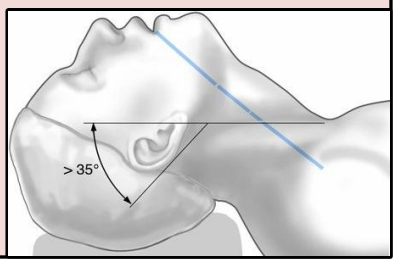
Sierra – Sacramento Valley EMS Agency Treatment Protocol	PR-2
Airway & Ventilation Managment	
Approval: Troy M. Falck, MD – Medical Director	Effective: 04/01/2025
Approval: John Poland – Executive Director	Next Review: 01/2028

INDICATIONS

- Airway & ventilation management techniques may include: basic airway maneuvers, use of airway adjuncts (e.g., oropharyngeal or nasopharyngeal airways), & advanced airway procedures (e.g., endotracheal intubation, supraglottic airway devices, or cricothyrotomy) based on the situation & the provider's level of training – Indications for airway management may include but are not limited to:
  - Obstructed airway
  - Respiratory distress/failure
  - Altered mental status
  - Severe shock (hemorrhagic, septic, cardiogenic)
  - Cardiac arrest
  - Trauma/burns/smoke inhalation
- An i-gel SGA is the preferred advanced airway device & should be attempted prior to ET intubation unless video laryngoscopy is available & the ALS provider has completed training for that device
- During cardiac arrest, advanced airway placement should not delay or interrupt CPR & shall not be considered until after the 1st round of defibrillation (if indicated) & administration of epinephrine

BLS AIRWAY PROCEDURE

- Look, Listen, and Feel for level of responsiveness, chest movement, breath sounds, obstructions
- Positioning of unresponsive pts:
  - Place in the Head Elevated Laryngoscopy Position (HELP) to facilitate alignment of the pharyngeal, laryngeal & oral axis of the airway
  - Use the Head-Tilt/Chin-Lift, Jaw-Thrust, or Lateral Recovery Position (as appropriate)
- Remove visible obstructions &/or suction fluids as necessary, limiting suctioning to 10-15 secs
- Maintain airway patency – insert OPA/NPA as appropriate



BAG-VALVE-MASK (BVM) VENTILATION PROCEDURE

BVM ventilation should be performed by two rescuers whenever possible

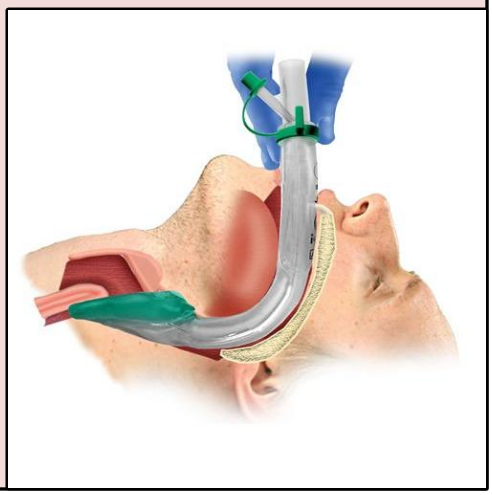
- Attach oxygen to BVM at a minimum flowrate of 10-15 L/min
- For one rescuer ventilation, position the mask over the nose & mouth & ensure a tight seal with an E-C clamp technique
- Squeeze the bag slowly, delivering breath over 1-2 secs
- Deliver only enough volume to achieve normal chest rise & fall **avoid excessive ventilation**
- If utilizing a Positive End Expiratory Pressure (PEEP) valve, maintain between 5-10 cmH_2O. Do not utilize PEEP in any of the following circumstances:
  - Suspected pneumothorax
  - Suspected TBI or increased intracranial pressure
  - Hypovolemic shock
- Ventilate to maintain SpO_2 & $EtCO_2$ within appropriate range for pt condition
- An Impedance Threshold Device (ITD) may be utilized in adult non-traumatic pulseless arrest pts; however, two rescuers are required to maintain effectiveness if no advanced airway is in place

i-gel SUPRAGLOTTIC AIRWAY (SGA) PROCEDURE

Contraindications:
- Intact gag reflex
- Caustic ingestion
- Unresolved complete airway obstruction

Relative Contraindications:
- Trismus or limited ability to open the mouth
- Oral trauma
- Distorted anatomy that prohibits device placement

