

## Northwestern Medicine-West Region Pediatric UTI Treatment Guideline Summary

### Background<sup>1</sup>

- Identification and treatment of urinary tract infection (UTI) in children is important to avoid damage to the upper urinary tract such as renal scarring. Such damage can result in long-term complications such as poor renal growth, recurrent pyelonephritis, impaired glomerular function, early hypertension, end-stage renal disease, and preeclampsia.
- In a study in children aged 0 to 36 months, boys were found to have a higher proportion of UTIs caused by gram-positive organisms (52.3% vs. 18.6% in girls), and boys were more likely to have a UTI caused by a gram-negative organism other than *E.coli*.<sup>2</sup>

### Common Signs and Symptoms of UTI in Children<sup>1</sup>

- Dysuria
- Stranguria
- Urinary frequency
- Infants and children may also have non-specific signs such as poor appetite, failure to thrive, lethargy, irritability, vomiting, or diarrhea; fever may be the only symptom in young children.
- Urinary urgency
- Malodorous urine
- Incontinence
- Hematuria
- Suprapubic pain

### Diagnosis of UTI<sup>1,3</sup>

- Exclude other potential sources of fever when diagnosing UTI, and perform thorough physical examination to check for physical conditions that may predispose the patient to UTI
- Ensure urine sample is obtained prior to starting any antimicrobials for accurate results
- There is a high likelihood of UTI if both pyuria and bacteriuria are present
- Ultrasound is recommended in patients with febrile UTI or in patients with pain and hematuria to discriminate between complicated and uncomplicated UTI (if no prior normal US on file)
- Bacteria Counts in Urine to Diagnose UTI in Children:

Urine specimen from suprapubic bladder puncture	Urine specimen from bladder catheterization	Urine specimen from midstream void
Any number of CFU per mL (at least 10 identical colonies)	>10,000	> 50,000 with symptoms ≥ 100,000 CFU/mL without symptoms

### Treatment Recommendations<sup>1, 2, 3, 4, 5</sup>

- If a patient has asymptomatic bacteriuria (positive urine culture but no symptoms of UTI), and no leukocyturia, it is recommended to avoid antibiotics unless a surgical procedure is planned
- Febrile children < 2 months old or pyelonephritis ages 0-6 months old: parenteral antibiotics are recommended

Must complete sepsis work up as needed prior to antibiotics in infants 0-60 days (CBC, blood culture, UA, urine cx, blood cx, LP)-

- Ampicillin 150-200mg/kg/day IV divided q6-8h plus gentamicin 7.5mg/kg/day IV divided q8h or
- Ampicillin 150-200mg/kg/day IV divided q6-8h plus cefotaxime 150mg/kg/day IV divided q6-8h
- Narrow agent once susceptibilities known
- If 0-30 days, recommend 7- 10 days of parenteral therapy, before switching to oral therapy.
- If > 30 days, give IV until the child is afebrile, negative blood cultures, then complete 7 to 14 days of oral antibiotics based on susceptibilities
- Uncomplicated pyelonephritis ages > 6 months old: parenteral antibiotics initially, if necessary
  - Ceftriaxone 50mg/kg IV daily then switch to po based on susceptibilities for total of 7 to 14 days
- Febrile children > 2 months old:
  - May do IV or PO therapy depending on clinical factors including age; suspicion of urosepsis; severity of illness; refusal of fluids, food, and/or medication; vomiting/diarrhea; and complicated febrile UTI (e.g., upper tract dilatation)
  - PO options:
    - Cephalexin [Keflex] 20 mg/kg q8h for 7 to 14 days
    - TMP-SMX [Bactrim] if PCN allergy 4-5 mg/kg (TMP component) BID for 7 to 14 days
  - IV option:
    - Ceftriaxone 50mg/kg IV daily then switch to PO for total of 7 to 14 days
- Uncomplicated UTI in children > 6 months old:

Treatment options same as ABOVE; If afebrile with only cystitis, can treat minimum 3-5 days

  - Cephalexin [Keflex] 20 mg/kg q8h for a minimum of 3 to 4 days
  - TMP/SMX [Bactrim] 4-5mg/kg (TMP component) divided BID for minimum of 3 to 4 days

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### References:

1. Stein R, et al. Urinary tract infections in children: EAU/ESPU Guidelines. *Eur Urol* (2014). <http://dx.doi.org/10.1016/j.eururo.2014.11.007>
2. Frumkin K. Bacteriology of urinary tract infections in emergency patients aged 0-36 months. *J Emerg Med* (2014). <http://dx.doi.org/10.1016/j.jemermed.2014.11.004>
3. 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); 128:595-610.
4. Taketomo CK, et al., eds. *Pediatric and Neonatal Dosage Handbook*, 19<sup>th</sup> ed. Hudson, OH, Lexicomp, Inc.; 2012:1589.
5. Lexicomp Online, Hudson, Ohio: Lexi-Comp, Inc.; 2015; April 14, 2015.