



# Prescribing Guidelines for Urinary Tract Infections



PARTNERS  
FOR KIDS®



# Urinary Tract Infections in Children

Urinary tract infections (UTIs) are common infections of childhood that may affect any part of the urinary tract, from the urethra to the kidneys. The following guidance will focus on uncomplicated UTIs in otherwise healthy children. Infections in children with underlying renal diseases, anatomic or functional anomalies of the urinary tract, urinary catheters, or immunocompromising conditions/therapies constitute complicated UTIs and must be approached on an individual basis.

## General Management

1. Start by obtaining an appropriate urine sample for urinalysis and urine culture. Urine culture should be performed if urinalysis is positive or if there is a high clinical suspicion for infection.
  - Clean-catch urine specimens should be obtained in all toilet trained children. While bagged urine samples can be used for initial urinalysis, catheterization is recommended to obtain appropriate samples for urine cultures in pre-toilet trained children.
2. Decide whether empiric antibiotic therapy for presumed UTI is warranted, and prescribe the most appropriate empiric therapy for the optimal duration (see Table 1). Sometimes, it may be reasonable to wait until culture results are back before prescribing antibiotics.

**Table 1: Empiric Antibiotic Therapy**

Suspected Diagnosis	Age Range	Preferred Antibiotic*	Alternate Antibiotic
Bacterial Cystitis <sup>6-10</sup> (bladder infection)	<12 years	cephalexin 25 mg/kg/dose TID x 3 days (max dose: 500 mg)	cefdinir 14 mg/kg/dose daily x 3 days (max dose: 600 mg)
	≥12 years	nitrofurantoin macrocrystal/ monohydrate 100 mg BID x 3 days	cephalexin 500 mg BID x 3 days
Pyelonephritis <sup>1,9-12</sup> (kidney infection)	<12 years	cephalexin 25 mg/kg/dose TID x 7 days (max dose: 500 mg)	cefdinir 14 mg/kg/dose daily x 7 days (max dose: 600 mg/day)
	≥12 years	cephalexin 500 mg TID x 7 days	cefdinir 600 mg daily x 7 days

\* Preferred empiric antibiotic choices are based on commonly recovered pathogens, antimicrobial susceptibility patterns at Nationwide Children’s Hospital, and drug penetration into sites of infection. It is recommended to review local resistance patterns and antibiograms for susceptibility in your area.

3. Follow up the results of urine culture and susceptibility testing, and adjust therapy as needed (i.e., stop or change the antibiotic).

## Treatment of UTI in Children

Sometimes, the clinical presentation and/or urinalysis clearly suggest an uncomplicated UTI and the desire is to start treatment empirically. Table 1 has suggestions on preferred empiric antibiotic choices and durations of treatment.

Other times, it may be reasonable to wait until culture results are back before deciding on a treatment course. Here are some important points to help make this decision:

### **Does the child have presumed cystitis or pyelonephritis?**

- Presence of vomiting, flank pain, or costovertebral angle tenderness: suggests pyelonephritis so treat empirically
- Presence of fever: suggests pyelonephritis so treat empirically
- Children without signs or symptoms of pyelonephritis: consider waiting for urine culture results to make a definitive diagnosis and optimal management

### **Has the child had prior culture-confirmed UTIs to guide empiric therapy?**

- Previous urine culture results and susceptibilities may help guide the choice of empiric therapy

## Follow-up of Urine Culture Results

For follow-up management, adjust the antibiotic therapy as indicated depending on the results of the urine culture and susceptibilities. If the urine culture does not suggest a UTI, stop the antibiotic and consider other diagnoses.

For children who improve with treatment, test-of-cure urine cultures are NOT routinely recommended. For children who do not improve within 48-72 hours of appropriate antibiotic therapy, consider obtaining a renal/bladder ultrasound to evaluate for complications such as renal or perirenal abscess.

