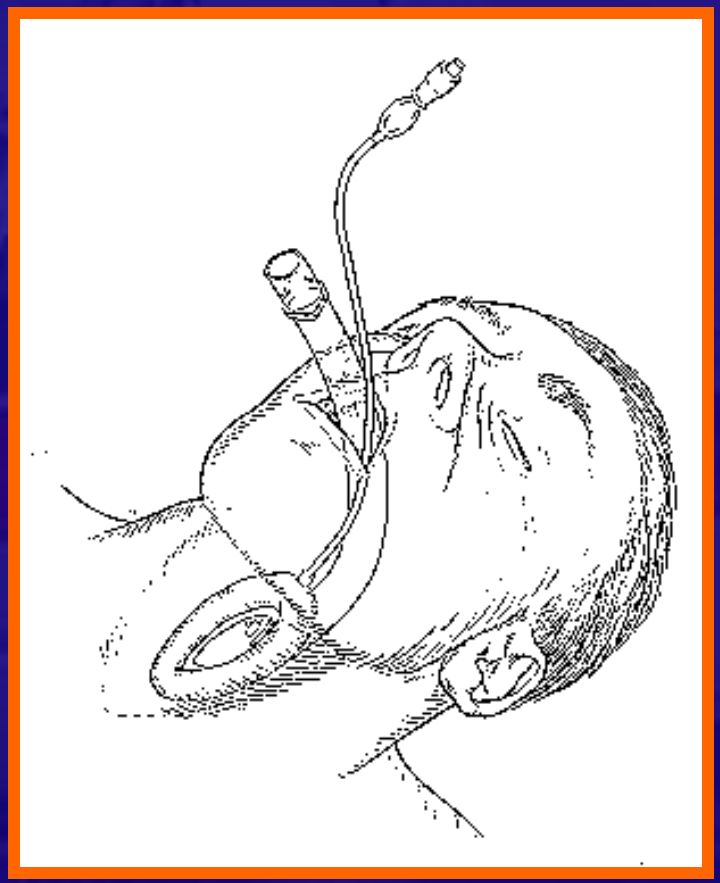
Laryngeal Mask Airways (LMA),

Indications and Use for the Pre-Hospital Provider

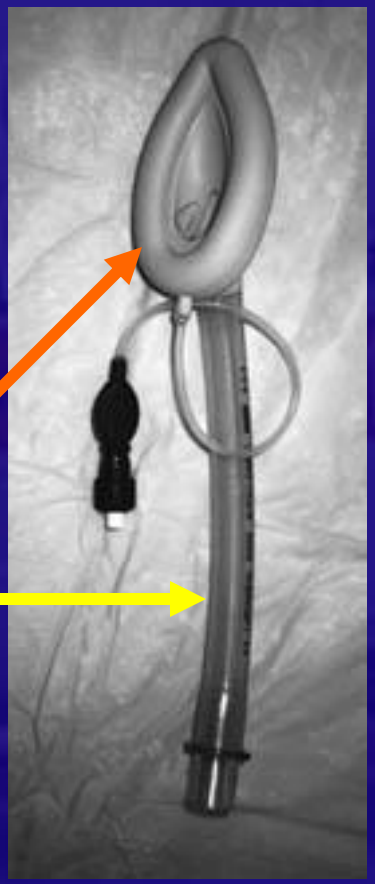


Objectives:

- Identify the indications, contraindications and side effects of LMA use.
- Identify the equipment necessary for the placement of an LMA.
- Discuss the steps necessary to prepare for LMA placement.
- Discuss the methods of LMA placement.
- Identify and discuss problems associated with LMA placement.

