ADULT INTRAOSSEOUS PROCEDURE

ALWAYS USE STANDARD PRECAUTIONS

INDICATIONS

- Patient in extremis, cardiac arrest, profound hypovolemia, or septic and in need of immediate delivery of medications / fluids and immediate IV access is not possible

CONTRAINDICATIONS

- Absolute contraindications:
  - Recent fracture of involved bone (less than 6 weeks)
  - Vascular disruption proximal to insertion site
  - Inability to locate landmarks
- Relative contraindications:
  - Infection or burn overlying the site
  - Congenital deformities of the bone
  - Metabolic bone disease

EQUIPMENT

- Intraosseous infusion needle and/ or mechanical device
- Commercially prepared chlorhexidine with alcohol swab or ampule. If patient has allergy to chlorhexidine, use alcohol swab only.
- Sterile gauze pads
- 10-12 ml syringe filled with 10 ml saline
- IV NS solution and tubing with 3-way stopcock
- Supplies to secure infusion
- Pressure bag
- **Lidocaine 2%** (Preservative Free)

PROCEDURE

- Aseptic technique must be followed at all times
- Position and stabilize chosen site
- Prepare insertion site using aseptic technique
- Air or gauze dry
- Insert IO needle according to manufacturer's directions
- Confirm placement
- Attach primed extension set and flush with 10 ml of saline
- If patient awake and/or responsive to pain, infuse 2% **Lidocaine** 20-40 mg over 30-60 seconds. Wait 30-60 seconds before fluid infusion. May repeat Lidocaine in 15 minutes if needed.
- If resistance is met, remove needle, apply pressure to site and attempt at secondary site
- Attach pre-flooded IV tubing
- Stabilize as recommended by manufacturer
- Fluid administration requires pressure bag
- Monitor insertion site and patient condition

ORAL ENDOTRACHEAL INTUBATION PROCEDURE

ALWAYS USE STANDARD PRECAUTIONS

INDICATION

- Severe ventilatory compromise where the airway cannot be adequately maintained by BLS techniques

CONTRAINDICATION

- Absolute
  - Patient whose height is less than the length of the color-coded resuscitation tape **and** <12 years of age
  - Epiglottitis
- Relative
  - Spontaneous respirations are present
  - Responsive patient with intact gag reflex
  - Suspected opiate overdose
  - Profound hypoglycemia

EQUIPMENT

- Battery powered laryngoscope handle, extra batteries and bulbs or equivalent devices
- Laryngoscope blades
- Video Laryngoscopy (if available; refer to manufacturer's recommendation for use)
- McGill forceps
- Cuffed endotracheal tubes
- ETTI
- Lubricating jelly
- Disposable stylets
- Suction
- Pulse oximetry
- End Tidal CO2 detector
- Esophageal Detector Device (EDD)
- Capnometer or capnograph when available

PROCEDURE

- Open airway and pre-oxygenate with BVM for 1-3 minutes with 100% O2. Avoid hyperventilation in cardiac arrest.
- Select proper ETT
- Insert stylet
- Select proper sized blade and visualize the larynx
- Suction as needed
- If possible, provide continuous high flow oxygen during procedure
- Under direct visualization insert ETT 2-3 cm past the cords. Each attempt should not exceed 30 seconds, hyperventilating between attempts.
- Remove stylet
- Inflate cuff
- Verify placement using all of the following:
  - Rise and fall of chest

    - Absence of epigastric sounds
    - Bilateral breath sounds
    - Capnometry/capnography **or** EDD *and* Colormetric Device
- Secure the tube. Consider spinal immobilization to prevent extubation. Do NOT use C-collar.
- Reassess tube placement after each patient movement. If any doubt about placement, confirm by capnography or direct visualization.

SPECIAL CONSIDERATION

- Defibrillation should precede intubation in cardiac arrest VF / VT situations.
- Limit intubation attempts (an attempt is defined as passing the device beyond the patient's teeth).
- Consider use of ETTI if difficult intubation.
- If unable to intubate, manage airway with other airway adjunct.

