

Advanced Airway Management for EMT-Basics



Meeker Fire & Rescue

2026

Objectives

Review anatomy and physiology

Review the tools, techniques

Airway Maneuvers

Suctioning

Oral and nasal adjuncts

BVM

I-gel

Why learn advanced airway management

Most often a neglected prehospital skill

It is vital that the prehospital crew be confident and comfortable with the rescue airways approved for their level of licensure.

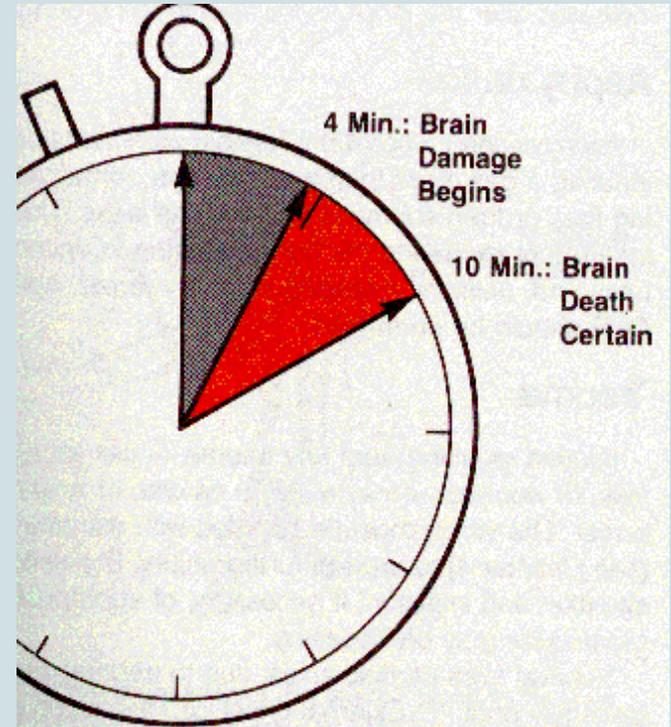
Bag valve mask (BVM) is one of the most important EMT skills to master.

Mastering BVM skills is fundamental for EMTs to effectively improve patient outcomes in emergencies

Every member - firefighter and EMTs are critical for this skill

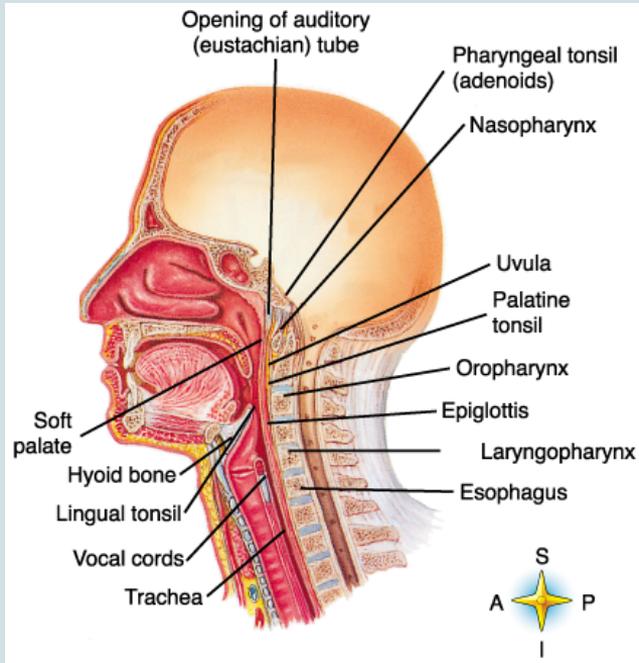
What does airway management do for the patient

- 0 – 1 minute: cardiac irritability
- 0 – 4 minutes: brain damage not likely
- 4 – 6 minutes: brain damage possible
- 6 – 10 minutes: brain damage very likely
- > 10 minutes: irreversible brain damage

