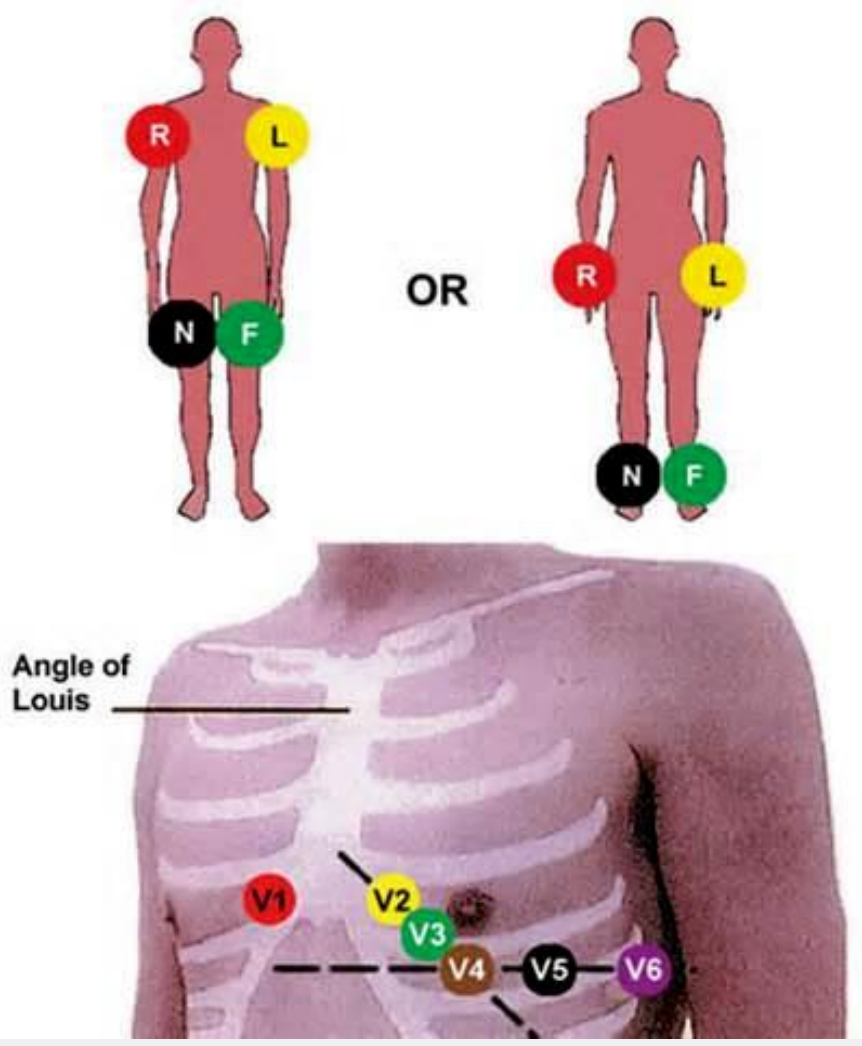
	EMT
A	A-EMT
P	Paramedic

ECG, 12-Lead - Procedures

Procedure:

- ❑ 1. Prepare ECG monitor and connect patient cable to electrodes
- ❑ 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- ❑ 3. Apply chest leads and extremity leads using the following landmarks: (Distal to shoulder and distal to hip joint for most accurate ECG)
  - RA: Right Arm
  - LA: Left Arm
  - RL: Right Leg
  - LL: Left Leg
  - V1: 4th intercostal space at right sternal border
  - V2: 4th intercostal space at left sternal border
  - V3: Directly between V2 and V4
  - V4: 5th intercostal space at midclavicular line
  - V5: Level with V4 at left anterior axillary line
  - V6: Level with V5 at left midaxillary line
- ❑ 4. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- ❑ 5. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- ❑ 6. Provide 12 Lead to hospital staff, transmit when appropriate
- ❑ 7. Document the procedure, time, and results on/with the PCR



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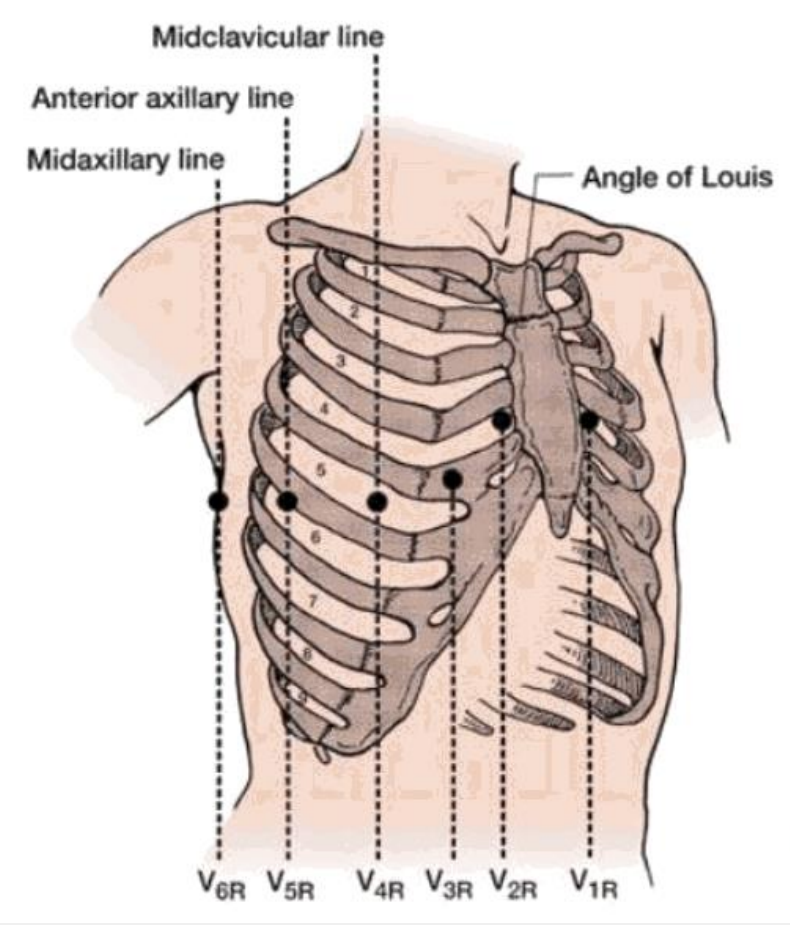
ECG, Right-Sided - Procedures

To detect right ventricular STEMI associated with occlusion of the Right Coronary Artery, obtain a Right Sided ECG.
Indications of a Right Ventricle Wall infarct may include:

- ❑ ST elevation in the inferior leads, II, III and aVF
  - ST elevation that is greatest in lead III is especially significant
- ❑ ST elevation in V1 (the only precordial lead that faces the RV on standard 12-lead ECG)
- ❑ Right Bundle Branch Block, 2nd and 3rd Degree AV Blocks, ST elevation in V2 50% greater than the ST depression in aVF

Procedure:

- ❑ 1. Prepare ECG monitor and connect patient cable to electrodes
- ❑ 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- ❑ 3. Apply chest leads and extremity leads using the following landmarks: (Distal to shoulder and distal to hip joint for most accurate ECG)
  - V1R: 4th intercostal space, left sternal border
  - V2R: 4th intercostal space, right sternal border
  - V3R: halfway between V2R and V4R, on a diagonal line
  - V4R: 5th intercostal space, right midclavicular line, same horizontal line as V5R and V6R
  - V5R: right anterior axillary line, same horizontal line as V4R and V6R
  - V6R: right mid-axillary line, same horizontal line as V4R and V5R
- ❑ 4. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- ❑ 5. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- ❑ 6. Provide Right Sided ECG to hospital staff, transmit when appropriate
- ❑ 7. Document the procedure, time, and results in the electronic Patient Care Report (ePCR)



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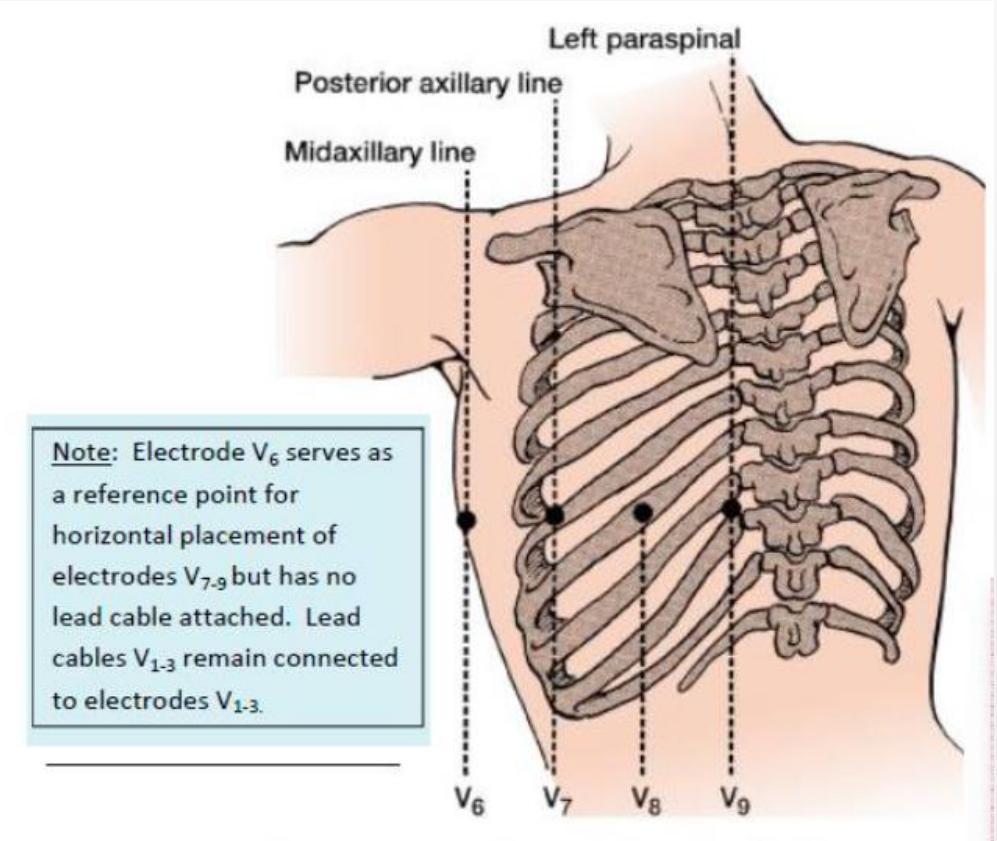
ECG, Posterior - Procedures

To detect posterior STEMI associated with occlusion of the circumflex artery or dominant right coronary artery, obain a posterior ECG. Indications of a posterior wall infarction may include:

- ❑ Changes in V1-V3 on the standard 12-lead ECG predominantly, which include
  - Horizontal ST depression
  - A tall, upright T-wave
  - A tall, wide R-wave
  - R/S wave ratio greater than one
- ❑ Inferior or lateral wall MI (especially if accompanied by ST depression or prominent R waves in leads V1-V3)

Procedure:

- ❑ 1. Prepare ECG monitor and connect patient cable to electrodes
- ❑ 2. Expose chest and prep as necessary. Modesty of the patient should be respected.
- ❑ 3. Place three additional ECG electrodes. TIP: start at V9 (the last electrode) and work forward
  - V9: Left spinal border, same horizontal line as V4-6
  - V8: midscapular line, same horizontal line as V7 and V9
  - V7: posterior axillary line, same horizontal line as V4-6
- ❑ 4. Place ECG lead cables as follows (using standard 12-Lead)
  - Lead cable V6 connects to electrode V9
  - Lead cable V5 connects to electrode V8
  - Lead cable V4 connects to electrode V7
  - Lead cables V1-V3 are connected the same way as when obtaining a standard 12-lead ECG
- ❑ 5. Instruct patient to remain still, minimize artifact as able (examples include stopping motion of ambulance and instructing patient to remain still)
- ❑ 6. Press the brand specific button to acquire the 12-Lead ECG (complete age and gender questions correctly)
- ❑ 7. Provide Posterior Sided ECG to hospital staff, transmit when appropriate
- ❑ 8. Document the procedure, time, and results in the electronic Patient Care Report (ePCR)



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Airway Obstruction - Procedures

Procedure:

Foreign Body Airway Obstruction – 1 Year Old Or Less, *Conscious*

- ❑ If coughing, wheezing and exchanging air, do not interfere with the victims efforts to expel the foreign body.
- ❑ If unable to cry or speak, weak or absent cough or no air exchange
  - 1. Support the victim in the head down position with your non-dominant hand and forearm.
  - 2. Perform 5 back slaps with the heel of your dominant hand between the should blades
  - 3. Perform 5 chest thrusts with two fingers in the center of the chest
  - 4. Repeat the steps above until the object is expelled or the victim becomes unresponsive

Foreign Body Airway Obstruction – Greater Than 1 Year Old, *Conscious*

- ❑ If coughing, wheezing and exchanging air, do not interfere with the patient's efforts to expel the foreign body.
- ❑ If unable to speak, weak or absent cough OR no air exchange, perform abdominal thrusts (Heimlich Maneuver).

Foreign Body Airway Obstruction – All Ages, *Unconscious*

- ❑ 1. If patient was responsive and then became unresponsive
  - lower the victim to the ground and begin CPR, starting with compressions (do not check for a pulse)
  - Every time you open the airway to give breaths, open the mouth wide and look for the object
  - If you see an object that can easily be removed, remove it with your finger
  - If you do not see an object, continue CPR
- ❑ 2. If a foreign body is visualized but cannot be removed with finger, attempt to remove it under direct visualization using the Laryngoscope blade and Magill forceps
  - Assemble Laryngoscope and check bulb on blade
  - Hold Laryngoscope in left hand,
  - Place patient in sniffing position
  - Using tongue-jaw lift or cross-finger technique to open mouth
  - Insert laryngoscope blade into right corner of mouth and move to midline, sweeping tongue out of way
  - Elevate mandible to visualize obstruction without using teeth or gums as a fulcrum
  - Grasp Magill forceps in right hand and remove obstruction under direct visualization
- ❑ 3. Provide suction as needed
- ❑ 4. Resume appropriate CPR and airway management

P	Paramedic

Paramedic:
Move to FAILED AIRWAY MANAGEMENT PROTOCOL

- ❑ If the obstruction is not visualized or cannot be retrieved, attempt endotracheal intubation with appropriate size ET tube or 0.5 smaller if ≥12 years old
- ❑ If ETT cannot pass and patient is ≥12 years old perform cricothyrotomy with pertrach.
- ❑ If patient is ≥1year old but <12 years old perform needle jet insufflation

TRANSPORT RAPIDLY TO THE CLOSEST FACILITY!

Rapid Sequence Airway - Procedures

P | Double Paramedic

Indications:

- ❑ Age >18 unless specific permission given prior to procedure by medical control
- ❑ Need for invasive airway management in the setting of an intact gag reflex or inadequate sedation to perform non-pharmacologically assisted airway management
  - Apnea
  - Decreased LOC with respiratory failure (ie. Hypoxia O2 sat <90% not improved by 100% Oxygen, and/or respiratory rate <8)
  - Poor ventilatory effort (with hypoxia not improved by 100% Oxygen)
  - Unable to maintain patent airway by other means
  - Burns with suspected significant inhalation injury

Contraindications:

- ❑ Sensitivity to Succinylcholine or other RSA drugs
- ❑ Inability to ventilate via BVM
- ❑ Suspected hyperkalemia
- ❑ Myopathy or neuromuscular disease
- ❑ History of malignant hyperthermia
- ❑ Major burn (>48 hours after injury)
- ❑ Crush Injury
- ❑ End Stage Renal Disease
- ❑ Recent Spinal Cord Injury (72 hours – 6 months)

SIMULTANEOUSLY CONTACT MEDICAL CONTROL

TWO PARAMEDICS REQUIRED FOR THIS PROCEDURE

Procedure:

- ❑ **PREPARATION (T-8 minutes)**
  - Monitoring (continuous ECG, SPO2, Blood Pressure)
  - 2 patent IV's
  - Functioning Laryngoscope and BVM with highflow O2
  - Endotracheal tube(s), stylet, syringe(s)
  - LTA(s) and appropriate syringe(s)
  - Alternative/Rescue Airway (LMA and surgical airway kit) immediately available
  - All medications drawn up and labeled (including post-procedure sedation)
  - Suction - turned on and functioning
  - End Tidal CO2 device on and operational (colometric immediately available as backup only)
  - Assess for difficult airway – LEMON
- ❑ **PREOXYGENATE**
  - 100% O2 x5 minutes (NRB) or 8 vital capacity breaths with 100% O2 (BVM/NRB)
  - Continue apneic oxygenation via high-flow Nasal Cannula throughout procedure (if available)
- ❑ **PRETREATMENT (T-3 minutes)**
  - Lidocaine 1.5mg/kg IV/IO (max 150mg)
  - Begin cricoid pressure/Sellick's maneuver
- ❑ **PARALYSIS and INDUCTION (T=0)**
  - Etomidate 0.3mg/kg (max 20mg)
  - Succinylcholine 2mg/kg (max 200mg)
- ❑ **PLACEMENT with PROOF (T + 30 seconds)**
  - Place LTA/ETT
  - Confirm with
    - ❑ EtCO2 waveform
    - ❑ Auscultation
    - ❑ Physical findings
  - Secure Device, note position
- ❑ **POST-PLACEMENT MANAGEMENT (T + 1 minute)**
  - Sedation: Refer to Sedation Protocol, as needed.
  - If additional needed and transport time >10 minutes: Rocuronium 1mg/kg IV/IO

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Pulse Oximetry - Procedures

Procedure:

- ❑ 1. Apply probe to patient finger or toe, as recommended by the device manufacturer.
- ❑ 2. Allow machine to register oxygen saturation level
- ❑ 3. Record time and initial saturation percent on room air if possible on/with the PCR
- ❑ 4. Verify pulse rate on machine or with actual manual pulse check of the patient
- ❑ 5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary
- ❑ 6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia
- ❑ 7. In general, normal saturation is 97-99%. Below 93% suspect a respiratory compromise
- ❑ 8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device
- ❑ 9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain
- ❑ 10. Factors which may reduce the reliability of the pulse oximetry reading include:
  - Poor peripheral circulation (blood volume, hypotension, hypothermia)
  - Excessive pulse oximeter sensor motion
  - Fingernail polish (may be removed with acetone pad)
  - Carbon monoxide bound to hemoglobin
  - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
  - Jaundice
  - Placement of Blood Pressure cuff on same extremity as pulse ox probe

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Adult Endotracheal Intubation - Procedures

P Paramedic

When Considering Intubating Any Patient, Prepare Materials EARLY:

- ❑ Laryngoscope handle with appropriate size blade
- ❑ Proper Size Endotracheal Tube (ETT) *PLUS* Backup ETT 0.5-1.0mm smaller and BIAD
- ❑ Water-soluble lubrication gel, (lubricate distal end of tube at cuff)
- ❑ 10cc syringe (larger syringe if low pressure cuff)
- ❑ Stylet, (insert into ET tube and do no let stylet extend beyond tip of ET tube) – if not already incorporated into ETT
- ❑ Tape or ETT securing device
- ❑ Proper size oral pharyngeal airway
- ❑ BVM
- ❑ Oxygen Source
- ❑ Suction Device
- ❑ Stethoscope
- ❑ Continuous Digital Waveform Capnography
- ❑ Oxygen saturation monitor

Procedure:

- ❑ 1. Maintain cervical alignment and immobilization, as necessary
- ❑ 2. Attach proper blade to laryngoscope handle and check light
- ❑ 3. Check endotracheal tube cuff, lubricate distal end of the tube
- ❑ 4. Confirm patient attached to cardiac monitor and oxygen saturation monitor
- ❑ 5. Ready ETCO2 detection device
- ❑ 6. Specify personnel to:
  - Apply cricoid pressure
  - Maintain cervical alignment and immobilization during procedure
  - Watch cardiac and oxygen saturation monitors
- ❑ 7. Preoxygenate patient with 100% Oxygen (BVM or NRB) before intubation attempt to achieve O2 saturation ≥93% for 5 minutes or 8 vital capacity breaths. Have assistant apply cricoid pressure (Sellick's Maneuver) during entire procedure.
- ❑ 8. Remove all foreign objects, such as dentures, Oropharyngeal Airways (OPA), etc., and suction the patients airway if needed.
  - May leave an esophageal ETT if prior unsuccessful attempt to use as landmark for second attempt
- ❑ 9. Insert the blade into the right side of the patient's mouth sweeping the tongue to the left side
- ❑ 10. Visualize the vocal cords while avoiding any pressure on the teeth
- ❑ 11. Insert the endotracheal tube until the cuff passes the vocal cords.
  - Insert far enough so that balloon port tubing is even with the lips
  - Typical depth = tube size (ID) x3 (example would be tube depth of 24 for a 8.0mm tube)
- ❑ 12. Remove the laryngoscope blade
- ❑ 13. Inflate the endotracheal cuff with the syringe with 5-10cc of air (low pressure cuff may require larger volume) and remove the syringe from inflation valve
- ❑ 14. Ventilate with BVM and confirm tube placement:
  - Observe immediate (within 6 breaths) EtCO2 waveform and number with capnography
  - Watch for chest rise AND
  - Auscultate abdomen, listening for air movement in the stomach to ensure tube is not esophageal
  - Auscultate bilateral breath sounds to confirm tube placement
- ❑ 15. Observe oxygen saturation

Note: Regardless of apparent presence of lung sounds, tube misting, chest rise, AND/OR lack of gastric sounds:
if EtCO2 does NOT indicate proper tube location (alveolar waveform), ETT must be removed.

Adult Endotracheal Intubation - Procedures

Procedure (continued):

- ❑ 16. If unilateral right sided breath sounds are heard, consider:
  - Right mainstem intubation
  - Deflate the cuff and withdraw tube 1-2cm
  - Reinflate cuff and repeat auscultation procedure as above for breath sounds
- ❑ 17. If bowel sounds heard with bagging or EtCO2 device does not indicate proper ETT placement, deflate cuff, remove tube and ventilate with BVM for two minutes
  - **IF AND ONLY IF** intubation attempted for medical reason AND unsuccessful on first attempt, may return to Step 7 of Procedure and repeat
- ❑ 18. If intubation attempt unsuccessful, refer to the next step in the Airway Management, Adult protocol.

IF successful intubation confirmed by Steps 13-15 above:

- ❑ 19. Secure tube using an endotracheal securing device
- ❑ 20. Document depth of tube
- ❑ 21. Reassess and document lung sounds, Vital Signs and patient clinical status
- ❑ 22. Insert Oropharyngeal Airway (OPA), or use commercially available bite block with ET Tube holder (if available)
- ❑ 23. Ensure Cervical Spine is immobilized to prevent accidental dislodgement of ETT during procedures or patient movement
- ❑ 24. Continue ventilations at a rate of 8-10 breaths per minute; adjust rate to maintain SpO2 ≥93% and EtCO2 35-45mmHg, and as appropriate for patient condition
- ❑ 25. Document EtCO2 waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Video Assisted Laryngoscopy (VAL)

- ❑ Video Assisted Laryngoscopy (VAL) shall be performed in accordance with documented manufacturer recommendations.
- ❑ Follow Intubation procedure with the addition of VAL technology.
- ❑ It is *essential* that every operator of a VAL be competent in Direct Laryngoscopy (DL) in preparation for unsuccessful VAL operation or equipment malfunction.

