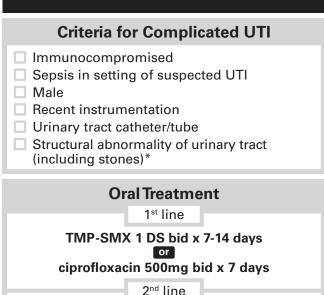
# Toronto Central LHIN: Guidelines for Empiric Treatment of Urinary Tract Infection in Adults

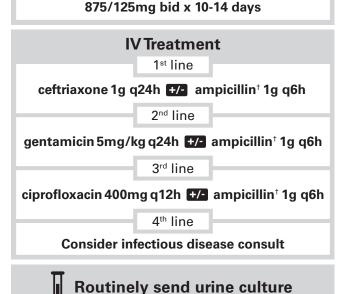
### **Uncomplicated UTI / Cystitis**

# **Oral Treatment** 1st line nitrofurantoin macrocrystals 100mg bid x 5 days 2<sup>nd</sup> line trimethoprim-sulfamethoxazole (TMP-SMX) 1 DS bid x 3 days 3rd line ciprofloxacin 500mg bid x 3 days 4th line amoxicillin-clavulanate 875/125mg bid x 5-7 days 5<sup>th</sup> line cephalexin<sup>◊</sup> 500mg qid x 5-7 days Urine culture recommended if: Other than 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> line antibiotic is used Persistent symptoms despite treatment Recurrent UTI within 3 months of treatment **Indications for Hospitalization with Complicated UTI / Pyelonephritis** Inability to tolerate oral intake ☐ Suspected sepsis (e.g. hypotension, confusion) Urinary tract obstruction

### **Complicated UTI / Pyelonephritis**



amoxicillin-clavulanate

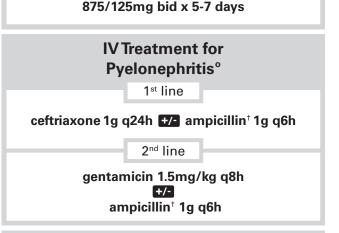


### **Asymptomatic Bacteriuria**

No treatment, except if pregnant

### **UTI in Pregnancy**

# Oral Treatment for Cystitis/Asymptomatic Bacteriuria 1st line nitrofurantoin macrocrystals 100mg bid x 5 days 2nd line amoxicillin-clavulanate





Acute renal insufficiency

Last revised: December 2014



<sup>♦</sup> Use if E.coli susceptibility >70% at local hospital.

<sup>\*</sup> Patients with urogenital abnormalities will need 10-14 days of treatment.

<sup>†</sup> Add ampicillin if prior urine colonization with enterococcus or septic patients with suspected UTI.

<sup>§</sup> Use nitrofurantoin macrocrystals if less than 36 weeks gestation.

Treat pyelonephritis in pregnancy initially with IV antibiotics.

# **Guidelines for Empiric Treatment of Urinary Tract Infection in Adults: Appendix**

- 1 The microbial spectrum of uncomplicated UTI and pyelonephritis consist mainly of *E.coli* (75-95%), with occasional other species of *Enterobacteriaceae*, such as *Proteus mirabilis* and *Klebsiella pneumoniae*, and *Staphylococcus saprophyticus*. Other gramnegative and gram-positive species are rarely isolated in uncomplicated UTIs.
- 2 Local antimicrobial susceptibility patterns of *E.coli* in particular should be considered in empirical antimicrobial selection for uncomplicated UTIs. Since resistance patterns of urinary *E.coli* varies considerably between regions and countries, a specific treatment recommendation may not be universally suitable for all regions or countries.
- **3** Do **not** use nitrofurantoin to treat pyelonephritis because of negligible drug levels in serum and renal parenchyma. Avoid nitrofurantoin with decreased creatinine clearance (<60 mL/min) and in the elderly (>age 75).
- 4 In patients with pyelonephritis who will be managed as outpatients, a select proportion based on severity of illness will benefit from an initial one-time dose of a long-acting parenteral antibiotic (beta lactam or aminoglycoside) and continued treatment with oral antibiotics. This practice allows administration of an antibiotic with better coverage of *E. coli* while awaiting culture and sensitivity results.

