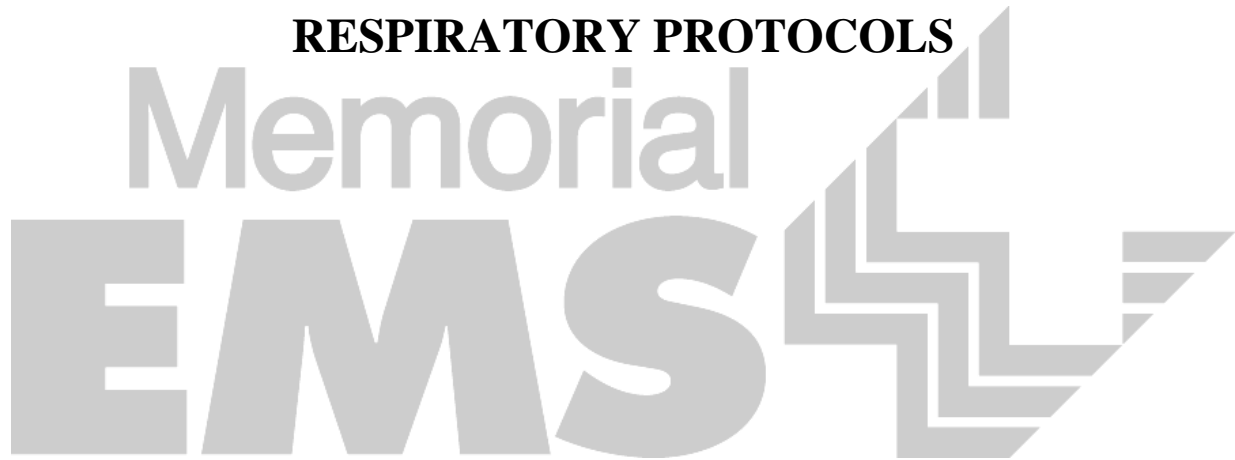


MEMORIAL EMS SYSTEM
ADULT PREHOSPITAL CARE MANUAL

RESPIRATORY PROTOCOLS



MEMORIAL EMS SYSTEM
ADULT PREHOSPITAL CARE MANUAL

Basic Airway Control

Establishing and maintaining an open airway and assuring adequate ventilation is a treatment priority with all patients. Proper techniques must be used to assure treatment maneuvers do not inadvertently complicate the patient's condition.

Basic Airway Control

1. Assure an open airway by utilizing either the head tilt/chin lift maneuver; the modified jaw thrust maneuver or the tongue-jaw lift maneuver. The head tilt/chin lift maneuver is **NOT** to be used if there is any possibility of cervical spine injury.
2. Expose the chest and visualize for chest rise and movement, simultaneously listen and feel for air movement at the mouth and nose. This procedure will need to be done initially and after correcting an obstruction and securing the airway.
3. If the chest is not rising and air exchange cannot be heard or felt:
 - a) Deliver two positive-pressure ventilations. If resistance continues, follow AHA sequences for obstructed airway rescue.
 - b) Reassess breathing and check for a carotid pulse.
 - c) If spontaneous respirations return and a pulse is present, provide supplemental Oxygen by non-rebreather mask or assist respirations with bag-valve mask (BVM) at 15 L/min.
 - d) If the patient remains breathless and a pulse is present, initiate ventilations with a BVM at 15 L/min at a rate of 12 breaths per minute.
 - e) If the patient remains breathless and a pulse is not present, initiate CPR and institute the appropriate cardiac protocol.
4. If the patient presents with stridor, "noisy breathing" or snoring respirations, render treatment for partial airway obstruction in accordance with AHA guidelines.
 - a) Reassess effectiveness of the airway maneuver.
 - b) If initially unable to resolve partial airway obstruction, suction the airway and visualize the pharynx for any evidence of foreign objects. Perform a finger sweep if a foreign object can be seen.
 - c) If partial airway obstruction persists, treat according to AHA guidelines for resolving a complete airway obstruction.
5. Once the obstruction has been corrected:
 - a) Insert an oropharyngeal airway in the unconscious patient (without a gag reflex).

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Basic Airway Control

Basic Airway Control {Continued}

- b) Insert a nasopharyngeal airway in the conscious patient or an unconscious patient with a gag reflex. *Note:* NPA is the airway of last resort if the possibility of a head injury exists.
6. Establish the presence and adequacy of breathing by observing the frequency, depth and consistency of respirations. Also, observe the chest wall for any indications of injuries which may contribute to respiratory compromise.
7. Supplemental oxygen should be delivered to any patient who exhibits signs of difficulty breathing, sensation of shortness of breath, tachypnea or bradypnea, use of accessory muscles, altered level of consciousness/altered mental status, cyanosis, cardiac symptoms, head injury or any indications of shock. If indicated
 - a) Supplemental oxygen should be provided by a non-rebreather mask (NRM) at a rate of 15 L/min (assuring reservoir bag is inflated).
 - b) If patient is unable to tolerate the NRM, administer oxygen via nasal cannula at a rate of 2-6 L/min.
8. Bag-valve mask ventilation with supplemental oxygen at 15 L/min should be initiated at the rate of 12/min if respirations are absent, there is evidence of inadequate ventilation, respiratory rate is < 8/min, absent or diminished breath sounds or wounds to the chest wall.