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Peds Endotracheal Intubation - Procedures

P Paramedic

- **Video Laryngoscopy with recording capability turned on and video files attached to ePCR are MANDATORY for any service performing Pediatric Intubations under the Dane Co EMS Protocols.**
- **ALL Peds ETT's MUST have a Quality Assurance review by the EMS Service Director and Medical Director within 48 hours.**

When Considering Intubating ANY Patient, Prepare Materials EARLY:

- ❑ Video Laryngoscope on and functioning; Direct Laryngoscope handle with appropriate size blade and bulb function verified
- ❑ Proper Size Endotracheal Tube (ETT) *PLUS* Backup ETT 0.5-1.0mm smaller and BIAD
- ❑ Water-soluble lubrication gel, (lubricate distal end of tube at cuff)
- ❑ 10mL syringe (larger syringe if low pressure cuff)
- ❑ Appropriate size bougie, (insert into ET tube and do no let bougie extend beyond tip of ET tube)
  - 10fr bougie for use with ETT sizes 4.0 – 6.0
  - 15fr bougie for use with ETT sizes 6.0 – 8.0
- ❑ Tape or ETT securing device
- ❑ Proper size oropharyngeal airway
- ❑ BVM
- ❑ Oxygen Source
- ❑ Suction Device
- ❑ Stethoscope
- ❑ Continuous Digital Waveform Capnography
- ❑ Oxygen saturation monitor

Procedure:

- ❑ 1. Maintain cervical alignment and immobilization, as necessary
- ❑ 3. Check endotracheal tube cuff, lubricate distal end of the tube
- ❑ 4. Confirm patient attached to cardiac monitor and oxygen saturation monitor
- ❑ 5. Ready $EtCO_2$ detection device
- ❑ 6. Specify personnel to:
  - Apply cricoid pressure
  - Maintain cervical alignment and immobilization during procedure
  - Watch cardiac and oxygen saturation monitors
- ❑ 7. Preoxygenate patient with 100% Oxygen (BVM or NRB) before intubation attempt to achieve O2 saturation ≥93% for 5 minutes or 8 vital capacity breaths. Have assistant apply cricoid pressure (Sellick's Maneuver) during entire procedure.
- ❑ 8. Remove all foreign objects, such as dentures, Oropharyngeal Airways (OPA), etc., and suction the patients airway if needed.
  - May leave an esophageal ETT if prior unsuccessful attempt to use as landmark for second attempt
- ❑ 9. Insert the video laryngoscope midline into the patient's mouth
- ❑ 10. Visualize the vocal cords while avoiding any pressure on the teeth
  - Ensure that the video laryngoscope is recording the intubation procedure
  - Bougie use is mandatory for video laryngoscopy
- ❑ 11. Insert the endotracheal tube until the cuff is visualized passing the vocal cords.
  - Insert far enough so that balloon port tubing is even with the lips
  - Typical depth = tube size (ID) x3 (example would be tube depth of 24 for a 8.0mm tube)
- ❑ 12. Remove the laryngoscope blade
- ❑ 13. Inflate the endotracheal cuff with the syringe with 5-10cc of air (low pressure cuff may require larger volume) and remove the syringe from inflation valve
- ❑ 14. Ventilate with BVM and confirm tube placement:
  - Observe immediate (within 6 breaths) EtCO2 waveform and number with capnography
  - Watch for chest rise AND
  - Auscultate abdomen, listening for air movement in the stomach to ensure tube is not esophageal
  - Auscultate bilateral breath sounds to confirm tube placement
  - ***Note: Regardless of apparent presence of lung sounds, tube misting, chest rise, AND/OR lack of gastric sounds:***
  - ***if $EtCO_2$ does NOT indicate proper tube location (alveolar waveform), ETT must be removed.***
- ❑ 15. Observe oxygen saturation
- ❑ 16. Verify ETT cuff pressure using manometer

Peds Endotracheal Intubation - Procedures

P Paramedic

Procedure (continued):

- ❑ 16. If unilateral right sided breath sounds are heard, consider:
  - Right mainstem intubation
  - Deflate the cuff and withdraw tube 0.5-1cm
  - Reinflate cuff and repeat auscultation procedure as above for breath sounds
- ❑ 17. If bowel sounds heard with bagging or $EtCO_2$ device does not indicate proper ETT placement, deflate cuff, remove tube and ventilate with BVM for two minutes
  - **IF AND ONLY IF** intubation attempted for medical reason AND unsuccessful on first attempt, may return to Step 7 of Procedure and repeat
- ❑ 18. If intubation attempt unsuccessful, refer to the next step in the Airway Management, Peds protocol.

IF successful intubation confirmed by Steps 13-15 above:

- ❑ 19. Secure tube using an endotracheal securing device
- ❑ 20. Document depth of tube
- ❑ 21. Reassess and document lung sounds, Vital Signs and patient clinical status
- ❑ 22. Insert Oropharyngeal Airway (OPA), or use commercially available bite block with ET Tube holder (if available)
- ❑ 23. Ensure Cervical Spine is immobilized to prevent accidental dislodgement of ETT during procedures or patient movement
- ❑ 24. Continue ventilations at a rate of 8-10 breaths per minute; adjust rate to maintain SpO_2 ≥93% and EtCO2 35-45mmHg, and as appropriate for patient condition
- ❑ 25. Document $EtCO_2$ waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

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King LT-D and King LTS-D Laryngeal Tube Airway - Procedures

Prepare All Procedure Specific Materials:

- ❑ Correctly sized Laryngeal Tube Airway (LTA) – see chart below
- ❑ Bag Valve Mask
- ❑ Oxygen Reservoir
- ❑ Suction Device
- ❑ Bite Block AND/OR endotracheal tube holder (if available)
- ❑ Appropriately sized syringes for inflating cuff
- ❑ End Tidal CO2 and Oxygen Saturation Monitoring Devices

Airway Size	Connector Color	Patient Weight	OD/ID (mm)	Cuff Volume (ml)	Gastric Tube (Fr.)
0	Transparent	<5kg	NA	10ml	10
1	White	5-12kg	NA	20ml	10
2	Green	12-25kg	NA	25-35	16
2.5	Orange	41-51 inches	NA	30-40	16
3	Yellow	4-5 feet	18/10mm	45-60	Up to 18
4	Red	5-6 feet	18/10	60-80	Up to 18
5	Purple	>6 feet	18/10	70-90	Up to 18

Procedure:

- ❑ 1. Pre-oxygenate patient with 100% Oxygen via Bag Valve Mask or spontaneous ventilation to achieve O_2 saturation of ≥93% if possible
- ❑ 2. Check the integrity of the cuff inflation system and pilot balloon
- ❑ 3. Fully deflate the cuff with the syringe
- ❑ 4. Lubricate the posterior distal tip of the device with a water soluble lubricant
- ❑ 5. Place patient in neutral sniffing position (if no Cervical Spine/Spinal Injury suspected)
  - For patient with suspected Cervical Spine injury, perform two-person insertion technique
  - One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure
- ❑ 6. Pull mandible down to open mouth
- ❑ 7. Insert uninflated device into oral cavity with midline or a lateral technique
- ❑ 8. Advance the tip behind the base of the tongue while rotating tube back to midline so that the blue orientation line faces the chin of the patient.
- ❑ 9. Without exerting excessive force, advance tube until base of the colored connector is aligned with teeth or gums
- ❑ 10. Inflate the King with the appropriate volume:
  - If inflated King Airway insertion is difficult, perform jaw thrust, pulling the tongue forward. Alternately, a laryngoscope may be used to lift the jaw/mandible to facilitate insertion.
- ❑ 11. Attach the BVM to the King.
- ❑ 12. While bagging the patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure).
- ❑ 13. Adjust cuff inflation if necessary to obtain a seal of the airway at the peak ventilatory pressure employed.
- ❑ 14. Obtain End-tidal CO_2 (waveform), auscultate breath sounds bilaterally, look for chest excursion, and check oxygen saturation
- ❑ 15. Secure in the midline to help maintain a good seal over the larynx.
- ❑ 16. Place bite block, oral airway or endotracheal tube holder (if available) between teeth to prevent biting tube
- ❑ 17. Place orogastric tube and attach to low continuous suction as directed in the applicable procedure to assist in gastric decompression
- ❑ 18. Ensure C-spine is still immobilized
- ❑ 19. If repeated attempts are made, oxygenate with 100% O2 for 2 minutes between attempts
- ❑ 20. **Follow manufacturers suggested guidelines at all times**
- ❑ 21. Document $EtCO_2$ waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO2 does NOT indicate proper tube location (alveolar waveform), Advanced Airway must be removed.

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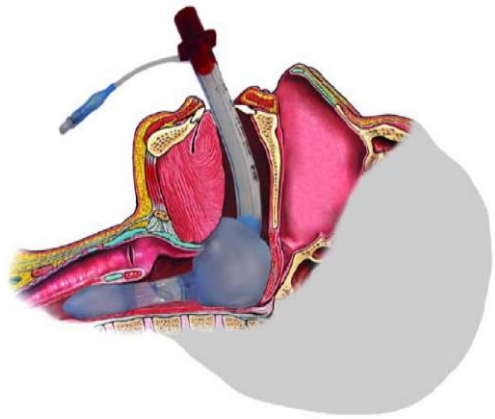
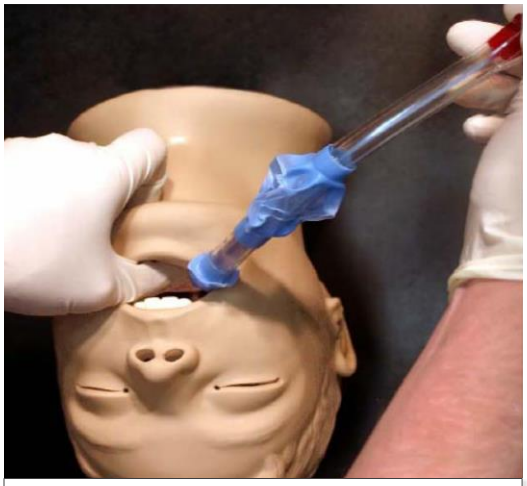
P	Paramedic

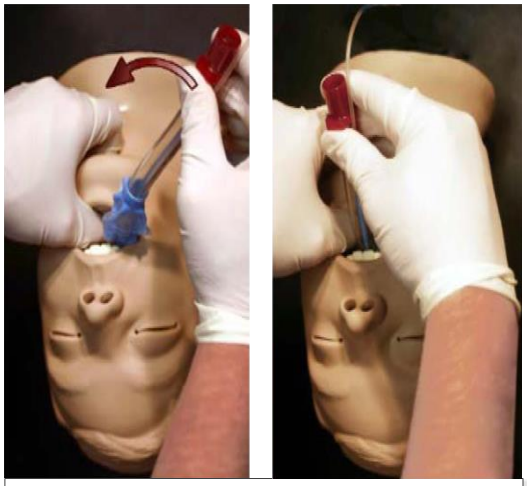
King LTD and King LTS-D Laryngeal Tube Airway - Procedures



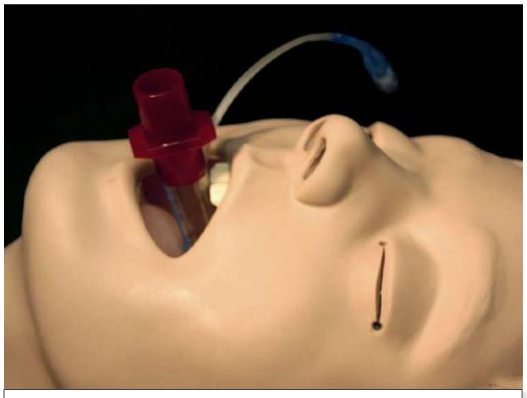
King LT Airway – The correctly placed King LT airway lies with the tip resting in the upper esophagus. The distal cuff inflates in the esophagus, isolating the larygopharynx from the esophagus. The proximal cuff inflates at the base of the tongue. It isolates larygopharynx from the oropharynx and the nasopharynx.



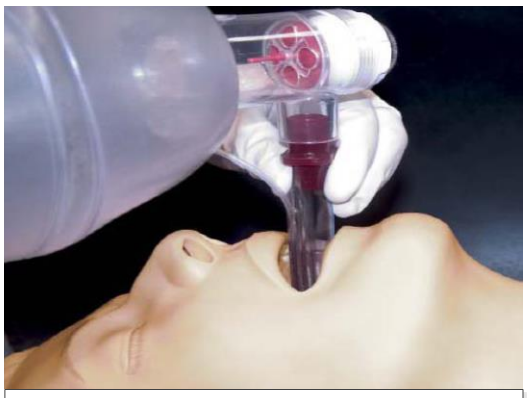
1. Place Patient in neutral (sniffing position if no cervical spine injury suspected) and pull down on the mandible to open the mouth. Insert the King LT into the oral cavity from either a midline or lateral approach.



2. Advance the tip of the tube behind the base of the tongue (see figure 1). Then rotate the tube back to the midline so that the blue orientation line faces the chin of the patient (see figure 2).



3. Without exerting force, advance tube until base of connector is aligned with the teeth or gums. Then inflate cuff with appropriate volume.



4. Attach BVM to King LT. While bagging the Patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure). Adjust cuff inflation to maintain seal at the peak ventilatory pressure employed.

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P	Paramedic

Laryngeal Mask Airway (LMA) - Procedures

Prepare All Procedure Specific Materials:

- ❑ Correctly sized laryngeal mask airway (see chart below)
- ❑ Bag valve mask or automatic ventilator
- ❑ Oxygen reservoir
- ❑ Suction device
- ❑ Bite block and/or endotracheal tube holder (if available)
- ❑ 25 and/or 35mL syringes for expanding cuff
- ❑ End Tidal CO2 and Oxygen saturation monitoring devices

Laryngeal Mask Airway Sizes					
Mask Size	**Patient weight (kg)**	**Age (years)**	**Length (cm)**	**Cuff volume (mL)**	**Largest ETT***
1	<5kg	<0.5yrs	10cm	4	3.5mm
1.5	5-10		10	5-7	
2	10-20	.5-5	11.5	7-10	4.5
2.5	20-30	5-10	12.5	14	5
3	30-60	10-15	19	15-20	6
4	60-80	>15	19	25-30	6.5
5	>80	>15	19	30-40	7

*Appropriately sized endotracheal tube (internal diameter) that can be passed through LMA for blind intubation if intubating LMA is inserted

Procedure:

- ❑ 1. Pre-Oxygenate patient with 100% Oxygen via bag valve mask to achieve O2 saturation of >93% if possible
- ❑ 2. Remove the red tag from the balloon port
- ❑ 3. Check the integrity of the cuff and pilot balloon
- ❑ 4. Tightly deflate the cuff with the syringe – the deflated cuff should appear BOAT shaped
- ❑ 5. Lubricate the posterior surface
- ❑ 6. Place patient in neutral sniffing position (if no c-spine/spinal injury suspected)
  - For patients with suspected c-spine injury, perform two person insertion technique: One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure as below
- ❑ 7. Pull mandible down to open mouth
- ❑ 8. Insert uninflated LMA into oral cavity with cuff facing away from hard palate
- ❑ 9. Guide LMA around curvature of the posterior pharynx into the hypopharynx until resistance is felt. Resistance is due to the tip of the LMA stopping at the upper esophageal sphincter
- ❑ 10. If uninflated LMA insertion is difficult:
  - If the curvature of the posterior/hypopharynx is too acute, perform a jaw thrust, pulling the tongue forward. Alternately, a laryngoscope may be used to lift the jaw/mandible to facilitate insertion
  - A slight inflation of the cuff to ⅓ to ½ of typical inflation volume may also increase ease of insertion
  - Insert LMA with cuff facing hard palate, then rotate 180 degrees into the proper position after the angle around the posterior aspect of the tongue has been cleared.

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO2 does NOT indicate proper tube location (alveolar waveform), Advanced Airway must be removed.

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P	Paramedic

Laryngeal Mask Airway (LMA) - Procedures

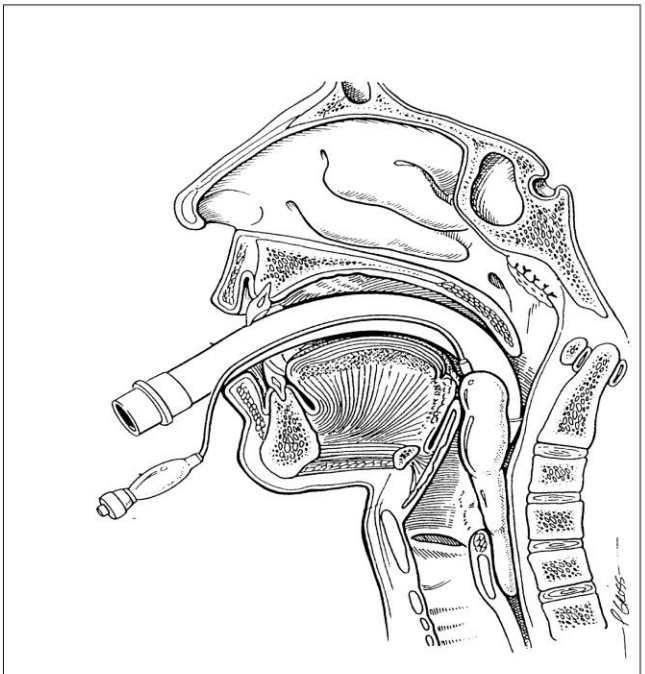
Procedure (continued):

- ❑ 11. Inflate cuff without holding the tube
- ❑ 12. Ensure that the black line running the length of the LMA shaft is in the midline of the upper lip and between the two central incisors (this will help maintain a seal)
- ❑ 13. Administer gentle positive pressure ventilation
- ❑ 14. Obtain End-Tidal CO_2 (waveform), listen for breath sounds bilaterally, look for chest excursion, and check oxygen saturation
- ❑ 15. Secure in the midline to help maintain a good seal over the Larynx
- ❑ 16. Place bite block, gauze or endotracheal tube holder (if available) between teeth to prevent biting tube
- ❑ 17. Ensure c-spine is still immobilized
- ❑ 18. If repeated attempts are made, oxygenate with 100% O2 for 2 minutes between attempts.

Intubation using Intubating Laryngeal Mask Airway (ILMA):

- ❑ 1. Select correct size ILMA
- ❑ 2. Insert endotracheal tube into oropharynx at 90 degree angle (from corner of mouth)
- ❑ 3. During insertion and passage through the ILMA rotate ET tube 90 degrees so that the tip of the ET tube will pass through the bars that traverse the distal opening of the ILMA
- ❑ 4. Confirm placement as per endotracheal intubation procedure.

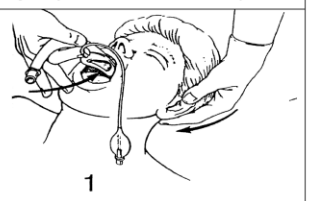
Laryngeal Airway Mask



Laryngeal Mask Airway – The correctly placed LMA lies with the tip resting against the upper esophageal sphincter, the sides against the pyriform fossa and the upper border against the tongue. The opening of the distal end of the LMA should be directly over the glottis (the anterior portion under the epiglottis)

LMA, continued

Proper placement for an LMA (Emergency Insertion Technique)

1. Place patient in neutral (sniffing position if no cervical spine injury suspected) and pull down on the mandible to open the mouth. Insert the LMA into the oral cavity and hold it against the hard palate. This also may be performed from the foot of the bed.	 1
2. Press the LMA tube firmly against the hard palate by placing a lubricated finger or thumb just inside the mouth under the tube **(1).** (see figure) Guide the LMA around the curvature of the posterior pharynx and into the hypopharynx until the characteristic resistance is felt as the tip touches the upper esophageal sphincter. (do not place finger into mouth as shown in this figure. Maintaining firm pressure push tube inwards **(2)** aiming in a cephalad direction so that it slides between the finger and palate until resistance is felt.	 1 2
3. Inflate the cuff. This will cause the LMA to advance out of the oropharynx by 1-2 cm. Apply gentle positive pressure ventilation and listen for breath sounds. If successful place bite block.	

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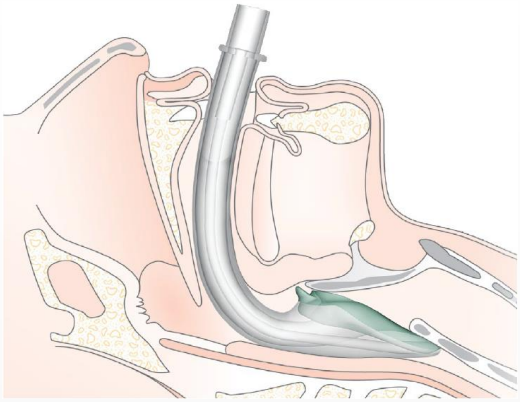
i-gel Airway - Procedures

Prepare All Procedure Specific Materials:

- ❑ Correctly sized i-gel Airway Device – see chart below
- ❑ Bag Valve Mask
- ❑ Oxygen Reservoir
- ❑ Suction Device
- ❑ Appropriate endotracheal tube holder (if available)
- ❑ End Tidal CO_2 and Oxygen Saturation Monitoring Devices



Patient Size	Size	Weight
Neonate	1	2-5kg
Infant	1.5	5-12kg
Small paediatric	2	10-25kg
Large paediatric	2.5	25-35kg
Small adult	3	30-60kg
Medium adult	4	50-90kg
Large adult	5	90+kg

Procedure:

- ❑ 1. Pre-oxygenate patient with 100% Oxygen via Bag Valve Mask or spontaneous ventilation to achieve O_2 saturation of ≥93% if possible
- ❑ 2. Lubricate the posterior distal tip of the device with a thin layer of water soluble lubricant
- ❑ 3. Place patient in neutral sniffing position (if no Cervical Spine/Spinal Injury suspected)
  - For patient with suspected Cervical Spine injury, perform two-person insertion technique
  - One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure
- ❑ 4. Pull mandible down to open mouth
- ❑ 5. Insert device into oral cavity with midline or a lateral technique
- ❑ 6. Advance the tip behind the base of the tongue with the i-gel cuff outlet facing toward the chin of the patient
  - NOTE: If necessary, the upper airway should be suctioned prior to attempted insertion
- ❑ 7. Without exerting excessive force, advance tube downwards and backwards along the hard palate with a continuous but gentle push until definitive resistance is felt.
  - WARNING: Do not apply excessive force on the device during insertion.
- 8. The incisors should be resting on the device integrated bite block.
- ❑ 9. Attach the BVM to the i-gel.
- ❑ 10. Obtain End-Tidal CO_2 (waveform), auscultate breath sounds bilaterally, look for chest excursion, and check oxygen saturation
- ❑ 11. Secure in the midline to help maintain a good seal over the larynx.
- ❑ 12. Place orogastric tube in side port and advance to appropriate position. Attach to low continuous suction as directed in the applicable procedure to assist in gastric decompression
- ❑ 13. Ensure C-spine is still immobilized
- ❑ 14. If repeated attempts are made, oxygenate with 100% O2 for 2 minutes between attempts
- ❑ 15. **Follow manufacturers suggested guidelines at all times**
- ❑ 16. Document ETCO2 waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the Emergency Department.