- 5 The addition of ampicillin to empiric treatment should be based on both prior urine colonization with enterococcus and clinical stability of patient (enterococcal coverage should be included in septic patients with suspected complicated UTI until C&S results are available).
- **6** Avoid gentamicin with impaired renal function. Caution is advised regarding the risk of ototoxicity, especially with prolonged use of gentamicin. If >24 hours of treatment with gentamicin is required, then pharmacy involvement is recommended.
- **7** Avoid using the same antibiotic if recurrent UTI within 3 months.
- 8 Beta-lactam agents are appropriate choices for therapy when other recommended agents cannot be used. However, they have higher failure rates even when cultured organisms are deemed susceptible and require longer duration of treatment (5-7 days for uncomplicated UTI and 10-14 days for pyelonephritis).
- **9** Collateral damage (e.g. *Clostridium difficile* colitis and selection of drug-resistant organisms) is more likely to occur with use of fluoroquinolones and broad-spectrum cephalosporins over TMP-SMX and nitrofurantoin.
- **10** Shortening the duration of antibiotic therapy is one of the strategies to reduce increasing antibiotic resistance in patients with mild symptoms or early clinical response.



# **Guidelines for Empiric Treatment of Urinary Tract Infection in Adults: Additional Tools**

| Toronto Central LHIN Emergency Department Urine <i>E. coli</i> Susceptibility (%) - 2013 |                |         |               |                             |            |           |             |            |  |
|--|----------------|---------|---------------|-----------------------------|------------|-----------|-------------|------------|--|
| Emergency<br>Department  | nitrofurantoin | TMP-SMX | ciprofloxacin | amoxicillin-<br>clavulanate | cephalexin | cefazolin | ceftriaxone | gentamicin |  |
| MSH  | 96             | 75      | 79            | 81                          | 52         |           | 90          | 92         |  |
| SB   | 91             | 71      | 72            |                             |            | 84        | 88          | 90         |  |
| SMH  | 90             | 63      | 69            | 84                          |            | 79        | 82          | 89         |  |
| TEGH   | 94             | 74      | 80            |                             | 87         | 86        | 88          | 92         |  |
| TGH  | 90             | 66      | 68            | 75                          | 46         |           | 87          | 87         |  |
| TWH  | 93             | 76      | 75            | 80                          | 54         |           | 90          | 90         |  |
| St. Joseph's (in & out pts.)   | 95             | 84      | 84            | 88                          |            | 73        | 97          | 92         |  |

| Guide to S     | selecting Antimicrobials Used to   | Approximate Antimicrobial Costs  |   |                          |
|----------------|--|--|---|--------------------------|
| Antimicrobial  | Pro's  | Con's  | Antibiotic  | Cost/Course <sup>‡</sup> |
| nitrofurantoin | Lower rates of resistance     Generally well tolerated   | <ul><li>Cannot use in pyelonephritis</li><li>Unsafe with impaired creatinine clearance</li></ul>   | nitrofurantoin macrocrystals<br>100mg po bid x 5d | \$7.40                   |
|                | <ul> <li>Limited effects on resistance to other antimicrobials</li> </ul>  | <ul> <li>Use with caution in elderly</li> <li>More expensive than alternatives</li> </ul>  | TMP-SMX<br>1 DS po bid x 3d                       | \$0.30                   |
|                | Reasonable resistance rates with <i>E.coli</i> Lower rates of <i>C.difficile</i> than fluoro-  | Many potential adverse effects,<br>primarily with prolonged use  | ciprofloxacin<br>500mg po bid x 3d                | \$1.00                   |
| TMP-SMX        | quinolones or amoxicillin clavulanate  • Inexpensive   | Potential for drug-drug interactions     Not recommended in pregnancy  | amoxicillin-clavulanate<br>875/125 po bid x 7d    | \$5.00                   |
| ciprofloxacin  |  | Induces resistance to fluoroquinolones   | cephalexin<br>500mg po qid x 7d                   | \$4.20                   |
|                | <ul> <li>Reasonable resistance rates with <i>E.coli</i></li> <li>Generally well-tolerated</li> <li>Allows for shorter course of therapy</li> </ul> | <ul> <li>and other antimicrobials</li> <li>Increased risk of <i>C.difficile</i></li> <li>Potential for drug-drug interactions</li> </ul> | Antibiotic  | Cost/Day                 |
|                | (especially pyelonephritis)  | <ul> <li>Risk of QT-prolongation</li> <li>Relatively contraindicated in pregnancy</li> </ul>   | ceftriaxone<br>1g iv q24h                         | \$8.10                   |
| amoxicillin-   | Lower rates of resistance  | Longer courses needed     Relatively broad-spectrum activity   | gentamicin<br>5mg/kg iv q24h                      | \$21.00 (70kg)           |
| clavulanate    | Fewer side effects   | Can cause diarrhea   | ciprofloxacin<br>400mg iv q12h                    | \$4.20                   |
| cephalexin     | Generally well tolerated   | <ul><li>Local susceptibility rates vary</li><li>QID dosing</li></ul>   | ampicillin<br>1g iv q6h                           | \$18.00                  |

<sup>‡</sup> Does not include dispensing fee.