Child Presents to Emergency Department with Suspected Bronchiolitis

Inclusion Criteria: Age 30 days – 23 months with viral respiratory symptoms +/- wheezing & increased work of breathing

(See Box 1 for Exclusion Criteria)

Box 1: Exclusion Criteria

- Born < 32 weeks gestation
- Cardiac disease requiring home medications
- Chronic lung disease or on home oxygen or requires airway clearance support at baseline for any reason
- Significant neuromuscular disease (requires assistance with breathing and/or feeding); known or suspected dysphagia
- Presenting with apnea
- Patient requiring immediate HFNC, CPAP, BiPAP or intubation for respiratory failure

Assess patient using **Clinical Bronchiolitis Score (CBS)**

	0 – None	1– Mild	2 – Moderate	3 – Severe
Heart Rate	<2 mos: <160 2-11 mos: <150 1-2 yrs: <140	<2 mos: 160-180 2-11 mos: 150-170 1-2 yrs:140-160	<2 mos: 181-200 2-11 mos:171-180 1-2 yrs: <161-170	<2 mos: >201 2-11 mos:>181 1-2 yrs: >171
Respiratory Rate	< 2 mos: < 60 2-11 mos: < 50 1-2 yrs: < 40	< 2 mos: 60-70 2-11 mos:50-60 1-2 yrs: 40-50	< 2 mos: 71-80 2-11 mos: 61-70 1-2 yrs: 51-60	<2 mos: > 81 2-11 mos: > 71 1-2 yrs: > 61
Oxygenation	SpO2 ≥93% on room air (RA)	SpO2 90-92% on RA	SpO2 88-89% on RA **or** SpO2 ≥ 93% on low flow/supplemental O2	SpO2 < 88 % on RA **or** SpO2 < 93% on low flow/supplemental O2
Work of Breathing	None	Belly breathing or mild subcostal retractions	Nasal flaring and/or moderate retractions (intercostal, tracheosternal, or subcostal)	Any severe retractions, head-bobbing, and/or grunting
Auscultation			Diminished breath sounds, diffuse wheeze, or marked prolonged expiration	Severe diffuse wheeze breath sounds becoming inaudible

Albuterol is not recommended for bronchiolitis. See Additional Treatment Considerations (Pg 2) for further guidance

Place patient on carepath based on **Clinical Bronchiolitis Score (CBS)**

Box 2: Additional Considerations for Admission

- Immunodeficiency/immunosuppression
- Age < 3 months
- Prematurity (32-36 weeks gestation)
- Poor feeding (50% reduction of oral intake)/risk of dehydration
- Failure to thrive or malnourished

CBS 0-4
Start **Mild** Supportive Care

- Administer antipyretic if febrile
- Nasal suction with bulb syringe and saline
- Consider using suction tip (i.e.Neosucker®) if severe congestion or significant work of breathing
- Oral hydration if indicated
- Re-score in 1 hour

CBS ≤ 4

NO

YES

CBS 5-8
Start **Moderate** Supportive Care

HFNC Initiation Pause (HIP)
Bedside huddle (MD/RT/RN) to assess patient and trial interventions prior to HFNC

- Nasal suction with syringe tip (NeoSucker®) and saline if not done recently
- Administer antipyretic for comfort if not already given
- Address hydration needs; consider IV bolus if clinically dehydrated
- Trial administration of humidified low-flow nasal cannula (for saturation ≤90% and/or severe work of breathing requiring intervention)

CBS ≥ 9
Go to **Severe** Algorithm (Pg 2)

Clinical judgement supersedes CBS, may initiate HIP if clinical concern at any score

CBS ≤ 4 on RA: Assess parental readiness for discharge, social circumstances for follow-up and ability to care.
(See Box 2: Additional Considerations for Admission and Box 3: Discharge Criteria)
CBS ≤ 4 on supplemental O2: Consider RA trial for 1 hr.

Successful Room Air Trial (SpO2 ≥ 90%)	Assess readiness and consider for discharge; **Go to Box 3: Discharge Criteria**
Failed Room Air Trial	**Go to Box 4: Initiate Admission to PCRS**

Medical Team Determine HIP Outcome 30 min later:
Is the CBS improved?
No signs of clinical deterioration?

