Learning Objectives

Students should be able to

- Identify the various Airway management Adjuncts and O2 delivery systems.
- Identify indications for use of O2 therapy.
- Demonstrate knowledge of NIV including indications, contra-indications and possible complications.
Oropharyngeal Airways

- Oropharyngeal airways should be reserved for use in unconscious (unresponsive) patients with no cough or gag reflex.

- Airways may aid in the delivery of adequate ventilation with a bag-mask device by preventing the tongue from occluding the airway.

- Incorrect insertion of an airway can displace the tongue into the hypopharynx, causing airway obstruction.
Oropharyngeal Airways

- The correct size oropharyngeal airway is chosen by measuring against the patient's head (the flange is aligned with the centre of the lips and the tip to the angle of the jaw).

- Adult insertion: insert upside down and rotate 180 degrees
Nasopharyngeal Airways

- Nasopharyngeal airways are useful in patients with airway obstruction or those at risk for development of airway obstruction, particularly when conditions such as a clenched jaw prevent placement of an oral airway.
- Nasopharyngeal airways are better tolerated than oral airways in patients who are not deeply unconscious.
- Airway bleeding can occur in up to 30% of patients following insertion of a nasopharyngeal airway.
Nasopharyngeal Airways

- Case reports of inadvertent intracranial placement of a nasopharyngeal airway in patients with basilar skull fractures suggest that nasopharyngeal airways should be used with caution in patients with severe craniofacial injury.

Laryngeal Mask Airway (LMA)

- The LMA provides a more secure and reliable means of ventilation than the face mask.
- Insertion of the LMA does not require laryngoscopy and visualization of the vocal cords.
Laryngeal Mask Airway

- The LMA may also have advantages over the endotracheal tube
  - when access to the patient is limited,
  - there is a possibility of unstable neck injury
  - or appropriate positioning of the patient for endotracheal intubation is impossible.

(Pennant et al, 1993)
Endotracheal Tubes
Endotracheal Tubes

- The endotracheal tube keeps the airway patent
- permits suctioning of airway secretions, enables delivery of a high concentration of oxygen
- provides an alternative route for the administration of some drugs, facilitates delivery of a selected tidal volume
- with use of a cuff may protect the airway from aspiration

(AHA, 2005)
Suction catheters

- Rigid catheters (yankaur) are used to suction the mouth and oropharynx
  - Insert the catheter to the base of the tongue and apply suction as the catheter is withdrawn.
  - Suction no longer than 10-15 seconds.
Suction Catheter

- Soft or flexible catheters are used to suction the nose and nasopharynx.

- Flexible suctioning is also used to remove secretions from the airway of pts with ET or tracheostomy tubes insitu.
Complications of Suctioning

- Hypoxia
- Vomiting/aspiration
- Trauma to the mucous membranes
- Gagging
Oxygen Therapy

Oxygen is a drug and should always be prescribed.

Prescriptions should identify the following:

- Oxygen delivery system eg nasal cannula, face mask.
- Oxygen percentage
- Duration of therapy
- Monitoring to be undertaken e.g resp rate, colour, pulse oximetry, abg’s.
Oxygen Delivery Systems

Nasal Cannula

- Inspired O2 concentration of 24%-40% depending on flow rate.
- For any given flow rate inspired O2 concentration varies upon rate and depth of pt breaths.
- Maximum flow rate of 6 lpm
- Higher rates cause nasal mucosa drying and may cause epistaxis

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<thead>
<tr>
<th>Flow rate</th>
<th>%O2</th>
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<tr>
<td>1-2 lpm</td>
<td>24-28%</td>
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<tr>
<td>2-4 lpm</td>
<td>28-34%</td>
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<tr>
<td>4-6 lpm</td>
<td>34-40%</td>
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Simple Face Mask

- Minimum oxygen flow rate of ~5 lpm in order to prevent build up of exhaled gas, high in carbon dioxide within the mask.
- Can achieve inspired oxygen concentrations of up to 50-60%

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<tr>
<td>5 lpm</td>
<td>35%</td>
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<tr>
<td>6 lpm</td>
<td>40%</td>
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<tr>
<td>8 lpm</td>
<td>50%</td>
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Venturi Masks

- The inspired oxygen concentration with these masks is determined by the oxygen flow rate and not the patients rate and depth of breathing

- A constant inspired concentration throughout the respiratory cycle is maintained by high flow rate.

