

Urinary Tract Infection and Asymptomatic Bacteriuria Guidance

Urinary tract infection (UTI) is the most common diagnosis associated with antimicrobial use in hospitals, and a significant proportion of this use is inappropriate or unnecessary. This guidance was developed to facilitate the evaluation and treatment of UTIs.

A urine culture should only be obtained when a significant suspicion for a UTI exists based on a patient's symptoms. Urine culture data should always be interpreted by taking into account the results of the urinalysis AND the patient's symptoms. When interpreting a urinalysis, the presence of leukocyte esterase suggests white blood cells are present while nitrites suggest that gram-negative organisms are present. Neither of these findings are diagnostic of a UTI.

UTI Evaluation Order Panel

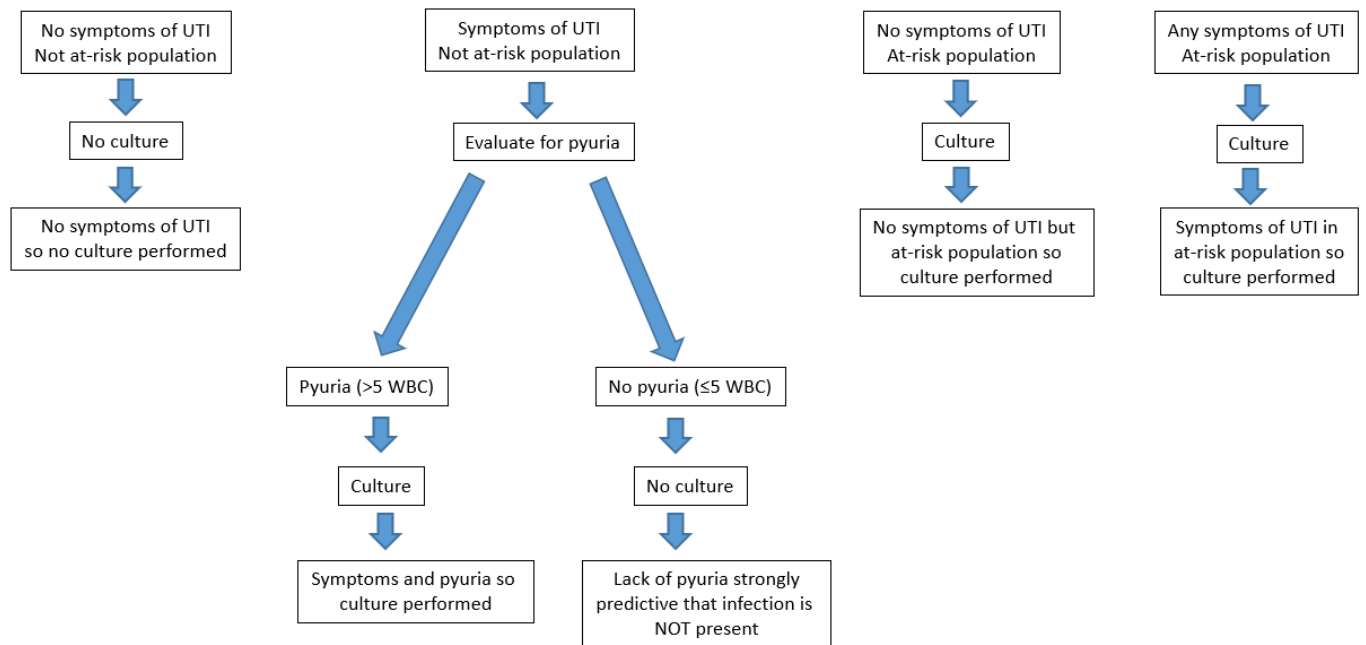
Assess symptoms

- No symptoms suggestive of UTI
- Dysuria
- New onset frequency or urgency
- Suprapubic or CVA tenderness
- Fever and unable to assess for UTI symptoms
- New alteration in mental status without a clear cause
- Acute hematuria
- Sepsis of unknown etiology

Assess if "at-risk population"

- Neutropenia
- Kidney transplant
- Pregnant
- Impending urologic surgery
- Child under 3 years

Urinalysis with Reflex to Culture Algorithm



Indication for urinalysis with reflex to culture:

- When signs or symptoms of a urinary tract infection are present
- Inpatient who cannot provide history (e.g., intubated) and has sepsis with an unexplainable source

Urinalysis with culture is NOT recommended:

- Change in urine color, odor, or turbidity -these are typically due to patient hydration and not indicators of infection
- Patients without symptoms of a urinary tract infection
- Automatically in work-up of fever or sepsis -patients who can provide a history should not have a urine culture obtained as part of fever evaluation unless symptoms suggest a UTI is present
- Preoperatively except in urologic surgery where mucosal bleeding is anticipated
- When a urinary catheter is placed or changed
- Upon admission without signs of a urinary tract infection
- After treatment of UTI to document cure

Interpretation of urine culture:

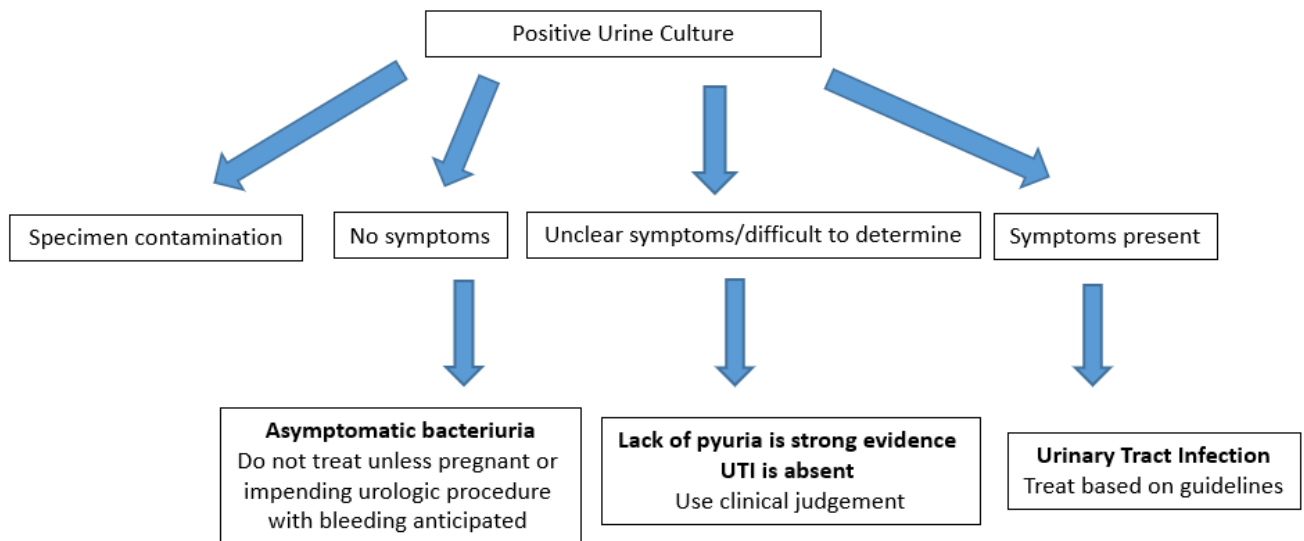
Bacteria are frequently noted on urinalysis and culture from urine specimens. The presence of bacteria in the urine may indicate one of three conditions:

1. Specimen contamination
2. Urinary tract infection (UTI)
3. Asymptomatic bacteriuria (ASBU).

When evaluating the clinical significance of a urine culture, these 3 conditions must each be considered and classification should be based upon history and exam findings coupled with urinalysis findings. Specimen contamination should always be considered, as this is common, particularly in female patients.

High numbers of squamous cell on urinalysis suggests contamination and results of the culture should be interpreted with caution. **It is important to recognize that pyuria is not an indication for treatment.** Pyuria is the presence of an increased number of polymorphonuclear leukocytes in the urine (generally >10 WBC/hpf) and is evidence of genitourinary tract inflammation. Pyuria can be seen in patients with catheter use, sexually transmitted diseases, interstitial nephritis, or asymptomatic bacteriuria. The absence of pyuria is a strong indicator that a UTI is NOT present and it is useful in ruling out a urinary tract infection (i.e. high negative predictive value).

