Clive Fire Department
Emergency Medical Services
Clinical Procedures

BLS and ALS Providers

(ADULT & PEDIATRIC)

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Patients with any of the following chief complaints should be treated as a potential cardiac cause unless another cause is readily apparent or identified.

1. Chest pain or pressure in any patient > 20 years of age.
2. Syncopal episode in any patient > 20 years of age.
3. Unexplained respiratory distress.
4. Atypical chest pain (i.e. shoulder, arm or jaw pain) in absence of chest pain, especially in patients having past cardiac history, irregular pulse, diabetes and in the elderly.
5. In young adults consider history of cocaine and methamphetamine use.

The following is a list of possible patient presentations in which a 12 lead ECG should be considered:

1. All chest pain, including blunt trauma to the chest.
2. Cardiac dysrhythmia, patient presents with cardiac signs or symptoms including but not limited to:

    - Palpitations
    - Heart rate greater the 150/min
    - Heart rate less than 50/min
    - Epigastric pain, thoracic back pain without trauma
    - Diaphoresis not explained by environment or fever
    - Shortness of breath / dyspnea with clear lung sounds
    - Syncope without seizure or obvious blood loss
    - Patient with PVC′s unchanged by oxygen and /or greater than 6/min
    - CHF / Pulmonary edema.
    - Overdose

Contra-indications

1. Treatment of life threatening problems (i.e. A, B, C′s, dysrhythmias) should be initiated prior to obtaining a 12 lead ECG.
2. Obtaining a 12 lead ECG should not delay transport of critically ill patients.

Preparation

1. Always protect the modesty of the patient.
2. Lead placement area should be clear of items that may cause artifact (i.e.,clothing, jewelry).
3. Skin should be clean and dry.
4. Shave chest hair as needed.

12 Lead ECG Electrode Placement

The following describes the placement of all 10 electrodes and the order in which they should be placed:

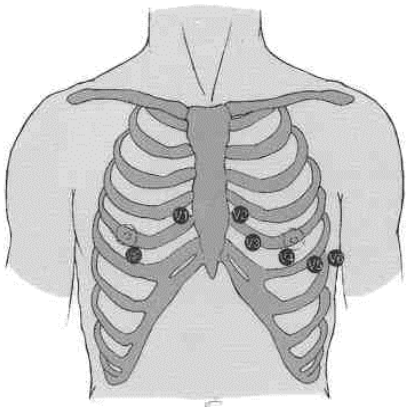
Limb Leads
RA- right arm, upper arm or upper chest near the shoulder.
LA- left arm, upper arm or upper chest near the shoulder.
RL- right leg or lower abdominal quadrant near the hip.
LL- upper leg or lower abdominal quadrant near the hip.

Chest Leads (See diagram below)
V1- 4th intercostal space, R sternal border.
V2- 4th intercostal space, L sternal border.
V4- 5th intercostal space in the midclavicular line (Note: V4 should be placed prior to V3).
V3- Placed between V2 and V4.
V5- 5th intercostal space in the anterior axillary line.
V6- 5th intercostal space in the mid axillary line.

The anterior axillary line can be found by making an imaginary line down from the fold formed where the arm meets the chest.

The mid axillary line divides the body into anterior and posterior halves. It can be identified by dropping an imaginary line from the mid armpit down.

The correct placement of the precordial leads is dependent on the accuracy of finding the fourth intercostal space. This can be found by identifying the sternal ridge (Angle of Lois). This is found on the upper third of the sternum and described as where the manubrium of the sternum meets the sternal body. The second rib joins the sternum at the level of the sternal ridge. Therefore, the space below the sternal ridge is the second intercostal space. Using moderate finger pressure and counting down from this space, the fourth intercostal space is easily found.



It is important to remember that the 12 lead ECG is only a diagnostic tool, care providers should remember to treat the patient, not the monitor. **It is possible to have a myocardial infarction in the presence of a normal ECG**. Maintain a high index of suspicion, especially with diabetics and the elderly.

