

i-Gel Supraglottic Airway Study

NYS PILOT PROGRAM PRESENTATION

GREENVILLE TOWNSHIP VOLUNTEER AMBULANCE CORPS

HUDSON VALLEY REGIONAL EMS COUNCIL

APRIL 2022

iGel Supraglottic Airway Study

This is a pilot program across New York State Certified EMS Agencies to determine the feasibility of BLS providers using a gel-type supraglottic airway with an adult patient in cardiac arrest.

REQUIREMENTS

- EMTs engaged in this pilot must be currently certified by the NYS DOH BEMS, and members in good standing of a NYS Certified Ambulance or First Response Agency.
- Participating agencies must have written support and approval by their medical director.
- Local Regional EMS Councils must approve the participation of agencies in their respective regions, and forward agency applications and written approvals to the Hudson Valley Regional EMS Council (HVREMSCO).
- Participating agencies must provide usage data through the NYS ePCR System that meets NEMSIS 3.4 standards.
- Participating agencies and providers must currently be using all approved BLS Adjuncts except for BLS 12-lead acquisition and transmission.

REQUIREMENTS CON'T

- All EMTs using this method of airway management must participate in a didactic and psychomotor training program and successfully complete cognitive and psychomotor skills testing administered by NYS Certified Instructor Coordinators (CIC), Certified Lab Instructors (CLI) and/or medical director approved training officers.
- EMTs must use an i-gel resus pack supraglottic airway device.
- EMTs must use waveform capnography with each gel supraglottic airway placement.
- EMTs must request Advanced Life Support (ALS) with each gel supraglottic airway use.

REQUIREMENTS CON'T

- Each gel supraglottic airway placement must be confirmed by either an ALS provider or an emergency department medical control Nurse Practitioner (NP), Physician Assistant (PA) or Physician (MD/DO).
- EMTs must document all aspects of use and verification in their ePCR and report any adverse patient outcomes.
- Agencies must engage in quality assurance of all uses and reposit data to the HVREMSCO.

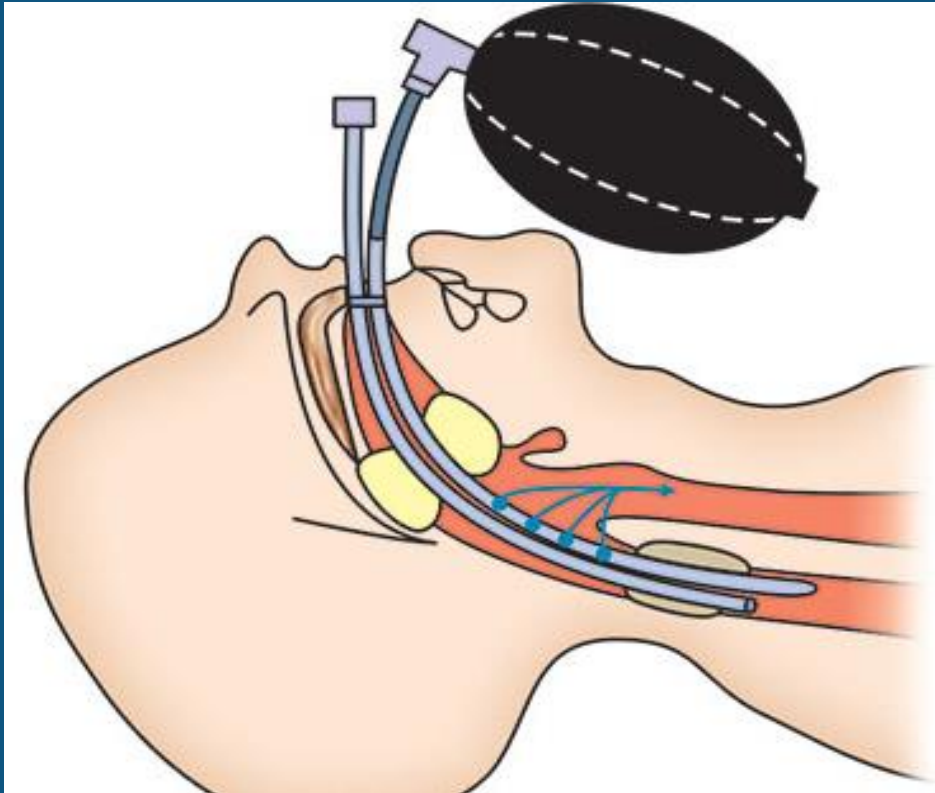
Presentation Objectives

- ▶ Review Retroglottic and Supraglottic airway devices and types
- ▶ Compare SGAs with Advanced Airways
- ▶ Review Wave Form Capnography
- ▶ Present SGA protocol
- ▶ Present SGA insertion technique

