



Southwest General

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University Hospitals

EMS Services

PRE-HOSPITAL CARE

MEDICAL CONTROL

PROTOCOLS AND PROCEDURES

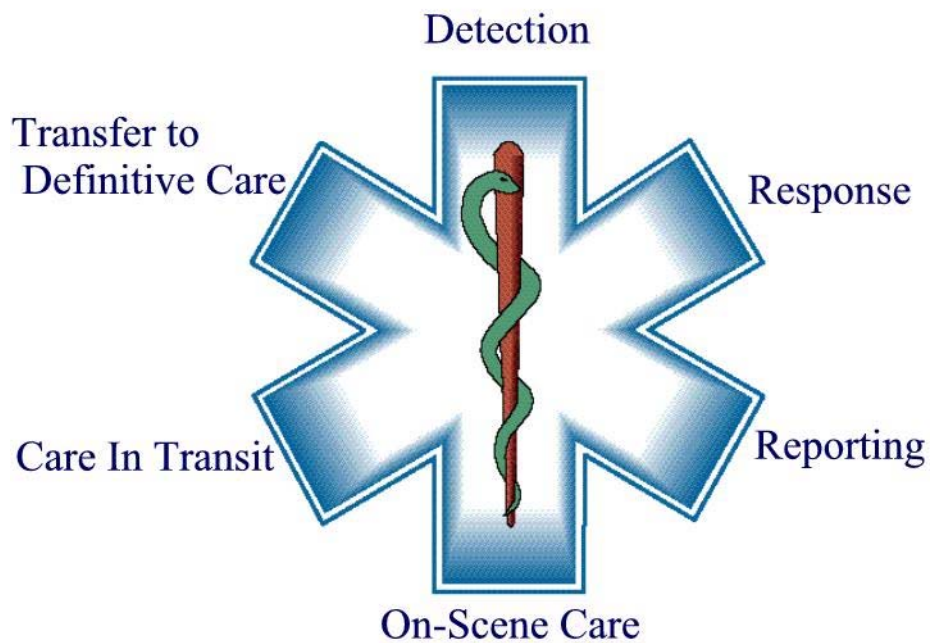


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MEDICAL PROCEDURES		
ADULT PATIENT ASSESSMENT		

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS:

- Any patient requesting a medical evaluation that is too large to be measured with a Broselow - Luten Resuscitation (weight/length based tape) Tape.

PROCEDURE:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient / caregiver interaction.
2. Assess need for additional resources.
3. Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
4. Assess mental status (e.g., AVPU) and disability (e.g., GCS).
5. Control major hemorrhage and assess overall priority of patient.
6. Perform a focused history and physical based on patient's chief complaint.
7. Assess need for critical interventions.
8. Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
9. Maintain an on-going assessment throughout transport, to include patient response / possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints / conditions.

GENERAL CONSIDERATIONS:**Dealing with the family:**

- **REMAIN CALM.** Show efficiency and competence, even if you don't really feel it.
- Show a caring a concerned manner for both the family and the patient. If you have negative feelings about the situation (for example if it is an injury as a result of neglect or abuse), try not to let them show. This will only increase hostility between yourself and the family.
- Honestly inform them of what you are doing and what you think is wrong with the patient.
- Reassurance is important for the family as well. Involve them in the care (for example, holding the oxygen or talking to the patient to calm them). This will help develop some trust between you and the family.

PEDIATRIC PATIENT ASSESSMENT

B	EMT-B	B
I	EMT – I	I
P	EMT – P	P

INDICATIONS:

- Any child that can be measured with the Broselow – Luten (weight/length based tape) Resuscitation Tape.

PROCEDURE:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient / caregiver interaction.
2. Assess patient using the pediatric triangle of ABCs:
 - Airway and appearance: speech / cry, muscle tone, inter-activeness, look / gaze, movement of extremities
 - Work of breathing: absent or abnormal airway sounds, use of accessory muscles nasal flaring, body positioning
 - Circulation to skin: pallor, mottling, cyanosis
3. Establish spinal immobilization if suspicion of spinal injury.
4. Establish responsiveness appropriate for age (AVPU, GCS, etc.).
5. Color code using Broselow - Luten tape.
6. Assess disability (pulse, motor function, sensory function, papillary reaction).
7. Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
8. Record vital signs (BP greater than 3 years of age, cap refill less than 3 years of age).
9. Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
10. Treat chief complaint as per protocol.

GENERAL CONSIDERATIONS:

- Illness and injuries in children can cause significant anxiety for pre-hospital personnel as well as panic in the patient, family, and bystanders. It is important for the EMT to remain calm and take control of the patient and situation.

Dealing with the child:

- Tell them what’s happening. It is important to remember to communicate with the child.
- Relate and speak on their developmental level.
- Be honest with them. Don’t say, this won’t hurt if it will. Explain your actions.
- Try to enlist their cooperation, if possible.
- Do not separate child from the parent unless they are ill enough to require significant interventions like airway positioning and ventilation.
- Reassure the child frequently.

Dealing with the family:

- **REMAIN CALM.** Show efficiency and competence, even if you don’t really feel it.
- Show a caring, concerned manner for both the family and the patient. If you have negative feelings about the situation (for example if it is an injury as a result of neglect or abuse), try not to let them show. This will only increase hostility between yourself and the family.
- Honestly inform them of what you are doing and what you think is wrong with the patient.
- Reassurance is important for the family as well. Involve them in the care (for example, holding the oxygen or talking to the patient to calm them). This will help develop some trust between you and the family.

MEDICAL PROCEDURES
AIRWAY / BREATHING
AEROSOL / INHALER TREATMENTS

I	EMT – I	I
P	EMT – P	P

AEROSOL TREATMENT

INDICATATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Patients experiencing bronchospasm 	<ul style="list-style-type: none"> • Shortness of breath • Wheezing • History of COPD / Asthma • Unable to complete full sentences • Accessory muscle use • Nasal flaring • Fatigue 	<ul style="list-style-type: none"> • Allergy to medication • Arrhythmias

PROCEDURE:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed Albuterol into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.
9. Document the treatment, dose, and route on/with the patient care report.

PERSONAL INHALER TREATMENT

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Patients experiencing bronchospasm 	<ul style="list-style-type: none"> • Shortness of breath • Wheezing • Patient has own prescribed inhaler 	<ul style="list-style-type: none"> • Medication is not prescribed to patient • Medication has expired • Patient has received maximum dose

PROCEDURE:

1. Make sure that personal inhaler is at room temperature or warmer.
2. Follow the instructions for either gentle or vigorous shaking.
3. Instruct patient to seal lips around opening of inhaler, using spacer if present.
4. Instruct patient to inhale deeply while depressing the inhaler.
5. Instruct patient to hold breath as long as possible.
6. Follow Airway Protocol.

GENERAL CONSIDERATIONS:

- Use mouthpiece if patient is able to hold nebulizer effectively.
- Use nebulizer mask if patient is unable to hold nebulizer effectively.

