

1.08 BRONCHIOLITIS

Introduction

Bronchiolitis is the most common viral lower respiratory illness in young children and infants. It is responsible for hundreds of thousands of outpatient and emergency department visits and more than 100,000 hospitalizations per year, accounting for more than \$1.7 billion in hospital charges annually. The most commonly identified etiology of bronchiolitis is respiratory syncytial virus (RSV), however bronchiolitis may be caused by many other viruses, including rhinovirus, human metapneumovirus, parainfluenza, adenovirus, and influenza. With hospital care provided for these patients in a variety of settings, the potential for significant variation in practices exists despite guidelines published by the American Academy of Pediatrics. Pediatric hospitalists should render evidence-based care that minimizes harm, improves outcomes, and avoids unnecessary testing, hospitalization, and treatments.

Knowledge

Pediatric hospitalists should be able to:

- Compare and contrast the epidemiology and pathogenesis of bronchiolitis with asthma.
- Describe the typical clinical signs of viral bronchiolitis (such as wheezing, rales, tachypnea, acute respiratory distress, hypoxia, cough, apnea, nasal obstruction, and others) and explain the ways in which presentations may vary.
- Discuss alternate diagnoses that may mimic bronchiolitis, such as pneumonia, congestive heart failure, previously undiagnosed cyanotic or non-cyanotic congenital heart disease, sepsis, aspiration, and others.
- Describe risk factors that predispose infants and children to severe illness or complications of bronchiolitis, including prematurity, heart disease, pulmonary disease, immunodeficiency, neuromuscular disease, and environmental smoke exposure.
- Explain indications for hospital admission and cite discharge criteria.
- Discuss indications for diagnostic testing, including viral testing and chest radiographs.
- Discuss risks of serious bacterial infection and initial diagnostic evaluations for febrile infants of various ages presenting with bronchiolitis, attending to ages less than 30 days, 31-60 days, and others.
- Explain the indications and contraindications for RSV immunoprophylaxis.
- Summarize the evidence for the use of specific therapies in the treatment of routine bronchiolitis, including beta-agonists, hypertonic saline, and steroids.
- Discuss the evidence regarding use of supportive measures, including suctioning (such as nasal-pharyngeal, oral, and others), chest physiotherapy, positioning, enteral versus intravenous fluids and nutrition, supplemental oxygen, and others.
- Define the benefits, limitations, and potential harms associated with use of various non-invasive monitoring modalities, including cardiorespiratory, oxygen saturation, and capnography.

- Discuss management strategies for patients with worsening respiratory status, including use of various oxygen delivery systems and advanced respiratory support (including heated high flow nasal cannula, forms of non-invasive ventilation, and endotracheal intubation and mechanical ventilation).

Skills

Pediatric hospitalists should be able to:

- Diagnose bronchiolitis by efficiently performing an accurate history and physical examination, determining if key features of the disease are present.
- Assess clinical signs of respiratory distress and identify impending respiratory failure.
- Identify the indications for escalating level of care, transferring to a tertiary care center, and initiation of ventilatory support.
- Assess nutrition and hydration status and choose appropriate methods to maintain adequate hydration and nutrition, with promotion of breastfeeding when appropriate.
- Order appropriate monitoring (type and frequency) and correctly interpret monitor data.
- Perform reassessments daily and as needed, note changes in clinical status, and respond with appropriate actions, including discontinuation of ineffective or unnecessary therapies and monitoring.
- Utilize standardized respiratory scores to objectively assess and document response to interventions.
- Implement appropriate oxygen weaning strategies, including the use of appropriate oxygen saturation parameters.
- Adhere to proper infection control measures and educate the family/caregivers in the importance of hand washing and minimizing environmental exposure in the prevention of infection.
- Communicate with the family/caregivers about the etiology and natural history of bronchiolitis, interpretation of clinical findings, care plans, and supportive care.
- Deliver efficient care by proactively creating a discharge plan that can be expediently activated when appropriate.
- Coordinate care with the primary care provider and other services as indicated, to arrange an appropriate transition plan for hospital discharge.

Attitudes

Pediatric hospitalists should be able to:

- Acknowledge the importance of discussing the role of supportive care and the limited evidence for other interventions with the family/caregivers.
- Exemplify a proactive, engaged attitude regarding proper isolation measures, including hand washing to prevent spread of the etiologic agent in the hospital.
- Realize responsibility for explaining the relationship between bronchiolitis and risk of future wheezing when educating the family/caregivers regarding this diagnosis.

Systems Organization and Improvement

In order to improve efficiency and quality within their organizations, pediatric hospitalists should:

- Collaborate with hospital infection control practitioners to prevent nosocomial infection related to bronchiolitis.
- Partner with community services to educate the public on respiratory infection preventive strategies.
- Lead, coordinate, or participate in multidisciplinary initiatives (including nursing, respiratory therapy, emergency department physicians, primary care physicians, intensivists, and other specialists) to develop, implement, and assess quality outcomes of evidence-based clinical guidelines for the care of children with bronchiolitis.
- Collaborate with intensivists, respiratory therapists, and nurses

to mutually develop and implement evidence-based criteria for use of non-invasive respiratory support therapies such as supplemental oxygen, heated high-flow nasal cannula, and others.

References

1. Ralston WL, Lieberthal AS, Meissner HC. Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis. *Pediatrics*. 2014; 134(5): e1474-1502. <https://pediatrics.aappublications.org/content/134/5/e1474.long>. Accessed August 28, 2019.
2. National Institute for Health and Care Excellence. Bronchiolitis: diagnosis and management of bronchiolitis in children. Clinical Guideline NG 9. June 2015. <https://www.nice.org.uk/guidance/ng9>. Accessed August 25, 2019.