

أسس العناية المركزة / الكورس الاول

OXYGEN THERAPY AND NIV LEC 7

Sawa University

جامعة ساوة الاهلية

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كلية التقنيات الصحية والطبية

Department of Anesthesia

قسم تقنيات التخدير

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.....المرحلة 3....

....محاضرة رقم 3...

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Lecture No.

Theoretical

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الكريم.....

Oxygen Therapy



Terminology

- **Fio2**-Fraction /percentage of inspired oxygen
- **ABGs** - Arterial Blood Gas measurements- test measures the acidity (pH) and the levels of oxygen and carbon dioxide in the **blood** from an **artery**. This test is used to check how well your lungs are able to move oxygen into the **blood** and remove carbon dioxide from the **blood**.

An ABG measures

Partial pressure of oxygen (PaO2).

- 80 -100 mmHg - children/adults
- 50 - 80 mmHg - neonates

Partial pressure of carbon dioxide (PaCO2).

- 35 - 45 mmHg children/adults

pH.

- between 7.35 and 7.45. A pH of less than 7.0 is called acid and a pH greater than 7.0 is called basic (alkaline). So blood is slightly basic.

Oxygen

- ✓ **Oxygen** is a colorless, odorless, tasteless gas that is essential for the body to function properly and to survive.
- ✓ The air that we breathe contain approximately **21% oxygen**
- ✓ The heart relies on **oxygen** to pump blood. If not enough **oxygen** is circulating in the blood, it's difficult for the tissues of the heart to keep pumping.
- ✓ Supplemental **oxygen** is used to treat medical conditions in which the tissues of the body do not have enough **oxygen**.

Oxygen therapy

- **Oxygen therapy** is the administration of **oxygen** at a concentration of pressure greater than that found in the environmental atmosphere
- It is the administration of oxygen as a medical intervention, which can be for a variety of purposes in both chronic and acute patient care
- Oxygen therapy is a key treatment in respiratory care

Oxygen therapy

- **Oxygen is often prescribed for people to prevent hypoxia because of the following conditions:**
 - 1.difficulty ventilating all areas of their lungs**
 - 2.Impaired gas exchange**
 - 3.Heart failure**
- **Prescribed by the physician who specifies the following:**
 - 1.Concentration**
 - 2. liter per minute**
 - 3.Method of delivery**

OXYGEN – A PRESCRIBED DRUG

- MUST BE WRITTEN LEGIBLY BY THE DOCTOR
- PRESCRIPTION SHOULD BE DATED BY THE DOCTOR
- DOCTOR MUST INDICATE DURATION OF O₂ THERAPY
- THE O₂ % CONCENTRATION MUST BE PRESCRIBED
- THE FLOW RATE MUST BE PRESCRIBED

INDICATIONS:

- ACUTE RESPIRATORY FAILURE
- ACUTE MYOCARDIAL INFARCTION
- CARDIAC FAILURE
- SHOCK
- HYPERMETABOLIC STATE INDUCED BY TRAUMA, BURNS OR SEPSIS
- ANAEMIA
- CYANIDE POISONING
- DURING CPR
- DURING ANAESTHESIA FOR SURGERY

Oxygen supply

1. **Piped in wall outlets** – at the client's bedside
2. **Portable (Tanks or cylinders)** – for transporting oxygen dependent clients, in home use;



Humidifier

Humidifier – add water vapor to inspired air because Oxygen is a dry gas that dehydrates respiratory mucous membrane

- Prevents mucous membrane from drying and becoming irritated
- Loosens secretions for easier expectoration