The 12 lead ECG should not be used as a means of clearing a patient of having a heart attack. It is imperative patients are informed that the means of AMI diagnosis in the pre-hospital setting are limited and further evaluation is needed by a physician.

Indications

1. Apply the AED to people that are unresponsive, breathless, and pulseless.

Contraindications

None in the setting of cardiac arrest

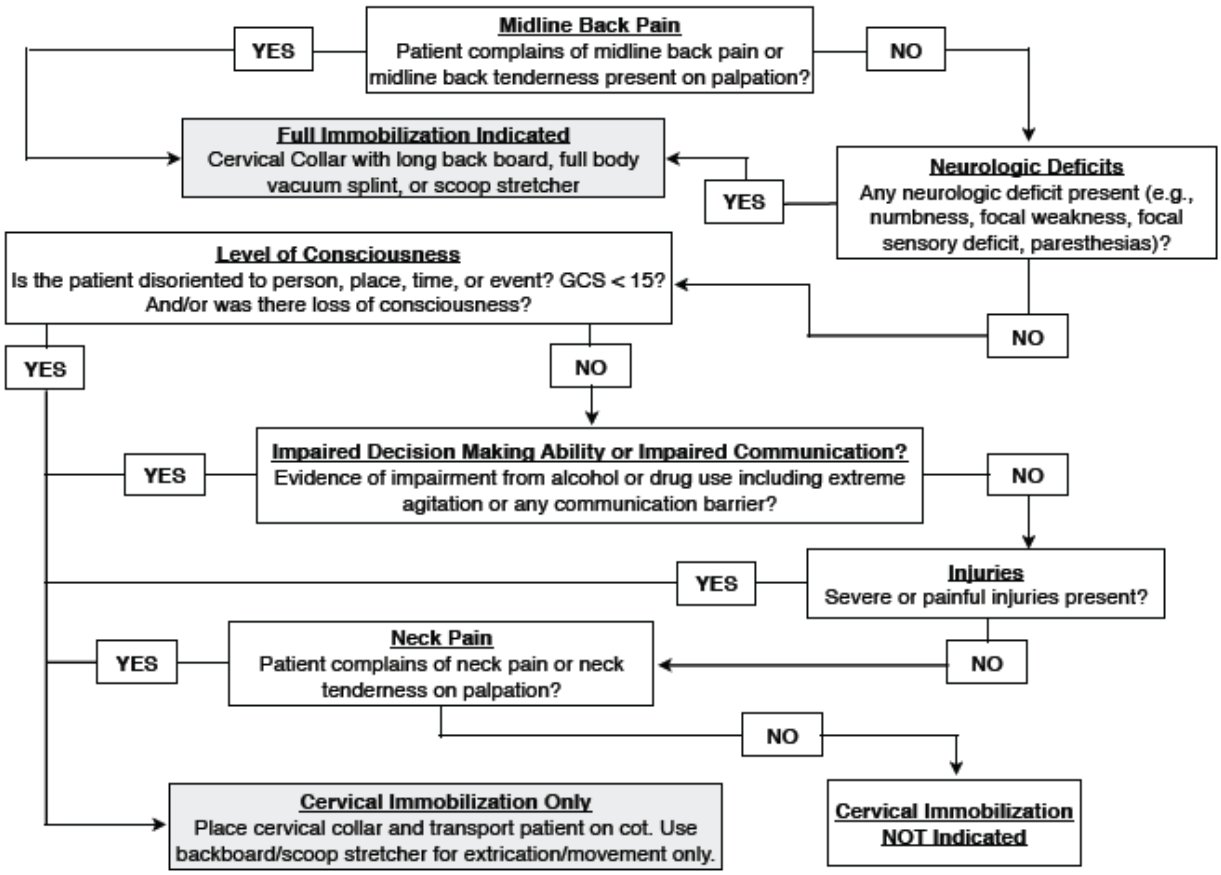
Preparation

1. Activate EMS as soon as possible.
2. Perform CPR until the AED arrives and is ready to be attached.
3. Remove hair with razor if necessary.
4. Remove any medication patches from the chest area.
5. Dry chest

