The following protocol addresses airway management experiencing medical and trauma emergencies. During the management of airway emergencies, advanced airway management should be considered for the following situations after the commencement of EMR and BLS procedures:

- Apnea
- Cardiac arrest
- Inability to maintain oxygen saturation > 90% with BVM ventilations
- Persistent GCS ≤ 8
- Severe head injuries
- Maxillofacial trauma
- Serious facial and airway burns
- Penetrating neck injury with an expanding hematoma
- Advanced management of special patient considerations (e.g. Stoma, tracheostomy).
- Persistent obstruction
- Signs of impending respiratory failure/arrest such as persistent cyanosis, hypoventilation or increased effort of breathing, diminished, absent, or noisy breath sounds, and/or respiratory depression.
- Major chest injuries (e.g. flail chest, pneumothorax).

A. Positioning Patient for Airway Support

EMR/BLS

1. If a ***conscious*** breathing patient, place in an upright position.

2. If an ***unresponsive*** patient is found in a prone position, log roll in the supine position with c-spine stabilization if indicated Protocol 40 to assess the need for ventilations or CPR.

3. If an ***unresponsive*** patient is found in the supine position and c-spine stabilization is not indicated, position in the recovery position (left lateral recumbent position) and administer supplemental oxygen as needed.

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B. Spontaneous Breathing is Present, but Impaired

EMR/BLS

1. Maintain a patent airway utilizing head-tilt/chin lift or modified jaw thrust maneuver, observing cervical spine precautions if indicated.
2. Evaluate for and manage any suspected obstructions.
3. Suction as necessary.
4. Insert an oropharyngeal or nasopharyngeal airway if indicated.
5. Administer supplemental oxygen Procedure 1 as needed.

C. Spontaneous Breathing is Absent or Seriously Compromised

EMR/BLS

1. Maintain a patent airway utilizing head-tilt/chin lift or modified jaw thrust maneuver, observing cervical spine precautions if indicated.
2. Ventilate with a bag-mask device supplied with 100% oxygen, 1 breath every 6 seconds (10 breaths/min).
3. If unable to ventilate, reposition the head.
    a) If still unable to ventilate, consider an airway obstruction and refer to Section E. Complete Airway Obstruction in Unconscious Patients.
4. Insert an oropharyngeal or nasopharyngeal airway, if indicated.
5. If the oxygen saturation continues to drop while ventilating with the bag-mask device, consider ALS (it is best to proceed with intubation without delay).

ALS

6. If pneumothorax is suspected, perform chest needle decompression on the affected side Procedure 5.
7. Perform endotracheal intubation and confirm proper placement Procedure 3.
    a) Preoxygenate the patient for 2-3 minutes, prior to intubation.

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b) If the patient is unable to maintain his/her own airway patency and requires endotracheal intubation, but has an intact gag reflex, perform intubation with sedation Section G or Nasotracheal intubation Procedure 7.

c) In the non-trauma patient, place the patient in the ***sniffing position*** to align the airway for visualization.

d) If c-spine stabilization is indicated Protocol 40, the head must be placed and maintained in a neutral in-line position.

e) If there is difficulty seeing the glottis opening, consider an assistant to perform the **BURP** (backward/upward/rightward pressure) maneuver on the lower third of the thyroid cartilage.

NOTE: If the patient is in cardiac arrest, DO NOT interrupt chest compressions to insert an ET tube. Intubation should be performed during continuous compressions, CPR should not be stopped for intubation.

NOTE: Inflate ET tube balloon with Saline in the event of hyperbaric chamber transport.

8. If endotracheal intubation is unsuccessful or a difficult airway is anticipated, perform endotracheal intubation with Bougie Stylette Procedure 46**.**

a) A **difficult airway** can be anticipated using **L-E-M-O-N**, and a Bougie Stylette may be used on the first attempt.

L ook externally (short or thick necks, obesity, dental conditions such as “overbite”)

E valuate **3-3-2 rule**

- mouth should be at least 3 fingers wide when open
- space from the chin to the hyoid bone at least 3 fingers wide
- distance from the hyoid bone to the thyroid notch at least 2 fingers

M allampati (structures visible in an upright, seated patient able to open their mouth)

O bstruction (anything that may interfere with intubation)

N eck mobility

b) A **difficult laryngoscopy** can be determined using the Mallampati Grade scale on a conscious patient and/or the Cormack & Lehane Grade scale during laryngoscopy.