RELATED POLICIES/ PROCEDURES

- Endotracheal Tube Introducer (ETTI) Procedure ALS PR 4
- King Airway Procedure ALS PR 14
- Head Trauma T 2
- Pediatric Respiratory Distress P03

ENDOTRACHEAL TUBE INTRODUCER (ETTI) PROCEDURE

ALWAYS USE STANDARD PRECAUTIONS

INDICATION

- Airway structure or condition which prevents adequate visualization by standard tools of endotracheal intubation. May include:
  - Patients with Grade II through IV laryngeal views (Cormack-Lehane grade)
  - Patients with airway edema regardless of laryngeal view

CONTRAINDICATION

- Endotracheal tubes smaller than 6.0
- Patient whose height is less than the length of the color-coded resuscitation tape **and** <12 years of age

EQUIPMENT

- Intubation supplies
- ETT Introducer

PROCEDURE

- Perform laryngoscopy and obtain the best possible laryngeal view
- Holding the ETTI in your right hand and the angled tip pointing upward, gently advance the ETTI anteriorly (under the epiglottis) to the glottic opening (cords).
- For grade II views:
  - Direct through the cords
- For all other situations:
  - Direct the ETTI to the area where the cords should lie and feel for washboard sensation as the tip ratchets on the tracheal rings.
- Gently advance the ETTI until resistance is encountered at the carina. Because the ETTI can potentially cause pharyngeal/ tracheal perforation, NEVER FORCE IT. If no resistance is encountered and the entire length of the ETTI is inserted, the device is in the esophagus.
- The ETTI is correctly placed when you see the device going through the cords, when the ratcheting of the tip on the trachea, and/or when resistance is met while advancing the device (ETTI is at the carina).
- Once positioned, withdraw the ETTI until the 37 cm black line mark is aligned with the lip and advance an endotracheal tube over the ETTI and into the trachea. This indicates that the tip is well beyond the cords and the proximal end has enough length to slide the endotracheal tube over it.
- If resistance is encountered – caused by the endotracheal tube catching on the arytenoids or aryepiglottic folds – withdraw the endotracheal tube slightly, rotate 90 degrees and reattempt. If this is unsuccessful, attempt with a smaller tube.
- Once the endotracheal tube is in position, while holding the tube, remove the ETTI through the endotracheal tube.
- Because this is a blind intubation, capnography should be utilized to confirm tracheal placement.

SPECIAL CONSIDERATION

- Use the confirmation methods standard for endotracheal intubation to verify placement of the endotracheal tube, both prior to and after initiating ventilation.

RELATED POLICIES/ PROCEDURES

- Oral Endotracheal Intubation ALS PR 3

PROCEDURE FOR INTRANASAL MEDICATIONS MIDAZOLAM (VERSED) & NARCAN

ALWAYS USE STANDARD PRECAUTIONS

INDICATION

- No IV access with the following symptoms:
  - Status epilepticus
  - Suspected narcotic overdose with respiratory depression

CONTRAINDICATION

- Epistaxsis
- Complete mucosal blockage of both nostrils
- Nasal trauma
- Any recognizable septal abnormalities
- Retropharyngeal lacerations/ dissections

EQUIPMENT

- MAD adapter
- Syringe
- Suction

PROCEDURE

- With medication in syringe, attach atomizer (do not lubricate tip).
- Stabilizing the head, place applicator in nares and briskly compress the syringe plunger.

SPECIAL CONSIDERATION

- Be attentive to excessive oral secretions, vomiting, and inadequate tidal volume.
- Intranasal administration of Midazolam is an optional medication delivery system

RELATED POLICIES/ PROCEDURES

- Seizure ALS N 2
- Coma/ ALOC N 1
- Respiratory Arrest R 1
- Pediatric Seizure P 9

NEEDLE THORACOSTOMY/ PLEURAL DECOMPRESSION PROCEDURE

ALWAYS USE BODY SUBSTANCE ISOLATION PRECAUTIONS

INDICATION

- To relieve tension pneumothorax as indicated by a combination of the following:
  - Severe dyspnea and/ or difficulty with ventilation, especially with an intubated patient
  - ALOC and or agitation
  - Absent or unequal breath sounds on affected side
  - Signs of shock
  - Neck vein distention
  - Paradoxical movement of the chest
  - Hyper resonance to percussion on the affected side
  - Tracheal shift away from the affected side

