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

Bronchiolitis
Emergency Department
Evidence Based Outcome Center

PEDIATRIC EBOC EVIDENCE BASED OUTCOMES 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

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 → Notify Provider and Initiate HFNC Pathway

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% awake or ≥88% while Asleep
Moderate Symptoms
Alert, consolable, & feeding decreased
Minimal to moderate retractions
Respiratory Rate is mildly to moderately elevated (50 - 69)
Sp02 < 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)
Sp02 < 90% awake or <88% while Asleep

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

Legal Disclaimer

dell children's Ascension

Last Updated October 8, 2019

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
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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 Q 4 hours or as indicated by PEWS score

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 → Notify Provider and Initiate HFNC Pathway

NO

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

NO

Patient Status Improving & Stable

YES

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

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 is notified
Any flow rates above what is listed below require an Intensivist consult.

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
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Patient Label

Date/Time_____

Bronchiolitis Assessment Scoring (BAS) Tool	0	1	2
RR	• **<2 mos: <50** • **2-12 mos: <40** • **>1 yr: <30**	• **<2 mos: 50-60** • **2-12 mos: 40-50** • **>1yr: 30-40**	• **<2 mos: >60** • **2-12 mos: >50** • **>1yr >40**
FiO2 AND O2 sat	≤24% & >90%	25-39% & >90%	≥40% & >90%
Breath Sounds (crackles don't change score)	Good air movement, few crackles, few wheezes	Decreased air movement, I-E wheezes, or crackles	Diminished or absent breath sounds, with severe wheezing, prolonged expiratory phase, crackles.
Work of Breathing	None, to mild subcostal retractions, abdominal breathing	Moderate retractions, nasal flaring	Severe retractions, nasal flaring, grunting, head bobbing
Mental Status	Normal to mildly irritability	agitated, restless	Lethargic
Color	Normal	Pale	Cyanotic
TOTAL	(calculate total score from all rows)		

Total Score

Mild = Weanable Score of 0-3

Moderate = Maintain = score of 4-8

Severe = increase support = score of 9-12

Emergency Department Pathway

Inpatient Pathway

Bronchiolitis
Hospital Admission Criteria
Evidence Based Outcome Center

Admission Criteria
Acute Care Unit
Routine bronchiolitis management
FiO2 < 50% to maintain SaO2 ≥ 90% awake or ≥88% while asleep
Continuation of care when transferred from higher acuity unit
HFNC (See HFNC Guidelines)
Actue Care Unit with High Acuity Status
Significant Cardiac or pulmonary co-morbidities
Moderate to Severe Symtoms (See Bronchiolitis Severity Assessment)
Worsening clinical Status despite increase flow rates
Co-morbidities (Suitability for unit, discussin between Provider and Charge RN)
PICU
Any patient with worsening clinical status after 60 minitues of HFNC
Positive pressure ventilation
Witnessed episode of apnea
Flow rates above max levels listed
Severe dehydration/Shock

Emergency Department Pathway

Inpatient Pathway

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:

Weight (kg)	Initial flow rate (lpm)	Max flow rate (lpm)
< 7	4	8
7 – 9	6	10
>9	6	12

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

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

EBOC Project Owner: Jennifer Simpson				
Approved by the Bronchiolitis Team				
Revision History				
Date Approved:	November 2016			
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Next Review Date:	October 2022			
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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
- **Version 3.0 (5/2018):** Revised High Flow Nasal Cannula guidance
- **Version 4.0 (10/2019):** 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.

Emergency Department Pathway

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Emergency Department Pathway

Inpatient Pathway