EdWISE

Assessment and Support of Breathing in the Emergency Department

For on site tutorials as part of the remote simulation program

Airway module A2

(last reviewed Oct 2012)

This project was possible due to funding made available by Health Workforce Australia

HealthWorkforce AUSTRALIA

An Australian Government Initiative

NSW GOVERNMENT Health

Sydney Clinical Skills and Simulation Centre

HETI HEALTH EDUCATION & TRAINING INSTITUTE

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Sponsor

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Introductions

General Aims

- Learn in a team setting
- Blend clinical skills with team skills
- Reflect critically on practice

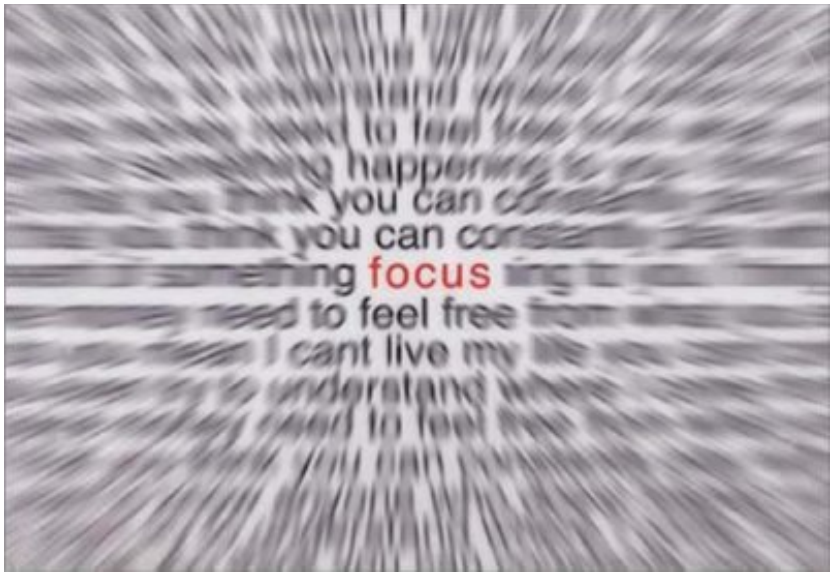
Ground Rules

- Participation
- Privacy
- Confidentiality
- Disclaimer
- Debriefing
- Mobile phones

Objectives

- Review the structured approach to assessment of airway and breathing
- Identify compromised breathing
- Use oxygen delivery systems appropriately
- Practice bag valve mask ventilation (BMV)
- Practice and discuss the use of laryngeal masks when BMV ineffective

Patients don't die from failure to intubate……they die from failure to oxygenate.



DON'T GET FIXATED ON THE PLASTIC

Emergency Department Airways

Assessment

- ❑ History
- ❑ Examination
  - ❑ Look
  - ❑ Listen
  - ❑ Feel
- ❑ Difficulty
  - ❑ B.O.O.T.S
  - ❑ L.E.M.O.N
- ❑ Available Skills

Management Options

- ❑ Simple airway maneuvers
- ❑ Nasal Prongs
- ❑ Oxygen Masks – variable and fixed
- ❑ Airway Adjuncts
- ❑ Bag Valve Masks
- ❑ Non-Invasive Ventilation
- ❑ Laryngeal Masks
- ❑ Intubation
- ❑ Surgical Airway

Oxygen Delivery Systems

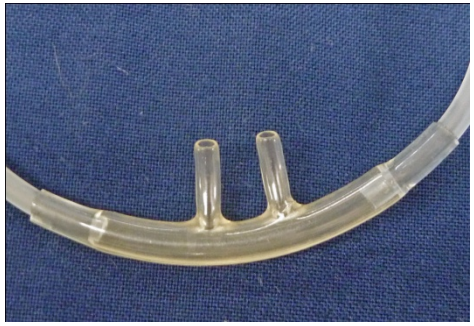
Variable

- FiO2 is unknown and determined by the inspiratory flow rate
- The more dyspnoeic the patient is, the higher their inspiratory flow rate
- The more air they will entrain resulting in lower FiO2

Fixed

- FiO2 is known
- Due to venturi principle
- Useful when low FiO2 required (COPD)
- In very dyspnoeic patients with very high inspiratory flow rates, will become variable systems

