Chapter 8 Airway Management and Ventilation

Airway management and ventilation are the ____________________________ and most critical steps in the initial assessment of every patient you will encounter.

Respiratory Problems

Airway Obstruction

The ____________________________ is the most common cause of airway obstruction.

Other Causes:

● Foreign bodies

● Laryngeal spasm and edema

The Tongue as an Airway Obstruction

Inadequate ____________________________ volume respirations can compromise adequate oxygen intake and carbon dioxide removal

Respiratory System Assessment

Primary Assessment

● Is the airway ____________________________?

● Is breathing adequate?

● Look, listen, and feel.

● If patient is not breathing, open the airway and ____________________________ ventilations as necessary.

Look.

Listen.

Feel.

Bag-valve-mask ventilation

Secondary Assessment: Focused History

● Symptom development

● Associated symptoms

● Past medical history

● ____________________________ history

● Does anything make symptoms better or worse?

Physical Examination

Inspection

● Skin ____________________________
● Patient’s position
● _____________________________
● Modified forms of respiration
● Rate
● _____________________________

16 □ Modified Forms of Respiration
● _____________________________: forceful exhalation of a large volume of air
● Sneezing: sudden, forceful exhalation through the nose
● Hiccoughing (Hiccups): sudden inspiration caused by spasm of the diaphragm with spastic closure of the glottis
● _____________________________: slow, deep, involuntary inspiration
● Grunting: a forceful expiration that occurs through closed epiglottis

17 □ Abnormal Respiratory Patterns (1 of 2)
● _____________________________ respirations
  – Deep, slow or rapid, gasping; common in diabetic ketoacidosis.
● _____________________________ respirations
  – Progressively increasing tidal volume, followed by a declining volume, separated by periods of apnea at the end of expiration indicating terminal illness or _____________________________ injury

18 □ Abnormal Respiratory Patterns (2 of 2)
● _____________________________ (Ataxic) Respirations:
  – Repeated episodes of gasping ventilations separated by periods of apnea, indicating increased intracranial pressure
● Central Neurogenic _____________________________
  – Deep, rapid respirations, indicating increased intracranial pressure
● _____________________________ Respirations
  – Shallow, slow, or infrequent breathing indicating brain anoxia

19 □ Auscultation
● Listen at the mouth and nose for adequate air movement.
● Listen with a _____________________________ for normal or abnormal air movement.

20 □ Position for auscultating breath sounds.

21 □ Palpation
● Palpate chest wall for tenderness, _____________________________, abnormal motion, crepitis, and subcutaneous emphysema.
● Assess compliance of lungs.

22 □ Non-Invasive Respiratory Monitoring

23 □ Pulse Oximetry
● A measurement of hemoglobin oxygen saturation in the _____________________________ tissues
Will detect problems with oxygenation **more** than monitoring other vitals

Measures the oxygen **percentage** (SaO2)

24  

**Pulse Oximeter**

25  

**Capnography**

- The measurement of exhaled carbon **concentration**
- Devices are called End Tidal Carbon Dioxide (ETCO2) Detectors
- Used to determine correct placement of **airways**
-Disposable or reusable units are available
- Accuracy is good but **cardiac arrest** will lower ETCO2 levels

26  

**Colorimetric End-Tidal CO2 Detector**

27  

**Electronic End-Tidal CO2 Detector**

28  

Combined devices check pulse oximetry, ETCO2 blood pressure, pulse, respiratory rate, and temperature.

29  

**Waveform Capnography**

- Provides monitoring of **effectiveness**
- < **mmHg** has been shown to have no chance of ROSC
- < **mmHg** indicates ineffective compressions
- Sharp increase can indicate ROSC
- These readings based on patients properly intubated with ETT
- Post-cardiac arrest target range for PETCO2 for patient who achieves ROSC is **- mm Hg**

30  

**Waveform Capnography**

31  

**Esophageal Detector Device (EDD)**

- Determines correct placement of **intubation tubes**
- May be rigid or **type syringe**
- If bulb refills easily, tube placement is **clearly incorrect**
- Trachea is rigid, esophagus is **clearly incorrect**

32  

**Esophageal Detector Device**

33  

An esophageal intubation detector-bulb style.