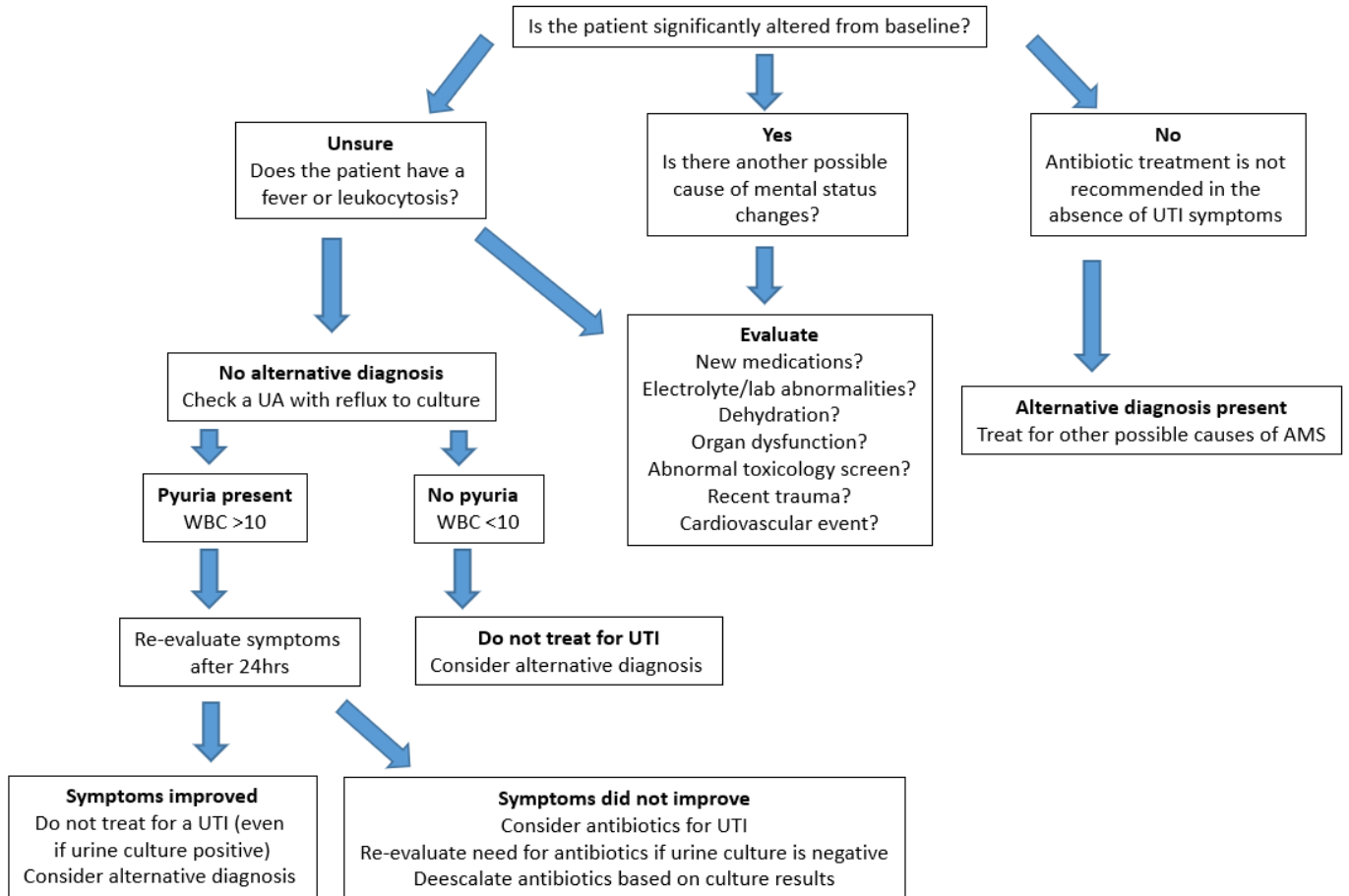
Although it is recommended to order a urine culture after assessment of symptoms, there may be circumstances that a urinalysis with culture may have been ordered and resulted prior to clinical assessment. In patients with a positive urine culture, where no contamination exists, clinicians must determine if the patient is exhibiting symptoms of a urinary tract infection. Symptoms typical for urinary tract infections are urinary frequency or urgency, dysuria, new onset hematuria, suprapubic pain, costovertebral tenderness, or fever. Patient with a urinary catheter in place may have more vague symptoms such as new onset or worsening fever, chills, pelvic discomfort, unexplained leukocytosis, or acute hematuria.



Altered mental status without urinary or systemic symptoms is not an indication for antimicrobial therapy in patients being evaluated for a UTI. Based on recommendations from the Infectious Disease Society of America (IDSA) and the American Medical Directors Association (AMDA), they recommend that in clinically stable patients antibiotics can be held and other causes of AMS be assessed while UTI only be considered if new symptoms arise or no other cause is found.

Dehydration is a very common cause of altered mental status in elderly patients. Providing hydration along with active monitoring is the best treatment for this condition. Although delirium can make assessment of symptoms difficult in this population, most patients with altered mental status and no clear signs of infection will improve without antibiotics.

Evaluating Altered Mental Status in Elderly Patients



Asymptomatic Bacteriuria

Patients with positive urine culture who lack symptoms of a urinary tract infection have a diagnosis of asymptomatic bacteriuria (ASBU). ASBU is more common in some patient populations and the prevalence increases with advancing age (see table below). ASBU is also associated with sexual activity in young women and is more prevalent in patients with impaired urinary voiding or indwelling urinary devices.