Procedure

1. Apply defibrillator pads firmly to upper right anterior chest and lower left anterolateral chest. Use alternate placement when implanted devices are present (i.e., pacemakers, AICDs). Apply pediatric pads for patients less than 8 years of age / less than 25kg.
2. Confirm that defibrillator pads are connected to AED.
3. Activate AED.
4. Follow prompts given by AED.
5. If shock advised, ensure that all rescuers are clear of the patient. Resume CPR immediately after shock is delivered.
6. If no shock advised, check pulse. If pulse is absent, administer CPR for two minutes and reanalyze. Continue CPR if indicated.
7. If pulses return, check breathing. Support ventilations if inadequate, or place patient in recovery position if breathing adequately.
8. Leave AED attached to patient in case further defibrillation is needed.

- Patients presenting with a traumatic mechanism of injury
- Complete patient assessment will be completed to determine type of immobilization (if any)
- Patients should not be routinely transported on long spine boards unless condition warrants – examples may include:
  - Multiple fractures – immobilization device may facilitate pt transfer to ED bed
  - True time critical situations in which a delay to remove the immobilization device would delay transport or other treatment priorities



Notes:

Spine pain includes pain on palpation over spinous processes along cervical, thoracic and lumbar regions

An unreliable exam includes patients with altered mental status from any reason (metabolic, intoxication, trauma), patients with distracting injuries, or any patient who you determine cannot participate in their exam to the extent of providing good, reliable answers to questions regarding pain or neuro exam

Immobilization devices should be padded to prevent further injury

When in doubt, immobilize

Indications:

- Treatment of hypoxemia secondary to congestive heart failure (CHF) and acute cardiogenic pulmonary edema.
- Treatment for hypoxemia and shortness of breath in Chronic Obstructive Pulmonary Disease (Asthma, Chronic Bronchitis, Emphysema).
- A concern of impending respiratory failure is present
- Adults in respiratory distress that have bibasilar rales or wheezes plus two of the following
  - Increased work of breathing
  - Initial room air O2 saturation < 90%
  - Respiratory rate >28/in
  - ETCO2 >45

Contraindications:

- Respiratory Arrest
- Agonal Respirations
- Decreased level of consciousness/ inability to follow commands or directions.
- Cardiogenic Shock
- Pneumothorax
- Penetrating chest trauma
- Nausea/vomiting
- Facial Anomalies / Trauma
- If BP <100 systolic, contact medical control prior to administration
- Pneumonia

Procedure:

- Assess Vital Signs
- Attach heart monitor and pulse oximeter
- Verbally instruct patient.
  - Patient requires “verbal sedation” to be used effectively.
    - Example: Patient - “I can’t get air in!” Caregiver- “This will help you get air in.” “This will help you breathe easier”.
  - Instruct patient to breath in through their nose slowly and exhale through their mouth as long as possible (count out loud slowly to four and then instruct to inhale slowly)
- Treatment should be given continuously throughout transport to ED even if patient condition improves. Once CPAP is discontinued, patients can deteriorate rapidly.
- Vitals should be assessed / recorded every 5 minutes.
- If the patient condition deteriorates despite CPAP and/or medications, then terminate CPAP and manage airway as needed.
- Notify emergency department early during transport that CPAP is being utilized.
- Terminate CPAP if patient is not tolerating procedure.

Medications

Indications

1. Tachycardia associated with inadequate cardiac output and signs/symptoms of poor perfusion.
2. Stable ventricular tachycardia with pulses refractory to Amiodarone with presence of chest pain or hypotension.
3. SVT refractory to Adenosine with presence of chest pain or hypotension
4. Wide complex tachycardia of unknown origin that is refractory to Amiodarone and Adenosine with presence of chest pain or hypotension.

