# Urinary Tract Infections (UTIs) – Clinician Guide

**Diagnosis1-3**

* General categories of urinary tract infection (UTI):
  + Cystitis: Infection of the bladder; commonly presents with an acute onset of dysuria (painful urination), frequent need to urinate, and an urgent need to urinate.
  + Pyelonephritis: Infection of the kidney; commonly presents with fevers, chills, nausea emesis, and flank pain, in addition to the symptoms of cystitis.
* Foul-smelling or cloudy urine without urinary symptoms (e.g., dysuria) do NOT indicate a UTI.
* Urine culture results indicating bacteria in the urine without any associated urinary symptoms (i.e., asymptomatic bacteriuria) do NOT indicate a UTI.

**Populations where in-person visits are preferred**

* Symptoms more consistent with pyelonephritis than cystitis1-3
* Children
  + Need to exclude alternative diagnoses (e.g., appendicitis), urologic abnormalities, insertion of foreign bodies, sexual abuse
* Non-sexually active adolescent females
  + Need to exclude urologic abnormalities, sexual abuse
* Adolescent or adult males
  + Need to exclude urologic abnormalities, epididymitis, prostatitis, sexually transmitted infections
* Elderly people with mental status changes4-5
  + Need to exclude alternative diagnoses (e.g., electrolyte abnormalities, dehydration, intracranial bleed)
* People at risk for complicated UTIs (e.g., renal transplant recipient, pregnant female, indwelling or intermittent genitourinary hardware, kidney stones)
  + Concerns for imaging/interventions, higher risk of antibiotic-resistant bacteria

**Treatment**

* If access available, reviewing previous urine culture and antibiotic susceptibility results helpful to guide effective antibiotic therapy for the current UTI.
* Options for supportive care: hydration (6-8 cups of water per day), acetaminophen, ibuprofen, and over-the-counter urinary analgesics containing phenazopyridine (e.g., Azo Standard®, Pyridium®).
* Preferred options for uncomplicated cystitis:1
  + Nitrofurantoin (Macrobid®) 100 mg PO twice daily for 5 days6-8
  + Trimethoprim-sulfamethoxazole (Bactrim® or Septra®) 1 double-strength tablet (160 mg/800 mg) orally twice daily for 3 days9
* Select (generally equally effective) alternative oral options that also cover *E. coli* (which accounts for 80% of cystitis cases); select based on previous urine culture results (if available), insurance coverage, availability in pharmacies local to patient:
  + Cephalexin 500 mg four times a day for 5 days
  + Cefadroxil 500 mg twice daily for 5 days
  + Cefpodoxime 100 mg twice daily for 5 days
  + Cefdinir 300 mg twice daily for 5 days
  + Fosfomycin 3 grams orally as a single dose; mix powder in 3-4 ounces of cool water
  + Pivmecillinam 400 mg twice daily for 5 days

**Prevention to reduce risk of recurrent UTI3**

* Behavioral changes
  + Liberal fluid intake (6-8 ounces of water/day)10
  + Urinate immediately after sexual activity
  + Wipe front to back after using the bathroom
  + Avoid holding in urine for prolonged periods of time
  + Diaphragms or spermicides increase the risk of UTIs; consider alternative birth control
* Non-antibiotic options (reasonable to try alone or in combination based on patient preferences)
  + Methenamine hippurate 1 gram orally twice daily (Hiprex) often combined with vitamin C (ascorbic acid) or cranberry to increase effectiveness; avoid in patients with renal insufficiency of hepatic insufficiency due to risk of ammonia accumulation11-12
  + Cranberry products (pills or juice depending on patient preferences)13-16
  + Topical estrogen for post-menopausal women (better to defer to primary care provider)17-18
* Antibiotic options (**alternative** after failure of at least a 6-12 month trial period of non-antibiotic options)19-20
  + Data supporting antibiotic prophylaxis are more consistent than non-antibiotic alternatives but should be balanced with potential risks of antibiotics (adverse events, emergence of resistance limiting future treatment options)
  + Antibiotic prophylaxis should generally be reserved for women with ≥2 UTIs within 6 months or ≥3 UTIs within 12 months
  + Postcoital prophylaxis consists of a single dose of one of the treatment antibiotics after sexual activity19
  + Alternative is daily antibiotic prophylaxis (better to defer to primary care provider)

**Followup**

* Test of cure urine culture (i.e., urine culture after treatment) not necessary in the absence of ongoing clinical symptoms
* Patients not improving by day 3 or developing symptoms concerning for flank pain, fevers, or generally are feeling more ill should seek in-person medical attention

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