



اسس العناية المركزة

OXYGEN THERAPY AND NON-INVASIVE VENTILATION L8

Sawa University

College of health and medical techniques

Department of Anesthesia

..... Stage...3

جامعة ساوة الاهلية

كلية التقنيات الصحية والطبية

قسم تقنيات التخدير

.....المرحلة 3....

....محاضرة رقم 8...

Lecture No.8

الجانب العملي

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اختصاص تخدير وعناية مركزة

Oxygen Therapy and NIV



Oxygen is a drug and it doesn't have any substitute.

When appropriately used, it is extremely beneficial When misused or abused, it is potentially harmful

O₂ Therapy : CLINICAL OBJECTIVES

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Correct hypoxemia

cardiovascular effects of hypoxemia

Hypoxemia

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$\text{SPO}_2 < 90\%$ or

$\text{PaO}_2 < 60 \text{ mm Hg}$ on room air

Oxygen Therapy

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TARGET

$\text{SPO}_2 > 94\%$ OR $\text{PaO}_2 > 60 \text{ mm}$

Assessment

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- **Clinical assessment**
- **Monitoring: SpO₂**
(Pulse oximeter)
- **ABG - PaO₂**

Why do we need so many types of O2 Delivery devices?

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- To decide appropriate O2 therapy
- To know the progress of the pt
- To help in the Escalation or Descalation of O2 therapy
- To avoid O2 toxicity
- To avoid the wastage of O2 /optimise use of O2

Oxygen Delivery Devices

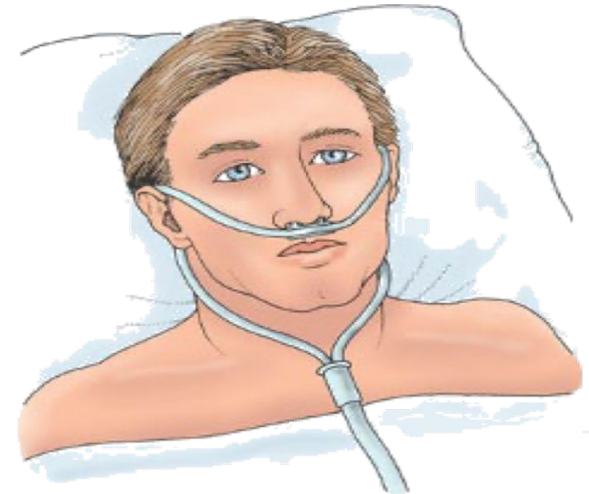
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- **Nasal Prong**
- **Face Mask**
- **Venturi mask**
- **Mask with reservoir bag /Non-rebreathing Mask**
- **High flow nasal Canula (HFNC)**
- **Non-invasive Ventilation (NIV)- BiPAP,CPAP mask**

Nasal cannula

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- Flow rate: 2-4 L/min
- FiO_2 : 24-35%
- Does not prevent eating, drinking and speaking



Face Mask

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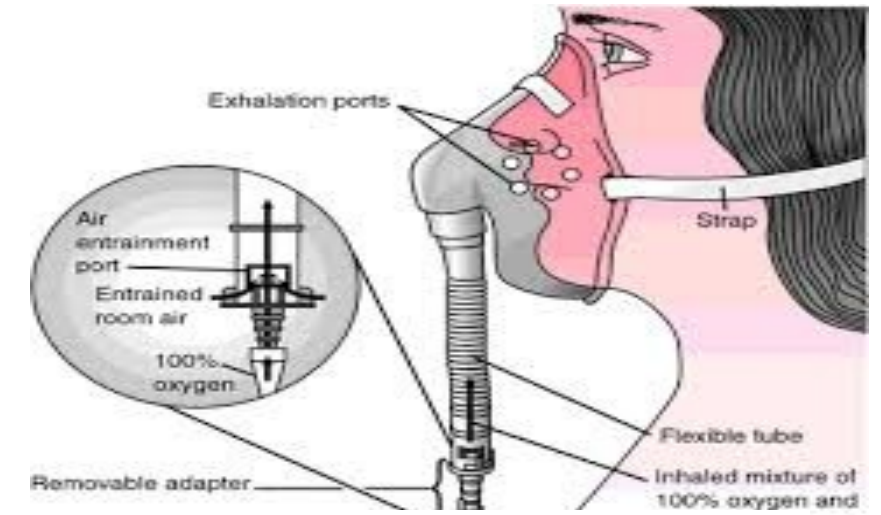
- Flow rate: 5-8 L/min
- FiO_2 : 40-60%
- Has vents
- Never apply less than 5L/min