Precautions

1. All of the precautions for defibrillation apply.
2. A patient who is alert and oriented is probably perfusing adequately. Pharmacological intervention is the first modality of a stable patient.
3. If sinus rhythm is achieved only transiently with cardioversion, subsequent cardioversion at higher energy setting will be of no additional value. Leave the energy setting the same and consider alteration of other variables (i.e. oxygenation, electrolyte abnormalities)
4. Beware of patients with chronic atrial fibrillation. They will not cardiovert easily and are almost certainly decompensated for another reason; they should not be cardioverted unless unstable
5. Sinus tachycardia is a symptom of an underlying problem. The patient must be treated for the underlying cause. Initial treatment should be for shock if perfusion is poor. Cardioversion is not indicated.

Procedure

1) Remove all clothing covering the patient's chest. Dry chest if necessary. If the patient has excessive chest hair, clip or shave to ensure proper adhesion of electrodes.
2) Attach ECG electrodes and monitor in lead II.
3) Apply electrical therapy pads according to instructions. Ensure that pads are in good contact with the patient's skin and are not covering any part of any other cables.
4) Ensure the pads are securely attached to multi-function cables.
5) Consider sedation per the cardiac protocol.
6) Select desired energy level;
   a) Adults:
      i) Philips: 100, 150, 200 respectively
      ii) Zoll: 70, 120, 150, 200 respectively
   b) Pediatrics:
      i) 1J/kg, 2J/kg respectively (regardless of device brand)
7) Press the SYNC key. SYNC marker "|" will appear on the monitor above each detected R-wave to indicate where discharge will occur. Verify that markers are clearly visible on the monitor and their location is appropriate and consistent from beat to beat. If necessary, use LEAD button and SIZE button to establish settings that yield the best display. **The unit automatically goes out of sync mode after each shock.** You will need to press the SYNC button again to reactivate sync mode.
8) Press the CHARGE button. Changing the selected energy while the unit is charging or charged will cause the defibrillator to disarm itself. Press the CHARGE button again to charge the unit.
9) After charging to selected energy, the SHOCK button will light along with an audible tone and the screen will display the energy setting chosen. The defibrillator is now ready.
10) Warn all persons in attendance of the patient to "Stand clear" prior to discharge. Verify that no one is in contact with the patient, monitoring cables or leads, bed rails, or any other potential current pathways.
11) Deliver the shock by pressing and holding the SHOCK button. The discharge will occur on the next detected R-wave.
12) Monitor for change in rhythm and treat accordingly.

Side Effects and Special Notes

1. Erythema or irritation of skin will occur, particularly if good lubrication and skin contact are not achieved.
2. Cardioversion is rarely indicated in children.
3. Tachycardias are particularly devastating in patients with artificial valves which cannot move fast therefore causing circulatory backflow
4. Ventricular fibrillation and asystole are rare as complications of cardioversion and usually occur in the setting of a digitalis-toxic patient.

Indications

1. Patient with inadequate oxygenation and/or ventilation
2. Patient with altered level of consciousness with the inability to protect their airway,
3. Patient in respiratory or cardiopulmonary arrest.
4. Patient where complete obstruction of the airway appears imminent (i.e. respiratory burns)

Contraindications

1. Patient with preexisting condition that may cause laryngeal spasm (i.e. epiglottitis, croup)

Possible Complications

1. Accidental intubation of the esophagus.
2. Oropharyngeal trauma.
3. Fractured teeth or dentures.
4. Spasm of the vocal cords.

Procedure

1) Prepare and check equipment.
2) Pre-oxygenate patient with 100% oxygen.
3) Place the patient in the 'sniffing position' with the head extended, unless c-spine injury is suspected. If so, maintain in-line neutral position during intubation.
4) Insert laryngoscope into mouth and visualize cords.
5) Insert ETT maintaining visualization as the tube passes through the laryngeal opening.
6) Inflate cuff with 5-10cc of air.
7) Confirm ETT placement using a minimum of two techniques and waveform capnography.
8) Secure tube with appropriated device.
9) Consider use of cervical collar to help maintain tube placement
   a) If used, ensure documentation is included in the hospital copy of the written patient care report

Precautions:

