Bronchiolitis
Emergency Department
Evidence Based Outcome Center

If respiratory arrest imminent - triage and initiate care in resuscitation room

EXCLUSION CRITERIA

- Children w/ Comorbid/ complex medical conditions such as: chronic lung diseases, cystic fibrosis, congenital heart disease, immunodeficiency, toxic appearance/shock, neuromuscular disease, artificial or abnormal airway, recurrent wheezing
- > 3 episodes of bronchiolitis
- Respiratory failure requiring mechanical ventilation

INCLUSION CRITERIA

>28 days and <24 months with clinical symptoms of ↑WOB, persistent cough, feeding difficulty, +/- fever, first episode of wheezing OR with a diagnosis of bronchiolitis

Assess Disease Severity

Mild Symptoms

- Mild Interventions:
  - Nasal suction using nasal aspirator
  - Reposition
  - Assess hydration

- Document Bronchiolitis Assessment Score before and after interventions

Moderate OR Severe Symptoms

- Moderate & Severe Interventions:
  - Notify Provider
  - Nasal Suction using nasal aspirator
  - Rehydration
  - Maintain a SpO2 of greater than or equal to 90% while awake or 88% while asleep; utilizing nasal cannula or simple mask

- Document Bronchiolitis Assessment Score before and after interventions

- Notify Provider and Initiate HFNC Pathway

ED Discharge Criteria

- SpO2 ≥ 90% on room air
- Respiration < 60 per minute and/or minimal to no evidence of increased work of breathing
- Oral feeding tolerated at a level to maintain hydration
- Parents comfortable with providing home care
- Parent/Guardian education complete

- Yes: DISCHARGE Home
- No: Notify Provider and Initiate HFNC Pathway

Bronchiolitis Severity Assessment

Mild Symptoms

- Alert, active, & feeding well
- None or minimal retractions
- Respiratory Rate is normal to mildly elevated (< 50)
- Breath sounds with good air movement, exp scattered wheezing or rales/crackles
- SpO2 ≥ 90% awake or ≥88% while Asleep

Moderate Symptoms

- Alert, consolable, & feeding decreased
- Minimal to moderate retractions
- Respiratory Rate is mildly to moderately elevated (50 - 69)
- SpO2 < 90% awake or <88% while Asleep

Severe Symptoms

- Fussy, difficult to console, & poor feeding
- Moderate to severe retractions
- Respiratory Rate is mildly to moderately elevated (≥ 70)
- SpO2 < 90% awake or <88% while Asleep

Bronchiolitis Assessment Score

Mild Interventions:

- Nasal suction using nasal aspirator
- Reposition
- Assess hydration

Moderate & Severe Interventions:

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Last Updated October 8, 2019

Not Recommended

Labs & Diagnostic
- Chest X-Ray
- Viral Testing
- Complete Blood Count/Blood Culture for patients > 90 days

Treatments
- Epinephrine
- Steroids
- Antibiotics
- Chest percussion therapy
- Hypertonic saline
- Albuterol
- Deep suction beyond nasopharynx
Bronchiolitis
Inpatient
Evidence Based Outcome Center

**Inclusion Criteria**
- >28 days and <24 months with clinical symptoms of ↑WOB, persistent cough, feeding difficulty, +/- fever, first episode of wheezing OR with a diagnosis of bronchiolitis

**Exclusion Criteria**
- Children w/ Comorbid/complex medical conditions such as: chronic lung diseases, cystic fibrosis, congenital heart disease, immunodeficiency, toxic appearance/shock, neuromuscular disease, artificial or abnormal airway, recurrent wheezing
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**Moderate & Severe Interventions:**
- Notify Provider
- Nasal Suction using nasal aspirator
- Rehydration
- Maintain a SpO2 of greater than or equal to 90% while awake or 88% while asleep; utilizing nasal cannula or simple mask

**Inpatient Discharge Criteria**
- SpO2 ≥ 90% on room air for ≥ 2 hours
- Respiration < 60 per minute and/or minimal to no evidence of increased work of breathing
- Oral feeding tolerated at a level to maintain hydration
- Parents comfortable with providing home care
- Parent/Guardian education complete

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Last Updated October 8, 2019
**Bronchiolitis Assessment Score**

<table>
<thead>
<tr>
<th>BRONCHIOLITIS</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment Scoring (BAS) Tool</strong></td>
<td>&lt;2 mos: &lt;50</td>
<td>&lt;2 mos: 50-60</td>
<td>&lt;2 mos: &gt;60</td>
</tr>
<tr>
<td></td>
<td>2-12 mos: &lt;40</td>
<td>2-12 mos: 40-50</td>
<td>2-12 mos: &gt;50</td>
</tr>
<tr>
<td></td>
<td>&gt;1 yr: &lt;30</td>
<td>&gt;1 yr: 30-40</td>
<td>&gt;1 yr: &gt;40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RR</th>
<th>&lt;24% &amp; &gt;90%</th>
<th>25-39% &amp; &gt;90%</th>
<th>≥40% &amp; &gt;90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>FiO2 AND O2 sat</td>
<td>Good air movement, few crackles, few wheezes</td>
<td>Decreased air movement, I-E wheezes, or crackles</td>
<td>Diminished or absent breath sounds, with severe wheezing, prolonged expiratory phase, crackles.</td>
</tr>
<tr>
<td>Breath Sounds (crackles don’t change score)</td>
<td>None, to mild subcostal retractions, abdominal breathing</td>
<td>Moderate retractions, nasal flaring</td>
<td>Severe retractions, nasal flaring, grunting, head bobbing</td>
</tr>
<tr>
<td>Work of Breathing</td>
<td>Normal to mildly irritability</td>
<td>agitated, restless</td>
<td>Lethargic</td>
</tr>
<tr>
<td>Mental Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Normal</td>
<td>Pale</td>
<td>Cyanotic</td>
</tr>
<tr>
<td>TOTAL</td>
<td>(calculate total score from all rows)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Score**

