

The Emergency Department Diagnosis and Management of Urinary Tract Infection

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KEYWORDS

- Urinary tract infection • Cystitis • Pyelonephritis • Sepsis • Obstruction
- Hydronephrosis • Mimic

KEY POINTS

- The evaluation and management of urinary tract infections (UTIs) in the emergency department depend on illness severity, patient hemodynamic status, and underlying comorbidities. A variety of potentially deadly conditions may mimic cystitis or pyelonephritis.
- Dysuria, urinary frequency, and urinary urgency in the absence of vaginitis or cervicitis with vaginal discharge are supportive of UTI.
- Most patients with simple cystitis and pyelonephritis can be treated as outpatients, and the specific antibiotic used depends on the region's antibiogram and diagnosis.
- Urinary testing with urinalysis or urine dipstick is associated with several pitfalls but can be helpful when used appropriately. Urine cultures should be obtained in complicated or upper UTI. Simple and lower tract UTIs do not require urine cultures, unless the patient is pregnant. Asymptomatic bacteriuria should only be treated in specific circumstances; otherwise, it does not require antibiotics.

INTRODUCTION

Urinary tract infection (UTI) is a common condition evaluated and managed in the emergency department (ED). Emergency physicians evaluate a wide spectrum of UTIs, including uncomplicated cystitis, pyelonephritis, and even septic shock. When compared with other hospital or outpatient settings, patients in the ED are often sicker. Emergency physicians are faced with several challenges when managing patients with UTI with limited history, absence of follow-up, lack of culture results, and less ability to care for patients in a longitudinal manner. Patients in the ED may have little to no ability to follow-up.

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Emergency physicians are tasked with several decisions. The first is determining if an infection is complicated versus uncomplicated, second is assessing what laboratory and imaging evaluation is necessary, and third is determining the need for antibiotics and patient disposition.¹⁻⁴ Potential mimics of UTI should also be considered. This review addresses these factors through a focused evaluation of the literature.

DEFINITIONS

UTIs can be classified by location and the presence of functional or structural abnormalities. This classification is important, because evaluation and treatment depend on accurate assessment. Infection of the bladder defines acute cystitis or lower tract UTI. Pyelonephritis, which most commonly occurs when bacteria ascend to the kidney from the bladder, is the most common presentation of upper UTI.¹⁻⁵ Symptoms are typically more severe, although it usually starts as simple cystitis.¹⁻⁷ Untreated, pyelonephritis has the potential in some cases to progress to septic shock and death.^{8,9}

An uncomplicated UTI, or cystitis, occurs in young, healthy premenopausal women.^{1,2,5,6} These women are not pregnant and do not possess structural or functional urinary tract abnormalities.⁵⁻⁷ Uncomplicated infections of the lower urinary tract are at low risk for treatment failure and are usually not associated with antibiotic-resistant organisms, although resistance rates are continually increasing.^{6-8,10-14} All other patients meet criteria for complicated infection, a heterogenous definition (**Box 1**).^{8,15} Complicated infections are at risk for drug-resistant organisms and may require further evaluation and more extensive treatment.^{3,4}

Epidemiology

UTIs are a common disease: approximately half of women experience one infection during their lifetime.^{1-3,16} Premenopausal women demonstrate an incidence of 0.5 to 0.7 cases per person-year in sexually active women.^{7,16} UTI risk factors for this population include sexual intercourse, spermicidal use, and prior UTI.^{1,2,6,7} Men demonstrate lower rates of UTI, with 5 to 8 UTIs per 10,000 in young and middle-aged men.^{17,18} Men older than 50 years, however, demonstrate a higher risk of UTI (20%–50% prevalence) due to prostate enlargement, debilitation, and potential urinary tract instrumentation.¹⁷⁻¹⁹ ED visits approached more than 3 million visits in the United States in 2010, with more than 80% of visits made by women and 50% in patients 18 years to 44 years old.^{2,3,20,21} Most of these patients are diagnosed

Box 1

Complicated urinary tract infection

- Pyelonephritis/upper UTI
- Male
- Pregnancy
- Anatomic abnormalities (vesicoureteral reflux, stricture, and neurogenic bladder)
- Urolithiasis
- Catheter, stent, or tube present in urinary system
- Malignancy, chemotherapy, and immunosuppression
- Failure of antibiotics
- Hospital/health care-associated UTI

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