Empiric management of Urinary Tract Infections (UTI)

DIAGNOSIS

UTI: presence of signs/symptoms of urinary tract infection **plus** positive urinalysis (+ leucocytes or nitrites) and culture.

Urosepsis: urinary symptoms plus signs/symptoms of systemic inflammatory response syndrome (SIRS) +/- symptoms of organ dysfunction

Asymptomatic bacteriuria is common and does not lead to symptomatic infections in most cases

Typical UTI symptoms

Cystitis	Dysuria, urinary frequency, urinary urgency, suprapubic pain
Pyelonephritis	Symptoms of cystitis not always present; fever (>38°C), chills, flank pain,costovertebral angle tenderness, and nausea/vomiting

DEFINITIONS:

Asymptomatic Bacteriuria	Positive urine culture without signs or symptoms of a UTI; reflects colonization of the urinary tract
Uncomplicated UTI	UTI in female patient who is otherwise healthy, not pregnant, and with functionally and anatomically normal urinary tract -
Complicated UTI	UTI in: Males, patients with urinary tract obstruction/other functional or anatomic abnormality of the urinary tract, renal transplant, renal failure, diabetes mellitus, immunosuppression, hospital-acquired infection
Uncomplicated pyelonephritis	Infection of the renal parenchyma (most often in young women)
Complicated pyelonephritis	Upper UTI or pyelonephritis complicated by an abscess, nephrolithiasis, papillary necrosis, or emphysematous pyelonephritis
Urosepsis	Life threatening organ dysfunction (sepsis) caused by dysregulated host response to infection originating from the genito-urinary tract
Catheter-associated UTI	UTI in patient with indwelling bladder catheters or occurring within 2 days ofcatheter removal

MOST COMMON UTI pathogens in ED (MUHC 2020-2022)

Enterobacterales

- *E.coli* 75%
- Klebsiella pneumoniae 11%
- E. faecalis 5%
- *Proteus mirabilis* 4%

Less common:

- *Staphylococcus saprophyticus, other Enterococci,*
- *Staphylococcus aureus, Pseudomonas sp* (long-term catheterization)

RESISTANCE RATES for urinary *E. Coli* isolates (Emergency department MUHC – 2021)

Resistance to TMP/SMX: 23% of urinary isolates
Resistance to Cipro: 21%
Resistance to Clavulin: 16%
Resistance to Ceftriaxone: 12%
Resistance to Nitrofurantoin: 3%
Resistance to fosfomycin: 2%

DIAGNOSTIC WORK-UP

- **Urine cultures should only be collected in patients with high clinical suspicion of UTI**; a positive urine culture may confirm a suspected UTI, but may also reflect asymptomatic bacteriuria
- Urine cultures should NOT be obtained for asymptomatic patients with foul smelling or cloudy urine.
- If indwelling urinary catheter, samples should be obtained from newly placed catheter (within 5 days) or by straight catheterization.
- Consider sexually transmitted infection (chlamydia, gonorrhea) in sexually active patients with symptoms of urethritis
- In males with recurrent infection, consider prostatitis

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EMPIRIC TREATMENT

If known or suspected ESBL or CRE infection/colonization, suggest ID consult

Check cultures and readjust therapy as soon as possible after results

Asymptomatic bacteriuria	Treat ONLY pregnant women, patients with renal transplant within past 1 month and/or patients who will have major urologic surgery **NO ANTIBIOTICS IN OTHER CASES**
Uncomplicated UTI	**Nitrofurantoin**[1] **(Macrobid)** 100 mg po BID (suggested duration of treatment: 5 days) *If Crcl < 30 ml/min: Fosfomycin 3 g PO x 1 dose*
UTI pregnant women	**Cefixime** 400 mg po die (suggested total duration of treatment: 7 days) *If Crcl < 20 ml/min: Cefixime 200 mg po die* *If severe hypersensitivity reaction to cephalosporin: Fosfomycin 3 g PO x1*
Complicated UTI, *OR* Acute (uncomplicated) pyelonephritis	**Ceftriaxone** 2g IV q24h (suggested total duration of treatment: 7 days) *If severe hypersensitivity reaction to cephalosporin: Ciprofloxacin*[2] *500 mg po BID*
Acute complicated pyelonephritis	**Ceftriaxone** 2 g iv Q24H (**Duration** as per source control and clinical evolution) *If severe hypersensitivity reaction to cephalosporins:* ***Consult ID*** If older than 75y: **ADD ampicillin** 1 g iv Q6H (for enterococcal coverage) or **vancomycin** 15mg/kg IV q12h [if severe hypersensitivity reaction to penicillin] (consult Pharmacy for dosing recommendation of vancomycin)
Urosepsis **Definition**: Life threatening organ dysfunction (sepsis) caused by dysregulated host response to infection originating from the genito-urinary tract	**Piperacillin-tazobactam** 4.5 g IV q8h *If severe type I hypersensitivity reaction to penicillin, or known ESBL colonization/infection in the last 6 months:* **Meropenem 1 g IV q8h – CONSULT ID**

[1]Nitrofurantoine cannot be used in men

[2]Fluoroquinolones: should be spared to decrease risk of development of resistance and C. difficile Colitis ; several FDA black box safety warnings

REFERENCES

Gupta, et al. International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Societyfor Microbiology and Infectious Diseases Clinical Infectious Diseases 2011;52(5):e103–e120

Bonkat G et al. EAU Guidelines on Urological Infections. European Association of Urology March 2021

V3 Revision by F.Bourdeau (pharmacy), M. Semret (ID), V.Loo (ID) and T.Lee (ID)

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