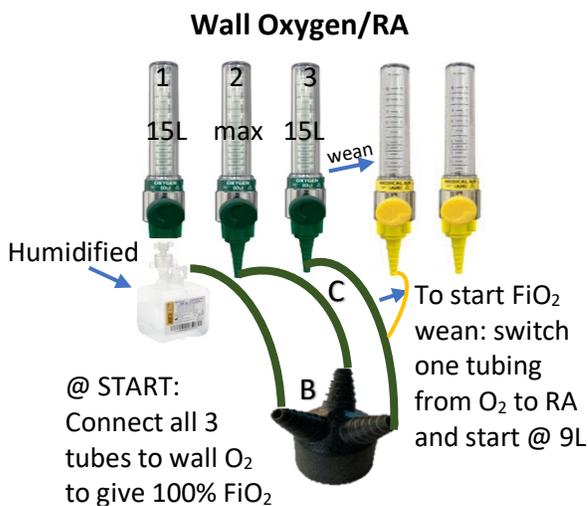


## PROTOCOL TO SET UP HELMET

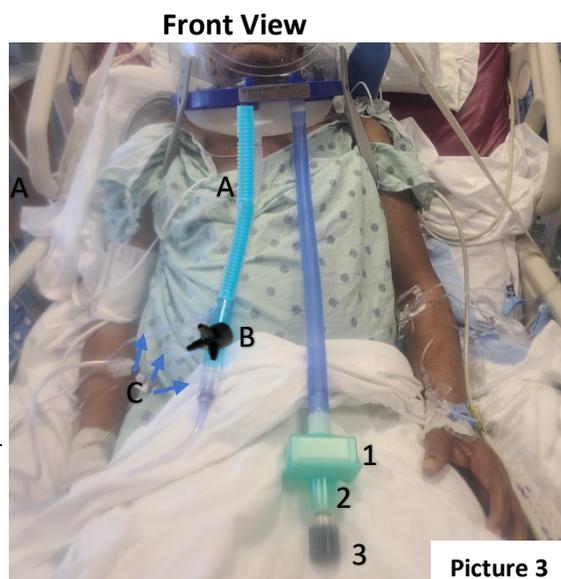
- Measure patient's neck circumference
- Cut collar two sizes smaller than indicated on sizing guide → can always size up if needed
- Fit the plastic ring into the transparent hood (**Picture 1**) → must be pressed **VERY TIGHT**
  - The sticker on the plastic ring should face **INSIDE** the helmet
- RT to apply the connections:
  - **Inspiratory limb (Picture 2 and 3):**
    - 100cc of Deadspace tubing (A)
    - Three prong adapter (B)
    - 3 sets of oxygen tubing to connect to room air/oxygen flow meters (C)
  - **Expiratory limb (Picture 3 and 4):**
    - DAR Filter (make sure patient side is facing the helmet) (1)
    - 1 blue boy adapter (2) \*may not be needed depending of PEEP valve used
    - PEEP valve set to start at 8cm (3)



Picture 1



Picture 2



Picture 3



Picture 4

Prior to placing on patient:

- Make sure two tree adapters are placed on oxygen flow meters and one humidifier attached to a third oxygen flow meter (**Picture 2**)
- May want to connect to oxygen flow meters and ensure helmet can inflate without leak
- Place a rolled up hand towel as a pillow inside the helmet (**Picture 4**)
- Place duoderm/mepilex at nape of neck to protect skin
- Once placed onto patient, secure with arm straps (**Picture 5**)
  - Attach grey strap to the front and back of the helmet on each side
  - For a tighter fit: criss cross the straps in the back, such that the back right attaches to the front left and vice versa (like Suspenders)
  - Can secure with wrist restraints to prevent upward motion of helmet



Picture 5



Picture 5

## TITRATION OF THERAPY AT START OF HELMET NIV

1. Connect all three tubings to THREE oxygen flow meters (one humidified, two nonhumidified)
2. Start with PEEP valve set to 8 cm of H<sub>2</sub>O
3. Start with 100% FiO<sub>2</sub> (see **figure 2**)
  - 1<sup>st</sup> OXYGEN FLOW meter set to 15L
  - 2<sup>nd</sup> OXYGEN FLOW meter set to max (50L)
  - 3<sup>rd</sup> OXYGEN flow meter with humidifier set to 15L
4. Then attempt to wean to 60% FiO<sub>2</sub>
  - Take one O<sub>2</sub> tubing (nonhumidified O<sub>2</sub> at 15L) and connect to ROOM AIR FLOW Meter set to 9L
  - Then increase RA flow meter from 9L to max (50L) and decrease humidified O<sub>2</sub> to 1L → 60% FiO<sub>2</sub>
5. If saturation <90% increase PEEP by increments of 2-3cm H<sub>2</sub>O to maintain saturation >90%
  - If PEEP increased to 20cm H<sub>2</sub>O without improvement or if patient intolerant of high levels of peep increase FiO<sub>2</sub> following the **figure 2**

STARTING HELMET	Oxygen flow meter	Oxygen flow meter	Oxygen flow meter	RA flow meter	RA flow meter	Total flow	FiO <sub>2</sub>	WEANING HELMET
Start with 3 O <sub>2</sub> flow meters →	15	50	15			80	100%	
		50	15	9		74	90%	Wean PEEP to 8cm H <sub>2</sub> O or less on 60%
		50	2	15		67	~80%	
Wean to 60% by moving O <sub>2</sub> tubing to RA flow meter and titrate accordingly →		50	15	50		115	~70%	
		50	1	50		101	60%	
		15	15	50		80	50%	
			15	50	5	70	40%	Wean FiO <sub>2</sub> to 40%
indicates use of bubble humidifier to flow meter: be careful to not increase flow on humidified limb >15L								