34  

If the bulb does not refill, the tube is **clearly incorrect** placed.

35  

If bulb refills easily upon release, it indicates **clearly incorrect** placement.
Manual Airway Maneuvers

Personal Protective Equipment

Head Tilt/Chin Lift

Jaw-Thrust Maneuver

Modified Jaw Thrust in Trauma

Jaw-Lift Maneuver

______________________________ Maneuver (Cricoid Pressure)

Airway before applying Sellick’s

Airway with Sellick’s applied (note compression on the esophagus)

Basic Mechanical Airways

Basic Mechanical Airways

● _____________________________ Airway

● _____________________________ Airway

Nasopharyngeal airway, inserted

Advanced Airway Management

Endotracheal Intubation

Endotracheal intubation is clearly the ____________________________ method of advanced airway management in prehospital emergency care.

Equipment Needed

● _____________________________ (with blades)

● Endotracheal Tube (ETT)

● 10cc syringe

● _____________________________

● BVM

● Suction Device

● _____________________________ Block

● _____________________________ Forceps

● Tape or commercial securing device

Engaging Laryngoscope Blade and Handle

Activating Laryngoscope Light Source

Laryngoscope Blades

● Macintosh Blades: ____________________________ Blades

● Miller Blades: ____________________________ Blades

● Sizes from _________ to _________
Macintosh (Curved) Blades
- Designed to fit into ____________________________________
- When lifted ____________________________________, blade elevates the tongue, and indirectly the epiglottis, allowing you to see the glottic opening (vocal cords)
- Permits more room for visualization
- Less trauma to ____________________________________

Placement of Macintosh blade into Vallecula

Miller (Straight) Blades
- Designed to fit under the ____________________________________
- Lifts the epiglottis directly
- Preferred in ____________________________________
- Preferred in adults with large ____________________________________

Placement of the Miller blade under the epiglottis

Endotracheal Tubes
- Lengths range from 12 cm to 32 cm
- BVM or other ventilation devices connect to proximal end
- Most have ____________________________________ to seal the trachea
- Tube diameters range from ________ to ________ mm
  - 2.5 mm to 4.5 mm are normally ____________________________________
  - Tubes from 5.0 and larger are ____________________________________

Endotracheal Tubes
- Pilot ____________________________________ indicates whether the distal cuff is inflated
- Pilot balloon is normally inflated with ________ cc of air from a syringe
- Normal Adult Sizes
  - Females: ________ to ________ mm
  - Males: ________ to ________ mm

Other Equipment
- ____________________________________ : malleable plastic covered wire used to direct the ETT by bending the distal end
- 10 mL syringe: used to inflate cuff
- Tube-Holding Devices: used to secure tube
- Magill Forceps: scissor-style clamps used to remove foreign bodies or direct ETT
- Lubricant: ___________________ soluble solution (KY)
- ___________________
- Bite Block (oral airway or commercial device)

Endotrol ETT

ETT, Stylet, and Syringe, Unassembled

ETT and Syringe
ETT, Stylet, and Syringe, Assembled for Intubation

Magill Forceps

Endotracheal Intubation Indications
- Respiratory or cardiac arrest.
- Unconsciousness __________________________ gag reflex.
- Risk of __________________________ .
- Obstruction due to foreign bodies, trauma, burns, or __________________________ .
- Respiratory insufficiency due to disease.
- Pneumothorax, hemothorax, hemopneumothorax with __________________________ difficulty.

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- Respiratory insufficiency due to disease.
- Pneumothorax, hemothorax, hemopneumothorax with __________________________ difficulty.

Advantages of Endotracheal Intubation
- Isolates trachea and permits complete control of __________________________ .
- Impedes gastric __________________________ .
- Eliminates need to maintain a mask seal.
- Offers direct route for suctioning.
- Permits administration of some __________________________ .