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO2 does NOT indicate proper tube location (alveolar waveform), Advanced Airway must be removed.

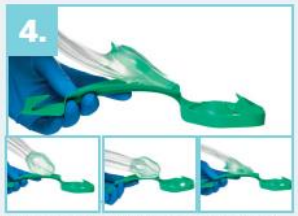
i-gel Airway - Procedures

Adult sizes

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

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, such as K-Y Jelly®, onto the middle of the smooth surface of the protective cradle in preparation for lubrication.



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.

Inspect the device carefully, confirm there are no foreign bodies or a BOLUS of lubricant obstructing the distal opening. Place the i-gel back into the protective cradle in preparation for insertion.

Go to step **6.** for insertion technique

Paediatric sizes

Open the i-gel package, and on a flat surface take out the cage pack containing the device.

Open the cage pack and transfer the i-gel into the lid of the cage.

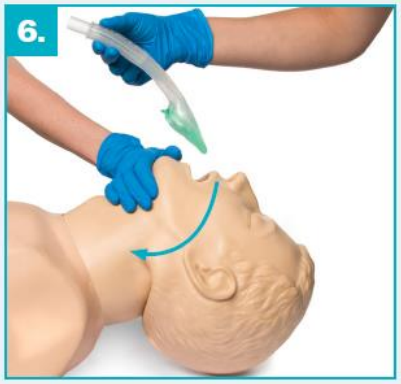
Place a small bolus of a waterbased lubricant, such as K-Y Jelly®, onto the middle of the smooth surface of the cage pack ready for use.

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

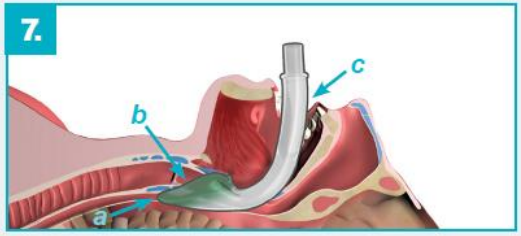
Inspect the device carefully, confirm there are no foreign bodies or a BOLUS of lubricant obstructing the distal opening. Place the i-gel back into the cage pack in preparation for insertion.

Go to step **6.** for insertion technique

Insertion technique

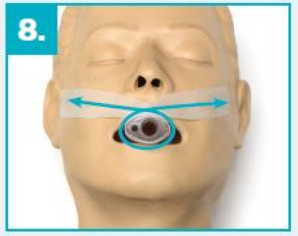


Remove the i-gel from the protective cradle or cage pack. Grasp the lubricated i-gel firmly along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the chin of the patient. The patient should be in the 'sniffing the morning air' position with head extended and neck flexed. The chin should be gently pressed down before proceeding. 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.

The tip of the airway should be located into the upper oesophageal opening (a) and the cuff should be located against the laryngeal framework (b). The incisors should be resting on the integral bite block (c).



The i-gel should be taped down from 'maxilla to maxilla'.

http://www.intersurgical.com/info/igel

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Suctioning (Basic) - Procedures

Procedure:

- ❑ 1. Ensure suction device is in proper working order with suction tip in place.
- ❑ 2. Set mechanical suction device to appropriate setting (Adult: 120-150mmHg **OR** Pediatric: 80-100mmHg).
- ❑ 3. Measure suction tip from corner of mouth to ear lobe and mark maximum insertion depth; **OR** ensure tip of catheter is always in sight during use.
- ❑ 4. Preoxygenate the patient.
- ❑ 5. Explain the procedure to the patient, if they are coherent.
- ❑ 6. Examine the oropharynx and remove any potential foreign bodies or material that may occlude the airway if dislodged by the suction device.
- ❑ 7. If applicable, remove ventilation devices (i.e. BVM, OPA) from the mouth and upper airway.
- ❑ 8. Insert into mouth without finger hole covered
- ❑ 9. Once inserted, cover the finger hole with a gloved finger to remove any secretions, blood, or other substances. The alert patient may assist with this procedure. Continue to cover the finger hole while removing.
- ❑ 9. Max suction time:
  - Adult - 15 seconds
  - Pediatric - 10 seconds
  - Infant - 5 seconds
- ❑ 10. Reattach ventilation device (i.e. BVM) and resume ventilations or patient assistance, as applicable.
- ❑ 11. Record the time and result of the suctioning procedure in the electronic Patient Care Report (ePCR).

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P	Paramedic

Stoma Care (Basic) - Procedures

Procedure:

Permanent Tracheostomy (upper airway structures surgically removed and trachea surgically attached to skin stoma)

- ❑ Suction of visible structures in opening in neck (upper airway is surgically absent and aspiration not possible)
- ❑ Ventilate as necessary through stoma
- ❑ Consider ALS Intercept for intubation if any concerns about airway, ventilation or patient stability

Temporary Tracheostomy (a metal or plastic tube is placed through the anterior neck and is held in place with ties around the neck)

- ❑ Suction visible entrance to inner trach tube only
- ❑ Ventilate as necessary by attaching bag-valve directly to tube (an adapter from an ET tube may be needed to make the connection
- ❑ If ventilating through stoma with uncuffed tube, block the upper airway
- ❑ Consider ALS Intercept for intubation if any concerns about airway, ventilation or patient stability

Notes:

Suctioning removes air as well as secretions. Be sure to over-ventilate for 20-30 seconds after suctioning

"Fresh" Tracheostomies (<3 months) are very fragile and have a high potential for creating a false tract if manipulated without trach tube in place – this should be avoided unless all other airway options have been exhausted and the patient is in extremis

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Suctioning Endotracheal Tube - Procedures

P Paramedic

Procedure:

- ❑ 1. Ensure suction device is in proper working order with suction tip in place.
- ❑ 2. Preoxygenate the patient.
- ❑ 3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
- ❑ 4. For all devices, use the suprasternal notch as the end of the airway. Measure the depth desired for the catheter (judgement must be used regarding the depth of suctioning with Endotracheal, Cricothyrotomy and Tracheostomy tubes).
- ❑ 5. If applicable, remove ventilation devices (i.e. BVM, OPA) from the airway.
- ❑ 6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
- ❑ 7. Once the desired depth (measured in #4 above) has been reached, use a gloved finger to occlude the thumb port and remove the suction catheter slowly.
- ❑ 8. A small volume (<10mL) of normal saline may be used to lavage secretions as needed, with supplemental oxygen and/or ventilations x 5 tidal volumes between lavages.
- ❑ 9. Reattach ventilation device (i.e. BVM) and ventilate or assist the patient as needed.
- ❑ 10. Record the time and result of the suctioning procedure in the electronic Patient Care Report (ePCR).

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Tracheostomy Care - Procedures

P Paramedic

Purpose:

- ❑ To maintain a patent airway and adequate oxygenation of the patient with a temporary or permanent tracheostomy.

Clinical Indications:

- ❑ Patient with temporary or permanent tracheostomies obstructed by secretions.
- ❑ Patient unable to replace own tracheostomy tube.

Procedure:

Permanent Tracheostomy (upper airway structures surgically removed and trachea surgically attached to skin stoma)

- ❑ Suction through opening in neck (upper airway is surgically absent and aspiration not possible)
- ❑ If secretions are very thick, instill 2.5-5mL NS to liquefy secretions
- ❑ Ventilate as necessary through stoma
- ❑ Consider intubation
- ❑ Insert ET tube through stoma until cuff is past opening
- ❑ Inflate cuff with 6-8mL of air
- ❑ Auscultate bilaterally over axilla and stomach to confirm placement
- ❑ Connect end-tidal CO2 monitoring as standard
- ❑ Secure ET tube
- ❑ ET tube may only be shortened to where the balloon inflation line separates from the tube

Temporary Tracheostomy (a metal or plastic tube is placed through the anterior neck and is held in place with ties around the neck)

- ❑ Suction through inner trach tube
- ❑ If secretions are very thick, instill 2.5-5mL NS to liquefy secretions
- ❑ If outer tube has been displaced or is blocked, remove and replace it with patient's spare tube or an ET tube
- ❑ Ventilate as necessary by attaching bag-valve directly to tube (an adapter from an ET tube may be needed to make the connection
- ❑ If ventilating through stoma with uncuffed tube, block the upper airway
- ❑ Consider intubation

IF ABLE To Intubate Through Stoma

- ❑ Remove tracheostomy tube
- ❑ Insert ET tube through stoma until cuff is past skin opening
- ❑ Inflate cuff with 6-8mL of air
- ❑ IF uncuffed ET tube was used, upper airway must be blocked when ventilating
- ❑ Auscultate bilaterally over the axilla and stomach to confirm placement
- ❑ Connect end-tidal CO2 monitoring as standard
- ❑ Secure ET tube
- ❑ ET tube may only be shortened to where the balloon inflation line separates from the tube

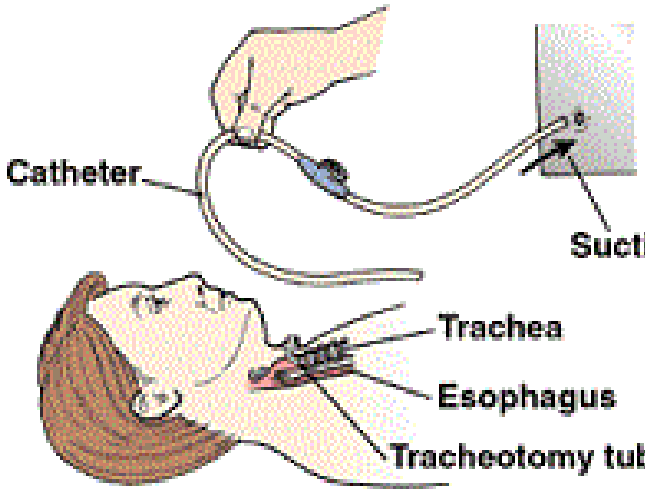
IF NOT ABLE To Intubate Through Stoma

- ❑ Intubate through upper airway
- ❑ Pass cuff of tube BELOW stoma opening in anterior neck (partner or assistant to visually verify externally)
- ❑ Inflate cuff with 6-8mL of air
- ❑ Ventilate, blocking opening in anterior neck
- ❑ Auscultate bilateally over axilla and stomach to confirm placement
- ❑ Connect end-tidal CO2 monitoring as standard
- ❑ Secure ET tube
- ❑ No shortening of ET tube permitted

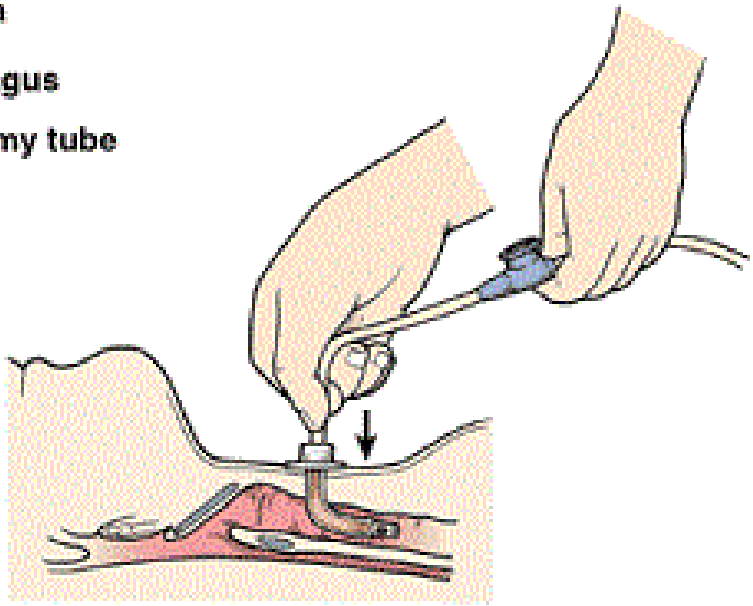
Notes:

- ❑ Suctioning removes air as well as secretions. Be sure to over-ventilate for 20-30 seconds after suctioning
- ❑ "Fresh" Tracheostomies (<3 months) are very fragile and have a high potential for creating a false tract if manipulated without trach tube in place – this should be avoided unless all other airway options have been exhausted and the patient is in extremis

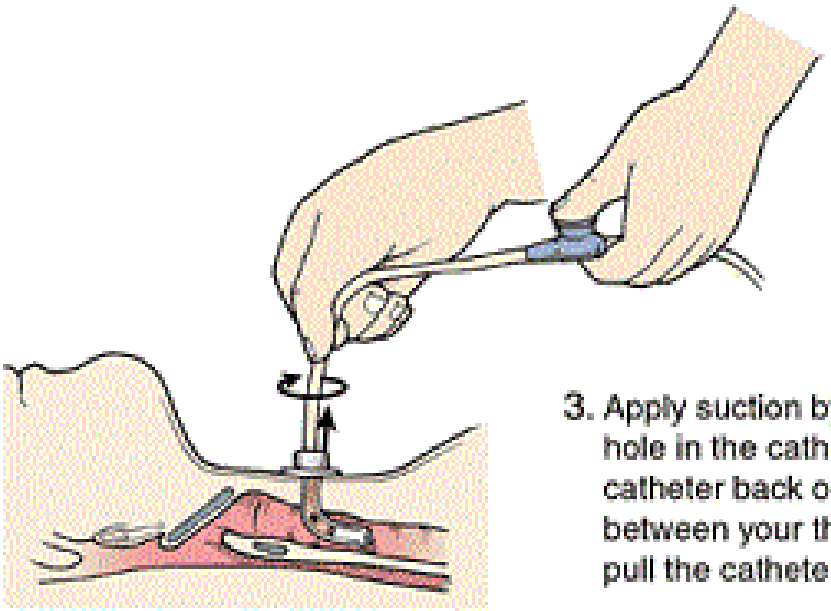
How to Suction a Tracheostomy Tube



1. Connect the catheter to the suction machine. Do not touch the end of the catheter that will go into the trach tube.



2. Insert the catheter the proper distance into the trach tube (usually the length of the trach tube plus 1/4 inch.)



3. Apply suction by putting your thumb over the hole in the catheter while you gently pull the catheter back out. Gently roll the catheter between your thumb and forefinger as you pull the catheter out.

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Continuous Positive Airway Pressure (CPAP) - Procedures

Prepare All Procedure Specific Materials:

- ❑ Medical Director approved Continuous Positive Airway Pressure (CPAP) Device as per manufacturer written procedure.

Procedure:

- ❑ 1. Attach cardiac monitor, End-tidal CO_2 ($EtCO_2$) and continuous pulse oximetry (SpO_2).
- ❑ 2. Assemble device according to manufacturer procedure. Attach supplemental Oxygen per manufacturer procedure.
- ❑ 3. Verbally instruct patient and coach breathing with the device.
  - Patient must be able to follow commands and interact with EMS Provider to use this tool effectively.
- ❑ 4. Instruct patient to slowly breathe in through the nose and exhale through the mouth.
  - Inhalation to exhalation ratio should be roughly 4:1.
- ❑ 5. Set positive end-expiratory pressure (PEEP) to 5cmH_2O.
- ❑ 6. Secure mask in place with head strap.
- ❑ 7. Reassess patient and titrate PEEP to desired effect, per protocol.
- ❑ 8. Record and monitor vital signs, $EtCO_2$, and SpO_2 frequently.
  - Changes in patient condition, patient complaint or clinical picture should all result in repeat of full VS and documentation.
- ❑ 9. In the event of worsening respiratory status after initiation of CPAP:
  - Evaluate patient compliance and offer reassurance, verbal coaching if appropriate.
  - Remove CPAP mask and stop treatment if patient unable to tolerate CPAP **OR** if clinically deteriorating.
  - Institute BLS and ALS care per appropriate protocol.
  - Document adverse reactions, and reasons why CPAP was discontinued in electronic Patient Care Report (ePCR).

Consider CPAP protocol if 2 or more are present:

- ❑ Tachypnea, nasal flaring, subcostal/intercostal retractions, tracheal tugging
- ❑ Suspected bronchospasm on clinical exam
- ❑ Rales suggesting pulmonary edema and patient with history of congestive heart failure (CHF) or renal insufficiency
- ❑ Respiratory rate >25 per minute
- ❑ Oxygen saturation <93% on high flow Oxygen

Contraindications

- ❑ Respiratory Arrest
- ❑ Agonal Respirations
- ❑ Unconsciousness or obtundation
- ❑ Shock associated with cardiac insufficiency
- ❑ Trauma
- ❑ Persistent nausea and vomiting
- ❑ Facial anomalies
- ❑ Inability to cooperate with the procedure
- ❑ Current tracheostomy

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Bougie - Procedures

P Paramedic

Procedure:

- ❑ 1. Prepare, position, and oxygenate the patient with 100% Oxygen
- ❑ 2. Select proper ET tube without stylette, test cuff and prepare suction
- ❑ 3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal ½ of the endotracheal tube introducer (Bougie)
  - Note: failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT
- ❑ 4. Using laryngoscopic techniques, visualize the vocal cords if possible using the Sellick's/BURP as needed.
- ❑ 5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or about the arytenoids if the cords cannot be visualized.
- ❑ 6. Once inserted, gently advance the Bougie until you meet resistance (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated).
- ❑ 7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie
- ❑ 8. Gently advance the Bougie and loaded ET tube until you have resistance again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie
- ❑ 9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth
- ❑ 10. IF you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails, to facilitate passing the ETT you may attempt a direct laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie and if so desired advance the ETT)
- ❑ 11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie
- ❑ 12. Confirm tracheal placement with capnography according to the intubation protocol. Inflate the cuff, auscultate for equal breath sounds, and reposition accordingly
- ❑ 13. When final position is determined secure the ET tube, continuously monitor, and record
- ❑ 14. If there is any question regarding placement of ETT (Esophageal vs. Tracheal) remove immediately and ventilate with BVM

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Capnography - Procedures

Nasal End-tidal CO2 ($EtCO_2$)

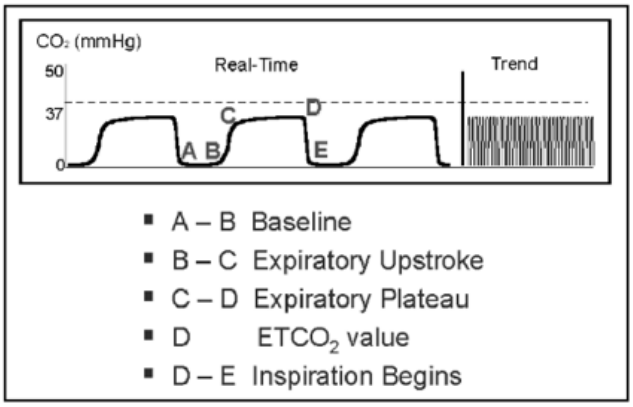
Procedure:

- ❑ 1. Attach capnography tubing to device
- ❑ 2. Attach tubing to patient (may supplement with NRB mask if needed)
- ❑ 3. Record readings initially and throughout treatment as with other vital signs
- ❑ 4. Document the procedure and results on/with the electronic Patient Care Report (ePCR)

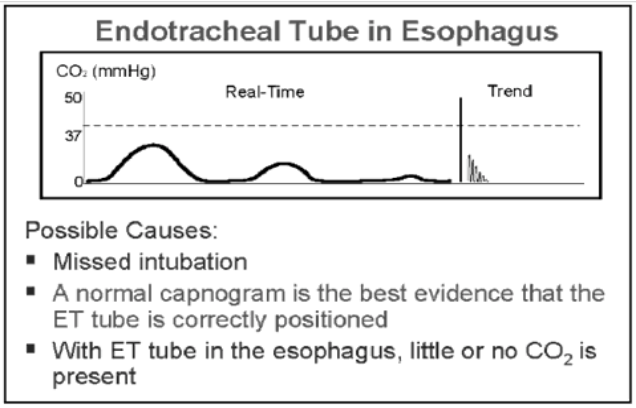
Advanced Airway End-tidal CO2 ($EtCO_2$)

Procedure:

- ❑ 1. Attach capnography sensor to Advanced Airway.
- ❑ 2. Note CO_2 level and waveform.
- ❑ 3. Record readings on scene, en route to the hospital and upon patient delivery to receiving facility.
- ❑ 4. Any loss of EtCO2 detection of waveform indicates an airway problem – recheck tube placement and remove if appropriate
- ❑ 5. End-tidal CO_2 goal is 40mmHg
  - Above 45mmHg, increase ventilation rate
  - Below 35mmHg, slow down ventilation rate
- ❑ 6. Document the procedure and results on/with the Patient Care Report (PCR)



- A – B Baseline
- B – C Expiratory Upstroke
- C – D Expiratory Plateau
- D $ETCO_2$ value
- D – E Inspiration Begins



Possible Causes:

- Missed intubation
- A normal capnogram is the best evidence that the ET tube is correctly positioned
- With ET tube in the esophagus, little or no CO_2 is present

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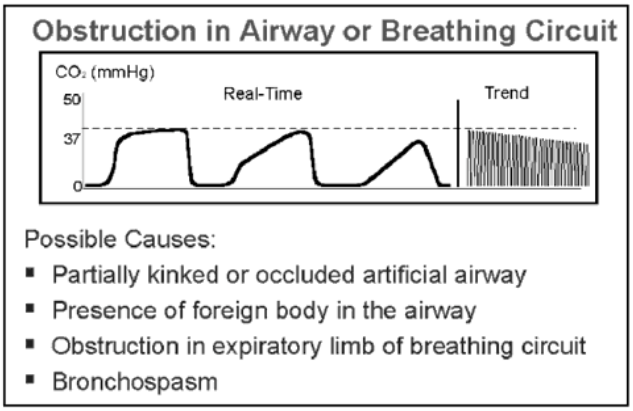

Possible Causes:

- Partially kinked or occluded artificial airway
- Presence of foreign body in the airway
- Obstruction in expiratory limb of breathing circuit
- Bronchospasm

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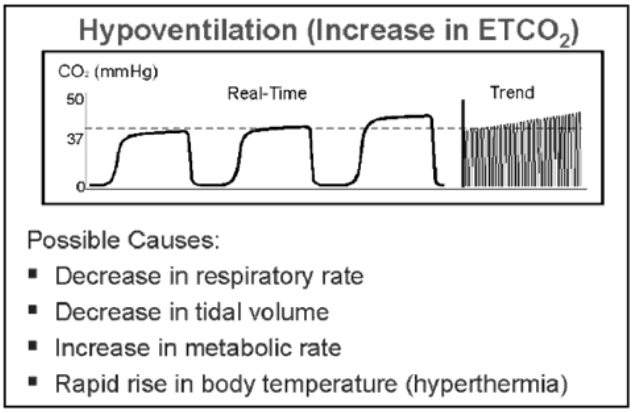