The EZ-IO is not intended for prophylactic use

Equipment:

EZ-IO Driver
EZ-IO Adult or Pediatric Needle Set
Alcohol
EZ-Connect or Standard Extension Set
10ml syringe
0.9% Sodium Chloride (Normal Saline)
Pressure Bag or Infusion Pump
Lidocaine 2% (preservative free)
EZ-IO yellow wristband

Indications:

EZ-IO Adult: 40 kg and greater
EZ-IO Large Adult: 40 kg and greater who have too much tissue for regular adult needle
EZ-IO Pediatric: 3 to 39 kg

1. Immediate vascular access in emergencies.
2. Intravenous fluid or medications are urgently needed and a peripheral IV cannot be established in two attempts or 120 seconds and the patient exhibits one or more of the following:
    a. An altered mental status (GCS less than or equal to eight)
    b. Respiratory compromise (SaO2 90% after appropriate oxygen therapy, respiratory rate < 10 or >40 per minute)
    c. Hemodynamic instability (Systolic Blood Pressure of <90).
3. EZ-IO Adult and Pediatric may be considered PRIOR to peripheral IV attempts in the following situations:
    a. Cardiac arrest (medical or traumatic)
    b. Profound Hypovolemia with alteration of mental status
    c. Patient in extremis with immediate need for delivery of medications and/or fluids.

Contraindications:

1. Fracture of the bone selected for IO infusion (consider alternate site)
2. Excessive tissue at insertion site with the absence of anatomical landmarks (consider alternate site)
3. Previous significant orthopedic procedures (IO within 24 hours, prosthesis-consider alternate tibia)
4. Infection at the site selected for insertion (consider alternate site)

Considerations:

Flow rate: Due to anatomy of the intraosseous space, flow rates may appear to be slower than those achieved with an IV catheter.

- Ensure the administration of an appropriate rapid Syringe Bolus or flush prior to infusion. NO Flush = No Flow.
  - Adult flush: 10ml of normal saline
  - Pediatric flush: 5ml of normal saline
  - Repeat flush as needed
- To improve continuous infusion flow rates always use a syringe, pressure bag or infusion pump

Pain: Insertion of the EZ-IO in conscious patients has been noted to cause mild to moderate discomfort. Infusion of the EZ-IO for conscious patients has been noted to cause severe discomfort.

- Prior to IO flush or continuous infusion in alert patients, slowly administer Lidocaine 2% through the EZ-IO hub. Verify that the patient has no allergies or sensitivity to Lidocaine.
  - Adult: slowly administer 20 to 40 mg Lidocaine 2%
  - Pediatric: slowly administer 0.5 mg / kg Lidocaine 2%

Procedure: If the patient is conscious, advise of Emergent Need for this procedure and obtain informed consent.

1) Wear approved Body Substance Isolation Equipment (BSI)
2) Determine EZ-IO Adult and / or Pediatric Indications
3) Rule out Contraindications
4) Locate appropriate insertion site (Multiple sites are FDA cleared including – Proximal / Distal Tibia and Proximal Humerus)
5) Prepare insertion site using aseptic technique.
6) Prepare the EZ-IO driver and appropriate needle set.
7) Stabilize site and insert appropriate needle set
8) Remove EZ-IO driver from needle set while stabilizing catheter hub
9) Remove stylet from catheter, place stylet in shuttle or approved sharps container
10) Connect primed EZ-Connect
11) Aspirate to obtain bone marrow / blood return, confirming place.
12) Slowly administer appropriate dose of Lidocaine 2% (preservative free) IO to conscious patients
13) Syringe bolus / flush the EZ-IO catheter with the appropriate amount of normal saline
14) Utilize pressure (syringe bolus, pressure bag or infusion pump) for continuous infusions where applicable
15) Begin infusion
16) Dress site, secure tubing and apply wristband as directed
17) Monitor EZ-IO site and patient condition- remove catheter within 24 hours.