ILS Care

ALS Care

1. If BVM ventilations are being performed, providers may add a PEEP valve at 5-10 cm of H₂O to the BVM (regardless of mechanism: OPA/NPA, supraglottic, or endotracheal tube) to increase or improve oxygenation.

***PEEP valves will only be used in patients with a pulse and those ≥ 16 .**

Pearls

- Inadequate maintenance of the patient's airway, inappropriate airway maneuvers, using inappropriately sized airway equipment and/or failure to recognize an obstructed airway will complicate the patient's condition.
- Do NOT use the head tilt/chin lift maneuver on a patient with a suspected cervical spine injury.
- Proper facemask seal during artificial ventilations is imperative to assure adequate ventilation.

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Airway Obstruction Procedure

An airway obstruction is life threatening and must be corrected immediately upon discovery.

1. If the patient has an obstructed airway and is still conscious:
 - a) Encourage the patient to cough.
 - b) Perform 5 abdominal thrusts or chest thrusts if the cough is unsuccessful.
 - c) Repeat until the obstruction is relieved or the patient becomes unconscious.
 - d) Administer oxygen at 15 L/min if the patient has a partial airway obstruction and is still able to breathe.
2. If the patient is unconscious:
 - a) Open the patient's airway and attempt to ventilate.
 - b) Reposition the head and reattempt to ventilate if initial attempt is unsuccessful.
 - c) Immediately begin CPR
 - d) Perform visualized finger sweep of the patient's mouth and reattempt to ventilate.
 - e) Repeat steps (c) and (d) if obstruction persists.
 - f) **BLS** & **ILS** immediately initiate ALS intercept.
 - g) **ILS** & **ALS** attempt direct extraction via laryngoscopy with Magill forceps.
 1. Use the laryngoscope and examine the upper airway for foreign matter and suction as needed.
 2. Remove any foreign objects with forceps and suction.
 3. Re-establish an open airway and attempt to ventilate.
 4. If the obstruction is relieved, continue with airway control, ventilations, assessment and care.
 - h) Continue CPR until obstruction is resolved. Follow appropriate algorithms.

Pearls

- Maintain in-line c-spine stabilization using 2 EMTs in patients with suspected cervical spine injury.

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Apneic Oxygenation

Flooding the nasopharynx with oxygen is one of the most effective ways to preoxygenate a patient prior to an elective airway procedure. The same principle applies to a non-elective (emergent airway) up until the point where the airway is occluded with the distal tube cuff. Utilizing apneic oxygenation can allow additional time for airway attempts and help ensure that the first airway attempt is the successful and non-traumatic airway attempt.

Procedure

1. Place a nasal cannula on the patient with the prongs in the nares during the preoxygenation phase prior to intubation/ supraglottic airway placement.
2. Attach the nasal cannula to a secondary oxygen source and turn the oxygen up to 15L/min. Additionally, patient should be preoxygenated prior to intubation/ King airway placement using either a bag valve mask attached to 15L/min via primary oxygen source or a nonrebreather mask (if spontaneous respirations prior to intubation are adequate) at 15L/min.
3. Ensure patient is on a pulse oximeter and cardiac monitor. Just prior to intubation remove the primary preoxygenation source (BVM or nonrebreather) but leave the nasal cannula in place at 15L/min.
4. Obtain Definitive airway based on *Supraglottic Airway Procedure* or *Advanced Airway Procedure*.
5. Remove nasal cannula only after ETT or supraglottic airway placement is confirmed and secured.
6. Apneic oxygenation is intended to extend the safe apnea time during intubation before desaturation occurs; it is not a replacement for adequate preoxygenation.

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Supraglottic Airway Procedures
(BLS, ILS, and ALS)

A supraglottic Airway device is an effective airway adjunct when intubation is not available or difficult to perform. Insertion is rapid & easy and does not require specialized equipment or visualization of the larynx. They are latex-free and should be considered safe to use on latex-sensitive patients. MEMS currently utilizes The IGEL and The King LTS-D as its approved supraglottic airways. As Kings are used or expire they will be replaced with the IGEL's.

King LTS-D

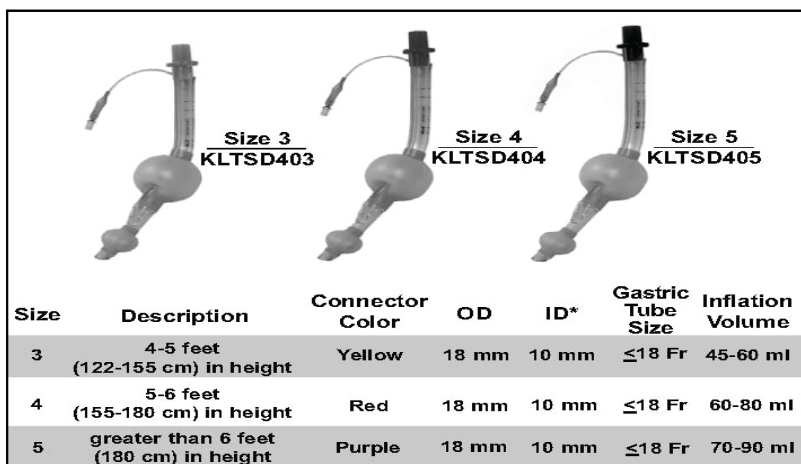
- The King LTS-D is an airway device designed for emergency or difficult airway management in the apneic or unresponsive patient without a gag reflex.