Possible Causes:

- Decrease in respiratory rate
- Decrease in tidal volume
- Increase in metabolic rate
- Rapid rise in body temperature (hyperthermia)

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Cricothyrotomy - Procedures

P Paramedic

Contact Medical Control Prior to Initiating Procedure, IF Time and Situation Permit

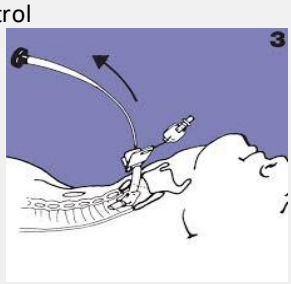
- *When all airway interventions have failed and the patient needs a secure airway immediately, consider performing cricothyrotomy.* ***The percutaneous approach is preferred to the open.***
- *If the patient is not able to be ventilated via BVM, ETT or BIAD and the Paramedic feels a surgical airway is necessary, Medical Control should be contacted first. If time and situation do not allow it, this Procedure may be completed prior to authorization by Medical Control.*

Prepare All Procedure Specific Materials:

- ❑ 14 gauge or larger IV catheter
- ❑ Needle
- ❑ 10 mL syringe
- ❑ Adapter from a 3.0mm ETT
- ❑ Saline
- ❑ Alcohol pad
- ❑ 4x4 gauze pad
- ❑ Tape
- ❑ Suction

Procedure:

- ❑ 1. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
- ❑ 2. Cleanse anterior neck
- ❑ 3. Fill a 10mL syringe with 5mL of 0.9% Normal Saline
- ❑ 4. Remove dilator from the package and sheath and advance into the tracheostomy tube
- ❑ 5. Insert the splitting needle perpendicular to the skin and cricothyroid membrane while gently holding negative pressure and aspirating with the syringe. Upon entering the trachea there will be a loss of resistance and free flow of air with bubbles flowing easily into the syringe.
- ❑ 6. Drop the angle of the needle ≥ 45 degrees and aim the tip of the needle toward carina (toward the feet) and complete insertion of needle, while continuing to aspirateto ensure the needle remains in the trachea.
- ❑ 7. While stabilizing the needle in place, disconnect the needle form the syringe and advance guidewire (attached to the dilator) into the hub of the splitting needle until resistance is met.
- ❑ 8. Squeeze wings of needle together. The needle should split in half and allow the guidewire/dilator to be advanced.
- ❑ 9. When the dilator meets resistance at the skin, remove the needle by pulling in opposite directions, while securing the guidewire in the trachea and the dilator at the skin.
- ❑ 10. Place thumb on dilator knob while first and second fingers are curved under flange of trachea tube. With gentle, continuous pressure, advance the dilator and tracheostomy tube into position until flange is secure against the skin.
- ❑ 11. Remove dilator and inflate cuff until device is secure in the airway (max 5mL).
- ❑ 12. Attach EtCO2 and BVM.
- ❑ 13. Secure tube in place using the provided twill tape behind the neck of the patient.
- ❑ 14. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted
- ❑ 15. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
- ❑ 16. Consider Sedation Protocol as appropriate.
- ❑ 17. If not previously done, immediately contact receiving facility and Medical Control



Cricothyrotomy (Open) Surgical - Procedures

P Paramedic

Contact Medical Control Prior to Initiating Procedure, IF Time and Situation Permit

Clinical Indication:

- ❑ Failed airway management when standard airway procedures cannot be performed or have failed in an adult patient that requires airway management.
- ❑ Upper airway obstruction (eg. facial or neck trauma occluding airway patency, foreign body unable to be removed, angioedema) and inability to adequately oxygenate and ventilate using less invasive methods.
- ❑ If Possible Contact Medical Control Before Proceeding. If not possible, notify receiving hospital as soon as possible.

Prepare All Procedure Specific Materials:

- ❑ Scalpel
- ❑ Antiseptic swab
- ❑ 6.0 mm endotracheal tube
- ❑ 10cmL syringe
- ❑ Tracheal hook (if available)
- ❑ Bougie device
- ❑ Continuous Digital Waveform Capnography

Contraindications:

- ❑ Ability to oxygenate and ventilate using less invasive methods.
- ❑ Pediatric Patients
- ❑ Suspected fractured larynx and/or cricoid cartilage
- ❑ Suspected tracheal transection
- ❑ Inability to find anatomical landmarks

Procedure:

- ❑ 1. Have suction and supplies available and ready.
- ❑ 2. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
- ❑ 3. Prep the area with an antiseptic swab.
- ❑ 4. Using the non-dominant hand, spread the overlying skin taut with the thumb and fingers, and slightly depress the skin over the cricothyroid membrane with the index finger to mark the site of cricothyrotomy. Do not release the non-dominant hand from the neck until the procedure is complete. Once the anatomy is found and defined, avoid movement of the anatomy to promote proper cricothyrotomy airway placement.
- ❑ 5. Using a sterile scalpel, make a vertical incision in the mid-line of the neck extending from just above the lower edge of the thyroid cartilage to the middle of the cricoid cartilage. Make the depth of this incision sufficient to extend through the skin and fatty tissue underneath.
- ❑ 6. Using the same scalpel, make a short horizontal incision in the middle of the cricothyroid membrane into the trachea.
  - If a tracheal hook *is* available: prior to removing scalpel from incision, use a tracheal hook to pull anterior and inferior on the thyroid cartilage (lower edge of horizontal incision). Exercise caution when manipulating the tracheal hook into the incision – the tip of most tracheal hooks is particularly sharp-edged.
  - If tracheal hook *is not* available: a bougie device should be used as introducer into the tracheal opening prior to passing the ET tube.
- ❑ 7. Pass a 6.0mm Endotracheal Tube through the horizontal incision in the cricothyroid membrane, angling the tube inferior and posterior along the tracheal anatomy.
- ❑ 8. Inflate the endotracheal cuff with 5-10mL of air and verify airway placement with EtCO2 (continuous digital capnography monitoring) and physical exam (chest rise, breath sounds).
- ❑ 9. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted
- ❑ 10. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
- ❑ 11. Consider Sedation Protocol as appropriate.
- ❑ 12. If not previously done, immediately contact receiving facility and Medical Control
- ❑ 13. Continually monitor for respiratory changes during transport, especially after any patient movement/transfers.
- ❑ 14. Monitor for complications (ie hemorrhage, expanding neck hematoma, dislodgement).
- ❑ 15. Document procedure.

Control-Cric - Procedures

P Paramedic

Contact Medical Control Prior to Initiating Procedure, IF Time and Situation Permit

- *When all airway interventions have failed and the patient needs a secure airway immediately, consider performing cricothyrotomy.* ***The percutaneous approach is preferred to the open.***
- *If the patient is not able to be ventilated via BVM, ETT or BIAD and the Paramedic feels a surgical airway is necessary, Medical Control should be contacted first. If time and situation do not allow it, this Procedure may be completed prior to authorization by Medical Control.*

Prepare All Procedure Specific Materials:

- ❑ Control-Cric Kit
- ❑ Alcohol pad
- ❑ 4x4 gauze pad
- ❑ Tape
- ❑ Suction

Procedure:

- ❑ 1. Position patient supine in the sniffing position with slight extension of the neck – identify landmarks of the cricothyroid membrane by palpation utilizing anatomical landmarks (below the thyroid cartilage and above the cricoid cartilage).
- ❑ 2. Cleanse anterior neck
- ❑ 3. If Right-Handed, operator should be positioned on the right side of the patient; if Left-Handed, operator should be positioned on the left. Operator should stabilize the larynx with the thumb and middle finger of non-dominant hand. Identify the cricothyroid membrane, typically 4 finger breadths below the mandible and 3 finger breadths above the sternal notch.
- ❑ 4. Use the Cric-Knife to incise the skin. A vertical incision should be made initially to allow positive identification of the cricothyroid membrane. Once the cricothyroid membrane has been identified, rotate the knife horizontally and make a single, perpendicular "plunge" incision through the membrane.
- ❑ 5. Once the horizontal incision is made, maintain downward pressure on the knife; do NOT remove knife from the tracheal opening. Slide the attached tracheal hook through the newly formed stoma until it "pops" through the cricothyroid membrane and stops against the posterior wall of the trachea. With your non-dominant hand, grab the handle of the tracheal hook and pull back on the thyroid cartilage to hold stable placement.
- ❑ 6. While maintaining traction with the trach hook, insert the Cric-Key through the incision. Confirmation of proper placement can be made by moving the Cric-Key along the anterior wall of the trachea and feeling the tracheal rings with the device. Once correct placement is obtained, insert the Cric-Key tube down to level of the flange. Flange should rest on the patient's anterior neck.
- ❑ 7. Rotate the Cric-Key towards patient shoulder and retract to remove from airway.
- ❑ 8. Firmly stabilize the Cric-Key tube and remove the Cric-Key introducer with slow, steady pull. Inflate the cuff until resistance is met.
- ❑ 9. Ventilate with BVM and 100% O_2.
- ❑ 10. Confirm placement with gentle ventilation via BVM, continuous digital waveform capnography, and physical exam. Be sure air movement is fluid with bilateral symmetric chest rise and that no visible neck or soft-tissue distortion is noted.
- ❑ 11. Secure tube with supplied tube holder.
- ❑ 12. Observe for subcutaneous air, which may indicate tracheal injury or extra-tracheal tube position.
- ❑ 13. If tracheal placement is unclear, remove device and transport immediately to the closest Emergency Department.
- ❑ 14. Consider Sedation Protocol as appropriate.
- ❑ 15. If not previously done, immediately contact receiving facility and Medical Control

Needle Jet Insufflation - Procedures

P | Paramedic

Contact Medical Control Prior to Initiating Procedure, IF Time and Situation Permit

- *When all airway interventions have failed and the patient needs oxygenation immediately, consider performing needle jet insufflation.*
- *If the patient is not able to be ventilated via BVM, ETT or BIAD and the Paramedic feels needle jet insufflation is necessary, Medical Control should be contacted first. If time and situation do not allow it, this Procedure may be completed prior to authorization by Medical Control.*

Clinical Indications:
Life threatening upper airway obstruction where all other BLS and ALS maneuvers and techniques have failed.

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. Locate the cricothyroid membrane and prep the area with antiseptic wipe
- ❑ 3. Extend the neck to bring the cricothyroid membrane anterior and as close to the skin as possible
- ❑ 4. Insert the #10 gauge angiocath through the membrane at 90° to the skin until loss of resistance
  - Use a 3mL syringe and apply negative pressure to confirm free aspiration of air and needle presence in the trachea
  - Consider using a second angiocath through the same insertion site if first needle becomes occluded during procedure
- ❑ 5. Drop the angle of the needle to approximately 60° with the tip aimed toward the patient's feet
  - Continue negative pressure on the syringe to confirm continued placement in the trachea
- ❑ 6. Attach the 7.0 Endotracheal Tube BVM adapter to the end of the syringe
- ❑ 7. Ventilate at a ratio of 1:5 inhalation:exhalation
- ❑ 8. If the airway resistance continues to increase, disconnect the BVM to allow for exhalation
  - Consider addition of second angiocath for use as an exhalation port
- ❑ 9. If subcutaneous emphysema develops, stop insufflation and remove angiocath
  - Repeat steps 2-7 as above
- ❑ 10. Notify the receiving facility of Failed Airway Protocol use and need for Needle Jet Insufflation.
- ❑ 11. Document the procedure and patient response to care in the electronic Patient Care Report (ePCR).

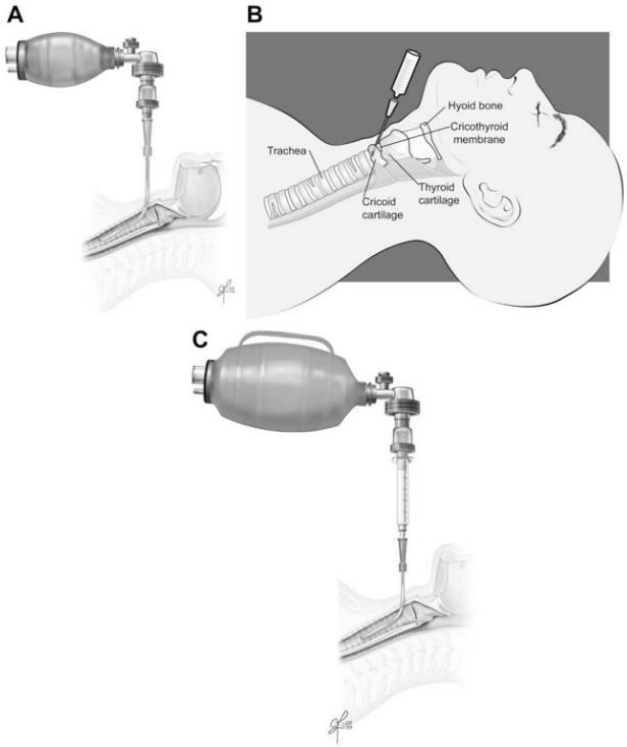


Fig. 6. Ventilation using a standard ventilation bag (*A*) using a 3.5-mm pediatric endotracheal tube (ET) adapter; (*B*) using a 7.0-mm adult ET adapter connected to a plungerless 3 mm syringe without a bag-valve–mask attached; and (*C*) using a 7.0-mm adult ET adapter connected to a plungerless 3-mm syringe with a bag-valve–mask attached. (*Courtesy of* S.E. Mace, MD, and J. Loerch, Clinic Cleveland Center for Medical Art and Photography, Cleveland, OH; with permission.)

	EMT
A	A-EMT
P	Paramedic

Blood Glucose Analysis - Procedures

Prepare All Procedure Specific Materials:

- ❑ Glucometer
- ❑ Test Strip
- ❑ Lancet
- ❑ 2x2 gauze pad
- ❑ Alcohol prep pad
- ❑ Bandage

Procedure:

- ❑ 1. Select appropriate site.
- ❑ 2. Blood samples for performing glucose analysis may be obtained simultaneously with intravenous access when possible.
- ❑ 3. Cleanse site appropriately with alcohol prep.
- ❑ 4. Puncture skin with lancet.
- ❑ 5. Dispose of sharps in proper container.
- ❑ 6. Wipe first drop of blood with 2x2 gauze.
- ❑ 7. Place correct amount of blood on reagent strip or site on glucometer per the manufacturers instructions.
- ❑ 8. Apply direct pressure and cover site with bandage as needed.
- ❑ 9. If result does not fit patient clinical picture:
  - Consider presumptive management per Diabetic Emergencies Protocol while reassessing.
  - Consider equipment error, may redraw sample and repeat analysis.
- ❑ 10. Record the time and result of the blood glucose analysis in the electronic Patient Care Report (ePCR).

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	EMT
A	A-EMT
P	Paramedic

Carbon Monoxide Measurement - Procedures

Procedure:

- ❑ 1. Apply probe to patient's digit(s) as recommended by the manufacturer. If near strobe lights, cover the finger to avoid interference and/or move away from the lights if possible. Where the manufacturer provides a light shield it should be used.
- ❑ 2. Allow machine to register percent circulating carboxyhemoglobin values
- ❑ 3. Verify pulse rate on machine with palpated pulse of the patient
- ❑ 4. Record levels in electronic Patient Care Report (ePCR) or on the scene rehabilitation form
  - If CO ≤5%, assess for other possible illness or injury
  - If CO >5% to ≤15% and symptomatic from Carbon Monoxide – treat per Carbon Monoxide Exposure Protocol
  - If CO >15% - treat per Carbon Monoxide Exposure Protocol

***Signs and symptoms of Carbon Monoxide (CO) poisoning* – altered mental status, dizziness, headache, nausea/vomiting, chest pain, respiratory distress, neurological impairments, vision problems, reddened eyes, tachycardia, tachypnea, arrhythmias, seizures and/ or coma.**

- ❑ 5. Monitor critical patients continuously with continuous pulse oximetry (SpO2) and SpCO until arrival at the hospital.
- ❑ 6. Document percent of carboxyhemoglobin values every time vital signs are recorded during therapy for exposed patients.
- ❑ 7. Use the SpO2 feature of the device as an added tool for patient evaluation. Treat the patient, not the data provided by the device. Utilize the relevant protocol for guidance.
- ❑ 8. The SpO2 reading should never be used to withhold oxygen from a patient with respiratory distress or complaining of shortness of breath.
- ❑ 9. Factors which may reduce the reliability of the reading include:
  - Poor peripheral circulation (hypovolemia, hypotension, hypothermia).
  - Excessive external lighting, particularly strobe/flashing lights
  - Excessive sensor motion.
  - Fingernail polish (should be removed with acetone pad).
  - Irregular heart rhythms (atrial fibrillation, SVT, etc.).
  - Jaundice.
  - Placement of BP cuff on same extremity as SpO2 probe.

CO poisoning can look a lot like influenza, particularly in the winter months. Have a high index of suspicion when seeing multiple patients from the same environment with flu-like illnesses and consider Carbon Monoxide.

Synchronized Cardioversion - Procedures

P Paramedic

Procedure:

- ❑ 1. Ensure the patient is attached properly to a cardiac monitor/defibrillator capable of synchronized cardioversion.
- ❑ 2. Have all equipment prepared for unsynchronized cardioversion/defibrillation, if the patient fails synchronized cardioversion and/or the clinical condition worsens.
- ❑ 3. Firmly apply defib pads to patients chest – assure it is clean, dry, with minimal chest hair.
- ❑ 4. Consider the use of Sedation Protocol, as appropriate.
- ❑ 5. Set energy selection to the appropriate setting, per Protocol.
- ❑ 6. Set monitor/defibrillator to synchronized cardioversion mode, per manufacturer's instructions.
- ❑ 7. Make certain all personnel are clear of the patient.
- ❑ 8. PRESS and HOLD the "Shock" button to deploy the charge and cardiovert. Stay clear of the patient until you are certain the energy has been delivered.
  - NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there may be a delay between activating the cardioversion and the actual delivery of energy.
- ❑ 9. Note patient response – immediately refer to Appropriate Cardiac Dysrhythmia Protocol.
  - Document patient response to intervention, VS and clinical condition as situation permits.
- ❑ 10. Repeat per protocol until maximum setting or until efforts successful.
- ❑ 11. Note procedure, response, and times in electronic Patient Care Report (ePCR).

AHA Initial Recommended Doses	
Narrow Regular	50-100 J
Narrow Irregular	120-200 J
Wide Regular	100 J

Escalate the second and subsequent shock dose as needed

Follow manufacturer recommendations if available

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	EMT
A	A-EMT
P	Paramedic

Cardiopulmonary Resuscitation - Procedures

Procedure:

- ❑ 1. Check for responsiveness and feel for a pulse
  - Carotid pulse for adults and older children, brachial or femoral pulse for infant
- ❑ 2. If compressions are ongoing on EMS arrival, evaluate rate and depth while attaching the Cardiac Monitor **OR** AED
  - If compressions adequate, charge the monitor for rhythm analysis and shock evaluation immediately if appropriate **OR** begin AED analysis
  - If no compressions **OR** felt to be inadequate, initiate high quality chest compressions at >100 compressions per minute for two minutes.
- ❑ 3. Open the patient's airway
  - Head-tilt, chin-lift technique if no head or neck trauma suspected
  - Jaw-thrust if head or neck trauma suspected or unknown
- ❑ 4. For arrests without advanced airway, perform compressions:breaths as age appropriate
  - Once advanced airway established, transition to >100 compressions per minute *uninterrupted* with 8-10 breaths per minute.
- ❑ 5. At first rhythm analysis:
  - If shock advised by AED or interpreted as V-fib / Pulseless V-tach, defibrillate and notify dispatch of first defibrillation time.
  - If no shock advised by AED or interpreted to be non-shockable, discard shock and continue.
- ❑ 6. At 2 minutes if no response to resuscitation, consider advanced airway placement (BIAD or ETT) if situation and clinical presentation appropriate.
  - If good chest rise and air exchange achieved, it is acceptable to continue BVM with an airway adjunct (NPA or OPA)
- ❑ 7. Begin charging the monitor to prepare for defibrillation approximately 20 seconds before the 2 minute mark
- ❑ 8. At every 2 minute mark (200 chest compressions)
  - Rotate compressors (as allowed by personnel on scene)
  - Perform a rhythm and pulse check.
    - ❑ If V-fib / Pulseless V-tach, deliver shock as per Appropriate Cardiac Arrest Protocol
      - Medications delivered *after* shock as per Appropriate Cardiac Arrest Protocol
    - ❑ If no shockable rhythm, safely dump pending charge to prevent negligent discharge and/or responder injury.
      - Medications delivered *after decision* as per Appropriate Cardiac Arrest Protocol
- ❑ 9. Resume compressions at 100 per minute, ventilations at 8-10 breaths per minute (as age appropriate if no advanced airway).
  - Minimize interruptions in chest compressions as much as possible.
- ❑ 10. Repeat steps 7-9 until change in patient condition or decision made to terminate resuscitation after 20 minutes (4 rounds of ACLS medications)
- ❑ 11. Contact Medical Control as needed for orders or with any questions.

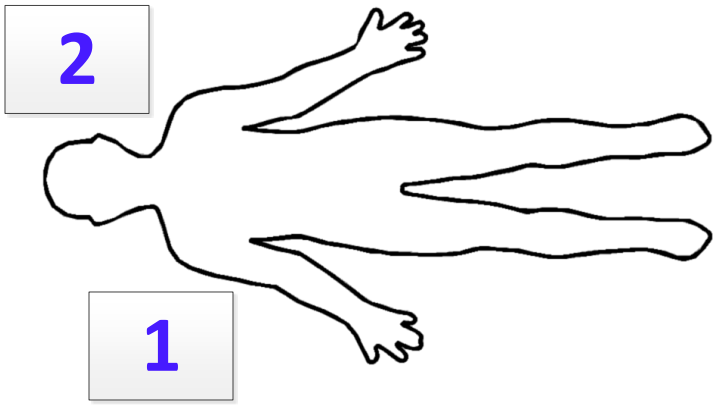
Age	Location	Depth	Rate
Neonate	Lower 1/3 of the sternum, between nipples, 2 thumbs technique	(1/3 of the anterior-posterior chest dimension)	90 compressions and 30 breaths per minute 1 or 2 Rescuers - 3:1
Infant (<1 year excluding newborns)	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1.5 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 Rescuer - 30:2 2 Rescuers - 15:2
Child (1 year to puberty)	Over sternum, between nipples (inter-mammary line), heel of one hand	2 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 Rescuer 30:2 2 Rescuers 15:2
Adult (puberty through adulthood)	Over sternum, just above the xyphoid process, hands with interlocked fingers	At least 2 inches (1/3 the anterior-posterior chest dimension)	At least 100-120 per minute 1 or 2 Rescuers - 30:2

Legend	
	First Responder
B	EMT
A	A-EMT
P	Paramedic

High Performance CPR - Procedures

High Performance CPR is a basis for increasing communication and efficiency during resuscitation of a cardiac arrest. It is based on four guiding principles taken from proven tactics developed by The Resuscitation Academy in Seattle, WA:

- ❑ 1. "BLS owns CPR" - focusing on fundamentals, predetermined roles, coordinated movement and minimized interruptions **WILL** improve outcomes
- ❑ 2. "It isn't complicated, but it isn't easy" - standardization of the approach across all of Dane County takes time, but **WILL** increase efficiency and patient survival
- ❑ 3. "Measure, improve, measure, improve…" - tracking our survival rates and making incremental improvements **WILL** have enormous effects
- ❑ 4. "Everyone in V-Fib survives" - If we can get to patients who are in shockable rhythms – OR use HPCPR to get them back to shockable – plan on getting ROSC!