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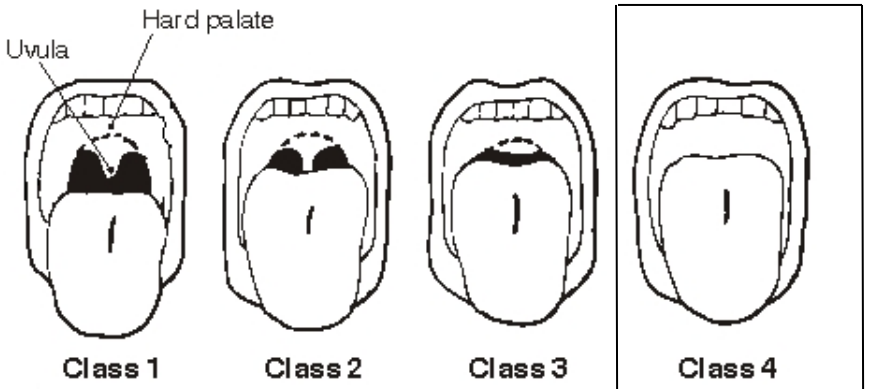
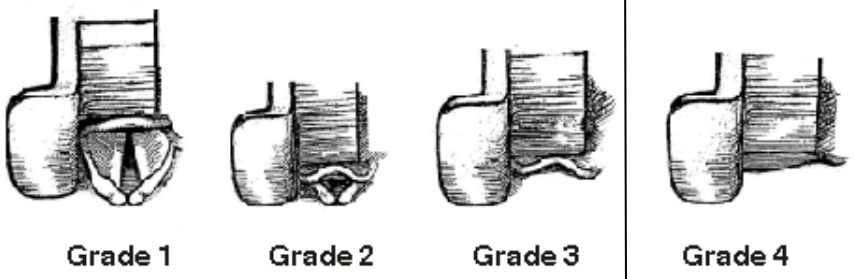
Mallampati

Grade scale



Cormack & Lehane

Grade scale



***NOTE: Class 4 and Grade 4 the glottis opening may be difficult to visualize.**

9. If intubation with the Bougie Stylette is unsuccessful and there are no contraindications for the iGel, insert the i-Gel secondary airway device Procedure 49**.**

10. If the patient is combative following a successful intubation, perform chemical restraint Protocol 43.

11. Consider insertion of a nasogastric tube Procedure 12 in situations where abdominal distension persists after successful endotracheal intubation. If i-Gel inserted, gastric tube will be required.

12. If unable to ventilate, consider an airway obstruction and refer to Section E. Complete Airway Obstruction in Unconscious Patients.