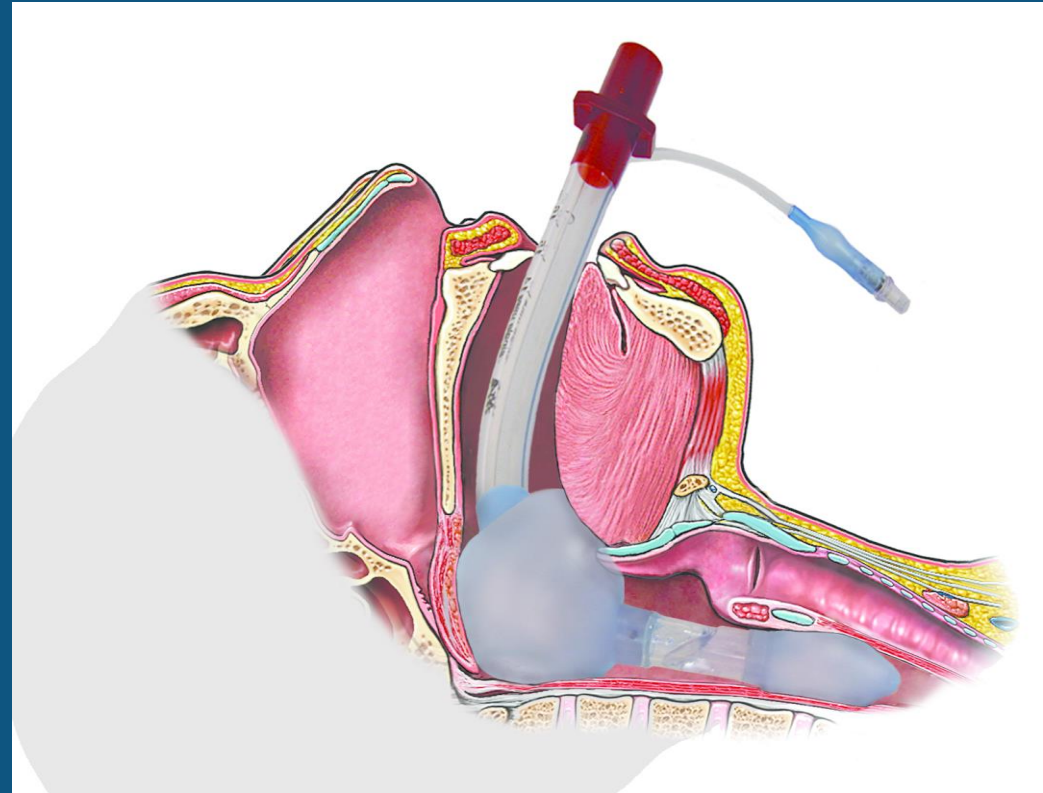
RETROGLOTTIC / SUPRAGLOTTIC

Retroglottic Airway Devices

Combitube

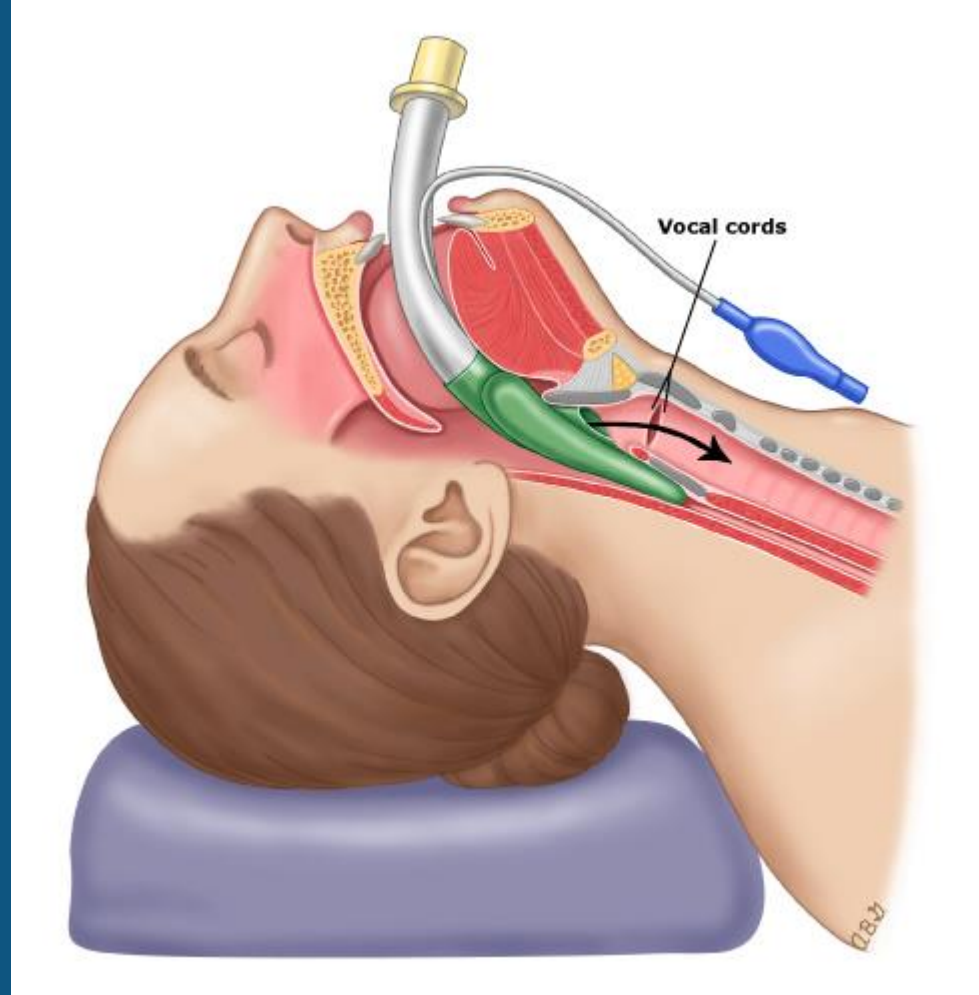


King Airway



Supraglottic Airway Devices

- ▶ LMA (Teleflex)
- ▶ Air-Q (Mercury Medical)
- ▶ Aura (Ambu)
- ▶ i-gel (Intersurgical)



Supraglottic Airway Types

INFLATING

- ▶ LMA Series of SGAs (Teleflex)
- ▶ Auragain (Ambu)
- ▶ Air-Q (Cookgas Mercury Medical)

NON-INFLATING

- ▶ i-gel (Intersurgical)



Inflating vs. non-Inflating

A 2014 meta-analysis study published in the *Journal of the Association of Anaesthetists* reviewed 31 separate studies and a total of 2000 cases.

Their findings indicated (igel vs LMA):

- ▶ i-gel™: faster and easier to insert
- ▶ No difference in success rate
- ▶ Can achieve higher airway pressures before leak occurs

de Montblanc, J., Ruscio, L., Mazoit, J. X., & Benhamou, D. (2014). A systematic review and meta-analysis of the i-gel® vs laryngeal mask airway in adults. *Anaesthesia*, 69(10), 1151–1162.

Reasons for using Supraglottic Airways over other advanced airway types

- ▶ Placed blindly
- ▶ Require less training
- ▶ Can be placed in less time
- ▶ Are easier to place during chest compressions

Potential Challenges

- ▶ Must be inserted to the correct depth for the ventilation port to be over the glottic opening
- ▶ If not seated correctly:
 - ▶ Inadequate ventilation
 - ▶ Inadequate protection from aspiration
 - ▶ Inability to detect lung sounds after placement
- ▶ Supraglottic airway devices are ineffective for patients with upper airway edema, such as from burns or anaphylaxis

Problems

- ▶ Unrecognized misplacement, which is just as devastating as a misplaced endotracheal tube

