

Canadian Undergraduate Urology Curriculum (CanUCC) - Urinary Tract Infection

Objectives:

1. Describe the signs and symptoms of bacterial cystitis and pyelonephritis
2. Define when to treat asymptomatic bacteriuria
3. List the common bacteria causing UTI
4. List the common classes of antimicrobials used to treat urinary tract infections
5. Outline the investigation and treatment of bacterial cystitis and pyelonephritis
6. Describe treatment regimens available for a patient with recurrent bacterial cystitis
7. Recognize the importance of early diagnosis and emergent treatment of an obstructed UTI

1. Signs and Symptoms of UTI's

a. Bacterial Cystitis

Ascending infection from urethra

Inflammation is limited to the lower urinary tract (bladder and urethra)

Symptoms of Bacterial Cystitis: "Lower tract" symptoms

Classic symptoms: dysuria, frequency, urgency, suprapubic pain

Signs of Bacterial Cystitis

Suprapubic tenderness, if any

b. Pyelonephritis

Pathogenesis usually either:

Non-obstructed ascending infection from lower urinary tract

OR

Obstruction of upper urinary tract (most common cause stone)

Inflammation involves upper urinary tract (ureters and kidneys)

Symptoms of Pyelonephritis: "Upper tract" symptoms

Classic symptoms: flank pain and fever, often preceded by "lower tract" symptoms

Signs of Pyelonephritis

Early: fever and flank or costovertebral angle (CVA) tenderness

Late: unwell, flushing, diaphoretic, hypotension, tachycardia (ie. septic shock)

2. Asymptomatic Bacteriuria

Definition: presence of bacteria in urine without any symptoms

Usually not clinically significant

However, a few indications to treat patients with ASB

Absolute Indications:

Pregnancy

Before urological/urogynecological procedures

Relative Indications (controversial):

Before surgical procedures with implant material

Transplant patients

Immunocompromised state

Women with recurrent UTI's

Spinal cord injured patients

Diabetic women
Patients with indwelling urethral catheters
Elderly nursing home patients

3. UTI Bacteriology

Gram negative:

E. coli

Klebsiella

Proteus

Pseudomonas

Serratia

Gram positive:

Enterococcus

Staphylococcus saprophyticus

4. Antimicrobials

Penicillins/aminopenicillins

Cephaosporins

Fluoroquinolones

Aminoglycosides

Trimethoprim/sulfamethoxazole

Nitrofurantoin

Tetracycline

5. Investigation and Treatment of UTI's

Investigation

a. Bacterial Cystitis

Urinalysis +/- urine culture

Uncomplicated: other tests not required

Complicated: PVR scan/ultrasound +/- cystoscopy

b. Pyelonephritis

Same as cystitis, plus:

Bloodwork, blood cultures, upper tract imaging (U/S or CT)

Treatment

a. Bacterial Cystitis

Non-pharmacologic: hygiene, fluids, voiding, cranberry products

Pharmacologic: 1-7 day course of oral antibiotics

b. Pyelonephritis

1-3 week course of antibiotics – oral or IV, depending on condition of patient

6. Recurrent UTI's

Continuous (long-term) prophylaxis

Low dose of less potent oral antibiotic x 3-12 months

Self-treatment

Self diagnosis and treatment with a short course of oral antibiotic

Peri-coital prophylaxis

1-2 doses of pre- and/or post-coital oral antibiotic

7. Obstructive UTI's

Life threatening urologic emergency

Early diagnosis and treatment important

Acute onset flank pain, fever, systemically unwell if progresses

Treatment:

ABC's

IV fluids

IV antibiotics

Urgent renal drainage by ureteral stent or nephrostomy tube