Procedure:

1) Prepare equipment for medication administration
2) Remove atomization device from syringe
3) Fill syringe with desired volume of medication
4) Remove excess air from syringe
5) Replace atomization device on syringe
6) Wedge atomization device firmly into nostril
7) Firmly deploy up to 1ml of the desired volume into nostril
8) If desired dose is greater than 1ml, instill remaining dose in other nostril (max 1 ml/nare)

Medications:

- Fentanyl
- Midazolam (Versed)
- Lorazepam (Ativan)
- Naloxone (Narcan)

1) Takes / Verbalizes BSI precautions.
2) Appropriate basic airway management procedures initiated in a timely manner.
3) Provides BVM ventilation with high flow oxygen per current AHA guidelines as needed
4) Assesses patient for KingLTS-D insertion indications / contraindications.
5) Pre-oxygenates the patient utilizing BVM and 100% oxygen.
6) Selects proper size KingLTS-D and notes appropriate cuff inflation volume.
    a. Yellow: Size 3= 4 to 5 feet
    b. Red: Size 4= 5 to 6 feet
    c. Purple: Size 5= > 6 feet
7) Checks cuffs for proper inflation and lubricates tip with water soluble lubricant PRN.
8) Positions head in slight hyperextension, if no trauma present; neutral position if trauma.
9) Performs tongue jaw lift.
10) Using a lateral (side) approach introduces tip into corner of mouth, tube rotated outward
11) Advances tip behind base of tongue while rotating tube to the midline position
12) Without exerting excessive force, advance tube until base of colored connector is aligned with teeth or gums.
13) Inflates cuffs with minimum volume of air to make a seal, while not exceeding max volume.
    a. Yellow Size 3 = 45-60ml
    b. Red Size 4 = 60-80ml
    c. Purple Size 5 = 70-90 ml
14) Attempt to ventilate. If chest rise inadequate/ventilation difficult, gently withdraw tube until ventilation is easy and produce good chest rise.
15) Confirm proper tube placement. Notes depth in cm. at teeth.
16) Add 10-20 ml to cuff volume as needed to optimize seal (no air leakage at the mouth)
17) Secure tube with commercially manufactured tube holder.
18) Colorimetric monitoring device if waveform capnography is not available
19) End tidal Capnography monitoring
20) Note: Depth of tube insertion is KEY to adequate ventilation.

Background

Mechanical CPR has benefits over manual CPR in the out of hospital setting. The use of mechanical CPR minimizes interruptions in compressions, maintains the proper rate and depth of compressions and prevents interruptions while moving the patient. The use of mechanical CPR also promotes safety during transport for those patients that require CPR en route to the hospital, as providers do not have to attempt compressions while standing in a moving ambulance.

The Lucas device should be used any time manual compressions are indicated unless the device does not fit the patient. All steps for the use of the Lucas device on a patient should be planned and orchestrated to minimize interruptions in compressions. The only contraindications to the use of the Lucas device are age less than 8 years old or body size too large or small to accommodate the device.

Indications

1. Cardiac arrest requiring manual chest compressions

Contra-indications

1. Age less than 8 years old
2. Device does not fit body size

Procedure

1. Initiate resuscitation following established protocols using manual compressions
    a. if Lucas device is not immediately available, use CPR feedback device on cardiac monitor to measure compression rate and depth. (note – this will be removed once mechanical compressions begin. It cannot be used with the Lucas in place)
    b. If approved manual plunger type device, such as ResQPump is being used, then it is up to the discretion of the senior paramedic on the ambulance to continue with manual compressions or placement of the Lucas. In all situations, the Lucas will be placed prior to movement of the patient if resuscitation will be continued through transport.
2. Activate Lucas device as soon as bag is opened
3. Place Lucas backboard in position
4. Secure arms of Lucas device to backboard
5. Use two fingers on each hand to place piston/suction cup on chest
6. Press start button for compressions
    a. use 30:2 ratio if no advanced airway is in place (ET tube or supraglottic device)
    b. use continuous compressions if advanced airway is in place
7. Defibrillation should be performed without stopping compressions.
8. Rhythm and pulse checks should be done 30 seconds after defibrillation by pausing the Lucas for the minimal time necessary for assessment.