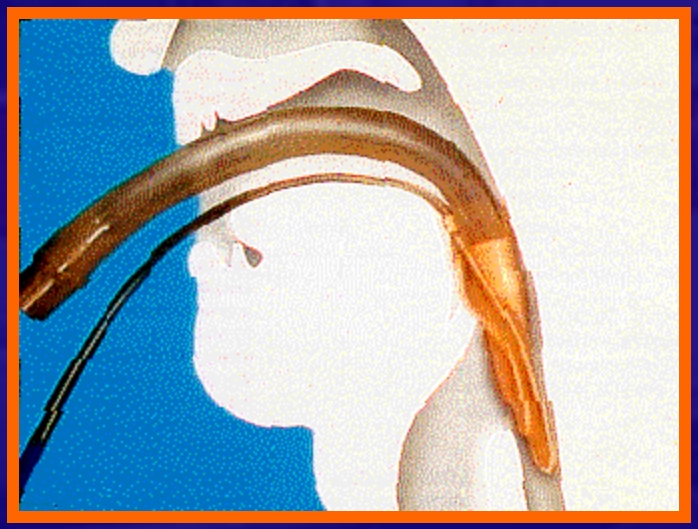
Introduction

- The LMA was invented by Dr. Archie Brain at the London Hospital, Whitechapel in 1981
- The LMA consists of two parts:
  - The mask
  - The tube
- The LMA has proven to be very effective in the management of airway crisis



Introduction continued

- The LMA design:
  - Provides an "oval seal around the laryngeal inlet" once the LMA is inserted and the cuff inflated.
  - Once inserted, it lies at the crossroads of the digestive and respiratory tracts.



Indications for the use of the LMA

- Situations involving a difficult mask (BVM) fit.
- May be used as a back-up device where endotracheal intubation is not successful.
- May be used as a "second-last-ditch" airway where a surgical airway is the only remaining option.

Contraindications of the LMA

- Greater than 14 to 16 weeks pregnant
- Patients with multiple or massive injury
- Massive thoracic injury
- Massive maxillofacial trauma
- Patients at risk of aspiration
- NOTE: Not all contraindications are absolute

Side-Effects of the LMA

- Throat soreness
- Dryness of the throat and/or mucosa
- Side effects due to improper placement vary based on the nature of the placement

Equipment for LMA Insertion

- Body Substance Isolation equipment
- Appropriate size LMA
- Syringe with appropriate volume for LMA cuff inflation
- Water soluble lubricant
- Ventilation equipment
- Stethoscope
- Tape or other device(s) to secure LMA

Preparation of the LMA for Insertion

- Step 1: Size selection
- Step 2: Examination of the LMA
- Step 3: Check deflation and inflation of the cuff
- Step 4: Lubrication of the LMA
- Step 5: Position the Airway

Step 1: Size Selection

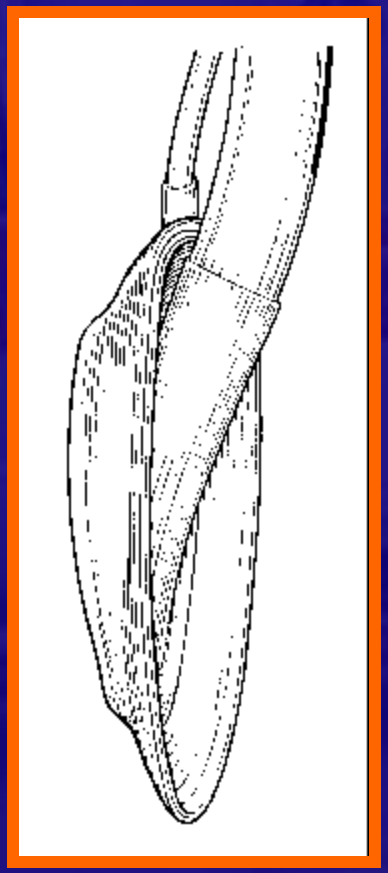
- Verify that the size of the LMA is correct for the patient
- Recommended Size guidelines:
  - Size 1: under 5 kg
  - Size 1.5: 5 to 10 kg
  - Size 2: 10 to 20 kg
  - Size 2.5: 20 to 30 kg
  - Size 3: 30 kg to small adult
  - Size 4: adult
  - Size 5: Large adult/poor seal with size 4