- If a functioning i-gel SGA is in place & there are no clinical signs of ventilatory insufficiency, the i-gel SGA shall not be replaced by ET intubation
- Pre-oxygenate pt with high-flow O_2, via NRM or BVM as appropriate, for a minimum of 3 mins
- Administer 10-15 L/min O_2 via NC, in addition to NRM/BVM O_2 to augment pre-oxygenation
- Select the correct size i-gel SGA device
- Lubricate the back & sides of the i-gel SGA device with a water-based lubricant
- Place the pt in a sniffing position or use a Jaw-Thrust maneuver if spinal injury is suspected
- Grasp the i-gel SGA device by the proximal end with the dominant hand, making sure the cuff is pointing downwards & the airway tube is aligned in the midline
- Gently press down on the chin & introduce the soft tip into the mouth towards the hard palate
- Glide the i-gel SGA device downwards & backwards Along the hard palate with a continuous but gentle Push until a definitive resistance is felt
- Begin ventilating with a BVM at the appropriate ventilation rate
- Follow **ADVANCED AIRWAY DEVICE PLACEMENT CONFIRMATION & POST-PROCEDURE** instructions on page 3



ENDOTRACHEAL (ET) INTUBATION PROCEDURE

- ET intubation attempts should last no more than 30 secs
- Pre-oxygenate pt with high-flow O_2, via NRM or BVM as appropriate, for a minimum of 3 mins
- Administer 10-15 L/min O_2 via NC, in addition to NRM/BVM O_2 to augment pre-oxygenation
- Assemble/prepare all equipment prior to ET intubation attempt
- Consider utilizing an ET tube introducer
- Follow manufacturer's directions for use specific to the laryngoscope utilized (direct laryngoscopy or video laryngoscopy)
- Visualize the vocal cords & pass the ET tube through the cords & into the trachea, approx. 2-3 cm beyond the cords
  - *A common depth is approximately 21 cm for women/23 cm for men (measured at the teeth)*
- Inflate the ET tube cuff with 5-10 mL of air
- Begin ventilating with a BVM at the appropriate ventilation rate
- If required, prior to 2nd ET attempt ventilate with 100% oxygen for a minimum of 1 min
- Follow **ADVANCED AIRWAY DEVICE PLACEMENT CONFIRMATION & POST-PROCEDURE** instructions on page 3

NEEDLE CRICOTHYROTOMY PROCEDURE

Indications:
- Severe airway obstruction
- Failed intubation with an inability to ventilate using other methods

Contraindications:
- Pt age <3 yo or estimated weight <15 kg
- Conscious pt
- Presence of midline neck hematoma or massive subcutaneous emphysema

- Do not perform procedure in a moving ambulance
- Assemble/prepare all equipment prior to procedure attempt
- Position pt supine with the neck slight extended (if no cervical spine injury suspected)
- Locate the cricothyroid membrane
  - Palpate for the depression between the thyroid cartilage (Adam's apple) & the cricoid cartilage
- Attach a 10 mL syringe filled with 5 mL NS to the airway catheter
- **If utilizing a 12ga, 3" airway catheter:** With the bevel facing up, insert the needle through the skin at a 45^{o} angle caudally into the cricothyroid membrane penetrating the skin & cricothyroid membrane with the needle
- **If utilizing a Rusch® QUICKTRACH® Needle Cricothyrotomy Device:** Puncture the skin & underlying cricothyroid membrane at a 90^{o} angle with the needle, then adjust angle to 45^{o} after penetrating the cricothyroid membrane
- Advance the catheter/cannula, aspirating with the syringe until bubbles are observed in the NS
- Continue advancing the catheter/cannula into the trachea while withdrawing the needle
- Secure in place, ensuring it is fixed to avoid displacement
- Begin ventilating with a BVM at the appropriate ventilation rate

ADVANCED AIRWAY DEVICE PLACEMENT CONFIRMATION

- Using a stethoscope, check for the absence of gurgling sounds over the epigastrium & the presence of equal breath sounds over the lungs while observing for chest rise and fall. When an ET tube is in place, no sounds should be heard over the epigastrium. Gurgling may still be heard in pts who are breathing spontaneously or when an i-gel SGA device is in place
- Attach an $EtCO_2$ monitoring device, which must remain in place until arrival to the hospital or cessation of resuscitation efforts
- At least four (4) of the following techniques must be utilized to confirm advanced airway placement
  - Bilateral breath sounds
  - Bilateral chest rise and fall
  - Consistent $EtCO_2$ waveform
  - Change in Colorimetric CO_2 detector from purple to yellow
  - Condensation in the airway tube
  - SpO_2 rising to/or remaining above 94%
- ALS/LALS personnel must immediately confirm patency of an advanced airway placed by an EMT

POST-PROCEDURE

- Airway patency must be reassessed at a minimum of every 15 mins and:
  - Each time the patient is moved
  - If ventilation becomes difficult
  - If vital signs, including SpO2 & EtCO2 change unexpectedly
- If a pt with an advanced airway in place regains consciousness:
  - Use restraints as necessary to avoid displacement of the advanced airway device
  - Consider sedation with **Midazolam 10 mg IV/IO/IM/IN** for adult pts (may repeat same dose x 1)
  - Contact base/modified base hospital for pediatric Midazolam dosing if needed
- Document all methods/devices used to confirm advanced airway device placement in the PCR