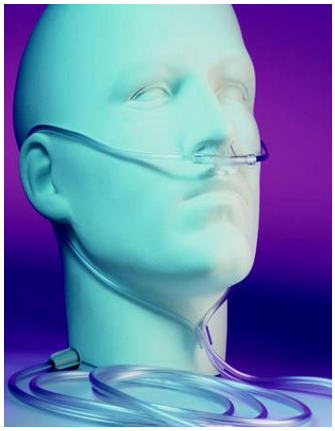
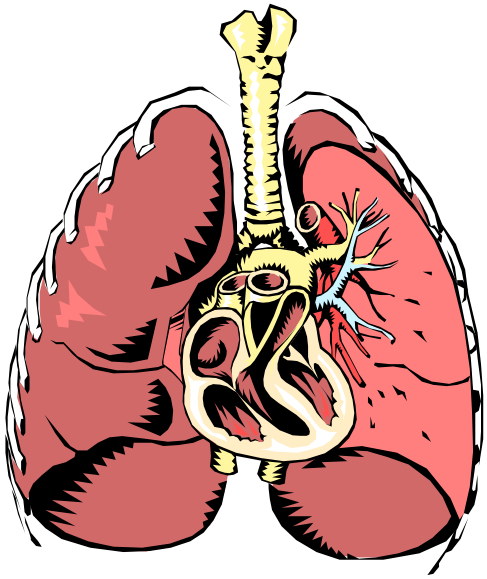
Oxygen Therapy Review





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Purpose: This outline is a basic review of oxygen therapy devices, safety considerations, and related policies. It is designed to aid hospital personnel in the safe, efficient, and proper use of these devices within the hospital and during patient transports.

I. **Oxygen Therapy**

A. **Nasal Cannula**

1. Set up

   a. Prongs curve down into external nares.

   b. Tubing loops over ears and tightened under chin.

   c. Connects to oxygen tubing (7 ft. lengths).

   d. Comfort cannula has threaded connector at end of tubing.

2. Guidelines

   a. FiO_2 equivalents

   - Room Air = 21% (add 3)
   - 1 lpm = 24% (add 4)
   - 2 lpm = 28%
   - 3 lpm = 32%
   - 4 lpm = 36%
   - 5 lpm = 40%
   - 6 lpm = 44%

   b. Normal range = 1 – 6 lpm; typically run at 2 – 4 lpm, but other liter flows occur.

   c. Flows in excess of 6 lpm will not appreciably increase inhaled concentration.

   d. Use humidification if liter flow over 4 lpm or as needed for patient comfort.

   e. Use extension tubing (up to 3 lengths) connected using green connector. 

   f. Low flow system: An increase in minute ventilation will lower FiO_2 while a decrease in minute ventilation will raise FiO_2 due to variations in room air entrainment.

   g. Use caution when treating patients with severe COPD (hypoxic drive); 1 – 2 lpm only.

I. Oxygen Therapy (continued)

B. Venturi Mask (aka Venti-Mask)

1. Set up

   a. Mask covers mouth and nose; mask should be snug on face.

   b. Use color code concentration adaptor (**GREEN** = 24 – 30%, WHITE = 35 – 50%).

   c. Opening controls air entrainment to deliver specific FiO_2.

   d. Flow must be set at specified liter flow to ensure accurate FiO_2.

   - 24% = 3 lpm
   - 26% = 3 lpm
   - 28% = 6 lpm
   - 30% = 6 lpm
   - 35% = 9 lpm
   - 40% = 12 lpm
   - 50% = 15 lpm

   e. Connects to oxygen tubing.

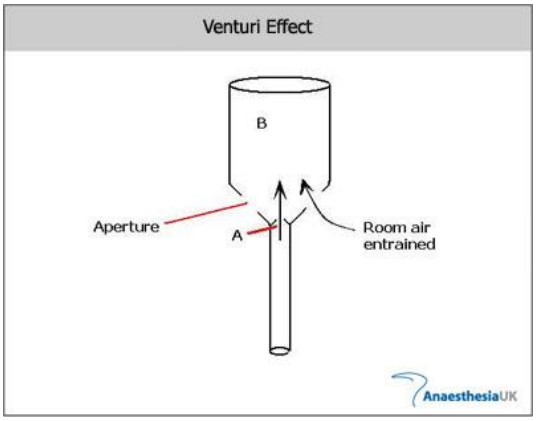
   f. Lock ring utilized to prevent slippage or disconnect of concentration adaptor.