EQUIPMENT

- 14 gauge or larger needle ≥ 2 inches
- Heimlich or other one-way valve
- 10 ml syringe

PROCEDURE

- Choose appropriate site on the affected side:
  - If patient head is elevated, locate the second intercostal space, mid-clavicular line
  - If patient is flat, locate the 4th or 5th intercostal space, midaxillary line
- Prepare site with Betadine
- Attach the large gauge IV needle to a large syringe.
- With patient exhaling, introduce the needle at a 90 degree angle, just over the rib at the selected site.
- Advancing slightly superior to the rib, continue until lack of resistance or a “pop” is felt as the needle enters the pleural space.
- If the air and/ or blood returns under pressure or is easily aspirated, continue to advance the catheter superiorly and remove the needle.
- When no further air escapes, attach a one- way valve.
- Secure the catheter with the valve in a dependent position.
- Reassess patient

VERIFICATION OF TUBE PLACEMENT PROCEDURE

ALWAYS USE STANDARD PRECAUTIONS

INDICATION

- To verify the placement of an endotracheal tube

EQUIPMENT

- Esophageal Detector Device (EDD)
- End Tidal Carbon Dioxide Detector (ETCO2 Detector)
- Stethoscope
- Capnography device

PROCEDURE

- After tube placement, apply EDD prior to first ventilation.
- Check for the following:
  - Auscultate the lungs; assess for presence and equality of breath sounds
  - Movement of air through the tube
  - Presence of condensation in the tube
  - Auscultate the stomach; assess for absence of air movement
- Apply capnometer or capnography if available.

DOCUMENTATION

- Response of EDD
- Color change of ETCO2 Detector
- Number and waveform of capnography

RELATED POLICIES/ PROCEDURES

- Oral Endotracheal Intubation Procedure ALS PR 3

IV ACCESS PROCEDURE

ALWAYS USE BODY SUBSTANCE ISOLATION PRECAUTIONS

INDICATION

- To describe a method for establishment of intravenous access in the pre-hospital setting

EQUIPMENT

- IV catheter
- Equipment to secure line
- Tourniquet
- Syringe
- IV fluid / IV tubing if indicated

PROCEDURE

- Select insertion site and needle size as appropriate to the patients condition using the smallest catheter and most distal site indicated
- Apply a tourniquet above the insertion site
- Don a clean pair of gloves
- Clean insertion site using a back and forth motion for 30 seconds with commercially prepared chlorhexidine with alcohol swab or ampule. If patient has allergy to chlorhexidine, clean with alcohol swab only.
- Allow the site to air dry for 2 minutes. If site is not dry after time, dry with sterile 2X2
- Insert IV catheter; assure patency
- Attach appropriate solution, begin flow, adjust rate or attach “lock” if saline lock appropriate
- Secure with anchoring tape, avoiding puncture site
- Apply occlusive sterile dressing over the needle insertion site. Do not put tape over the occlusive dressing.
- If saline lock was started, irrigate with 5 ml NS.
- Saline locks may be used in lieu of intravenous lines when:
  - Treatment protocol specifies IV NS TKO
  - Fluid resuscitation or challenge is not anticipated

EXTERNAL CARDIAC PACING PROCEDURE

ALWAYS USE STANDARD PRECAUTIONS

INDICATION

- Symptomatic bradycardia which may include: HR < 50 with decreasing perfusion, chest pain, shortness of breath, decreased LOC, pulmonary congestion or congestive heart failure

☎ PHYSICIAN CONSULT

- Concomitant administration of **opioids** (Morphine and Fentanyl) and **Midazolam**
- If SBP < 80, obtain physician consult for **Push-dose Epinephrine**

CRITICAL INFORMATION

- If patient is unstable, do not delay pacing for IV access

EQUIPMENT

- Cardiac monitor/ defibrillator/ external pacemaker
- Pacing capable electrode pads