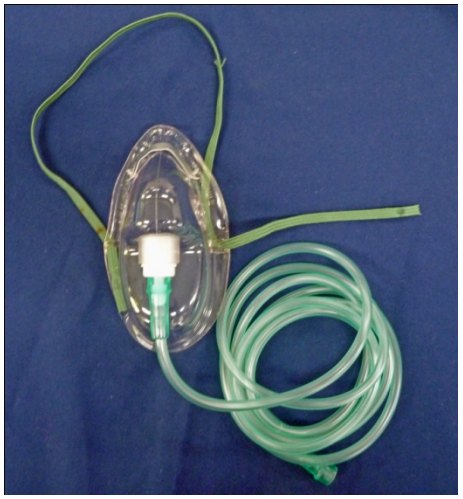
Nasal cannulae

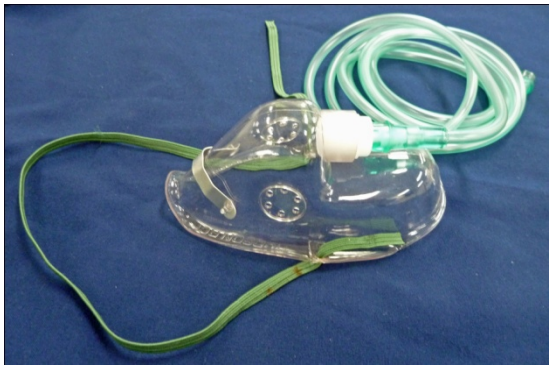


- Apply 02 at 1-4l/min.
- Uses dead space of nasopharynx as a reservoir of oxygen
- Delivered Fi02 not known
- At high flows the nasopharyngeal mucosa quickly drys
- Should be used as an adjunct for intubation

Hudson face mask

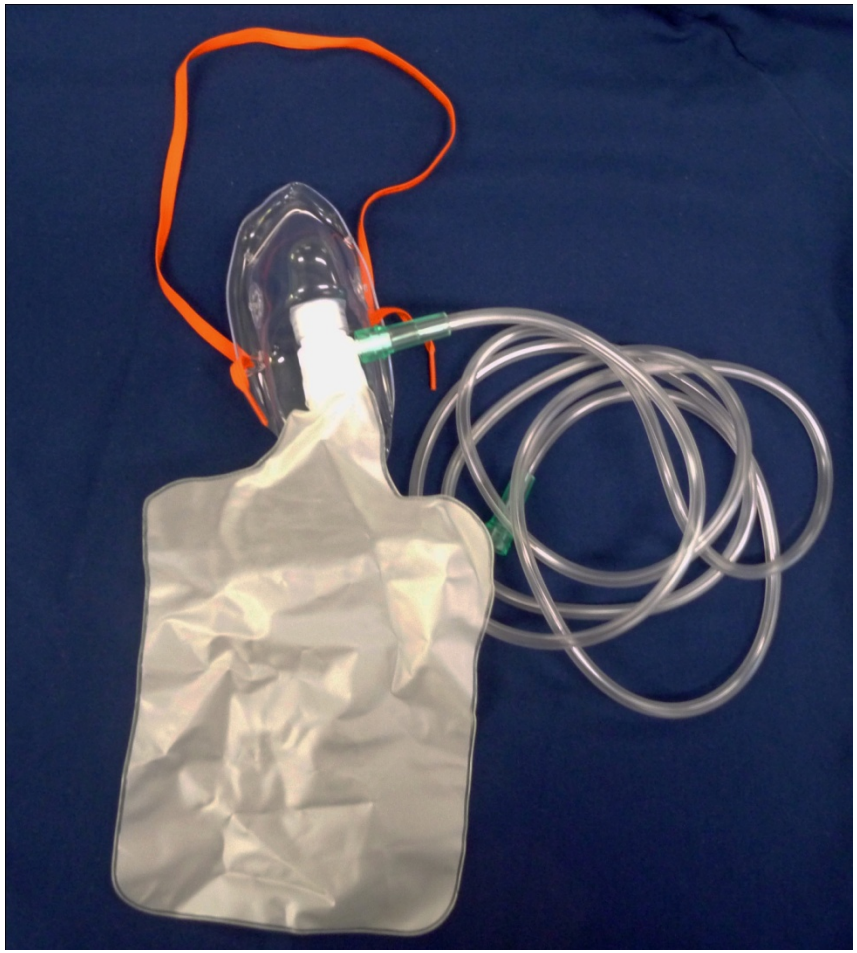
- Clear mask covering the nose and mouth, elastic head strap, oxygen tubing.
- Apply 02 at 6-10l/min.
- On the side of the mask are a series of perforated holes which entrain air if the patients inspiratory flow exceeds the wall oxygen flow.
- Simple to attach. (Variable 02 delivery)