Step 2: Examination of the LMA

- Visually inspect the LMA cuff for tears or other abnormalities
- Inspect the tube to ensure that it is free of blockage or loose particles
- Deflate the cuff to ensure that it will maintain a vacuum
- Inflate the cuff to ensure that it does not leak

Step 3: Deflation and Inflation of the LMA

- Slowly deflate the cuff to form a smooth flat wedge shape which will pass easily around the back of the tongue and behind the epiglottis.
- During inflation the maximum air in cuff should not exceed:
  - Size 1: 4 ml
  - Size 1.5: 7 ml
  - Size 2: 10 ml
  - Size 2.5: 14 ml
  - Size 3: 20 ml
  - Size 4: 30 ml
  - Size 5: 40 ml



Step 4: Lubrication of the LMA

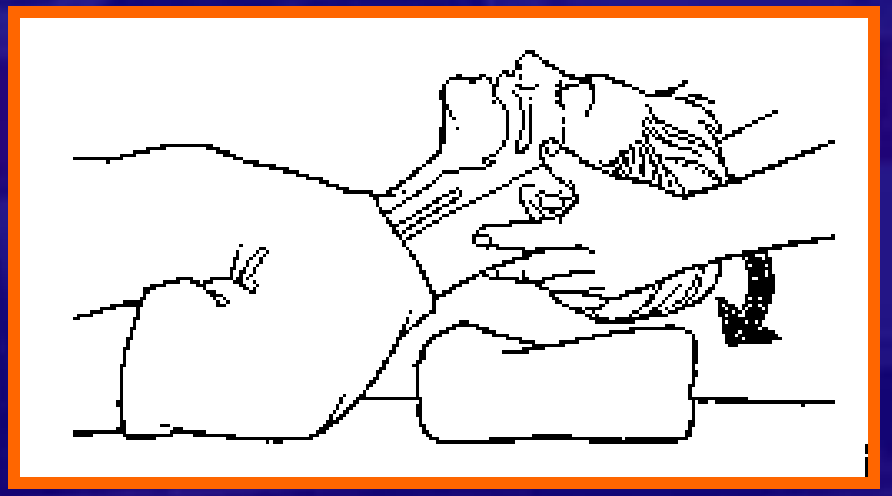
- Use a water soluble lubricant to lubricate the LMA
- Only lubricate the LMA just prior to insertion
- Lubricate the back of the mask thoroughly

Important Notice:

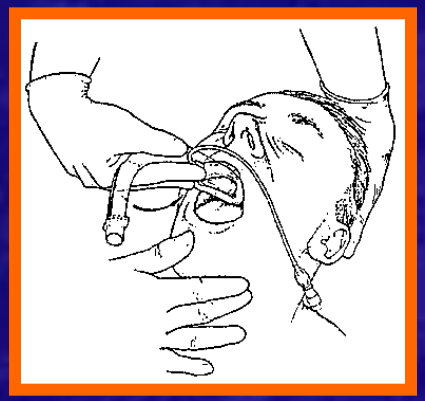
- Avoid excessive amounts of lubricant
  - on the anterior surface of the cuff or
  - in the bowl of the mask.
- Inhalation of the lubricant following placement may result in coughing or obstruction.