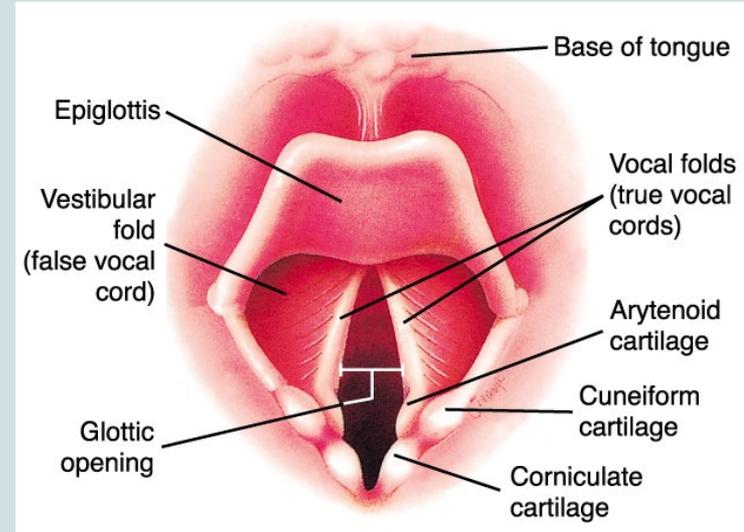


Airway Anatomy Review

Upper Airway Anatomy



Glottic Opening



Remember this for later

Lower Airway Anatomy

Trachea

Lungs

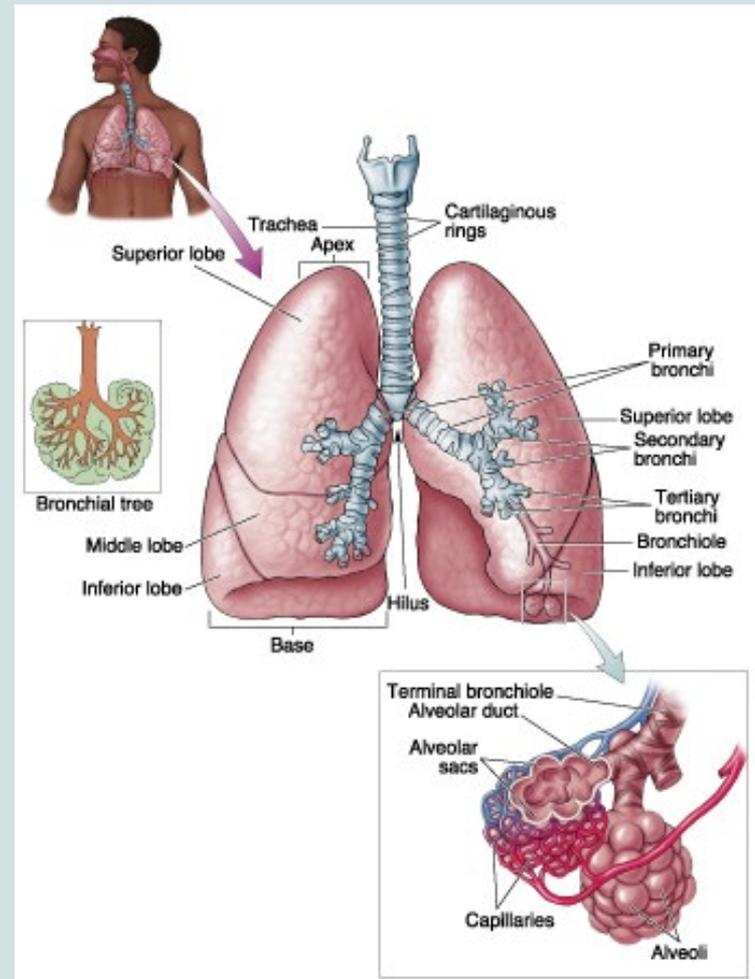
Bronchi

Bronchioles

Alveoli

Function of the lower airway:

Exchange of O₂ and CO₂



Adequate Breathing

Normal Rate

- Adult : 10 to 20 respirations per minute
- Child: 15 to 30 respirations per minute
- Infant: 25 to 50 respirations per minute

Regular rhythm of breathing

Adequate Quality

- Movement of air at mouth, nose
- Chest expansion is adequate, equal
- Breath sounds present, equal
- Minimum effort of breathing
- Adequate depth of breath (tidal vol.)

Inadequate Breathing

Abnormal Rate

- Adult: < 10 to > 20 respirations per minute
- Child: < 15 to > 30 respirations per minute
- Infant: < 25 to > 50 respirations per minute

Inadequate Quality

Absent or reduced at mouth, nose

Chest expansion shallow, or unequal

Breath sounds diminished, unequal, noisy, absent.

