Bronchiolitis Emergency Department

Evidence Based Outcome Center



NO.

HFNC

Ordered?

YES

Admit to Inpatient Unit

Based on Admit Criteria

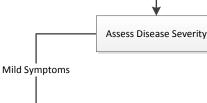
EXCLUSION CRITERIA

- 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 个WOB, persistent cough, feeding difficulty, +/- fever, first episode of wheezing OR with a diagnosis of bronchiolitis





Mild Interventions:

- · Nasal suction using nasal aspirator
- Reposition
- Assess hydration

Document Bronchiolitis Assessment Score before and after interventions

Moderate & Severe Interventions: NOTIFY PROVIDER

Moderate **OR** Severe

Symptoms

- 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



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%

Sp02 ≥ 90% on room air

☑ Respirations < 60 per minute and/or minimal to no evidence of increased work of breathing

ED Discharge Criteria

- ☑ Oral feeding tolerated at a level to maintain hydration
- ☑ Parents comfortable with providing home care
- \checkmark Parent/Guardian education complete

YES

DISCHARGE Home

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





Bronchiolitis Inpatient

Evidence Based Outcome Center



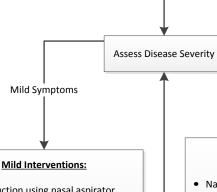
EXCLUSION CRITERIA

- 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
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INCLUSION CRITERIA

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Bronchiolitis Assessment Score



- · Nasal suction using nasal aspirator
- Reposition
- Assess hydration

Document Bronchiolitis Assessment Score before and after interventions

Moderate & Severe Interventions: NOTIFY PROVIDER

Moderate **OR** Severe

Symptoms

- Nasal Suction using nasal aspirator
- Rehydration
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Document Bronchiolitis Assessment Score before and after interventions

> Oxygen **HFNC** AND Ordered? Work of Breathing needs met? YES

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%

Inpatient Discharge Criteria

NO

Patient Status Improving & Stable

YES

- ☑ Respirations < 60 per minute and/or minimal to no evidence of increased work of breathing
- Oral feeding tolerated at a level to maintain hydration
- $\overline{\mathbf{V}}$ Parents comfortable with providing home care
- Parent/Guardian education complete

High Flow Nasal Cannula Guidelines Patient to be watched for at least 30

NO

Transfer patient to higher level of care

based on Unit Criteria

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.

DISCHARGE Home

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





For questions concerning this pathway, Click Here Last Updated March 15, 2017

Bronchiolitis Bronchiolitis Assessment Score Evidence Based Outcome Center



| 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



Bronchiolitis Hospital Admission Criteria Evidence Based Outcome Center



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|-------|--|--|
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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 $Sp02 \ge 90\%$

Pulmonary Unit - High Acuity

Inpatient Floor Criteria

Moderate to severe WOB

O2 requirement (≤50% FiO2)

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



Bronchiolitis High Flow Nasal Cannula (HFNC) Evidence Based Outcome Center



Recommendations:

- 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 (Ipm) | Max flow rate (Ipm) | | |
|-------------|-------------------------|---------------------|--|--|
| < 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



Bronchiolitis High Flow Nasal Cannula (HFNC) FEEDING Evidence Based Outcome Center



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)*
 - o IVF
 - o 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



Bronchiolitis Workgroup & Disclaimer Evidence Based Outcome Center



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|-------------------------------|---------------|-------------------------------|----------------------|-------------|--|--|
| Approved by the B | ronchiolitis | Team | | | | |
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| Revised: | March 2017 | | | | | |
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Emergency Department Pathway



Bronchiolitis Summary of Changes Evidence Based Outcome Center



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

Emergency Department Pathway



Bronchiolitis References



Evidence Based Outcome Center

HYPERTONIC SALINE

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