Disadvantages of Endotracheal Intubation
- Requires considerable training and experience.
- Requires specialized __________________________ .
- Requires direct __________________________ of vocal cords.
- Bypasses __________________________ airway’s functions of warming, filtering, and humidifying the inhaled air.

Complications of Endotracheal Intubation
- Equipment __________________________ breakage and soft tissue lacerations
- Hypoxia __________________________ intubation
- Endobronchial intubation
- Tension pneumothorax

Orotracheal Intubation

Orotracheal Intubation Procedure (1 of 5)
Position patient supine
- __________________________ with 100% oxygen
- Prepare Equipment
  - Check handle and light on blade, close handle
  - Inflate cuff and check for __________________________
  - Insert __________________________ and bend as needed (do not allow stylet to be exposed on distal end of ETT)
– Lubricate as needed
– Prepare suction equipment

### Orotracheal Intubation Procedure (2 of 5)

Remove ____________________________ if present

– Place in “______________________________ position”. Flex neck forward and head backward

– Hold laryngoscope in __________________________ hand

– Have partner apply __________________________ maneuver (cricoid pressure)

– Insert blade into right side of mouth and sweep tongue

### Orotracheal Intubation Procedure (3 of 5)

– Move blade to __________________________

– Advance Macintosh until distal end is at base of the tongue in valcula

– Advance Miller until the distal end is under the epiglottis

– Lift the handle slightly upward and and toward the feet at __________° Angle

– Do not pry on __________________________

– Observe for vomitus, fluids, or foreign bodies

– _______________ as needed

### Orotracheal Intubation Procedure (4 of 5)

– Adjust blade until landmarks are visible

– Hold ETT in __________________________ hand and advance through right corner of mouth

– Visualize tube passing through the vocal __________________________ with cuff advancing 1-2cm past cords

– Hold tube in place and remove blade

– Use BVM to ventilate in tube

– Inflate cuff with ________ to __________cc of air

### Orotracheal Intubation Procedure (5 of 5)

– Check for proper tube placement

– __________________________ Both Lungs

– Auscultate Over __________________________

– Attach ETCO2 Monitor

– Hyperventilate the patient

– Secure tube

– Document tube __________________________

– Recheck tube __________________________ periodically

_____________________________ patient.

_____________________________ equipment.

Apply __________________________ Maneuver and Insert Laryngoscope.

Visualize __________________________ and Insert the ETT Between the
Vocal Cords until top of cuff is just below the vocal cords.

81. Visualize through laryngoscopy

82. Cuff, ventilate, and Auscultate.

83. Confirm Placement With an _________________ Detector.

84. Tube.

85. ETT placement.

86. Continuously _________________ and reconfirm the placement of the endotracheal tube.

87. Assuring Proper Placement
   - The most reliable confirmation of tube placement is ____________________________ of tube passing through cords
   - Presence of bilateral lung sounds
   - Absence of breath sounds over epigastrium
   - ____________________________ end-tidal CO2
   - Presence of ____________________________ in tube
   - Absence of vomitus in tube
   - Absence of vocal sounds

88. Key Points in Intubations
   - Limit attempts to _______ seconds or less. If unable to intubate, hyperventilate before reattempting
   - Advance distal cuff no more than 1-2cm past vocal cords to avoid Endobronchial intubation
   - Check lung sounds in ____________________________ lungs AND epigastric sounds
   - Have suction ready before attempting
   - If unsuccessful after 2nd attempt, consider alternative airway device (king airway or combi-tube)
   - ____________________________ the tube

89. Lighted Stylet for Endotracheal Intubation

90. Insertion of Lighted Stylet ETT

91. Lighted Stylet ETT in Position

92. Transillumination of a Lighted Stylet

93. Blind (Digital) Intubation
   - Prepare as normal
   - Insert bite block
   - Insert left middle and index fingers into mouth and “walk” hand down midline and palpate ____________________________
   - Advance tube pushing with right hand
• Use middle and index finger to direct ETT between epiglottis and your
  ———

• Attach BVM and continue as normal

94 □ Blind Orotracheal Intubation by Digital Method

95 □ Digital Intubation
  • Insert your middle and ____________________________ fingers into patient’s mouth

96 □ Digital Intubation
  • Walk your ____________________________ and palpate the patient’s epiglottis.