MEDICAL PROCEDURES

AIRWAY / BREATHING

ESOPHAGEAL COMBITUBE

B	EMT-B	B
I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • In an apneic patient when endotracheal intubation is not possible or not available. • Patient must be over 5 feet and greater than 16 years of age. (Use Combi Tube SA for individuals 4 ft. to –5 ft. 5 in. in height and Regular Combi Tube for 5 ft. and up.) • Patient must be unconscious 	<ul style="list-style-type: none"> • Respiratory and/or cardiac arrest • Respiratory insufficiency when the patient is totally unconscious and unresponsive to outside stimuli. • After attempts at endotracheal intubation have not been successful. • EMT-B's and EMT-I's may use the Esophageal Combitube as a primary airway in the above stated situations. 	<ul style="list-style-type: none"> • Responsive victims (gag reflex present) • Known esophageal disease or cirrhosis • Caustic poison ingestion • Foreign body in the trachea • History of esophageal trauma or injury • Presence of a tracheostomy or laryngectomy • Suspected narcotic overdose or hypoglycemia prior to the administration of Narcan and/or Glucose

PROCEDURE:

1. Pre-oxygenate and hyperventilate the patient.
2. Lubricate the tube.
3. Remove dentures and/or suction any secretion from mouth and oropharynx.
4. Remove oral airway if in use; place head and neck in neutral position.
5. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
6. Gently insert the tube until the teeth are between the printed rings.
7. Inflate line 1 (blue pilot balloon) leading to the pharyngeal cuff with 100 mL of air.
8. Inflate line 2 (white pilot balloon) leading to the distal cuff with 15 mL of air.
9. Ventilate the patient through the longer blue tube.
 - Auscultate for breath sounds and sounds over the epigastrium.
 - Look for the chest to rise and fall.
10. If breath sounds are positive and epigastric sounds are negative, continue ventilation through the blue tube. The tube is in the esophagus.
 - In the esophageal mode, stomach contents can be aspirated through the #2, white tube relieving gastric distention.
11. If breath sounds are negative and epigastric sounds are positive, attempt ventilation through the shorter, #2 white tube and reassess for lung and epigastric sounds. If breath sounds are present and the chest rises, you have intubated the trachea and continue ventilation through the shorter tube.
12. Confirm tube placement using end-tidal CO₂ detector.
13. Secure the Combitube with appropriate securing device.
14. Monitor SPO₂ and/or End Tidal CO₂.

DO NOT FORCE THE COMBITUBE INTO POSITION

If the tube does not advance easily, redirect it or withdraw and attempt one more insertion and if unsuccessful, continue ventilation with an oral airway and BVM or demand valve.

MEDICAL PROCEDURES**AIRWAY / BREATHING****REMOVAL OF THE “COMBITUBE”****INDICATIONS:**

- If the patient begins to breathe spontaneously and effectively AND is resisting the presence of the Combitube, removal of the airway is necessary.

PROCEDURE:

1. Turn victim on his/her side.
2. Have suction equipment ready with large bore suction catheter in position.
3. Deflate the pharyngeal cuff (blue pilot bulb), attempt endotracheal intubation at this time, if applicable.
4. Deflate the distal cuff (white pilot bulb) and remove the airway.
5. Suction any emesis. A significant number of patients will vomit at this point.

GENERAL CONSIDERATIONS:

- The Esophageal Combitube is a single patient use device and is not to be cleaned and reused.
- You should not take more than ten (10) seconds during any one attempt at inserting the Combitube. This will help prevent hypoxia.
- Insertion of the suction catheter may be initiated any time it is desirable to evacuate the stomach contents.
- In the event of cervical spine injury, be sure that the head, neck and back are secured in place during insertion of the tube. This is done to prevent any further injury.
- If lung sounds are present and gastric sounds absent with ventilations through the longer blue port, the Combitube has been placed in the esophagus.

MEDICAL PROCEDURES
GENERAL CONSIDERATIONS
END TIDAL CO ₂ DEVICES

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> The End-Tidal CO₂ detector shall be used with all endotracheal or Combitube airways 	<ul style="list-style-type: none"> Shortness of breath Wheezing History of COPD / Asthma Unable to complete full sentences Accessory muscle use Nasal flaring Fatigue 	<p>This device is not to be used for:</p> <ul style="list-style-type: none"> Detection of hypercarbia Detect mainstem bronchial intubation During mouth to tube ventilation

End Tidal CO₂ Monitor

A device utilizing gas sensitive paper to reveal the presence of CO₂ during respiration of the intubated patient. Assists in assuring proper tube placement and assessing pulmonary perfusion. The time for effectiveness is up to two hours. If it is not in an air-tight seal, it will not work. If the patient has been apneic for a long time, the detector may not register CO₂.

PROCEDURE:

- Intubation has been successfully completed and verified.
- The end-tidal CO₂ detector is in place by placing it on end of tube, or using BVM with built in detector.
- Observe change in color of paper following 6 breaths during exhalation.
- YELLOW = normal level of CO₂ (2-5%, 15 – 35 mmHg).
- TAN = moderately low (0.5 – less than 2 %, 4- 15 mmHg).
- PURPLE = little or no CO₂ present.

Remember, the CO₂ detector is a tool adjunct. Rely on Breath Sounds, Visualizing the chords during placement, patient's color, ect.

MEDICAL PROCEDURES
AIRWAY / BREATHING
INTUBATION BY NASOTRACHEAL

P	EMT - P	P
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INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Patients with spontaneous breathing when all other methods of airway control is inadequate • Trauma patients when c-spine manipulation must be kept to a minimum • Nasotracheal intubation is an option when an adult airway cannot be maintained due to clenched jaw or unable to ventilate by other means 	<ul style="list-style-type: none"> • Unstable airway • Unmaintainable airway 	<ul style="list-style-type: none"> • Nasotracheal intubation is not indicated for patients with suspected fractures in the base of the skull or face. • Nasotracheal intubation is not indicated for patients who are apneic

PROCEDURE:

1. Begin with basic airway control and oxygenation.
2. Determine tube size based on size of nasal opening.
3. Check the cuff for leaks and lubricate.
4. With tube against the floor or septum of the nasal cavity, slip the tube distally through the largest naris.
5. Insert along the floor of the nasal cavity (90 degree angle to the face).
6. When the tube reaches the posterior pharyngeal wall, take great care on "rounding the bend". Advance tube gradually anterior to posterior, direct the tube toward the glottic opening.
7. As the tube enters the pharynx, listen for breath and pull on the tip control ring loop to turn the tube anterior towards the trachea.
8. When the patient takes a breath, advance the tube into the trachea.
9. Listen for lung sounds, inflate the tube's cuff, and maintain ventilation and oxygenation. Confirmation of tube placement with breath sounds.
10. Watch the neck at the laryngeal prominence.

GENERAL CONSIDERATIONS:

- Nasotracheal intubation is a blind procedure that requires skill and training.
- The attempt should not take longer than 30 seconds.
- If any resistance is encountered, abandon procedure.

MEDICAL PROCEDURES
AIRWAY / BREATHING
INTUBATION BY ENDOTRACHEAL

I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort 	<ul style="list-style-type: none"> • Unstable airway • Respiratory arrest • Cardiac Arrest • GCS less than 8 without a treatable cause (i.e., hypoglycemia) 	<ul style="list-style-type: none"> • Patient intolerance is only a relative contraindication to this procedure

PROCEDURE:

1. Cervical immobilization should be applied to the patient when indicated by mechanism of injury or when it is deemed necessary.
2. Prepare all equipment and have suction ready.
3. Hyperventilate the patient (one breath every two seconds) for at least one minute before attempting endotracheal intubation, if possible.
4. Suction the pharynx as needed.
5. Open the patient's airway and holding the laryngoscope in the left hand, insert the blade into the right side of the mouth and sweep the tongue to the left.
6. Use the blade to lift the tongue and epiglottis (either directly with the straight blade or indirectly with the curved blade).
7. Once the glottic opening is visualized, slip the tube through the cords and continue to visualize until the cuff is past the cords.
8. No more than 30 seconds may be used per attempt.
 - Re-ventilation for at least 30 seconds after each attempt.
 - Some situations such as copious vomiting or bleeding may require suction attempts longer than 30 seconds. These are the exception; not the norm.
9. Remove the stylet.
10. Inflate the cuff of the endotracheal tube with 10 mL of air.
11. Attach the bag-valve device to the ET tube and ventilate the patient.
12. Assess for tube placement:
 - Confirmation of lung sounds bilaterally and in both basis.
 - Absence of epigastric sounds.
 - Good compliance with bag-valve ventilation.
 - Air aspirator easily removed.
 - Color change of end tidal CO₂ detector (purple to yellow).
 - Not reliable in cardiac arrest with a long down time.
 - Chest rise with ventilation.
13. If placement cannot be confirmed or obtained, the ETT shall be removed, an oral airway placed, and the patient shall be ventilated with a bag-valve-mask.
 - If there is any doubt about proper placement, the tube shall be removed.
6. If proper placement is confirmed, the cm markings on the tube at the level of the teeth shall be noted and secure the tube with a commercial tube holder, tape, rolled gauze, or IV tubing.