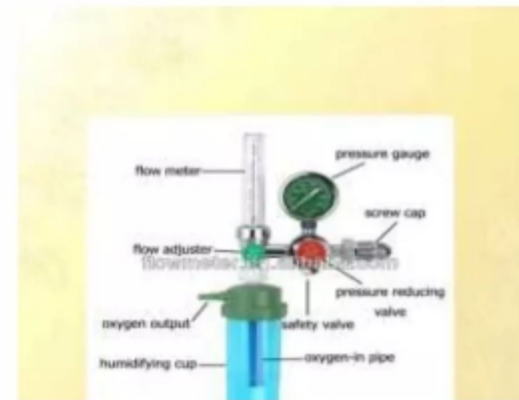
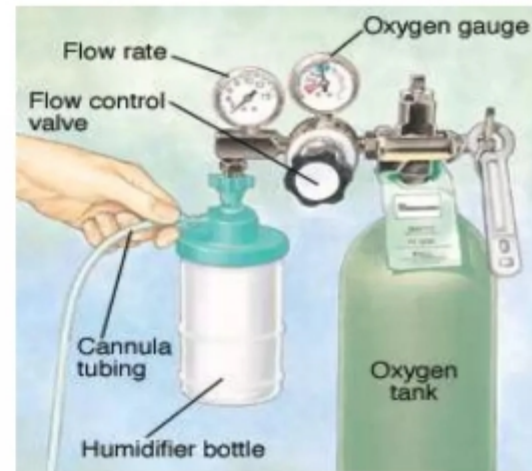
1 Using oxygen cylinders:

The **oxygen** cylinder is delivered with

- **A protective cap** to prevent accidental force against the cylinder outlet.
- **A regulator** To release **oxygen** safely and at a desirable rate, is used.

It consists of two parts.

- ❖ **A reduction gauge** that reduces the pressure to a working level and shows the amount of **oxygen** in the tank.
- ❖ **A flow meter** that regulates the control of **oxygen** in liters per minutes



2- Wall – outlet oxygen:

- The **oxygen** is supplied from a central source through a pipeline.
- Only a **flow meter** and a **humidifier** are required.



Cautions For Oxygen Therapy

- **Oxygen** toxicity – can occur with **FiO₂ > 50%** longer than **48 hrs**
- Suppression of ventilation – will lead to increased **CO₂** and carbon dioxide narcosis
- Danger of fire
- Infection



Classification of Oxygen Delivery Systems

- **Low flow systems**

- Contribute partially to inspired gas client breathes
- Do not provide constant **Fio₂[fraction /percentage of inspired oxygen]**
- Ex: nasal cannula, simple mask , non-re breather mask , Partial rebreather mask

- **High flow systems**

- Deliver specific and constant percent of oxygen independent of client's breathing
- Ex: Venturi mask,, trach collar, T-piece

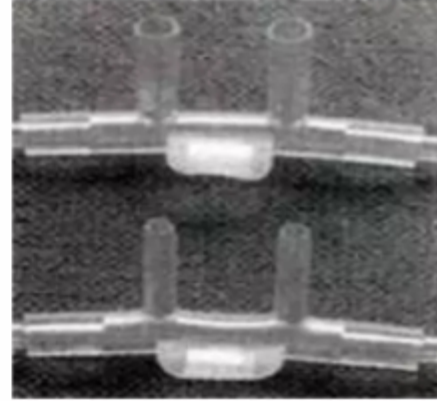
Oxygen Delivery Systems:

1. Nasal Cannula
2. Simple Mask
3. Partial Re-Breather Mask
4. Non-Re Breather Mask (NRBM)
5. Venturi Mask
6. Oxygen Hood
7. Oxygen Tent
8. AMBU Bag
9. Tracheostomy Collar,
10. T-piece

Nasal cannula(NC)



- is a thin tube with two small nozzles that protrude into the patient's nostrils.
- Most common and inexpensive device
- provides oxygen at low flow rates, 2–6 liters per minute (LPM), delivering a concentration of 24–45%.
- allows the patient to continue to talk, eat and drink while still receiving the therapy. [home set up]
- associated with greater overall safe , comfort, and improved oxygenation and respiratory rates than with face mask oxygen.



