**CYSTITIS OR ASYMPTOMATIC BACTERIURIA**

**DEFINITION**
Cystitis is an infection of the bladder (usually with E. Coli) accompanied by clinical symptoms. It is the most common bacterial infection seen in ambulatory settings; over 8 million cases occur each year. Treatment of cystitis is recommended to reduce the infrequent risk of pyelonephritis, but mainly to reduce morbidity. Laboratory testing of women with more than 2 symptoms does not improve accuracy of the diagnosis. On the other hand, asymptomatic bacteriuria (presence of significant numbers of bacteria in the urine without complaints) is considered a benign condition – a protective mechanism in many cases. Asymptomatic bacteriuria (ABU) is commonly found in older adults but is known to resolve spontaneously. Treatment of asymptomatic bacteriuria is not recommended in nonpregnant adults. However, in pregnancy, both routine screening urine culture and treatment of asymptomatic bacteriuria are recommended to prevent serious infections, complications and preterm birth. Treatment recommendations now reflect not only efficacy, but also ecological adverse events, such as development of antibiotic resistance.

**UNCOMPPLICATED CYSTITIS**

**SUBJECTIVE**
Must include one of the following:
1. Acute dysuria.
2. Urinary frequency.
3. Urgency, worsening incontinence.
5. History of and treatments for UTIs within the last year.

Must exclude:
1. Flank pain.
2. Fever.
3. Inability to take oral medications.
4. Immunosuppression, sickle cell disease.
5. Voiding abnormalities – spinal cord injury, catheter use, renal transplant, abnormalities in GU system, (calculi, and neurogenic bladder).
6. Symptoms that are better explained by vaginal infection (women) or prostatitis (men).

**OBJECTIVE**
May include:
1. Suprapubic tenderness.
2. Urethral or bladder tenderness.
3. Low grade fever.

Must Exclude:
1. CVA tenderness.
2. Temperature ≥ 100.5°F.
3. Uterine contractions, if pregnant (refer to evaluate preterm labor).
4. Vaginal or cervical/pelvic infection (discharge, tenderness), unless concomitant infections discovered.
5. Prostatic tenderness (detected by gentle massage).

**LABORATORY**
Note: for nonpregnant symptomatic, low risk women with at least 2 symptoms, no labs are needed unless infection is recurrent.
May include one or more of the following:
1. Urine dipstick positive for nitrite or leukocyte esterase with or without blood.
2. Microscopic analysis of midstream, clean catch urine specimen shows WBCs and bacteria.
3. Urine culture of midstream specimen identified microorganisms with $10^3$ CFU/mL. Culture is most helpful for sensitivity testing when resistance is suspected (recurrent infection) and in pregnant women.
NOTE: Because many labs do not report colony forming counts/mL below $10^4$, a “No growth” result does not rule out infection in a symptomatic person.

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<th>ASSESSMENT</th>
<th>Uncomplicated cystitis or recurrent cystitis.</th>
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**PLAN**

1. Single episode uncomplicated cystitis. Treatment depends upon local antibiotic resistance profiles and antibiotic availability. In general, both men and pregnant women require longer term therapies rather than the shorter ones. People with diabetes are treated the same as non-diabetics. Always evaluate for drug allergies before prescribing.
   a. The preferred antibiotics: treat with one of the following:
      1) Trimethoprim-sulfamethoxazole 160/800 mg orally twice daily for 3 days. *(First line choice if local antibiotic resistance < 20%; contraindicated for women with G6PD deficiency and in first and third trimester of pregnancy.)*
      2) Nitrofurantoin for men and nonpregnant women. *(Contraindicated for women with G6PD deficiency should not be given to elderly with creatinine clearance ≤ 40 mL/minute.)*
         a) 100 mg orally twice daily for 5-7 days.
         OR
         b) 50 mg orally four times a day for 7 days.
         Note: In pregnant women, the dosage is 100 mg orally twice daily for 7 days. *(Do not use in first trimester if other drugs available.)*
      3) Fosfomycin 3 g sachet orally single dose
   b. Alternative therapies have lower efficacy or greater societal impacts and are used only when preferred antibiotics are not available or are inappropriate. Use one of the following in men and non-pregnant women:
      1) Fluoroquinolones
         a) Ciprofloxacin 250 mg orally twice daily for 3 days.
         b) Levofloxacin 250 mg or 500 mg orally daily for 3 days.
      2) Beta-lactams
         a) Amoxicillin-clavulanate 875 mg orally twice daily for 3-7 days.
         b) Cephalexin 500 mg orally twice daily for 7-14 days.
   c. Alternatives that can be used in pregnancy based on susceptibility testing (it is generally not advisable to delay treatment in pregnancy until susceptibility results available) include one of the following:
      1) Amoxicillin 500 mg orally 3 times daily for 7 days.
      2) Cephalexin 500 mg orally 4 times daily for 7 days.
   d. For patients with significant symptoms, a urinary analgesic (phenazopyridine 200 mg OTC) can be offered orally 3 times a day, as needed for up to 2 days.
   e. In men and non-pregnant women, no test of cure is needed unless symptoms persist.
      1) In women, rule out vaginitis.
      2) In men, rule out prostatitis.
   f. Pregnant women who are treated for ABU or UTI need close surveillance with repeat urine culture and sensitivity testing periodically throughout pregnancy. Prophylactic antibiotic suppression does not reduce UTI recurrence, pyelonephritis or preterm birth better than surveillance and treatment when the patient develops a recurrent infection.