TABLE 1
Prevalence of Asymptomatic Bacteriuria
in Selected Populations

<i>Population</i>	<i>Prevalence (%)</i>
Healthy premenopausal women ³	1.0 to 5.0
Pregnant women ³	1.9 to 9.5
Postmenopausal women (50 to 70 years of age) ³	2.8 to 8.6
Patients with diabetes	
Women ⁴	9.0 to 27.0
Men ⁴	0.7 to 1.0
Older community-dwelling patients	
Women (older than 70 years) ³	> 15.0
Men ⁴	3.6 to 19.0
Older long-term care residents	
Women ⁴	25.0 to 50.0
Men ⁴	15.0 to 40.0
Patients with spinal cord injuries	
Intermittent catheter ⁵	23.0 to 89.0
Sphincterotomy and condom catheter ⁶	57.0
Patients undergoing hemodialysis ⁷	28.0
Patients with an indwelling catheter	
Short-term ⁸	9.0 to 23.0
Long-term ⁸	100

Information from references 3 through 8.

Screening, and therefore treatment of ASBU should only be done in 2 specific clinical scenarios:

1. **Pregnant women** should be screened and treated for ASBU, as they have a significantly increased risk of developing pyelonephritis as well as experiencing premature delivery and delivering a low birthweight infant.
2. Patient should be screened for ASBU **prior to transurethral resection of the prostate or any other urologic procedure with a risk of mucosal bleeding**. These patients are at an increased risk for post-procedural bacteremia and sepsis.

Table 2: IDSA Guideline Recommended Indications for the Screening and Treatment of ASBU²

Screen and Treat	DO NOT Screen and Treat
<ul style="list-style-type: none"> • Pregnant women (at least once in early pregnancy) <ul style="list-style-type: none"> ○ 4-7 days; shortest effective course should be used • Prior to urologic procedure with risk of mucosal bleeding (e.g., TURP, etc.) <ul style="list-style-type: none"> ○ 1-2 dose short course started 30-60 mins prior to procedure 	<ul style="list-style-type: none"> • Children • Healthy, nonpregnant women • Healthy, postmenopausal women • Older persons living in the community • Elderly residents of long-term care facilities • Patients with diabetes • Kidney transplant recipient with surgery >2 months prior • Any other solid organ transplant • Spinal cord injury • Indwelling urethral catheter • Elective non-urologic surgery • Placement or presence of artificial urine sphincters or penile prostheses • Asymptomatic funguria

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Unfortunately, many patients with ASBU receive treatment from which they do not benefit and by which they are likely harmed. The unnecessary treatment of ASBU can lead to antibiotic resistance, adverse drug effects, *C. difficile* infection, and unnecessary costs of medical care. Gandhi and colleagues described antibiotic use for 3 months on a single medicine ward with 54% (224/414) of patients treated with antimicrobials. UTI was the most common diagnosis (n=49). Of those who were treated for a urinary tract infection, 32.6% had no symptoms suggestive of a urinary tract infection. In another study, Cope et al. analyzed 280 catheterized patients at the VA with 58.6% of patients were considered to have ASBU. Thirty-two percent received inappropriate treatment and 3 patients developed *C. difficile* infection. Linares et al. M reported 26% of 117 patients with ASBU at their institution were treated inappropriately for an average of 6.6 days and the treatment resulted in 2 cases of *C. difficile* infection and 1 case of QT prolongation.

Asymptomatic bacteriuria is common and does not require antibiotic management unless the patient is pregnant or is going to be undergoing a urologic procedure with risk of mucosal bleeding. Treating all other patients can result in significant patient harm.

References:

1. Adopted from Nebraska Medicine urinary tract infection asymptomatic bacteriuria guidance document.
2. 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 Disease Society of America and the European Society of Microbiology and Infectious Diseases. *Clin Infect Dis*. 2011;52:e103-120.
3. Nicolle LE et al. Clinical practice guidelines for the management of asymptomatic bacteriuria: 2019 updated by infectious disease Society of America. *Clin Infect Dis*. 2019 May 2;68(10):e83-e110.
4. Gandhi T et al. importance of a urinary tract infection to antibiotic use along hospitalized patients. *Infect Control Hosp Epidemiol*. 2009;30:193-5.
5. Cope M et.al. and appropriate treatment of catheter associated asymptomatic bacteriuria in a tertiary care hospital. *Clin Infect Dis*. 2009; 48:1182-8.
6. Linares LA et al. electronic memorandum decreases unnecessary antimicrobial use for asymptomatic bacteriuria and culture-negative pyuria. *Infect Control Hosp Epidemiol*. 2011;32:644-8