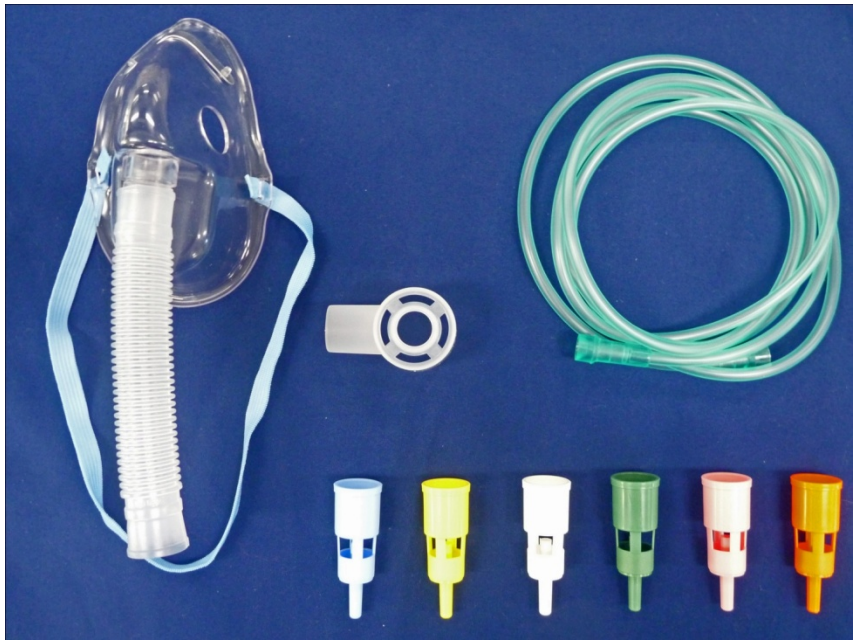
Non rebreathing mask

- Similar face mask to the "Hudson" mask.
- Additional reservoir bag with 1-2 valves which direct wall oxygen to the reservoir bag.
- During inspiration a disc valve allows the patient to breathe from the reservoir bag.
- The valve stops expired air going back into the reservoir bag but a second valve allows the expired air to escape back into the atmosphere.
- Typical Fi02 delivered 50%-80%.



Fixed delivery systems
Venturi mask

- A Venturi valve exists between the oxygen supply and the mask.
- The jet creates pressure which entrains surrounding room air. The size of the valve determines the amount of room air entrained and therefore the Fi02.
- The colour coded valves are available for FiO2 of 24%, 28%, 31%, 35%, 40%, 50%

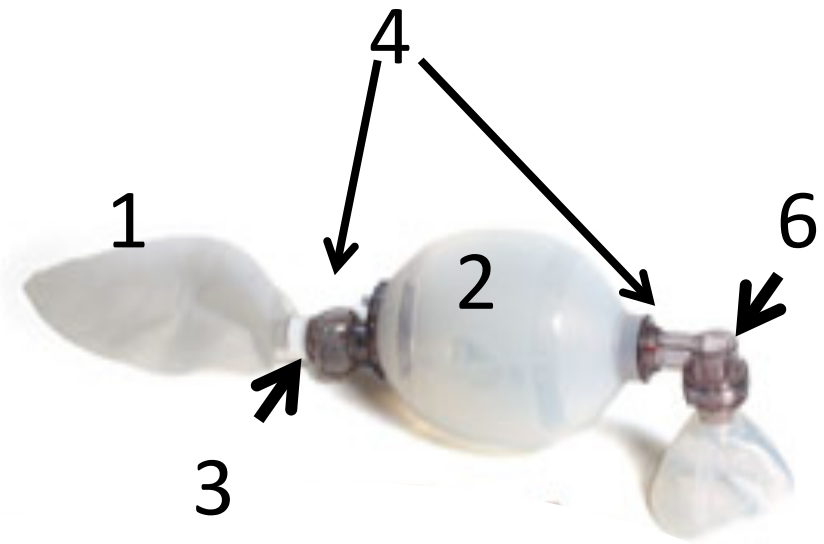


Bag Mask Ventilation

- Simplest way to oxygenate patient in resp difficulty
- Provides up to 100% O2 (with reservoir bag and good seal)
- Relies on simple airway manoeuvres…patient positioningis of prime importance

