

Emergency

Care and Transportation of the Sick and Injured



Section 8: ALS Techniques

39: Advanced Airway Management

Cognitive Objectives (1 of 5)

- 8-1.1 Identify and describe the airway anatomy in the infant, child, and the adult.
- 8-1.3 Explain the pathophysiology of airway compromise.
- 8-1.4 Describe the proper use of airway adjuncts.
- 8-1.5 Review the use of oxygen therapy in airway management.

Cognitive Objectives (2 of 5)

- 8-1.6 Describe the indications, contraindications, and techniques for insertion of nasal gastric tubes.
- 8-1.7 Describe how to perform the Sellick maneuver (cricoid pressure).
- 8-1.8 Describe the indications for advanced airway management.

Cognitive Objectives (3 of 5)

- 8-1.9 List the equipment required for orotracheal intubation.
- 8-1.10 Describe the proper use of the curved blade for orotracheal intubation.
- 8-1.11 Describe the proper use of the straight blade for orotracheal intubation.
- 8-1.12 State the reasons for and proper use of the stylet for orotracheal intubation.

Cognitive Objectives (4 of 5)

- 8-1.13 Describe the methods of choosing the appropriate size endotracheal tube in an adult patient.
- 8-1.14 State the formula for sizing an infant or child endotracheal tube.
- 8-1.15 List complications associated with advanced airway management.
- 8-1.17 Describe the skill of orotracheal intubation in the adult patient.

Cognitive Objectives (5 of 5)

- 8-1.18 Describe the skill of orotracheal intubation in the infant and child patient.
- 8-1.19 Describe the skill of confirming endotracheal tube placement in the adult, infant, and child patient.
- 8-1.20 State the consequences of and the need to recognize unintentional esophageal intubation.
- 8-1.21 Describe the skill of securing the endotracheal tube in the adult, infant, and child patient.

Affective Objectives (1 of 2)

- 8-1.22 Recognize and respect the feelings of the patient and family during advanced airway procedures.
- 8-1.23 Explain the value of performing advanced airway procedures.
- 8-1.24 Defend the need for the EMT-B to perform advanced airway procedures.
- 8-1.25 Explain the rationale for the use of a stylet.

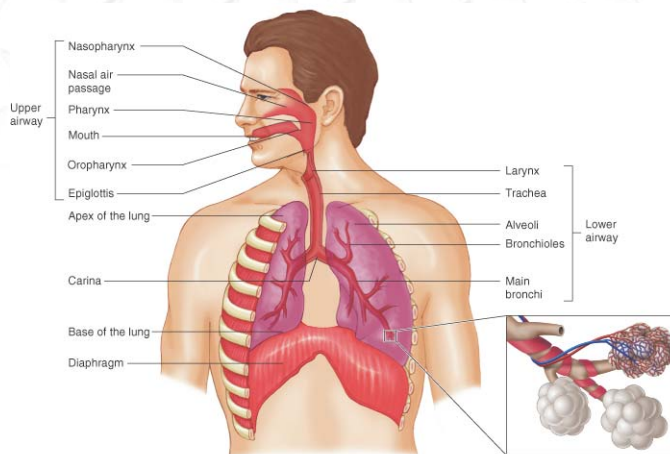
Affective Objectives (2 of 2)

- 8-1.26 Explain the rationale for having a suction unit immediately available during intubation attempts.
- 8-1.27 Explain the rationale for confirming breath sounds.
- 8-1.28 Explain the rationale for securing the endotracheal tube.

Psychomotor Objectives

- 8-1.29 Demonstrate how to perform the Sellick maneuver.
- 8-1.30 Demonstrate the skill of orotracheal intubation in the adult patient.
- 8-1.31 Demonstrate the skill of orotracheal intubation in the infant and child patient.
- 8-1.32 Demonstrate the skill of confirming endotracheal tube placement in the adult patient.
- 8-1.33 Demonstrate the skill of confirming endotracheal tube placement in the infant and child patient.
- 8-1.34 Demonstrate the skill of securing the endotracheal tube in the adult patient.

