HFNC Guideline – Inclusion/Exclusion

GUIDELINE: High Flow Nasal Cannula (HFNC) for use in Bronchiolitis

Inclusion Criteria:

- Patient has primary condition of Bronchiolitis with:
  - Respiratory distress or increased work of breathing **unresponsive to standard nasal cannula**
- Patient is between 1 month and 24 months of age

Exclusion Criteria:

- Patients in severe respiratory failure (lethargy, prolonged apnea, bradycardia)
- Patients with significant comorbidities (cardiac, pulmonary, or neuromuscular disease, craniofacial abnormalities, immunodeficiency)
  - Patients with hemodynamically insignificant cardiac defects (small ASD/VSD) are not excluded
- History of prematurity < 34 weeks gestation
- Strong suspicion or confirmed concurrent bacterial pneumonia

Off-Guideline Patients:

At times when the PICU is at or near capacity, the floor may accept or continue to manage patients who do not meet criteria for this guideline.

COVID-19 Considerations:

Refer to the most recent COVID-19 hospital guidelines for additional details and specifics including isolation and personal protective equipment requirements as HFNC is considered an aerosol generating procedure.

Situational Awareness:

All HFNC patients on the floor will be watcher patients and be reported out on the daily safety call (Mon-Fri) to increase general awareness of the acuity on the floor.

HFNC Guideline – Initiation

Procedure for **INITIATION** of HFNC on floor patient**:**

Procedure	Points to Remember
1. Patient made "Watcher" status for "escalating respiratory support."	**1.** Floor RN/Physician to notify PICU RN/Physician of initiation of HFNC on floor patient.
2. Patient should initially be kept NPO with IV access ideally established. Continuous pulse oximetry monitoring is indicated.	**1.** If IV access is unable to be achieved, discuss further with PICU attending.
3. Patient will be set up on the high flow nasal cannula system by RT. RT will ensure suctioning set up in room as well as correct size mask/bag.	**1.** Select the appropriate size cannula ensuring less than 50% of the nare is occluded at all times.
4. Goal and maximum flow rate of 2 L/min/kg (max flow of 20 L/min).	**1.** Initiate flow at 6 L/min and increase by 2 L/min until goal flow rate is reached to allow infant to adjust to high flow. Notify provider if unable to achieve goal flow rate within 10 minutes.
5. **Start at FiO2 of 50%.** Once goal flow rate is achieved, decrease FiO2 as tolerated to maintain SpO2 ≥ 90% to a goal FiO2 of 30%	

HFNC Guideline - Reassessment

Procedure for **REASSESSMENT** of HFNC patient**:**

HFNC Initiated on the Floor	Indications for potential ICU transfer
1. RT and physician will assess the patient every hour for two occurrences. Physician to document a progress note of reassessment.	**1.** Worsening or elevated PEWS score ≥ 7
2. After the initial q1hour assessments x2, ongoing RT assessments every 2 hours for the next four hours, then every 3 hours for the duration of HFNC. RT will document liter flow, FiO2, heart rate, respiratory rate, SpO2 and patient work of breathing with every patient assessment.	**2.** Requiring ≥ 50% FiO2 for more than 10 minutes to maintain SpO2 ≥ 90%

