Urinary Tract Infections

Asymptomatic bacteriuria is the presence of bacteria in the urine in the absence of any lower urinary tract symptoms o fever. **Catheterized patients** often experience dysuria and urethritis as a result of catheterization. In these patients, symptoms of fever and suprapubic pain should prompt workup for UTI.

! Positive urine cultures (bacteriuria) or pyuria in asymptomatic patients should NOT be treated except in pregnancy or prior to invasive urological procedures

Definitions

Cystitis (lower UTI)

Uncomplicated

Bacteriuria in the presence of lower urinary tract symptoms (dysuria, new onset urinary frequency, supra-pubic pain, etc.) in a patient with normal urinary anatomy. Generally excludes signs & symptoms of systemic illness (i.e. fever).

Complicated

Cystitis in patients with abnormal urinary anatomy, obstructive uropathy, or prosthetic devices (i.e. indwelling catheter, stents, nephrostomy tubes, etc.), and cystitis with fever.

Pyelonephritis

Uncomplicated

Bacterial infection of the kidney, characterized by fever and flank pain, with or without the presence of lower urinary tract symptoms.*

Complicated

Pyelonephritis with obstructive uropathy, or presence of foreign objects (i.e. nephrostomy tubes) or renal stones.*

**The presence of bacteremia is a common finding in pyelonephritis, and is not considered a complicating factor*

Empiric Therapy

First-line therapy

IV therapy should only be used in patients unable to take oral medications or with impaired GI absorption

PO Nitrofurantoin 100 mg BID x 5d[1] ⚠
Amoxicillin-clavulanate 875/125 mg BID x 5-7d
Cephalexin 500 mg QID x 5-7d

IV Ceftriaxone 1 g q24h

If known colonization/suspected infection with ESBL pathogens:

PO *Fosfomycin 3 g x one dose, then repeat at 48h*[1] ⚠

IV *Ertapenem 1 g q24h*

First-line therapy

IV Ceftriaxone 1 g Q24H

If known colonization/suspected infection with ESBL pathogens:

IV *Ertapenem 1 g Q24H*

Alternative therapy (i.e. anaphylaxis to beta-lactams)

IV Ciprofloxacin 400 mg q12h[2]
Ertapenem 1 g q24h[3]

If Enterococcus spp is suspected (based on previous history)

Add Ampicillin 2 g IV q6h

Step down to oral antibiotics is recommended when hemodynamically stable and able to take oral medications. Culture and sensitivity should be used to guide antibiotic selection

1 - ⚠ In complicated cystitis, Fosfomycin and Nitrofurantoin should be avoided due to increased risk of treatment failure
2 - Urinary *E.coli* resistance rates are above 25% at Osler for ciprofloxacin and co-trimoxazole; they are not ideal empiric agents
3 - Carbapenems are reasonable alternatives for patients with penicillin allergies due to minimal cross-reactivity

Treatment Duration

In complicated cystitis (indwelling catheter, obstructive uropathy), duration of therapy should be extended to 7 days

Acute uncomplicated pyelonephritis: 7 days
Complicated pyelonephritis: 10-14 days
(optimal duration driven by expert opinion)

Clinical Considerations

- ESBL *E.coli* account for roughly 20% of urinary *E.coli* isolates across both Etobicoke and Brampton campuses
- Agents with no urinary penetration (e.g. Moxifloxacin) are not therapeutically effective, and should be avoided