MEDICAL PROCEDURES
AIRWAY / BREATHING
INTUBATION BY ENDOTRACHEAL cont.

7. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report. Document all devices used to confirm initial tube placement. Also, document positive or negative breath sounds before and after each movement of the patient.
8. Routinely reassess for proper tube placement. The initial tube placement and all reassessments must be documented.

GENERAL CONSIDERATIONS:

- It is essential to have complete and detailed documentation concerning the placement of the endotracheal tube. The documentation MUST include:
 1. **Placement:** direct visualization of the tube passing through the vocal chords.
 2. **Confirmation:** equal lung sounds, no sounds over the epigastric area, positive color change in the CO₂ detector, ease removing the air aspirator, and chest wall movement with ventilations. Also, consider changes in the patient's SpO₂, and condensation in the tube.
- Applying c-collar may assist in minimizing ETT movement.
- It is the paramedic's responsibility to be familiar with the proper technique of using the different laryngoscope blades.
- Tube placement must be confirmed, after it was initially placed, after every movement, any significant change in patient status, and prior to entering the emergency department.
- Continually monitor the patient's SpO₂, ease of ventilation, heart rate, and presence of JVD.
- A common complication of endotracheal intubation and / or manual ventilation is a pneumothorax and tension pneumothorax. Refer to the Chest Decompression Protocol.
- Only functioning paramedics can intubate.
- Intubation does NOT have to be attempted in pediatric patients if their airway can be effectively managed with BVM ventilations.

TUBE REMOVAL:

- If the patient begins to breathe spontaneously and effectively and is resisting the presence of the tube, removal of the tube may be necessary. The following procedures will be followed:
 1. Explain procedure to victim.
 2. Prepare suction equipment with large-bore catheter and suction secretions from endotracheal tube, mouth and pharynx.
 3. The lungs should be completely inflated so that the patient will initially cough or exhale as the tube is taken from the larynx. This is accomplished in 2 ways:
 - a. The patient is asked to take the deepest breath they possibly can and, at the very peak of the inspiratory effort, the cuff is deflated and the tube removed rapidly;
 4. Prepare to suction secretions and gastric content if vomiting occurs.
 5. Appropriate oxygen is then administered.
 6. The patient's airway is immediately evaluated for signs of obstruction, stridor or difficulty breathing. The patient should be encouraged to take deep breaths and to cough.

MEDICAL PROCEDURES**AIRWAY / BREATHING****INTUBATION BY ENDOTRACHEAL cont.****TUBE SIZING:**

- The size of tube that can be passed easily into most adults is 8 mm (id). Therefore this tube should be tried first on the average adult. The size of tube is judged by the size of the adult, not by age.
- For children, the proper tube is usually equal to the size of the child's little finger. The following guide will also help in determining the proper size tube:

Premature	3mm (id)	18-24 months	5-6mm (id)
14-24 weeks	4mm (id)	2-4 years	6mm (id)
6-12 months	4-5mm (id)	4-7 years	6-7mm (id)
12-18 months	5mm (id)	7-10 years	7mm (id)

GENERAL CONSIDERATIONS:

- All the above tube sizes are still dependent on the child's size rather than consideration of age.
- Children before puberty should have a cuffless tube, or if the tube has a cuff it should not be inflated after insertion.

ADMINISTRATION OF MEDICATION THROUGH ET TUBE:

- In the event an intravenous or interosseous route for administration of medication cannot be established, but an endotracheal tube has been properly put in place.

Endotracheal Guidelines - Adult and Peds

1. Lidocaine, Epi., Atropine, Narcan and Vasopressin can be given down the ET Tube.
2. The optimal dose of most drugs given by ET is unknown.
3. ET drugs deliver low blood levels. All drugs except Epi are given 2-3x's normal dose.
4. Epi in low levels may produce transient, detrimental vasodilatation thus Epi down the ET Tube are given 10 x's the normal dose.
5. Instill the drug while briefly holding compressions, follow with 5 mL (smaller with neonates) of NS flush, followed by 5 positive-pressure ventilations.

PROCEDURE:

1. If applicable, remove needle from syringe.
2. Hyperventilate patient and make sure ET tube and airway are clear of mucous.
3. With medication syringe luer-lock end connect to luer-lock port on side of AMBU bag and deliver the medications.
4. Ventilate patient to assure passage of medications down the tube and airway.

**Do not take longer than 15 seconds to administer medication
in order to prevent hypoxia of the patient.**

**REMEMBER, PULSE OXIMETRY IS A TOOL ADJUNCT. RELY ALSO ON BREATH
SOUNDS, VISUALIZATION OF THE VOCAL CORDS DURING PLACEMENT, AND
SKIN COLOR.**

MEDICAL PROCEDURES**AIRWAY / BREATHING****CRICOTHYROTOMY****P EMT - P P**

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> ● Failed Airway Protocol ● Complete upper airway obstruction ● Management of an airway when standard airway procedures, cannot be accomplished or have failed in a patient greater than or equal to 8 years of age ● Unable to intubate by another route ● Cervical spine injuries ● Maxillo- facial trauma ● Laryngeal trauma 	<p>Oropharyngeal obstruction from:</p> <ul style="list-style-type: none"> ● Edema from infection, caustic, ingestion, allergic reaction and/or inhalation injuries ● Foreign body ● Mass Lesion 	<ul style="list-style-type: none"> ● Postoperative bleeding ● Late bleeding ● Abscess behind packing ● Cellulitis of neck ● Subcutaneous emphysema ● Voice change ● Feeling of lump in throat ● Persistent stoma ● Obstructive problems ● Misplacement of the airway

PROCEDURE:

1. With patient supine, neck hyperextended, prep site with appropriate antiseptic solution.
2. Have suction supplies available and ready.
3. Locate the cricothyroid membrane utilizing anatomical landmarks.
4. Secure larynx laterally between thumb and forefinger.
5. Hold the device and puncture the cricothyroid membrane (in the midline between thyroid cartilage and cricoid cartilage at a 90 degree angle).
6. Confirm entry of needle in trachea by aspirating air through the attached syringe.
7. If air is present, change the angle of insertion to 60 degrees.
8. Advance the device to the level of the stop guide.
9. Slide the plastic cannula along the needle into the trachea until the flange rest against the neck.
10. Carefully remove the needle and syringe.
11. Secure the cannula with the provided anchoring device.
12. Attach the connecting tube to the 15 mm connection.
13. Attach a BVM to the connecting tube.
14. Confirm placement by auscultation and observing patient for adequate chest rise. Make certain ample time is used not only for inspiration but expiration as well.
15. If unable to obtain an adequate airway, resume basic airway management and transport the patient as soon as possible.
16. Regardless of success or failure of needle cricothyrotomy, notify the receiving hospital at the earliest possible time of a surgical airway emergency.
17. Document time / procedure / confirmation / change in patient condition / time on the patient care record.

