



On Unexplained Fever in Young Children, Removable Brace vs. Casting, and Contamination in Mid-Stream Urine Collection

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Each month, Dr. Nahum Kovalski will review a handful of abstracts from, or relevant to, urgent care practices and practitioners. For the full reports, go to the source cited under each title.

Evaluating Fever of Unidentifiable Source in Young Children

Key point: *An excellent review of the approach to the febrile child.*

Citation: Sur DK, Bukont EL. *Am Fam Physician*. 2007;75:1805-1811.

Even with a thorough history and a complete physical examination, one in five acutely ill, nontoxic-appearing children had an unidentifiable source of fever. Physicians should be cautious in their approach because of the potential for unrecognized and untreated serious bacterial infections (SBI).

The review notes that most children will have been evaluated for a febrile illness by 36 months of age and that most of these children have a self-limited viral illness.

However, studies from the 1980s and 1990s showed that 7% to 13% of children younger than 36 months without apparent sources of fever had occult bacteremia and SBI. These infections may include bacterial gastroenteritis, cellulitis, meningitis, osteomyelitis, pneumonia, septic arthritis, and urinary tract infections.

Since the introduction of *Haemophilus influenzae* type B and *Streptococcus pneumoniae* vaccines, there has been a sig-

nificant decrease in the number of cases of occult bacteremia and SBI in febrile children, with occult bacteremia rates of 1.6% to 1.8%. Similarly, epidemiologic data reflect a decrease in the rates of *S. pneumoniae* infections since the introduction of a pneumococcal conjugate vaccine.

Typically, fever that is clinically significant is defined as a rectal temperature higher than 100.4°F (38°C). Further evaluation is required for previously healthy, well-appearing children 3 to 36 months of age with a rectal temperature of 102.2°F (39°C) or higher. Several studies have shown that axillary and tympanic temperatures are unreliable in young children.

Specific recommendations are as follows:

- Any infant younger than 29 days, and any child who appears toxic, regardless of age, should undergo a complete sepsis work-up and be admitted for observation and administration of intravenous antibiotics after completion of a sepsis work-up until the source of the fever is found and treated.
- Work-up should include a complete blood cell (CBC) count with manual differential; blood cultures; lumbar puncture for cell counts, glucose, protein, and culture; and urinalysis with culture.

Laboratory evaluations for neonatal herpes simplex virus infection also should be considered in patients with risk factors for infection—particularly maternal infection at the time of delivery; the use of fetal scalp electrodes; vaginal delivery; cerebrospinal fluid pleocytosis; and skin, eye, or mouth lesions.



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However, there should be a low clinical threshold to test for and treat neonatal herpes simplex virus infection; if the infant is not improving while receiving antibiotic therapy, herpes simplex virus infection should be considered.

For low-risk infants aged 29 to 90 days who appear nontoxic, have an unremarkable history, and are under the care of a reliable adult, there are two management options:

Option 1: Perform a laboratory evaluation including a CBC count with manual differential, cerebrospinal fluid analysis, and urinalysis with urine culture. If the white blood cell count is less than 15,000 cells/mm³ with an absolute neutrophil count less than 10,000 cells/mm³ and cerebrospinal fluid and urinalysis are normal, ceftriaxone (Rocephin), 50 mg/kg intramuscularly, may be given, with a follow-up appointment in 24 hours for repeat history and examination and review of results.

Option 2: Perform a CBC count and urinalysis with urine culture without obtaining blood cultures, doing cerebrospinal fluid studies, or giving antibiotics, provided the infant is carefully observed and followed up with a re-examination within 24 hours. If laboratory testing is positive, appropriate action is needed.

For well-appearing infants and children aged 3 to 36 months with a fever less than 102.2°F (39°C) without an apparent source, observation only is adequate without any laboratory testing or antibiotics needed, but a follow-up visit should occur if symptoms worsen or fever continues for longer than 48 hours.

Well-appearing infants and children 3 to 36 months of age with fever of 102.2°F (39°C) or higher with no apparent source may receive observation only, with close follow-up. A second option if there is no apparent source for the fever and if the child has received the appropriate vaccinations is to order screening laboratory analysis and send the child home with close follow-up.

Recent developments, including the dramatic decrease in the incidence of *H. influenzae* type B infection, mandate re-evaluation of the recommended protocols for evaluating and treating febrile children ages ≥36 months. ■

A Randomized, Controlled Trial of a Removable Brace Versus Casting in Children with Low-Risk Ankle Fractures

Key point: The removable ankle brace is more effective than the cast for isolated distal fibular ankle fractures.

Citation: Boutis K, Willan AR, Babyn P, et al. *Pediatrics*. 2007; 119:e1256-e1263.

Isolated distal fibular ankle fractures in children are very common and carry very low risk for future complications. Nevertheless, standard therapy for these fractures still consists of casting, a practice that does carry risk, inconvenience, and use of subspecialty healthcare resources.

This was a non-inferiority, randomized, single-blind trial in which children who were 5 to 18 years of age and treated in a

pediatric emergency department for low-risk ankle fractures were randomly assigned to a removable ankle brace or a below-knee walking cast. The primary outcome at four weeks was physical function, measured by using the modified Activities Scale for Kids. Additional outcomes included patient preferences and costs.

The mean activity score at four weeks was 91.3% in the brace group (*n*=54)—considerably higher than the mean of 85.3% in the cast group (*n*=50).

Further, more children who were treated with a brace had returned to baseline activities by four weeks compared with those who were casted (80.8% vs 59.5%).

The removable ankle brace is more effective than the cast with respect to recovery of physical function, is associated with a faster return to baseline activities, is superior with respect to patient preferences, and is also cost-effective. ■

To Clean or Not to Clean: Effect on Contamination Rates in Mid-Stream Urine Collections in Toilet-Trained Children

Key point: Cleaning may reduce the risk for returning for repeat cultures and for receiving unnecessary antibiotic treatment and investigations.

Citation: Vallancourt S, McGillivray D, Zhang X, et al. *Pediatrics*. 2004;119:e1288-e1293.

Urinary tract infection is one of the most common bacterial infections among children. Difficulty in specimen collection and interpretation of inadequately collected specimens may contribute to misdiagnosis of urinary tract infection. The objective was to assess the effect of perineal/genital cleaning on bacterial contamination rates of mid-stream urine collections in toilet-trained children.

The authors conducted a randomized trial in toilet-trained children who presented to a tertiary care pediatric emergency department between November 1, 2004 and October 1, 2005.

All toilet-trained children who were between the ages of 2 and 18 years and had a mid-stream urine sample requested were eligible. Those whose parents consented were cluster-randomized by week to either cleaning or not cleaning the perineum with soap. The risk for a contaminated urine culture and the risk for a positive urinalysis were analyzed by intention to treat.

In all, 350 children were enrolled. The rate of contamination in the cleaning group was 14 (7.8%) of 179 vs. 41 (23.9%) of 171 in the non-cleaning group. Children who were randomly assigned to cleaning were less likely to have a positive urinalysis (37 of 179 [20.6%]) than those in the non-cleaning group (63 of 171 [36.8%]).

Urine contamination rates are higher in mid-stream urine that is collected from toilet-trained children when obtained without perineal/genital cleaning. ■