WAVEFORM CAPNOGRAPHY

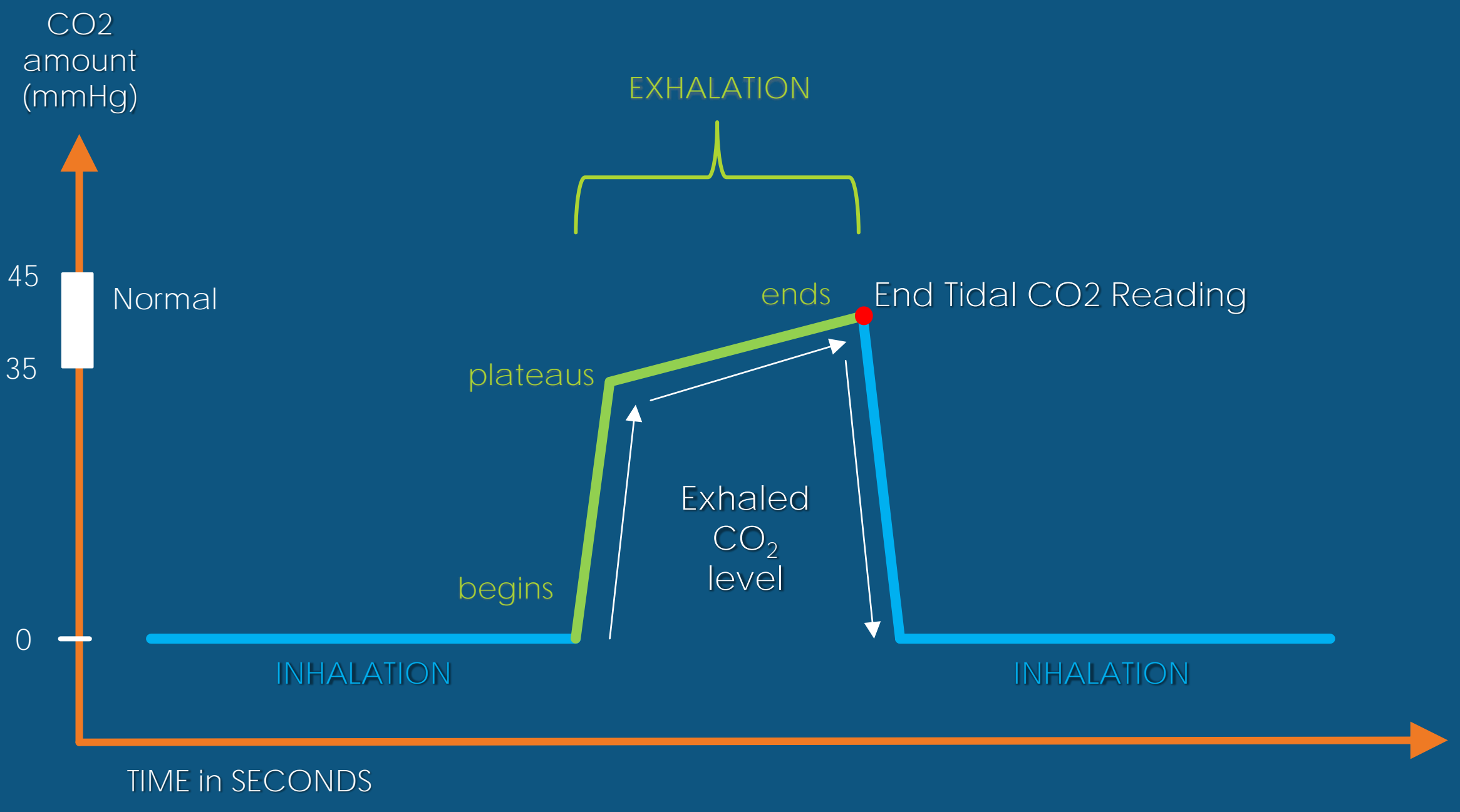
Capnography

The measurement of exhaled carbon dioxide

Indicates:

- ▶ Metabolism is occurring at the cellular level
- ▶ Perfusion is occurring at the cellular level
- ▶ Gas exchange (respiration) is occurring at the cellular and alveolar level
- ▶ Ventilation of the alveoli is occurring

Waveform Capnography shows a combination of all these facets



CO₂
amount
(mmHg)

EXHALATION

45
Normal

35

ends End Tidal CO₂ Reading

plateaus

Exhaled
CO₂
level

begins

0

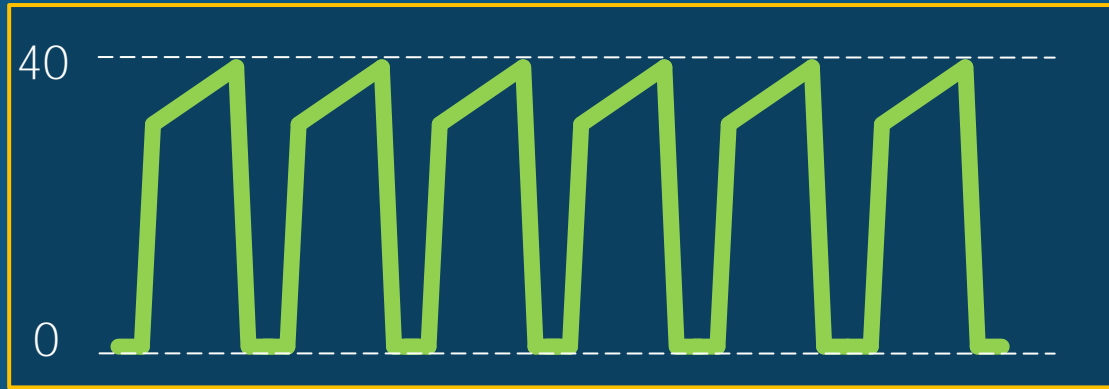
INHALATION

INHALATION

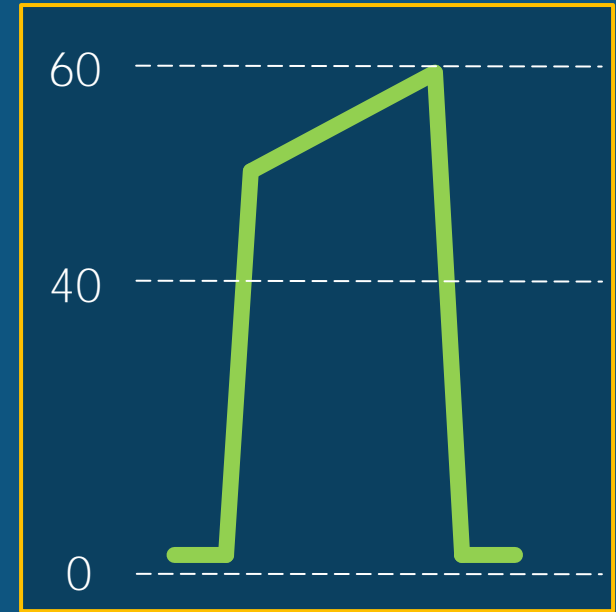
TIME in SECONDS

Waveform Capnography can tell you if ventilations are:

