



Bronchiolitis Clinical Practice Guidelines

Emergency Department Management

- If initial examination demonstrates life threatening symptoms (apnea, cyanosis, Severe retractions, lethargy) implement emergency management.
- Give O₂ if SpO₂ on R.A. is \leq 91-94%. Patients presenting in acute respiratory distress should be placed on oxygen until respiratory status can be stabilized.
- Perform Naso-pharyngeal suction to clear secretions.
- Assess the following: Oxygen dependency, respiratory distress level, ability to feed, hydration status, fever, parent/social situation, pre-existing conditions, exposure to tobacco.

NOTE: If above findings are within normal limits, observation should be continued and discharge preparations considered.

If patient at risk, continue monitoring:

- **Consider:** RSV EIA only if admission is likely. This test should not be ordered on routine patients who are being discharged from the ED. An RSV-EIA may be ordered for a repeat patient or complex patient where the etiology could help determine prognosis.
- Routine ordering of RIPD is also not recommended as it is very expensive and does not typically impact course of treatment.
- Electrolytes, CBC (only if secondary infection suspected)
- CBG/CXR, if patient exhibits significant respiratory distress or at physician discretion in borderline cases.
- Reassess respiratory status, repeat SPO₂ in room air. If patient is being evaluated for discharge or admission with the diagnosis of bronchiolitis, the oxygen saturation goal shall be 91% with oxygen weaning accordingly.

Aerosol Trial: Routine bronchodilator trials are no longer being recommended as very few infants respond. Bronchodilator treatments have been shown to create hypoxemia in infants with bronchiolitis as the medication causes tachycardia (increased cardiac output) and tremors while doing little for improving ventilation. This can result in increased shunting and hypoxemia. Much of the improvement seen with aerosols can be attributed to the suctioning that occurs pre and post treatment and the moisture

from the aerosol. If the physician believes the level of respiratory distress in the infant warrants a trial:

- 0.5 cc (2.5 mg.) albuterol is the medication of choice. Infants with history of wheezing and night time coughing not associated with an URI, or patient's with eczema, atopy or strong family history of asthma are most likely to respond.
- Only one treatment should be ordered to gauge response; if the infant improves, additional aerosols may be ordered.
- Duoneb is not indicated, ipratropium bromide is not effective with viral wheezing.

CONSIDER AEROSOL RESPONSE WHEN DETERMINING CONTINUED CARE, ADMITTING DIAGNOSIS AND ORDERS.

Criteria for Consideration of Hospitalization

- Persistent Respiratory Distress
- Hypoxia
- Need for IV fluid
- Co-morbidity
- Apnea

Patient Placement:

All non- ICU admissions are placed in observation care as the normal length of stay is less than 2 days. If a patient requires a longer length of stay, the attending can change the patient's status to inpatient later in the course of care.

ADMIT ICU (For any of the following criteria)

- Witnessed apnea
- O2 requirement > 40%
- Severe respiratory distress
- High risk co-morbidity (severe BPD, cyanotic CHD)

ED Discharge criteria (All must be met)

- RR < 60
- Adequate PO intake
- Supportive social environment
- Minimal respiratory distress
- SaO2 \geq 91% on room air
- No co-morbidity factors

If applicable, family members should be counseled to not use tobacco products around infant.

Inpatient/Observation Management

Clinical Respiratory Assessment:

- History of upper respiratory symptoms and/or rhinorrhea.
- Respiratory rate, heart rate
- Color/Oxygen saturation
- Degree of wheezing/air entry
- Degree of retractions
- Level of consciousness

These symptoms should be evaluated and the patient assigned a score using the Bronchiolitis scoring system. This allows for an objective evaluation of the patient’s condition that can be compared to later scores, indicating improvement or worsening of the patient’s clinical condition.

BRONCHIOLITIS SCORING SYSTEM

	0 - NORMAL	1 – MILD	2 – MODERATE	3 - SEVERE
Resp Rate	< 40	40-50	50-60	>60
Color O2 Sat on RA Cap Refill	Normal >97% <2 sec.	Normal 94-96% on RA < 2 sec.	Normal 90-93% < 2 sec. On O2 ≤ 30% of HFNC or ≤ 1lpm off the wall	Dusky, Mottled < 90% => 3 sec. On O2 > 30% of HFNC or > 1lpm off the wall
Retractions / WOB	None	Subcostal	Intercostal and Subcostal when Quiet	Supraclavicular Sternal Paradoxical Respiration
Air Entry Wheezing	Breath Sounds Clear/ Good	Good Entry End Exp. Wheeze +/- Rales	Fair Air Entry Insp and Exp Wheeze +/- Rales	Poor/ Grunting Insp and Exp wheeze +/- Rales
LOC	Normal/ Alert	Mild Irritability	Restless When Disturbed- Agitated	Lethargic Hard to Arouse

Other factors used in evaluation of infants with suspected bronchiolitis:

- Signs of dehydration/difficulty feeding.
- Parental ability to provide necessary care for child during acute infection.
- Pre-existing condition contributing to increased possibility of respiratory failure, i.e., prematurity, previous intubation, CHD, cystic fibrosis, etc.