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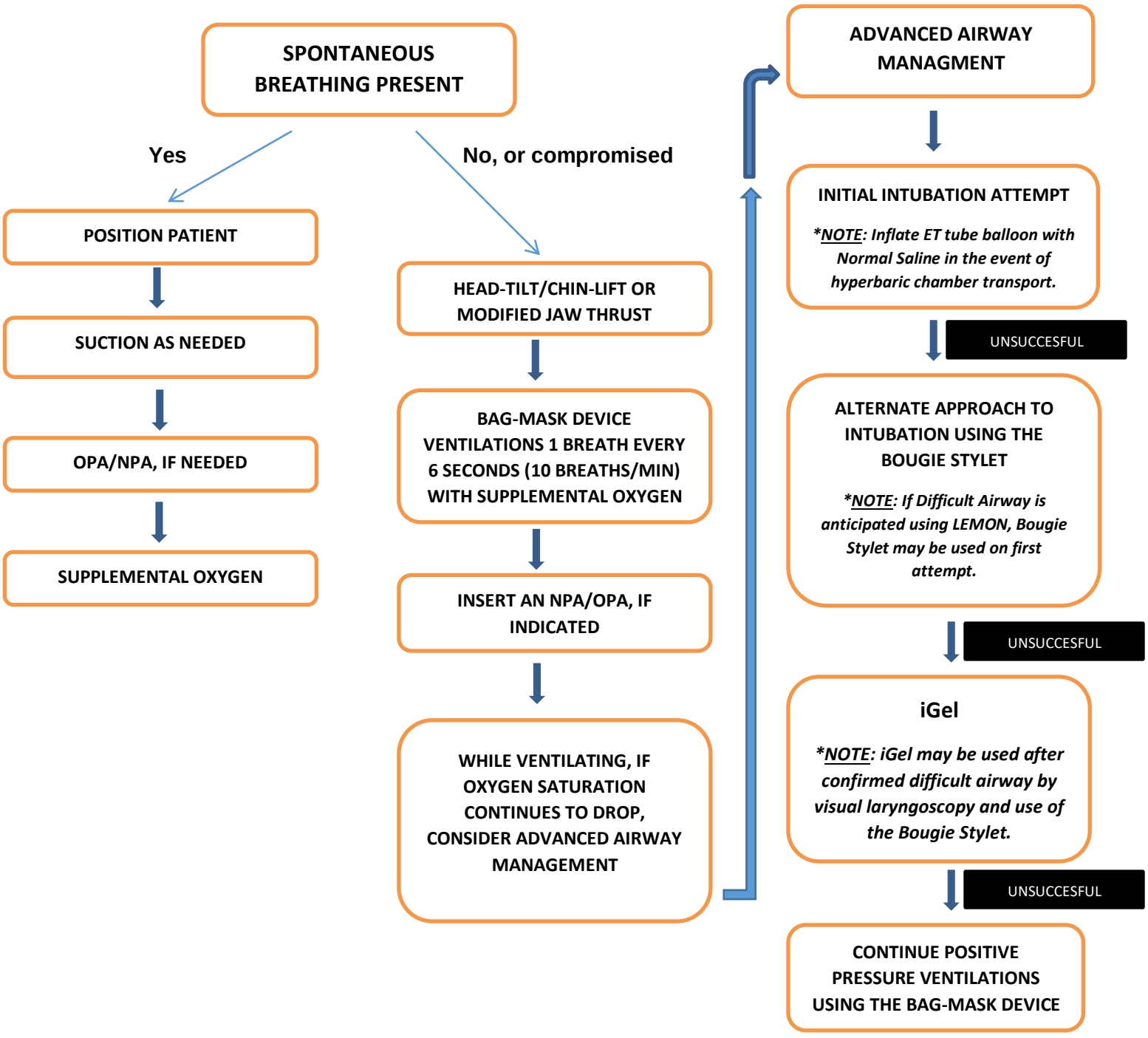
AIRWAY MANAGEMENT ALGORITHM FLOWCHART



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D. Airway Obstruction in Conscious Patients

NOTE: Patients with a partial airway obstruction may display signs of poor air exchange and increased breathing difficulty, cyanosis, or inability to speak or breathe. Encourage these patients to cough forcefully to relieve their own partial obstruction. **

EMR/BLS

1. Approach the patient from behind and perform abdominal thrusts, also known as the Heimlich maneuver, in rapid succession, until the object is expelled, or the patient becomes unconscious and proceed to Section E.
    a) Use chest thrusts for obese or pregnant patients. Repeat until obstructions is expelled or the patient becomes unconscious and proceed to Section E.

E. Complete Airway Obstruction in Unconscious Patients

EMR/BLS

1. Open the airway.
2. Attempt to ventilate. If unsuccessful, begin chest compressions/chest thrusts as if performing CPR.
3. After 30 compressions, and before attempting to ventilate, examine the airway for objects in the patient's mouth and if found, remove it.
4. Attempt to ventilate. If still unsuccessful, repeat steps 2 & 3 above.

ALS

5. If the airway remains obstructed, use a laryngoscope to visualize the obstruction and attempt to remove it using the Magill forceps.

MCP

If still unable to relieve the obstruction:

6. Intubate the trachea and force the obstruction into one of the mainstem bronchi with forceful ventilations from a BVM

OR

7. Consider cricothyrotomy Procedure 8**.**

NOTE: Patients experiencing a partial or complete airway obstruction, which has been cleared on the scene, can experience delayed onset of symptoms including laryngospasm and laryngoedema. The patient should be transported to the closest appropriate facility even though the airway has been cleared.

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F. Special Patient Considerations (Stoma, Tracheostomy)

Stoma

EMR/BLS

1. To ventilate with a bag-mask device, place the patient's head in a neutral position, locate and expose the stoma.
2. Place the bag-mask device mask (pediatric mask preferred) or resuscitation mask (MDFR Ocean Rescue) over the stoma and ensure an adequate seal.
3. Assess for proper ventilation by observing rise of the chest and feeling for air leaks around the mask.
4. If air leakage is felt around the mask, seal the patient's mouth and nose during ventilations.

