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

# Bronchiolitis
## Emergency Department
## Evidence Based Outcome Center

PEDIATRIC EBOC

**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 ventialtion

**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

**Bronchiolitis Assessment Score**

Assess Disease Severity

NO

Mild Symptoms

Moderate **OR** Severe Symptoms

**Mild Interventions:**

- Nasal suction using nasal aspirator
- Reposition
- Assess hydration

**Document Bronchiolitis Assessment Score before and after interventions**

**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**

Oxygen **AND** Work of Breathing needs met?

NO → HFNC Ordered?

YES

YES

**ED Discharge Criteria**

- ☑ Sp02 ≥ 90% on room air
- ☑ Respirations < 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

NO

**Admit to Inpatient Unit Based on Admit Criteria**

YES

**DISCHARGE Home**

| 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 |
| Sp02 ≥ 90% |
| **Moderate Symptoms** |
| Alert, consolable, & feeding decreased |
| Minimal to moderate retractions |
| Respiratory Rate is mildly to moderately elevated ( 50 - 69 ) |
| Sp02 < 90% |
| **Severe Symptoms** |
| Fussy, difficult to console, & poor feeding |
| Moderate to severe retractions |
| Respiratory Rate is mildly to moderately elevated ( ≥ 70 ) |
| Sp02 < 90% |

| 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 nasopharnyx |

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# Bronchiolitis
## Inpatient
## Evidence Based Outcome Center

**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 ventialtion

**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

**Bronchiolitis Assessment Score**

Assess Disease Severity

Mild Symptoms

Moderate **OR** Severe Symptoms

**Mild Interventions:**

- Nasal suction using nasal aspirator
- Reposition
- Assess hydration

**Document Bronchiolitis Assessment Score before and after interventions**

**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**

Oxygen **AND** Work of Breathing needs met?

NO → HFNC Ordered?

NO → Assess Disease Severity

YES → Transfer patient to higher level of care based on **Unit Criteria**

**High Flow Nasal Cannula Guidelines**
Patient to be watched for at least 30 minutes after starting High Flow in the ER. If no worsening of symptoms, PCRS IMC resident is notified
Any flow rates above what is listed below require an Intensivist consult.

YES → Patient Status Improving & Stable

NO → Assess Disease Severity

YES → **Inpatient Discharge Criteria**

- ☑ Sp02 ≥ 90% on room air for ≥ 2 hours
- ☑ Respirations < 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

**DISCHARGE Home**

| 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 |
| Sp02 ≥ 90% |
| **Moderate Symptoms** |
| Alert, consolable, & feeding decreased |
| Minimal to moderate retractions |
| Respiratory Rate is mildly to moderately elevated ( 50 - 69 ) |
| Sp02 < 90% |
| **Severe Symptoms** |
| Fussy, difficult to console, & poor feeding |
| Moderate to severe retractions |
| Respiratory Rate is mildly to moderately elevated ( ≥ 70 ) |
| Sp02 < 90% |

| Not Recommended |
|---|
| **Labs & Diagnostic** |
| Chest X-Ray |
| Viral Testing |
| Complete Blood Count/Blood Culture for patients > 90 days |
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| Epinephrine |
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| Chest percussion therapy |
| Hypertonic saline |
| Albuterol |
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| Bronchiolitis Assessment Score (BAS) | | | |
|---|---|---|---|
| Assessment | 0 | 1 | 2 |
| Respiratory Rate | < 40 per min. | 40 - 50 per min. | > 50 per min. |
| 02 ≥ 90% Sa02 | RA | NC < 2L | NC ≥ 2L |
| Wheezing | none | expiratory | inspiratory & expiratory |
| WOB | none | nasal flaring | grunting +/- head bobbing |
| Retractions | none | subcostal +/- intercostal | supra sternal +/- clavicular |
| The BAS is an assemsnet tool and is not inteded to determine admission and/or placement of the patient. | | | |

**Emergency Department Pathway** **Inpatient Pathway**

# Bronchiolitis
## Hospital Admission Criteria
### Evidence Based Outcome Center

| Admission Criteria |
|---|
| **Inpatient Floor** |
| 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 |
| Sp02 ≥ 90% |
| **Pulmonary Unit - High Acuity** |
| Inpatient Floor Criteria |
| Moderate to severe WOB |
| O2 requirement (≤ 50% Fi02) |
| HFNC (See HFNC Guidelines) |
| **IMC** |
| Pulmonary Unit Criteria |
| Co-morbidities (CLD) |
| Blood pressure requires close monitoring |
| **PICU** |
| IMC Criteria |
| Positive pressure ventilation |
| Witnessed episode of apnea |
| Severe dehydration/Shock |
| Not improving on HFNC after 30 minutes |

Emergency Department Pathway

Inpatient Pathway

Recommendations:

1. It is desirable that all PCRS faculty 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 IMC resident is notified.
5. Criteria for use on the 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)
   - Post-conceptual age > 44 wks but < 2 yrs
   - Moderate to severe disease (further definition of this pending)
   - FiO2 < 50% to maintain SaO2> 90%
   - Flow Rates are recommended within the following parameters:

| Weight (kg) | Initial flow rate (lpm) | Max flow rate (lpm) |
|---|---|---|
| < 7 | 4 | 6 |
| 7 – 9 | 6 | 8 |
| >9 | 6 | 10 |

6. Use of HFNC in IMC:
   - Same age criteria as the floor
   - Comorbidities above may be managed in IMC
   - Patients with mild respiratory acidosis may be managed in IMC at provider's discretion
7. Critical Care consultation suggested for:
   - Any patient worsening after 30 minutes on HFNC
   - Any patient in severe distress not improving after 30 minutes on HFNC
   - FiO2 >50%
   - Flow rates above the recommended parameters
   - Apnea
8. **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
9. 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

**Emergency Department Pathway** **Inpatient Pathway**

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.*

Emergency Department Pathway

Inpatient Pathway

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| EBOC Project Owner: Jennifer Simpson | | | | | | |
| | | | | | | |
| Approved by the Bronchiolitis Team | | | | | | |
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| Revision History | | | | | | |
| Date Approved: | November 2016 | | | | | |
| Revised: | March 2017 | | | | | |
| Next Review Date: | March 2020 | | | | | |
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**Emergency Department Pathway** **Inpatient Pathway**

- **Version 1.0 (11/2014):** Initial implementation
- **Version 2.0 (3/2017):** Aligned Guideline to Children's Hospital of Texas recommendations

Emergency Department Pathway

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**HYPERTONIC SALINE**

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**CHEST X-RAY**

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**STEROIDS**

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**CHEST PHYSIOTHERAPY**

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