2 Person Resuscitation Crew

#1 – Compressor (Patient Right)
- ❑ Checks Pulse - <10 seconds
- ❑ Immediately starts CPR (100-120 / minute)
- ❑ 30:2 Compressions:Ventilations
- ❑ Don't pause compressions until #2 (Airway) ready

#2 – AED / Airway (Patient Left)
- ❑ Applies pads without interrupting compressions
- ❑ Operates AED / Monitor (if manual, charge at 1min45sec)
- ❑ Manages Airway – OPA with BVM
  - ▪ (Advanced Airway placed at 6minutes or as resources allow)
- ❑ Alternates with Compressor every 2 minutes

BLS owns CPR – depth 2-2.4 inches, rate 100-120 compressions minute, rock palms to allow chest recoil, rotate in <5 sec, hover hands during shock delivery
Eliminate ALL unneccessary interruptions in compressions – coordination and communication among expert resuscitationists, count down the last 15sec
Controlled ventilations – 1 second breath delivery, 350-500mL (just enough for chest rise); with advanced airway, 1 breath every 10sec (6x/min) with same volume
AED / Monitor integration – begin charges BEFORE rhythm / pulse check to defibrillate ASAP, hover hands to keep compression delays to a minimum
Metronome *always on* for cardiac arrests, set to 110bpm
At 6 minutes or as soon as practical, apply **mechanical CPR device**; monitor for migration of device, particularly before/after patient movement

3+ Person Resuscitation Crew

#1 – Compressor (Patient Right)
- ❑ Checks Pulse - <10 seconds
- ❑ Immediately starts CPR (100-120 / minute)
- ❑ Alternates every 2 minutes

#2 – AED (Patient Left)
- ❑ Applies pads without interrupting compressions
- ❑ Operates AED / Monitor (if manual, charge at 1min45sec)

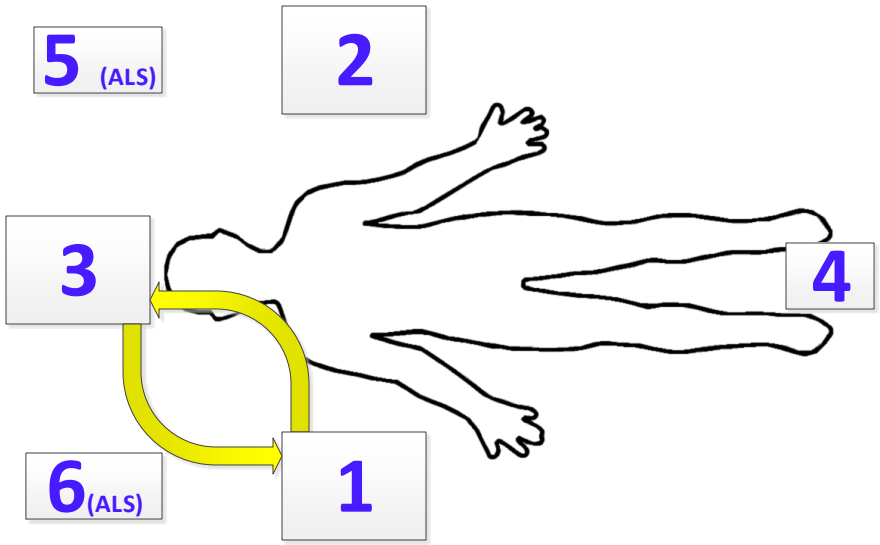
#3 – Airway (Patient Head)
- ❑ Alternates with Compressor every 2 minutes
- ❑ Manages Airway – OPA with BVM
  - ▪ (Advanced Airway placed at 6minutes or as resources allow)

#4 – Team Leader (Patient Foot)
- ❑ Oversight of Care
- ❑ Monitors time
- ❑ Liaison with Family, Obtains patient history

#5 – Access / ALS 1 (Patient Left Shoulder)
- ❑ Obtain IV / IO Access
- ❑ Initiate ACLS meds
- ❑ Transition to manual defib when reasonable

#6 – Airway / ALS 2 (Patient Right Shoulder)
- ❑ Manages Advanced Airway, if not already done
- ❑ Manages Monitor and ALS interventions as needed

Additional Providers
- ❑ Rotate with Compressors
- ❑ Assist with Family and obtaining patient history



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Defibrillation - Procedures

Manual

Procedure:

- ❑ 1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the Monitor is being prepared for use
- ❑ 2. Remove any medication patches on the chest and wipe off any residue
- ❑ 3. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions (front/back or shifted slightly to not rest on the implanted device). Refer to pictures for pediatric placement.
- ❑ 4. If necessary, connect defibrillator leads, per manufacturer recommendations
- ❑ 5. Charge the defibrillator per protocol. Continue chest compressions while the defibrillator is charging
- ❑ 6. Pause chest compressions and determine if shockable after reviewing rhythm for max of 5 seconds.
- ❑ 7. Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.
- ❑ 8. Defibrillate if appropriate by depressing the "shock" button.
- ❑ 9. If non-shockable discard the shock, per manufacturer recommendations
- ❑ 10. Continue to follow protocol
- ❑ 11. Record the time and result of the analysis in the patient care report (PCR).

Automated

Procedure:

- ❑ 1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use
- ❑ 2. Remove any medication patches on the chest and wipe off any residue
- ❑ 3. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions (front/back or shifted slightly to not rest on the implanted device).
- ❑ 4. If necessary, connect defibrillator leads, per manufacturer recommendations
- ❑ 5. Activate AED for analysis of rhythm
- ❑ 6. Stop chest compressions and clear the patient for rhythm analysis. Keep interruption in chest compressions as brief as possible
- ❑ 7. Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.
- ❑ 8. Defibrillate if appropriate by depressing the "shock" button. Biphasic defibrillators will determine the correct joules accordingly
- ❑ 9. Continue to follow protocol
- ❑ 10. Record the time and result of the analysis in the electronic Patient Care Report (ePCR).

Double Sequential Defibrillation - Procedures

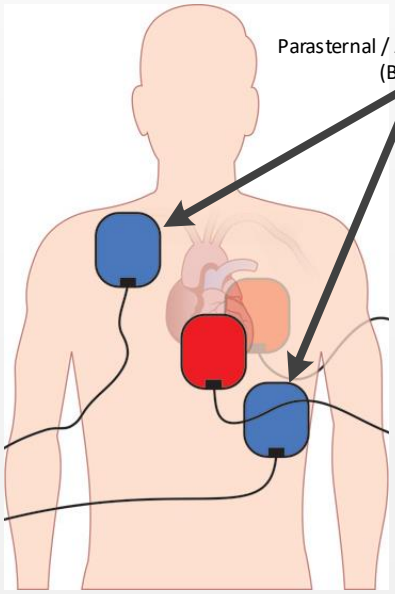
P Paramedic

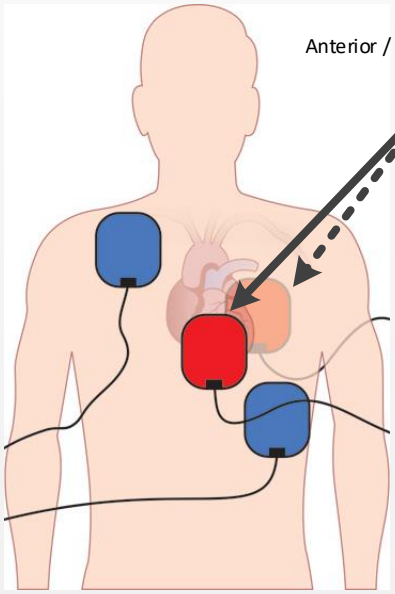
Clinical Indications:

- ❑ Patients with refractory or recurrent ventricular fibrillation (V-fib) or pulseless ventricular tachycardia (V-tach) or shockable rhythm per AED analysis that has not responded to ≥3 standard defibrillation attempts.

Procedure:

- ❑ 1. Ensure all necessary cardiac arrest interventions have been applied up to this point.
  - Uninterrupted and effective CPR.
  - Defibrillation at maximum output for at least three rounds of shocks (including first responder AED shocks, if applicable).
  - Administration of Amiodarone 300mg.
  - Consideration of other possible causes of cardiac arrest.
- ❑ 2. Upon decision to attempt Double Sequential Defibrillation, the first set of pads should be removed from the patient
- ❑ 3. Apply the manual defibrillator in the parasternal / axillary positions as shown in the figure below (blue pads)
  - The first rhythm check after moving the pads should be completed as a single shock, as previous
- ❑ 4. Apply an AED in the anterior / posterior positions as shown in the figure below (red pads)
  - Assure that the two sets of pads do not contact one another
- ❑ 3. Select maximum energy setting for both devices. Charge devices in advance of the anticipated break in CPR and ensure chest compressions continue while both devices are being charged.
- ❑ 4. At next rhythm analysis, if patient remains in ventricular fibrillation (V-fib) or pulseless ventricular tachycardia (V-tach) OR shock advised by AED:
  - Clear patient.
  - Deliver **double sequential defibrillation** by having two operators depressing both "Shock" buttons simultaneously.
- ❑ 5. Once criteria are met for dual sequential defibrillation, *all subsequent shocks delivered shall be using this method*.





NOTE:

- ❑ There is the potential to cause damage to equipment when performing this procedure. Therefore, it is recommended that attempts be made to perform Double Sequential Defibrillation using an AED in combination with a monitor to reduce risk.
- ❑ The case reports of equipment failure have not indicated the mechanism of damage; the steps above are an attempt to improve patient outcome while mitigating risk, but have not been proven to change outcomes.
- ❑ Because of the potential for adverse equipment results, **it is important that your Service Director and Medical Director approve this procedure BEFORE attempting.**
- ❑ **Devices used for Double Sequential Defibrillation should be removed from service until a full evaluation and function check can be completed to ensure safety of subsequent patients.**

External Cardiac Pacing - Procedures

P Paramedic

Procedure:

- ❑ 1. Attach standard cardiac monitor.
- ❑ 2. Apply defibrillation/pacing pads per manufacturer recommendations.
  - One pad to left mid chest next to sternum, one pad to left mid posterior back next to spine.
- ❑ 3. Place monitor into pacing mode, as specified by manufacturer.
- ❑ 4. Adjust heart rate to 70bpm for an adult, 100bpm for pediatric patients.
- ❑ 5. Note pacer spikes on EKG screen.
- ❑ 6. Slowly increase output until capture of electrical rhythm is noted on the monitor.
- ❑ 7. If unable to capture while at maximum current output, stop pacing immediately.
- ❑ 8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
- ❑ 9. Mechanical capture occurs when paced electrical spikes on the monitor correspond with palpable pulse.
- ❑ 10. Consider Sedation Protocol as appropriate.
- ❑ 11. Document the dysrhythmia and the response to external pacing with ECG strips in the electronic Patient Care Report (ePCR).

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Mechanical CPR Device (LUCAS) - Procedures

Clinical Indications:

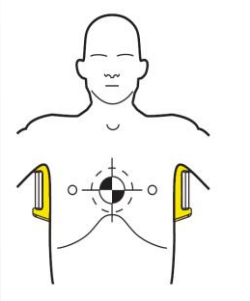
- May be used in patients 12 years of age or greater requiring chest compressions related to cardiac arrest.

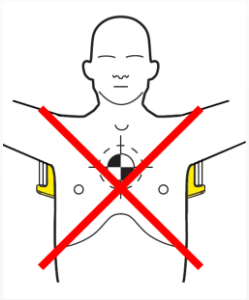
Contraindications:

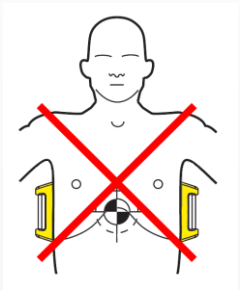
- Patients <12 years
- Patients suffering traumatic cardiac arrest or patients with obvious signs of traumatic injury
- Patients who do not fit within the device:
  - Too large and with whom you cannot press the pressure pad down 2 inches
  - Too small and with whom you cannot pull the pressure pad down to touch the sternum

Procedure:

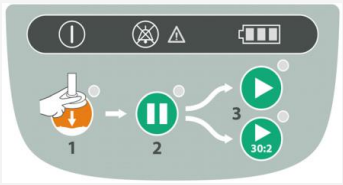
- ❑ All therapies related to the management of cardiopulmonary arrest should be continued as currently defined.
- ❑ Initiate resuscitative measures following protocol – **DO NOT DELAY MANUAL CPR FOR THE DEVICE. CONTINUE MANUAL CPR UNTIL THE DEVICE CAN BE PLACED**
- ❑ Detailed instructions for LUCAS device follow:
- ❑ 1. While resuscitative measures are initiated, the LUCAS device should be removed from its carrying device and placed on the patient in the following manner
- ❑ 2. The Backplate should be centered on the nipple line and the top of the backplate should be located just below the patients armpits







- ❑ 3. In cases which the patient is already on the stretcher, place the backplate underneath the thorax. This can be accomplished by log-rolling the patient or raising the torso (placement should occur during a scheduled discontinuation of compressions [ie. After five cycles of 30:2 or two minutes of uninterrupted compressions])
- ❑ 4. Position the compressor
- ❑ 5. Turn the LUCAS Device on (the device will perform a 3 second self test)



- ❑ 6. Remove the LUCAS device from its carrying case usign the handles provided on each side
- ❑ 7. With the index finger of each hand, pull the trigger to ensure the device is set to engage the backplate. Once this is complete you may removed your index finger from the trigger loop
- ❑ 8. Approach the patient from the side opposite the person performing manual chest compressions
- ❑ 9. Attach the claw hook to the backplate on the sie of the patient opposite that where compressions are being provided.
- ❑ 10. Place the LUCAS device across the patient, between the staff members' arms who is performing manual CPR
- ❑ 11. At this point the staff member performing manual CPOR stops and assists attaching the claw hook to the backplate on their side
- ❑ 12. Pull up once to make sure that the parts are securely attached

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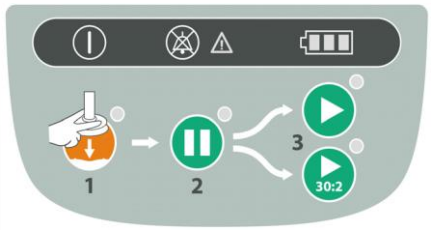
Mechanical CPR Device (LUCAS) - Procedures

Procedure Continued:

- ❑ 13. Adjust the height of the compression arm
- ❑ 14. Use the two fingers (V pattern) to make sure that the lower edge of the Suction Cup is immediately above the end of the sternum. If necessary, move the device by pulling the support legs to adjust the position
- ❑ 15. Press the Adjust Mode Button on the control pad labeled #1 (this will allow you to easily adjust the height of the compression arm)



- ❑ 16. To adjust the start position of the compression arm, manually push down the SUCTION CUP with two fingers onto the chest (without compressing the patient's chest)
- ❑ 17. Once the position of the compression arm is satisfactory, push the green PAUSE button labeled #2 (This will lock the arm in this positon), then remove your fingers from the SUCTION CUP
- ❑ 18. If the position is incorrect, press the ADJUST MODE BUTTON and repeat the steps
- ❑ 19. Start Compressions
- ❑ 20. If the patient in not intubated and you will be providing compression to ventilation ratio of 30:2 push ACTIVE (30:2) button to start
- ❑ 21. If the patient is intubated and you will be providing continuous compressions push ACTIVE (continuous) button
- ❑ 22. Patient Adjuncts
- ❑ 23. Place the neck roll behind the patient's head and attach the straps to the LUCAS device (this will prevent the LUCAS from migrating toward the patient's feet
- ❑ 24. Place the patients arms in the straps provided

-Defibrillation can and should be performed with the LUCAS device in place and in operation
-One may apply the defibrillation electrodes either before or after the LUCAS device has been put in position
-The pads and wires should not be underneath the suction cup
-If the electrodes are already in an incorrect position when the LUCAS is placed, you must apply new electrodes
-If the rhythm strip cannot be assessed during compressions, one may stop the compressions for analysis by pushing the PAUSE BUTTON (The duration of interruption of compressions should be kept as short as possible and should not be > 10 seconds. There is no need to interrupt chest compressions other than to analyze the rhythm).
-Once the rhythm is determined to require defibrillation, the appropriate ACTIVE BUTTON should be pushed to resume compressions while the defibrillator is charging and then the defibrillator should be discharged.

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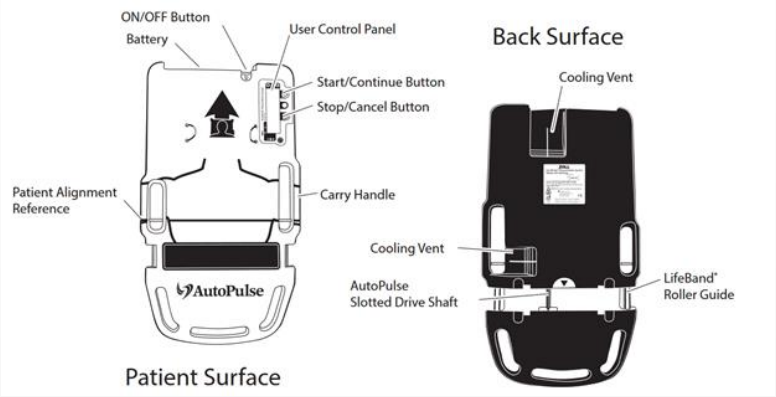
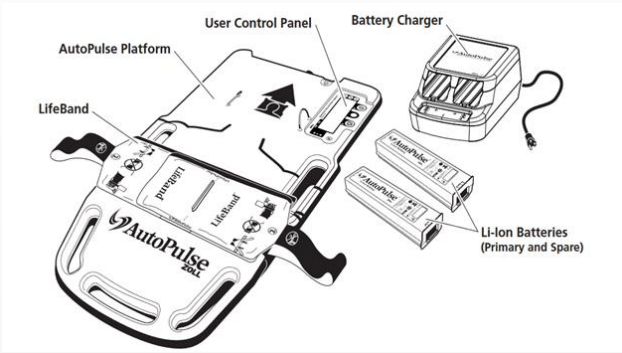
Mechanical CPR Device (AutoPulse) - Procedures

Clinical Indications:
- May be used in patients 12 years of age or greater requiring chest compressions related to cardiac arrest.

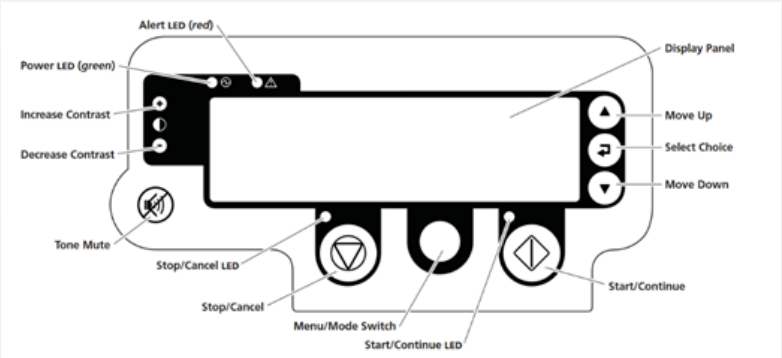
Contraindications:
- Patients <12 years
- Patients suffering traumatic cardiac arrest or patients with obvious signs of traumatic injury
- Patients who do not fit within the device:
  >300lbs or too small to get adequate tightening of the band; in both, compressions delivered will be ineffective

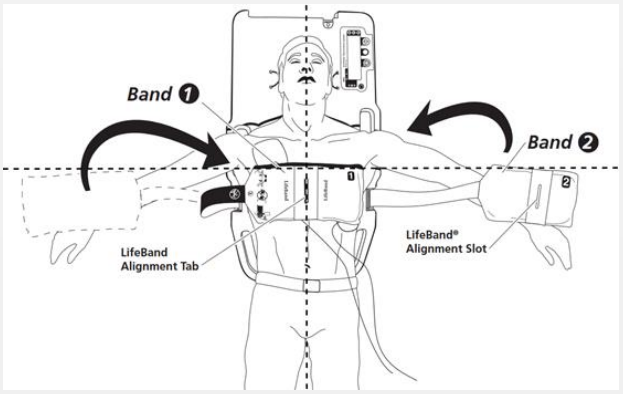
System Components:
- AutoPulse platform – Patient Surface
- LifeBand
- AutoPulse Battery and Battery Charger





Procedure:
- ❑ All therapies related to the management of cardiopulmonary arrest should be continued as currently defined.
- ❑ Initiate resuscitative measures following protocol – **DO NOT DELAY MANUAL CPR FOR THE DEVICE. CONTINUE MANUAL CPR UNTIL THE DEVICE CAN BE PLACED**
- ❑ Detailed instructions for AutoPulse device follow:
- ❑ 1. Power up the device using the ON/OFF button located on the top edge of the device
- ❑ 2. Make sure no user advisory, fault or system error messages display
- ❑ 3. Open the Velcro LifeBand Chest Compression Assembly (CCA)
- ❑ 4. At first practical 2 minute interval and coordinated with rotation of compressors, sit patient up by pulling the patient's arms forward (use C-collar and manual stabilization if concern for C-spine injury)
  - Make a single cut down the back of any clothing at this time, in order to facilitate removal and placement of device

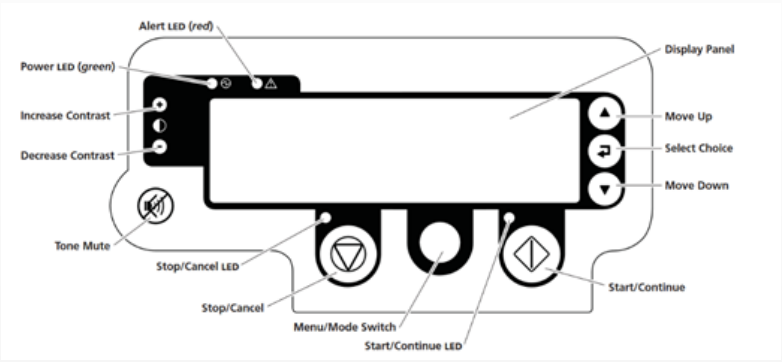


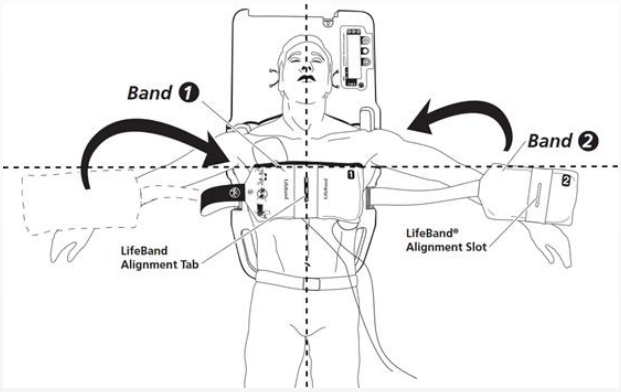


Mechanical CPR Device (AutoPulse) - Procedures

Procedure (continued):

- ❑ 5. Slide the AutoPulse device behind the patient and lower the patient down onto the device, centering the supine patient with the armpits just above the YELLOW line
- ❑ 6. Locate mating slot of band 2 and place on top of band 1 already on chest. Press the bands together to engage and secure the Velcro fastener. Make sure the bands are not twisted
  - **If bands cannot be closed, use manual chest compressions instead**
- ❑ 7. Press and release the START/CONTINUE button once. The AutoPulse automatically adjusts the band to the patient's chest and determined the appropriate compression
  - Do not touch the patient or the LifeBand CCA while the AutoPulse is analyzing the patient's size
- ❑ 8. Verify the patient is properly aligned and that the LifeBand CCA has taken up any slack in the bands
- ❑ 9, Press the START/CONTINUE button a second time to start compression cycles and the AutoPulse will begin chest compression cycles
- ❑ 10. Set the mode to either the pre-set compression-to-ventilations or continuous compressions option
- ❑ 11. Continue to monitor the placement of the patient on the AutoPulse after moving the patient or during transport to ensure proper alignment. Using Zoll approved restraints to secure the patient to the platform is recommended.