FAST



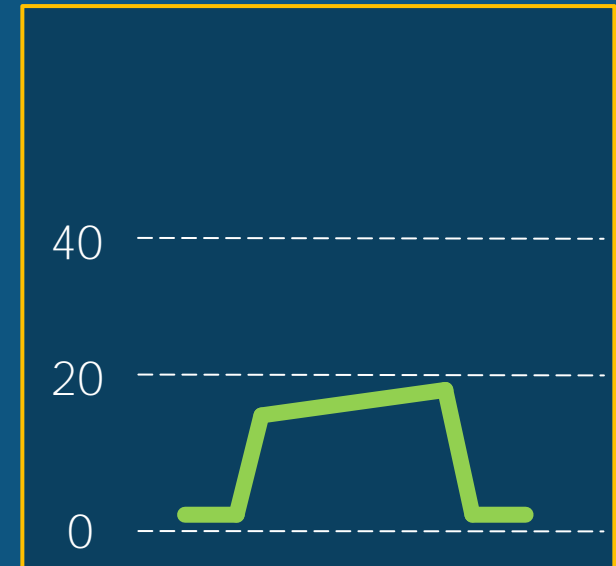
DEEP or
INCREASED
CO₂ BEING
EXHALED



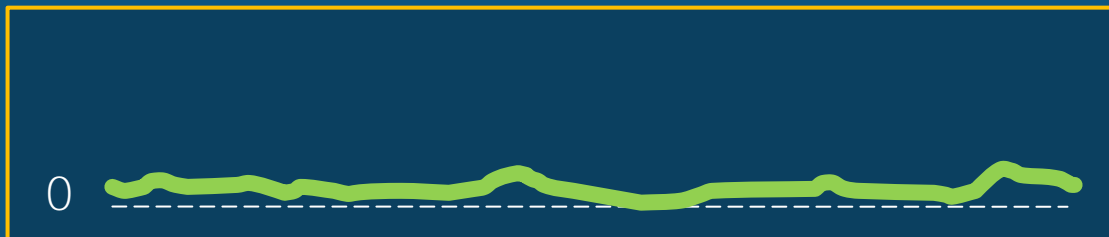
SLOW



SHALLOW
or LITTLE
CO₂ BEING
EXHALED

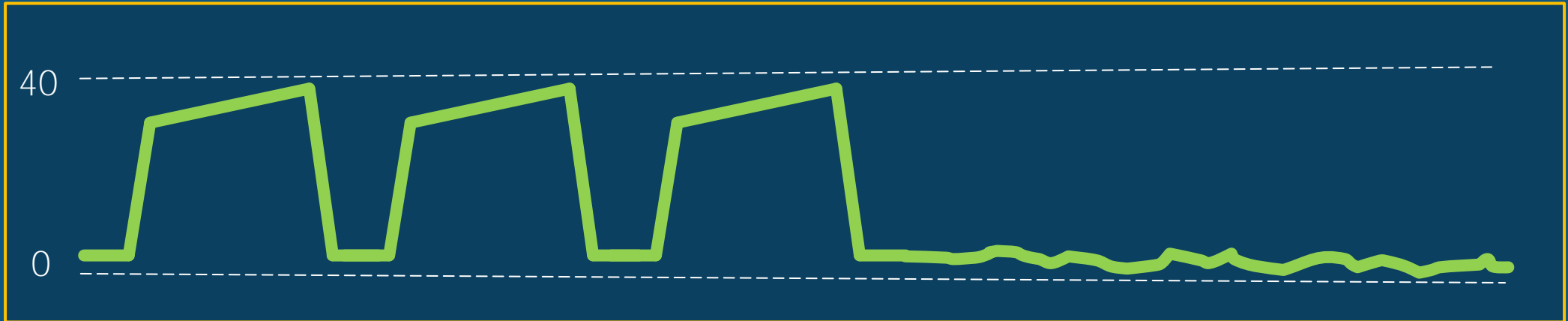


ABSENT

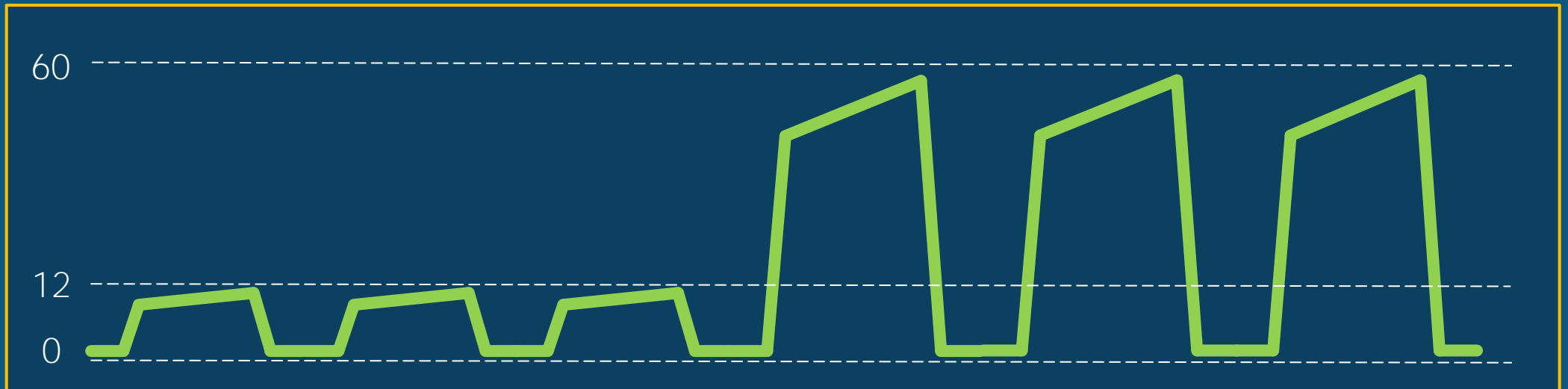


Or if there's a sudden loss (displacement?) or gain (ROSC?)

