

## Diagnosis

- **First, ask about symptoms**
  - Acute cystitis: dysuria, frequency, urgency, suprapubic pain
  - Pyelonephritis: fever, flank pain
  - Sending a urine culture in the absence of symptoms is indicated only early during pregnancy or in patients who will undergo urologic procedures involving mucosal bleeding<sup>1</sup>
- **Second, if symptoms are present, decide if a urinalysis (UA) and urine culture is needed**
  - Most adolescent and adult women with acute cystitis can be treated without testing given the strong correlation of symptoms and the presence of infection<sup>2</sup>
  - UA and urine culture should be sent in the following situations:<sup>2</sup>
    - Risk factors for antibiotic-resistant bacteria
      - Recent antibiotic exposure
      - History of recurrent urinary tract infections (UTIs)
    - Suspected complicated UTIs
      - UTIs in adolescent or adult males or UTIs in a female occurring in the presence of an obstruction, chronic urinary stasis, or urinary catheterization
    - Pyelonephritis or ill appearance
  - Urine culture should not be sent if the patient reports foul-smelling or cloudy urine or for a positive urine dipstick in the absence of other symptoms<sup>1</sup>
- **Third, give the patient directions on how to collect a clean urine sample**
  - Clean urethral meatus with a wipe and obtain clean-catch midstream sample
- **Fourth, review the results<sup>2</sup>**
  - A positive urinalysis shows evidence of inflammation (e.g., white blood cell count [WBC]  $\geq 10$ )
  - A positive urine culture is defined as  $\geq 10,000$ – $100,000$  CFU/mL of a urinary pathogen (most commonly *Escherichia coli*)

## Treatment

- Do not start antibiotics for a positive UA or urine culture without asking about symptoms.
  - Treating asymptomatic bacteriuria can increase the risk for a UTI in the future<sup>3-4</sup>
- Review prior urine culture results as previous susceptibility data can guide antibiotic choice

Condition	Antibiotic Options <sup>2</sup>	Comments
Uncomplicated cystitis <sup>2</sup>	<ul style="list-style-type: none"> <li>• Nitrofurantoin</li> <li>• TMP/SMX</li> <li>• Cephalexin, cefadroxil</li> <li>• Cefdinir, cefpodoxime</li> </ul>	Fluoroquinolones are not recommended as first-line agents due to the adverse event profile.
Uncomplicated pyelonephritis <sup>2</sup>	<ul style="list-style-type: none"> <li>• Ciprofloxacin</li> <li>• Levofloxacin</li> <li>• TMP/SMX</li> <li>• Cephalosporin</li> </ul>	<b>Not ill appearing:</b> fluoroquinolones or TMP/SMX generally acceptable, with close followup for clinical improvement; alternative for patients with previous uropathogens resistant to these agents or known intolerance to these agents are oral cephalosporins. <b>Ill appearing:</b> refer to emergency department.
Complicated UTI <sup>2</sup>	<ul style="list-style-type: none"> <li>• Same agents as uncomplicated pyelonephritis</li> </ul>	

Note: TMP/SMX = Trimethoprim/sulfamethoxazole

## Duration

- Cystitis: 3–5 days is typically sufficient<sup>2</sup>
- Pyelonephritis or complicated UTI: 7 days is typically sufficient for fluoroquinolones or TMP/SMX and 10–14 days for oral cephalosporins<sup>2</sup>

## Followup

- Patients with cystitis should seek further medical care if symptoms are not improving by day 3 or if patients develop flank pain or fevers or feel more ill
- Patients with pyelonephritis or complicated UTIs should seek medical care if fevers persist by day 3, rigors develop, or if patients are generally feeling more ill at any time

## References

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2. Gupta K, Hooton TM, Naber KG, 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 the European Society for Microbiology and Infectious Diseases. *Clin Infect Dis*. 2011 Mar 1;52(5):e103-20. PMID: 21292654.
3. Cai T, Mazzoli S, Mondaini N, et al. The role of asymptomatic bacteriuria in young women with recurrent urinary tract infections: to treat or not to treat? *Clin Infect Dis*. 2012 Sep;55(6):771-7. PMID: 22677710.
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