Treatment of Adult Urinary Tract Infections

(NB Provincial Health Authorities Anti-Infective Stewardship Committee, February 2021)

Indication	Empiric Therapy **(Tailor regimen based on urine/blood C&S results)**	Duration	Comments
Asymptomatic Bacteriuria (Presence of bacteria in the urine with no symptoms or clinical signs)	Antibiotic therapy only recommended for: - Prophylaxis for urological procedures when mucosal bleeding expected - Treatment in pregnancy - Recent renal transplant (less than 12 months) – consult nephrology • **Outside of these three indications there is NO valid reason for antimicrobial therapy or specimen collection.** • Select antimicrobial therapy according to urine C&S.	Urological procedures: see surgical prophylaxis guideline Pregnancy: 3 – 7 days	• Asymptomatic bacteriuria with pyuria is NOT an indication for antimicrobial therapy **Pregnancy** • Repeat culture and urinalysis 1 week after therapy complete as a test of cure; if positive repeat treatment according to urine C&S • Monthly repeat urine cultures recommended for screening until completion of pregnancy • Consider prophylactic/suppressive antibiotic therapy for persistent bacteriuria • Intrapartum prophylaxis of early-onset Group B Streptococcal (GBS) disease is recommended if GBS is isolated in urine or vaginal swab
Uncomplicated Cystitis (Lower UTI) (Female patients with dysuria, urgency, frequency, or suprapubic pain with no fever or flank pain) Usual Pathogens: *E.coli, S. saprophyticus,* other Enterobacteriaceae (e.g. *Klebsiella spp, Proteus mirabilis,* etc.); Enterococcus spp.	Preferred Regimen: nitrofurantoin monohydrate/macrocrystals 100 mg PO q12h (Not recommended if CrCl less than 40 mL/min; **in pregnancy**, avoid near term (36-42 weeks) due to risk of haemolytic anemia in the new born) Alternative Regimens: cefuroxime 500 mg PO q8-12h **OR** fosfomycin 3 g PO once[4] **OR** sulfamethoxazole/trimethoprim 800/160 mg PO q12h[1,3] (Not recommended in pregnant women) **Multidrug Resistant Organisms (MDR) resistant to nitrofurantoin and fosfomycin:** **Single dose** aminoglycoside (tobramycin or gentamicin) 5 to 7 mg/kg IV[5] if confirmed susceptibility	5 days 7 days One dose 3 days One dose	**Pregnancy** • Repeat culture and urinalysis 1 week after therapy complete as a test of cure; if positive repeat treatment according to urine C&S • Monthly repeat urine cultures recommended for screening until completion of pregnancy • Consider prophylactic/suppressive antibiotic therapy for persistent or recurrent cystitis • Intrapartum prophylaxis of early-onset Group B Streptococcal (GBS) disease is recommended if GBS is isolated in urine or vaginal swab
Acute Uncomplicated Pyelonephritis (Upper UTI) (Signs/Sx: fever, flank pain, costovertebral tenderness, abdominal/pelvic pain, nausea, vomiting with or without signs/sx of lower tract UTI) Usual Pathogens: *E.coli,* other Enterobacteriaceae, *Enterococcus* spp.; *S. saprophyticus* **OR** **Complicated UTI** (Complicating Factors: structural abnormality, obstruction, recent urogenital procedure, male sex, immunosuppression, poorly controlled diabetes, spinal cord injury, catheterization or Signs/Sx greater than 7 days) Usual Pathogens: *E.coli,* other Enterobacteriaceae, *Enterococcus spp, S. agalactiae* (Group B Strep) if pregnant or diabetic, *P. aeruginosa, Corynebacterium urealyticum, Aerococcus urinae.*	**Systemically Well:** Preferred Regimen: cefixime 400 mg PO q24h[3] Alternative Regimens: amoxicillin/clavulanate 875/125 mg PO q12h[3] Additional options if culture confirmed susceptibility: sulfamethoxazole/trimethoprim 800/160 mg PO q12h[1,3] **OR** ciprofloxacin 500 mg PO q12h[1,3] **Systemically Unwell/Pregnant:** cefTRIAXone 1 g IV q24h[2] **OR** ampicillin 2 g IV q6h + (tobramycin **OR** gentamicin) 5 - 7 mg/kg IV once daily[2,3,5] **Risk of Multidrug Resistant Organisms:** meropenem 500 mg IV q6h[2,3] MDR Risk Factors: • Previous infection or colonization with a multidrug resistant organism [ex. ESBL; AmpC-producing organism (*Enterobacter spp, Citrobacter spp, Serratia marcescens, Acinetobacter spp, Providencia spp. Morganella morganii, etc.*) • IV 3rd-generation cephalosporin or piperacillin/tazobactam use within the last 3 months • Recent international travel, especially for the receipt of healthcare services while abroad • Nosocomial acquired infection (if systemically unwell)	See Comments	**Acute Uncomplicated Pyelonephritis** • Outpatient management an option if female, not pregnant, no nausea/vomiting, no evidence of dehydration, sepsis or high fever • Treat for 10 - 14 days • May treat for 7 days if female, uncomplicated and using ciprofloxacin or sulfamethoxazole/trimethoprim • For treatment using oral β-lactams, consider an initial single intravenous dose of cefTRIAXone 1 g IV and use a 14 day total duration of antimicrobial therapy **Complicated UTI:** • Treat 7 days if prompt response, female and only lower urinary tract infection • Treat 10 – 14 days if male, delayed response, structural abnormality, or upper tract symptoms **Catheter-Associated UTI**: • Pyuria not diagnostic, only treat if symptomatic • Catheters frequently colonized, obtain culture through new catheter • Change catheter if in place for greater than 2 weeks & still required • Treat for 10 to 14 days **Pregnancy** • Treat for 10 to 14 days • Prophylactic/suppressive antibiotic therapy recommended for the remainder of the pregnancy • Repeat culture and urinalysis 1 week after therapy complete as a test of cure; if positive repeat treatment according to urine C&S • Monthly repeat urine cultures recommended for screening until completion of pregnancy • Intrapartum prophylaxis of early-onset Group B Streptococcal (GBS) disease is recommended if GBS is isolated in urine or vaginal swab