DISPLACEMENT
OR NO
VENTILATIONS



ROSC



General Rules of Waveform Capnography

Sudden drop of ETCO₂ to zero

- Disconnected from BVM
- Defect with ETCO₂ analyzer

Sudden decrease of ETCO₂ (not to zero)

- Airway device dislodged
- Leak in connections
- Potential obstruction

Gradual Lowering of ETCO₂

- Decreasing Cardiac Output

Sudden increase in ETCO₂

- Access to lung tissue previously obstructed
- Sudden increase in cardiac activity / blood pressure

If there is a Loss or Sudden Decrease of ETCO₂

Apply the DOPE mnemonic to troubleshoot airway problems

- Dislodgement, Obstruction, Pneumothorax, and Equipment failure
- Reassess lung sounds to check for airway dislodgement and pneumothorax and use a suction catheter to assess for an obstruction in the airway.

Check the capnography circuit

- Ensure that the circuit is clear of secretions and replace the circuit if needed.
- Ensure that the capnography tubing is not pinched closed, and that it is attached to the monitor correctly.
- It is important to document the reason for any interruptions in ETCO₂ when an advanced airway is in place, and the actions taken to correct it.

PROTOCOL

Pilot Study Indications for Use

- ▶ Adult Patient in Cardiac Arrest

Pilot Study Contraindications for Use

- ▶ Patient NOT Adult
- ▶ Patient NOT in Cardiac Arrest
- ▶ Caustic Ingestion
- ▶ Trismus / Lockjaw
- ▶ Limited Mouth Opening
- ▶ Pharyngeal Trauma or Mass

Gel Supraglottic Airway Insertion for EMTs

Criteria

For adult patients who are unresponsive without signs of life

Contraindications

Patients with a stoma

Obstructive lesions below the glottis

Trismus or limited mouth opening

Pharyngo-perilaryngeal abscess, trauma or mass

Caustic ingestion

CFR

- Follow Adult Cardiac Arrest protocol
- Call for ALS



CFR STOP

Gel Supraglottic Airway Insertion for EMTs

EMT

1. Follow Adult Respiratory Arrest / Failure protocol components:
 - Open the airway using the head-tilt/chin-lift or modified jaw-thrust maneuver
 - Remove any visible airway obstruction by hand
 - Clear the airway of any accumulated secretions or fluids by suctioning
 - Provide positive pressure ventilation using a bag-valve mask
 - If ventilations are not successful, refer immediately to the “Extremis: Foreign Body Obstructed Airway” protocol
 - BLS airway management with use of airway adjuncts and bag-valve mask device, as indicated, including suction as needed, if available
 - Bag-valve mask should be connected to supplemental oxygen, if available
 - Ventilate every 5-6 seconds (adult patient)
 - Each breath is given over 1 second and should cause visible chest rise

Gel Supraglottic Airway Insertion for EMTs

EMT

2. Prepare and insert Gel Supraglottic Airway as per manufacturer's instructions
3. Attach and monitor waveform capnography
4. Confirm presence of bilateral lung sounds
5. Confirm absence of epigastric sounds
6. Secure the Gel Supraglottic Airway as per manufacturer's instructions
7. Continue to ventilate the patient as you would if no supraglottic airway was in place
8. If ALS intercepts, an ALS provider must confirm correct placement
9. If no ALS is available and the patient is transported to the local hospital, the emergency department medical control Nurse Practitioner (NP), Physician Assistant (PA) or Physician (MD/DO) must confirm correct placement
10. Document in the ePCR all confirmation methods used to confirm correct placement