Contraindications

- Active gag reflex
- Ingestion of a caustic substance (*e.g.* gasoline, drain cleaner, etc.)
- Use caution in pregnant females
- Morbid obesity
- Tracheostomy (will be ineffective with esophageal placement)
- Patient less than 16 years old or under four (4) feet tall (BLS provider restriction only)
- Known or suspected esophageal disease (*e.g.* esophageal varices)

KING Airway Insertion Procedure

1. Pre-oxygenate/ventilate utilizing a bag-valve mask (BVM) at 15 L/min according to the *Basic Airway Control Procedure*.
2. Initiate Oxygen based on *Apneic Oxygenation Protocol*.
3. Choose the correct size.



*Equivalent ID of Ventilation Lumen

Supraglottic Airway Procedures (BLS, ILS, and ALS)

KING Airway Insertion Procedure {Continued}

4. Initiate Oxygen based on *Apneic Oxygenation Protocol*.
5. Apply a water-based lubricant (*e.g.* K-Y or Surgilube) to the beveled distal tip and posterior aspect of the tube. Avoid introducing lubricant in or near the ventilatory openings.
6. Position the head in the “sniffing position” if possible. It can also be inserted with the head in the neutral position if following c-spine precautions/c-collar in place.
7. Hold the KING LTS-D at the connector with the dominant hand. With the non-dominant hand, hold mouth open and apply chin lift.
8. With the KING LTS-D rotated laterally 45-90° (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 force the tube into position** and do not take longer than **20 seconds** for the attempt!



9. As the tube tip passes over the tongue, rotate the tube back to midline (blue orientation line faces chin).
10. Without exerting excessive force, advance the KING LTS-D until the proximal opening of gastric access lumen is aligned with teeth or gums.

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Supraglottic Airway Procedures
(**BLS**, **ILS**, and **ALS**)

KING Airway Insertion Procedure {Continued}

11. Inflate the cuffs with the minimum volume necessary to seal the airway (see chart). Additional air may be needed to occlude pharynx with upper/ lower cuffs. .
12. Attach BVM. Gently bag the patient while assessing ventilations. Simultaneously withdraw the airway **very slowly** until ventilation is easy & free-flowing.



13. Confirm placement using *Airway Confirmation Procedure 13.H.1*
14. Secure using a commercial tube-holder.
15. The gastric access lumen allows the insertion of up to an 18 Fr diameter gastric tube into the esophagus & stomach. Lubricate the gastric tube prior to insertion (**ALS only**).

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Supraglottic Airway Procedures
(**BLS**, **ILS**, and **ALS**)

iGel

- The iGel is an airway device designed for emergency or difficult airway management in the apneic or unresponsive patient without a gag reflex.
- It is the primary airway of choice for adult and pediatric cardiac arrest patients.
- It is the back-up airway in cases of an unsuccessful intubation attempt.

Contraindications

- Active gag reflex
- Ingestion of a caustic substance (e.g. gasoline, drain cleaner, etc.)
- Use caution in pregnant females
- Morbid obesity
- Tracheostomy (it will be ineffective)
- Patient less than 30kg (**BLS** provider restriction only)
- Known or suspected esophageal disease (e.g. esophageal varices)

i-gel size		Patient size	Patient weight guidance (kg)
	3	Small adult	30-60
	4	Medium adult	50-90
	5	Large adult+	90+

iGel Airway Insertion Procedure

1. Don appropriate PPE
2. Pre-Oxygenate the patient with 100% Oxygen. Utilize Apneic Oxygenation Protocol if time permits.
3. Select the appropriate iGel size from the chart above.
4. Remove the device from the packaging and check for signs of damage.
5. Place water-soluble jelly in the middle of the cradle packaging.
6. Lubricate the back, sides, and tip of the iGel's non-inflatable cuff. Ensure no lubricant is inside the cuff.
7. Grasp along the integral bite block and face the cuff towards the patients' chin.
8. Insert the iGel into the mouth in the direction of the hard palate.
9. Glide the device down and back along the hard palate with continuous, gentle pressure until resistance is met.

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Supraglottic Airway Procedures
(BLS, ILS, and ALS)

iGel Airway Insertion Procedure (Cont.)

10. Connect the iGel to the BVM.
11. Confirm placement using *Airway Confirmation Procedure 13.H.1*
12. Secure using a commercial tube-holder.
13. Continuously monitor the patient.
14. (ALS only) Insert appropriately sized gastric tube if time permits.
 - a. Use a 12Fr gastric tube for iGel sizes #2- #5
 - b. Use a 10Fr gastric tube for iGel size #1.5

Critical Thinking

- If unsuccessful in placing a Supraglottic Airway, remove the airway and a **second attempt** with the device following the same insertion procedures may be made. If this attempt is unsuccessful, immediately revert to *Basic Airway Control Procedures*.
- Sizes for the iGel are based on ideal body weight for the size of the patient.
- A proficient provider can insert an iGel in 5 seconds or less.
- Do NOT administer medications via any Supraglottic Airway Device. It is designed as an airway adjunct only and cannot be utilized as a medication route.
- **Warning:** *In order to avoid the possibility of the device moving up out of position prior to being secured in place, it is essential that as soon as insertion has been successfully completed, the iGel is held in the correct position until being secured.*
- **Warning:** *Do not apply excessive force on the device during insertion.*
- It is not necessary to insert fingers or thumbs into the patients' mouth during the iGel insertion process.
- Supraglottic Airways do not prevent the aspiration of gastric contents.

