Bronchiolitis Clinical Guideline

Target Population: Infants < 12 months, first presentation with typical signs and symptoms of bronchiolitis

Desired Outcomes: clinical improvement, decreased hospitalizations, decreased length of stay, decreased number of transfers to increased level of care

Exclusions: Other pulmonary diagnosis (pulmonary dysplasia, cystic fibrosis), immunodeficiency, ICU patients requiring ventilator care, other significant co-morbidities, gestational age < 35 weeks, strong family history of asthma, congenital heart disease, chronic neuromuscular disease, clinical significant gastroesophageal reflux disorder, structural airway disease

Rationale for this Guideline: Bronchiolitis is the most common lower respiratory tract infection in infants. Respiratory Syncytial Virus (RSV) is responsible for the majority of bronchiolitis cases, particularly in the winter months. Other known causes include parainfluenza, adenovirus, and influenza. In children less than 1 year of age presenting for the first time with routine clinical signs of bronchiolitis, the objectives of this guideline are:

- Avoid unnecessary diagnostic studies
- Decrease the use of medications and respiratory therapy when improvement from these interventions is not noted
- Provide guidance for appropriate hospital admission
- Decrease the incidence of nosocomial infections
- Use monitoring only if clinically indicated
- Maintain or improve the length of hospital stay

Diagnosis: Diagnosis of bronchiolitis is based on physician assessment and evaluation of clinical criteria. Infants with fever, rhinitis, tachypnea, and wheezing between November and May are presumed to have bronchiolitis. (Bronchiolitis may be seen year round). Specific testing is available, but it is not routinely recommended that diagnostic studies (RSV swab, chest x-ray, cultures, capillary or arterial blood gases, rapid influenza or other rapid viral studies) be performed.

Treatments:

All patients hospitalized with bronchiolitis will be placed in respiratory/contact isolation for the entire length of stay. Isolation in the outpatient setting is generally impractical.

Oxygen: The Cook Children’s oxygen administration policy recommends supplemental oxygen if the SpO2 is consistently < 91%. Heated, humidified high flow nasal cannula (HHFNC) oxygen is associated with decreased rates of intubation in children < 24 months of age who were admitted to the PICU with bronchiolitis.


**Monitoring**: Repeated clinical assessment is the most important aspect of monitoring for deteriorating respiratory status. Infants will be placed on cardiac-apnea monitors, especially when there is a history of prematurity, underlying chronic conditions, or with episodes of witnessed apnea. Infants with RSV who contract the virus less than 3 months of age are at the highest risk for apnea and mechanical ventilation.

Overuse of SpO₂ monitoring has been associated with prolonged hospitalization. During the early admission phase, infants should be placed on continuous SpO₂ monitoring. Heart rate and respiratory rate should also be monitored. As the clinical course improves, intermittent measurement of SpO₂ may be done. Infants with severe respiratory distress and apneic episodes should be monitored in the pediatric intensive care unit.

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**Suction**: Deep suctioning of the lower pharynx or larynx is not recommended. Instead, it is recommended that bulb suction with normal saline nose drops be used to clear the airway prior to feeding and inhalation therapy, and as needed. Suctioning may improve respiratory status and thus make inhalation therapy unnecessary.

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**Surfactants:** Evidence suggests that a surfactant deficiency may result in severe bronchiolitis. Surfactant may be indicated when children with bronchiolitis are admitted to the PICU for mechanical ventilation because this therapy may shorten the duration of mechanical ventilation.


**Bronchodilators:** There are two systematic reviews about bronchodilators and bronchodilators with steroids. The reviews concluded that adrenaline provides the strongest clinical outcomes for children in the outpatient setting. Routine scheduled or serial use of nebulized albuterol is not recommended. A single use trial treatment using epinephrine or albuterol may be recommended in selected patients. If effective, continued treatment is recommended if improvement in respiratory scoring is noted. Bulb suctioning is recommended before inhalation therapy and before feeding. Normal saline drops are also recommended prior to suctioning.


**Steroids:** There is one systematic review regarding the use of glucocorticoids in children with acute viral bronchiolitis. Conclusions are that current evidence does not support the use of systemic, inhaled, intramuscular, oral, or intravenous glucocorticoids because there is no effect on preventing admissions or reducing length of stay. Current research is needed to determine if combined therapy with dexamethasone and epinephrine may decrease outpatient admissions.
NOT Routinely Recommended:

CPAP: Evidence regarding the use of CPAP for bronchiolitis is inconclusive. CPAP with or without heliox may lessen the work of breathing and prevent intubation in children with hypoxemia and hypercapnia.

Hypertonic Saline: There is inconsistent evidence to support the use of hypertonic saline for inhalation therapy in children with bronchiolitis. Some studies suggest that the length of stay may be reduced when a 3% nebulized saline solution is used as a treatment for acute bronchiolitis. Bronchospasm may be induced with the use of hypertonic saline therefore the risk of use may be greater than the benefit.

Other Treatments: Chest physiotherapy, aerosol therapy with saline, antibiotics in the absence of bacterial focus, antihistamines, oral decongestants and nasovasoconstrictors, antibodies, Montelukast, recombinant human deoxyribonucleic acid, and inhaled furosemide are not routinely recommended.


Ottolini MG, Hemming VG. Prevention and treatment recommendations for respiratory syncytial virus infection. Background and clinical experience 40 years after discovery. Drugs 1997; 54:867.


**Discharge Criteria:**

- Respiratory rate <70
- Stable without supplemental oxygen
- SpO2 > 91% on room air
- Adequate oral intake/feeds to prevent dehydration
- Caregiver can clear the airway using bulb suction
- Adequate home resources to support necessary home therapies
- Caregiver confidence to provide home care
- Family education complete
- Follow up appointments scheduled
Discharge Instructions:

- Hand washing emphasis in all settings
- Avoid exposure to cigarette smoke, including second-hand smoke, and pollution
- Avoid contact with persons with respiratory tract infections
- Protective measures of breastfeeding for at least 6 months
- How to use bulb suction, saline nose drops, and any other prescribed home therapies
- Dietary instructions
- When to return to day care (if applicable)
- Where to obtain prescriptions and how to give medications (if applicable)
- Reporting symptoms of worsening condition (increased rate and/or work of breathing, worsening general appearance, difficulty feeding)
- Avoidance of over-the-counter medications
- Clinical course of the disease lasting 12-21 days or longer

Prevention: Prophylaxis with palivizumab is indicated to decrease the risk of hospitalization due to RSV for premature infants and for infants with bronchopulmonary dysplasia and congenital heart disease.

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