GENERAL CONSIDERATIONS:

- Adult (4 mm) Quick Trach: Any patient greater than 100 pounds (45kg) and greater than 2 years (24 months) in age.

AIRWAY / BREATHING

NEEDLE CHEST DECOMPRESSION

P EMT - P P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Tension pneumothorax with significant dyspnea. 	<ul style="list-style-type: none"> Severe or significant dyspnea Increasing dyspnea Tachypnea Hyporesonance Absent breath sounds on the affected side Tachycardia Possibly diminished breath sounds on the unaffected side Tracheal deviation (rare/late sign) Hypotension Distended neck veins Chest pain Extreme anxiety Altered LOC / Coma 	<ul style="list-style-type: none"> Insufficient training

PROCEDURE:

- Confirm presence of a tension pneumothorax or identify strong clinical evidence in a rapid deteriorating patient in the setting of major trauma. Consider in the setting of refractory PEA.
- Locate the insertion site at the second intercostal space, midclavicular line on the affected side of the chest.
- Prep the insertion site. Use sterile gloves and utilize aseptic procedure to the fullest extent possible under the circumstances.
- Insert the 2 inch, 16 gauge angiocath (3 inch, 18 gauge angiocath in patients less than 8 years) direct the needle just over the top of the third rib (2nd intercostal space) to avoid intercostal nerves and vessels which are located on the inferior rib borders.
- Advance the catheter 1-2 inches (3/4 - 1 inch in patients less than 8 years) through the chest wall. Tension should be felt until the needle enters the pleural space. A “pop” or “give” may also be felt. Do not advance the needle any further. **In a tension pneumothorax, air under pressure should be released when the needle enters the pleural cavity. This will be heard as a rush of air through an open catheter-over-the-needle. (Remember these needles are in the drug box).**
- Withdraw the needle and advance the catheter until flush with the skin. Listen for a gush or a “hiss” of air which confirms placement and diagnosis. **Caution:** this is frequently missed due to ambient noise.
- Dispose of the needle properly and never reinsert into the catheter.
- Once the presence of a tension pneumothorax has been confirmed:
 - Remove the needle, leaving the catheter in place.
 - Tape the catheter in place.
- Secure the catheter and rapidly transport the patient providing appropriate airway assistance.

GENERAL CONSIDERATIONS:

- A tension pneumothorax can occur in any situation in which a simple pneumothorax occurs.
- A tension pneumothorax can occur WITHOUT trauma.
- Some patients who are at risk of developing a tension pneumothorax; include those receiving positive pressure ventilation, or any patient with blunt or penetrating trauma, and those with pre-existing lung diseases such as COPD.
- Cover all penetrating chest trauma with an occlusive dressing taped on three sides (Asherman Chest Seal).
- In some cases of penetrating chest trauma, placing an occlusive dressing on the wound will convert an open pneumothorax to a closed tension pneumothorax. In these cases, treatment consists of removing the dressing and converting the wound back to an open pneumothorax. This may be the only treatment needed.
- DO NOT perform a chest decompression, if the patient is not in significant respiratory distress and is otherwise stable.
- Major trauma victims should have catheter-over-the-needles placed on both sides of the chest with or without one – way valve devices, if all of the following are present:
 - Obvious chest trauma.
 - Patient intubated.
 - Difficulty bagging, tracheal deviation, or absent breath sounds on one / both sides.

MEDICAL PROCEDURES
GENERAL CONSIDERATIONS
PULSE OXIMETRY

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> ● Patients with suspected hypoxemia ● All cases of respiratory distress ● For the treatment of primary respiratory or cardiac disease ● All cases of altered or depressed level of consciousness ● Drug overdoses ● Any patient requiring intubation or BVM support ● Major trauma ● Smoke Inhalation (may not be accurate due to CO) ● Any patient on home oxygen, home ventilator, or BiPAP 	<ul style="list-style-type: none"> ● Dyspnea ● Tachypnea ● Tachycardia ● Bradycardia (late sign in adults) ● Altered mental status ● Pallor, cyanosis ● Diaphoresis ● Prolonged capillary refill ● Accessory muscle use ● Abnormal breath sounds 	<ul style="list-style-type: none"> ● Poor perfusion; must be applied with good perfusion ● Patients with history of anemia ● Patients with suspected high carboxyhemoglobin / methemoglobin (CO poisoning, smoke inhalation, heavy cigarette smokers)

PROCEDURE:

1. Turn the machine on and allow for self-tests.
2. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
3. Allow machine to register saturation level.
4. Record time and initial saturation percent on room air if possible on/with the patient care report.
5. Verify pulse rate on machine with actual pulse of the patient.
6. 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.
7. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
8. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
9. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
10. 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.
11. 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

All patients who require vital signs to be taken should have oxygen saturation measured and recorded as part of the vital signs. Measure oxygen saturation before applying oxygen and repeat the measurement after oxygen has been applied. Do not delay oxygen administration in patients experiencing severe respiratory distress.

MEDICAL PROCEDURES
GENERAL CONSIDERATIONS
PULSE OXIMETRY

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

TREATMENT GUIDELINES		
SPO2 READING	INTERPRETATION	ACTION
100% TO 95%	Ideal Range	No supplemental oxygen is needed
95% TO 90%	Mild to Moderate Hypoxemia	Check airway, start oxygen therapy via nasal cannula @ 4-6 lpm
90% TO 85%	Severe Hypoxemia	Check airway, start aggressive oxygen therapy, high flow oxygen via nonrebreather mask @ 15 lpm. Consider bag valve mask ventilation with 100% oxygen if the patient does not have adequate ventilations
85% OR LESS	Respiratory Failure	Prepare to intubate or assist ventilations with 100% oxygen and bag valve mask

GENERAL CONSIDERATIONS:

- 100% oxygen should be administered to all patients despite a good SpO₂ if they are hypoxic.
- Make sure that all dirt and nail polish or any obstructive covering is removed to prevent the unit from giving a false reading.
- Attempt to obtain a room air reading and a reading with supplemental oxygen.
- DO NOT read while BP being taken. May give false readings.
- Oxygen saturation measurements must routinely be recorded as part of the run report.
- Include those measurements taken as part of routine vital signs and those measurements taken before and after oxygen administration.
- Although the pulse oximeter displays the heart rate, the unit should not be used in place of the cardiac monitor and a physical assessment of the heart rate.
- Oxygen saturation readings may be inaccurate in any situation where the flow of blood through the finger is impaired, such as:
 - a. hypotension or shock with poor peripheral perfusion
 - b. peripheral vascular disease
 - c. extremity injury with restriction of peripheral perfusion
 - d. cold extremities
- Oxygen saturation readings may be incorrectly high in situations such as carbon monoxide poisoning.
- Many patients with COPD have chronic low oxygen readings and may lose their respiratory drive if administered prolonged high oxygen therapy. Routinely assess pulse oximetry as well as respiratory drive when administering oxygen to these patients. Do not withhold oxygen from any patient that requires it.
- The room air pulse oximetry reading is NOT required if the patient has been placed on supplemental oxygen prior to EMS arrival.

REMEMBER, PULSE OXIMETRY IS A TOOL ADJUNCT. RELY ALSO ON BREATH SOUNDS, VISUALIZATION OF THE VOCAL CORDS DURING PLACEMENT, AND SKIN COLOR.

