

[Inclusion & Exclusion Criteria](#)

Assess Symptom Severity

[Risk factors for severe disease and apnea](#)

### NCH Bronchiolitis Symptom Severity Assessment Guide

|                                       | Low Severity   | Moderate Severity  | High Severity   |
|---------------------------------------|--|--|---|
| <b>Respiratory Rate</b>               | ≤ 2 mo <60<br>3-11mo <50<br>12-24 mo <40               | 60-69<br>50-59<br>40-49  | ≥70<br>≥60<br>≥50   |
| <b>Work of Breathing (WOB)</b>        | Mild or no retractions                                 | Mild to moderate retractions or nasal flaring (infant)           | Severe retractions or nasal flaring with head bobbing or grunting (infant)      |
| <b>General Appearance and Feeding</b> | Alert and appropriate; normal feeding & vocalization   | Tired but interactive or fussy but consolable; Decreased feeding | Drowsy/lethargic or inconsolable/ agitated; Refusing to feed                    |
| <b>Breath Sounds</b>                  | End-expiratory wheeze, minimal crackles; good aeration | Expiratory wheeze throughout; moderately impaired aeration       | Inspiratory and expiratory wheeze or diminished with severity impaired aeration |

- Nasal suctioning
- Spot check O<sub>2</sub> saturation
- Supplemental O<sub>2</sub> if <90% saturation for ≥ 2 min and not resolved by suctioning

[Definition](#)

[Red Flags](#)

[Differential Diagnosis](#)

Reassess Bronchiolitis Symptom Severity

**Moderate or High Severity**

- Consider **ONE** time albuterol trial if:
  - >6 month old **AND** wheezing on exam **AND** h/o recurrent wheezing OR atopic dermatitis/eczema OR allergies OR parent/sibling with asthma
- Then, **reassess** symptom severity and document response
- Continue albuterol **ONLY** if improvement after trial

Reassess Bronchiolitis Symptom Severity

Low Severity

**Moderate or High Severity**

- HFNC / BiPAP or mechanical ventilation as indicated
- IVF as indicated by hydration status

[Meets Transfer Criteria?](#)

Yes

Transfer to ED

No

Discharge Patient

**Rest is Best!**

The following are NOT routinely recommended in typical bronchiolitis:

- Albuterol
- Steroids
- Hypertonic saline
- Racemic epinephrine
- CXR

# Inclusion & Exclusion Criteria

## **Inclusion criteria**

- Children <24 months old with uncomplicated bronchiolitis

## **Exclusion criteria**

- Critically ill child or requiring PICU
- Underlying respiratory conditions including but not limited to asthma, cystic fibrosis (CF), bronchopulmonary dysplasia (BPD) and laryngotracheomalacia.
- Neuromuscular disease
- Hemodynamically significant congenital heart disease
- Immunodeficiency – confirmed or suspected
- Suspected serious bacterial infections (SBI)

[Return to Algorithm](#)

# Risk Factors for Severe Disease & Apnea

## **Risk Factors for Severe Disease**

- Age <12 weeks
- Prematurity  $\leq$  36 weeks
- Birth weight < 5 lbs
- Chronic pulmonary disease
- Airway abnormalities
- Hemodynamically significant CHD
- Immunodeficiency
- Neurologic disease

## **Risk factors for apnea:**

- Age < 2 months
- Prematurity  $\leq$  36 weeks
- Respiratory rate at presentation < 30 or > 70 BPM
- Oxygen saturation < 90%

[Return to Algorithm](#)

[Return to Admission Criteria](#)

# Definition, Red Flags & Differential Diagnosis

## Is this Bronchiolitis?

**Bronchiolitis** is a lower respiratory tract infection affecting infants and young children characterized by inflammation and congestion of the bronchioles (small airways), caused by RSV or other viruses.

### Typical Presentation:

- Starts with viral URI symptoms: rhinorrhea, congestion, cough, fever
- Progresses to lower respiratory tract involvement: increases work of breathing including tachypnea and/or accessory muscle use & Abnormal and shifting lung sounds including rales and/or wheezes

### Consider Other Alternate Diagnoses when:

- No upper respiratory symptoms are present.
  - *Consider pneumonia, foreign body aspiration, congenital anomaly, aspiration.*
- Persistently and disproportionately high heart rate or hepatomegaly.
  - *Consider myocarditis or other cardiac etiology.*
- Recurrent episodes:
  - *Consider aspiration or congenital airway anomaly.*
  - *Consider asthma (& Asthma Pathway) if risk factors for asthma esp.  $\geq 12$  mo old with wheezing on exam **AND** history of either recurrent wheezing **OR** atopic dermatitis/exema **OR** h/o asthma in 1st degree relative.*
- Paroxysmal coughing spells, apneic spells, and/or known pertussis exposure. *Consider pertussis.*
- Fever in infant less than 60 days
- Fever late in illness course.
  - *Consider pneumonia or other serious bacterial illness.*