Increased effort of breathing, use of accessory muscles

Shallow breathing (inadequate tidal volume)

Common Clinical Presentation

Tachypnea - rapid breathing

Shallow breathing - ineffective quick breaths

Grunting

Nasal Flaring (especially in infants)

Chest Retractions: chest muscles pulling inward with each breath

Cyanosis: bluish tint to skin, lips, or nail beds

Hypoxia: low oxygen levels, pulse ox < 90%

Confusion

Altered Mental Status

Tachycardia - fast heart rate

Wheezing

Pale, cool, clammy skin

Example:

<https://youtu.be/5OR-0zuw9v0?si=BaeJpheZwmyrLxWp>

Where do we start for patients who are not breathing

1. Open the Airway

Ways to Open the Airway

Head-tilt/Chin Lift

Jaw Thrust

Suctioning

Nasopharyngeal Airway

Oropharyngeal Airway

2. Ventilation

Ways to Ventilate

Mouth to Mouth

Mouth to mask with supplemental

oxygen

1 person bag valve mask with oxygen

2 person bag valve mask with oxygen

Advanced Airways

Methods to Open the Airway

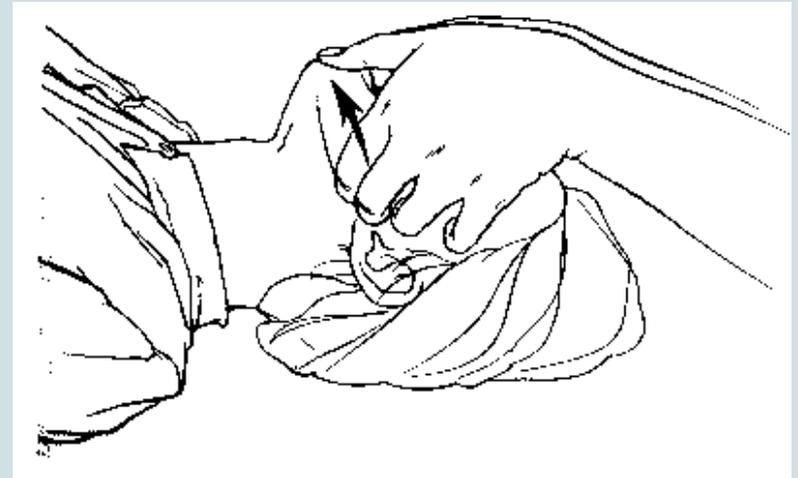
Head Tilt-Chin Lift - one hand on the forehead, apply backward pressure, tips of the fingers under the jaw and lift the chin

Do not do this if suspected neck injury



Jaw-Thrust Maneuver - place fingers behind the angle of the jaw, use thumbs to open mouth.

Use this for suspected neck injury



When and why these are methods to open the airway for the patient

Easy to do

No equipment required

Anyone - firefighters and EMTs can do this.

This simple maneuver can lead to spontaneous ventilation

Remember the airway anatomy - this is why !!!

https://youtu.be/p_QM7vjvRYk?si=4ofECmeVISiyk90P

When to do Head-Tilt Chin Lift

Best to use for unresponsive patient, cardiac arrest patient, or apneic patients **without** signs of trauma

When to do Jaw Thrust

Best to use unresponsive trauma patient or unresponsive patient with undetermined mechanism of injury

Airway is open - what would be next ?

Suctioning

- Remove blood, vomit, other liquids, food particles from airway
- May not be adequate for removing large, solid objects (teeth, foreign bodies, food)
- Should be performed immediately when gurgling is heard with spontaneous or artificial ventilation
- Rinse catheter with saline or water to prevent obstruction

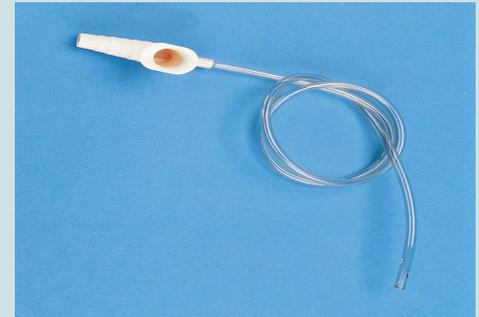
Suction can be portable or on ambulance

Suction no longer than the following:

15 seconds in adults

10 seconds in children

5 seconds in infants



Nasal Airways

USE:

Used on responsive patients who need help keeping tongue out of airway

Insertion is uncomfortable for responsive patients

Unresponsive patients who are snoring

Unresponsive patients with **gag reflex**



Technique:

- Measure from tip of nose to earlobe
- Ensure airway will fit through nostril
- Lubricate with water-soluble lubricant
- Insert with bevel toward base of nostril or septum
- If resistance is met, try other nostril

Do not use in patients with mid-face trauma or head trauma.