PROCEDURE

- ALS RMC
- If patient is conscious, administer **Midazolam** 1 mg slow IV/IO. May repeat 1 mg every 3 minutes to desired degree of sedation. Maximum dose = 0.05 mg/kg.
- If tolerated, position patient supine, applying pacing electrodes to bare chest according to manufacturers recommendations (anterior/ posterior or sternal/ apex).
- Confirm and record ECG.
- Set pacing rate at 60, turn on pacing module, and confirm pacer activity on monitor. May increase rate to 80.
- Increase mA until capture occurs or maximum output is reached.
- Once capture is confirmed, increase output by 10%
- Confirm pulses with paced rhythm.
- Monitor vital signs and need for further sedatives or pain control.
- If SBP < 90, consider NS 250 ml bolus IV/IO
- ☎ **Opioids** for pain management if concomitant administration of Midazolam
- ☎ Physician consult for **Push-dose Epinephrine** for SBP < 80
  - Mix 1mL Epinephrine (0.1mg/mL concentration) with 9mL Normal Saline in a 10mL syringe
  - Administer Push-dose Epinephrine 1mL IV/IO every 3-5 minutes
  - Titrate to maintain SBP >80mmHg
  - Monitor blood pressure every five minutes

DOCUMENTATION

- mA needed for capture
- Time pacing started/ discontinued

RELATED POLICIES/ PROCEDURES

- Bradydysrhythmia C 4
- Adult Sedation ATG 3
- Adult Pain Management ATG 2

12-LEAD ECG PROCEDURE

ALWAYS USE STANDARD PRECAUTIONS

INDICATION

- Patients with a medical history and/ or presenting complaints consistent with Acute Coronary Syndrome (ACS). Indications for the procedure may include one or more of the following:
  - Chest or upper abdominal pain, described as pressure or tightness
  - Nausea or vomiting
  - Diaphoresis
  - Shortness of breath and/ or difficulty with ventilation
  - Anxiety, feeling of “doom”
  - Syncope or dizziness
  - Other signs or symptoms suggestive of ACS

☎ PHYSICIAN CONSULT

- If interpretation of ECG is inconclusive and ST segment elevation is present, seek immediate consultation with STEMI Receiving Center (SRC)

EQUIPMENT

- ECG machine and leads

PROCEDURE

- Attach ECG limb leads to arms and legs.
- Attach ECG chest leads as follows:
  - V1: right of sternum, 4th intercostal space
  - V2: left of sternum, 4th intercostal space
  - V3: halfway between V2 and V4
  - V4: left 5th intercostal space, mid-clavicular line
  - V5: horizontal to V4, anterior axillary line
  - V6: horizontal to V5, mid- axillary line
  - V4R- V6R: right 5th intercostal space, mid-clavicular line to mid axillary line (for suspected right ventricular infarction (RVI) and/ or physician request). Lead V4R must be obtained whenever ST segment elevation is noted in leads II, III, and AVF

SPECIAL CONSIDERATIONS

- If the 12-lead ECG demonstrates ST elevation and an acute ST elevation Myocardial Infarct is suspected refer to STEMI Policy C 9
- Infarctions may be present with a normal 12-lead ECG. Consider taking a 15-lead ECG.

RELATED POLICIES/ PROCEDURES

- Chest Pain/ Acute Coronary Syndrome C 8
- STEMI Policy C 9

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) PROCEDURE

ALWAYS USE BODY SUBSTANCE ISOLATION PRECAUTIONS

INDICATION

- Patients > 8 years of age in severe respiratory distress and signs of CHF, COPD, and asthma.
- Near drowning

CONTRAINDICATION

- Absolute
  - Age < 8
  - Respiratory or Cardiac Arrest
  - Agonal respirations
  - Severely depressed level of consciousness
  - Signs and symptoms of pneumothorax
  - Inability to maintain airway patency
  - Major trauma (especially head trauma with signs of ICP or significant chest trauma)
  - Facial anomalies or trauma (e.g., burns, fractures)
  - Vomiting
- Relative Contraindications
  - Systolic BP <100
  - History of Pulmonary Fibrosis or history of barotrauma
  - Decreased LOC
  - Claustrophobia or inability to tolerate mask (after 1-2 minutes trial)