### Red Flags

- Severe atopy (allergic conditions or eczema, requiring steroids)
- Prolonged fevers
- Fever in child less than 60 days
- Concern for foreign body aspiration
- Severe dehydration
- Persistent tachycardia
- Heart Murmur
- Poor perfusion
- Hepatomegaly

[Return to Algorithm](#)

### Differential Diagnosis

- Asthma
- Febrile Infant
- Pneumonia
- Laryngotracheomalacia
- Foreign body aspiration
- Gastroesophageal reflux
- Congestive heart failure
- Vascular ring
- Allergic reaction
- Cystic fibrosis
- Mediastinal mass
- Tracheoesophageal fistula
- Sepsis

# Monitoring

- Level of **respiratory distress** and **overall appearance** should be monitored.
- **Pulse oximetry spot checks** with vitals when on room air and at any point when clinically indicated, including before and after suctioning.
- Supplemental O<sub>2</sub> if pulse oximetry spot check is <90%. **Continuous pulse oximetry only if receiving supplemental O<sub>2</sub>.**
- **Evidence-Based Practice:**
  - There is **very poor correlation between respiratory distress and oxygen saturations among infants with lower respiratory tract infections.**(3)
  - Accuracy of pulse oximetry is poor, especially in the 76% to 90% range.(2)
  - Further, it has been well demonstrated that oxygen saturation has much less impact on respiratory drive than carbon dioxide concentrations in the blood.(3)
  - Other than cyanosis, no published clinical sign, model, or score accurately identifies hypoxemic children.(5)
  - Transient desaturation is a normal phenomenon in healthy infants. In 1 study of 64 healthy infants between 2 weeks and 6 months of age, 60% of these infants exhibited a transient oxygen desaturation below 90%, to values as low as 83%.(7)

[Return to Algorithm](#)

# Recommended Treatments

- **Suctioning** of the nares with a non-invasive device (NoseFrida, bulb, Little Sucker®, BBG nasal aspirator) may be performed. *Evidence Quality: Low; Recommendation Strength: Weak*
- **Supplemental O<sub>2</sub>** should be provided if pulse oximetry is <90% for ≥2 minutes on room air with good waveform on monitor and no improvement is obtained by repositioning and non-invasive suctioning. *NCH Consensus Recommendation*
- **Positioning** of the child should **adhere to safe sleep guidelines**. Modify patient position as clinically required to optimize respiratory status. *NCH Consensus Recommendation*

[Return to Algorithm](#)

# Treatments Not Recommended

- Administration of **albuterol** in the ED or outpatient setting does not reduce the risk of hospital admission. Airway obstruction and plugging rather than bronchospasm has been shown to be the primary mechanism of wheezing in bronchiolitis. While albuterol may provide small, short-term improvements in symptoms in the outpatient setting, side effects including tachycardia and tremors are common. The risk of side effects and lack of benefit, combined with cost, does not justify the routine use of albuterol in patients with bronchiolitis. *Evidence Quality: High; Recommendation Strength: Strong*
- Consider one time **albuterol trial** for patients with moderate or high severity on subsequent re-assessment if >6 month old **AND** wheezing on exam **AND** h/o recurrent wheezing OR atopic dermatitis/eczema OR allergies OR parent/sibling with asthma.
- **Systemic corticosteroids** should not be administered to infants with a diagnosis of bronchiolitis. *Agreement with AAP Recommendation*
- **Antibacterial medications** should not be administered to infants and children with a diagnosis of bronchiolitis unless there is a concomitant bacterial infection or a strong suspicion of one. *Agreement with AAP Recommendation*

[Return to Algorithm](#)

# Treatments with Inconclusive Evidence

- **Nebulized 3% hypertonic saline** has not been shown to decrease length of stay and should not be routinely administered to infants and children with bronchiolitis. Limited use after individualized patient assessment may be considered as symptomatic improvement may be seen in select patients hospitalized with bronchiolitis. *Evidence Quality: Moderate; Recommendation Strength: Weak*
- **Nebulized racemic epinephrine** should not be routinely administered to infants and children with bronchiolitis. Limited use based on individualized patient assessment may be considered as symptomatic improvement may be seen in select patients with bronchiolitis. *Evidence Quality: Moderate; Recommendation Strength: Weak*

[Return to Algorithm](#)

# Transfer Criteria

**Consider transfer if  $\geq 1$  of following criteria are met:**

- Respiratory Status
  - Persistent tachypnea for age
  - Respiratory distress, respiratory fatigue, or apnea
  - Lethargy or poor perfusion
  - Parent unable to clear the patient's airway using nasal noninvasive suction (NoseFrida)
  - O<sub>2</sub> saturation persistently <90% in room air
- Hydration & Nutritional Status
  - Inability to maintain level of oral feedings to prevent dehydration
- Inadequate resources for necessary care at home

