Pre-hospital Airway Devices
Appendix

Objectives:

1) Discuss the different types of pre-hospital airway devices
2) Provide the appropriate steps to confirm proper placement of these devices
3) Establish guidelines for managing these airway devices once in a hospital setting

LMA (Laryngeal Mask Airway)

An LMA is an extraglottic airway device made of polyvinyl chloride or silicone that is available in six different sizes. This range of sizes is custom to fit infant to adult patients. This device has an elliptical mask which has a cuff, a pilot tube, and balloon to inflate the cuff and maintain intracuff pressure. The mask is attached to a ventilation tube with a 15-mm adapter on the proximal end. At the junction of the ventilation tube and the mask, there are two bars to prevent the epiglottis from obstructing the ventilating lumen. These are known as aperture bars.

When properly placed, the LMA airway tip lies against the cricopharyngeus muscle at the top of the esophagus. Positive pressure ventilation through an LMA can only be achieved if there is an adequate airway seal. In order to confirm proper placement of LMA, the leak pressure must be quantified.

Three Techniques to evaluate leak pressure (proper placement)

1) Provide increased positive pressure through the device and listen for an audible leak at the patient’s mouth and during auscultation lateral to the thyroid cartilage
2) Use intraoral capnography to detect leakage of CO2 from around the device at a given pressure
3) Use manometry to measure the pressure at equilibrium with the leak

**Esophageal Tracheal Combitube**

Based on the earlier esophageal obturator devices, the Combitube is commonly used in prehospital airway management. It has a double-lumen and double cuff with separate pilot balloons for the proximal and distal cuffs, therefore, ventilation can be established whether it enters the esophagus or the trachea. Lumen #1 is blue and ends in small fenestrations between the proximal and distal cuffs, while lumen #2 is clear and terminates at the distal end of the device. The Combitube may be placed blindly or with the aid of direct visualization using a rigid laryngoscope.

**Confirmation of proper placement (“Eeny, meeny, miny, moe”)**

First, auscultate for lung sounds during ventilation of lumen #1, if there are no lung sounds and/or gastric insufflation during ventilation, ventilation should be switched to lumen #2. If proper ventilation is still not obtained, the Combitube may need to be pulled back with reassessment of ventilation through each lumen.

**Laryngeal Tube (King Tube)**

The King Tube is a slightly curved silicone extraglottic airway device with a single inflation line for both cuffs. The distal cuff seals the esophagus and the proximal cuff seals the hypopharynx. This allows for ventilation of the larynx through the ventilating lumen between the cuffs. Since the King Tube’s ventilating lumen is large enough to pass a tube exchanger, bougie, or flexible bronchoscope, it can also serve as an adjunct to tracheal intubation.
Confirmation of proper placement

If available, capnometry should be used to confirm proper placement in conjunction with auscultation of breath sounds during ventilation.

Endotracheal Tube (ET Tube)

An ET Tube is an airway device that is usually made from polyvinyl chloride or silicone-latex rubber. The majority of these tubes have inflatable cuffs to seal the trachea against air leakage and aspiration of gastric contents as well as other fluids. In the pediatric population, uncuffed tubes are available. This airway devices comes in a wide range sizes to accommodate patients from infancy to adulthood. ET Tubes are placed through the vocal cords into the trachea using rigid laryngoscopy. Proper placement establishes and maintains a patent airway as well as providing adequate gas exchange.
Confirmation of proper placement (4 steps)

1) Visualization of ET tube transcending the vocal cords
2) Colorimetric CO2 monitoring (capnometry) – single measurement of CO2
3) Auscultation for bilateral breath sounds over lung fields
4) Continuous CO2 detection with a waveform (Capnography) – if available