

# Bronchiolitis

## From Practice Guideline to Clinical Practice

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### KEYWORDS

- Bronchiolitis • ED management • Guidelines pediatric respiratory emergency
- Respiratory distress • AAP CPG • RSV • Therapy • Diagnosis

### KEY POINTS

- Bronchiolitis is a common but challenging cause of respiratory distress in infants and children presenting to an emergency department.
- Emergency physicians must be able to stabilize those patients with escalating illness, distinguish patients with impending respiratory failure, and determine who may be discharged safely home.
- Emergency practitioner must be familiar with the American Academy of Pediatrics' clinical practice guideline for bronchiolitis in order to apply best practices appropriately.

This article discusses recent literature to inform the implementation of the American Academy of Pediatrics' (AAP's) bronchiolitis clinical practice guideline (CPG) into the emergency department (ED) management of bronchiolitis in children aged 1 month to 23 months. Recommendations on general resuscitation or inpatient management of bronchiolitis are not discussed.

### BRONCHIOLITIS: FROM GUIDELINES TO CLINICAL PRACTICE: AN EMERGENCY DEPARTMENT PERSPECTIVE

#### *The Guidelines*

The 2014 update of the AAP's 2006 bronchiolitis CPG reflects a minimalist approach to bronchiolitis and addresses the care of previously healthy infants and children, most of whom do not need major intervention.<sup>1</sup> Before the 2006 CPG, widespread practice

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variation existed.<sup>2</sup> Despite increasing evidence that many bronchiolitis therapies lack effect, several recent studies describe the unnecessary resource and treatment utilization that still occurs globally.<sup>3</sup> Many infants still routinely receive medications with no proven benefit.<sup>2</sup> Although the 2014 guidelines have not yet had a major impact on all physician behavior, recent quality initiatives are promising in the reduction of unnecessary treatments in the inpatient setting.<sup>4</sup>

### ***Disparity in treatment and evaluation***

A comparison of general versus pediatric emergency physician (EP) treatment of bronchiolitis revealed poor adherence to the CPG and greater use of non-evidence-based therapies or testing in general EDs (GEDs) 77% of this large pediatric cohort received their care in GEDs<sup>5</sup> which suggests a lack of awareness of published CPGs and/or challenges in implementation of the guidelines in GEDs that might have contributed to these findings. With advances in knowledge diffusion via collaborative media sites targeting general EPs, synopses of evidence-based guidelines are increasingly available.<sup>6</sup>

### ***Bronchiolitis: The Disease***

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Bronchiolitis is a disease of the lower respiratory tract most prevalent in children less than two years of age. Respiratory syncytial virus is a common cause, although other viruses such as human metapneumovirus and human rhinovirus have also been implicated.<sup>7</sup> The clinical respiratory effects stem from damage of epithelial cells in the terminal bronchi leading to edema, inflammation, excessive mucous production, and epithelial cell sloughing.<sup>8</sup> This cascade causes widespread obstruction of bronchioles from mucous plugging and causes atelectasis resulting in varying levels of respiratory distress. Symptoms may range from mild nasal congestion, to copious secretions, wheezing, and/or rales (crackles). Ventilation-perfusion mismatch due to obstruction causes hypoxia, rather than the smooth-muscle contraction of airways seen in reactive airway disease.

### ***Epidemiology***

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Bronchiolitis outbreaks span the winter months into spring, with peaks in January and February. Boys and girls are equally affected. Worldwide, 3.4 million hospitalizations occur annually.<sup>9</sup> In the United States, 1.4 million outpatient and ED visits per year result in 150,000 admissions of patients less than 5 years old.<sup>10</sup> Risk factors that increase the likelihood of developing bronchiolitis include having an older sibling, exposure to cigarette smoke, daycare attendance, and birth within 2 months of the peak season.

### ***Diagnosis***

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Bronchiolitis remains a clinical diagnosis with a wide spectrum of illness. Many patients with mild symptoms can be discharged with minimal to no ED intervention as recommended by the CPG.<sup>11</sup>

### ***To Intervene or Not to Intervene***

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The CPG targets children with mild to moderate symptoms of bronchiolitis.<sup>1</sup> Findings such as a history of poor feeding, severe retractions, oxygen saturation of 92% or less, and a respiratory rate of 60/min or more were found to be predictive of major interventions and possible hospitalization in one study.<sup>12</sup> However, any child in shock (frank or impending), hypoxemia, and/or respiratory failure needs urgent stabilization and treatment (**Fig. 1**).

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