MEDICAL PROCEDURES
AIRWAY / BREATHING
SUCTIONING

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Any patient who is having trouble maintaining an airway and fluid is noted in the oropharynx, endotracheal tube, or tracheostomy. • Tracheal suctioning should also be performed when rhonchi is heard in the intubated patient or tracheotomy patients. 	<ul style="list-style-type: none"> • Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, Combitube, tracheostomy tube, or a cricothyrotomy tube. 	<ul style="list-style-type: none"> • The patient must be well oxygenated before attempting this procedure.

PROCEDURE:**ORAL SUCTIONING**

1. Body substance isolation procedures must be used.
2. Assess the need for suctioning.
3. If the patient requires artificial ventilations, hyperventilate the patient for 30 seconds prior to suctioning.
4. Select an appropriate size suction catheter:
 - a. A soft flexible suction catheter can be used if only fluids need to be removed.
 - b. A Yankaur or “Tonsil Tip” should be used for thick fluids, small particles, or large volumes.
5. Prepare a cup of sterile water or saline to flush the catheter after suctioning and in between attempts.
6. While maintaining aseptic technique, quickly insert the catheter into the patient’s mouth until it is at the desired depth.
7. Apply suction and withdraw the catheter. Suction no more than 15 seconds per attempt.
8. Immediately after each suction attempt, hyperventilate the patient (one breath every two seconds) for thirty seconds with 100% oxygen if the patient’s ventilations require assistance.
9. Repeat this procedure as needed until the airway is clear.

TRACHEAL SUCTIONING:

1. Body substance isolation procedures must be used.
2. Assess the need for suctioning.
3. Hyperventilate the patient prior to suctioning.
4. Select an appropriate size suction catheter
 - a. A soft flexible suction catheter should be used.
 - b. A Yankaur or Tonsil Tip should NOT be used.
5. Prepare a cup of sterile water or saline to flush the catheter after suctioning and in between attempts.
6. While maintaining aseptic technique, quickly insert the catheter into the endotracheal or tracheal tube until it is at the desired depth.
7. Apply suction and withdraw the catheter using a gentle rotating motion. Suction no more than 15 seconds per attempt.
8. Immediately after each suction attempt, hyperventilate the patient (one breath every two seconds) for thirty seconds with 100% oxygen.
9. Repeat this procedure as needed until the airway is clear.

MEDICAL PROCEDURES**GENERAL CONSIDERATIONS****SUCTIONING****General:**

- In order to maintain aseptic technique, keep the distal end of the catheter in the wrapper when not being used.
- If the suction catheter needs to be set down between suction attempts, place it back inside its wrapper.
- Patients who require assisted ventilations should be hyperventilated before and after every suction attempt.
- DO NOT suction for more than 15 seconds per attempt.
- DO NOT insert farther than the desired depth.
- If a backboarded patient vomits, turn the board on its side and then suction.

Oral Suctioning:

- If using a soft flexible suction catheter, determine the length by holding it against the patient's face. Measure from the edge of the patient's mouth to the tip of the ear lobe.

Tracheal Suctioning:

- Even though endotracheal tubes isolate the trachea, if there is fluid present in the lower airway, oxygenation will be reduced.
- There are many patients at home with tracheotomy tubes. These tubes have a tendency to become obstructed because the patient cannot cough normally. EMS is often called when these tubes become obstructed.
- This procedure should be performed with aseptic technique. Use an unopened sterile catheter for every patient.
- Use the largest sized suction catheter that will fit down the endotracheal tube.
- Estimate the length by looking at the distance between the end of the tube and the sternal notch. This approximates the level of the carina.
- If tracheal secretions are extremely thick and unable to be removed, administer 2-3 mL of sterile saline followed by 2 BVM ventilations and then perform suctioning.

GENERAL CONSIDERATIONS

Continuous Positive Airway Pressure (CPAP)

I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<p>For <i>consideration</i> in patients with moderate to severe respiratory distress secondary to:</p> <ul style="list-style-type: none"> • asthma/reactive airway disease • COPD • CHF • pulmonary edema (cardiogenic or noncardiogenic) • pneumonia • near drowning • Thoes who are over 12 years of age, awake and oriented, with the ability to maintain an open airway, systolic BP above 90 mmHg, and are exhibiting two or more of listed signs and symptoms. 	<ul style="list-style-type: none"> • Accessory muscle use/retractions • Respiratory rate > 25 • Wheezing, rales, rhonchi, or significantly diminished lung sounds/poor air exchange with auscultation • Pulse oximetry <90% not improving with standard therapy • ETCO2 > 50 	<ul style="list-style-type: none"> • respiratory arrest, ineffective Vt, RR<12, agonal respirations or signs of impending respiratory failure (consider intubation) • unconscious, unresponsive, GCS<9, or inability to protect airway • excessive secretions • inability to sit up • persistent nausea/vomiting • systolic BP < 90 • inability to obtain a good mask seal • suspected pneumothorax • penetrating chest trauma • active upper GI bleeding or history of recent gastric surgery • Tracheostomy

PROCEDURE:

1. Treat underlying conditions as needed. (see appropriate protocol)
2. Assess for indications and contraindications (especially suspected pneumothorax)
3. Place patient in upright or sitting position.
4. Assess and monitor the patient:
 - Vital signs every 5 minutes
 - Lung sounds before and after CPAP, and as feasible thereafter.
 - Attach EKG monitor and pulse oximeter
 - **Contact Medical Control prior to application of CPAP if systolic BP less than 90.**
5. Explain the procedure to the patient.
6. Anticipate anxiety and offer verbal coaching as needed.
7. Assemble CPAP. Attach CPAP to O2 source and adjust starting CPAP pressure:
 - Begin at 3 cm H2O for patient with S&S consistent with asthma, COPD, pneumonia or near drowning. Titrate to maximum of 6 cmH2O to achieve pulse ox >90% and improvement of respiratory status.
 - Begin at 5 cm H2O for patients with CHF and/or pulmonary edema. Titrate to maximum of 10 cmH2O to achieve pulse ox >93% and improvement of respiratory status.
 - Consider use of nebulized medications in line with CPAP circuit as indicated by patient’s clinical presentation and suspected etiology.
 - Progressively increase the cm H2O pressure titrating to patient response. There is better tolerance with gradual pressure increases.

GENERAL CONSIDERATIONS

Continuous Positive Airway Pressure (CPAP) cont.**-MAX CPAP PRESSURE:**

*CHF and pulmonary edema: 10 cmH₂O

*All other respiratory conditions: 6 cmH₂O

8. Apply mask:

- Check for air leaks
- Consider having the patient hold the mask in place for a minute or so to reduce anxiety.
- Assist patient to maintain a good mask seal if needed.
- Using the head straps: Use of the head straps is at the discretion of the provider based on the ability to maintain a continuous face mask seal weighed against the anxiety the head straps may cause the patient.
 1. Place head strap over occipitoparietal area
 2. Gently hold the delivery device to the patient's mouth and nose.
 3. Attach the straps, loosely at first, gradually tightening as the patient tolerates.
 4. Proceed with tightening straps until air leaks are eliminated.

- Continue to coach patient to keep mask in place and readjust as needed.

9. An in line nebulizer may be run simultaneously with CPAP at 5-6 lpm.

10. Treatment should be given continuously throughout transport to ED.

11. If respiratory status deteriorates, remove device and consider positive pressure ventilation with or without intubation.

GENERAL CONSIDERATIONS:

- Removal of CPAP: CPAP therapy needs to be continuous and should not be removed unless the patient can not tolerate the mask, requires suctioning or airway intervention, is experiencing nausea, has continued or worsening respiratory failure, or a pneumothorax is suspected. Positive pressure ventilation with BVM and/or intubation should be considered if patient is removed from CPAP therapy.
- Intubation considerations: These patients are often in a state of crisis and progressing towards respiratory failure. Intubation will be inevitable in some patients regardless of the use of CPAP, and the paramedic must be prepared for rapid intervention. Indications to proceed to ET placement are (not all inclusive):
 1. Deterioration of mental status
 2. Decline of pulse ox
 3. Progressive fatigue
 4. Ineffective tidal volume
 5. Respiratory or cardiac arrest

GENERAL CONSIDERATIONS

Continuous Positive Airway Pressure (CPAP) cont.