EQUIPMENT

- CPAP equipment
- In-line nebulizer

PROCEDURE

- ALS RMC
- Place patient in a seated position with legs dependant
- Follow manufacturer directions for CPAP device set up
- Explain device to patient
- Apply device to patient; set flow rate in excess of the patients inspiratory flow rate & monitor every 5 minutes including continuous SAO2
- If albuterol and/or ipratropium appropriate, may administer with CPAP in-line nebulizer.
- Reassess V/S q 5 minutes after CPAP applied
- Increase oxygen percentage if patient does not demonstrate improvement after 5 minutes of application; repeat as needed to obtain improvement
- Remove the CPAP device and assist ventilations with BVM and/or intubation if patient condition worsens

SPECIAL CONSIDERATION

- Consider using sedation to alleviate possible anxiety associated with the CPAP device

RELATED POLICIES/ PROCEDURES

- Adult Sedation ATG 3
- Bronchospasm/Asthma/COPD R4

KING AIRWAY PROCEDURE

ALWAYS USE STANDARD PRECAUTIONS

INDICATION

- When ventilation cannot be adequately maintained by BVM or other BLS techniques and intubation is anticipated to be difficult or intubation is unsuccessful after no more than one attempt (cardiac arrest patients) or two attempts (respiratory arrest patients)

CONTRAINDICATION

- Responsive patient with an intact gag reflex
- Patient with known esophageal disease
- Patients who have ingested caustic substances
- Tracheal stoma
- Patient < 4 feet tall or < 12 years of age

EQUIPMENT

- King Airway
- Syringe
- Water soluable lubricant
- Portable suction device
- Capnometry/capnography or Colormetric Device
- Stethoscope

Size	Patient Criteria	Color	Inflation Volume
3	4 – 5 ft.	Yellow	45 - 60 ml.
4	5 – 6 ft.	Red	60 - 80 ml.
5	> 6 ft.	Purple	70 - 90 ml.

PROCEDURE

- Open airway and pre-oxygenate with BVM for 1-3 min. with 100% O2. Avoid hyperventilation in cardiac arrest.
- Test cuff according to manufacturer's instructions
- Apply water soluble lubricant to the distal end of the tube.
- Position the head into the "sniffing" position or neutral position if trauma is suspected
- Remove dentures before placing tube to prevent laceration of the cuffs
- Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums
- Inflate cuffs based on size of tube
- Attach bag-valve to King Airway
- While gently bagging the patient to assess ventilation, withdraw the airway until ventilation is easy and free flowing
- Verify placement using all of the following:
    - Rise and fall of chest
    - Bilateral breath sounds
    - Absence of epigastric sounds
    - Capnometry/capnography *or* Colormetric Device
- Secure the tube with tape or commercial tube holder, noting depth marking on tube

SPECIAL CONSIDERATION

- If there is any doubt about the proper placement of the King Airway, deflate the cuffs and remove device; ventilate the patient with BVM for 30 seconds and repeat sequence of steps
- If unsuccessful on second attempt, resume BLS airway management

METERED DOSE INHALER (MDI) FIRELINE MEDICINE PROCEDURE

ALWAYS USE BODY SUBSTANCE ISOLATION PRECAUTIONS

INDICATION

- To deliver an aerosolized bronchodilator for patients experiencing bronchospasm in the fireline medicine setting

EQUIPMENT

- Metered dose inhaler Albuterol OR
- Metered dose inhaler Atrovent

PROCEDURE

- Have patient sit or stand in an upright position
- Remove dust cap and have the patient hold the MDI in an upright position
- Gently shake MDI for 5-10 seconds
- Have patient tilt head back slight and exhale normally and completely
- Patient should place lips around mouthpiece to produce a seal
- While inhaling slowly, have patient press down on inhaler to release the medication
- Inform patient to continue inhaling until they have taken the deepest breath possible
- Hold breath for 10 seconds
- Exhale slowly through pursed lips
- Administer a second dose as described above