Clinical Pearls:

- Cloudy and foul-smelling urine alone are NOT considered signs of infection and are NOT an indication for a urine culture and sensitivity.
- Urinalysis interpretation:
  - Presence of nitrites and leukocytes (leukocyte esterase positive or WBC) and new UTI symptoms: good positive predictive value of UTI.
  - Absence of nitrites and/or leukocytes (negative leukocyte esterase or WBC): good negative predictive value.
- Therapy should be adjusted according to culture and sensitivity results if a culture has been obtained.
- Blood cultures should be drawn if febrile; septic; signs and symptoms suggestive of pyelonephritis; or immunocompromised.
- Staphylococcus aureus bacteriuria may be an indicator of a S. aureus bacteremia – recommend obtaining blood cultures and clinically evaluate for a systemic Staphylococcal infection.
- Post-treatment culture not recommended except in case of persistent or recurrent symptoms or pregnancy.
- Nitrofurantoin and fosfomycin are not appropriate for men, complicated UTI or systemic infections.
- Men with symptoms of pelvic or perineal pain should be evaluated for acute prostatitis, consider a cautious digital rectal examination to evaluate for a tender or edematous prostate.

[1]CAUTION: Significant E.coli resistance (greater than 20%) to fluoroquinolones, sulfamethoxazole/trimethoprim and amoxicillin exist in some areas of the province; check local antibiogram and confirm urine C&S results when available.

[2]De-escalate according to urine/blood C&S and switch IV to PO when afebrile and tolerating PO intake for 1 to 2 days.

[3]Dose adjustment required in renal impairment.

[4]Fosfomycin criteria for use: for multi-drug resistant *E.coli* or *Enterococcus faecalis* with limited oral options OR where recommended alternatives are not appropriate due to allergies, drug interactions, poor renal function or other considerations.

[5]Please see aminoglycoside dosing guide for more details on appropriate dosing adjustments and/or monitoring.

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