I. Purpose
The mixture of medical grade Helium and Oxygen gases, known as Heliox, is administered to improve oxygenation and ventilation in patients with disease processes that obstruct airflow, including but not limited to post extubation stridor, bronchiolitis, and status asthmaticus.

II. Scope
A. Pediatric Critical Care Areas
B. Adult Critical Care Areas
C. Pediatric Emergency Areas
D. Adult Emergency Areas

III. Policy
A. The objective of Heliox therapy is to correct hypoxemia, correct PCO₂ levels, and relieve symptoms of airway obstruction.
B. Heliox delivery will be administered with the 80% Helium with 20% Oxygen mixture.
C. Acceptable criteria for Heliox is:
   1. Blood gas sample that demonstrates hypoxemia as defined by an:
      a) \( \text{SaO}_2 \leq 92\% \) or a \( \text{PaO}_2 \leq 80 \text{ mmHg} \) for pediatric patients.
      b) \( \text{SaO}_2 \leq 90\% \), or a \( \text{PaO}_2 \leq 55 \text{ mmHg} \), or a \( \text{PaCO}_2 \geq 45 \text{ mmHg} \), or a \( \text{pH} \leq 7.35 \) for adult patients.
   2. A patient admitted with an airway obstruction or in a state of status asthmaticus that does not respond to conventional therapy.
D. \( \text{PaO}_2 \) or \( \text{SaO}_2 \) should be assessed every 2 hours for the need to continue Heliox.
E. A Risk-Benefit assessment should be performed when administration to pregnant women is being considered.
F. Oxygen may be used in addition to that delivered by the 80/20 or 70/30 Heliox mixture if the patient cannot maintain an acceptable PaO2 or SaO2 as established by the ordering physician.
G. Peak flow measurements should be performed in non-intubated patients who are able to follow commands.

IV. Equipment
A. Non rebreather or partial rebreather
B. Circulaire nebulizer
C. HOPE nebulizer
D. Heliox gas cylinder (80/20 or 70/30)
E. Heliox regulator with a CGA #280 connection fitting
SUBJECT: Heliox Delivery

F. Oxygen wye connector
G. Oxygen flowmeter
H. Oxygen tubing (2)
I. Nipple adapter
J. 1/4 inch Y tubing adapter
K. Large wrench

V. Procedure
A. Heliox Therapy Without Bronchodilator Therapy
   1. Wash hands
   2. Connect Heliox regulator to Heliox tank
   3. Check PSI in Heliox tank
   4. Attach rebreather mask connecting tubing on Heliox regulator flowmeter
   5. Secure mask strap over patient's head and place mask on the patient's face
   6. Adjust flow to keep the bag inflated
   7. Calculate cylinder duration:
      \[ \text{Flow in liters per minute} = \frac{\text{H-tank Factor of (2.5) X PSI}}{\text{cylinder duration in minutes}} \]
   8. If additional oxygen is required to maintain saturation, attach a small bore wye tubing connector to the tubing on the mask
   9. Document all appropriate data in the patient's medical record using the MediLinks patient management database using the hospital computer system

B. Heliox Therapy with Bronchodilator Therapy
   1. Continuous Medication Nebulization
      Note: Hope nebulizer's primary source set @ 13 liters per minute delivers an output of 25 mL/hour.
      a) Check PSI in Heliox tank; ensure enough gas to deliver therapy; have additional tank available
      b) Mix 4 hours of medication
         (1) Example: dose ordered is 2mL/hour
         (2) 2mL Albuterol X 4 hours = 8mL Albuterol for four hours
         (3) 25mL output/hour X 4 hours = 200mL total output
         (4) 200-8 = 192 mL normal saline
         (5) Mix 8mL albuterol with 192 mL normal saline to equal 200mL total
      c) Connect Hope nebulizer to the primary source of compressed air or oxygen only (depends on desired FIO2)
      d) Adjust the primary gas to 13 LPM
      e) Connect large bore tubing to Hope nebulizer
      f) Connect aerosol facemask to large bore tubing
      g) Connect the tubing from Heliox to the Hope nebulizer's secondary port
      h) Adjust the heliox flow to 12-13 LPM
      i) Measure FIO2; adjust as necessary by manipulating the Heliox flow
      j) Secure strap over patient's head
      k) Place mask over mouth and nose
      l) Document all data in the Lifetime Clinical Record (LCR) using MediLinks patient management database.