Oral Airways

USE:

Used on unresponsive patients without gag reflex

Helps hold tongue away from back of throat

Unresponsive, apneic patients with or without trauma

Any apneic patient being ventilated with BVM



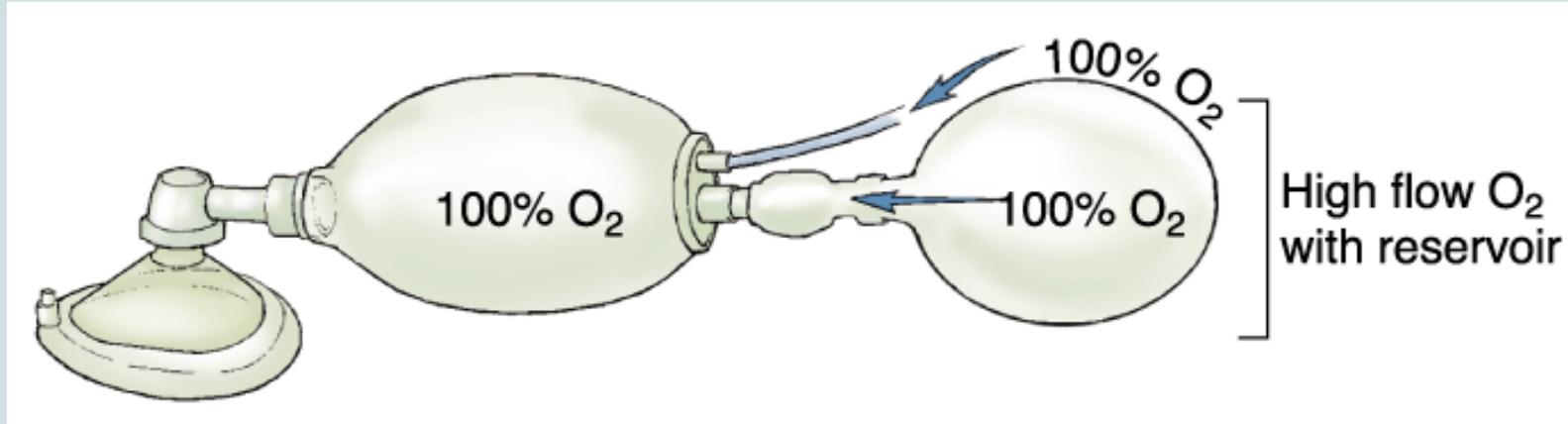
Technique:

- Measure from corner of mouth to earlobe or angle of jaw
- Open patient's mouth
- In adults insert with tip facing roof of patient's mouth, advance until resistance encountered, turn 180° until flange comes to rest on patient's teeth
- In infants and children use tongue depressor to lift tongue, insert oral airway right side up

When to assist a patient's breathing

Who needs assistance?

- A patient who is not breathing
- A patient who has reduced respiratory rate and tidal volume
- A patient whose breathing rate is increased, but whose tidal volume is inadequate



Assisting the patient who IS breathing but in TROUBLE

Patients with labored breathing: This can be rapid, slow, or shallow.

If patient is alert to understand explain what you are doing.

Place mask over patient's mouth and nose

Initially assist ventilations at the rate at which a patient is breathing - squeeze bag as patient inhales.



Assisting the patient who is NOT breathing

STEPS:

1. Airway Maneuver
2. Nasal or Oral Adjunct

Sometimes someone who is not breathing - you will not be able to open their mouth

1. Bag Valve Mask

This is a critical skill for every EMT to know how to do. It will save a person's life

Recommended if you do not have a BVM - use a mask to perform ventilation.

It is more effective to have two people perform BVM.

BVM Advantages -

- Provides immediate ventilatory support
- The BVM bag squeeze EMT can assess the compliance of the patient's lungs
- Is it hard to ventilate ? does this mean lung collapse, obstruction ?