Venturi Mask

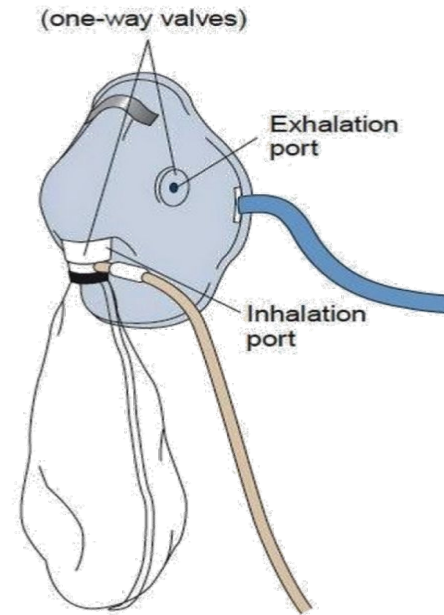
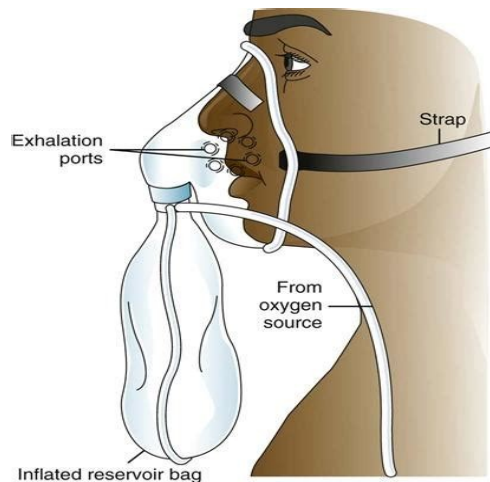
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- Flow rate: 4-12 L/min
- FiO_2 : 24-60%
- Air entrainment port to mix oxygen with room air



Mask with reservoir bag / Non-rebreathing Mask (NRM)

- Offers highest O_2 concentration
- Valves open during expiration and close during inhalation
- 8-12 L/min = 60-90% FiO_2





Non Invasive Ventilation in Children

High Flow Nasal Cannula (HFNC)



Introduction

- High flow:

- 10-60 L/min

- Heated (34-37⁰ C)

- Humidified gas (Air+O₂)

- Nasal cannula:

- Nasal prongs (postero-superior direction)

Indication

- Hypoxemic respiratory failure (Type I RF)

Setting the Device

Starting the Device

Flow: 60 L/ Min

FiO₂: 100%

Temperature: 34-37⁰ C----Every 1-2 hr

Monitoring

Respiration: Rate < 25 per min SPO₂: > 94%

ABG: P/F > 200-300; pCO₂ < 45 mm (Improvement)

Setting the Device

De-escalation

First **Decrease FiO₂** by 5% till 40-50%

F/B Decrease Flow by 5 L/min till 15 L/min

Weaning

After reducing flow to 15 L/min with **FiO₂ < 40%**

Common problems

- Wrong insertion of nasal cannula
- Patient Discomfort:
 - Counsel the patient
 - Apply only few minutes after starting
 - Check flow, temperature, FiO_2
- Low oxygen alarm:
 - Check connection; flowmeter
 - Circuit block/kink
 - Condensate in circuit

Common problems

- Empty Water bag; Empty humidifier chamber
- System failure (E#):
 - Switch off the device for 3-5 minutes and restart
 - Contact engineer

Delivery of BiPAP

- Non Invasive Ventilation delivering machines
- Use of Ventilators

BiPAP Settings

BiPAP; Bi Level Positive Airway Pressures

- PSV; Pressure Support Ventilation; ↑ Tidal Volume; Range 8-18.
- PEEP; Positive End Expiratory Pressure; ↑ Oxygenation; Range 5-10.
- FiO₂; Start with 100, titrate down; Oxygenation
- BPM; Mandatory breaths by ventilator; Range 12-30.



Continuous Positive Airway Pressure (CPAP)

- Delivers one constant air pressure throughout the respiratory breathing cycle (inhalation & exhalation).
- The patient breathes spontaneously at a preset baseline pressure
- The patient controls both the rate and depth of breathing. When the patient's respiratory effort is sensed by flow sensors, flow through the circuit is increased to maintain a stable preset pressure.

CPAP

- Types- Bubble, Flow driver and ventilator
- Essential-
 - Oxygen : Fractional Inspired Oxygen
 - Pressure: Continuous positive airway pressure
 - Warming and Humidification
- Prescription- CPAP 8 CM H2O

O₂ Delivery Devices

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	O ₂ Flow Rate	FiO ₂ Delivered
Nasal Cannula	2-4 L/min	24-35%
Face Mask	5-8 L/min	40-60%
Venturi Mask	4-12 L/min	24-60%
Non-rebreathing Mask	8-12 L/min	60-90%
HFNC	10-60 L/min	40-100%



THANK YOU