- **Documentation:** In addition to standard documentation, the patient care record should include:
 1. starting CPAP level and any titration (in cmH₂O)
 2. FiO₂ (100%)
 3. Vital signs including pulse ox every 5 minutes while CPAP is in use
 4. Response to treatment
 5. Any adverse reactions
 6. Justification for discontinuation of CPAP or subsequent intubation.

- **Special Notes:**
 1. This procedure is specific to the Emergent PortO₂ Vent CPAP device. Do not apply it to other manufacture's devices.
 2. Advise receiving hospital as soon as possible so they can prepare for the patient's arrival.
 3. Do not remove CPAP until hospital therapy is ready to be placed on the patient.
 4. Monitor patient for gastric distension which may lead to vomiting. Consider use of Zofran if patient c/o nausea.
 5. For CHF or pulmonary edema patients, initial SL Nitro should be administered prior to placement of CPAP mask.
 6. Success is highly dependant upon patient tolerance and EMT-P ability to coach patient.
 7. Monitor closely for development of pneumothorax and/or hypotension.
 8. Monitor patients closely for vomiting or gastric distension.
 9. In line nebulization of Albuterol may be used with CPAP in place. Nebulizer should be connected to oxygen and run at 5-6 lpm. Monitor CPAP level and adjust as needed to maintain desired setting.
 10. Most patients will improve within 5-10 minutes. If no improvement is seen within this time, asses for other causes and problems. Reevaluate need for positive pressure ventilation or intubation.
 11. CPAP is an acceptable treatment option for a patient with a DNR/DNI order who is in respiratory failure.

MEDICAL PROCEDURES
CIRCULATION / SHOCK
PERIPHERAL INTRAVASCULAR (IV)

I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Any patient where intravenous access is indicated (significant trauma or mechanism, emergent or potentially emergent medical condition). 	<ul style="list-style-type: none"> • Dehydration • Hypovolemia • Need for drug therapy 	<ul style="list-style-type: none"> • Hypersensitivity to IV catheter

PROCEDURE:

1. Universal precautions. Gloves and Goggles.
2. Prepare equipment.
3. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
4. Connect saline lock and IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line and the saline lock.
5. Place a tourniquet around the patient's extremity to restrict venous flow only.
6. Select a vein and an appropriate gauge catheter for the vein and the patient's condition. The initial attempt should be the antecubital fossa.
7. Prep the skin with an antiseptic solution.
8. Insert the #18 (if possible) needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
9. Advance the catheter into the vein. Never reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
10. Remove the tourniquet and connect the IV tubing with a saline lock or primed saline lock alone.
11. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.
12. Secure IV using appropriate measures to insure stability of the line.
13. Check for signs of infiltration.
14. Adjust flow rate.
15. Document the procedure, time and result (success) on/with the patient care report.

GENERAL CONSIDERATIONS:

- IVs will be started by the EMT-Intermediate / Paramedic as allowed by each patient care Protocol.
- IV placement must not delay transport of any critical patient involved in trauma.
- Generally, no more than two (2) attempts or more than two minutes should be spent attempting an IV. If unable to initiate IV line, transport patient and notify hospital IV was not able to be started.
- IVs may be started on patients of any age providing there are adequate veins and patient's condition warrants an IV.
- Use 1000 mL bags of Ringers Lactate or normal saline for trauma patients and 500 - 1000 mL bags of normal saline for medical patients.
- Any pre-hospital fluids or medications approved for IV use, may be given through an intraosseous IV.
- All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
- Use microdrips for all patients 6 years old or less.
- Extreme care should be made to discard all IV sharps in the appropriate sharps container immediately after cannulation.
- Any venous catheter which has already been accessed prior to EMS arrival may be used.
- Upper extremity IV sites are preferable to lower extremity sites.
- Lower extremity IV sites are contraindicated in patients with vascular disease or diabetes.
- In post-mastectomy patients, avoid IV, blood draw, injection, or blood pressure in arm on affected side.

First attempt at insertion on an adult patient should be:

- 16ga IV catheter for trauma patients
- 18ga IV catheter for medical patients

MEDICAL PROCEDURES
CIRCULATION / SHOCK
EXTERNAL JUGULAR INTRAVASCULAR (IV)

I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> External jugular vein cannulation is indicated in a critically ill patient greater than 8 years of age who requires IV access for fluid or medication administration and in whom an extremity vein is not obtainable. External jugular cannulation can be attempted initially in life threatening events where no obvious other peripheral site is noted. 	<ul style="list-style-type: none"> Dehydration Hypovolemia Need for drug therapy 	<ul style="list-style-type: none"> Only (1) attempt per pt Start IV away from head, towards feet

PROCEDURE:

- Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
- Turn the patient's head toward the opposite side if no risk of cervical injury exists.
- Position yourself at patient's head.
- Locate external jugular vein.
- Prep the site as per peripheral IV site.
- Align the catheter with the vein and aim toward the same side shoulder.
- Select IV catheter
 - On adults, a large bore (16ga or 18ga) may be used
 - Use 2" IV catheter when available
- "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
- Attach the IV and secure the catheter avoiding circumferential dressing or taping.
- Secure IV using appropriate measures to insure stability of the line.
- Check for signs of infiltration
 - Adjust flow rate.
 - Document the procedure, time, and result (success) on/with the patient care report.

**ONLY (1) ATTEMPT SHOULD BE MADE DURING EXTERNAL JUGULAR IV.
DO NOT ATTEMPT AN IV ON THE OTHER SIDE OF THE NECK.**

MEDICAL PROCEDURES**GENERAL CONSIDERATIONS****PROCEDURE FOR STARTING SALINE LOCK**

1. Prepare equipment: Inject saline (approx. 1 mL) into saline lock/extension tubing and leave syringe attached to tubing.
2. Initial attempt should be the antecubital fossa, this is the preferred site for all patients. (however, other sites are to be evaluated as the situation/patient dictates)
3. Apply tourniquet.
4. Cleanse site with alcohol.
5. 18 ga IV catheter should be used for all saline locks and (IV's with tubing and solution also).
6. Flush the remaining saline through tubing/saline lock and catheter. Remove syringe.
7. Secure IV using appropriate measures to insure stability of the line.
8. Check for signs of infiltration.

GENERAL CONSIDERATIONS:

- Saline locks are preferred for patients who do not need immediate IV medication or fluids.
- Saline locks are to be attached to all IV tubing and primed together.
- Whenever a patient requires an IV primarily for medication administration, or for any patient where the IV would have been ran at TKO rate (except for traumas and cardiac / respiratory arrests).
- Extreme care should be made to discard all IV sharps in the appropriate sharps container immediately after cannulation.
- External jugular (greater than 12 years of age).

IV Tubing :

- For all adult fluid lines, use regular administration set (10 gtts) tubing.
- For child and infant patients, use (60 gtts) tubing.