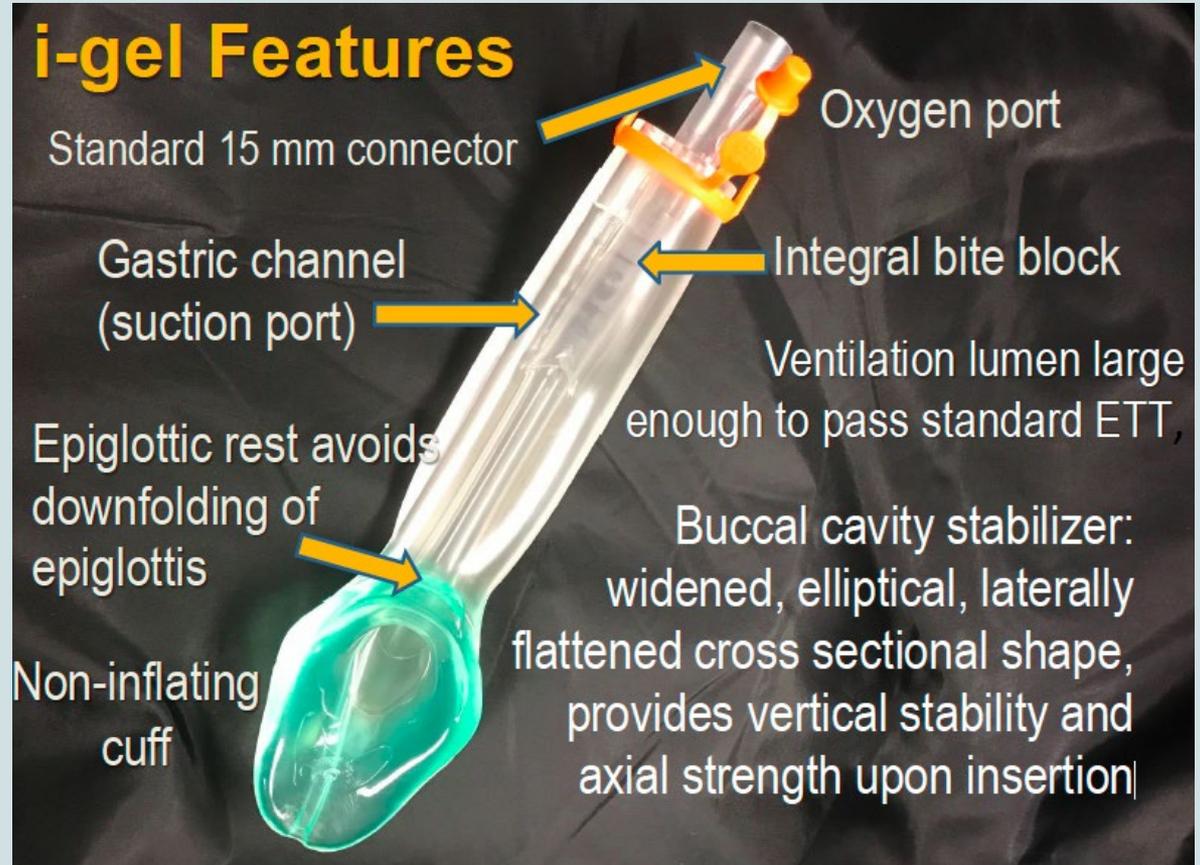
Disadvantages -

- Can cause the stomach to distend
- Can be difficult to obtain a adequate seal

What is the EMT advanced airway

A supraglottic airway

Evolving science affirms the need to provide effective airways for all patients including pediatrics.



I-gel Advantages.

THIS IS AN EMT BASIC SKILL

- Ease and speed of insertion
- Multiple sizes for all patients
- Better 1st attempt success vs. previous airways like the king
- Non-inflating cuff; superior anatomical seal; less cuff over pressurization and air leak
- Minimal risk tissue trauma, compression, displacement
- Stability after insertion (no position change d/t cuff inflation)

The “Yes” and the “No” of i-gels

INDICATIONS:

- 1st line advanced airway during cardiac arrest.
- Need for advanced airway in unconscious patient with NO gag reflex.
- Only person to help is EMT-Basic
- Signs and symptoms of difficult intubation for ALS provider



CONTRAINDICATIONS:

- +Gag reflex
- Caustic ingestion
- Trismus/Lockjaw
- Limited mouth opening
- Facial trauma, or mass



Step 1 - Choose the size of i-gel

Choosing the i-gel size is based on the patient's ideal weight.



i-gel size	Patient Size	Pt wt (kg)	(LBS)	Broselow color	NG or Suction
1.5	Infant	5-12 kg	11-25	Pink, red, purple	10 Fr.
2	Small child	10-25 kg	22-55	Yellow, white, blue	10 Fr.
2.5	Large child	25-35 kg	55-77	Orange	10 Fr.
3	Small adult	30-60 kg	65-130	Green (2.5-3)	12 Fr.
4	Medium adult	50-90 kg	110-200		12 Fr.
5	Large adult	90+ kg	200+		14 Fr.