Anatomy and Physiology of the Airway



Basic Airway Management

- Airway is always assessed first.
- Advanced techniques are used after basic management.
- The first step is opening the patient's airway.
- Once the airway has been cleared, determine the need for an airway adjunct.

Gastric Tubes

- Provide channel into patient's stomach
- Nasogastric tubes: Inserted through the nose
- Orogastric tubes: Inserted through the mouth
- Nasogastric tubes: Contraindicated in a patient with major facial, head, or spinal trauma

Equipment

- Proper-sized tubes
- Catheter-tipped 60-mL syringe
- Water-soluble lubricant
- Emesis container
- Tape
- Stethoscope
- Suctioning unit and catheters



Gastric Tube Insertion

- Measure the tube.
- Lubricate the distal end of the tube.
- Place the patient in proper position.
- Pass the tube until you reach the tape marker.
- Confirm proper tube placement.
- Aspirate air and stomach contents with the syringe.
- Secure the tube in place with tape.

Sellick Maneuver

- Visualize the cricoid cartilage.
- Palpate to confirm its location.
- Apply firm pressure on the cricoid ring.
- Maintain pressure until intubated.



Endotracheal Intubation

- Insertion of a tube into the trachea in order to maintain the airway
- Orotracheal intubation: Through the mouth
- Nasotracheal intubation: Through the nose
- EMT-Bs only intubate patients who are:
 - Unresponsive with no gag reflex
 - In cardiac arrest

Equipment (1 of 2)

- BSI equipment
- Proper-equipment endotracheal tube (ET tube)
- Laryngoscope handle and blade (visualized technique)
- Stylet or light stylet
- 10-mL syringe
- Oxygen, with BVM device

Equipment (2 of 2)

- A suctioning unit with rigid and soft-tip catheters
- Magill forceps
- Towels for raising the patient's head and/or shoulders
- A stethoscope
- Water-soluble lubricant for tubes and scopes
- A commercial securing device or tape

Laryngoscope

- Sweeps the tongue out of the way and aligns the airway
- Has a light powered by batteries in handle
- Has blades that connect to handle
 - Blades are curved or straight.
 - They range in size from 0 to 4.

Curved Blade



Straight Blade



Endotracheal Tubes

- Tubes come in many sizes, from adult to infant.
- Normal tube-to-teeth mark is usually around 22 cm.
- Diameter for normal adult male ranges from 7.5 to 8.5 mm.
- Diameter for normal adult female ranges from 6.5 to 8.0 mm.
- Use tape or chart for pediatric sizes.

Stylet

- Plastic-coated wire may be inserted in the ET tube to add rigidity and shape to the tube.
- Bend the tip of the stylet to form a gentle curve in adults.
- Bend the tip of the stylet to form a hockey stick shape for an infant and child.
- Confirm that the stylet is not sticking out past the end of the ET tube.

Syringe

- Use the 10-mL syringe to test for air leaks in the ET tube before intubation.
- After the ET tube has been properly inserted, inflate the cuff with 5 to 10 mL of air.
- Remove the syringe from the pilot balloon to prevent air from leaking.



Other Equipment

- Oxygen
- A suctioning unit
- A BVM device
- Magill forceps
- Towels for raising the patient's head or shoulders
- Secondary confirmation device
- C-collar backboard

The Intubation Procedure

- First EMT-B applies AED.
- Second and third EMT-B perform CPR.
- Fourth EMT-B prepares and intubates patient.



Visualized (Oral) Intubation (1 of 2)

- Open airway.
- Insert an oropharyngeal airway.
- Preoxygenate the patient.
- Assemble equipment.
- Position the head and neck.

Visualized (Oral) Intubation (2 of 2)

- Grasp laryngoscope with left hand.
- Visualize vocal cords.
- Insert ET tube.
- Inflate balloon.
- Confirm placement.
- Secure tube.

Blind (Nasal) Intubation (1 of 2)

- Many of the steps are the same as those for oral intubations.
- Preoxygenate the patient.
- Check for gag reflex.
- Insert tube through nostril.
- Pass tube through vocal cords as patient is inhaling.