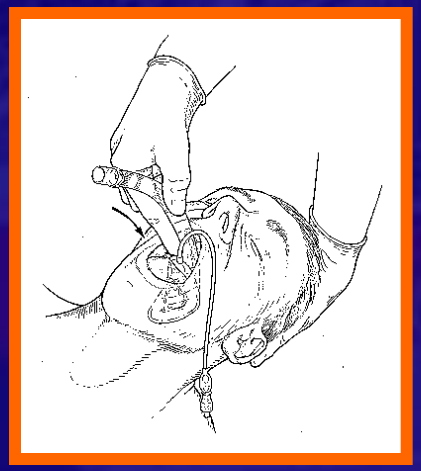
Step 5: Positioning of the Airway

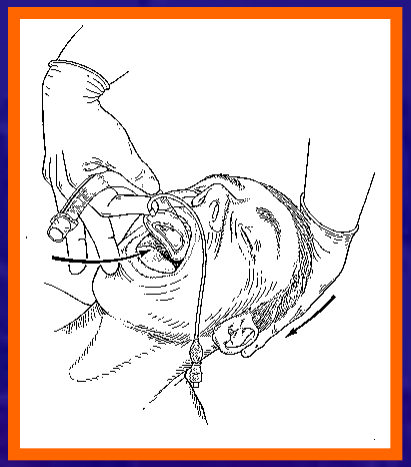
- Extend the head and flex the neck
- Avoid LMA fold over:
  - Assistant pulls the lower jaw downwards.
  - Visualize the posterior oral airway.
  - Ensure that the LMA is not folding over in the oral cavity as it is inserted.