2. Recurrent cystitis:
   a. Confirm pathogen and sensitivities with urine culture. Evaluate possible drug allergies.
   b. Treat initially with one of preferred antibiotics until sensitivities are identified. If needed, switch antibiotics at that time.
   c. Postmenopausal women with genitourinary menopause syndrome and recurrent UTIs may benefit from vaginal estrogen therapy. *(See protocol Atrophic Vulvovaginitis.)*
   d. Ultrasound evaluation of kidney, ureters, and bladder may be helpful if the patient has persistent hematuria or multiple early recurrences (< 3 months) with the same strain of bacteria.
**ASYMPTOMATIC BACTERIURIA** should be treated only in pregnant women and in people undergoing urologic procedures that will disrupt the bladder mucosa.

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| 1. Clean catch midstream urine specimen has at least one of the following:  
  a. Microscopic examination: WBC and bacteria.  
  b. Urine dipstick positive for nitrates, leukocyte esterase or occult blood.  
  c. Culture shows ≥ 10^3 colony forming units/mL urine (often 2 consecutive specimens must show such growth).  

**NOTE:** If urine culture positive for Group B Strep, see protocol *Prevention of Prenatal Group B Streptococcal Infection*. |

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<td>Pregnant women with asymptomatic bacteriuria (ABU).</td>
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| 1. Treat with one of antibiotics used to treat cystitis in pregnancy listed above. The only exception is when Group B Strep is found in asymptomatic pregnant women. Initial treatment for ABU with Group B strep may not be needed, but treatment in labor is mandatory. Repeat GBS screening later in pregnancy is not needed, since women will automatically be given antibiotics in labor or with rupture of membranes.  
2. Close surveillance is needed following treatment for ABU in pregnancy. Repeat urine culture and sensitivity tests every month during pregnancy. Treat with appropriate antibiotic when a positive culture is found.  
3. Antibiotic suppression is no more effective at reducing recurrent urinary tract infection than is close surveillance. |

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<th>PATIENT EDUCATION</th>
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| 1. Instruct patient to go to ER if fever, chills, nausea, vomiting or flank pain develops.  
2. Advise patient to RTC if symptoms are not relieved by medication.  
3. Urge completion of course of medication even after symptoms resolved.  
4. Emphasize importance of drinking at least 8-10 glasses of liquids (e.g., water, juice, milk) per day.  
5. Advise patient that vaginitis and some digestive upsets are not uncommon side effects of some antibiotic medications.  
6. Advise patient to take antibiotics 1 hour before or 2 hours after meals or dairy products, iron and antacid.  
7. Warn people who plan to use OTC phenazopyridine that the color of their urine will change to orange and may stain their underwear.  
8. Advise prenatal patients who have Group B Streptococcal urine infections that they will need antibiotic treatment in labor or with rupture of membranes.  
9. Tell patient that some coital positions put excessive pressure on bladder and may irritate inflamed tissue within the bladder. Avoid these positions until bladder infection subsides.  
10. Advise patient that although cranberries contain a substance that blocks bacteria from binding to the bladder wall, there are no studies that show that cranberries are helpful in the treatment of bladder infection.  
11. If recurrent UTI:  
   a. Consider advising patient to discontinue vaginal spermicides if patient can use another method.  
   b. Counsel patient that post-coital voiding, douching or wiping techniques and cranberry juice or cranberry products have not proved effective at reducing risk of recurrent UTIs. |

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| 1. If culture and sensitivity results demonstrate resistance to medications in protocol.  
2. If symptoms persist after treatment.  
3. If symptoms present with negative culture results.  
4. If pregnant with cervical dilation or temperature > 100.4º F. (L&D/ER) |
5. Non-pregnant women or men with temperature > 101°F.
6. People with 3 or more UTIs in one year.

REFERENCES