Blind (Nasal) Intubation (2 of 2)

- Release the jaw and hold tube against nostril.
- Inflate cuff.
- Attach the BVM device.
- Confirm placement.
- Secure the tube.

Intubation Complications

- Intubating the right main stem bronchus
- Intubating the esophagus
- Aggravating spinal injuries
- Taking too long to ventilate
- Patient vomiting
- Soft-tissue trauma
- Mechanical failure
- Patient intolerant of the ET tube
- Decrease in heart rate

Multilumen Airways

- Inserted without direct visualization
- Provide ventilation when placed in either trachea or esophagus

Esophageal Tracheal Combitube (ETC)

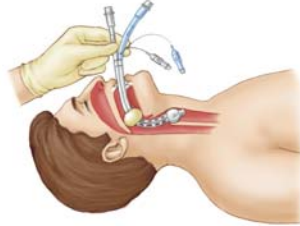


Combitube Contraindications

- Conscious or semiconscious patients with gag reflex
- Children younger than 16 years
- Adults shorter than 5'
- Patients who have ingested a caustic substance
- Patients with esophageal disease

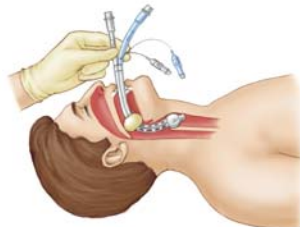
Inserting the ETC (1 of 2)

- Assemble and check the proper equipment.
- Apply water-soluble lubricant to the ETC.
- Position the patient.
- Preoxygenate the patient.
- Lift the lower jaw and tongue.



Inserting the ETC (2 of 2)

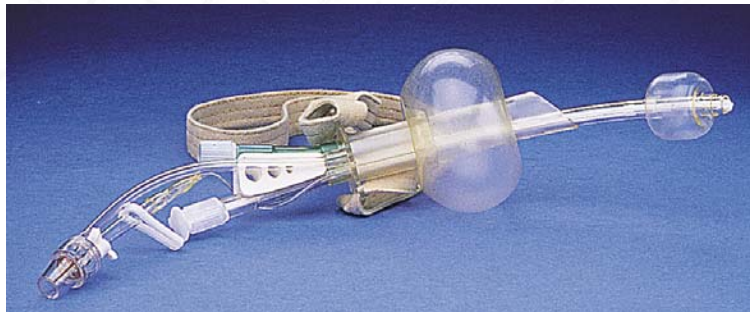
- Guide the ETC along the base of the tongue.
- Inflate the blue and then the white pilot balloon.
- Ventilate the patient.
- Confirm placement.
- Monitor the patient.



Removing the ETC

- Be prepared to suction patient.
- Deflate both balloon cuffs.
- Gently remove the tube.

Pharyngeotracheal Lumen Airway (PtL)



PtL Contraindications

- Conscious or semiconscious patients with gag reflex
- Children younger than 14 years
- Adults shorter than 5'
- Patients who have ingested a caustic substance
- Patients with esophageal disease

Inserting the PtL (1 of 2)

- Assemble and check equipment.
- Lubricate tube with water-soluble lubricant.
- Position the patient.
- Preoxygenate the patient.
- Lift the lower jaw and tongue.
- Hold the PtL so that it curves in the same direction as the pharynx.



Inserting the PtL (2 of 2)

- Inflate balloon cuffs.
- Ventilate patient through the short, green tube.
- Evaluate placement.
- Verify that the patient is receiving adequate ventilations.
- Monitor the patient.



Removing the PtL

- Be prepared to suction the patient.
- Deflate balloon cuffs.
- Gently remove the tube.

Laryngeal Mask Airway (LMA)



LMA Contraindications

- Asthma
- COPD
- Leaking mask
- Active vomiting
- Esophageal diseases

Inserting the LMA (1 of 2)

- Assemble and check equipment.
- Open the airway.
- Preoxygenate the patient.
- Select proper size.
- Hold LMA down.
- Remove oropharyngeal device and begin insertion.



Inserting the LMA (2 of 2)

- Insert until you feel resistance.
- Stabilize the tube.
- Inflate mask.
- Confirm placement.
- Insert bite block and secure the LMA.