MEMORIAL EMS SYSTEM
ADULT PREHOSPITAL CARE MANUAL

**Advanced Airway Control
Policy (ILS & ALS Only)**

Endotracheal intubation is the only way to provide a true definitive airway. However, if endotracheal intubation is difficult or unsuccessful, intubation may be attempted utilizing the “bougie” or consider a supraglottic airway. Basic airway control techniques should always be maintained prior to and during any advanced airway procedure, and should always be your primary means of airway control should other methods fail.

Advanced Airway Control Procedure

1. Implement basic airway measures in accordance with the *Basic Airway Control Procedure*.
2. Initiate Oxygen based on *Apneic Oxygenation Protocol*.
3. Select the proper tube size (based on patient size) and attach a 10mL syringe.
4. Consider “Bougie” ETT introducer for anticipated difficult intubation (or any intubation).
5. Insert stylet and bend to the approximate configuration of the pharynx (some stylets used for video laryngoscopes do not bend.)
6. Lubricate the ETT with a water-soluble lubricant.
7. Have suction, BVM, stethoscope, colorimetric end-tidal CO₂ detector/capnography and commercial ETT holder readily available.
8. Pick up the laryngoscope handle with your left hand and the appropriate blade with your right hand.

MEMORIAL EMS SYSTEM
ADULT PREHOSPITAL CARE MANUAL

Advanced Airway Procedures
(ILS & ALS Only)

Advanced Airway Control Procedure {Continued}

9. Holding the blade parallel to the handle, attach the blade to the handle by inserting the U-shaped indentation of the blade into the small bar at the end of the handle. When the indentation is aligned with the bar, press the blade forward and snap into place.
10. Lower the blade until it is at a right angle to the handle. The light should come on. If it does not, see if the bulb is tight and/or the batteries need to be replaced (This should be done on a daily basis so you do not have to spend valuable time fixing it at the scene of a call).
11. Suction the pharynx as needed.
12. Pre-oxygenate the patient with high concentration oxygen prior to intubation attempt.
13. Insert the blade into the mouth on the right side, moving the tongue to the left. Follow the natural contour of the pharynx, lifting the tongue (not prying) until you can see the glottic opening.
 - a) If you are using a **straight blade** (Miller), insert it until you can see the epiglottis. With the tip of the blade, lift up on the epiglottis so that you can visualize the vocal cords and glottic opening. If needed, have someone gently press down on the cricoid cartilage (Sellick Maneuver) and/or utilize the BURP procedure to aid in visualization of the vocal chords.
 - b) If you are using a **curved blade** (Macintosh), insert the tip into the vallecula and lift forward and up. This will lift the epiglottis and expose the vocal cords and glottic opening. If needed, have someone gently press down on the cricoid cartilage (Sellick Maneuver) so that you can see the cords well.

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Advanced Airway Procedures
(ILS & ALS Only)

Advanced Airway Control Procedure {Continued}

- c) As an alternative to direct laryngoscopy, video laryngoscopes may be used. You should follow the manufacturer directions specific to the particular video laryngoscope you are using. Some hyper-angulated video laryngoscopes are inserted into the mouth at midline and are lifted up instead of forward to visualize the glottic opening. Other video scopes have traditional Macintosh or Miller shaped blades with video assist allowing direct or indirect laryngoscopy with the same device. Video laryngoscopes should be used with proprietary stylets in the endotracheal tube as recommended by the manufacturer. Video laryngoscopy is not ideal for situations in which the camera may become obscured such as blood in the pharynx or excessive secretions, recent emesis, or hematemesis or hemoptysis. Many video laryngoscopes are advantageous for intubating while c-spine precautions must be maintained or if an anterior larynx is expected. Whenever using a video laryngoscope as a primary method of intubation, direct laryngoscopy must be also immediately available. Endotracheal tube placement should be confirmed just as with direct laryngoscopy.
14. After visualizing the glottic opening, grasp the ETT with your right hand and advance the tube from the right corner of the mouth. Insert the tube into the glottic opening between the vocal cords, just far enough to pass the cuff of the tube past the opening.
15. Inflate the cuff with 10mL of air.
16. Confirm placement using *Airway Confirmation Procedure 13.H.1*
- a) If you have inserted the ETT too far, it will usually go into the right main stem bronchus. Therefore, if you hear breath sounds only on the right, you should pull the tube back $\frac{1}{2}$ inch at a time until you hear bilateral breath sounds. Inflate the cuff with 10mL of air.
 - b) If you hear no breath sounds, you are in the esophagus and must remove the ETT immediately. Ventilate patient and proceed to supraglottic airway insertion or continue basic airway control measures.
17. Secure using a commercial tube-holder.
18. Continuously monitor the patient with pulse oximetry, capnography, and cardiac monitor.

Advanced Airway Procedures
(ILS & ALS Only)

Advanced Airway Control Procedure {Continued}

19. Frequently reassess breath sounds to be sure that the ETT is still in place.
20. Ventilate the patient at a rate of 12 times per minute.
21. If intubation is unsuccessful after (2) attempts, refer to the *supraglottic airway Procedure* or *Basic Airway Control Procedure*.