Gel Supraglottic Airway Insertion for EMTs

MEDICAL CONTROL CONSIDERATIONS

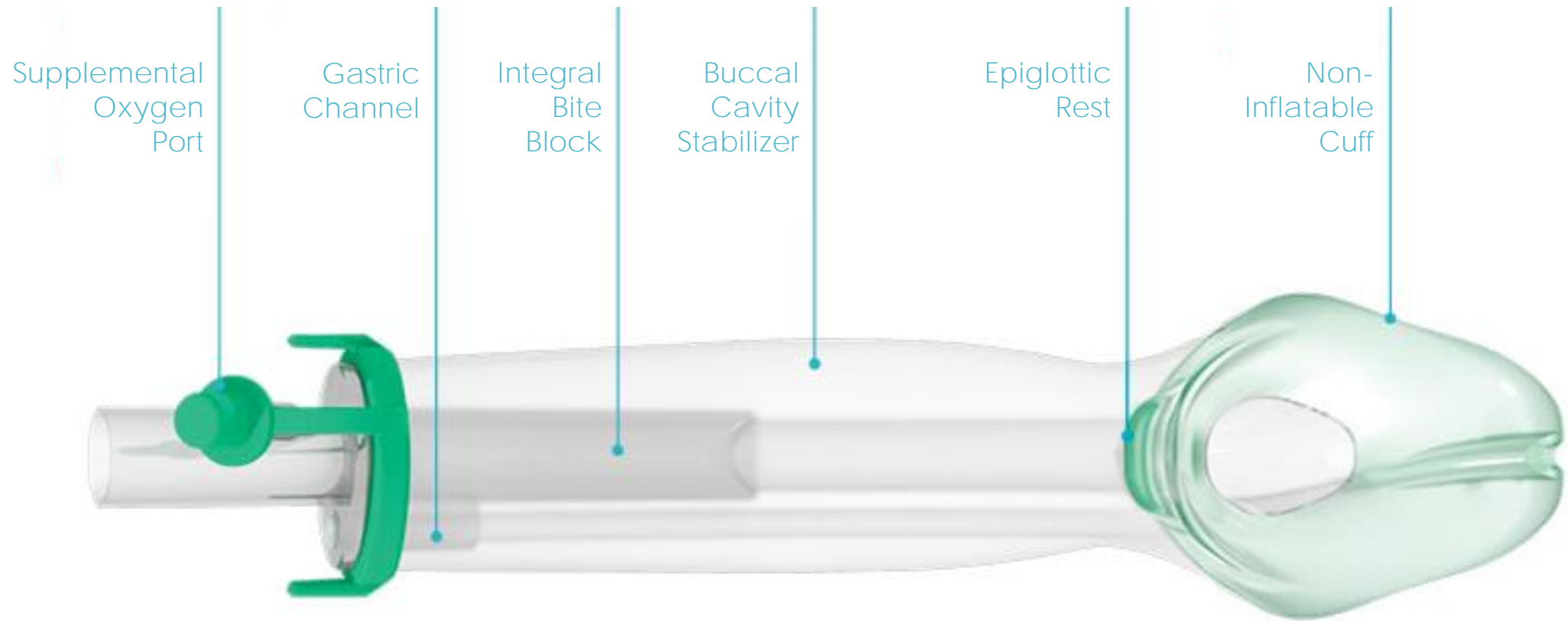
- Insert Gel Supraglottic Airway if approved, trained, and equipped

Key Points/Considerations

- Do not delay beginning compressions to begin ventilations
- Do not delay ventilations to connect supplemental oxygen
- Adequate ventilation may require disabling the pop-off valve if the bag-valve mask unit is so equipped
- Do not interrupt compressions for placement of an airway
- Ongoing assessment is required to assess the effectiveness of ventilations
- Do not delay transport

GEL SUPRAGLOTTIC AIRWAY INSERTION TECHNIQUE

Gel Supraglottic Airway Product Overview



15 mm connector

Reliable connection to any standard catheter mount or connection

Proximal end of gastric channel

Color coded hook ring

To secure the GSA in position with the airway support strap

Clearly displayed product information

For quick easy reference. Includes confirmation of size and weight guidance

Position Guide (adult sizes only)



Airway Support Strap

Gel Supraglottic Airway

Lubricant Pack



Small Adult Size 3	30-60 kg	66-132 lb
Medium Adult Size 4	50-90 kg	110-198 lb
Large Adult Size 5	90+ kg	198+ lb

Gel SGA Selection

1



Choose the right size SGA based on the patient's weight

Small Adult Size 3	30-60 kg
Medium Adult Size 4	50-90 kg
Large Adult Size 5	90+ kg

Gel SGA Preparation

2



Open the i-gel package and on a flat surface take out the protective cradle containing the device

Gel SGA Preparation

3



In the final minute of pre-oxygenation, remove the i-gel and transfer it to the palm of the same hand that is holding the protective cradle, supporting the device between the thumb and index finger.



Place a small bolus of a water-based lubricant onto the middle of the smooth surface of the cradle in preparation for lubrication. Do not use silicone-based lubricants.

Gel SGA Preparation

4



Grasp the i-gel with the opposite (free) hand along the integral bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant.

This process may be repeated if lubrication is not adequate, but after lubrication has been completed, check that no BOLUS of lubricant remains in the bowl of the cuff or elsewhere on the device.

Avoid touching the cuff of the device with your hands

Gel SGA Preparation

5



Place the i-gel back into the cradle in preparation for insertion.

The i-gel must always be separated from the cradle prior to insertion. The cradle is not an introducer and must never be inserted into the patient's mouth.

Warnings

- Do not place the device onto a pillow or the patient's chest and always use the protective cradle/ cage pack provided.
- Do not use unsterile gauze to help in lubricating the device.
- Do not apply lubricant too long before insertion.
- Remove dentures or removable plates from the mouth before attempting insertion.

Just prior to Insertion

- Make sure the appropriate size of i-gel has been prepared prior to insertion as described in section.
- Always have a smaller and/or larger size of the i-gel readily available.
- Adequate preparation, proper lubrication of the device and correct positioning of the head and neck with optimum mouth opening is the key to a successful insertion of i-gel.
- Always pre-oxygenate.

WARNING:

The i-gel is supplied in a protective cradle or cage pack to ensure the device is retained in the correct flexion prior to use and also acts as a base for lubrication.