97 □ Digital Intubation—Insertion of the ETT

98 □ Endotracheal Intubation with In-line Stabilization

99 □ Hyperventilate patient and apply c-spine stabilization.

100 □ Apply Sellick’s Maneuver and intubate.

101 □ Ventilate Patient and Confirm Placement.

102 □ Secure ETT and Apply a Cervical Collar.

103 □ Reconfirm Placement.

104 □ Rapid Sequence Intubation
  • AKA pharmacologically assisted intubation (PAI)
  • RSI: giving ____________________________ to sedate and temporarily paralyze a patient to facilitate intubation
  • A patient who needs intubation may be awake. RSI paralyzes the patient to facilitate endotracheal intubation.

105 □ The Pediatric Airway
  • Smaller and more ____________________________ than an adult.
  • Tongue proportionately larger.
  • Epiglottis floppy and round.
  • Glottic opening higher and more ____________________________.
  • Vocal cords slant upward, and are closer to the base of the tongue.
  • Narrowest part is the ____________________________ cartilage.

106 □ Pediatric ET Sizes
  • ETT Size in mm =
    (Age in years + 16)
    ____________________________
  • Alternative method: use an ETT the size of the infant’s little finger

107 □ Pediatric ETT Sizes (Page 498)

108 □ Endotracheal Intubation in a Child
Hyperventilate the child.

Position the head.

Insert the laryngoscope.

Insert ETT and ventilate the child.

Confirm placement and secure ETT.

Nasotracheal Intubation May be Useful in Some Situations:
- Possible __________ injury
- Clenched __________
- Fractured jaw, oral injuries, or recent oral surgery
- Facial or airway swelling
- Arthritis preventing sniffing position

Nasotracheal Intubation Not Recommended in Some Situations:
- Possible __________ fractures
- Suspected basilar __________ fracture
- Deviated septum or nasal destruction
- Cardiac or respiratory arrest

Advantages of Nasotracheal Intubation
- The head and neck can remain in __________ position.
- It does not produce as much gag response and is better tolerated by the awake patient.
- It can be secured more easily than an orotracheal tube.
- The patient cannot __________ the ETT.

Disadvantages of Nasotracheal intubation
- More difficult and __________- consuming to perform than orotracheal intubation.
- Potentially more __________ for patients.
- May kink or clog more easily than an orally placed tube.
- Poses a greater risk of __________
- Improper __________ is more likely when performing blind nasotracheal intubation.
- Blind nasotracheal intubation requires that the patient be __________.

Nasotracheal Intubation
- Prepare patient and equipment
- Select the larger __________
- Apply topical anesthesia
- Insert with bevel facing the __________
- Listen for respiratory sounds
- Advance with next __________ breath
- Inflate and confirm placement

119

- Blind Nasotracheal Intubation

120

- Field Extubation
  - ________________ done

If needed to be done:
  - Suction oropharynx
  - Deflate cuff
  - Turn head or roll onto side if possible
  - Remove ETT upon __________________________ or cough
  - Be prepared for __________________________
  - Provide __________________________
  - Reassess patient

121

- Esophageal Tracheal CombiTube (ETC)

122

- Advantages of CombiTube (1 of 2)
  - Provides alternate airway control when conventional intubation techniques are unsuccessful or unavailable.
  - Insertion is rapid and easy and does not require ________________ of the larynx or special equipment.
  - Pharyngeal balloon anchors the airway behind the hard ________________.
  - Patient may be __________________________ regardless of tube placement.

123

- Advantages of CombiTube (2 of 2)
  - Significantly diminishes gastric __________________________ and regurgitation.
  - Can be used on __________________________ patients, since the neck can remain in neutral position during insertion and use.
  - If tube is placed in __________________________, gastric contents can be suctioned for decompression through the distal port.