Endotracheal tube introducer, AKA “Bougie” procedure

Use of the endotracheal tube introducer (AKA “Bougie”)

The endotracheal tube introducer, AKA “Bougie” is a useful tool to help facilitate difficult intubation. Unlike a stylet, a bougie is inserted independently of the ET tube and is used as a guide, over which an ET Tube may be placed into the trachea. It is used where a difficult intubation is anticipated, or a poor view of the glottic opening has been confirmed on laryngoscopy.

7. Prepare the endotracheal tube introducer for use: Curve the bougie and ensure the distal tip is formed into a J (coudé) shape.
8. Utilize the laryngoscope as you would do during intubation to obtain the best possible view of the glottic opening. You should always be able to view the tip of the epiglottis and, ideally, the arytenoid cartilages.
9. Advance the bougie, continually observing its distal tip, with the concavity facing anteriorly.
10. Visualize the tip of the bougie passing posteriorly to the epiglottis and (where possible) anterior to the arytenoid cartilages.
11. Once the tip of the bougie has passed the epiglottis, continue to advance it in the mid-line so that it passes behind the epiglottis but in an anterior direction.
12. As the tip of the bougie enters the glottic opening you may feel “clicks” as it passes over the tracheal rings or the tip may stop against the wall of the airways. This suggests correct insertion, although this cannot be relied upon to indicate correct positioning.
13. Hold the bougie firmly in place and pass the endotracheal tube over the proximal end of the bougie.

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Advanced Airway Procedures
(ILS & ALS Only)

Endotracheal tube introducer, AKA “Bougie” procedure {Continued}

14. As the proximal tip of the bougie is re-exposed, carefully grasp it, assuming control of the bougie.
15. The ET tube should then be carefully advanced along the bougie and hence through the glottic opening, taking care to avoid movement of the bougie.
16. Once the ET tube is fully in place hold it securely as you slowly withdraw the bougie.

Pearls

- SUCCESSFUL INTUBATION MAY BE CONSIDERABLY ENHANCED BY ROTATING THE ET TUBE 90° COUNTER CLOCKWISE, SO THAT THE BEVEL FACES POSTERIORLY.
- The bougie should never be allowed to move up and down during the procedure.

Airway Control in the Trauma Patient

Any type of airway manipulation may be dangerous during airway control of the suspected spinal injury patient. Maintain in-line stabilization while attempting airway control. Consider utilizing a supraglottic airway or video laryngoscopy *in lieu of traditional intubation*.

1. A minimum of two (2) trained rescuers is needed to assure special attention to spinal precautions.
2. One rescuer will apply manual in-line stabilization by placing the rescuers hands about the patient's ears with the little fingers under the occipital skull and the thumbs on the face over the maxillary sinuses.
3. The rescuer performing airway placement should be at the head.
4. Maintain the patient's head in a neutral position during intubation or insertion of a supraglottic airway, taking care to prevent cervical manipulation.

MEMORIAL EMS SYSTEM
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**Advanced Airway Control
Policy (ILS & ALS Only)**

Pearls

- If intubation attempts fail (2 attempts), switch to a supraglottic airway or revert to basic airway control.
- During an arrest, CO2 levels in the lungs precipitously drop—there is no cardiac output, and no ventilation. In effective compressions and ventilations, CO2 levels should rise. There should always be a waveform if the tube is in the proper position.

Prohibited Advanced Airway Procedures

Attempting difficult, unfamiliar, and rarely performed procedures may pose a danger to the patients they are being performed on. Certain procedures that are used in the hospital setting are **not approved** for prehospital personnel in the Memorial EMS System. These include:

- Nasotracheal Intubation
- Percutaneous Transtracheal Ventilation
- Cricothyrotomy/Surgical Airway

MEMORIAL EMS SYSTEM
ADULT PREHOSPITAL CARE MANUAL

**Advanced Airway Control
Policy (ILS & ALS Only)**

Medication Assisted Intubation

Rare situations occur where the respiratory distress patient is so exhausted from the efforts of breathing that their ability to continue any respiratory effort has a very limited future. In such situations, patients (typically those with diagnosed respiratory and circulatory diseases) will identify that they have been intubated before and that they are not going to be able to continue the work of breathing.

ALS Care

1. Bag valve mask, OA/NA, supraglottic airway and intubation equipment including bougie must be readied. Until all equipment is readied, patient's respirations can be assisted with BVM and 100% Oxygen.
2. Apply **Waveform Capnography**
3. Provide **Apneic Oxygenation** at 15 LPM via nasal cannula.
4. **Ketamine:** 2mg/ kg IV/IO IBW over 2 minutes (dosing based on Ideal Body Weight)

The formula for calculating IBW is:

Men= 50 kg + 2.3 kg for every inch over 5 foot tall.

Women= 45.5 kg + 2.3 kg for every inch over 5 foot tall.

5. **Hurricane Spray:** 1-2 sprays in posterior pharynx. May repeat once in 30 seconds
6. **Obtain Definitive Airway** based on *Supraglottic Airway Procedure* or *Advanced Airway Procedure*.
 - a. If intervention takes greater than 20 seconds, stop and ventilate the patient before second (final) attempt.
7. **Fentanyl:** 1 mcg/kg (Maximum 100 mcg single dose) slow IV/IO for comfort **after** airway is placed and confirmed using *Airway Confirmation Procedure 13.H.1*
8. If patient has a history of renal failure the dose should be reduced by half.
Contact Medical Control for re-dosing of Ketamine and/or Fentanyl
9. Medication assisted intubation will be reviewed through the CQI process. EMS paperwork should include EKG and capnography tracings.

