

## HELMET VENTILATION GUIDE

**Indication:** SpO<sub>2</sub> < 92%, or increased work of breathing, despite supplemental oxygen up to 6 LPM NC O<sub>2</sub>.

### **Initiation of therapy:**

Helmet will arrive in either one of two configurations (Figure 1), set PEEP, open oxygen flowmeter and place on patient's head, secure arm straps. Set gas flow as indicated below, depending on system used.

Initial settings: FiO<sub>2</sub> 60%, PEEP 5 cm H<sub>2</sub>O.

Reassess SpO<sub>2</sub> and work of breathing. If SpO<sub>2</sub> and work of breathing do not improve, increase PEEP to 10 cmH<sub>2</sub>O.

Reassess SpO<sub>2</sub> and breathing effort. If SpO<sub>2</sub> > 96%, can try lower FiO<sub>2</sub>. If SpO<sub>2</sub> < 92% and/or persistent respiratory distress at PEEP 10 cm H<sub>2</sub>O, proceed to intubate.

**Continuation:** Mobilize patient OOB with helmet as tolerated. Incentivize cough and deep breathing while in the helmet. Allow standing with support. If able to tolerate breaks, remove helmet at meal times (synchronize with PO meds). If unable, place NGT/DHT and feed enterally.

**Weaning:** Decrease PEEP to 5, titrate FiO<sub>2</sub> to 40% as tolerated.

When able to tolerate PEEP 5 cmH<sub>2</sub>O and FiO<sub>2</sub> 40% for 12 hours; Wean to NC O<sub>2</sub> 2-4 L/min.

**Helmet circuit assembly:** Helmet circuit is preassembled (Figure 2). Ensure that blue caps are removed from helmet and placed over the helmet base open ports (do not throw away). For the helmet base, pre-cut to approx. 13in, if too small, may need to customize. Use tape measure to obtain neck size, cut with sharp scissors to approx. 2 inches less than neck size to assure proper seal. Make sure PEEP valve is connected to expiratory limb and set at desired PEEP (Figure 3). Ensure four clips are in place to avoid undesired opening (Figure 4). Make sure antimicrobial filters are present on both the inflow and outflow limbs.

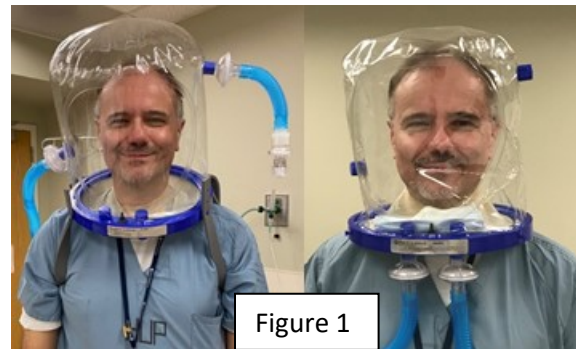




Figure 2

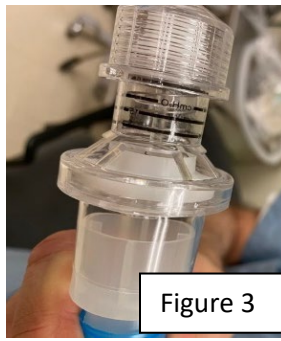


Figure 3

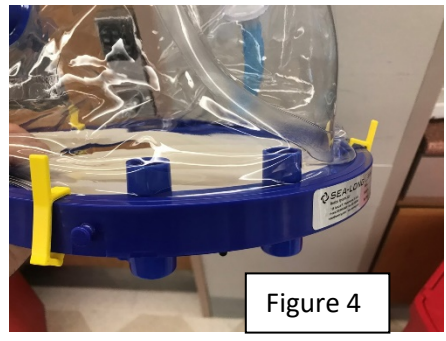


Figure 4

### **Delivery Configurations**

**-MaxVenturi (ICUs/transport):** connect inflow limb to humidifier outlet (Figure 5), set oxygen flow at 50-60 l/min and FiO2 60%.

