

# A Room Without a View: Toward the Evidence

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Bronchiolitis is 1 of the most common causes of pediatric hospitalization and accounts for >\$1.7 billion in hospital charges annually.<sup>1</sup> The history of management of bronchiolitis in infants is a study in the reduction of unnecessary resources. Early in treating this disease, routine testing and ineffective therapies were common. Many of us recall the days of ubiquitous chest radiography, complete blood cell counts, albuterol, racemic epinephrine, and steroids. Many recall average lengths of stay of 5 days rather than perhaps 2.5 now. We have not entirely gotten away from that history. Although data show a lack of efficacy of these therapies and guidelines have reduced use, overtesting and overuse of interventions remain common.<sup>2</sup> And we continue to employ new therapies before evidence demonstrates efficacy. For example, the use of high-flow nasal cannula has not been shown to impact length of stay or any resource use other than use of high-flow nasal cannula, yet we continue to broadly adopt it in the United States without robust evidence demonstrating benefit.<sup>3,4</sup>

Although there have been considerable efforts to improve cost-effective care in the diagnosis and treatment of bronchiolitis through research and quality improvement, less attention has been paid to the costs of infection-control practices in hospitalized bronchiolitis patients. Many institutions have guidelines that require patients with bronchiolitis to be roomed with others who share the same causative pathogen, as assayed by respiratory viral pathogen (RVP) testing, on the basis of the logic that rooming patients with bronchiolitis who are infected with different viruses risks cross-infection. The cost of routine RVP testing is not insignificant, and it has been demonstrated that RVP testing lacks clinical value.<sup>5,6</sup> Furthermore, cohorting presents significant logistic challenges, and there are no firm safety data supporting the need for this practice. Simplification of these cohorting practices has been shown to decrease unnecessary viral testing and reduce cost.<sup>7</sup> Accordingly, cohorting patients with bronchiolitis on the basis of viral pathogen is an important source of potentially unnecessary hospital expenditure and effort and may increase emergency department wait time and delay hospital throughput.

In some cases, for instance, among adults with influenza, cohorting has been shown to be an effective manner of reducing nosocomial infection<sup>8</sup>; however, to our knowledge, this has never been assessed in infants with bronchiolitis before.

In this issue of *Hospital Pediatrics*, Bekhof et al<sup>9</sup> study this widespread belief that rooming patients with bronchiolitis caused by different viruses increases the probability of hospital-acquired infections (HAIs). In their prospective cohort study, they examined the hospital courses of 218 children admitted for acute bronchiolitis infection. RVP testing was performed, and all bronchiolitis patients were roomed at least 1.5 m apart with up to

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[www.hospitalpediatrics.org](http://www.hospitalpediatrics.org)

DOI:<https://doi.org/10.1542/hpeds.2019-0079>

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HOSPITAL PEDIATRICS (ISSN Numbers: Print, 2154-1663; Online, 2154-1671).

**FINANCIAL DISCLOSURE:** The authors have indicated they have no financial relationships relevant to this article to disclose.

**FUNDING:** No external funding.

**POTENTIAL CONFLICT OF INTEREST:** The authors have indicated they have no potential conflicts of interest to disclose.

Opinions expressed in these commentaries are those of the authors and not necessarily those of the American Academy of Pediatrics or its Committees.

Dr Andrews conceptualized this article, researched the content, and drafted and edited the manuscript; Dr Alverson assisted with conceptualizing this article, drafting, and research; and both authors approved the final manuscript as submitted.

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3 others without regard to each other's causative pathogen. Notably, 75% of patients were sharing a room with at least 2 other patients with bronchiolitis. Hygienic precautions at this institution involved only contact precautions without the use of face or eye protection. Bekhof et al<sup>9</sup> found that although HAIs were somewhat common in general (12.8%), HAI with a different virus acquired from a roommate with bronchiolitis was rare (3 of 218 patients; 1.3%). Notably, these HAIs were determined on the basis of RVP testing, which itself is known to have a false-positive rate of 27% to 47%.<sup>10</sup> Furthermore, their study found no significant association between the development of HAI and disease severity or clinical outcomes.

These results are provocative, especially when taken in the context of other literature examining the transmission mechanism of bronchiolitis. Much of this research has focused specifically on respiratory syncytial virus (RSV), the most common virus in bronchiolitis, which represented 83% of the infections studied by Bekhof et al,<sup>9</sup> and whose transmission is widely understood to be via contact and not aerosolized particle inhalation. This stems from the work of Hall and Douglas<sup>11</sup> in 1981 comparing the incidence of infection in 3 groups of caregivers exposed to RSV-infected infants who were either in direct contact with the infants, were in indirect contact with objects in the infants' beds, or instead were not in contact but sitting 6 ft away from the bed wearing a gown and gloves. Although caregivers exposed through both direct and indirect contact were infected, none of the caregivers within 6 ft were. Although patients with RSV bronchiolitis have been found to emit aerosolized particles that are theoretically small enough to be inhaled,<sup>11–13</sup> the majority of studies maintain that airborne transmission is highly inefficient and infection occurs primarily via contact.<sup>11,14–17</sup> Perhaps more importantly and echoing the findings from Bekhof et al,<sup>9</sup> patients with bronchiolitis who have multiple viral coinfections have not been shown to have more severe disease.<sup>18–20</sup>

Overall, the preponderance of the evidence suggests that cohorting on the basis of RVP

testing, from both a pathophysiological and empirical perspective, seeks to mitigate an extremely low-incidence, low-level risk. That said, even with this evidence, we expect that many institutions will be reluctant to change their bronchiolitis cohorting policies. This is because it generally seems difficult to remove practices that are deemed safety enhancing (regardless of reality) because of parental pressures to keep their children away from others with other viruses and because of habit. That said, reluctance should not justify inaction. Routine practice to cohort patients on the basis of a test with questionable clinical relevance contradicts the basic principle of value-based medicine that treatment and policies should strive to optimize both quality of care and cost. It introduces waste from the under- and overuse of hospital resources (empty beds and needless provider and administrator shuffling of patients), increases direct costs from RVP testing expenses, and as found by Bekhof et al,<sup>9</sup> has no effect on quality. Policy change should be seriously considered.

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*Hospital Pediatrics* 2019;9;479

DOI: 10.1542/hpeds.2019-0079 originally published online May 28, 2019;

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