The i-gel must always be separated from the cradle or cage pack prior to insertion. The cradle and cage pack are not introducers and must never be inserted into the patient's mouth.

Gel SGA Insertion Technique

6



Grasp the lubricated i-gel firmly along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the chin of the patient.

The patient should be in the 'sniffing' position with head extended and neck flexed.

The chin should be gently pressed down before proceeding to insert the i-gel.

Gel SGA Insertion Technique

7



Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.

Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.

Gel SGA Insertion Technique

8



WARNING: Do not apply excessive force on the device during insertion. It is not necessary to insert fingers or thumbs into the patient's mouth during the process of inserting the device.

If there is early resistance during insertion, a 'jaw thrust' is recommended.

Gel SGA Insertion Technique

9



- a) The tip of the airway should be located into the upper esophageal opening
- b) The cuff should be located against the laryngeal framework
- c) The incisors should be resting on the bite block

Gel SGA Insertion Technique

10



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 i-gel is held in the correct position until and while the device is secured in place.

Once placement is confirmed, secure the device by sliding the strap underneath the patient's neck and attaching to the hook ring.

Do not secure the device too tightly but maintain a slight downward pressure.

Gel SGA Insertion Technique

11



Attach waveform capnography and check lung & epigastric sounds

Recheck placement:

- If ETCO₂ reading / waveform changes or is not what the provider expects
- After movement of the patient
- Throughout patient care
- Upon transfer to another provider / practitioner

Notes on insertion:

- ▶ Insertion can be achieved by trained providers in less than five seconds.
- ▶ Sometimes a feeling of 'giving-way' is felt before the end point resistance is met. This is due to the passage of the bowl of the Gel SGA through the faucial pillars. It is important to continue to insert the device until a definitive resistance is felt.
- ▶ Once correct insertion is achieved and the teeth are located on the integral bite block, do not repeatedly push down or apply excessive force during insertion.
- ▶ No more than three attempts on one patient should be attempted.
- ▶ It is not necessary to insert fingers or thumbs into the patient's mouth during the insertion process.

Recognizing a poorly placed airway

Bite Block Placement

- A horizontal line at the middle of the integral bite-block represents the correct position of the teeth. If the teeth are located lower than the distal tip of the bite block, then it is likely the device has been incompletely inserted. In this instance, remove the i-gel and reinsert with a gentle jaw thrust applied by an assistant. If that does not resolve the problem, use one size smaller i-gel.

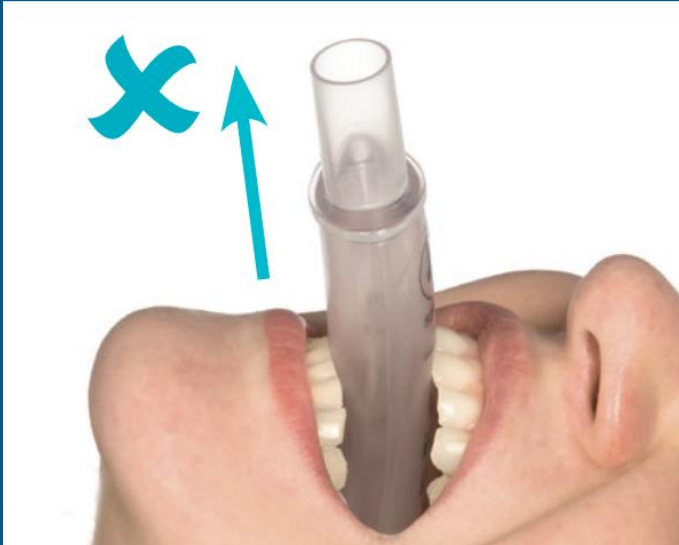
Ineffective gas exchange:

- Observation of poor chest rise and fall / inadequate tidal volume
- Inaudible lung sounds
- Poor capnograph tracing
- High airway pressure / inability to ventilate
- Excessive air leaking around the device or through the gastric channel

Gastric Channel

- ▶ There is a risk of aspiration with all Supraglottic Airways
- ▶ The gastric channel helps to remove stomach contents and decrease risk of aspiration.
- ▶ Place a bolus of lubricant on the gastric channel opening, then disperse the lubricant with an appropriately sized nasogastric tube in the proximal portion of the channel before fully inserting the tube.
- ▶ When using a size 3 or 4 airway, use a size 12F NG Tube.
- ▶ When using a size 5 airway, use a size 14F NG Tube.

Supraglottic Airway Removal



- ▶ Should a patient regain consciousness and protective reflexes such as coughing and swallowing have returned, gently suction around the airway device in the pharynx and hypopharynx.
- ▶ If the patient can follow vocal commands, ask the patient to open his/ her mouth wide, and remove the device following its natural curve.
- ▶ DO NOT attempt to forcibly remove the device if the patient is biting on it. Wait until the patient, on vocal command, has fully opened their mouth or opens their mouth spontaneously.

Insertion Technique Video



I-gel

- Easy to use
- No cuff to inflate
- Similar success rates to King Airway
- Gastric port for suction
- German word for Hedgehog



References

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