

**Table 1 - Local Outpatient Antibigram Data for Microorganisms Associated with UTI, 2023**

ORGANISM % UTI Pathogen*	Number of Isolates	Gentamicin	Ampicillin or Amoxicillin	Cefazolin or Cephalexin	Ceftriaxone	Ciprofloxacin	Levofloxacin	Nitrofurantoin	Tetracycline	Trimethoprim-Sulfamethoxazole
<i>Escherichia coli</i> (approx. 75%)	517	90	54	91	94	80	87	100	77	76
<i>Klebsiella pneumoniae</i> (approx. 5%)	44	100	R	96	98	93	98	32	80	82
<i>Proteus mirabilis</i> (approx. 5%)	47	77	85	92	94	94	94	R	R	85
<i>Enterobacter cloacae</i> (approx. 5%)	40	98	R	R	78	90	93	33	93	75

\*Percentages based on local outpatient urine culture data, 2023

**\*Inclusion Criteria**  
Patients >60 days of age with most or all of the following:

- Fever ≥ 38 degrees Celsius
- Dysuria
- Urinary frequency
- Flank pain
- Vomiting

Note: if <60 days, refer to febrile young infant pathway

**Exclusion Criteria**

- Major comorbidity (immunocompromise, malignancy etc.)
- Known urinary tract abnormalities
- Neurogenic bladder
- Chronic/complex conditions (i.e. spina bifida, indwelling or intermittent urinary catheter, hardware. Etc.)
- Recent GU surgery or instrumentation
- Critical illness

**Definition of a UTI:**  
Compatible clinical syndrome plus the following laboratory abnormalities:

- *Catheterized specimen or suprapubic aspiration*
  - Definite: > 50,000 cfu/mL
  - Possible: > 10,000 cfu/mL
- *Clean-catch specimen*
  - Definite: > 100,000 cfu/mL
  - Possible: >50,000 cfu/mL

**Considerations:**

- Poly-microbial cultures in an otherwise healthy child should be considered contaminated and do not warrant treatment with antibiotics.

Rare Pathogenic Organisms	Other Organisms Considered Contaminants
Group B <i>Streptococci</i>	"Other Gram positives" <i>Lactobacillus</i>
<i>Staphylococcus saprophyticus</i>	<i>Corynebacteria</i> , diphtheroids
<i>Candida</i> (in premature) infants)	<i>Micrococcus</i> sp.
<i>Pseudomonas</i> sp.	<i>Bacillus</i> sp.
<i>Enterobacter</i> sp.	Coagulase-negative <i>Staphylococci</i>
<i>Staph aureus</i>	

# Urinary Tract Infection

## Clinical Practice Guideline

### Antibiotic Therapy

### Table 2- Antibiotic Dosing

#### Inpatient treatment

- <28 days of age: refer to Fever in Young Infants guideline
- ≥28 days of age: Ceftriaxone 50 mg/kg/day, max 1000 mg/day, once daily
- For step-down therapy, see outpatient treatment recommendations below

#### Outpatient treatment- refer to Table 2 for dosing

- Uncomplicated UTI:
  - 1st choice - cephalexin (based on local outpatient antibiogram data)
  - 2nd choice - nitrofurantoin
  - 3rd choice - cefixime
  - 4th choice - ciprofloxacin
- Complicated UTI (i.e. pyelonephritis)
  - Use culture results to guide therapy.
  - Bactrim, ciprofloxacin or levofloxacin are preferred over beta-lactams due to better kidney penetration.
  - If isolate is susceptible (MIC <2), consider cephalexin (has good kidney penetration)

#### Considerations:

- If previous UTI, review previous organism & susceptibilities
- If patient is on UTI prophylaxis, do not use the same antibiotic for treatment
- For all patients treated empirically, check urine culture results to assure appropriate antibiotic therapy.
- Do not obtain a follow up urinalysis if clinically improved with appropriate antibiotic treatment.
- Stop empiric treatment if culture results as contaminant or negative
- Check response to treatment within 48 hours.
- Targeted antibiotic therapy should be based on organism ID and susceptibility.
- For bacteremia, renal abscess or resistant organisms, including ESBL producers, consult infectious diseases for treatment recommendations.
- Consider upper tract infection (pyelonephritis) if signs/symptoms of fever, flank pain, or ill appearance

Antibiotic Name	Dose	Frequency & Duration for Uncomplicated UTI	Frequency & Duration for Complicated UTI (i.e. Pyelonephritis)	Relative Cost*	Notes
<b>Cephalexin (Keflex®)</b>	50mg/kg/DAY, max 4000mg/day	3 times a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 3-7 days	4 times a day <u>Children:</u> 10-14 days <u>Adolescents:</u> 10-14 days	\$	Good kidney penetration.
<b>Nitrofurantoin (Macrobid®)</b>	< 30 kg OR cannot swallow capsules: 6 mg/kg/DAY, max 400mg/day	4 times a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 5 days	<i>Do not use</i>	Cap: \$\$ Susp: \$\$\$	Capsules can be sprinkled. Suspension may be difficult to obtain. Poor kidney penetration.
<b>Nitrofurantoin (Macrobid®)</b>	≥ 30 kg AND able to swallow capsules: 200 mg/DAY	Twice a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 5 days	<i>Do not use</i>	\$\$	Poor kidney penetration.
<b>Cefdinir (Omnicef®)</b>	14mg/kg/DAY, max 600mg/day	Twice a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 3-7 days	<i>Do not use</i>	\$\$	Poor kidney penetration.
<b>Cefixime (Suprax®)</b>	8mg/kg/DAY, max 400mg/day	Daily <u>Children:</u> 7-10 days <u>Adolescents:</u> 3-7 days	Daily <u>Children:</u> 10-14 days <u>Adolescents:</u> 10-14 days	\$\$\$	On Medicaid formulary as of August 2020
<b>Ciprofloxacin (Cipro®)</b>	30mg/kg/DAY, max 1500mg/day	Twice a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 3 days	Twice a day <u>Children:</u> 10-14 days <u>Adolescents:</u> 7 days	\$\$	Suspension not always available in pharmacies other than VCH outpatient pharmacy.
<b>Levofloxacin (Levaquin®)</b>	10mg/kg/DOSE max 750 mg/day	6 mo to < 5 years: Twice a day ≥ 5 years: Daily <u>Children:</u> 7-10 days <u>Adolescents:</u> 3 days	6 mo to < 5 years: Twice a day ≥ 5 years: Daily <u>Children:</u> 10-14 days <u>Adolescents:</u> 5 days	\$\$	Suspension not always available in pharmacies other than VCH outpatient pharmacy.
<b>Cefprozil (Cefzil®)</b>	30mg/kg/DAY, max 1000mg/day	Twice a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 3-7 days	<i>Do not use</i>	\$\$\$	Not always available in pharmacies. Poor kidney penetration.
<b>Cefpodoxime (Vantin®)</b>	10mg/kg/DAY, max 200mg/day	Twice a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 3-7 days	<i>Do not use</i>	\$	Not always available in pharmacies. Poor kidney penetration.
<b>Trimethoprim-sulfamethoxazole (Bactrim®, Septra®)</b>	10mg/kg/DAY, max 320mg/day	Twice a day <u>Children:</u> 7-10 days <u>Adolescents:</u> 3 days	Twice a day <u>Children:</u> 10-14 days <u>Adolescents:</u> 10-14 days	\$\$	Use with caution for empiric therapy based on antibiogram data.

\*Estimated average wholesale price per 10-day course

This guideline does not take into account individual patient situations, and does not substitute for clinical judgment

# Urinary Tract Infection Clinical Practice Guideline



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