2. Guidelines

   a. **Cannot be humidified with bubble humidifier!**

   b. Bed clothes and linens should not cover concentration adaptor = change in FiO_2.

   c. Use nasal cannula during meals in patients with mask oxygen system.



I. **Oxygen Therapy (continued)**

C. **High Flow Aerosol (aka CSU, FMN, HAM, CAM, Trach Collar)**

1. Set up

a. Aerosol face mask covers mouth and nose or tracheostomy (i.e. trach collar).

b. Venturi-type column with dial inserted into 1500mL sterile water bottle.

c. Two dial ranges; WHITE = 28 – 60%, GRAY = 35 – 95%.

d. Opening control air entrainment to deliver specific FiO_2.

e. Use chart on sticker to obtain corresponding liter flow for various concentrations.

f. Wide bore tubing to delivery system with water trap inserted mid-tubing.

g. Ballard suction wand utilized to remove drained condensation from water trap.

2. Guidelines

a. RT to set up high-flow aerosol system.

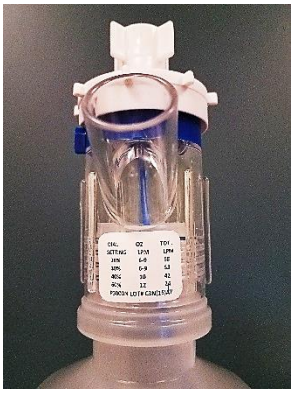
b. Keep tubing drained by positioning water trap vertically on floor.

c. Bubbling or gurgling sound indicates excessive water condensation in tubing.

d. Excessive water condensation will change FiO_2.

e. Change sterile water bottle when appropriate.

f. Complete system changed daily by RT.



I. **Oxygen Therapy (continued)**

D. **Partial Rebreather Mask (PRBM)**

1. Set up

a. Mask with reservoir bag attached covers mouth and nose.

b. No one-way valves.

c. Flow set at 10 – 15; adequate to keep reservoir bag filled through breathing cycle.

d. Mask delivers 60 – 80% FiO_2.

2. Guidelines

a. **Cannot be humidified with bubble humidifier!**

b. Mask should be snug on face.

c. Openings at sides used for air entrainment.

d. Keep adequate flow to meet patient inspiratory demand.

E. **Non-Rebreather Mask (NRBM)**

1. Set up

a. Mask with reservoir bag attached covers mouth and nose.

b. Two (2) one-way valves; one at side, one covering reservoir bag outlet.

c. Flow set at 15 – Flush; adequate to keep reservoir bag fully inflated.

d. Mask delivers 80 – near 100% FiO_2.

2. Guidelines

a. **Cannot be humidified with bubble humidifier!**

b. Openings at sides used for air entrainment.

c. Keep adequate flow to meet patient inspiratory demand.

d. Flush = flow turned up beyond standard flowmeter readings.

I. **Oxygen Therapy (continued)**

F. **Flow Meter**

1. Standard model has a visual range of 0 – 15 lpm.
2. Standard model can deliver 65+ lpm at flush.
3. Flowmeter inserted into wall outlet via quick connect system.
4. Fluid from tipped bubble humidifier must not enter flowmeter.
5. The middle of the ball should line up with number line for an accurate setting.
6. Do not connect oxygen tubing to yellow flowmeter – This is air not oxygen.

G. **Manual Resuscitator (aka AMBU BAG, BVM)**

1. Bag and mask in every patient room on floors.
2. Bag and mask in rooms with ventilator, BiPAP, or patient with tracheostomy.
3. Flow set at 15 – Flush; adequate to keep reservoir bag fully inflated.
4. Delivers near 100% oxygen.
5. Respiratory rate 10 – 12 breaths per minute.
6. Squeeze bag not reservoir.
7. Stoma should be covered and patient bagged using standard bag-to-face method.
8. In an emergency (e.g. code blue), RT will arrive to assume bagging.