- Interchangeable venturi heads are available for different O2 concentrations
Non-rebreathing masks

- These are similar to the simple face mask but have a reservoir bag attached and one or two valves over the exhalation ports.

- The valves stop exhaled gases from entering the reservoir bag and limit intrainment of room air.

- This permits inspired oxygen concentration of >60% (often close to 100%)
How to use Non-rebreather

1. Attach tubing to a flowmeter and set flow rate to 15lpm.

2. Occlude the valve between the oxygen reservoir and the mask. This allows the reservoir to fill.

3. Squeeze the reservoir to test patency of the valve. If the bag will not empty discard the mask and use another.

4. Repeat stage 2.

5. Place mask on patients face, using as tight a fit as possible.
Humidification

– When longer term oxygen therapy is required, humidification is necessary, especially for patients with sputum retention or who are mouth breathing.

– Effective humidification requires a wide bore delivery system:
“Blue bloaters” rely on certain lack of oxygen for desire to breathe.

- Desirable to keep sats 90% and/or Po2 7.5-8 (this ensures that brain kidneys and other vital organs are protected).
- Adjust flow rate and constantly monitor.
- Use venturi mask.
- If oxygen level only achieved with dangerous rise in CO2 – try respiratory stimulants, ventilation.
Non Invasive Ventilation (NIV)

The delivery of mechanically assisted breaths without placement of an artificial airway

**TYPES:**

- **Continuous Positive Airway Pressure (CPAP)** is the maintenance of positive pressure throughout the whole respiratory cycle when the patient is breathing spontaneously.

- **BIPAP:** Provides two levels of pressure
  - IPAP – Inspiratory Pressure
  - EPAP – Expiratory Pressure
When is NIV used?

**Indications for CPAP**
- Sleep Apnoea
- Obesity
- Hypoventilation
- Cardiogenic Pulmonary oedema

**Indications for BIPAP**
- Acute exacerbations of COPD
- Post-op atelectasis
- Hypoxic Respiration Failure
- Weaning from mechanical ventilation
- ARDS
Criteria for NIV

- Respiratory distress
  - Moderate to severe dyspnoea
  - Use of accessory muscles
- Respiratory rate > 25 bpm
- pH < 7.35
- PaCO2 > 6 kPa
NIV Contraindications

- Respiratory arrest
- Unconsciousness
- Pneumothorax or susceptibility to pneumothorax.
- Uncooperative patient
- Rib fractures
- Cardiorespiratory instability
  - Hypotension
  - Arrythmia
  - MI
  - Extreme anxiety
Contraindications Cont’d

- Fixed anatomical abnormalities of the nasopharynx
- Recent facial, oesophageal or gastric surgery
- Active gastric bleed
- Inability to protect airway, aspiration risk or risk of vomiting
Complications

- Gastric distension/aspiration
- Barotrauma
- Increased intrathoracic pressure
- Discomfort/Intolerance
- Eye irritation
- Sinus pain/Nasal congestion
- Increased confusion or agitation
TB The Facts - Worldwide

- Remains an epidemic in much of the world
- 1 in 3 people get infected worldwide
- 3 million deaths yearly
- Left untreated each person with Active TB will infect 10 -15 people every year
- Someone in the world is newly infected with TB every second
The Facts Ireland

- 7000 cases of TB in Ireland in 1950’s

2003 data.

- 407 cases in Ireland
- Highest rates in 65 years
- 74% Irish born
- Outcome – 264 completed treatment, 32 died (6 due to the TB).
What is TB?

- Disease caused by Mycobacterium – tuberculosis, africanum bovis
- Usually effects lungs but can effect glands, bones, brain, kidney, spine
- Notifiable disease
- Infectious (open/smear positive/active)
- Non-infectious (closed/smear negative)
- Latent TB (dormant)
References


References


References


With thanks to Bettina Korn (Respiratory Nurse Specialist) and Dr Finbar O’ Connell (Consultant Respiratory Physician) for their assistance.