124

- Disadvantages of CombiTube (1 of 2)
  - Maintaining adequate __________________________ seal is difficult on some Combi Tubes.
  - Suctioning __________________________ secretions is impossible when the airway is in the esophagus.
  - Cannot be used in conscious patients or in those with a gag reflex.
  - Cuffs can cause esophageal, tracheal, and hypopharyngeal ischemia.
  - Pt must be at least ________’ tall

125

- Disadvantages of CombiTube (2 of 2)
  - Does not isolate and completely protect the __________________________
  - Cannot be used in patients with __________________________ disease or caustic ingestions.
• Cannot be used with ________________________________ patients.
• Placement of CombiTube is not foolproof—errors can be made if assessment skills are inadequate.

126 Placing a CombiTube  (1 of 3)
• Hyperventilate the patient
• Check equipment
  – Inflate and check _____________________________
• Place patient’s head in _____________________________ position
• Lubricate as needed
• Insert the CombiTube gently in _____________________________ using tongue-jaw-lift maneuver until teeth are between 2 black lines

127 Placing a CombiTube  (2 of 3)
• Inflate pharyngeal cuff with ____________ cc of air and distal cuff with ________ - ____________ cc of air
• Ventilate through the longer _____________________________ port with BVM (#1)
• Check lung sounds
• If lung sounds present, tube is in the _____________________________, continue to ventilate

128 Placing a CombiTube  (3 of 3)
• If lung sounds absent, ventilate through the shorter _____________________________ port (#2)
• If lung sounds now present, the tube is in the _____________________________
• Attach _____________________________ tube

129 More on the CombiTube
• _____________________________ tube may be placed through port #2 if in esophagus
• Drugs can be given down tube if in the _____________________________ (Port #2)
• You must know where the tube is placed!
  – Many physicians and ER personnel are NOT familiar with the CombiTube

130 ETC Airway—Tracheal Placement
131 ETC Airway—Esophageal Placement
132 Other Intubation Devices
• Laryngeal mask airway (_______)
• Pharyngo-tracheal lumen airway (_______)
• _____________________________ gastric tube (EGTA)
• Esophageal _____________________________ airway (EOA)
Laryngeal Mask Airway

Pharyngo-Tracheal Lumen Airway (PtL)

Advantages of the PtL Airway
- Can function in either the ___________________________ or esophageal position.
- No face ___________________________ to seal.
- Does not require direct visualization.
- Can be used in trauma patients, since the neck can remain in neutral position during insertion and use.
- Helps protect the trachea from upper airway bleeding and ___________________________.

Disadvantages of the PtL Airway (1 of 2)
- Does not isolate and completely protect the ___________________________ from aspiration.
- The oropharyngeal balloon can ___________________________ out of the mouth anteriorly, partially dislodging the airway.
- ___________________________ around the PtL is extremely difficult, even with the oropharyngeal balloon deflated.

Disadvantages of the PtL Airway (2 of 2)
- Cannot be used in ___________________________ patients or those with a gag reflex.
- Cannot be used in pediatric patients.
- Can only be passed ___________________________.

Esophageal Gastric Tube Airway (EGTA)
- The EGTA is a ___________________________ tube. A cuff just proximal to the distal, open port blocks air to the esophagus.

Esophageal Obturator Airway
- The EOA is a hollow tube with a ___________________________ end and a distal cuff intended to block air from the esophagus.

Contraindications to EOA Insertion
- Age less than _________ years.
- Height less than _________ feet or more than _________ feet, 7 inches.
- Possible ingestion of ___________________________ poisons.
- History or esophageal disease or ___________________________.

King Airway

King Airway
- Single ___________________________ esophageal device
- Used by all levels
- Primary airway device for many ___________________________.