NO

FAIL

- Go to Severe Algorithm and initiate HFNC protocol or non-invasive positive pressure ventilation
- Document HIP outcome (MD in note; RT/RN in flowsheet)
- Admit to PICU

YES

PASS

- Remains on RA or low-flow nasal cannula
- Document HIP outcome (MD in note; RT/RN in flowsheet)
- Re-score in 1 hour and determine disposition

CBS ≤ 4?

YES

NO

Box 3: Discharge Criteria

- CBS 0-4, and
- O2 saturation ≥ 90% on room air, and
- Able to feed to maintain hydration

Discharge Education

Educate family on suctioning; dispense bulb suction (if available)	Provide bronchiolitis discharge brochure (if available)
Need for frequent feeding	Follow up with PCP (schedule preferably)
Smoking cessation handout as indicated	Return precautions

Box 4: Initiate Admission to PCRS (for any of the following):

- Patient requires inpatient supportive measures and observation
- Concern for parental readiness and social circumstances
- CBS 5-8 with **PASS** HIP

ED Severe Algorithm
CBS ≥ 9

Goal for severe bronchiolitis is to stabilize and monitor the patient closely until placement in PICU

1. Place patient on continuous pulse oximetry and continuous CR monitor
2. Suction patient with neo-sucker
3. Re-score patient
4. Initiate **HFNC Outside of ICU Protocol**
   - See Job Instruction for instruction on equipment set-up (Airvo® or Vapotherm®) and initiation of HFNC
5. Once HFNC is initiated, admit patient to PICU

HFNC Outside of ICU Protocol				
Weight	**Flow Rate (L/min)**	**FiO2**	**Re-assessment**	**Escalation While Awaiting Transfer**
< 13 kg	1. Weight x 1.5 = starting flow rate 2. Round up to nearest whole number flow rate *Ex: 7 kg x 1.5 = 11 L/min*	Start at FiO2 40% Titrate to keep SpO2 92-97%	Obtain vitals and re-score patient every 30 minutes after HFNC initiation x 2 If stable after 60 minutes, obtain vitals and re-score every 1 hour x 3 hours, then every 2 hours thereafter and until transfer	Perform team bedside huddle (RT, RN, MD/LIP) 60 minutes on HFNC initiation ***Contact receiving PICU for additional guidance if patient needs > 60% FiO2 to maintain SpO2 > 92%***
≥13 kg	20 L/min			

6. Make patient NPO
7. Obtain peripheral IV access and if possible obtain CBC and RFP
8. Administer 10-20mL/kg NS bolus, unless signs of fluid overload or heart failure (i.e. hepatomegaly)
9. If febrile, provide IV/PR acetaminophen
10. Obtain CXR
11. All pediatric patients initiated on HFNC in the ED should be transferred to PICU as soon as possible
12. In the event of transfer delays, provider to provider discussions must occur regularly to guide treatment steps. While awaiting transfer, conference with PICU every 6 hours or more frequently if needed

*****if the clinical impression supports a decision different from this guidance, then the RN, RT, and MD/LIP should discuss the decision together***

Additional Treatment Considerations

Albuterol (Nebulized or MDI) Trial	Studies have shown no benefit for albuterol treatment in infants with typical bronchiolitis. An albuterol trial may be considered in children with features suggestive of possible asthma (recurrent wheezing, age > 12 months, family history of asthma, prior inhaled corticosteroid use)
Nebulized Racemic Epinephrine	Consider use in patients with increasing severe respiratory distress on severe algorithm; this may provide bronchodilator and/or airway clearance effects
High Flow Nasal Cannula	Provides warm, humidified air with adjustable oxygen concentration and reduces work of breathing. Indicated only if not responding to supportive care. See HFNC Job Instruction to set-up treatment
Nebulized Hypertonic Saline	Current research does not support a role for routine use of nebulized hypertonic saline in the ED or Inpatient unit
Antibiotics	Do NOT prescribe antibiotics without evidence of bacterial infection. Consider further evaluation for possible bacterial superinfection or sepsis if patient is persistently febrile or tachycardic, toxic appearing, or worsening clinical status. See focal infection treatment or sepsis pathway