Failed Airway

If unable to maintain $SPO_2 \geq 90\%$, regardless of patient positioning, the most proficient scene provider should

1. Re-assess ability to increase $SPO_2 \geq 90\%$ with all available, complaint appropriate adjuncts up to and including *Medication Assisted Intubation*. If $SPO_2 < 90\%$ revert to NPA with BVM (regardless of contraindications), immediate transport and hospital notification.

MEMORIAL EMS SYSTEM
ADULT PREHOSPITAL CARE MANUAL

**Orogastric (OG) Tube Insertion
Procedure (Transport **ALS** Only)**

Indications

Indication for orogastric (OG) tube placement in the Memorial EMS System is:

- Gastric decompression of an adult cardiac arrest patient after endotracheal intubation has been performed and placement verified; OR with use of a supraglottic airway.

Contraindications

- Known esophageal varices
- Esophageal stricture
- Esophageal or stomach cancer
- Esophagectomy or partial gastrectomy
- Gastric bypass surgery
- Penetrating neck trauma

OG Insertion Procedure

1. Estimate the length of the tube needed to reach the stomach by measuring the tube from the corner of the mouth to the earlobe and down to the xiphoid process. Mark the length with tape.
2. Lubricate the Salem sump tube (18F) with a water soluble lubricant (*e.g.* K Y Jelly).
3. Insert the tube through the oropharynx or through the gastric access lumen on the supraglottic airway until the marked depth is reached.
4. If the tube coils in the posterior pharynx, direct laryngoscopy can be utilized to place the tube in the esophagus.
5. Verify placement (see *OG Placement Verification*).

OG Placement Verification

1. Using a 60mL catheter tip syringe, instill 30mL of air into tube and auscultate over epigastrium for air sounds.
2. Aspirate for gastric contents and assess for cloudy, green, tan, brown, bloody or off-white color contents consistent with gastric contents.
3. Secure tube with tape.

Orogastric (OG) Tube Insertion Procedure (Transport **ALS** Only)

Gastric Decompression

Once placement of the Salem sump tube has been verified, begin gastric decompression in one of the following manners:

1. Attach the tube to portable suction (and suction intermittently as needed).
2. Attach the tube to the onboard suction (and suction intermittently as needed).
3. Attach the tube to continual low suction (approximately 60 mmHg) using the onboard suction.
4. If suction is not readily available, connect the 60mL syringe to the tube while keeping the (blue) air vent patent. This will allow the sump function of the tube to work until suction can be applied and will also prevent gastric contents from leaking from the tube.

Pearls

- If you cannot place the OG tube quickly (no more than 2 attempts), forego the procedure – do not delay transport.
- The **blue** air vent must remain patent to ensure proper sump function and to prevent damage to the gastric lining during suctioning.

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Respiratory Distress Protocol

Correct management of the patient in respiratory distress is dependent on identifying the etiology of the distress and recognizing the degree of the patient's distress. Signs and symptoms of respiratory distress will include:

- Shortness of breath
- Difficulty speaking
- Altered mental status
- Diaphoresis
- Use of accessory muscles
- Retractions
- Respiratory rate less than 8 or greater than 24

If the etiology is questionable or your assessment does not provide a clear etiology, consult Medical Control for direction in patient care.

Asthma/COPD/Pneumonia

In addition to general signs & symptoms of respiratory distress, patients may present with inspiratory & expiratory wheezing and/or "tight" lung sounds with decreased air movement.

First Responder Care

Emergency Medical Responder Care should be focused on assessing the situation and initiating routine patient care to treat for shock.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.
2. **Oxygen**: If respiratory distress noted, 15 LPM via NRM or 6 LPM via nasal cannula.
 - a. If no obvious respiratory distress, apply pulse ox. If $\geq 94\%$ and no signs/symptoms of respiratory distress, no Oxygen is required. If $\leq 89\%$ apply nasal cannula at 2-6 LPM. If unable to increase $\geq 94\%$ move to 15 LPM via NRM.
3. May suggest and assist patient with home prescribed inhalers.
4. Be prepared to support with **BVM** if necessary.

BLS Care

BLS Care should be directed at conducting a thorough patient assessment, initiating routine patient care to treat for shock and preparing the patient for or providing transport.

1. BLS Care includes all components of *Emergency Medical Responder Care*.
2. **Proventil (Albuterol)**: 2.5mg in 3mL of normal saline via nebulizer over 15 minutes. May repeat Albuterol 2.5mg every **15 minutes** as needed.
3. Apply **Waveform Capnography** (if equipped).
4. **Initiate ALS intercept** if needed and transport as soon as possible.
5. Contact receiving hospital as soon as possible or Medical Control if necessary.

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ADULT PREHOSPITAL CARE MANUAL

Respiratory Distress Protocol

Asthma/COPD/Pneumonia
{Continued}

ILS Care

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport. ILS Care includes all components of *BLS Care*.