## When to Refer

Consider referral to Pediatric Urology for further evaluation of children with recurrent UTIs, abnormal renal/bladder ultrasound results, or symptoms of voiding dysfunction when not infected (urgency, frequency, enuresis).



## References

1. Roberts KB, Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management. Urinary Tract Infection: Clinical Practice Guideline for the Diagnosis and Management of the Initial UTI in Febrile Infants and Children 2 to 24 Months. *Pediatrics*. 2011;128(3):595-610.
2. Shaikh N, Morone NE, Lopez J, et al. Does this child have a urinary tract infection? *JAMA*. 2007;298(24):2895-2904.
3. Montini G, Tullus K, Hewitt I. Febrile urinary tract infections in children. *N Engl J Med*. 2011;365(3):239-250.
4. Shaikh N, Mattoo TK, Keren R, et al. Early Antibiotic Treatment for Pediatric Febrile Urinary Tract Infection and Renal Scarring. *JAMA Pediatr*. 2016;170(9):848-854.
5. Edlin RS, Shapiro DJ, Hersh AL, Copp HL. Antibiotic resistance patterns of outpatient pediatric urinary tract infections. *J Urol*. 2013;190(1):222-227.
6. Keren R, Chan E. A meta-analysis of randomized, controlled trials comparing short- and long-course antibiotic therapy for urinary tract infections in children. *Pediatrics*. 2002;109(5):E70-70.
7. Michael M, Hodson EM, Craig JC, Martin S, Moyer VA. Short compared with standard duration of antibiotic treatment for urinary tract infection: a systematic review of randomised controlled trials. *Arch Dis Child*. 2002;87(2):118-123.
8. Shaikh N, Hoberman A. Urinary tract infections in infants older than one month and young children: Acute management, imaging, and prognosis. In: Torchia MM, ed. UpToDate. Waltham, MA: *UpToDate*.
9. Saadeh SA, Mattoo TK. Managing urinary tract infections. *Pediatr Nephrol*. 2011;26(11):1967-1976.
10. National Collaborating Centre for Women's and Children's Health. *Urinary tract infection in children: diagnosis, treatment and long-term management*. London, UK: National Institute for Health and Clinical Excellence;2007.
11. Stein R, Dogan HS, Hoebeke P, et al. Urinary tract infections in children: EAU/ESPU guidelines. *Eur Urol*. 2015;67(3):546-558.
12. Working Group of the Clinical Practice Guidelines for Urinary Tract Infection in Children. *Clinical Practice Guidelines for Urinary Tract Infection in Children*. Ministry of Health National Health Service Quality Plan, Social and Equality Policy; Aragon Institute of Health Sciences (I+CS) 2011, SNS Clinical Practice Guidelines: I+CS No 2009/01.
13. Hoberman A, Wald ER. Urinary tract infections in young febrile children. *Pediatr Infect Dis J*. 1997;16(1):11-17.
14. Hoberman A, Greenfield SP, Mattoo TK, et al. Antimicrobial prophylaxis for children with vesicoureteral reflux. *N Engl J Med*. 2014;370(25):2367-2376.
15. Reaffirmation of AAP Clinical Practice Guideline: The Diagnosis and Management of the Initial Urinary Tract Infection in Febrile Infants and Young Children 2-24 Months of Age. *Pediatrics*. 2016;138(6).
16. Shaikh N, Hoberman A, Keren R, et al. Recurrent Urinary Tract Infections in Children With Bladder and Bowel Dysfunction. *Pediatrics*. 2016;137(1).



---

## Referrals and Consultations

Online: [NationwideChildrens.org/Urology](https://www.NationwideChildrens.org/Urology)

Phone: (614) 722-6200 or (877) 722-6220 | Fax: (614) 722-4000

Physician Direct Connect Line for 24-hour urgent physician consultations:  
(614) 355-0221 or (877) 355-0221.



PARTNERS  
FOR KIDS®