**Lower threshold for transfer if [risk factors for severe disease](#) or early in the course of illness at time of evaluation**

[Return to Algorithm](#)

# Quality Metrics

## Goals:

- Decrease use of:
  - Chest x-ray
  - Rapid RSV lab testing
  - Albuterol use
  - Continuous O<sub>2</sub> saturation monitoring
  - Antibiotic use

## Utilization Metrics:

- Use of ED/UC Bronchiolitis Order Set

## Outcome Metrics:

- Rate of albuterol, CXR, continuous O<sub>2</sub> saturation monitoring and antibiotic use
- ED/UC LOS
- HFNC Rate

## Balancing Metrics:

- 72hr return visit rate to ED/UC

[Return to Algorithm](#)

# Key References

1. Ralston SL, Lieberthal AS, Meissner HC, et al. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. *Pediatrics* 2014;134: e1474-502.
2. National Institute for Health and Care Excellence. Bronchiolitis: diagnosis and management of bronchiolitis in children. (Clinical guideline ng9) 2015. [www.nice.org.uk/guidance/ng9](http://www.nice.org.uk/guidance/ng9)
3. Flaherman V, Li S, Ragins A, et al. Respiratory syncytial virus testing during bronchiolitis episodes of care in an integrated health care delivery system: a retrospective cohort study. *Clin Ther.* 2010;32(13):2220-9.
4. Hasegawa K, Pate BM, Mansbach JM, et al. Risk factors for requiring intensive care among children admitted to ward with bronchiolitis. *Acad Pediatr.* 2015;15(1):77-81.
5. Mussman GM, Parker MW, Statile A, Sucharew H, Brady PW. Suctioning and length of stay in infants hospitalized with bronchiolitis. *JAMA Pediatr.* 2013;167(5):414–21.
6. Rojas MX, Granados Rugeles C, Charry- Anzola LP. Oxygen therapy for lower respiratory tract infections in children between 3 months and 15 years of age. *Cochrane Database Syst Rev.* 2009;1:CD005975.
7. Mitka M. Joint commission warns of alarm fatigue: multitude of alarms from monitoring devices problematic. *JAMA.* 2013;309(22):2315–16.
8. Schroeder AR, Marmor AK, Pantell RH, Newman TB. Impact of pulse oximetry and oxygen therapy on length of stay in bronchiolitis hospitalizations. *Arch Pediatr Adolesc Med.* 2004;158(6):527–30.
9. Weisgerber MC, Lye PS, Li SH, et al. Factors predicting prolonged hospital stay for infants with bronchiolitis. *J Hosp Med.* 2011;6(5):264–70.
10. Brooks CG, Harrison WN and Ralston SL. Association between hypertonic saline and hospital length of stay in acute viral bronchiolitis: A reanalysis of 2 meta-analyses. *JAMA Pediatrics* 04/2016 (2168-6203)
11. Gadomski AM, Scribani MB. Bronchodilators for bronchiolitis. *Cochrane Database Syst Rev.* 2014 Jun 17;6.

[Return to Algorithm](#)

# Pathway Team & Process

## Content Development Team:

### Leaders:

Urgent Care:

Luci Berg, MD, FAAP  
Cynthia Zimm, MD, MBA, FAAP

Emergency Medicine:

Aarti Gaglani, MD

### Members:

This pathway was adapted from the Emergency Department version of the Bronchiolitis pathway. Please see the ED Bronchiolitis Clinical Pathway document for the original list of pathway members.

## Clinical Pathways Program:

Medical Director – Emergency Medicine:

Aarti Gaglani, MD

Medical Director – Clinical Informatics & Emergency Medicine:

Laura Rust, MD, MPH

Physician Informatics:

Kathy Nuss, MD

Business & Development Manager:

Rekha Voruganti, MBOE, LSSBB

Program Coordinators:

Tahje Brown, MBA

## Clinical Pathway Approved:

Medical Director – Associate Chief Quality Officer, Center for Clinical Excellence:

Ryan Bode, MD, MBOE

Advisory Committee Date: *September, 2016*

Origination Date: *September, 2016*

Last Revision Date: *February, 2026*

Next Revision Date: *February, 2031*

## Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associated with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

Copyright © 2023. Nationwide Children's Hospital. All rights reserved. No part of this document may be reproduced, displayed, modified, or distributed in any form without the express written permission of Nationwide Children's Hospital.

**For more information about our pathways and program please contact:  
[ClinicalPathways@NationwideChildrens.org](mailto:ClinicalPathways@NationwideChildrens.org)**

[Return to Algorithm](#)