HFNC Guideline - Weaning

Procedure for **WEANING** HFNC**:**

Procedure	Points to Remember
Oxygen: **1.** Attempt to wean FiO2 by 5% at a minimum of every 2 hours as tolerated to maintain SpO2 ≥90%. RT, bedside nurse, and/or physician can wean FiO2. **2.** Wean FiO2 to 30% prior to weaning flow.	**1.** If after the wean, SpO2 falls to <90%, or if the patient demonstrates new or marked retractions the wean has failed. Return to previous FiO2 and reassess for wean at a minimum of every 3 hours.
Flow: **RT is responsible for weaning flow rate. (However, physicians can also wean flow.)** 1. Wean liter flow when patient meets **weaning criteria**: a. FiO2 is ≤ 30% AND b. RR is ≤ 20 breaths/min above the normal range for at least 2 hours AND c. there are no marked retractions	**1.** For patients > 6 kg, decrease flow by 4 L/min and reassess within 30 min. For patients ≤ 6 kg, wean by 2 L/min and reassess within 30 min. **2.** The wean has failed if any of the following criteria are met: a. FiO2 requirement increases by ≥ 10% b. Patient demonstrates new or marked retractions **3.** If wean failed, return to previous liter flow and reassess for wean in 2-4 hours. **4.** If wean successful, continue to assess readiness for subsequent weans at least every 3 hours. Wean by 4 L/min (> 6 kg) or 2 L/min (≤ 6 kg) when patient meets weaning criteria. **5.** RT will page the physician team if patient does not meet weaning criteria for >8 hours. **a.** It is expected that some patients not be able to wean for > 12-24 hours. **b.** If a patient has previously failed wean or RT/nursing feels that they are not ready to wean this should be communicated to physician team who may write a “Hold Wean” communication order for a specified period of time. The practitioner will remove “Hold Wean” order when weaning attempts may be reinitiated.

HFNC Guideline - Feeding

Procedure for **FEEDING** patients on HFNC**:**

Goal is for all patients to receive enteral feeds within the first 24 hours of HFNC treatment.

HFNC patients are initially made NPO with IV or SC fluids and maintained for a minimum of 4 hours after initiation to allow for a period of observation and stability prior to considering feeds.

Procedure	Points to Remember
1. Practitioner removes NPO order and enters diet order for patient on HFNC.	**1.** Patient should exhibit stable or improving FiO2 and Flow requirements.
1. Initial feed must be monitored by a nurse or physician to ensure no frank signs or symptoms of aspiration (to include: coughing, choking, gagging and/or increased FiO2 requirement by ≥ 10%, increase in RR > 20 bpm).	**1.** Nasal suction prior to attempted feeds when appropriate. **2.** NG feeds should be considered for those patients who fail a trial of oral feeds but otherwise demonstrate stability on HFNC. **a.** For patients on >10 L/min receiving NG feeds, the NG tube should be vented prior to every feed and at least q4 hours. **3.** Post-pyloric feeds (NJ) may be considered for patients unable to tolerate pre-pyloric feeds.

HFNC Guideline - Discontinuation

Procedure for **DISCONTINUING HFNC**:

Procedure	Points to Remember
1. When patient has successfully weaned to a flow rate of: **a.** ≤ 6 L/min if weight > 6 kg **OR** **b.** ≤ 4 L/min if weight ≤ 6 kg **AND** **c.** Weaning criteria met RT will transition patient to 2L O2 via simple cannula.	**1.** Physician can wean faster based on their discretion and clinical improvement. Physician must notify RN and RT of changes and enter orders to reflect these changes.
2. HFNC setup should remain in patient's room for at least 4 hours following discontinuation.	**2.** If after the transition to 2L, SpO2 falls to <90%, or if the patient demonstrates new or marked retractions, the transition has failed. Return to previous flow and reassess for wean at a minimum of every 3 hours.
3. After discontinuation, RT will continue to assess within 30 min, then every 2 hours for 2 occurrences.	

HFNC Guideline - Disclaimer

Guideline Disclaimer:
Clinical practice guidelines and algorithms at Nationwide Children's Hospital (NCH) and NCH-Toledo provide general guidance to clinicians. Patient choice and clinician judgment remain central to the selection of diagnostic tests and therapy. The ordering provider is ultimately responsible for care decisions. NCH-Toledo's guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.

During periods of high census, patient safety clearly takes priority and adjustments to the above protocol recommendations may be necessary including number of patients on HFNC on the floor, units and services able to administer HFNC and inclusion/exclusion criteria. These situations are continually evaluated by the physician and nursing leadership team

For questions or clarifications related to this guideline, please contact:

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Guideline Approved by BSMH Pediatric Medical Informatics Committee

Origination Date: *August, 2023*
Next Revision: *August, 2026*

HFNC Guideline - References

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