133 Laryngeal Mask Airway

134 Pharyngo-Tracheal Lumen Airway (PtL)

135 Advantages of the PtL Airway

136 Disadvantages of the PtL Airway (1 of 2)

137 Disadvantages of the PtL Airway (2 of 2)

138 Esophageal Gastric Tube Airway (EGTA)

139 Esophageal Obturator Airway

140 Contraindications to EOA Insertion

141 King Airway

142 King Airway
King Airway

Advantages/Disadvantages of King Airway

- Only _______ ventilation port
  - No need to determine placement
  - Placement is _____________________________ only; very slim chance of tracheal placement
- Allows placement of _____________________________ tube (in LTS-D)
- No ET route for _____________________________
- Will not help with obstructed airways

Types

- King Airway ____________:
  - No port for gastric tube
- King Airway ____________:
  - Has port for gastric tube

King Airway Types

- LT-D
- LTS-D

Adult King Airway Sizes

1. Size 3
   - ________-__________’ Tall
   - ______________________ flange
   - Inflation: 40-55cc’s
2. Size 4
   - ________-__________’ Tall
   - ______________________ Flange
   - Inflation: 50-70cc’s
3. Size 5
   - Over _________’ Tall
   - ______________________ Flange
   - Inflation: 60-80cc’s

Pediatric Airway Sizes

- Available only in LT-D
1. Size 2
   - ________-__________” Tall
   - ______________________ flange
   - Inflation: 25-35cc’s
2. Size 2.5
   - ________-__________” Tall
   - ______________________ flange
- Inflation: 30-40cc’s

149 □ Indications
- For EMTs
  - Unconscious and no ______________________________ reflex
  - 1st line airway control device
- For Intermediates and Paramedics
  - After unsuccessful ______________________________ attempts
  - ______________________________ or “Backup” device

150 □ Contraindications
- Conscious with gag reflex
- Under __________” tall (2’ 11”)
- Ingestion of ______________________________ substances
- Patients with known ______________________________ disease

151 □ Procedure (1 of 6)
- Select appropriate size based on patient’s ______________________________
- Test cuffs (remove air)
- Apply ______________________________ -based lubricant
- Pre-oxygenate
- Position patient in “____________________________” or neutral position

152 □ Procedure (2 of 6)
- Holding the King at the connector with ______________________________ hand, hold the patient’s mouth open and apply chin lift unless contraindicated due to ______________________________ and/or Spinal immobilization

153 □ Procedure (3 of 6)
- With the King rotated laterally ____________-____________ degrees, such that the blue orientation line is touching the corner of the mouth, introduce tip into the mouth and advance behind the base of the tongue, Never ______________________________ the tube into position

154 □ Procedure (4 of 7)
- As the tip passes under tongue ______________________________ tube back to midline (blue orientation line faces chin).
- Without exerting excessive force, advance the King until base of connector aligns with ______________________________ or gums.

155 □ Procedure (5 of 7)
- ______________________________ the cuffs based on the listed volumes for the tube size used.
- Attach BVM and verify placement by ALL of the following criteria:
  - Rise and fall of ______________________________
  - Bilateral breath sounds
  - Absent ______________________________ sounds
– CO2 measurement (capnography)

156 Procedure (6 of 7)
- If ventilation is difficult, _________ out very slightly until ventilation is performed easily.
- Re-verify placement
  - Lung sounds, absent epigastric sounds, etc
- _________ Tube

157 Procedure (7 of 7)
- If there is any question about the proper placement of the King Airway, _________ the cuffs and remove the airway, Ventilate the patient with BVM for 30 seconds and repeat insertion procedure
- Continue to _________ the patient for proper airway placement throughout prehospital treatment and transport

158 Key Points
- Must guess the patient’s _________
- Lubricate
- At ALS level, introduction may be aided with _________
- Not used for any patient under 35” tall
- Use is required by SPEMS
- Attach _________ if an adult in cardiac arrest

159 Foreign Body Removal Under Direct Laryngoscopy

160 Direct visualization of the Larynx with a Laryngoscope may enable the removal of an obstructing foreign body

161 Foreign Body Removal with Direct Visualization and Magill Forceps

162 Surgical Airways

163 The only indication for a surgical airway is the _________ to establish an airway by any other method.

164 Anatomical Landmarks for ________________

165 Needle Cricothyrotomy (1 of 3)
- Position patient
- Palpate _________ portion of the thyroid cartilage and cricothyroid cartilage. The indentation between the two is the cricothyroid membrane
- Attach a large bore IV needle to a 10 or 20mL syringe
  - Adults: _________ or _________ gauge
  - Pediatrics: _________ or _________ gauge
Needle Cricothyrotomy (2 of 3)
- Insert needle into cricothyroid membrane at ___________ , at 45° angle toward the feet
- Advance the needle no more than _________ cm, then aspirate with the syringe
- After placement confirmed, hold needle still and advance catheter. Withdraw needle
- Secure catheter

Needle Cricothyrotomy (3 of 3)
- If needed ventilate with ____________________________ jet ventilations
- Use of ____________________________ will work with adapter from a small ETT

Locate/Palpate ________________ Membrane.