Complications

1. The Lucas may alarm and suddenly stop functioning if the piston /suction cup is interrupted. Resetting the alarm is most easily accomplished by removing and reinserting the battery. The device will retain settings – ensure the piston/suction cup is correctly positioned and re-start compressions at the appropriate interval.

2. Anecdotal reports show patients waking up during compressions because of the increased blood flow during mechanical CPR. Use good judgment – sedation should be last resort, and only considered if patient has ROSC with good cardiac output and needs to remain sedated for clinical or safety reasons.
3. In the case of battery failure, replace battery with spare. If desired, Lucas can run on 110V by plugging in charger with battery in place. Ensure ambulance inverter is turned on.
4. If hospital wants to continue to use Lucas device for prolonged resuscitation, you may leave device with hospital. They may provide a replacement device, or they may replace the Lucas with their own device. We can also return to service without the Lucas device – notify the OIC and /or Duty Officer.

Indications

1. Patients who are still breathing yet who are unable to adequately manage their own airway or need their airway protected.
2. A qualified EMS provider* may use this skill when unable to orotracheally intubate the patient, and the patient is a poor candidate for medication assisted orotracheal intubation.

Contraindications

1. Patients with facial fractures.
2. Patients who have a significantly deviated nasal septum.
3. Patients with nasal obstruction.

Possible Complications

1. Accidental intubation of the esophagus.
2. Oropharyngeal and laryngopharyngeal trauma.
3. Spasm of the vocal cords.

Procedure

1. Pre-oxygenate patient with 100% oxygen.
2. Assemble and check your equipment. Lubricate the distal end of a proper sized tube.
3. Place the patient's head and neck into a relaxed position. If spinal injury is suspected, maintain the head and neck in neutral, in-line position.
4. Inspect the nose, and select the larger nostril as your passageway.
5. Insert tube into the nostril, with the flanged end of the tube along the floor of the nostril or facing the nasal septum. Gently guide the tube in an anterior to posterior direction.
6. As the tube is felt to drop into the posterior pharynx, listen closely at tubes end for patient's respiratory sounds. Apply BAM to assist with hearing sounds.
7. With the patient's next inhaled breath, advance the tube rapidly into the glottic opening, and continue passing it until the distal cuff is just past the vocal cords. At this point, the patient may cough, buck or strain. When correctly placed in the trachea, the patient's exhaled air will be felt coming from the proximal end of tube. At the same time, breath condensation should intermittently fog the clear plastic tube.
8. Hold the tube in place with one hand to prevent displacement.
9. Inflate the distal cuff with 5-10cc of air.
10. Recheck for proper placement by observing breath sounds, chest rise, and absence of epigastric sounds.
11. Confirm ETT placement with waveform capnography.
12. Assist ventilations with BV device and supplemental oxygen.
13. Secure the endotracheal tube.

* A qualified EMS provider is a paramedic specialist who has been trained in the procedure

Indications: Tension Pneumothorax as evidenced by one or more of the following:

- Absent or greatly decreased breathe sounds over the hemithorax area.
- Trachea shifted to unaffected side and/or JVD.
- Subcutaneous emphysema.
- Multiple rib fractures.
- Obvious air hunger in the context of a closed chest injury
- Difficult ventilation in an intubated patient with other evidence of tension pneumothorax

Procedure/treatment:

1) Expose and cleanse anterior chest at level of the 2nd intercostal space on the affected side.
2) Find 2nd intercostal space midclavicular line with gloved finger.
3) Using a 2 ½ inch 14 gauge or larger catheter over-the-needle catheter and syringe attached direct needle over the superior aspect of third rib into the 2nd intercostal space.
4) Apply enough pressure to push the needle through the intercostal muscle and into the pleural cavity.
5) You should pull back air in the syringe or if no syringe on the needle you should hear or feel a rush of air, either of these should be considered a positive placement.
6) Remove the needle leaving the catheter in place and securing with tape.
7) Assess patient for improvement in status.