MEDICAL PROCEDURES
CIRCULATION / SHOCK
INTRAOSSEOUS INFUSION

I	EMT – I	I
P	EMT – P	P

ADULT and PEDIATRIC INTRAOSSEOUS INFUSION / EZ-IO SYSTEM:

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Inability to obtain peripheral access in a patients that requires access in an emergency manner. May administer all medication and dose the same as a peripheral IV. 	<ul style="list-style-type: none"> GCU less the 8 and or Unresponsive Cardiopulmonary arrest Decompensated shock 	<ul style="list-style-type: none"> The patient is postictal and is awakening Vascular access is prophylactic and is not emergently required Patient has an infection or injury overlying the point of insertion Inability to accurately determine the landmarks require for placement Visible scar from previous orthopedic procedure

PROCEDURE: EZ-IO SYSTEM:

1. Explain procedure to patient and family
2. Choose appropriate intraosseous needle set and assemble needed equipment (pink package = Pediatric patient/ EZ-IO PD® (3 – 39 kg) and Blue package = Adult patient/ EZ-IO AD® (40 kg and over)).
3. Obtain assistance as needed
4. Use universal precautions and prep site with appropriate solution prior to procedure.
5. Prepare two (2), 10 ml syringes with normal saline flush
6. Inspect needle set cartridge to ensure intact paper seal
7. Attach 10 ml syringe to EZ-Connect® extension tubing, prime tubing with normal saline. Leave syringe attached to EZ-Connect.

Note: For patients that respond to pain who are greater than 40 kgs, prime the EZ-Connect with 20-40 mg of 2% lidocaine (preservative free). For patients 39 kgs and less, we recommend 0.5 mg/kg.

8. Position patient and palpate site(s) to identify appropriate anatomical landmarks and needle set suitability
9. Locate and stabilize appropriate site
 - Proximal Tibia** – Insertion site is one finger width (2 cm) medial to the tibial tuberosity.
 - Distal Tibia** - Insertion site is located two finger widths (4 cm) proximal to the most prominent aspect of the medial malleolus.
 - Proximal Humerus** – Insertion site is located directly on the most prominent aspect of the greater tubercle.
 - Ensure that the patient's hand is resting on the umbilicus and that the elbow is adducted.
10. Connect appropriate needle set to driver and remove needle set safety cap.

MEDICAL PROCEDURES
CIRCULATION / SHOCK
INTRAOSSUEOUS INFUSION con't

11. Position driver at insertion site with needle set at 90-degree angle to bone surface. Gently pierce the skin with needle set until needle tip touches bone.
12. Check to ensure that at least 5 mm of catheter is visible as indicated by the proximal depth indicator (black line). If less than 5 mm of the catheter is visible (no black), patient may have excessive soft tissue over selected insertion site and needle set may not reach the medullary space. Consider an alternative site for insertion or a longer needle.
13. Insert the EZ-IO needle set into selected site (keep hand and fingers away from needle set rotation) penetrate the bone cortex by squeezing driver's trigger and applying gentle, consistent, steady downward pressure (allow the driver to do the work).
14. Release driver's trigger and stop insertion process when: A sudden "give" or "pop" is felt upon entry into medullary space the desired depth is obtained.
15. Remove EZ-IO Power Driver from needle set while stabilizing the catheter hub, remove stylet from needle set and immediately dispose of stylet in appropriate biohazard sharps container.
 - * NEVER return used stylet or shuttle to EZ-IO kit or drug box.
16. Connect the primed EZ-Connect to exposed Luer-lock hub.
17. If patient is responsive to pain, consider using the appropriate dose of 2% (preservation free) lidocaine syringe bolus or flush the EZ-IO catheter with 10 ml of normal saline.
18. Confirm placement and attach primed IV tubing to the EZ-Connect.
19. Begin infusion utilizing a pressure delivery system and secure tubing and catheter.
20. Monitor the extremity for signs of complications and place EZ-IO wristband on patient.
21. Document time, date and person placing catheter or beginning infusion

CATHETER REMOVAL:

1. Remove EZ-Connect extension tubing from catheter hub
2. Attach a zeroed, 5 or 10 ml sterile syringe to the catheter hub and grasp syringe and rotate clockwise while gently pulling the catheter out (maintain a 90-degree angle to the bone).
 - ** DO NOT ROCK OR BEND DURING REMOVAL
3. Dispose of catheter in approved biohazard sharps container and apply pressure to site as needed.

PEARLS:

- ** During the EZ-IO needle set insertion use gentle-steady pressure. Do not use excessive force on the needle set. Allow the needle set's tip rotation and gentle downward pressure to provide the penetrating action. "STOP WHEN YOU FEEL THE POP."
- ** Note: Excessive pressure may cause the driver to function at less than optimal performance – remember gentle steady pressure and "EZ-does it."
- ** CAUTION: If the needle set insertion cannot be properly completed, remove and dispose of the needle set in appropriate sharps biohazard container. Repeat the procedure in the patient's opposite extremity or appropriate site with a new needle set. Ensure documentation of failed attempt.
- ** NO FLUSH = NO FLOW: Failure to appropriately flush the IO catheter may result in limited or no flow
- ** The initial flush may feel like you are pushing D50 through a 22g or 24g catheter needle – push through this resistance.

MEDICAL PROCEDURES
CARDIAC / ACLS
AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

B	EMT-B	B
I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Non-traumatic cardiac arrest in patients greater than 1 year of age. 	<p>The patient must meet ALL of the following criteria:</p> <ul style="list-style-type: none"> • Unresponsive • Apneic (not breathing) • Pulseless • Pediatric patients greater than 1 year or age 	<ul style="list-style-type: none"> • If patient is found in water, remove from water and dry patient thoroughly. Do not use an AED in an explosive atmosphere, extremely wet atmosphere, or on a metal surface. • If Medication patch found, remove patch and wipe clean before applying EKG Patches. • Do not place EKG Patch directly over patient's implanted defibrillator. • Patients less than 8 years of age require specific pediatric monitoring equipment.

PROCEDURE:

1. Perform rapid Universal Patient Care Protocol, establish no breathing and no pulse.
2. Perform CPR for (2) minutes.
3. Attach the defibrillation pads to the patient's chest and connect the chords to the AED.
 - a. The sternum pad is to be attached to the patient's upper right chest, to the right of the sternum on the mid-clavicular line.
 - b. The apex pad is to be attached to the patient's lower left rib cage, laterally and beneath the left nipple.
4. Turn the unit ON and follow the voice prompts.
5. Rhythm analysis:
 - a. Do not have any patient contact while the AED analyzes.
 - b. Rhythm analysis should take approximately 9-13 seconds.
6. If the AED unit's voice prompts advise that 'no shock is advised':
 - a. Check for a pulse
 - b. If no pulse, continue CPR.
 - c. The unit will reanalyze.
7. Visually check that no one is in contact with the patient and announce CLEAR.
8. Press the SHOCK button when advised to by the unit's voice prompts.
9. Continue CPR for 2 minutes.
10. If the patient's pulse has returned:
 - a. Insure that the patient has a patent airway and treat accordingly.
3. If the patient remains pulseless, continue use of CPR and AED.

GENERAL CONSIDERATIONS:

- Do not use the AED in cases of traumatic or hypovolemic cardiac arrest (unless driver involved in MVA is in cardiac arrest and is suspected of having an acute MI while driving).
- Resuscitation should be withheld in all cases where such efforts would be futile. Patients should be considered DOA and resuscitation should not be attempted in the following situations:
 - a. Refer to the Dead on Arrival (DOA) Policy.
 - b. A valid (within the last 2 years) Do Not Resuscitate (DNR). Refer to the Advanced Directives – Do Not Resuscitate (DNR) Policy.
- Defibrillation cables should be inspected for damage and/or wear.