ALS

5. When suctioning a stoma, use a properly sized French-tip suction catheter.
6. Inject 3 mL of sterile saline through the stoma and into the trachea.
7. Instruct the patient to exhale and insert the suction catheter until resistance is felt.
8. Suction while withdrawing the catheter, for no longer than 15 seconds on the way out. Continue to suction until suction catheter is clear.
9. Resume ventilations with a bag-mask device and 100% oxygen. Use ETCO2 values as an instrument to assist appropriate ventilations.

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Tracheostomy

EMR/BLS

1. A tracheostomy tube is a plastic tube placed within the stoma.

2. To ventilate, connect bag-mask device via the 15/22-mm adapter.

ALS

3. When suctioning a tracheostomy tube, use a properly sized French-tip suction catheter.

4. Inject 3 mL of sterile saline through the stoma and into the trachea.

5. Instruct the patient to exhale and insert the suction catheter until resistance is felt.

6. Suction while withdrawing the catheter, for no longer than 15 seconds on the way out. Repeat to suction until suction catheter is clear.

7. Resume ventilations with a bag-mask device and 100% oxygen. Use ETCO2 values as an instrument to assist appropriate ventilations.

8. When a tracheostomy tube becomes dislodged, the tracheostomy tube may not be able to be replaced and a new ET tube may have to be inserted into the stoma.

9. Use the ET tube or device in the surgical cricothyrotomy kit or a 6.0 mm ET tube if the surgical cricothyrotomy kit is not available.

10. Instruct the patient to exhale and insert the ET tube approximately 1-2 cm beyond the balloon cuff and confirm patency and proper placement.

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G. Intubation with Sedation

Intubation with sedation may be indicated to provide for a patent airway via an endotracheal tube even when a patient has spontaneous respirations and is not completely unresponsive. Hemorrhagic shock, severe head injury (GCS ≤ 8), and heart failure with pulmonary edema are a few examples.

ALS

1. Administer **Ketamine 2 mg/kg (MAX 200 mg)** slow IV or IM**.** For IM administration, a second dose can be administered in a different IM injection site.
2. Follow with administration of **Versed 2.5 mg** slow IV **or 2.5 mg** IM/MAD.
3. Pre-oxygenate the patient via BVM with 100% O_2 until adequate sedation is achieved.
4. Once adequate sedation is achieved, proceed with oral or nasal intubation. Remember to limit oral intubation attempts to 30 seconds. If the patient's heart rate decreases at any time more than 20 bpm, **STOP** and oxygenate with 100% O2 via BVM for a minimum of two minutes.
5. If unable to intubate, insert supraglottic airway device (I-gel®) if not contraindicated.

H. Rapid Sequence Intubation (RSI)

Rapid Sequence Intubation (RSI) is a method of intubating a patient with a gag reflex who would otherwise be difficult to intubate. Intubation is accomplished by sedating and paralyzing the patient, allowing for easier intubation. **Only trained paramedics assigned to Air Rescue and EMS Field Supervisor units are authorized to perform RSI.**

Rapid Sequence Intubation may be indicated in the following situations:

- When normal intubation attempts are unsuccessful, or a difficult airway is anticipated.
- Toxic Gas inhalation or burns with airway involvement and inevitable loss of airway.
- Unconscious patient with trismus.

ALS

1. Pre-oxygenate the patient with BVM for at least 4 minutes if situation allows
2. Administer **Etomidate 20 mg** IVP.
3. Administer **Fentanyl 50 mcg** IVP (If needed for pain).
4. If systolic blood pressure is below 90 mmHg administer **Ketamine 2 mg/kg** IV push **in place of Etomidate and Fentanyl.**

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5. Administer **Succinylcholine 1.5 mg/kg** IV push and wait for paralysis to occur.
6. Cricoid pressure must be maintained from the time paralytic is administered until the patient is intubated and endotracheal tube is secured, or the paralytic agent wears off.
7. Perform endotracheal intubation. **STOP** and ventilate for 60 seconds if unable to intubate within 30 seconds or if heart rate falls below 60 bpm.
8. Confirm intubation with auscultation, physical findings, end tidal CO2 and Pulse Ox monitoring.
9. If unable to intubate, insert supraglottic airway device (I-gel®) if not contraindicated.
10. If unable to ventilate appropriately consider cricothyrotomy Procedure 8.

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