# Treatment of Adult Urinary Tract Infections

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

## Indication

### Asymptomatic Bacteriuria

(Presence of bacteria in the urine with no symptoms or clinical signs)

<table>
<thead>
<tr>
<th>Empiric Therapy</th>
<th>Duration</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotic therapy only recommended for:</td>
<td>Urological procedures: see surgical prophylaxis guideline</td>
<td>- Asymptomatic bacteriuria with pyuria is NOT an indication for antimicrobial therapy</td>
</tr>
<tr>
<td>- Prophylaxis for urological procedures when mucosal bleeding expected</td>
<td>Pregnancy</td>
<td>- Repeat culture and urinalysis 1 week after therapy complete as a test of cure; if positive repeat treatment according to urine C&amp;S</td>
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<tr>
<td>- Treatment in pregnancy</td>
<td>Monthly repeat urine cultures recommended for screening until completion of pregnancy</td>
<td></td>
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<tr>
<td>- Recent renal transplant (less than 12 months) – consult nephrology</td>
<td>Consider prophylactic/suppressive antibiotic therapy for persistent bacteriuria</td>
<td></td>
</tr>
<tr>
<td>• Outside of these three indications there is NO valid reason for antimicrobial therapy or specimen collection.</td>
<td>Intraparum prophylaxis of early-onset Group B Streptococcal (GBS) disease is recommended if GBS is isolated in urine or vaginal swab</td>
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<tr>
<td>• Select antimicrobial therapy according to urine C&amp;S.</td>
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</table>

### Uncomplicated Cystitis (Lower UTI)

(Female patients with dysuria, urgency, frequency, or suprapubic pain with no fever or flank pain)

<table>
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<tr>
<th>Empiric Therapy</th>
<th>Duration</th>
<th>Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred Regimen: nitrofurantoin monohydrate/macrocystals 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 anaemia in the new born)</td>
<td>5 days</td>
<td>- Repeat culture and urinalysis 1 week after therapy complete as a test of cure; if positive repeat treatment according to urine C&amp;S</td>
</tr>
<tr>
<td>Alternative Regimens: cefuroxime 500 mg PO q8-12h OR fosfomycin 3 g PO once OR sulfamethoxazole/trimethoprim 800/160 mg PO q12h 1,3 (Not recommended in pregnant women)</td>
<td>7 days One dose 3 days</td>
<td>Monthly repeat urine cultures recommended for screening until completion of pregnancy</td>
</tr>
<tr>
<td><strong>Multidrug Resistant Organisms (MDR) resistant to nitrofurantoin and fosfomycin:</strong> Single dose aminoglycoside (tobramycin or gentamicin) 5 to 7 mg/kg IV 2,3 if confirmed susceptibility</td>
<td>One dose</td>
<td>Consider prophylactic/suppressive antibiotic therapy for persistent or recurrent cystitis</td>
</tr>
</tbody>
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### 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)

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<th>Empiric Therapy</th>
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<th>Pregnancy</th>
</tr>
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<tr>
<td><strong>Systemically Well:</strong> Preferred Regimen: ceftriaxone 1 g IV q24h</td>
<td>5 days</td>
<td>- Repeat culture and urinalysis 1 week after therapy complete as a test of cure; if positive repeat treatment according to urine C&amp;S</td>
</tr>
<tr>
<td>Alternative Regimens: amoxicillin/clavulanate 875/125 mg PO q12h 2</td>
<td>7 days</td>
<td>Monthly repeat urine cultures recommended for screening until completion of pregnancy</td>
</tr>
<tr>
<td>Additional options if culture confirmed susceptibility: sulfamethoxazole/trimethoprim 800/160 mg PO q12h 1,3 OR ciprofloxacin 500 mg PO q12h 1,3</td>
<td>One dose</td>
<td>Consider prophylactic/suppressive antibiotic therapy for persistent or recurrent cystitis</td>
</tr>
<tr>
<td><strong>Systemically Unwell/Pregnant:</strong> ceftriaxone 1 g IV q24h OR ampicillin 2 g IV q6h + (tobramycin OR gentamicin) 5 - 7 mg/kg IV once daily 2,3,5</td>
<td>One dose</td>
<td>Intraparum prophylaxis of early-onset Group B Streptococcal (GBS) disease is recommended if GBS is isolated in urine or vaginal swab</td>
</tr>
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## Empiric Therapy (Tailor regimen based on urine/blood C&S results)

### Risk of Multidrug Resistant Organisms (MDR) resistant to ceftriaxone

- 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 morgani, 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)

## Systemically Unwell/Pregnant

- 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 ceefTRIAxone 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
- Intraparum 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.

References:


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


25. Glatt A. Three risk factors associated with community-acquired ESBL UTIs. Infectious Disease News January 9, 2019