FiO2 can be changed but do not decrease O2 below 50L/min. Set humidifier temperature in non-invasive mode to avoid fogging.

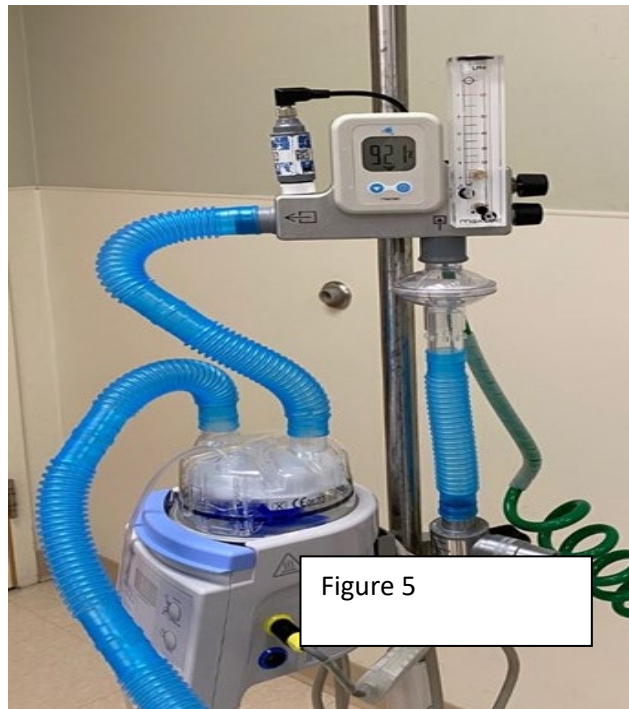
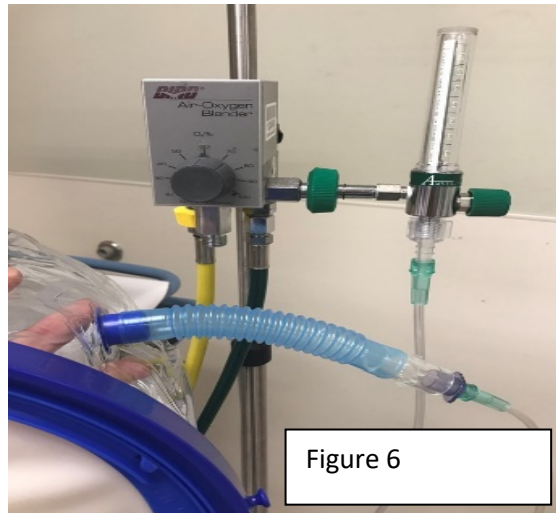


Figure 5

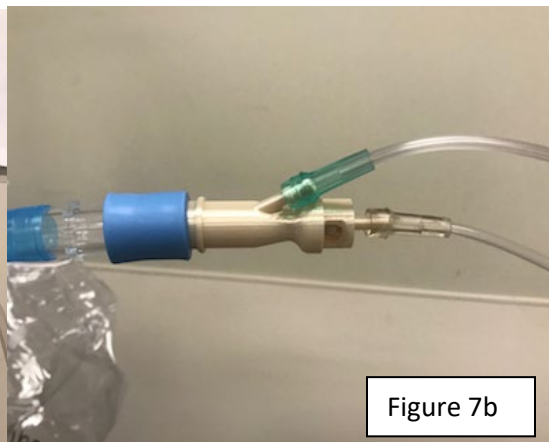
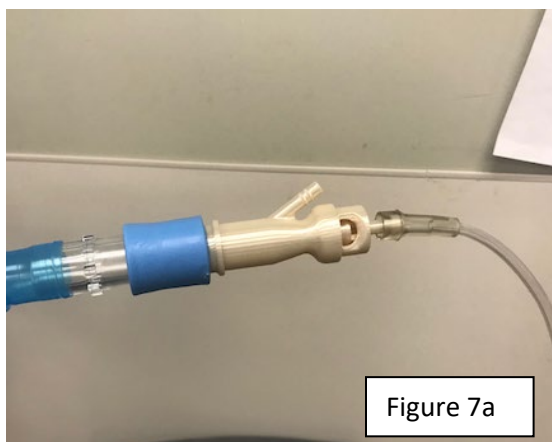
**-Blender (ICUs):** connect flowmeter to oxygen tubing. Attach the tubing to Helmet inflow limb (Figure 6). set oxygen flow rate at 50-60 l/min