Indications: Inability to gain airway access by other, less invasive means, or there is an upper airway obstruction that cannot be alleviated

Contraindications:

- Ability to ventilate using less invasive means

Complications:

- Injury to surrounding tissue.
- Hemorrhage.
- Infection.
- Edema.
- Aspiration of blood.
- Subcutaneous and mediastinal emphysema.

Procedure/Treatment:

1) Stabilize the patient's head in the neutral position.
2) Identify the cricothyroid membrane and prepare the skin.
3) Stabilize the cricoid and thyroid cartilages with the nondominant hand.
4) Once the cricothyroid membrane has been identified, insert the Quicktrach II device at the midpoint of the cricothyroid membrane with the needle angled at 90 degrees.
5) Once inserted through the skin and cricothyroid membrane, angle the device at 45 degrees caudally and continue to insert until the red stopper contacts the skin.
6) Aspirate air to confirm placement of the device in the trachea.
7) Remove the red stopper, and carefully advance the catheter off the needle until you hear/feel the click of the safety mechanism, telling you the tip of the needle is now covered
8) Withdraw the stylette carefully while advancing the plastic catheter caudally into the trachea.
9) Inflate cuff with air to create an airtight seal (approx 5 – 10 ml)
10) Attach corrugated tubing to device and to bag-valve device with waveform capnography
11) Ventilate with a BVM at a rate to support ventilation and oxygenation based on clinical assessment.
12) Confirm placement using two clinical techniques and waveform capnography.

Indications

1. Hemodynamically unstable bradycardias (heart rate <60, blood pressure <90, or other evidence of insufficient cardiac output such as altered mental status, chest pain, dyspnea)
2. Prolonged QT syndrome in conjunction with bradycardia, as evidenced by episodes of ventricular tachycardia or torsades

Contraindications
None when used in the emergency setting.

Procedure

1. Apply external pacing electrodes in the proper position and connect to cardiac monitor via electrical therapy cables. The limb lead monitoring patches must be on and the lead selector must be in Lead I, II or III. The pacer will function at a fixed rate if using monitor in "pads" mode.
2. Apply external pacing pads according to the instructions on the product. Ensure that all electrodes are making good contact with the patient's skin and are not covering any part of the other electrodes.
3. If pacing a conscious patient, pain/discomfort from the pacing current may be excessive. Consider sedation and /or pain relief as needed.
4. Turn selector switch to PACER.
5. Set PACER RATE to a value 10-20 bpm higher than patient's intrinsic rate. If profound bradycardia, start at 70 bpm.
6. Increase PACER OUTPUT mA until stimulation is effective (capture)
7. Determine capture. Electrical capture is determined by the presence of a widened QRS complex, the loss of any underlying intrinsic rhythm, and the appearance of an extended, and sometimes enlarged T-wave. Mechanical capture is assessed by palpation of peripheral pulse. In order to avoid mistaking muscular response to pacing stimuli for arterial pulsations the FEMORAL and RIGHT BRACHIAL or RADIAL arteries are the ONLY recommended locations for palpating pulse during pacing.
8. Determine optimum threshold. The ideal output current is lowest value that will maintain capture. This is usually about 10% above threshold. Location of pacing pads will affect the current required to obtain capture.
9. Constant monitoring for loss of capture should be performed.

Medications

Fentanyl
Adult:
25 – 100 mcg IV

Pediatric
1 mcg/kg IV

Midazolam
Adult:
2 – 5 mg IV

Pediatric:
0.1 mg/kg IV

Asynchronous Pacing

If ECG electrodes are not available or there is some circumstance that prevents or interferes with the surface ECG, it may be necessary to operate the pacemaker asynchronously. Asynchronous pacing should only be performed in emergency situations when there are no other alternatives.

To pace asynchronously, press the MENU button while the monitor is in pacing mode. Use the menu to select "Pacer Mode," and then select "Fixed." Push the "Start Pacing" soft key to start pacing at the rate and current setting displayed.