The simple Oxygen mask

- Simple mask is made of clear, flexible, plastic or rubber that can be molded to fit the face. It is held to the head with elastic bands.
- Some have a metal clip that can be bent over the bridge of the nose for a comfortable fit.
- It delivers 35% to 60% oxygen .A flow rate of 6 to 10 liters per minute.
- It has vents on its sides which allow room air to leak in at many places, thereby diluting the source oxygen



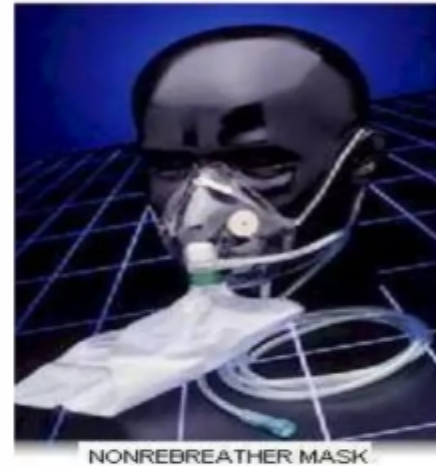
Partial rebreathing mask

- Has a reservoir bag, which increases the provided oxygen rate to 60–90% oxygen at 6 to 10 LPM.
- The mask is have with a reservoir bag must romaine inflated during both inspiration & expiration
- It collection of the first parts of the patients' exhaled air.



The non rebreather mask

- It is similar to the partial rebreather mask except two, one way valve present.
- When the patient exhales air. the **one-way valve** closes and all of the expired air is deposited into the atmosphere, not the reservoir bag.
- In this way, the patient is not rebreathing any of the expired gas.
- This mask provides the highest concentration of oxygen [95-100%] at a flow rate 6-15 L/min



Venturi masks [Air-entrainment masks]

- Has a wide bore tubing and color coded jet adapters (blue adapter – 24% at 4-10 L/ m; green adapter – 35% at 8 lpm)
- The mask is so constructed that there is a constant flow of room air blended with a fixed concentration of **oxygen**
- can accurately deliver a predetermined oxygen concentration to the trachea up to 24 - 50% at 4- 10 L/m .
- Each color code corresponds to a precise **oxygen** concentration and a specific liter flow.



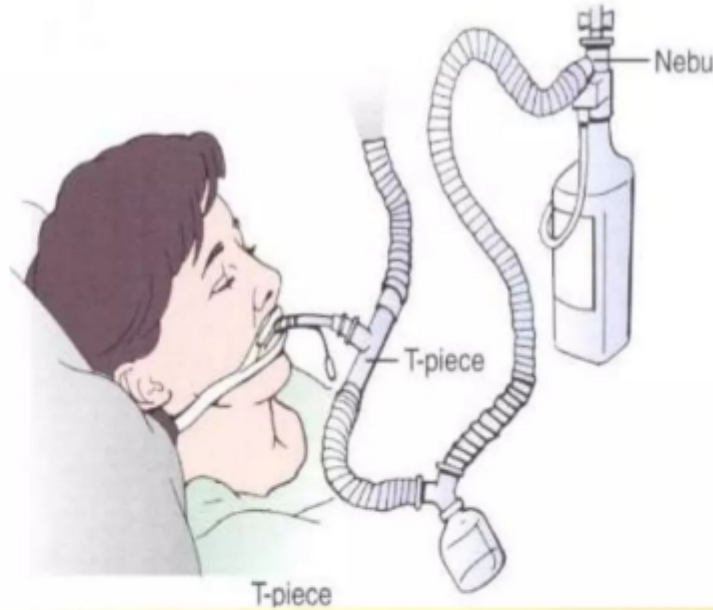
Tracheostomy Collar/ Mask

- Inserted directed into trachea
- Is indicated for chronic o2 therapy need
- O2 flow rate 8 to 10 L/M
- Provides accurate FIO2
- Provides good humidity.
- Comfortable ,more efficient
- Less expensive

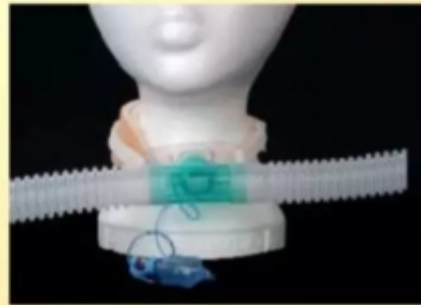


T-piece

- Used on end of ET tube when weaning from ventilator
- Provides accurate **FIO₂**
- Provides good humidity



.....T-PIECE



Any questions?

*Thank
You*

QUIZ

