

Index Patient

The index patient for this Guideline is an otherwise healthy adult female with localized rUTI in the absence of complicating factors. The infection should be associated with acute-onset symptoms attributable to the urinary tract as discussed below and occurs in the presence of both urinary inflammation (pyuria) and detection of a urinary bacterial uropathogen.¹² This Guideline does not apply to pregnant women, patients who are immunocompromised, those with anatomic or functional abnormalities of the urinary tract, women with rUTIs due to self-catheterization or indwelling catheters, or those exhibiting signs or symptoms of upper UTI or systemic bacteremia, such as fever and flank pain.⁴ This Guideline also excludes those with neurological disease or illness relevant to the lower urinary tract, including those who exhibit genitourinary sequelae of peripheral neuropathy, diabetes, and spinal cord injury. Further, this Guideline does not discuss prevention of UTI in operative or procedural settings.

Symptoms

In UTI, acute-onset symptoms attributable to the urinary tract typically include dysuria in conjunction with variable degrees of increased urinary urgency and frequency, hematuria, and new or worsening incontinence. *Dysuria (urethral burning during voiding) is central in the diagnosis of UTI*; other symptoms of frequency, urgency, suprapubic pain, and hematuria are variably present. Acute-onset dysuria is a specific symptom, with more than 90% accuracy for UTI in young women in the absence of concomitant vaginal irritation or increased vaginal discharge.^{13, 14} Dysuria can have other causes (e.g., atrophic vaginitis, pelvic floor myofascial pain, vulvar lichen sclerosus), however, the specificity of this symptom outside of this narrow population has not been defined.

In older adults, the symptoms of UTI may be less clear. Given the subjective nature of these symptoms, careful evaluation of their chronicity becomes an important consideration when the diagnosis of UTI is in doubt. Acute-onset dysuria, particularly when associated with new or worsening storage urinary symptoms, remains a reliable diagnostic criterion in older women living both in the community and in long-term care facilities.¹⁵⁻¹⁷ Older women frequently have nonspecific symptoms that may be perceived as a UTI, such as chronic dysuria, cloudy urine, vaginal dryness, vaginal/perineal burning, bladder or pelvic discomfort, urinary frequency and urgency, or urinary incontinence, but these tend to be either chronic or fluctuating in nature. The lack of a correlation between symptoms and the presence of a uropathogen on urine culture was discussed in a systematic review of studies evaluating UTI in community-dwelling adults older than 65 years. Symptoms such as chronic nocturia, incontinence, and general sense of lack of well-being (e.g., fatigue, malaise, weakness), were common and not specific for UTI.¹⁸ While this Guideline does not include women with chronic symptoms common in urology, such as overactive bladder (OAB), Guidelines from the American Geriatrics Society (AGS) and the Infectious Diseases Society of America (IDSA) agree that evaluation and treatment for suspected UTIs should be reserved for acute-onset (<1 week) dysuria or fever in association with other specific UTI-associated symptoms and signs, which primarily include gross hematuria, new or significantly worsening urinary urgency, frequency and/or incontinence, and suprapubic pain.¹⁹⁻²²

Diagnosis

Typically, for a diagnosis of cystitis, acute-onset symptoms should occur in conjunction with laboratory detection of a uropathogen from the urine, typically *Escherichia coli* (*E. coli*) (75% to 95%), but occasionally other pathogens such as other Enterobacteriaceae (e.g., *Proteus mirabilis* [*P. mirabilis*], *Klebsiella pneumoniae* [*K. pneumoniae*]) and *Staphylococcus saprophyticus* (*S. saprophyticus*), among other rare species.^{23, 24}

While historically standard urine culture has been the mainstay of diagnosis of an episode of acute cystitis,²⁵ variations in specimen processing, the colony count thresholds designating positivity, and the infectious organism detected will result in wide variations in the accuracy of diagnosis.²⁶ Standard agar-based clinical culture has been used since the 19th century with few technical refinements; more recent studies demonstrate that a large proportion of urinary bacteria are not cultivatable using these standard conditions. The definition for clinically-significant bacteriuria of 10⁵ colony-forming units (CFU)/mL was published more than 60 years ago and likely represents an arbitrary cut-off.²⁷⁻³¹ The origin of this cut-off derives from evidence that the use of this threshold in asymptomatic individuals is relevant to reducing the over detection of contaminating organisms. More than 95% of subjects with >10⁵ CFU/mL bacteria in a clean-catch specimen had definite bacteriuria on a catheterized specimen, while only a minority of patients with lower bacterial counts exhibited bacterial growth from a catheterized urine sample.²⁷ These data were obtained from asymptomatic women, however, and do not reflect the population in whom there is a suspicion of UTI. This threshold has been documented to provide a sensitivity of diagnosis of only 50% to 60%.³²

In symptomatic women, however, several studies have identified subsets of women with pyuria and symptoms consistent with a UTI but colony counts <10⁵ CFU/mL in voided urine.³³⁻⁴⁰ One study of more than 200 premenopausal, non-pregnant women who presented with at least 2 symptoms of acute cystitis compared colony counts in a midstream, clean-catch urine sample to specimens obtained by urethral catheterization. Approximately 40% of the women who had *E. coli* grow from a catheterized specimen had colony counts <10⁵ CFU/mL in the voided sample.³⁹ In multiple studies, a threshold of ≥10² CFU/mL of *E. coli* from voided specimens had 88% to 93% positive predictive value for bladder bacteriuria **in patients with a high suspicion of**