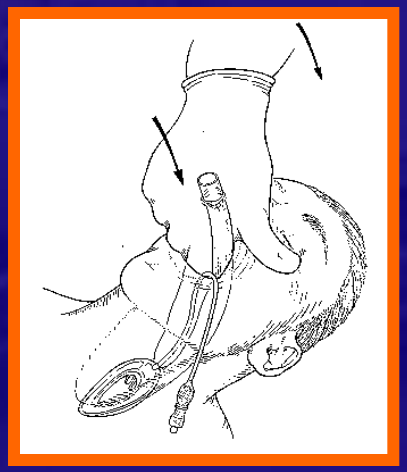


LMA
Insertion Technique





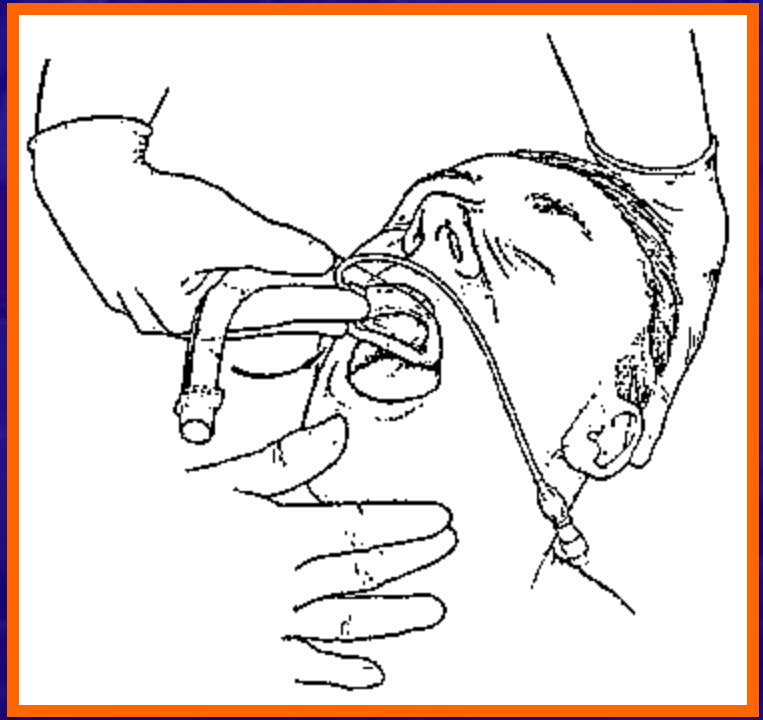




LMA Insertion

Step 1

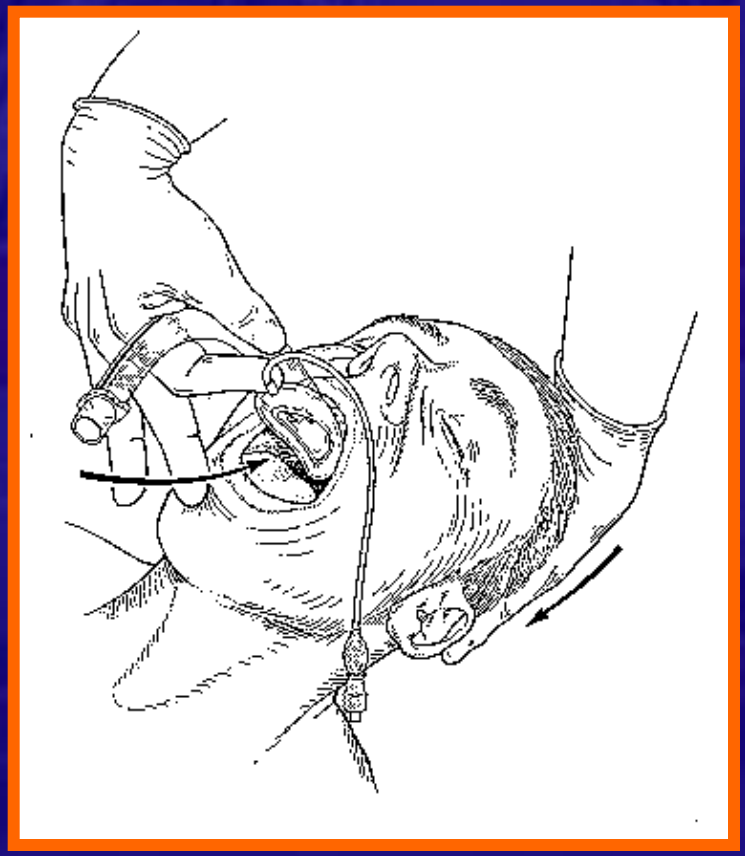
- Grasp the LMA by the tube, holding it like a pen as near as possible to the mask end.
- Place the tip of the LMA against the inner surface of the patient's upper teeth



LMA Insertion

Step 2

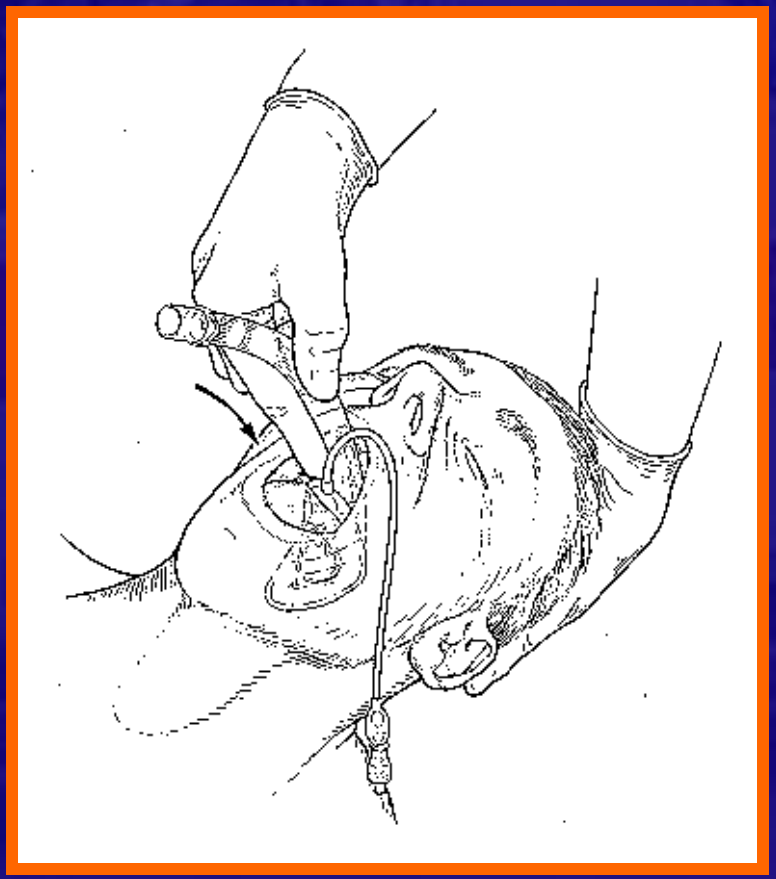
- Under direct vision:
  - Press the mask tip upwards against the hard palate to flatten it out.
  - Using the index finger, keep pressing upwards as you advance the mask into the pharynx to ensure the tip remains flattened and avoids the tongue.