Proper Positioning for Cricothyroid Puncture
- Advance the ____________________________ With the Needle.
- Cannula properly placed in trachea
- ________________ Ventilation with Needle Cricothyrotomy

Surgical (Open) Cricothyrotomy (1 of 2)
- Locate ____________________________ membrane
- Clean the area with ____________________________ -containing solution if time permits
- Stabilize the cartilages with one hand, while using a scalpel in the other hand to make a 1 to 2 cm ____________________________ incision over the membrane
- Make a 1 cm incision in the ____________________________ plane through the membrane

Surgical (Open) Cricothyrotomy (2 of 2)
- Insert ____________________________ into the membrane and spread it open
- Insert a ____________________________ ETT (6.0 to 7.0) or tracheostomy tube
- Inflate the cuff
- Confirm placement
- ________________ the tube

Locate Cricothyroid ____________________________ .

Stabilize ____________________________ and Make a 1–2 cm Skin Incision Over Cricothyroid Membrane.

Make a _________ cm horizontal incision through the cricothyroid membrane.

Using a ____________________________ Hemostat, Spread Membrane Incision Open.
Insert an ETT (6.0) or ___________________________ (6.0).

_____________________________ the cuff.

_____________________________ Placement.

Ventilate.

Secure tube, reconfirm placement, ___________________________ patient.

Patients with Stoma Sites

- Patients who have had a laryngectomy or tracheostomy breathe through a ___________________________.
- There are often problems with excess ___________________________, and a stoma may become plugged.

Tracheostomy Cannulae

Suctioning

- Anticipating ___________________________ when managing an airway is the key for successful outcomes.
- Be prepared to suction all airways to remove blood or other secretions and for the patient to ___________________________.

Suctioning Techniques

- Wear protective eyewear, gloves, and face mask.
- ___________________________ the patient.
- Determine depth of catheter insertion.
- With suction off, insert catheter.
- Turn on suction and suction while removing catheter (no more than _________ seconds).
- ___________________________ the patient.

Tracheobronchial Suctioning

- Suctioning through the ETT to remove secretions or mucous plugs
- Use ___________________________ technique
- Use only soft-tip catheter
- Insert tip until ___________________________ is felt
- Apply suction for _________-_________ seconds while pulling out
- _________-_________cc of sterile water may need to be injected prior to suctioning

Gastric Decompression (1 of 3)

- Common problem with ventilating a nonintubated patient is gastric distention.
- Occurs when the procedure’s high ___________________________ trap air in the stomach.
- Once patient has gastric distention, you should place a tube in the stomach for gastric decompression, using either the ___________________________ or orogastric approach.
Gastric Decompression (2 of 3)
To place a nasogastric or orogastric tube:
- Prepare patient’s head in ________________________________ position while preoxygenating.
- Determine length of tube insertion by measuring from epigastrum to the angle of the jaw, then to the tip of the ________________________________ .
- If patient is awake, suppress the gag reflex with a topical __________________________________ applied into the posterior oropharynx or with IV lidocaine.

Gastric Decompression (3 of 3)
- Lubricate the distal tip of the gastric tube and gently insert into the nares and along the nasal floor, or into the oral cavity at midline. Advance tube gently, and if patient is awake, encourage ________________________________ to facilitate tube’s passage.
- Advance to predetermined mark on tube.
- Confirm placement by ________________________________ .
- Apply ________________________________ and note gastric contents that pass through the tube.
- Secure the tube in place.