Laboratory and Radiologic Assessments:

Chest X-rays, blood work, and blood gases should be ordered *only* when clinical conditions of patient warrants the test.

Management:

Isolation: All patients in respiratory distress due to viral illness will be placed in “Droplet/Contact” isolation with or without viral confirmation.

Cardio-respiratory monitoring: This should be applied during the acute phase of the disease because of the risk of apnea and bradycardia. Continuous pulse oximetry is not recommended for patients in general care.

Oxygen per protocol: All patients should be placed on Oxygen per protocol upon admission, but will not be actively weaned for first 12 hours. In the protocol the patient will be set up on the appropriate oxygen delivery device with the FiO₂ titrated to maintain an adequate saturation. The patient will be reassessed Q30 minutes until stable then Q4 and PRN until the patients is on room air.

Aerosol Protocol: This allows the patients to be evaluated by a respiratory therapist at a frequency based on their Bronchiolitis severity score. Since aerosols very rarely improve the symptoms in bronchiolitis and have been shown to cause worsening hypoxemia, bronchodilator trials should be limited to those who present with moderate to severe distress.

Aerosol Trial: For patients who score 8 or higher, an aerosol trial should be considered. The respiratory therapist will notify the medical team when a patient scores ≥ 8 and an aerosol is being considered. For the trial, patients will be suctioned if necessary, scored, given aerosol and scored again. A positive response is defined as a decrease of the patient’s post aerosol bronchiolitis score by 2 or more (decrease wheezing, WOB, RR, increased aeration).

- **Normal – Bronchiolitis Score 0-4** Assess Q6
- **Mild Symptoms – Bronchiolitis Score 5-7** Assess Q4
- **Moderate Symptoms – Bronchiolitis Score 8-10**

Consider Albuterol trial X1. If the patient responds continue aerosols Q4 hrs for scores ≥ 8 , if no response to first medication, consider trial with vpponephrine. Continue to assess the patient Q2.

- **Severe Symptoms – Bronchiolitis Score 11-15**

Albuterol trial X1. Evaluate response. Consider trial with vpponephrine. If no response and severity persists, consider PICU transfer.

Hypertonic Saline: Hypertonic saline aerosols may be considered for those infants with documented copious secretions, after the second day of inpatient care. TID would be an appropriate frequency for 3% Saline aerosols.

Airway Clearance: It is recommended that patients be suctioned PRN and prior to therapies and feedings. BBG suctioning may be utilized to clear nasal passages. Nasopharyngeal suctioning is recommended when secretions are obstructive and causing respiratory distress. Chest percussion is contraindicated for patients with bronchiolitis.

Intravenous Fluids: The need for an intravenous line and fluid management should be based on clinical assessment of hydration and the patient's ability to feed orally. Intravenous fluids are recommended for the first day of hospitalization for those with hydration needs.

Nutrition: Nasogastric feeding is recommended for those requiring fluid support on the second day. Patients on HFNC will be evaluated for feeding tolerance and allowed to PO feed if tolerating well, if not NG placement is recommended.

Antibiotics: Are not recommended unless patient exhibits indication of bacterial infection.

High Flow Nasal Cannula (HFNC): This high humidity, high flow oxygen therapy should be considered for infants with significant respiratory distress. HFNC therapy can significantly reduce the infant's work of breathing. (See attached protocol.)

Parent Education: Parents should be educated on:

- Bronchiolitis pathophysiology and duration of illness.
- Proper techniques for airway clearance and suctioning.
- Handwashing and infection control.
- When to call their health care provider by explaining the signs of worsening symptoms.
- The value of continuing breastfeeding up to six months of age, when applicable.

Tobacco Counseling:

Clinicians should counsel caregivers/family about exposing the infant to environmental tobacco smoke and offer smoking cessation counseling and information on the Ohio Quit Line. Family at the bedside will be offered free nicotine replacement therapy to reduce nicotine cravings during their infant's hospitalization, assuming no contraindications.

Discharge Criteria:

- Respiratory Rate < 60 breaths per minute.
- Adequate P.O. intake.

- Patient SpO2 adequate on room air or is on supplemental oxygen consistent with previous home therapy.
- Parents are proficient with all necessary therapies for home, especially, secretion clearance using a bulb syringe.

INPATIENT/OBSERVATION MANAGEMENT PROTOCOL

SCORE	<u>Respiratory Treatment</u>	<u>Other Therapy</u>
0-4 NORMAL	Assess Q6	Suction PRN Bulb Syringe suction for home
5-7 MILD	Assess Q4	Oxygen per Protocol Suction PRN
8-10 MODERATE	Aerosol Trial X1 with Albuterol. If the patient responds continue aerosols Q4 hrs. for scores ≥ 8 , If not responsive consider a trial with an alternate bronchodilator. Assess Q2	IV fluids Oxygen per Protocol Consider Chest X-ray Capillary Blood Gas Suction PRN Consider HFNC if meets criteria Place on "watcher" list
11-15 SEVERE	Aerosol Trial X1 with Albuterol. If response is positive, continue aerosol Q2. Call PRT and consider PICU transfer	On "watcher" list IV fluids Oxygen per Protocol Chest X-Ray Capillary Blood Gas HFNC if meets criteria Excessive PCO2/acidosis warrants transfer to PICU