POLICY

1. The delivery and monitoring of helium/oxygen therapy (Heliox) is a basic procedure for the Respiratory Therapist.
   
   1.1 The Respiratory Therapist is required to review the policy on a yearly basis.

   **Note:** The basic theory of heliox is addressed in the Respiratory Therapy core curriculum; however, opportunities to perform this skill are limited.

2. A physician’s order is required to initiate Heliox therapy.

GUIDING PRINCIPLES AND VALUES

1. The goal of delivery and monitoring of heliox therapy is to reduce dyspnea in patients with upper airway obstruction or severe asthma by:
   
   1.1 Reducing airway resistance.
   
   1.2 Promote less turbulent gas flow
   
   1.3 Reducing respiratory muscle work until the underlying disease is treated by pharmacological and/or surgical means.

2. To be effective in reducing airway resistance, concentrations of helium must be high, ideally above 70% of the inhaled gas mixture.

3. Heliox has no therapeutic benefit in treating the underlying disease. It reduces airway resistance and work of breathing until other therapies are effective.
PROCEDURE

Equipment
- H-tank of heliox with attached regulator, flowmeter nipple and stand
  - Note - Use concentrations of 80/20 or 70/30 based on the oxygen needs of the patient
- Pulse oximeter
- Non-rebreather face mask with oxygen tubing (non ventilated)
- Nasal prongs for supplemental oxygen to maintain desired SpO₂ (non ventilated)
- Servo I Ventilator (ventilated)
- Heliox with Servo I Container which includes: instruction sheet, heliox regulator, high pressure hose and wrench.

Non-ventilated Patient
1. Obtain physician’s order.
2. Select the appropriate concentration of heliox based on FiO₂ requirements of the patient.
3. Don personnel protective equipment (PPE).
4. Explain the procedure to the patient.
5. Obtain a Heliox tank. “Crack” tank by quickly opening and closing tank to ensure no dust is present in the tank outlet.
6. Attach the regulator to the tank; check to ensure there is an adequate volume of gas remaining. Do not initiate therapy if heliox tank is below 200psi.
7. Attach the non-rebreather mask to the regulator.
8. Adjust the flow between 5-10 L/min. to ensure the reservoir bag of the non-rebreather mask does not empty during each tidal breath.
9. Monitor the patient with pulse oximetry; apply nasal cannula if needed to maintain the desired SpO₂.

Ventilated Patient
To Convert to Heliox
- Servo I ventilator can be converted to Heliox in the stand by or ventilation modes

1. Obtain physician’s order.
2. Don personnel protective equipment (PPE).
3. Explain the procedure to the patient.
4. Ensure patient is on Servo I ventilator.

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Note: Heliox is only to be used with Servo I ventilator.

5. Obtain an 80/20 Heliox tank.

Note: Only 80/20 Heliox mixture can be used with Servo I ventilator.

6. Connect regulator to the 80/20 Heliox tank.

6.1. Connect oxygen to a gas source when using Heliox.

7. Remove the Heliox adapter from the holder and connect it to the HeO₂ high pressure hose.

8. Connect HeO₂ high pressure hose to Heliox tank and turn tank on.

9. To change from Air to Heliox press menu on the Servo I ventilator:

   Menu → Compensate → Gas Type

   The message ‘Make sure HeO₂ is connected before compensating. Do you really want to compensate for HeO₂? Yes/No’ is displayed.

10. Remove Air adapter from ventilator.

11. Connect the Heliox adapter to the Air inlet.

12. Confirm the change by pressing ‘Yes’ on the ventilator screen.

   Another message informs the system has been compensated for Heliox and ventilator settings need to be checked.

13. Check ventilator settings and press ‘OK’ to confirm.

   HeO₂ will appear in the upper left corner of screen.

   Note: Highest FiO₂ that can be achieved is 60%.


To Convert to Air

1. Remove Air adapter from ventilator.

2. To change from Heliox to Air press menu on Servo I ventilator:

   Menu → Compensate → Gas Type

   The message ‘Make sure Air is connected before compensating. Do you really want to compensate for Air? Yes/No’ is displayed.

3. Connect Air adapter to the Air inlet on the ventilator.

4. Confirm the change by pressing ‘Yes’ on the ventilator screen.

   Another message informs the system has been compensated for Heliox and ventilator settings need to be checked.
5. Check ventilator settings and press ‘OK’ to confirm. 

\[ \text{HeO}_2 \text{ will disappear from the upper left corner of the screen.} \]

6. Document on the *Respiratory Monitoring* Record, CD0279MR.

**Changing Heliox Tanks during ventilation**

*Note: Change Heliox tank when pressure gauge on the Heliox regulator reaches 200PSI*

1. Obtain an 80/20 Heliox tank. “Crack” tank by quickly opening and closing tank to ensure no dust is present in the tank outlet.

2. Turn Heliox tank connected to Servo I ventilator off. Remove Heliox regulator.

**NOTE: Servo I will switch to 100% oxygen**

3. Connect Heliox regulator to the 80/20 Heliox tank.
4. Turn 80/20 Heliox tank on.

**Note: Servo I ventilator will switch from 100% oxygen to Heliox**

**REFERENCES**


Gentile, M. RRT. Inhaled Medical Gases: More to Breathe Than Oxygen. [Respir Care 2011;56(9):1341–1357.


**RELATED DOCUMENTS**

**Policies**
CC 45-070  Mechanical Ventilation Initiation Maintenance and Weaning

**Forms**
CD0279MR  Respiratory Monitoring Record

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