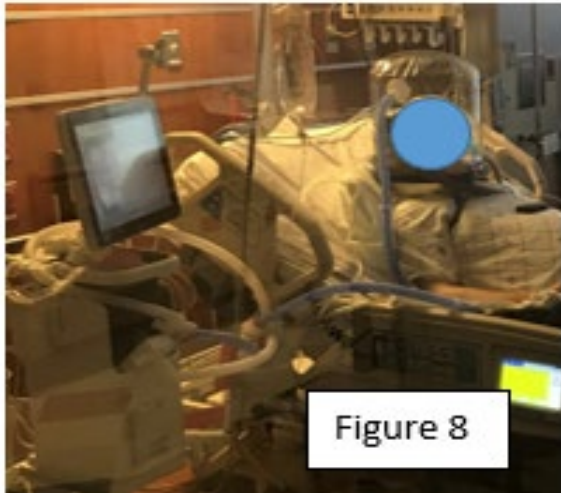
**-Venturi piece (ICUs):** Insert Venturi piece at the proximal end of the inflow limb (Figure 7). Connect side hose to wall oxygen (make sure hose is facing forward), then set wall flowmeter (use earplugs for noise reduction with Venturi piece). There are two options for the Venturi configuration:

- O<sub>2</sub> flow 30 l/min for FiO<sub>2</sub> 50% (tot flow = 80 l/min) (Figure 7a)

- O<sub>2</sub> flow 30 l/min *with additional flowmeter at 20 l/min to side port* for FiO<sub>2</sub> 60% (tot flow = 100 l/min) (Figure 7b)

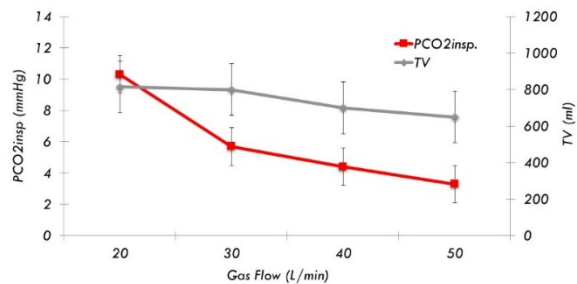


**-Ventilator setup (Servo U):** Using the high flow-NCO<sub>2</sub> set up on the ventilator, connect inflow limb to humidifier (Figure 8). Dial total oxygen flow of 50-60 l/min and desired FiO<sub>2</sub>.



## WARNING

Please always maintain total gas flow above 50 L/min at all times to avoid CO<sub>2</sub> rebreathing. These helmets are designed for hyperbaric O<sub>2</sub> delivery. They do not include a relief valve; undetected loss of gas supply can result in asphyxiation. Patients who are not alert and collaborative need to be closely monitored. Consider intubation if patient is agitated.



## Other Considerations

- Monitor for skin breakdown at **neck** and underarms. Can use mepilex to protect skin at these areas.
- Rolled-up hand towel can be placed inside helmet behind neck to provide neck support if desired.
- Patient can take breaks from the helmet if desired and clinically appropriate

- The helmet should be removed by members of the medical team comfortable with the system and with appropriate oxygen support ready (nasal cannula or HFNC).
- During a break, if safe to swallow may drink during short breaks and/or eat during prolonged breaks (i.e. 2-4 hours) if respiratory status allows.
- NG/dobhoff can be fed through rubber collar for nutrition.

### **Troubleshooting**

- If helmet needs to be removed, two staff members on opposite side of bed to remove simultaneously, place fingers inside rubber collar and stretch to remove over patient's head.
- If helmet deflates, assure all tubing is secure at helmet and oxygen delivery device.

Questions please reach out Maurizio Cereda or Mike Frazer.