**Figure 2:** Flow and FiO<sub>2</sub>

## WEANING OF HELMET NIV

1. Wean PEEP increments of 2-3cm H<sub>2</sub>O over 3-4 hours for goal saturation >90% and RR <30 on 60% FiO<sub>2</sub>
2. Once PEEP is 8 cm H<sub>2</sub>O or less → wean FiO<sub>2</sub> to 40% by adjusting flows (**Figure 2**)
3. Then take helmet off and try 6L Nasal cannula

## ASKING FOR HELP

- **Please note that the helmet will arrive to bedside pre-assembled and tested for leaks**
- Need helmet right away: place order call Contact RT supervisor/Lead RT at 6-1888
- RT Superusers: La’Kisha Grays-Walton (5-4435) or George Mathai (6-1895)
- RN Superusers: Kelly Coudron (Pager 9823) or Anne Pohlman (Pager 6283)
- MD Superusers: John P. Kress (Pager 7285), Bhakti Patel (Pager 3349), Steve Pearson (Pager 1041), Matthew Stutz (Pager 1857), Krysta Wolfe (Pager 4171)

## GENERAL CARE FOR A HELMET PATIENT

### PATIENT TAKING BREAKS FROM THE HELMET

1. Patients can take breaks from the helmet if desired and clinically appropriate.
2. The helmet should be removed by members of the medical team comfortable with the system and have appropriate oxygen support ready (NRB or nasal cannula)
3. During a break
  - a. If safe to swallow → May drink during short breaks and/or eat during prolonged break (i.e. 2-4 hours) if saturation allows (SpO<sub>2</sub> >90%) and no tachypnea (RR >30 breaths/min)
  - b. Perform oral care

### NUTRITION WITH THE HELMET ON

1. Patients can receive nutrition either orally through a straw apparatus (Picture 4) or tube feeds via NG/dobhoff
2. The NG/dobhoff can be fed through the rubber collar
3. A straw can be fashioned by cutting an NG tube fitted into the inner cannula of a tracheostomy
  - a. Then insert straw into the anterior middle port of the helmet (Picture 6)
  - b. Make sure the patient seals their lips on the straw prior to placing the other end in the cup to prevent spillage in the helmet



Picture 6

### CENTRAL ACCESS

1. Internal jugular lines can be threaded through the rubber collar
2. If dialysis access is present, can loop extra tubing around the ear to prevent kinking → then thread the tubing through the rubber collar.

### INDICATIONS FOR INTUBATION

- Inability to achieve an arterial oxygen saturation by pulse oximetry or arterial blood gas  $\geq 90\%$  despite adjusting PEEP and FiO<sub>2</sub>
- Respiratory rate > 36 breaths/min
- Loss of ability to maintain ventilation to keep arterial blood pH  $\geq 7.20$
- Loss of protective airway gag reflex
- Respiratory or cardiac arrest
- Intolerance of the helmet
- Airway bleeding, persistent vomiting, or copious secretions

### PREPARING FOR INTUBATION

- Set FiO<sub>2</sub> to **100%** to pre-oxygenate prior to intubation
- When Anesthesia is ready
  - Undo strap in the front of the helmet
  - Place hands under the rubber collar and spread opening apart
  - Remove helmet from head

### WHAT DO I DO WITH THE HELMET IF A PATIENT GETS INTUBATED?

- Collect the helmet and its parts and place into a bag
- Do not throw any helmet parts away and RT will collect

**SUPPLIES NEEDED AT BEDSIDE PRIOR TO INITIATION**

1. helmet
2. oxygen/ventilator tubing depending on mode of oxygenation (BiPap or Wall Oxygen)
3. scissors
4. measuring tape or trach ties for neck measurement
5. ear plugs
6. restraints (2 sets)
7. under arm straps
8. mepilex for around neck, can be cut to size
9. small size fluidized pillow (for inside of helmet)
10. mouth swabs

**PRIOR TO PLACEMENT**

- perform oral care/suctioning as able
- place ear plugs if needed
- tie hair back as needed
- place mepilex surrounding neck over helmet neck site

**CONSIDER PRIOR TO HELMET PLACEMENT**

- Does patient have a neck central line? will create a minor leak with high IPAP/EPAP
- Does patient have or need enteral access prior to helmet placement? Consider placing prior to extubation, will create minor leak as above
- Are supplies outside of room for reintubation if necessary? intubation pack/medications/airway cart

**AFTER HELMET PLACEMENT**

- Adjust underarm straps to have two fingers loose fit
- Can place two restraints clipped together over top of helmet to help with upward movement of helmet with breathing and take pressure off armpit straps (**Picture 7**)
- Assure seal is sitting on mepilex pad
- Assure fluidized pillow is placed behind neck for support

**SUCTIONING**

- Suction catheter can be placed through port on anterior portion of helmet (**Picture 8**)
- If unable, can have two staff members on opposite side of bed simultaneously lift at flexible neck and patient can suction themselves

**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 (**Picture 8**)
  - If helmet deflates, assure all tubing is secure at helmet, wall flow meters, or BiPap machine
  - If unable to alleviate leak, take off helmet as above and place on NRB 15L
  - Page primary team ASAP for guidance
- if underarm breaking down, place wash cloth or place mepilex under armpits
- if patient needs oral care, can open hole at anterior base of helmet and feed swab through



Picture 7



Picture 8