Step 2 - Prepare the i-gel



Preparation for use



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12

Step 3 - Insert the i-gel

PROFICIENT USERS CAN INSERT IN < 5 SECONDS

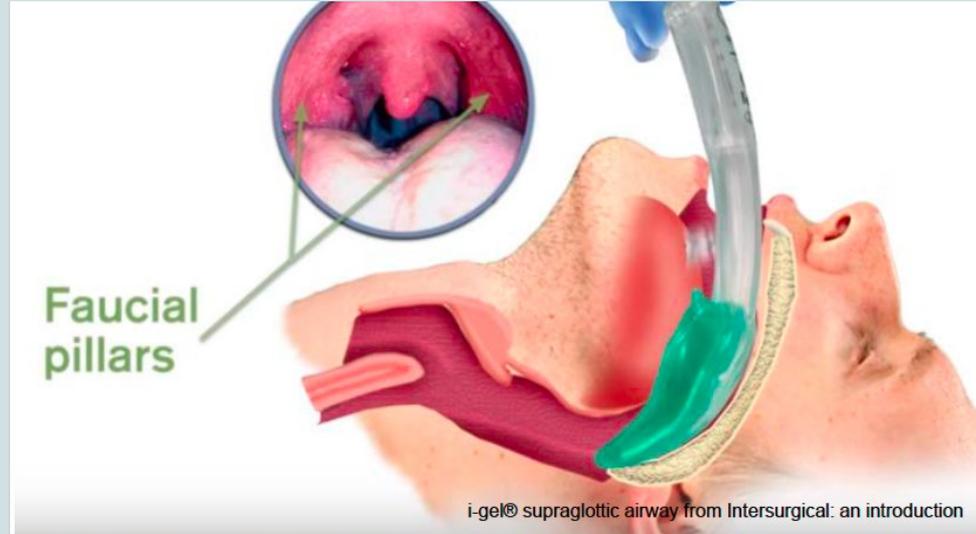
Position i-gel so cuff outlet is facing the patient's chin.

Introduce leading the soft tip into the mouth in a direction towards the roof of the mouth

Glide i-gel downwards and backwards along the roof of the mouth with a gentle push until definitive resistance is felt.

Do not apply excessive force during insertion

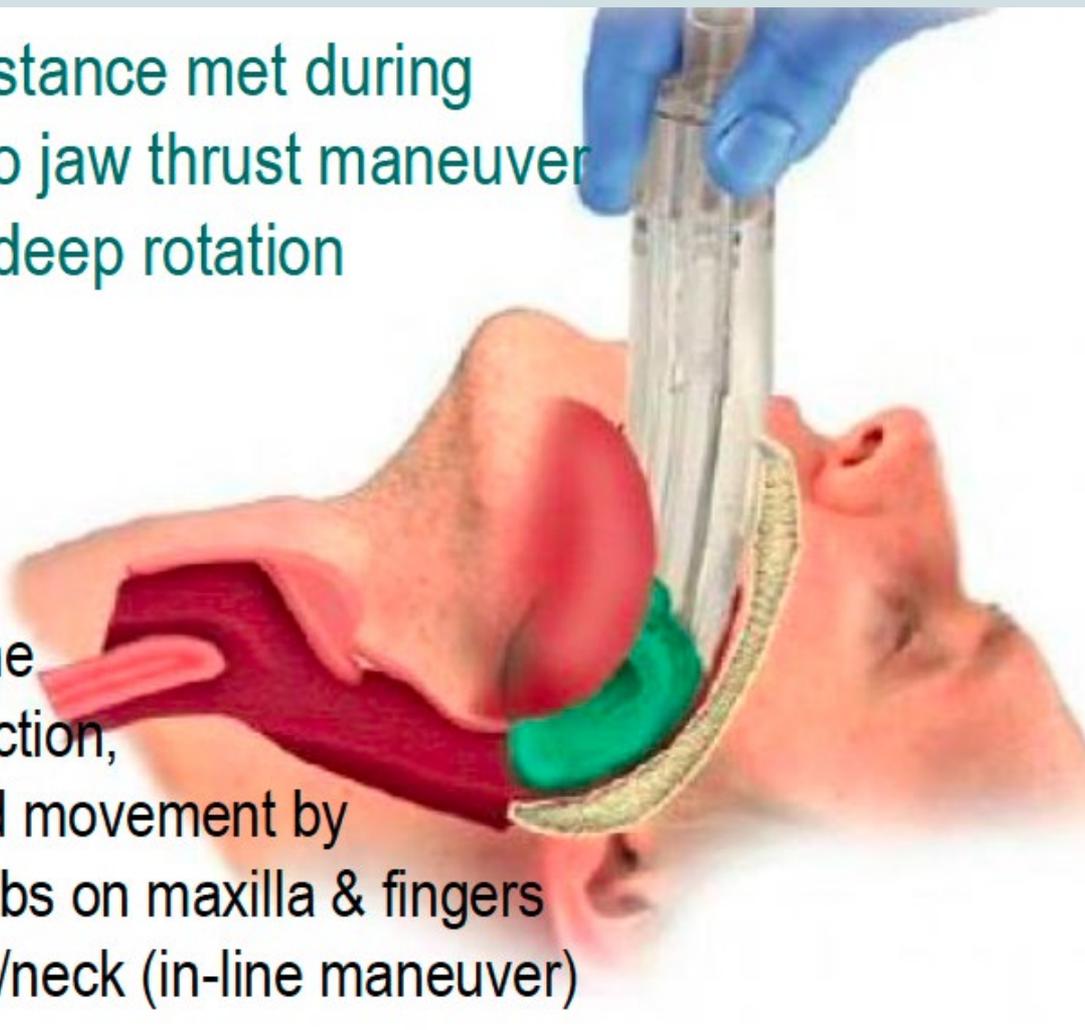
<https://youtu.be/ae1Yr0fbz98?si=hSvL2dldUJc6ERMv>