**Mild = Weanable Score of 0-3**

**Moderate = Maintain = score of 4-8**

**Severe = increase support = score of 9-12**
<table>
<thead>
<tr>
<th>Admission Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute Care Unit</strong></td>
</tr>
<tr>
<td>Routine bronchiolitis management</td>
</tr>
<tr>
<td>FiO2 &lt; 50% to maintain SaO2 ≥ 90% awake or ≥88% while asleep</td>
</tr>
<tr>
<td>Continuation of care when transferred from higher acuity unit</td>
</tr>
<tr>
<td>HFNC (See HFNC Guidelines)</td>
</tr>
<tr>
<td><strong>Acute Care Unit with High Acuity Status</strong></td>
</tr>
<tr>
<td>Significant Cardiac or pulmonary co-morbidities</td>
</tr>
<tr>
<td>Moderate to Severe Symptoms (See Bronchiolitis Severity Assessment)</td>
</tr>
<tr>
<td>Worsening clinical Status despite increase flow rates</td>
</tr>
<tr>
<td>Co-morbidities (Suitability for unit, discussion between Provider and Charge RN)</td>
</tr>
<tr>
<td><strong>PICU</strong></td>
</tr>
<tr>
<td>Any patient with worsening clinical status after 60 minutes of HFNC</td>
</tr>
<tr>
<td>Positive pressure ventilation</td>
</tr>
<tr>
<td>Witnessed episode of apnea</td>
</tr>
<tr>
<td>Flow rates above max levels listed</td>
</tr>
<tr>
<td>Severe dehydration/Shock</td>
</tr>
</tbody>
</table>
Recommendations:

1. It is desirable that all Physician Groups have the same general approach for this technology in the interest of safety, mutual understanding of what to expect when cross covering, and to be consistent in our education roles.
2. This document is not a protocol but rather an internal document to guide us.
3. Variation from this guideline is appropriate so long as documentation exists.
4. Patient to be watched for at least 30 minutes after starting High Flow in the ER. If patient improves or there is no worsening of symptoms, PCRS resident is notified.
5. Criteria for use on the High Acuity Pulmonary Unit:
   - “Classic Bronchiolitis” w/o significant comorbidity (e.g. no chronic lung disease [abn compliance], no symptomatic congenital heart disease and without suggestion of impending respiratory failure)
   - Moderate to severe disease (further definition of this pending)
   - FiO2 < 50% to maintain SaO2 > 90%
   - Flow Rates are recommended within the following parameters:

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Initial flow rate (lpm)</th>
<th>Max flow rate (lpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 7</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>7 – 9</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>&gt;9</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

6. Critical Care consultation suggested for:
   - Any patient worsening after 60 minutes on HFNC
   - Any patient in severe distress on HFNC
   - FiO2 >50%
   - Flow rates above the recommended parameters
   - Apnea
   - Consider NICU consultation for:
     - Patients not meeting acute care or high acuity criteria and currently <44 week corrected gestational age
     - Prematurity ≤ 32-week gestation and currently < 44 weeks post-menstrual age

7. Feeding while on HFNC:
   - No evidence exists regarding risks of feeding while on HFNC
   - Consider NPO initially with decision for NGT or PO trial made after some stability reached

8. Weaning:
   - O2 wean by RT based on SaO2 goals
   - Flow wean to start by a physician’s order but generally not until stabilized for 8 -12 hrs.
   - Decrease flow by 2 lpm every 4 hrs Change to NC when on 2 lpm for 4 hrs
   - Refer to High Flow Nasal Canula Weaning Guideline
Nutrition remains an important element to the treatment and healing of a child with bronchiolitis. There is little research that specifically addresses the safety of PO feeding a child with bronchiolitis AND has been started on high flow nasal cannula (HFNC). Below are guidelines based on literature review and the medical opinion of the DCMC Bronchiolitis workgroup.

Upon initiation of HFNC, the child should remain NPO to assess clinical response for approximately 1 hour. At that time, a discussion amongst the medical team and led by the attending physician will determine the appropriate method of nutrition.

- Should the child’s hydration status at the induction of HFNC be of concern, the medical team can choose from the following options:
  - Nasogastric tube (NGT)*
  - IVF
  - NGT + IVF
  - NJT (Nasojejunal tube)

If PO feeds have been started, it is strongly recommended to make the child NPO and consider the above options if:

- Choking/gasping and/or an increase in work of breathing during or acutely after PO feeding
- Respiratory rate consistently >60 bpm beyond 15 minutes
- Child is titrated to the maximum flow rate of HFNC for weight

At any time, the physician has the option to make the child NPO and hydrate the child by other means.

*Recommend initial NGT trial of pedialyte before (EBM or formula) to assess the child’s tolerance gastric distention while experiencing respiratory distress.
For questions concerning this pathway, Click Here
Last Updated October 8, 2019
- **Version 1.0 (11/2014)**: Initial implementation
- **Version 2.0 (3/2017)**: Aligned Guideline to Children’s Hospital of Texas recommendations
- **Version 3.0 (5/2018)**: Revised High Flow Nasal Cannula guidance
- **Version 4.0 (9/2019)**: Added HFNC Weaning Algorithm to support this document (Algorithm created but saved as separate document). Revised HFNC guidance. IMC references have been removed or edited.
**HYPERTONIC SALINE**

**CHEST X-RAY**

**VIRAL TESTING**

**STEROIDS**

**CHEST PHYSIOTHERAPY**
ANTIBIOTICS