Oxygenation
Get This……Never withhold ________________________________ from any patient for whom it is indicated

Oxygen Delivery Devices
- Nasal cannula: up to __________% O2 @ 6 lpm
- Venturi mask: adjustable from _________-__________%
- Simple face mask: _________-__________% @ 6 to 10 lpm
- Partial rebreather mask: up to _________% @10 lpm
- Nonrebreather mask > _________% @ 15 lpm
- Small-volume nebulizer
- Oxygen humidifier

Ventilation Methods
- Mouth-to-______________________________
- Mouth-to-nose
- Mouth-to-______________________________
- Mouth-to-______________________________
- Bag-valve device
- ________________________________ valve device
- Automatic transport ________________________________

Bag-valve-mask with built-in ________________________________ ETCO₂ detector

Ventilation of Pediatric Patients
• Mask seal can be more difficult.
• Bag size depends on age and size of child.
• Ventilate according to current ____________________________.
• Obtain ____________________________ rise and fall with each breath.
• Assess adequacy of ____________________________ by observing chest rise, listening to lung sounds, and assessing ____________________________ improvement.

198  Demand Valve and Mask
199  Portable Mechanical Ventilator
200  ResQPod
201  ResQPOD
• ResQPOD is an Impedance ____________________________ Device (ITD)
• Provides “Perfusion on Demand” (______________) by regulating pressures in the thorax during states of hypotension
• AHA 2005 Guidelines designated the ITD as a Class IIa recommendation (highest recommendation) for adult patients in cardiac arrest
  – Higher recommendation than any ____________________________

202  How It Works  (1 of 3)
• During normal CPR, air flows in and out of chest during
• Compression increases pressure in the lungs, which forces small ____________________________ of air out of the open airway
• As the chest recoils during the decompression phase, a slight ____________________________ sucks the small puff of air back into the airway in an effort to equalize the intra- and extrathoracic pressures.

203  How It Works  (2 of 3)
• An ITD temporarily blocks, or ____________________________, the airway immediately after the compression when exhalation releases the puff of air
• Chest recoil proceeds normally, but air cannot rush into the airway to equalize the pressure
• The rapidly expanding intrathoracic space pulls ____________________________ into the heart from the great vessels resulting in improved blood return (pre-load) to the heart

204  How it Works  (3 of 3)
• Prevents unnecessary air from entering the ____________________________ during CPR
• As the chest recoils, the vacuum (negative pressure) in the thorax is greater
• This chest recoils, the vacuum (negative pressure) in the thorax is greater
• Increases cardiac output, BP, and ____________________________ rates
205 Benefits of the ResQPOD
   ● __________________________ blood flow to the heart
   ● Increases brain blood flow by 50%
   ● Doubles systolic BP
   ● Increases survival rates
   ● Increases likelihood of successful __________________________
   ● Beneficial in all arrest rhythms
   ● Circulates drugs more effectively
   ● Timing __________________________ for ventilations

206 Indications
   ● __________________________ in cardiac arrest
     – Onset of puberty
     – Not for use in infants and __________________________
   ● NOT indicated for apneic patients with a heart beat; only cardiac arrest
     – No __________________________ =No ResQPOD

207 Use on a BVM or Mouth to Mask
   ● Connect to face mask, remove light __________________________
   ● Open airway
   ● Establish/MAINTAIN a tight seal. Best accomplished with 2 rescuers
   ● Connect BVM
   ● ______________ compression per light flash
   ● Ventilate after each 30 compressions (____________ light flashes)

208 Use With ET or King Airway
   ● __________________________ placement
   ● Connect to airway device and BVM, remove light tab
   ● Perform __________________________ compressions
   ● Ventilate with every light flash (__________/min)

209 Key Points of ResQPOD
   ● Used only on adults in __________________________ arrest
   ● If patient regains pulse and/or spontaneous respirations, ______________ the ResQPOD, but continue to ventilate as needed
   ● MUST maintain a constant seal if using with BVM only

210 Other Points
   ● These are expensive ($____________ each) so do not open unless you are going to use it.
   ● They do have __________________________ dates