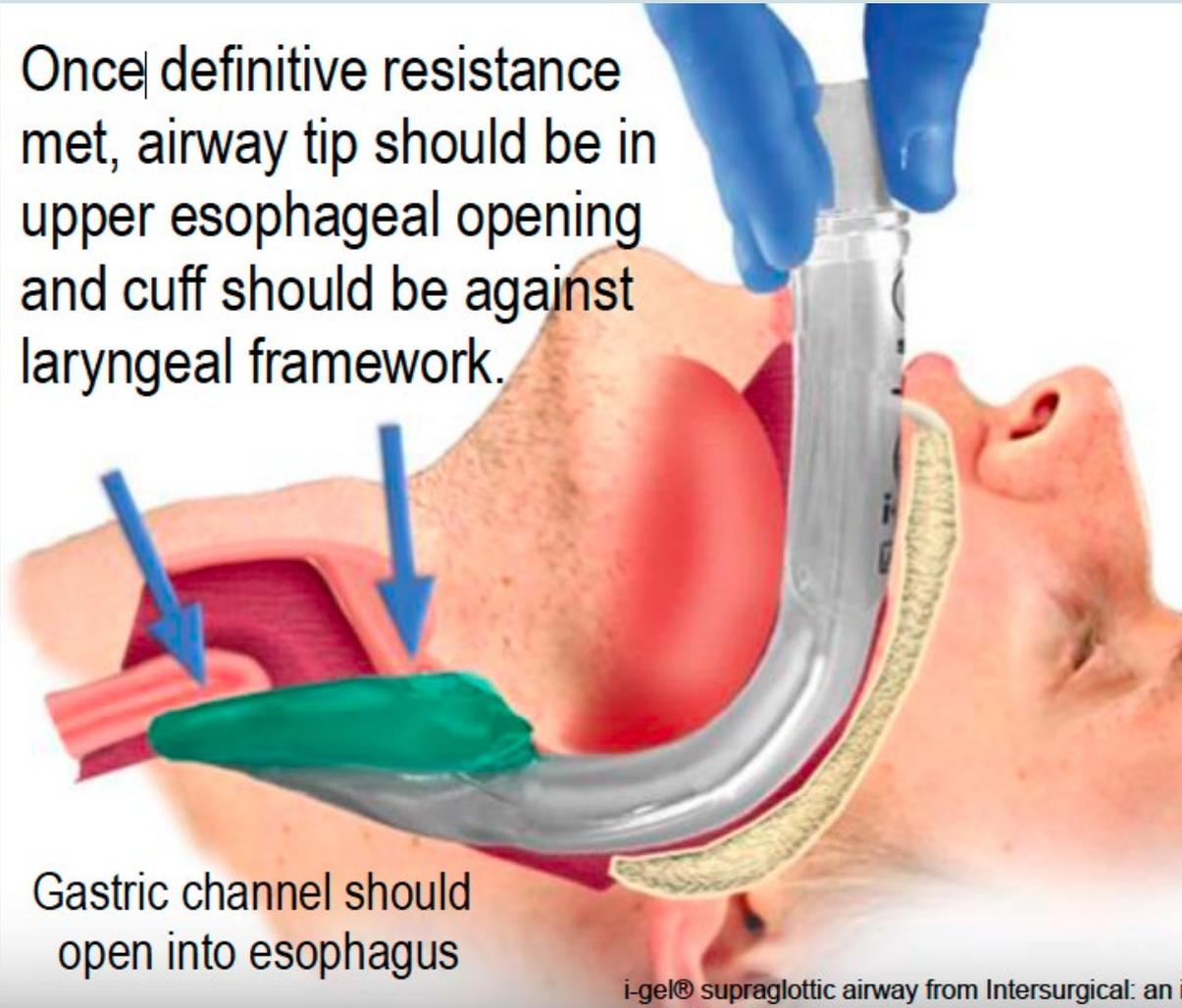
'Give-way' may be felt before end point met due to passage of i-gel bowl through faucial pillars
Continue until definitive resistance felt

If early resistance met during insertion, do jaw thrust maneuver or perform deep rotation

For pt in spine motion restriction, prevent head movement by placing thumbs on maxilla & fingers around head/neck (in-line maneuver)



Once definitive resistance met, airway tip should be in upper esophageal opening and cuff should be against laryngeal framework.