- ❑ ***NOTE: Do not stop the device for more than 10 seconds after at least 2 minutes of compressions per American Heart Association's (AHA) CPR guidelines. Intravenous cannulation, endotracheal intubation, or any other procedure should either be attempted during chest compressions or during the 10 second pause. Approved alternatives to those procedures, such as intraosseous infusion and a BLS airway (example: King Tube) should be considered. Cardiac defibrillation should be attempted during a 10 second pause.***

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Chest Decompression - Procedures

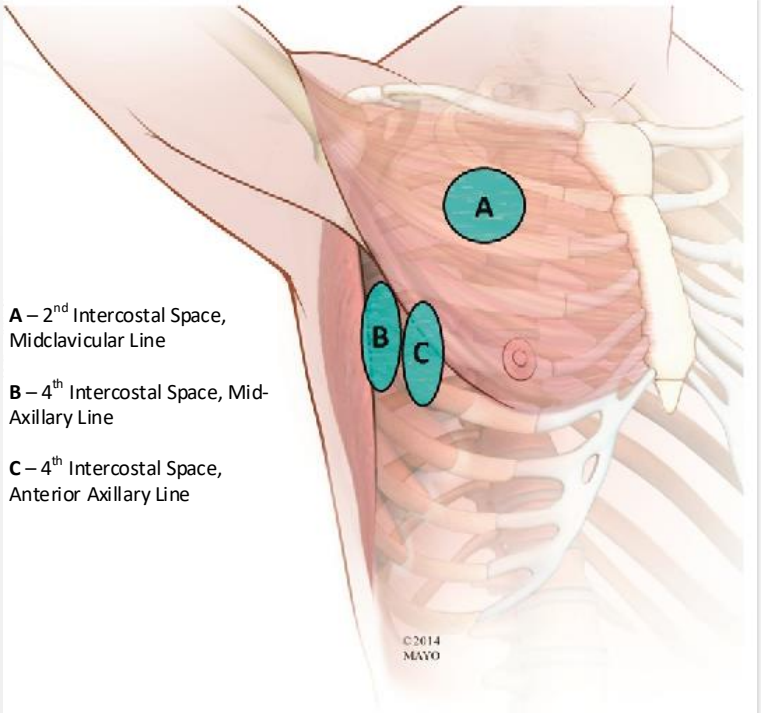
P | Paramedic

Prepare All Procedure Specific Materials:

- ❑ 14 gauge 2–2.5 inch over the needle catheter
- ❑ Tape
- ❑ Sterile Gauze Pads
- ❑ Antiseptic swabs
- ❑ Occlusive dressing

Procedure:

- ❑ 1. Locate landmarks for needle decompression
  - Site A - 2nd intercostal space in the mid-clavicular line on the same side as the pneumothorax
  - Site B – 4th intercostal space in the mid-axillary line on the same side as the pneumothorax (Adult ONLY)
    - ➢ **(This is a relatively NEW location for Prehospital Providers and requires familiarity with the anatomy, practice and appropriate credentialing with your Service)**
    - ➢ BE AWARE of and avoid underlying anatomical structures in the chest (lung, heart, vasculature) as well as abdominal organs that move significantly with respiration (spleen, liver, intestine, vasculature).
- ❑ 2. Prepare the site with an antiseptic swab
- ❑ 3. Firmly introduce catheter immediately above superior edge of rib at selected site
  - Remember: the neurovascular bundle (nerve, artery and vein) run under the inferior edge of the ribs)
- ❑ 4. Insert the needle perpendicular to the skin with downward pressure until there is a loss of resistance and a return of air.
- ❑ 5. Advance the needle another 1/8", to ensure the catheter is inside the thoracic cavity.
  - Hold the catheter in place with one hand while removing the needle and disposing of sharps in container.
- ❑ 6. Secure the catheter taking care not to allow it to kink
  - If time and situation allow, use an occlusive dressing to cover the catheter and tape on 3 sides to create a one-way valve.
- ❑ 7. Reassess lung sounds, pulses, tracheal deviation and patient clinical condition
- ❑ 8. Dress area with occlusive dressing then cover with sterile gauze pad
- ❑ 9. Reassess breath sounds and respiratory status
- ❑ 10. Document Procedure, patient response, VS and change in clinical condition in the electronic Patient Care Report

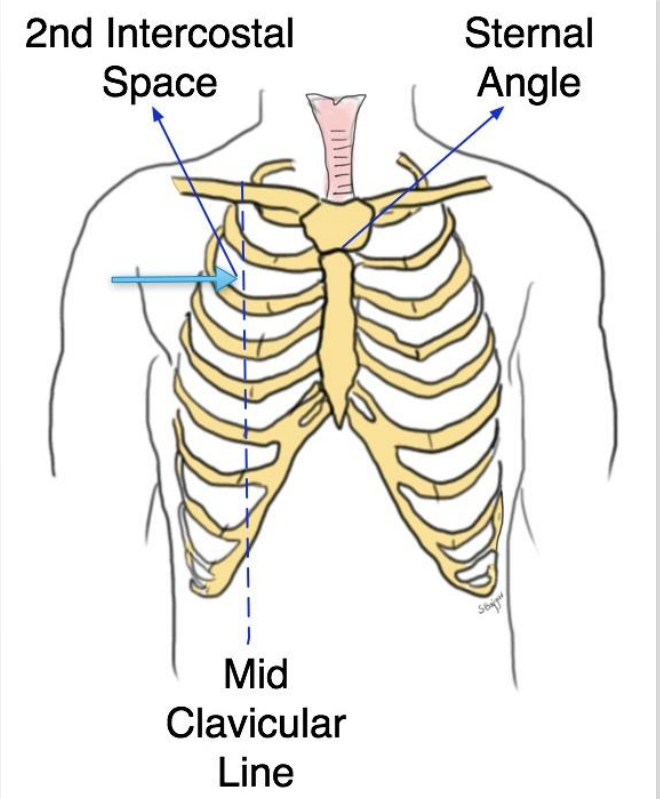


A – 2nd Intercostal Space, Midclavicular Line

B – 4th Intercostal Space, Mid-Axillary Line

C – 4th Intercostal Space, Anterior Axillary Line

https://rebelem.com/what-is-the-best-anatomic-location-for-needle-thoracostomy/



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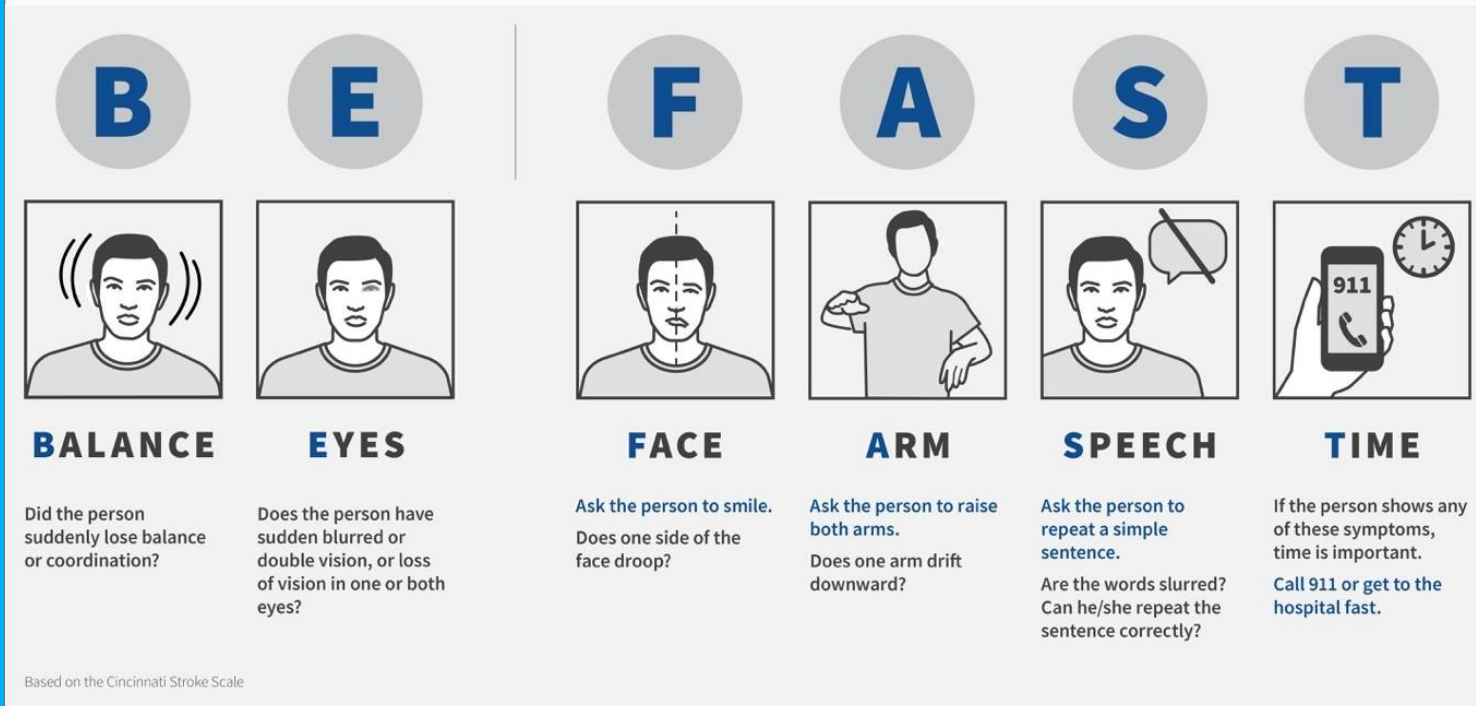
BE-FAST Stroke Scale - Procedures

Procedure:

- ❑ 1. Assess and treat suspected stroke patients as per protocol
- ❑ 2. The BE-FAST Stroke Screen should be completed for all suspected stroke patients
- ❑ 3. Establish the "time last normal" for the patient. This will be the presumed time of onset.
- ❑ 4. Perform the screen through physical exam:
  - Screen the patient for sudden loss of **B**alance or coordination
  - Ask the patient about sudden onset of blurred vision, double vision or loss of vision in one or both **E**yes
  - Look for **F**acial droop by asking the patient to smile
  - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes, and turn their palms upward. Assess for unilateral drift of an **A**rm.
  - Evaluate the patient's **S**peech by having the person say, "you can't teach an old dog new tricks", or some other simple, familiar saying. Assess for the person to slur the words, get some words wrong, or inability to speak.
  - Confirm the **T**ime of symptom onset; if possible, bring along witnesses or family to help corroborate information during assessment at the hospital
- ❑ 5. If one of these exam components is "yes", then the stroke screen is positive
- ❑ 6. Evaluate Blood Glucose level
- ❑ 7. If the "time last normal" is ≤24 hours, blood glucose is between 60 and 400, and at least one of the physical exam elements is positive, follow the Suspected Stroke Protocol,
  - Alert the receiving hospital by calling a "Stroke Alert" as early as possible.
- ❑ 8. All sections of the BE-FAST screen must be completed.
- ❑ 9. The complete screening should be documented in the electronic Patient Care Report (ePCR).



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FAST-ED Stroke Screen - Procedures

Procedure:

- ❑ 1. Assess and treat suspected stroke patients as per protocol **(p71)**
- ❑ 2. Establish the "time last normal" for the patient. This will be the presumed time of onset.
- ❑ 3. The FAST-ED Stroke Screen may be considered for all stroke patients with suspected Large Vessel Occlusion (LVO)
  - Patients who are likely to have a LVO may benefit from transport to a Comprehensive Stroke Center
- ❑ 4. Perform the screen through physical exam:
  - Look for facial palsy by asking the patient to smile
  - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes, and turn their palms upward. Assess for unilateral weakness or drift of an arm.
  - Have the person say, "you can't teach an old dog new tricks", or some other simple, familiar saying. Assess for the person to slur the words, get some words wrong, or inability to speak.
  - Ask the patient to look in all four cardinal directions (up, down, left, right). Assess for the ability of the pupil to cross midline
  - Assess the patient's ability to interpret stimulus from both sides of the body.
- ❑ 5. Add up the patient score from the table (below). A score of 4 or greater has a 60-85% prediction of a large vessel occlusion
- ❑ 6. Evaluate Blood Glucose level
- ❑ 7. If the "time last normal" is ≤12 hours, blood glucose is between 60 and 400, and the patient has a score of 4 or greater, consider the clinical presentation of the patient
  - Patients with unstable VS or emergent airway needs should go to the closest appropriate facility
  - Patients who are clinically stable and suspected LVO, consider transport directly to a Comprehensive Stroke Center.
  - Alert the receiving hospital with Stroke Alert and FAST-ED score as early as possible.
- ❑ 8. The complete screening should be documented in the electronic Patient Care Report (ePCR).

Field Assessment Stroke Triage for Emergency Destination (FAST-ED)	
Assessment Item	**Score**
Facial Palsy – Weakness on one side of the face with smile	
▪ Absent or minor paralysis	0
▪ Partial or Complete paralysis	1
Arm Weakness	
▪ No drift	0
▪ Drift or some effort against gravity	1
▪ No effort against gravity OR No movement	2
Speech Changes	
▪ Speech Content Normal AND Names 2-3 Items Correctly	0
▪ Speech Content is abnormal OR names only 0-1 Items Correctly	1
▪ Cannot Understand / Cannot Show Two Fingers When Asked	2
Time of Symptom Onset (not scored)	
Eye Deviation	
▪ No Deviation, Eyes Move To Both Sides Equally	0
▪ Gaze Preference – Clear Difficulty When Looking To One Side (Left OR Right)	1
▪ Forced Deviation – Eyes Deviated To One Side And Do NOT Pass Midline	2
Denial / Neglect	
▪ Absent	0
▪ Extinction to bilateral simultaneous stimulation in only one sensory modality	1
▪ Does not recognize own hand or only orients to one side of the body	2
LVO is likely if FAST-ED score is ≥ 4	

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Intranasal - Procedures

Procedure:

- ❑ 1. Determine appropriate dose of medication per Protocol
- ❑ 2. Draw medication into syringe and dispose of the sharps, do not administer more than 1ml per nostril.
- ❑ 3. Attach intranasal device to syringe
- ❑ 4. With one hand, control the patient's head
- ❑ 5. Gently introduce device into nare, stop when resistance is met.
- ❑ 6. Aim slightly upwards and toward the ear on the same side
- ❑ 7. ***Briskly*** compress the syringe to administer one half of the medication, repeat the procedure with the remaining medication on the other nare.
  - It is important for the medication to be atomized or it will not be absorbed.
- ❑ 8. Document the results in the electronic Patient Care Report (ePCR).

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Orogastric Tube Insertion - Procedures

Prepare All Procedure Specific Materials:

- ❑ Tube
- ❑ Lubricating Gel
- ❑ Securing device/Tape
- ❑ Suction
- ❑ Syringe for injecting Air

Procedure:

- ❑ 1. Measure the length of the tube from the tip of nose to earlobe to ziphoid process, mark maximum insertion depth.
- ❑ 2. Lubricate the tube with water based lubricant prior to insertion.
- ❑ 3. Insert lubricated tube through the gastric port of the BIAD or lift tongue/jaw anteriorly while passing tip lateral to endotracheal tube.
- ❑ 4. Continue to advance the tube gently until the appropriate distance is reached.
- ❑ 5. Confirm placement by injecting 20cc of air and auscultate for the whoosh or bubbling of the air over the stomach. If any doubt about placement, remove and repeat the insertion.
- ❑ 6. Secure the tube.
- ❑ 7. Decompress the stomach by connecting the tube to low continuous suction (50-150mmHg).
- ❑ 8. Document the procedure, time, and result (success) on/with the electronic Patient Care Report (ePCR).

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Restraints - Procedures

Any patient who may harm himself, herself or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique

Procedure:

- ❑ 1. The least restrictive means of managing the patient should always be employed first.
- ❑ 2. Ensure that there are sufficient personnel available to restrain the patient safely.
- ❑ 3. **Restrain the patient in a lateral or supine position. No devices such as backboards, splints or other devices will be on top of the patient.**
- ❑ 4. **The patient will never be restrained in the prone position.**
- ❑ 5. The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as continuous cardiac, pulse oximetry and capnography monitoring as indicated.
- ❑ 6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This MUST be documented in the electronic Patient Care Report (ePCR).
- ❑ 7. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider chemical restraint per protocol.
- ❑ 8. IF a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel cannot remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle
- ❑ 9. Consider Behavioral Emergencies Protocol.
- ❑ 10. **Restraining a patient in the prone position is never authorized.**

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Spinal Immobilization - Procedures

Clinical Indications:

- ❑ Need for spinal immobilization, as per appropriate Trauma Protocol
- ❑ Utilization of the Long Spine Board should occur in consideration with the risks and benefits to the individual patient and the current circumstances

Patients who should be immobilized with a Long Spine Board include:

- ❑ Blunt trauma with distracting injury
- ❑ Altered mental status
- ❑ Intoxication
- ❑ Neurologic complaint, including numbness and/or subjective weakness (even without finding on exam)
- ❑ Blunt trauma with spinal pain, tenderness to palpation of spine or paraspinal muscles, and spinal deformity
- ❑ Inability to communicate with the EMS Personnel

Prepare All Procedure Specific Materials:

- ❑ Backboard
- ❑ Straps
- ❑ C-collar appropriate for patient size
- ❑ Tape and/or Head Rolls

Procedure:

- ❑ 1. Explain the procedure to the patient.
- ❑ 2. Apply an appropriately sized c-collar while maintaining in-line stabilization of the c-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applies the collar. This may be performed by any credentialed responder if indicated by protocol.
- ❑ 3. Once the collar is secure, the second rescuer should continue to maintain inline neutral position to ensure stabilization.
  - The collar is helpful but will not do the job by itself.
- ❑ 4. If the patient is supine or prone, consider the log roll technique. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on the backboard by the safest method available that maximizes maintenance of in-line spinal stability
- ❑ 5. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
- ❑ 6. NOTE: some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and c-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital.
- ❑ 7. Document the time of the procedure in the electronic Patient Care Report (ePCR).

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Spinal Immobilization of Athletes with Helmets - Procedures

EMS Providers must use extreme caution when evaluating and treating an injured player, especially when the extent of the injury remains unknown Suspect any unconscious football player to have an accompanying spinal injury until proven otherwise. If the player isn't breathing or the possibility of respiratory arrest exists, its essential that certified athletic trainers and EMS providers work quickly and effectively to remove the face mask and administer care. In most situations, the helmet should not be removed in the field. Proper management of head and neck injuries includes leaving the helmet and shoulder pads in place whenever possible, removing only the face mask from the helmet and developing a plan to manage head-and-neck injured players using well-trained sports medicine and EMS providers.

Guidelines and Recommendations:

The following guidelines and recommendations were developed by the Inter-Association Task Force for the appropriate Care of the Spine-Injured Athlete:

❑ 1. General Guidelines for Care *Prior to Arrival of EMS*
- The Emergency Medical Services system should be activated
- Any athlete suspected of having a spinal injury should not be moved and should be managed as though a spinal injury exists.
- The athlete's airway, breathing and circulation, neurological status and level of consciousness should be assessed
- The athlete should NOT be moved unless absolutely essential to maintain airway, breathing and circulation
- If the athlete must be moved to maintain airway, breathing and circulation, the athlete should be placed in a supine position while maintaining spinal immobilization.
- When moving a suspected spine injured athlete, the head and trunk should be moved as a unit. One accepted technique is to manually splint the head to the trunk.

❑ 2. Face Mask Removal
- The face mask should be removed prior to transportation, regardless of current respiratory status (see figure 1)
- Those involved in the pre-hospital care of injured players must have the tools for face mask removal readily available.

Indications for Helmet Removal:

❑ 1. The athletic helmet and chin straps should *only* be removed *if*:
- The helmet and chin strap do not hold the head securely, such that immobilization of the helmet does not also immobilize the head
- The design of the helmet and chin strap is such that even after removal of the face mask the airway cannot be controlled, or ventilation be provided.
- The face mask cannot be removed after a reasonable period of time
- The helmet prevents immobilization from transporting in an appropriate position.

Helmet Removal:

❑ 1. If it becomes absolutely necessary, spinal immobilization must be maintained while removed the helmet
- Helmet removal should be frequently practiced under proper supervision by an EMS supervisor or Training Division staff
- Due to the varying types of helmets encountered, the helmet should be removed with close oversight by the team athletic trainers and/or sports medicine staff
- In most circumstances, it may be helpful to remove cheek padding and/or deflate air padding prior to helmet removal.