LMA Insertion

Step 3

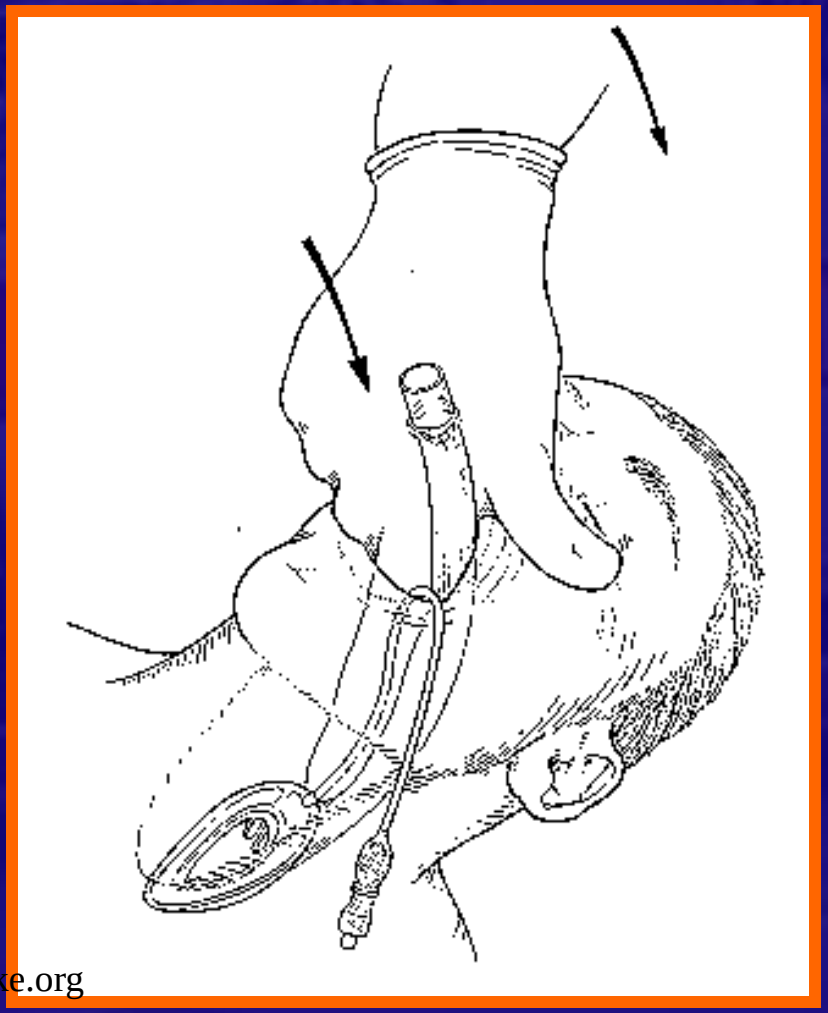
- Keep the neck flexed and head extended:
  - Press the mask into the posterior pharyngeal wall using the index finger.