Gastric channel should open into esophagus

Insertion depth



Once placed correctly, incisors should rest on horizontal line on bite block (adult sizes only)

Step 4 - Confirm placement

Confirm placement with chest auscultation and ETCO₂

- **<10 mmHg:** Poor perfusion; optimize chest compressions (depth, rate, recoil, switch compressors).
- **>10 mmHg (but low):** Some perfusion; continue CPR, but look for increases.
- **>15-20 mmHg:** Adequate chest compressions are likely occurring.
- **<10 mmHg (with sudden drop):** Indicates CPR quality worsened or airway issue.
- **35-40 mmHg:** Suggests ROSC is occurring, requiring immediate assessment for pulse and rhythm.

When good ventilations and appropriate position are confirmed, secure the tube.

REASSESS

Reassess frequently to detect displacement and complications - each time after movement of the patient or status/condition changes.

- ETCO₂
- Lung sounds
- Pulse ox (not cardiac arrest)
- HR (not cardiac arrest)
- BP (not cardiac arrest)

Step 5 - Secure

Secure with head strap in Resus pack



Step 6 - BVM and Oxygen to i-gel



Troubleshooting

If placed too high in pharynx, may result in a poor seal and cause excessive leakage. If excessive air leak during ventilation, use one or all of the following:

- Hand ventilate; gentle and slow
- Limit tidal volume to no more than 5mL/kg
- Limit peak airway pressure to 15-20cm H₂O
- Assess depth of sedation; ensure pt is not bucking the tube

If i-gel tip enters glottic opening, will have excessive air leak through gastric channel and obstruction to airflow

If suspected, remove & reinsert i-gel with gentle jaw thrust

If all fail, change to one size larger i-gel

Per Colorado State Regulation:
Appendix A - Medical Acts Allowed

EMT Basic

Cannot suction the lungs (tracheobronchial) or do gastric decompression

Would not place NG/suction catheter into the i-gel.

This can lead to coughing, retching, laryngospasm, excessive salivation

What you can do is suction the mouth, suction at the port.

Risks and Complications of Inserting an i-gel

- Excessive air leak
- Laryngospasm, sore throat
- Cyanosis
- Tongue numbness
- Trauma to the pharyngo-laryngeal framework
- Down-folding of epiglottis (more common in children)
- Gastric distention, regurgitation, aspiration
- Nerve injuries, vocal cord paralysis, lingual or hypoglossal nerve injuries

1080 PROCEDURE GUIDELINE: SUPRAGLOTTIC AIRWAY

EMT/EMT-IV

AEMT

Intermediate

Paramedic

Indications:

- Rescue airway if unable to intubate a patient in need of airway protection
- Primary airway if intubation anticipated to be difficult and rapid airway control is necessary
- Primary airway in pulseless arrest, when attempts at intubation are likely to interrupt CPR
- Designated advanced airway for EMTs

Contraindications:

- Intact gag reflex
- Caustic ingestion
- Relative to device specific height guidelines

Technique

1. Initiate BLS airway sequence
2. Select proper size supraglottic airway (based on selected brand) assemble and test equipment, lubricate posterior aspect distal tip with water-soluble lubricant (included)
3. Suction airway and pre-oxygenate with BVM ventilations, if possible
4. If trauma: have assistant hold in-line spinal immobilization in neutral position
5. If no trauma, sniffing position or slight cervical hyperextension is preferred
6. Insert and place airway as previously instructed.
7. Using supplied syringe, inflate cuff balloon with correct volume of air (marked on King tube if using).
8. Attach bag to airway and begin ventilating patient. (King airway: While bagging, slowly and slightly withdraw King until ventilations are easy and chest rise is adequate)
9. Confirm tube placement by auscultation, chest movement, and ET_{CO}₂
10. Monitor patient for vomiting and aspiration
11. Continuously monitor and record ET_{CO}₂, SpO₂, vital signs

Precautions:

1. Use with caution in patients with broken teeth, which may lacerate balloon
2. Use with caution in patients with known esophageal disease
3. Do not remove a properly functioning supraglottic airway in order to attempt intubation

Protocol