Spinal Alignment:

❑ 1. Appropriate spinal alignment *must* be maintained during care and transport using backboard, straps, tape, head blocks or other necessary equipment.
- Be aware that the helmet and shoulder pads elevate an athlete's trunk when in the supine position
- Should either be removed, or if only one is present, appropriate spinal alignment must be maintained.
- The front of the shoulder pads can be opened to allow access for CPR and defibrillation

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Splinting - Procedures

Clinical Indications:

- ❑ Immobilization of an extremity for transport due to suspected fracture, sprain or other traumatic injury
- ❑ Immobilization of an extremity for transport to secure medically necessary devices such as IV catheter

Procedure:

- ❑ 1. Assess and document pulses, sensation and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
  - If extended scene time, prolonged extrication and pulseless extremity, contact Medical Control for recommendations
- ❑ 2. Remove all clothing from the extremity.
- ❑ 3. Select a site to secure the splint both proximal and distal to the area of suspected injury or the area where the medical device will be placed.
- ❑ 4. Do not secure the splint directly over the injury.
- ❑ 5. Place the splint and secure with Velcro, straps, or bandage material (ie. Kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
- ❑ 6. Document pulses, sensation and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, reposition the splint and reassess. If no improvement, remove splint.
- ❑ 7. IF a femur fracture is suspected and there is no evidence of pelvic fracture or instability, place a traction splint.
- ❑ 8. Consider pain management per Pain Management Protocol.
- ❑ 9. Document the time, type of splint, and the pre and post assessment of pulse, sensation and motor function in the electronic Patient Care Report (ePCR).

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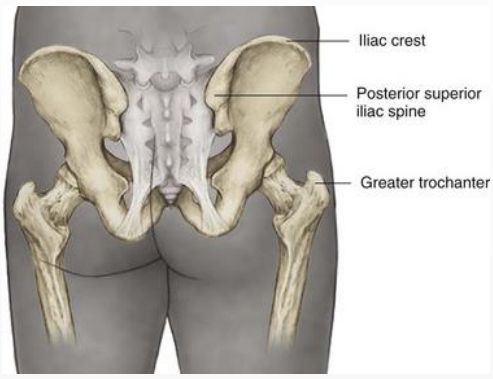
Pelvic Binder - Procedures

Clinical Indications:

- ❑ High Energy Mechanism such as Motor Vehicle Crash (MVC), pedestrians struck by vehicles, falls from significant height
  - Suspect fracture in mechanisms with pelvic, low back or groin pain **AND** SBP <90mmHg or Pediatric age specific hypotension
- ❑ Pelvic stabilization is an important intervention in the management of severe pelvic trauma, and has 4 primary objectives
  - Prevent re-injury from pathologic pelvic movement (most important), decrease pelvic volume, tamponade bleeding pelvic bones and vessels, decrease pain
  - Pelvic fractures have a high potential for significant intraperitoneal hemorrhage and blood

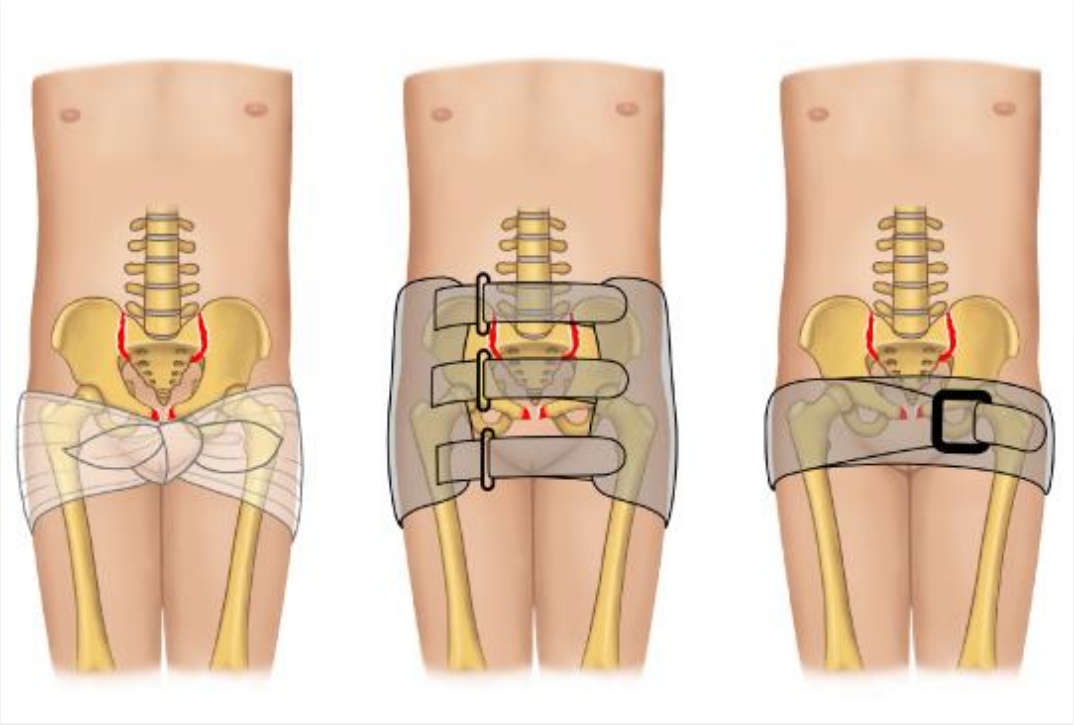
Procedure:

- ❑ Appropriately expose the patient and identify the greater trochanters bilaterally
- ❑ Assessment of the pelvis should be performed with extreme care
  - Inspect for ecchymosis, deformity, asymmetry, pelvic or lower extremity wounds
  - Palpate the skeletal structures – iliac crests, ischial tuberosity, lumbar spine and sacrum, greater trochanters
- ❑ Place a sheet or pelvic binder under the patient with the center at the level of the greater trochanters
- ❑ Tighten commercially available pelvic binder per manufacturer instruction
- ❑ With sheet binder, tighten by twisting and secure to maintain tension
- ❑ Assess for distal pulses before and after application
- ❑ Pelvic fractures have a high potential for significant intraperitoneal hemorrhage



Contraindications:

- ❑ Isolated femoral neck fracture
- ❑ Suspected traumatic hip dislocation
- ❑ Pelvic binding my exacerbate injury in iliac wing fractures and injuries with an over-riding pubic symphysis



***PEARL: The greater trochanters should be the area of pressure application, and are generally lower than you think!**

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Tourniquet (CAT – Combat Application Tourniquet) - Procedures

Principles:

- ❑ Apply Tourniquet as proximal as possible to wound, minimum of 2" above hemorrhage site. Do not cross joints or bony prominences with the Tourniquet
- ❑ Secure Tourniquet in place and expedite transport.
- ❑ Document time and location of tourniquet deployment in electronic Patient Care Report (ePCR) and on device.
- ❑ Notify receiving center of tourniquet use, location of device and time placed.
- ❑ IF hemorrhage not controlled, a second tourniquet can be deployed, proximal to the first without overlap.

Procedure:

1. Route the self adhering band around the extremity and pass the free-running end of the band through the inside slit of the friction adapter buckle

2. Pass the band through the outside slit of the buckle, utilizing the friction adaptor buckle, which will lock the band in place.

3. Pull the self-adhering band tight and securely fasten the band back on itself.

4. Twist the rod until bright red bleeding has stopped.

5. Lock the rod in place with the Windlass Clip™

6. Hemorrhage is now controlled. Secure the rod with the strap: Grasp the Windlass Strap™, pull it tight and adhere it to the opposite hook on the Windlass Clip™

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SOF Tactical Tourniquet - Wide - Procedures

Principles:

- ❑ Apply Tourniquet as proximal as possible to wound, minimum of 2" above hemorrhage site. Do not cross joints or bony prominences with the Tourniquet
- ❑ Secure Tourniquet in place and expedite transport.
- ❑ Document time and location of tourniquet deployment in electronic Patient Care Report (ePCR) and on device.
- ❑ Notify receiving center of tourniquet use, location of device and time placed.
- ❑ IF hemorrhage not controlled, a second tourniquet can be deployed, proximal to the first without overlap.

Procedure:

1. Release the quick disconnect buckle, then route the constricting band around the injured limb.

2. Reconnect the quick disconnect buckle

3. Remove slack by pulling on the loose end of the constricting band. Removing as much slack as possible will increased efficacy of windlass.

4. Turn windlass until bleeding stops completely. Wound may continue to seep but there should be no active blood flow.

5. Stow windlass in tri-ring once bleeding is controlled.

6. If possible, mark the time of tourniquet application so the next provider is aware.

Accessing Peripherally Inserted Central Catheter (PICC) - Procedures

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Clinical Indications:

- ❑ Inability to obtain adequate alternative peripheral access
- ❑ Access of an existing catheter for medication or fluid administration
- ❑ Central venous access in a patient in cardiac arrest
- ❑ Only appropriate for critical patients

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. Clean the port of the catheter with alcohol wipe
- ❑ 3. Using sterile technique, withdraw 5-10mL of blood and place syringe in sharps box.
- ❑ 4. Using 5mL normal saline, access the port with sterile technique and gently attempt to flush the saline.
  - IF there is NO resistance with flush, no evidence of infiltration (i.e. No subcutaneous, collection of fluid), and no pain experienced by the patient, then proceed to step 5
  - IF there IS resistance with flush, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, *do not use the catheter*.
- ❑ 5. Begin administration of medications or IV fluids slowly. Observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
- ❑ 6. Document procedure, any complications, and fluids/medications administered in the electronic Patient Care Report (ePCR).

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Extremity Venous Access - Procedures

Prepare All Procedure Specific Materials:

- ❑ Appropriate tubing or IV lock
- ❑ #14-#24 catheter over the needle, or butterfly needle
- ❑ Venous tourniquet
- ❑ Antiseptic swab
- ❑ Gauze pad or adhesive bandage
- ❑ Tape or commercially available securing device

Procedure:

- ❑ 1. Saline locks may be used as an alternative to IV tubing and fluid under the authorization of the Service Medical Director and at the discretion of the provider.
- ❑ 2. Intraosseous access can be used where threat to life exists as provided for in the Venous Access – Intraosseous Procedure.
- ❑ 3. Use the largest catheter bore necessary based upon the patient's condition and size of veins
- ❑ 4. Fluid and set up choice is preferably:
  - Normal Saline with macro drip (10 drops/mL) for medical/trauma conditions.
  - Normal Saline with a micro drip (60 drops/mL) for medication infusions or for patients at risk of fluid overload.
- ❑ 5. Assemble IV solution and tubing:
  - Open IV bag and check for clarity, expiration date, etc.
  - Verify correct solution
  - Open IV tubing and assemble according to manufacturer's guidelines
- ❑ 6. Insertion:
  - Explain to the patient that an IV is going to be started
  - Place the tourniquet around the patient's arm proximal to the IV site, if appropriate
  - Palpate veins for resilience
  - Clean the skin with the antiseptic swab in an increasing sized concentric circle and follow it with an alcohol swab
  - Stabilize the vein distally with the thumb/fingers
  - Enter the skin with the bevel of the needle facing upward
  - Enter the vein, obtain a flash, and advance the catheter into the vein while stabilizing the needle
  - Remove the needle while compressing the proximal tip of the catheter to minimize blood loss
  - Remove the tourniquet
  - Connect IV tubing to the catheter, or secure the IV lock to the catheter to minimize blood loss
  - Open the IV clamp to assure free flow (no infiltration, pain, etc) and set infusion rate
- ❑ 7. Secure the IV:
  - Secure the IV catheter and tubing
  - Recheck IV drip rate to make sure it is flowing at appropriate rate.
- ❑ 8. Trouble shoot the IV, (if the IV is not working well):
  - Make sure the tourniquet is off
  - Check the IV insertion site for swelling
  - Check the IV tubing clamp to make sure it is open
  - Check the drip chamber to make sure it is half full
  - Lower the IV bag below IV site and watch for blood to return into the tubing

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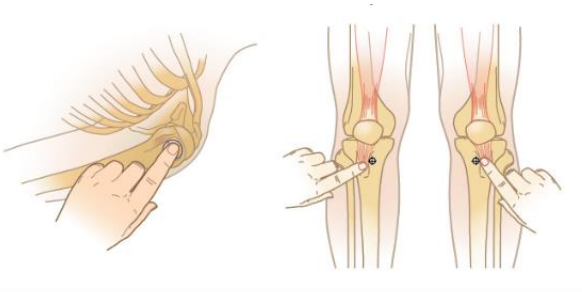
IO Intraosseous Venous Access - Procedures

Procedure:

❑ 1. Select the appropriate insertion site and palpate the appropriate bony landmarks to identify the site of insertion.

- **The PROXIMAL HUMERUS is contraindicated in patients ≤18 years old, UNLESS authorized by Medical Control.**

Anterior Tibia	Anteromedial aspect of the proximal tibia (bony prominence below the kneecap). The insertion location will be 1-2cm (2 finger widths) below this.
Proximal Humerus (Hand Over Umbilicus Technique)	Keeping the elbow flat on the floor and close to the side of the body, rotate the palm over the umbilicus (belly button) and palpate the greater tubercle of the humerus. The insertion location will be 1-2cm (2 finger widths) above the surgical neck.
Proximal Humerus ("Thumb-to-Bum" Technique)	With the arm fully extended and tight to the body, rotate the hand medially (inward) until the palm is facing out. Palpate the greater tubercle of the humerus approximately 1-2cm (2 finger widths) above the surgical neck.



❑ 2. Cleanse the site with chlorhexidine, iodine or alcohol prep pad.

❑ 3. Device insertion

- Manual devices (Cook or Jamshidi):
  - ❑ Hold the intraosseous needle at a 90° degree angle to the bony surface, aimed away from the nearby joint and epiphyseal plate.
  - ❑ Provide pressure to push the needle tip through the skin until resistance from the bone is felt.
  - ❑ Twist the needle handle with a rotating grinding motion applying controlled downward force until a "pop" or loss of resistance is felt.
  - ❑ *Do not advance more than 1cm after the loss of resistance is felt*.
- Powered Intraosseous Device (EZ-IO):
  - ❑ Hold the intraosseous needle at a 90° degree angle to the bony surface, aimed away from the nearby joint and epiphyseal plate.
  - ❑ Provide pressure to push the needle tip through the skin until resistance form the bone is felt.
  - ❑ Power the driver until a "pop" or loss of resistance is felt.
  - ❑ *Do not advance more than 1cm after the loss or resistance is felt*.
- Automatic Intraosseous Device (NIO):
  - ❑ Rotate the cap 90° in either direction to unlock
  - ❑ Place dominant hand over cap, and press device against patient. While pressing down on the device with palm, pull trigger wings upwards with fingers
  - ❑ Gently pull the NIO up in a rotating motion while holding the needle stabilizer against the insertion site
  - ❑ Continue holding the needle stabilizer in place and pull up the stylet to remove.

❑ 4. Remove the stylet and place in an approved sharps container

❑ 5. Attach a 10mL syringe filled with 5mL of Normal Saline; aspirate bone marrow to verify placement, then inject 5mL of Normal Saline to clear the lumen of the needle.

❑ 6. Attach the IV line with fluids on a pressure bag.

❑ 7. **Paramedics may infuse 10-20mg of Lidocaine into the IO in adult patients who are awake and aware of pain.**

- **½-1mL of 2% Lidocaine at 100mg/5mL concentration**
- **Allow the Lidocaine to sit in the marrow for approximately 30 seconds prior to fluid infusion through the line.**

❑ 8. Stabilize and secure the needle with dressings and tape

❑ 9. Document the procedure, time, and procedure success (or failure) on the PCR

Complications:

- Incorrect identification of landmarks
- A bent needle (more common with longer needles)
- Clogging of the needle with marrow, clot or bone spicules.
  -Can be avoided by flushing the needle or continuous infusion
- Through and through penetration of both anterior and posterior cortices caused by excess force after the needle has penetrated the cortex.
- Subcutaneous or subperiosteal infiltration, caused by incomplete placement or dislodgement of needle.
- Fractures caused by excess force or fragile bones.
- Compartment syndrome

Contraindications:

- Fracture proximal to proposed intraosseous site
- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site
- Previous intraosseous insertion or joint replacement at the selected site

External Jugular Venous Access - Procedures

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Clinical Indications:

- ❑ Medical patients who are awake and alert, and require IV access but are peripherally exhausted
- ❑ External jugular cannulation can be attempted initially in life threatening events when no obvious peripheral site is noted.

Prepare All Procedure Specific Materials:

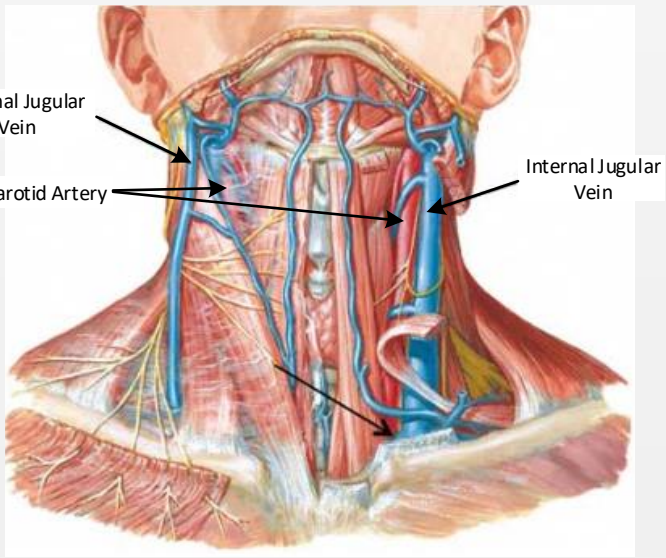
- ❑ Appropriate tubing or IV lock
- ❑ #14-#24 catheter over the needle or butterfly needle
- ❑ Antiseptic swab
- ❑ Gauze pad or adhesive bandage
- ❑ Tape or other securing device

Procedure:

- ❑ 1. Position yourself at the head of the patient.
- ❑ 2. Place the patient in a slight Trendelenburg (supine, head down) position if possible. This helps distend the vein and prevent air embolism.
- ❑ 3. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
- ❑ 4. Prep the site with antiseptic swab.
- ❑ 5. Align the catheter with the vein (insertion direction is away from the patient's head, toward the patient's same side shoulder).
- ❑ 6. Anchoring the vein lightly with one finger above the clavicle, puncture the vein at a superficial angle midway between the angle of the jaw and the clavicle and cannulate the vein.
- ❑ 7. Confirm placement with saline flush.
- ❑ 8. Attach the IV and secure the catheter (avoiding circumferential dressing or taping around the neck).
- ❑ 9. If unsuccessful, place occlusive dressing over site and do NOT go to other side of neck
- ❑ 10. Document the procedure appropriately.

<u>Contraindications:</u>

- ❑ Patient combative or uncooperative with positioning (i.e. unable to hold still while procedure is being performed)
- ❑ Anterior neck hematoma/burn/cellulitis
- ❑ Anatomic landmarks not visible
- ❑ Medical appliance in place covering anterior neck (i.e. c-collar)
- ❑ Monitor for complications
  - Expanding hematoma
  - Tracheal shift
  - Difficulty breathing



***PEARL: Superficial insertion angle is crucial as the carotid artery is in close proximity to the EJ.**

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Wound Care - Procedures

Clinical Indications:

Skin and soft tissue wounds with associated bleeding and pain.

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on compression bandage to control bleeding. Direct pressure is much more effective
- ❑ 3. Consider tourniquet use early for extremity bleeding not controlled with direct pressure.
- ❑ 4. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate
  - Consider Pain Management Protocol before beginning irrigation.
  - Irrigation and decontamination are key to stopping ongoing tissue injury, preventing infection and promoting wound healing.
  - Control bleeding and address life threats first.
  - Irrigate thermal burns, chemical burns or contaminated wounds with Normal Saline, Lactated Ringer's or sterile water.
  - For chemical splashes to the eye, emergent irrigation is critical to preventing further tissue damage. If possible, have patient remove contact lenses as early as possible. Go to Eye Pain Protocol, as appropriate.
- ❑ 5. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
- ❑ 6. Monitor wounds and/or dressing throughout transport for bleeding
- ❑ 7. Bolster existing bandages as necessary if saturation or
- ❑ 8. Consider second tourniquet use as indicated in protocol/procedure. Do not remove first tourniquet; apply the second higher on the limb.
- ❑ 9. If serious hemorrhage not controlled by other means:
  - Apply approved non-heat generating hemostatic agent per manufacturer's directions.
  - Supplement hemostatic agent impregnated gauze with direct pressure and standard hemorrhage control techniques
  - Apply additional hemostatic impregnated gauze and/or standard dressings as needed.
  - Hemostatic impregnated gauze is contraindicated in wounds involving the thoracic cavity or violating the peritoneum of the abdominal cavity.
- ❑ 10. Document the wound assessment and care in the electronic Patient Care Report (ePCR).

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Wound Packing - Procedures

Clinical Indications:

Skin and soft tissue wounds with MAJOR bleeding not controlled by direct pressure or tourniquet deployment as above .

Procedure:

- ❑ 1. Use personal protective equipment, including gloves, gown and mask as indicated.
- ❑ 2. Apply direct pressure to the wound
- ❑ 3. Insert finger(s) into the wound and apply firm pressure to visualized bleeding vessel to control bleeding.
- ❑ 4. Create a small ball at the beginning of the roll gauze (preferentially hemostatic impregnated)
- ❑ 5. Press the gauze deep into the wound, occluding the bleeding vessel against bone or firm tissue.
- ❑ 6. While maintaining pressure on the leading edge of the gauze, begin to feed more gauze into the wound, packing it tightly in place while continuing pressure on the bleeding vessel.
- ❑ 7. Continue packing the wound until you have filled the wound space -OR- until you have a minimum 2-3" of gauze remaining
  - Leave an adequate "tail" on packing to facilitate later removal at the hospital
- ❑ 8. Maintain manual direct pressure on the wound for 3-5 minutes.
- ❑ 9. Reassess and wrap the wound with a pressure dressing to maintain pressure for support.
- ❑ 10. If bleeding persists, apply more gauze but DO NOT remove the wound packing.
- ❑ 11. Continue monitoring the wound and assess for continued direct pressure as needed throughout transport.
- ❑ 12. Document the wound assessment and patient care in the electronic Patient Care Report (ePCR).

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Ventricular Assist Device - Procedures

Frequently Asked Questions:

What is a Ventricular Assist Device (VAD)?
A ventricular assist device (VAD) is a mechanical pump that is used to support heart funciton and blood flow in people who have weakened hearts. Some common reasons for VAD implantation are MI, Heart Failure, myocarditis, cardiomyopathy and heart surgery.

How does a VAD work?
The device takes blood from a lower chamber of the heart and helps pump it to the body and vital organs, just as a healthy heart would.

What are the parts of a VAD?
The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver blood to your body; and a power source.

What is the power source?
The power source is either batteries or AC power. The power source is connected to a control unit that monitors the VAD functions. The batteries are carried in a case usually located in a holster in a vest around the patient's shoulders.

What does the control unit (or controller) do?
The control unit gives warnings or alarms if the power is low or if it senses that the device isn't functioning properly.

MOST patients have a tag located on the controller around their waist that lists the type of device, the institution that put it in and a number to call.