1. Obtain peripheral IV access.
2. **Proventil (Albuterol)**: 2.5mg in 3mL of normal saline mixed with **Ipratropium (Atrovent)**: 0.5 mg via nebulizer over 15 minutes. May repeat Albuterol 2.5mg with Atrovent 0.5mg every **15 minutes** as needed. **In-line nebulizer** with **in-line capnography** may be utilized if patient is unresponsive or in respiratory arrest.
3. **Epinephrine 1:1000**: 0.3-0.5mg IM if the patient is suffering status asthmaticus. **Epinephrine administration should be the priority in these critical patients.**
 - Special consideration should be given to administering Epinephrine if the patient is > 40 years old, has an irregular heart rate, has a heart rate > 150bpm or has a significant history of heart disease. Consult Medical Control prior to administration if the patient meets any of these criteria.
4. For ongoing respiratory distress, the provider may initiate **CPAP** (see CPAP protocol 13.I.1)

ALS Care

ALS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Care includes all components of *ILS Care*.

Pearls

CPAP (Continuous Positive Airway Pressure) can be applied by **ILS/ALS** to achieve PEEP (Peak End Expiratory Pressure) for patients presenting with signs & symptoms of respiratory distress. The patient must be alert and able to adequately ventilate spontaneously in order for CPAP to be initiated.

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ADULT PREHOSPITAL CARE MANUAL

Respiratory Distress Protocol

CHF / Pulmonary Edema

In addition to general signs & symptoms of respiratory distress, patients may present with rales (or “crackles”), pedal edema, distended neck veins (JVD), orthopnea and tripod positioning.

First Responder Care

Emergency Medical Responder Care should be focused on assessing the situation and initiating routine patient care to treat for shock.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.
2. **Oxygen**: If respiratory distress noted, 15 LPM via NRM or 6 LPM via nasal cannula.
 - a. If no obvious respiratory distress, apply pulse ox. If $\geq 94\%$ and no signs/symptoms of respiratory distress, no Oxygen is required. If $\leq 89\%$ apply nasal cannula at 2-6 LPM. If unable to increase $\geq 94\%$ move to 15 LPM via NRM.
3. Be prepared to support with a **BVM** if necessary.

BLS Care

BLS Care should be directed at conducting a thorough patient assessment, initiating routine patient care to treat for shock and preparing the patient for or providing transport.

1. BLS Care includes all components of *Emergency Medical Responder Care*.
2. Be prepared to support the patient's respirations with BVM if necessary.
3. Apply **Waveform Capnography** (if equipped)
4. **Initiate ALS intercept** and transport as soon as possible.
5. Obtain **12-Lead EKG** and transmit to receiving hospital if capabilities exist and time permits.

ILS Care

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.
2. For ongoing respiratory distress, the provider may initiate **CPAP** (see CPAP protocol 13.I.1)
3. Obtain peripheral **IV access**.

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ADULT PREHOSPITAL CARE MANUAL

Respiratory Distress Protocol

CHF / Pulmonary Edema {Continued}

ILS Care {Continued}

4. **Nitroglycerin (NTG)**: 0.4mg SL. May repeat every **3-5 minutes** to a total of 3 doses (if systolic BP remains > 100mmHg). Do not delay Nitroglycerin administration waiting for I.V. insertion if systolic BP is >120 mmHg.
5. Contact receiving hospital as soon as possible. *Communicate early in the transmission if your patient is on CPAP so the appropriate equipment is ready upon patient arrival.*

ALS Care

ALS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Care includes all components of ILS care.

Critical Thinking Elements

- Constant reassessment of the respiratory distress patient is imperative to assure that the patient has adequate ventilation and oxygenation. Closely monitor the patient's response to treatment rendered.
- Patients in respiratory distress should be transported in an **upright position** to assist their respiratory effort.
- Do not delay CPAP application for administration of Nitroglycerin (*i.e.* you do not need to wait until all three (3) doses of NTG SL have been administered before applying CPAP).
- CPAP has its greatest effect when used without interruptions. CPAP should not be removed to administer NTG, a provider may coordinate those interruptions when CPAP must be transferred from portable to onboard O2 tanks.

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Airway Confirmation Procedure
(BLS, ILS, and ALS)

Consistency in airway placement **confirmation** methods and the **documentation** of such is a priority in our EMS System. The following are provider-level specific requirements to confirm Supraglottic Airway and Endotracheal Tube placement. All SGA and ETT's placed or attempted will be reviewed via the MEMS CQI Process. Failure to document in this manner will be actionable by the EMS System.

BLS Care

A “confirmed airway” at the BLS level is defined as established bilateral breath sounds/ absent epigastric noises when BVM ventilations are performed and one of the following:

- Continuous waveform capnography (if equipped)
- + Colormetric device color change purple to gold (eg “Easycap”)
- Chest rise and fall
- Condensation/fogging in the tube
- Clinical improvement (eg skin color, VS, level of responsiveness)

These findings should be reassessed and documented following any major move of the patient, including but not limited to:

- Placing patient on a backboard or CPR device
- Loading patient in an ambulance/ transferring care to higher level
- Unloading the patient at the hospital/ transferring care to E.D. staff

ILS Care

ALS Care

A “confirmed airway” at the ILS and ALS level is defined as established bilateral breath sounds/ absent epigastric noises when BVM ventilations are performed and **continuous waveform capnography**. These must be performed and documented at the ILS and ALS level. Further supporting documentation may include any of the following:

- Visualization of tube passing chords (ETT only)
- + Colormetric device color change purple to gold (eg “Easycap”)
- Chest rise and fall
- Condensation/fogging in the tube
- Clinical improvement (eg skin color, level of responsiveness)

These findings should be reassessed and documented following any major move of the patient, including but not limited to:

- Placing patient on a backboard or CPR device
- Loading patient in an ambulance/ transferring care to higher level
- Unloading the patient at the hospital/ transferring care to E.D. staff

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Capnography Procedure
(BLS, ILS, ALS)

Capnography, specifically waveform capnography, provides assessment of the quality of respiratory efforts as well as patency of airway adjuncts. Capnography can identify changes much sooner than waiting for signs and symptoms in a patient who is not able to communicate those changes. **Capnography is the most reliable and easily assessable tool for verification of airway patency and effects of respiratory support.**

All patients with advanced airways and/or complaining of respiratory distress should be monitored based on their quantitative (waveform) capnography. Additional complaints such as sepsis, and trauma would also benefit from capnography.