Self inflating bag

1 Reservoir bag
2 Self inflating bag
3 O2 port for supplemental O2
4 One way valves *
5 Mask
6 Pop-off valve



Bag Mask Ventilation

- **Indications**
  - Apnoea
  - Inadequate respiratory rate
  - Inadequate respiratory effort
  - Pre-Oxygenation

Bag-Valve mask Ventilation

- Equipment check
- Position
- Seal
- Oxygenation and ventilation
  - Pink patient / Chest up and down
- Troubleshooting
  - One vs Two operators

How do you know if you are ventilating adequately?

Look

for chest expansion and make sure the stomach is not distending

for waveform capnography

at the skin colour of the patient

Listen

for the pulse oximeter

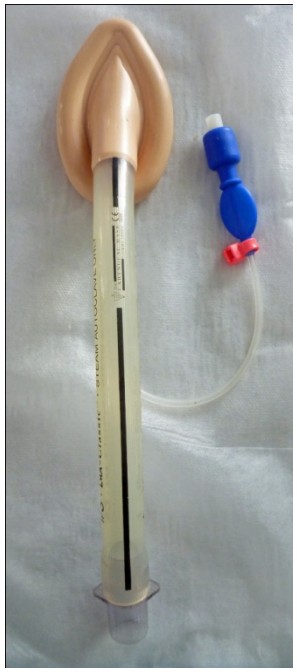
for any oxygen leak around the mask

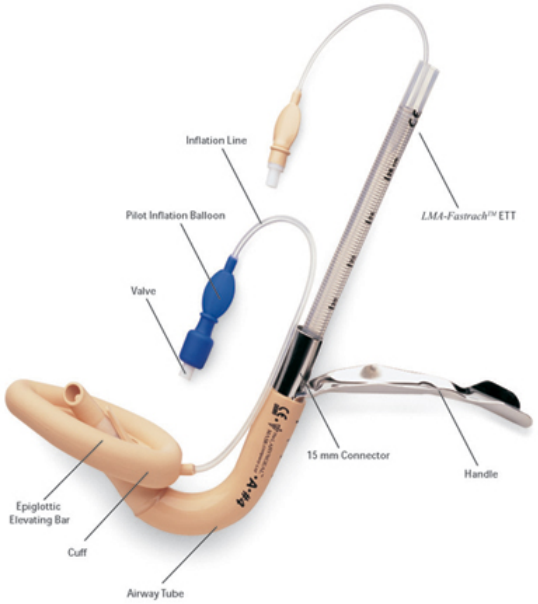
Feel

the compliance of the self inflating bag

for escaping air around the mask

Laryngeal mask airway (LMA)





Scenario

- Kate, 45 year old woman
- Found by her daughter this morning, unconscious. We believe she has consumed 60 2mg alprazolam and there was also 3 empty bottles of wine by her beside.
- Her GCS is 3, and she is saturating only 89%.
- She has left a suicide note.

Scenario

- I – Billy Connolly is a 65 year-old man who smells very intoxicated.
- M – Found on the side of the road, possible unwitnessed pedestrian hit and run.
- I – Head injury, Multiple abrasions, possible C-spine injury.
- S – He was combative to start with and now he is GCS 8 or 9. Sats about 95-97% via Hudson mask. Respiratory rate 22, BP 140/60 and HR 100 regular. He had been talking and now is only groaning.
- T – Cervical collar in situ, One cannulae, 10mg maxalon, 5mg morphine.
- AMB – Billy is well known to the Emergency department staff as he previously presented with an upper airway obstruction and had a surgical airway performed in theatre by ENT.
- O – The road where Billy was found has a speed limit of 80km/hr.

Summary

- Assessment of the airway is the first step
- Use of the BVM can be supported by simple manoeuvers and adjuncts.
- Re-assessment of adequacy of ventilation is essential in review response
- The LMA can be used as a primary or rescue device

References and Further Reading

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