Patient Management:

- ❑ 1. Assess the patients airway and intervene per the Airway Management Protocol
- ❑ 2. Auscultate heart sounds to determine if the device is functioning and what type of device it is. If it is a continuous flow device, you should hear a "whirling sound".
- ❑ 3. Assess the device for any alarms.
- ❑ 4. Look on the controller located around the patient's waist or in the VAD PAK and see what device it is.
- ❑ 5. Intervene appropriately based on the type of alarm and patient guide.
  - You may follow the standard Cardiac Arrhythmia Protocols as per ACLS guidelines, EXCEPT:
  - NO Chest Compressions
  - NO Thrombolytics
  - Defibrillation is the standard process
- ❑ 6. Start one large bore IV
- ❑ 7. Assess Vital Signs – use Mean BP with Doppler, if available. The first sound you will hear is the Mean Arterial Pressure (MAP)
- ❑ 8. If no Doppler available, use the Mean on the Non-Invasive BP cuff
- ❑ 9. Transport to the closest VAD Center. Call the number listed on the device for advice.
- ❑ 10. Bring all of the patient's equipment and paperwork to the Emergency Department.
- ❑ 11. Allow the trained caregiver to ride in the patient compartment when possible. They may be able to serve as an expert on the device if the patient is unconscious or unable to answer for themselves.

Quick Tips for Ventricular Assist Devices (VADs)

- ❑ Let the patient and/or caregiver take the lead; they will be your on-scene experts.
- ❑ Remember not to perform chest compressions because they could dislodge the pump, making the patient bleed to death. Use the assistance of the VAD coordinator before starting compressions in the case of obvious arrest and pump failure.
- ❑ Defibrillate / cardiovert as normal. Do NOT place the pads over the device that is under the patient's skin.
- ❑ Keep in mind it may be difficult to obtain an accurate SpO2 because of little or no pulse.
- ❑ **BE CAREFUL WHEN REMOVING / CUTTING CLOTHING so you don't inadvertently dislodge or cut the drive line.**
- ❑ Take the patient's emergency travel bag when leaving the scene. It should have an extra controller, batteries and the VAD Coordinator's emergency contact number.

http://mylvad.com/sites/mylvadrp/files/EMS%20Field%20Guides/MCSO%20EMS%20GUIDE%202015%20.pdf

http://www.jems.com/articles/print/volume-37/issue-2/patient-care/patients-ventricular-assist-device-need.html

Nitrous Oxide - Procedures

A	A-EMT
P	Paramedic

Clinical Indications:

- ❑ Adult patients with acute pain.
- ❑ Nitrous Oxide should ONLY be used by patients who have the capacity to understand and the ability to perform self-administration of inhaled medications.

Contraindications:

- ❑ Nitrous Oxide rapidly diffuses into air-filled spaces within the body and can significantly increase pressures exerted by gases. Therefore, it should NOT be used in cases where there are or are suspected to be abnormal collections of air within the body. Some common examples include but are not limited to:
  - Pneumothorax
  - Pulmonary Blebs (commonly seen in COPD)
  - Air Embolism
  - Small Bowel Obstruction
  - Pneumocephalus (air within the skull)
  - Eye Injury or Eye Surgery
  - Recent Middle Ear Surgery
- ❑ Nitrous is known to be teratogenic and is contraindicated before the end of 3rd trimester of pregnancy
- ❑ Altered mental status from head injury, alcohol or drugs
- ❑ Inability to follow commands and/or safely self-administer the medication

Preparation:

- ❑ Prepare all procedure specific materials:
- ❑ Set up Medical Director approved nitrous oxide system per manufacturer written procedure.
- ❑ Turn on exhaust fan in patient care area.
- ❑ Verify indications and contraindications prior to Nitrous Oxide administration

Procedure:

- ❑ 1. Instruct the patient to hold the face mask lightly on the face, covering the nose and mouth.
- ❑ 2. Instruct patient to breathe normally though the demand valve mask until pain at acceptable level or until patient no longer able to hold the mask to their face. Personnel must not hold mask to patient's face.
- ❑ 3. Turn off flow of nitrous oxide when patient completes self-administered dose.
- ❑ 4. Reassess patient's pain at 3-5 minutes with pain scale. If pain not controlled, consider other pain management options.
- ❑ 5. Document start and stop times for Nitrous Oxide use. Do not exceed time permitted by NIOSH occupational exposure standards.
  - In open, outside, well ventilated areas: no maximum time of administration
  - Ambulance with open windows and exhaust fans running: Max of 30 minutes per 8 hour period.
- ❑ 6. Document Nitrous Oxide canister pressure at the start of administration and at the end of administration.
- ❑ 7. Record vital signs during and after treatment (Nitrous Oxide may cause BP to drop in some cases).

Special notes:

- ❑ Nitrous oxide is in liquid state in its bottle. Ensure the bottle remains in the upright position when the bottle is open and especially during patient administration.
- ❑ Nitrous oxide can potentiate the effects of other CNS depressants such as narcotics, sedatives, hypnotics and alcohol.
- ❑ Patients on chronic opiates may be highly tolerant to the analgesic effects of nitrous.
- ❑ **Nitrous oxide is minimally metabolized in humans, and therefore retains its potency when exhaled into the room by the patient; a continuous-flow fresh-air ventilation system and/or N2O scavenger system must be used to prevent waste gas buildup in the passenger compartment.**

	EMT
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P	Paramedic

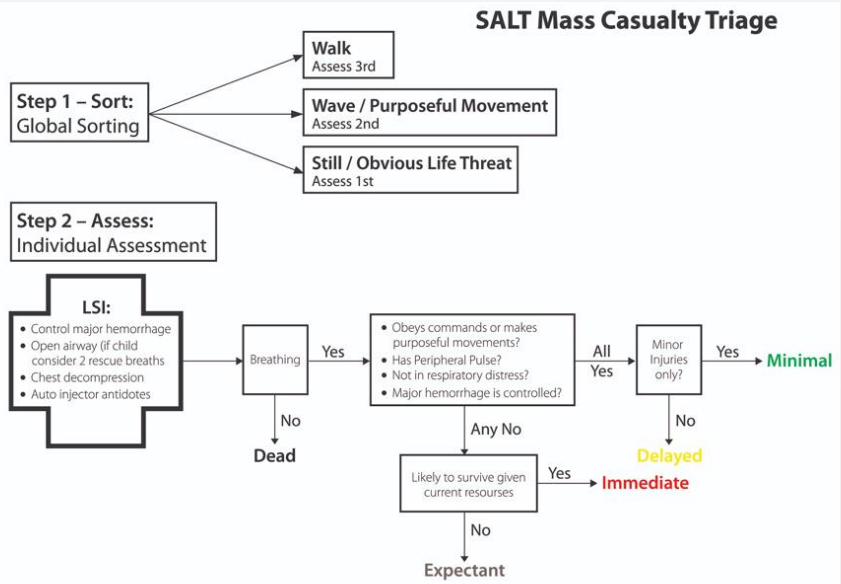
SALT Mass Casualty Triage - Procedures

Clinical Indications:

- ❑ It is important to use a Triage strategy any time there is a Mass Casualty Incident (MCI), or when limited resources need to be allocated to maximize the number of survivors
- ❑ SALT is an evidence-based, non-proprietary triage system developed in 2008. It is endorsed by the State of Wisconsin, is used by the majority of services in the Region and was adopted by Dane County EMS as the official Triage Strategy for all MCIs
- ❑ SALT stands for "**S**ort, **A**ssess, **L**ifesaving Interventions, **T**reatment and/or **T**ransport" and is based on the Model Uniform Core Criteria (MUCC) for Mass Casualty Incidents
- ❑ Only appropriate for critical patients

Procedure:

- ❑ *Step 1 – Global Sorting*
  - Patients who can walk should be asked t move to a designated area and should be assigned LAST priority for individual assessment
  - Those who remain should be asked to wave or be observed for purposeful movement those who do not move and those with obvious life-threatening conditions should be assessed FIRST because they are the most likely to need lifesaving interventions
- ❑ *Step 2 – Assess and Lifesaving Interventions*
  - Control major hemorrhage through the use of tourniquets or direct pressure provided by other patients or other devices
  - Open the airway through positioning or basic airway adjuncts (no advanced airway devices should be used); if the patient is a child, consider giving 2 rescue breaths
  - Chest decompression procedure (see pXx)
  - Autoinjector antidote administration
    - ➢ *Lifesaving interventions should be performed only within the responder's scope of practice and only if the equipment is immediately available
- ❑ *Step 3 – Treatment and/or Transport*
  - Priortize patients for treatment and/or transport based on 1 of 5 categories;
    - ➢ Minimal (GREEN) – Mild injuries that are self-limited if not treated, and can tolerate a delay in care without increasing mortality
    - ➢ Dead (BLACK) – Not breathing even after lifesaving interventions are attempted
    - ➢ Immediate (RED) – Do not obey commands, do not have a peripheral pulse, are in respiratory distress or have uncontrolled ajor hemorrhage
    - ➢ Expectant (GRAY) – Provider determines injuries are incompatible with life given the current available resources
    - ➢ Delayed (YELLOW) – All patients who do not fit into one of the categories above
  - The prioritization process is dynamic and may be altered by changing patient conditions, resources and scene safety
  - In general, treatment and/or transport should be provided for immediate patients first, then delayed, then minimal; EXPECTANT patients should be provided with treatment and/or transport when resources permit
  - Efficient use of transport assets may include mixing categories of patients and using alternate forms of transport



	EMT
A	A-EMT
P	Paramedic

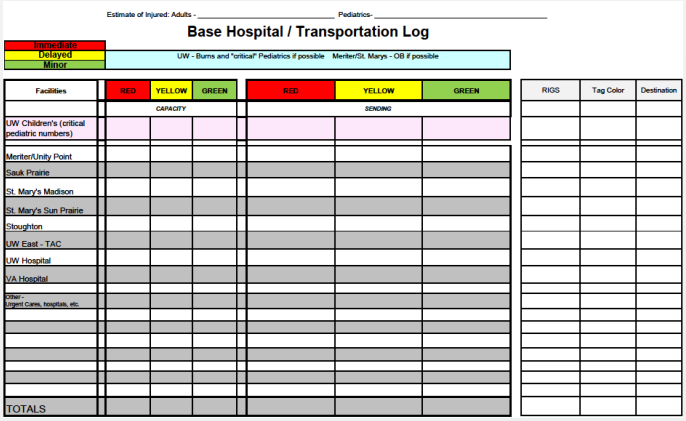
Base Hospital Activation - Procedures

Clinical Indications:

- ❑ It is important to activate the Base Hospital any time there is a Mass Casualty Incident (MCI), or when limited resources need to be allocated to maximize the number of survivors
  - For Base Hospital activation on incidents inside Dane County, an MCI is defined as any incident which is expected to result in ≥5 patients requiring EMS transport from the scene.
- ❑ Excellent communication between EMS and receiving hospitals will help coordination of care, optimize patient distribution to real time hospital capabilities and improve outcomes during a large scale event or MCI.

Procedure:

- ❑ *Step 1 – Establish Incident Command early*
  - The first in unit will generally take Command of the incident, ensure that Base Hospital has been activated and the EMResource (previously WITRAC) notification has been sent out by the Dane County 9-1-1 Center.
  - In accordance with ICS structure, EMS can keep Command, pass Command or assimilate into the Unified Command structure.
- ❑ *Step 2 – Establishment of EMS Branch*
  - The person in charge of EMS activities should assume the role of EMS Branch Director. This Director is tasked with assigning and supervising the roles of: Triage Group Supervisor, Treatment Group Supervisor, Transportation Group Supervisor
  - *Consider assigning a record keeper to the Transportation Group Supervisor, to complete the form for after-action reporting*
- ❑ *Step 3 – Establish Radio Contact with Base Hospital*
  - Transportation Group Supervisor should be on the "Base Hospital Talk Group" to speak with Base Hospital. All hospitals are expected to monitor this channel during a large event for information, but only Base Hospital has authority to speak
  - Address the Base as "Base Hospital"; the contact person will be providing objective data regarding resource availability, regardless of their primary hospital affiliation
  - Base Hospital will provide the real time capabilities of all hospitals that have answered the EMResource alert at that time
    - ➢ This will be listed as the number of each category of patients that the hospitals can manage at that moment
- ❑ *Step 4 – Triage and Treatment*
  - Patients should be triaged and managed in accordance with the SALT Triage Procedure (see pXx for details)
- ❑ *Step 5 – Transportation*
  - The Transportation Group Supervisor is responsible for assigning triaged patients to the most appropriate transportation mode based on acuity and resource availability
  - Transportation Group Supervisor should notify Base Hospital of destination, number and acuity of patients as they are assigned and leave the scene
  - Base Hospital will track the patient assignments, and will regularly update hospital capabilities as the event unfolds. Updates on capabilities will be regularly reported, and should be available upon request by the Transportation Group Supervisor
    - ➢ Like EMS, Hospital capabilities are NOT static; Walk-ins, security threats as well as increased staff presence can all impact the ability of our hospitals to receive and manage patients. Frequent and clear communication about the situation and the capabilities on both sides will be essential to successfully managing any event and optimizing patient outcomes.
  - Hospital communication by transporting ambulances are conducted on the same channel as routine. Reports expected to be BRIEF and CONCISE so as to keep radio traffic to a minimum; it is likely there will be many trying to access these channels
- ❑ *Step 6 – Event Resolution*
  - Once all patients have cleared the scene, a final notification to Base Hospital should be made, with final tally of the number and types of patients taken to each facility. This will be important for patient tracking, family reunification and after action reports



Estimate of Injured: Adults - _____ Pediatrics- _____

Base Hospital / Transportation Log

Immediate
Delayed
Minor

UW - Burns and *critical* Pediatrics if possible Meriter/St. Marys - OB if possible

Facilities	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RIGS	Tag Color	Destination
	CAPACITY			SENDING					
UW Children's (critical pediatric numbers)									
Meriter/Unity Point									
Sauk Prairie									
St. Mary's Madison									
St. Mary's Sun Prairie									
Stoughton									
UW East - TAC									
UW Hospital									
VA Hospital									
Other - Urgent Cares, hospitals, etc.									
TOTALS									

Estimate of Injured: Adults - _____ Pediatrics- _____

Base Hospital / Transportation Log

Immediate	
Delayed	UW - Burns and "critical" Pediatrics if possible Meriter/St. Marys - OB if possible
Minor	

Facilities	RED	YELLOW	GREEN	RED	YELLOW	GREEN	RIGS	Tag Color	Destination
	CAPACITY			*SENDING*					
UW Children's (critical pediatric numbers)									
Meriter/Unity Point									
Sauk Prairie									
St. Mary's Madison									
St. Mary's Sun Prairie									
Stoughton									
UW East - TAC									
UW Hospital									
VA Hospital									
Other - Urgent Cares, hospitals, etc.									
TOTALS									

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Care for Law Enforcement Working Canine - Procedures

CPR Algorithm

Unresponsive, apneic patient

CPR (1 cycle = 2 minutes)
Compressions: 100-120/min, lateral, 1/3-1/2 chest width
Ventilate: 10/min, V_T = 10ml/kg, I-Time = 1sec
Initiate Monitoring: ECG and $ETCO_2$

Evaluate Patient Check ECG

ROSC → Post-CPA Algorithm

Vfib
- Continue **CPR** while charging defibrillator
- Give **1 shock**
- **Resume CPR immediately** for 1 cycle

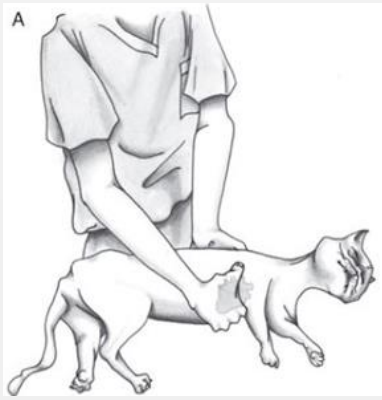
Asystole / PEA
- **Resume CPR immediately** for 1 cycle
- **Low dose epinephrine** or **vasopressin** q 3-5 mins
- Consider **atropine** if ↑ vagal tone

Evaluate Patient Check ECG

ROSC → Post-CPA Algorithm

Vfib
- Continue **CPR** while charging defibrillator
- Give **1 shock**
- **Resume CPR immediately** for 1 cycle
- Give **epinephrine or vasopressin** q 3-5 mins
- Consider **amiodarone** or **lidocaine** if refractory

Asystole / PEA
- **Resume CPR immediately** for 1 cycle
- **Low dose epinephrine** or **vasopressin** q 3-5 mins
- **Consider high dose epinephrine** after 10 mins
- **Consider atropine**



	EMT
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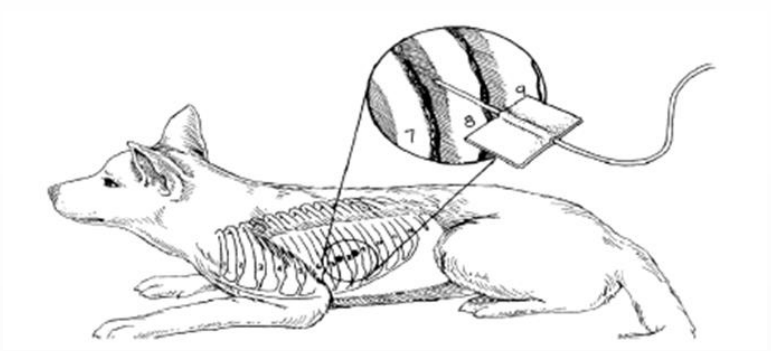
Care for Law Enforcement Working Canine - Procedures

Canine Baseline Normal VS

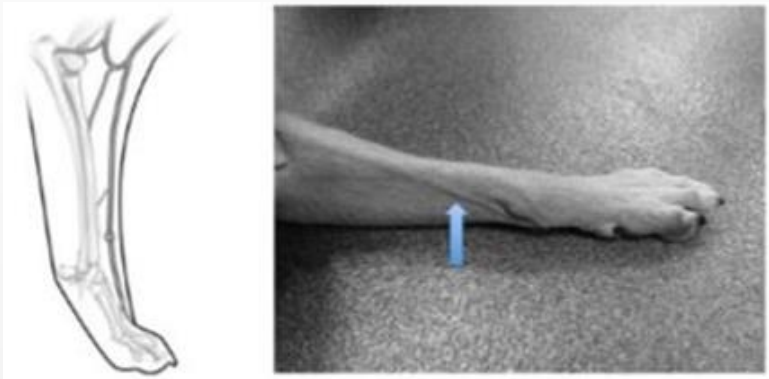
Rectal Temperature	99.5 – 102.5°F
Post-Exercise	103 - 106°F
Respiration Rate	10 – 40 Breaths/Min
Heart/Pulse Rate	60 – 80 Beats/Min
Post-Exercise	Up to 140 Beats/Min
MM Color	Pink
Capillary Refill Time	<2 seconds
Blood Pressure (S/D)	120/75 mmHg
Blood Glucose	75-120 mg/dL
Lactate	< 2mmol/L
SpO_2	>95%
E_TCO2	35 – 45 mmHg
Urine Output	>1mL/kg/h
HCT or PCV	37 – 55%
Serum Protein	6.0 – 7.5 g/dL

Needle Decompression

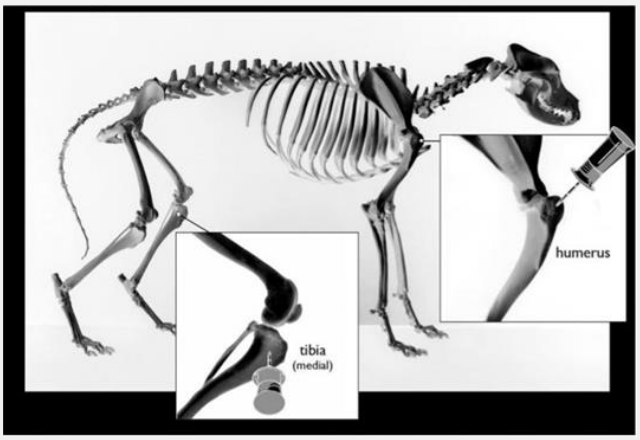


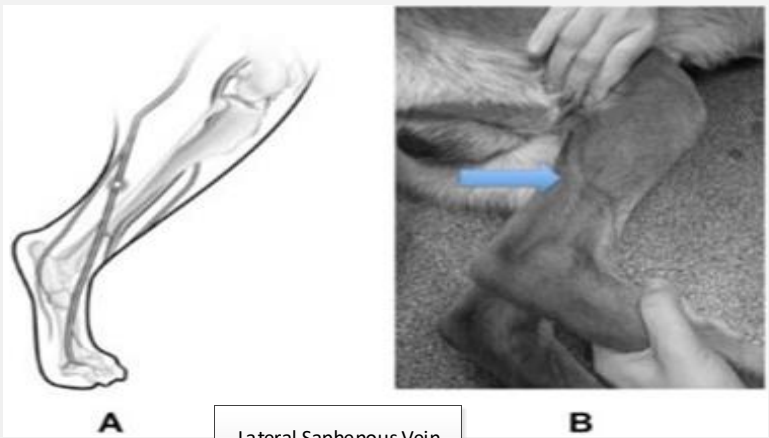
Preferred IV Access Sites and IVF

- ❑ IV
  - Primary – Cephalic Vein
  - Secondary – Lateral Saphenous (hind limb)
  - Tertiary – External Jugular (18g most commmon)
- ❑ IO
  - Medial Tibia (easy to locate and access)
  - Proximal Humerus (15g, 25-45mm)
- ❑ Fluids
  - Crystalloid Only – 20mL/kg bolus, 500mL max
  - Hypertonic Saline – 5mL/kg bolus, 125mL max
  - NO Human blood products, K9 specific only



Cephalic Vein





Lateral Saphenous Vein

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A	A-EMT
P	Paramedic

Care for Law Enforcement Working Canine - Procedures

EMERGENCY VETERINARY CARE LOCATIONS

If possible, please call the location ahead of time to inform them of the K9 being conveyed, ETA and any known information about injuries to help the clinic prepare to receive the patient.

- ❑ Middleton – (VES) Veterinary Emergency Services (Open 24/7)
  - 1612 High Point Rd., Suite 100
  - Middleton, WI 53562
  - **Phone: 608-831-1101**
  - Fax: 608-831-1181
- ❑ Madison (UW Campus Area) – UW Veterinary Care (Open 24/7)
  - 2015 Linden Drive
  - Madison, WI 53706
  - **Phone: 608-263-7600**
- ❑ East Madison – (VES) Veterinary Emergency Services (Open 24/7)
  - 4902 E. Broadway
  - Madison, WI 53716
  - **Phone: 608-222-2455**
  - Fax: 608-467-6014
- ❑ Madison (Beltline / Monona Area) – Madison Veterinary Specialists (Open 24/7)
  - 2704 Royal Avenue
  - Madison, WI 53713
  - **Phone: 608-274-7772**