

Current Concepts in the Evaluation of the Febrile Child



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KEYWORDS

- Fever • Serious bacterial infection • Thermometer • Immunizations
- Yale Observation Scale • Rochester criteria • Philadelphia criteria • Boston criteria

KEY POINTS

- Pediatric fever is a common and challenging presenting complaint.
- A thorough history and physical examination and correct method of temperature measurement are crucial.
- Immunization rates remain high, but some vaccine-preventable diseases are on the rise.
- Clinical decision tools and diagnostic evaluation are used to risk stratify febrile children.
- All children who appear ill or are under 28 days should be hospitalized.

INTRODUCTION

Febrile children account for a substantial proportion of emergency department (ED) visits. Most children who present with fever are less than 3 years of age.¹ Patients presenting with fever can be among of the more daunting challenges that providers face. Determining the source of the fever, the child's associated risks of serious illness or complication, offering assurances to worried parents, and creating a treatment plan that brings all of those things together can be difficult for even the most experienced ED provider. Throughout this article, the authors will discuss pediatric fever, and the current concepts in evaluation and management of the febrile child. The authors will discuss how certain factors must influence ED provider approach and management of febrile children, as well as the approach to febrile children within certain age cohorts. A discussion on immunizations and the way they have shaped current evaluation of fever in children will occur. The authors will also discuss how to incorporate evidence-based clinical decision rules into ED provider practice.

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FEVER

Fever is a controlled increase in body temperature over the normal values for an individual.² Several different definitions of fever exist, but most experts define fever as a rectal temperature of 38°C or above.³ The hypothalamus regulates body temperature in response to changes in blood temperature, as well as neural connections to receptors in skin and muscle. Fever results when the body's thermostat has been reset to a higher temperature in response to increased circulating endogenous pyrogens. There are a variety of conditions that can cause fever (**Box 1**).^{2,3} Contrary to popular belief, a single normal body temperature does not exist. Every person exhibits diurnal variation in body temperature, with lower body temperatures in the morning, and temperatures up to 1°C higher in the afternoon or early evening. Healthy individuals have been known to have a mean rectal body temperature between 36.1 C and 37.4 C.⁴

EVALUATION OF THE FEBRILE CHILD

Method of Fever Measurement

There are many methods of body temperature measurement that can be used to evaluate febrile children. Choice of oral, rectal, axillary, temporal, or tympanic thermometer should vary among patient population. And, since the method of temperature measurement varies among EDs, the ED provider should also know the benefits and limitations to each method of temperature measurement (**Table 1**).⁵ For example, tympanic measurement may give false readings if the instrument is not properly positioned or the external ear canal is occluded by wax, regardless of the age group in

Box 1

Conditions that can cause fever in pediatric patients

- Viral infections
- Bacterial infections
- Malignancy
- Rheumatic diseases
- Autoimmune disease
- Metabolic diseases
- Vaccine administration
- Medications
- Biologic agents
- Tissue injury
- Central nervous system abnormalities
- Inflammatory diseases
- Granulomatous diseases
- Endocrine disorders
- Genetic disorders
- Excess exposure to environmental heat

From Behrman RE, Kliegman RM, Jenson HB. Nelson's textbook of pediatrics. 18th edition. London: W. B. Saunders; 1999; and Hay WW. Current pediatric diagnosis & treatment. 18th edition. New York: Lange Medical Books/McGraw-Hill, Medical Pub. Division; 2007.

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