

# Clinical Policy for Well-Appearing Infants and Children Younger Than 2 Years of Age Presenting to the Emergency Department With Fever

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## ABSTRACT

This clinical policy from the American College of Emergency Physicians addresses key issues for well-appearing infants and children younger than 2 years presenting to the emergency department with fever. A writing subcommittee conducted a systematic review of the literature to derive evidence-based recommendations to answer the following clinical questions: (1) For well-appearing immunocompetent infants and children aged 2 months to 2 years presenting with fever ( $\geq 38.0^{\circ}\text{C}$  [ $100.4^{\circ}\text{F}$ ]), are there clinical predictors that identify patients at risk for urinary tract infection? (2) For well-appearing febrile infants and children aged 2 months to 2 years undergoing urine testing, which laboratory testing method(s) should be used to diagnose a urinary tract infection? (3) For well-appearing immunocompetent infants and children aged 2 months to 2 years presenting with fever ( $\geq 38.0^{\circ}\text{C}$  [ $100.4^{\circ}\text{F}$ ]), are there clinical predictors that identify patients at risk for pneumonia for whom a chest radiograph should be obtained? (4) For well-appearing immunocompetent full-term infants aged 1 month to 3 months (29 days to 90 days) presenting with fever ( $\geq 38.0^{\circ}\text{C}$  [ $100.4^{\circ}\text{F}$ ]), are there predictors that identify patients at risk for meningitis from whom cerebrospinal fluid should be obtained? Evidence was graded and recommendations were made based on the strength of the available data.

## INTRODUCTION

Fever is the most common chief complaint among infants and children presenting to an emergency department (ED), accounting for 15% of all ED visits in a given year for patients younger than 15 years.<sup>1</sup> The majority of febrile children will have a benign, self-limited viral infection. However, a small number of pediatric patients, especially those younger than 3 months because of their relatively immature immune system, will have a serious infection. The management of the toxic or ill-appearing pediatric patient is straightforward; however, the dilemma for the health care provider is to differentiate the well-appearing febrile infant or child with a serious bacterial infection (SBI) from the febrile infant or child with a benign, usually viral infection. In a study of more than 3,000 febrile infants, only 58% of those with bacteremia or bacterial meningitis appeared clinically ill.<sup>2</sup>

There are multiple considerations in the initial assessment of the febrile pediatric patient younger than 2 years: infants and children may have a serious infection and

be hypothermic or have a normal temperature; antipyretic use in the previous 4 hours may result in a normal or lower temperature when the infant or child presents to the ED or other health care setting; there should be a determination of the accuracy or validity of the temperature obtained with a home measuring device; fever may be the result of a bacterial or nonbacterial infection (eg, viral infection) or have a noninfectious cause; some viral infections, such as herpes simplex virus, can have devastating consequences in this age group; and the presence of a viral infection does not preclude the coexistence of a bacterial infection.

In terms of management, other complex issues to consider include immunization status (ie, fully, partially, or not immunized) and the capacity of the parent or caregiver to continuously monitor the infant or child if discharged home, or to return within 12 to 24 hours.

Fever without a source, or fever without a focus, has the following criteria: acute onset, duration of less than 1 week, and absence of localizing signs. In the prepneumococcal vaccine era, even after a thorough history and physical examination, a source of infection was not identified in 27.1% of children.<sup>3</sup>

There are many difficulties inherent in developing an evidence-based clinical policy for the management of infants and children with fever. This includes the heterogeneity of definitions, age groups, clinical settings, patient populations, types of diagnostic studies, inclusion or exclusion criteria, thresholds for positive or negative test results, and endpoints or outcomes. Even the definition of fever varies between studies, although the generally used definition is a rectal temperature of greater than or equal to  $38.0^{\circ}\text{C}$  ( $100.4^{\circ}\text{F}$ ), documented in the clinical setting or at home within the past 24 hours. The definitions (and thus incidence, outcomes, etc) of SBI vary greatly. In some studies, SBI includes bacteremia, bacterial meningitis, urinary tract infection, pneumonia, septic arthritis, osteomyelitis, cellulitis, and enteritis, whereas others include only bacteremia, bacterial meningitis, and urinary tract infection. In the majority of studies, the reference standard for the diagnosis of SBI is a positive culture result from a sample of blood, urine, cerebrospinal fluid, or stool (typically performed only if diarrhea is present).<sup>4-6</sup>

In the prepneumococcal vaccine era, for febrile infants and children the risk of SBI by age has been reported as 13% in neonates (aged 3 to 28 days),<sup>4</sup> 9% in infants aged 29 to 56 days,<sup>5</sup> and 7% in infants aged 90 days or younger.<sup>6</sup> Also, the risk of a positive blood culture result (ie, bacteremia) in an otherwise well-appearing febrile infant or child, aged 3 months to 36 months, was approximately 12% with a fever ( $\geq 40^{\circ}\text{C}$  [ $104^{\circ}\text{F}$ ]) or with the combination of a fever ( $\geq 39.5^{\circ}\text{C}$  [ $103^{\circ}\text{F}$ ]) and WBC

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