LMA Insertion

Step 4

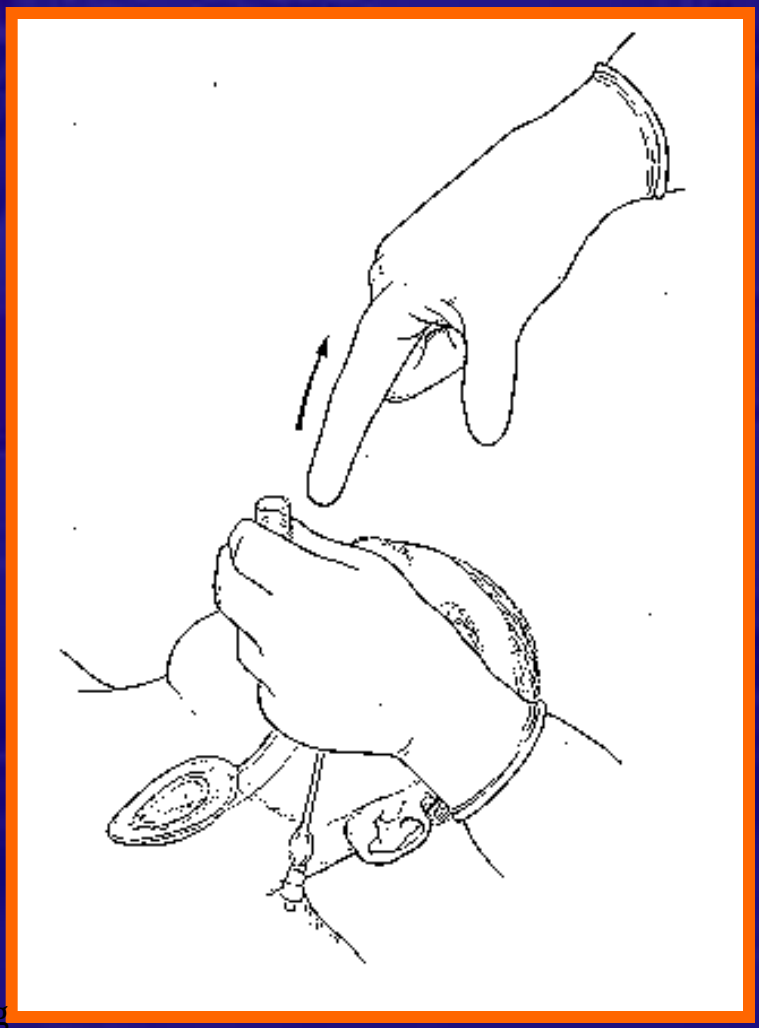
- Continue pushing with your index finger.
  - Guide the mask downward into position.



LMA Insertion

Step 5

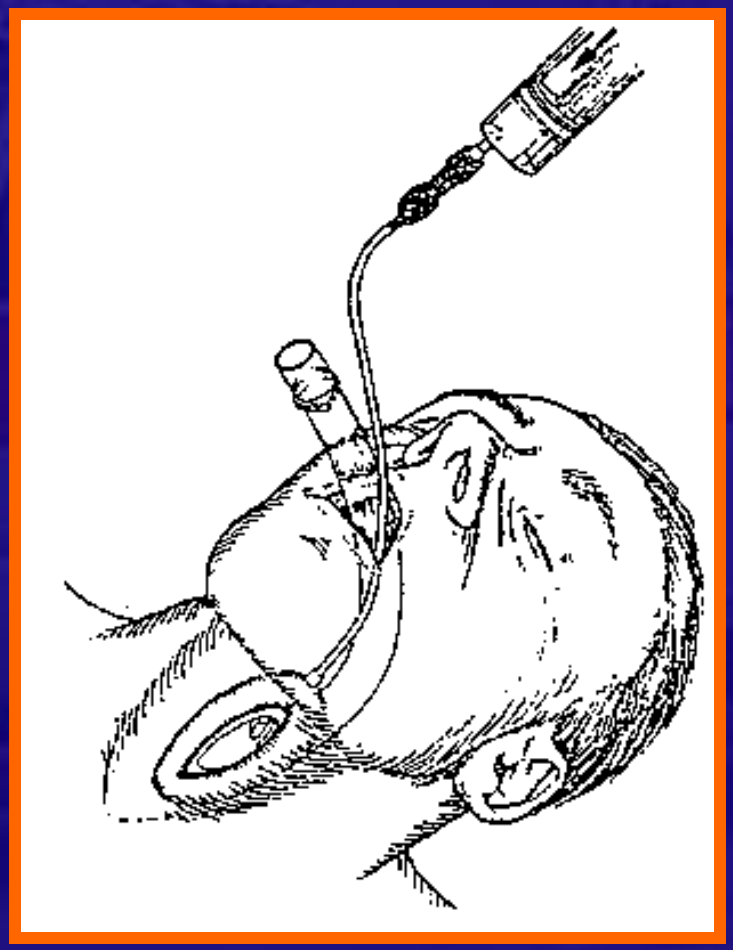
- Grasp the tube firmly with the other hand
  - then withdraw your index finger from the pharynx.
  - Press gently downward with your other hand to ensure the mask is fully inserted.