Treatment and Interventions

1. Assemble all equipment prior to utilization.
 - a. If required by unit model, zero the unit.
2. Apply ETCO₂ adapter.
 - a. If utilizing for monitoring of conscious patient, nasal cannula can be applied.
 - b. If utilizing with ETT/ supraglottic airway, placement location in circuit should be based on manufacturer recommendations.
3. Resume ventilations (continue spontaneous respirations).
4. Observe monitor for numeric value and waveform.
 - a. Obtain documentation strip prior to and after each patient move.
 - b. If absent or low numeric value and/or absent or inappropriate waveform
 - i. Immediately verify placement of advanced airway via
 - Colormetric device
 - Direct laryngoscopy
 - ii. Assess circulation for possible cause of low/ absent/ inappropriate readings
5. Unless directed otherwise by specific treatment protocol, seek to maintain ETCO₂ range of **35-45 mmHg**.
 - a. A sudden decrease in ETCO₂ in any situation could signal a change in patient condition. Immediately assess patient and begin resuscitation as indicated.
 - b. A sudden increase in ETCO₂ during cardiac arrest may indicate ROSC. Assess patient.

Critical Thinking Elements

- **Failure to place and document capnography on patients with airways in place is both unsafe and actionable by the EMS System.**
- **Know your equipment. Providers must know the difference between no value detected and no signal detected.**
- **Reasons for no value detected must be immediately assessed and include**
 - **Loss of airway, apnea, obstruction**
 - **Circulatory collapse, cardiac arrest**
 - **Equipment failure: BVM or oxygen**

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CPAP Procedure
(ILS/ALS only)

CPAP (Continuous Positive Airway Pressure) can be applied by **ILS/ALS** providers to achieve PEEP (Peak End Expiratory Pressure) for patients presenting with signs & symptoms of respiratory distress. The patient must be alert and able to adequately ventilate spontaneously in order for CPAP to be initiated.

Indications for CPAP

CHF/ Pulmonary Edema
Asthma
COPD
Pneumonia
Near Drowning

Contraindications for CPAP

Systolic BP of < 90mmHg
Severe cardiorespiratory instability and impending arrest
Respiratory or cardiac arrest
Upper airway abnormalities or trauma
Penetrating chest trauma
Compromised thoracic organs
Persistent nausea and vomiting
Gastric distention
Obtunded patient/ questionable ability to protect own airway

CPAP Application

1. Assess vital signs.
2. If the systolic BP is between 90-100mmHg, **Contact Medical Control** prior to initiating.
3. Set up the circuit and mask as per the manufacturers' instructions and connect to a normal oxygen regulator. Apply to the patient.
4. The CPAP device pressure settings are now adjustable based upon O2 flow rates.
5. Begin **CPAP** for all above indicated patients at **5cmH2O** which is 8-9 LPM O2 flow.
6. **Suspected CHF/Pulmonary Edema or Near Drowning only:** the provider may titrate the pressure by increasing 2.5cmH2O every 5 minutes to a maximum of **10cmH2O** which is 13-14 LPM O2 flow (if continued respiratory distress/hypoxemia).
7. Consider inline nebulizer treatment as indicated per Respiratory Distress Protocol.
8. Treat continuously while en route to the receiving facility.
9. Obtain and record vital signs every 5 minutes.

MEMORIAL EMS SYSTEM
ADULT PREHOSPITAL CARE MANUAL

CPAP Procedure
(ILS/ALS only)

CPAP Application (Cont.)

10. In cases of continued deterioration, severe anxiety, or life-threatening complications:
- Stop** the CPAP treatment.
 - Initiate appropriate BLS & ALS support per protocol.
 - On arrival at the receiving hospital, immediately communicate any adverse reactions to emergency department staff.

Flow vs Pressure

Lightweight & Portable	
80 grams nominal (less mask & harness) 90 mm X 53 mm X 65 mm (unit only)	
Flow (LPM)	CPAP/PEEP (approx. cm H ₂ O)
6	2.0 - 3.0
10	6.0 - 7.0
12	8.0 - 9.0
15	11.0 - 12.0
8 - 9	5.0
10 - 12	7.5
13 - 14	10.0
Flush	13.0 (Max.)

Pearls:

- CPAP can be a very beneficial adjunct in treating patients with respiratory distress.
- MEMS approved CPAP devices currently deliver approx. 70% FiO₂.
- CPAP increases intrathoracic pressures.
 - As CPAP pressure increases **expect** the systolic BP to drop.
 - Monitor closely and use with caution in patients with SBP<110mmHg.
- For Asthma, COPD, and Pneumonia, do not titrate CPAP pressure above 5cmH₂O.