II. **Portable Oxygen Cylinder**

A. **Walk-O_2-Bout Tank**

1. **Full** = unopened tank (>2000 psi) designated “emergency use” for crash carts.
2. **Partial** (Open) = Regulator reading >1000 psi to 2000 psi.
3. **Empty** tank = Regulator reading ≤1000 psi. **Tank will be pulled from use at 1000 psi**.
4. Tank must rest in tank holder while moving. **Tank should not be carried by handle**.
5. Turn black flow selector (top of tank) until appropriate liter flow is visible in window.
6. Attach oxygen tubing to barbed outlet on back of regulator body.

II. **Portable Oxygen Cylinder** (continued)

B. **Utilization Guidelines**

1. Adjust tank liter flow to same liter flow patient is receiving at bedside.
2. Do not interrupt oxygen therapy or alter oxygen liter flow unless otherwise ordered.
3. A bubble humidifier is not required for short duration oxygen transport (<1 hour).
4. Only use metal cylinder cage attached to bed or litter. Some newer litters have plastic tank tray. Do not place tank in bed during transport or use tank groove for storage.
5. Secure tank in tank holder when not in use. No free standing tanks.
6. Monitor tank gauge to avoid premature depletion of the oxygen supply.
7. Use Oxygen Cylinder Duration Chart to approximate number of minutes of use.
8. Trach collar patient can be transported using a venturi-type trach collar adaptor.

C. **Patient Transport – To**

1. Gather appropriate equipment.
   a. Tank > 1000 psi
   b. Prescribed oxygen delivery device
   c. Oxygen tubing
   d. Pulse oximetry monitoring (if applicable)
2. Verify tank will last duration of test.
3. Use appropriate tank holder.
4. Remove tubing from wall flowmeter and connect to oxygen tank. Remember to trace line from tank to patient.
5. Set flowmeter to proper setting.
6. Provide handoff report upon arrival.

D. **Patient Transport – From**

1. Verify tank with last duration of return transport
2. Upon return to room, remove oxygen tubing from tank and connect to wall flowmeter. Remember to trace line back to patient.
3. Set flowmeter to proper setting.
4. Return oxygen tank to proper storage unit. Segregate tanks by PSI gauge reading.
5. Update the **TRIPS** (Take Responsibility Immediately for Patient Safety) ticket as needed to reflect patient oxygen delivery needs.

III. **Oxygen Titration Policy**

A. **Summary**

1. To safely and effectively titrate oxygen for acutely ill, non-ventilated adult patients at Lancaster General Hospital (LGH) and Women & Babies Hospital (WBH).

2. Provides guidelines for titration and discontinuation of oxygen therapy.

3. Titration is defined as the practice of adjusting a patient's oxygen supply to sustain optimal oxygen saturation levels after supplemental oxygen has been ordered.

5. Provider order is required noting specific delivery device and corresponding liter flow or FiO_2. Some areas have protocols to initiate oxygen therapy.

6. Patient's disease, condition, and age help determine the most appropriate method of administration.

7. Titrate to least amount of oxygen required to keep $SpO_2 \geq$ prescribed level per order.

8. Weaning should be considered when patient is comfortable, hemodynamically stable, and stabilized:

   a. For patients utilizing non-rebreather mask (NRBM), obtain venti-mask and enter an order in EPIC to reflect the change in delviery method per protocol.

   b. For patients utilizing venti-mask, use correct color-air entrainment adapter and decrease FiO_2 in small increments every 15 – 30 minutes. When patient condition warrants a change (Up to NRBM or down to NC) enter order in EPIC to reflect the change per protocol.

   c. For patients with nasal cannula, decrease liter flow by 1–2 lpm every 15–30 minutes.

   d. Reassess patient after each down-titration including cardiac response, respiratory response, and level of consciousness.

   e. Reassess pulse oximetry 15 min after discontinuing oxygen and again in 2 hours to confirm patient is at the goals of care for titration.

   f. Notify provide if patient unable to maintain oxygen saturation on highest oxygen flow, unable to wean off oxygen, or for change in condition.

B. **Location:**

1. StarNet→Departments & Teams→Nurses→ Procedures & Manuals→Manuals→ Clinical Policies & Procedures→Clinical Policies and Procedures: M – O→Click policy link

2. StarNet→Type "Oxygen Titration Policy" in Search engine→ Click policy link