LMA Insertion

Step 6

- Inflate the mask with the recommended volume of air.
- Do not over-inflate the LMA.
- Do not touch the LMA tube while it is being inflated unless the position is obviously unstable.
  - Normally the mask should be allowed to rise up slightly out of the hypopharynx as it is inflated to find its correct position.



Verify Placement of the LMA

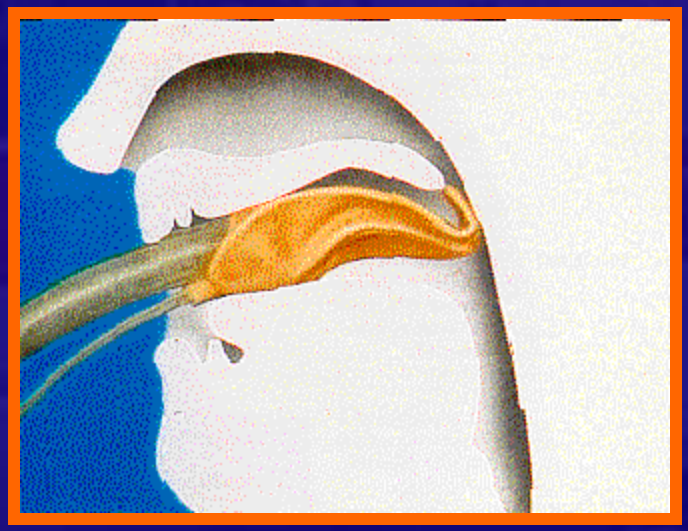
- Connect the LMA to a Bag-Valve Mask device or low pressure ventilator
- Ventilate the patient while confirming equal breath sounds over both lungs in all fields and the absence of ventilatory sounds over the epigastrium

Securing the LMA

- Insert a bite-block or roll of gauze to prevent occlusion of the tube should the patient bite down.
- Now the LMA can be secured utilizing the same techniques as those employed in the securing of an endotracheal tube.

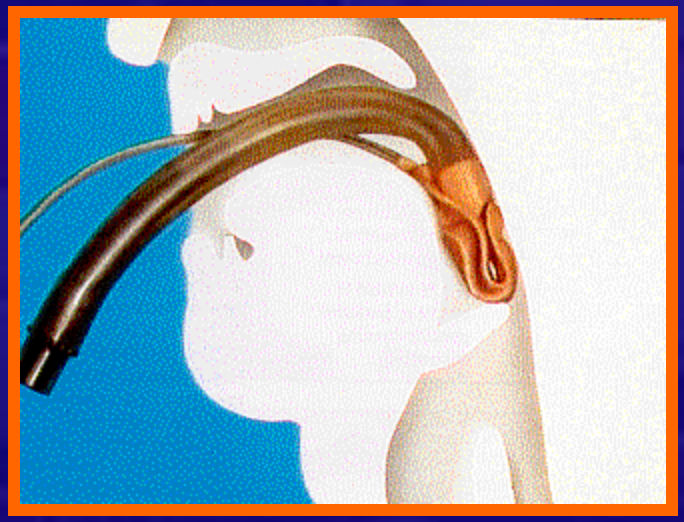
Problems with LMA Insertion

- Failure to press the deflated mask up against the hard palate or inadequate lubrication or deflation can cause the mask tip to fold back on itself.



Problems with LMA Insertion

- Once the mask tip has started to fold over, this may progress, pushing the epiglottis into its down-folded position causing mechanical obstruction



Problems with LMA Insertion

- If the mask tip is deflated forward it can push down the epiglottis causing obstruction
- If the mask is inadequately deflated it may either
  - push down the epiglottis
  - penetrate the glottis.