contraindicated if CrCl < 60 mL/min **AND** only indicated in acute cystitis

**NOTE: Dosing based on normal renal function. Refer to Table of Contents for section on Antimicrobial Dosing for Adult Patients Based on Renal Function**

# Urinary Tract: Non-Catheter Associated Urinary Tract Infection/Cystitis

CLASSIFICATION	CLINICAL FINDINGS	RECOMMENDED EMPIRIC REGIMENS	CLINICAL CONSIDERATIONS
<b>Symptomatic Uncomplicated/ Cystitis</b> <ul style="list-style-type: none"> <li>Female</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>No criteria for complicated (see previous page)</li> </ul>	<ul style="list-style-type: none"> <li>Pyuria (Urinalysis: <math>\geq 5</math> WBC)</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>Positive urine culture (<math>\geq 100,000</math> cfu/mL)<sup>†</sup></li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li>Presence of symptoms:               <ul style="list-style-type: none"> <li>Dysuria</li> <li>Urgency</li> <li>Frequency</li> <li>Suprapubic pain</li> </ul> </li> </ul>	Nitrofurantoin (MacroBID) <sup>‡</sup> 100 mg PO Q12H for 5 days <b>OR</b> SMX/TMP 1 DS tablet PO Q12H for 3 days  <i>Alternative agents should be avoided if possible due to the risk of C. difficile</i> <b>AND antibiotic resistance. IF patient has an allergy/contraindication to the above antibiotics alternatives include:</b> <b>Ciprofloxacin 250 mg PO Q12H for 3 days OR Cephalexin 500 mg PO Q12H for 3 days</b>	<ul style="list-style-type: none"> <li>Urine culture should be performed <b>ONLY IF:</b> <ul style="list-style-type: none"> <li>History of multiple UTIs</li> </ul> </li> <li><b>OR</b> MDRO infection(s)</li> <li>Narrow antibiotic therapy when organism and susceptibilities are known</li> <li>Follow-up urine cultures or UA are only warranted for on-going symptoms. They should <b>NOT</b> be obtained routinely to monitor response to therapy</li> </ul>

## Urinary Tract: Prostatitis

CLASSIFICATION	PREFERRED REGIMEN	ALTERNATIVE REGIMENS	CLINICAL CONSIDERATIONS
<b>Outpatient</b>	Ciprofloxacin 500 mg PO Q12H	SMX/TMP 1 DS tablet PO Q12H <b>OR</b> Levofloxacin 500 mg PO once daily (Requires ID Consult)  <b>Duration of Treatment: 28 days</b>	Beta-lactams <b>DO NOT</b> have adequate penetration into prostate

cfu= colony forming units; DS= double strength; H= hour(s); MDRO= multi-drug resistant organism; PO= by mouth; Q= every; SMX/TMP= sulfamethoxazole/trimethoprim; UA= urinalysis; UTI= Urinary Tract Infection; WBC= white blood cell count

### †Positive urine culture:

- For Women:** 2 consecutive voided urine specimens with isolation of  $>10^5$  cfu/mL of the same bacterial strain
- For Men:** A single, clean-catch, voided urine specimen with isolation of  $>10^5$  cfu/mL from 1 bacterial species

‡Nitrofurantoin: Contraindicated if CrCl < 60 mL/min **AND** only indicated in acute cystitis

**NOTE: Dosing based on normal renal function. Refer to Table of Contents for section on Antimicrobial Dosing for Adult Patients Based on Renal Function**

### References:

- Hooton TM, Bradley SF, Cardena DD, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 international clinical practice guidelines from the Infectious Disease Society of America. *CID* 2010;50:625-63.
- Nicolle LE, et al. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. *Clin Infect Dis*. 2005 Mar 1;40(5):643-54.
- Gupta K, et al. 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 European Society for Microbiology and Infectious Diseases. *Clin Infect Dis*. 2011 Mar 1;52(5):e103-20.