MEDICAL PROCEDURES
CARDIAC / ACLS
CARDIAC DEFIBRILLATION (MANUAL)

I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia 	<p>The patient must meet ALL of the following criteria:</p> <ul style="list-style-type: none"> Unresponsive Apneic (not breathing) Pulseless 	<ul style="list-style-type: none"> If patient is found in water, remove from water and dry patient thoroughly. Do not use an AED in an explosive atmosphere, extremely wet atmosphere, or on a metal surface. If Medication patch found, remove patch and wipe clean before applying EKG Patches. Do not place EKG Patch directly over patient's implanted defibrillator. Pediatric patients less than 8 years of age require specific pediatric monitoring equipment.

PROCEDURE:

Lifepak 12

- Follow the Universal Patient Care Protocol. Establish no breathing and no pulse.
- Provide (2) minutes of CPR.
- Attach EKG Fast Patches and cords. Plug cords into EKG monitor.
- Recognize EKG findings as ventricular fibrillation or pulseless ventricular tachycardia.
- Charge the device to 360 J if monophasic or 200 for first shock, 300 second shock and 360 for third and proceeding shock if biphasic.
- Press the SHOCK button and deliver the shock.
- Visually check that no one is in contact with the patient and announce CLEAR.
- Resume CPR for (2) minutes.
- Check monitor for changes in rhythm. Check pulse. If no change in rhythm, repeat steps 5 - 8.
- If EKG reveals change in findings, treat with the appropriate ACLS Protocol.

CARDIAC / ACLS

12 LEAD CARDIAC MONITORING

B	EMT-B	B
I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Suspected cardiac patient • Suspected tricyclic overdose • Electrical injuries 	<ul style="list-style-type: none"> • Chest pain / tightness • Chest discomfort • Chest discomfort relieved prior to arrival • Pulmonary edema • Palpitations • Irregular heartbeat • Syncope • Dizziness • Unexplained diaphoresis • Dyspnea not related to Asthma / COPD • Weakness / Numbness • ABD pain (of possible cardiac origin) • Tingling / discomfort to extremity / jaw • HR less than 50 or greater than 120 (unknown cause) • Hypotension / Hypertension • Medical Control orders 	<ul style="list-style-type: none"> • Insufficient training. • (Basic and Intermediate EMT's are to apply leads, do the 12 lead and transmit. However they are not to interpret).

Placement of the "V" Leads
V1: 4th ICS – right of the sternum
V2: 4th ICS – left of the sternum
V3: Between V2 and V4
V4: 5th ICS midclavicular
V5: Between V4 and V6
V6: Even with V4 midaxillary

PROCEDURE: Lifepak 12

1. Follow the Universal Patient Care Protocol.
2. Place the patient in a position of comfort and explain the procedure.
3. Apply the Limb and V Leads to the patient, protecting patient privacy.
4. Enter patient information.
5. Avoid patient movement and disturbance of EKG Leads.
6. Press 12 – LEAD button. Allow monitor to analyze, interpret, and print rhythm strip.
7. Make appropriate connections to transmitting device and press **TRANSMIT** button to send EKG rhythm strip to hospital via telemetry.

GENERAL CONSIDERATIONS:

- Standard pre-hospital EKG monitoring should be done using Lead II.
- A (6) second strip should be recorded and placed with the EMS run report.
- A 12-Lead EKG should be performed on any patient with a complaint that may be cardiac in origin.
- Protect the patient's modesty.
- The 12-Lead ECG should be acquired prior to medication administration (except oxygen) and extricating the patient.
- If the patient is having an acute MI, contact the receiving hospital as soon as possible.
- The paramedic should give one copy of the 12-Lead EKG to the ED physician / nurse and/or transmit via cell phone immediately. Attach a second copy to the run report.
- EKG adhesive patches should remain on the patient for consistent lead placement with follow up EKGs, but should be removed before the D-Fib patches are applied.
- The monitor should remain on the patient for continuous cardiac monitoring enroute.

MEDICAL PROCEDURES

CARDIAC / ACLS

SYNCHRONIZED CARDIOVERSION (MANUAL)

P

EMT – P

P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia) Patient is not pulseless 	<ul style="list-style-type: none"> Symptomatic Narrow Complex Tachycardia Symptomatic Wide Complex Tachycardia Symptomatic Atrial Fibrillation Symptomatic Atrial Flutter 	<ul style="list-style-type: none"> A Pulseless patient

PROCEDURE: Life Pak 12

- Apply 3 - Lead EKG.
- Consider sedation with Valium 2 - 5 mg IV, prior to administering synchronized cardioversion.
- Attach EKG Fast Patches to the patient and monitor.
 - Push the **PADDLES** button to monitor the patient's rhythm through the FAST Patches.
- Push the **SYNC** button. Confirm that the Sync LED blinks with each detected QRS complex.
 - Observe the EKG rhythm. Confirm that the triangle sense marker appears near the middle of each QRS complex.
 - If the sense markers do not appear or they are displayed in the wrong location adjust the EKG size or select another lead.
 - The location of the sense marker may vary slightly with each QRS complex.
- Rotate the **ENERGY SELECT** dial and select the proper setting as required by the protocol.
- Push the **CHARGE** button.
- Make sure that everyone is clear of the patient.
- After confirming that the monitor is still in SYNC mode, push and hold the **SHOCK** button until it discharges.
- Reassess the patient and the cardiac rhythm. Repeat steps 4-9 as indicated by the protocol.

GENERAL CONSIDERATIONS:

- When attempting to cardiovert, double check to make sure that the SYNC button is ON.
- Monitor the patient for V-Fib.
- If the patient converts into V-Fib or pulseless V- Tach, reassess the patient. Immediately defibrillate the patient at 360 J or biphasic equivalent and refer to the Ventricular Fibrillation / Pulseless Ventricular Tachycardia Algorithm.
- Tachycardia Protocol and treat accordingly.
- When using the Life Pak 12, apply the EKG Fast patches in the anterior lateral position.
- When using the Lif Pak 12, if the **SHOCK** button is not pushed within 60 seconds, the energy will be internally removed. It will be necessary to recharge to the indicated energy setting.
- When synchronized cardioverting a patient, there may be a delay from when the button is depressed to when the shock is delivered.

Synchronized Cardioversion (mono and biphasic monitors)

If:	Sequence:			
Atrial Fibrillation	100 to 200 J	300 J	360 J	
Stable monomorphic VT	100 to 200 J	300 J	360 J	
Other SVT Atrial Flutter	50 J	100 to 200 J	300 J	360 J
Polymorphic VT (irregular form and rate) and unstable	Treat as VF with high-energy shock (defibrillation doses)			

MEDICAL PROCEDURES
CARDIAC / ACLS
EXTERNAL TRANSCUTANEOUS PACING

P	EMT – P	P
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INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Patients with symptomatic bradycardia after no response to atropine or primary treatment if unable to start an IV • Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturer's guidelines • If used in asystole, it must be used early 	<ul style="list-style-type: none"> • Adult bradycardia with severe hemodynamic compromise • Symptomatic bradycardia that is refractory to pharmacological intervention • Symptomatic 2 or 3 degree heart block • Asystolic cardiac arrest 	<ul style="list-style-type: none"> • Hypothermia • Cardiac arrest longer than 20 minutes • Pediatric bradycardia

PROCEDURE: Life Pak 12:

1. Consider sedation with Valium 2 - 5 mg IV, prior to administering transcutaneous pacing.
2. Attach pacing cables to the monitor.
3. Apply the electrodes to the patient.
 - a. Place the pacing patches anterior-posterior or anterior-lateral.
 - b. Do not place the pacing patches over the sternum, spine or nipple.
4. Push the **PACER** button.
5. Push the **CURRENT** button and increase the milliamps until you reach electrical and mechanical capture (assess the carotid or femoral pulses to confirm mechanical capture).
6. Push the **RATE** button (it will default to 80 bpm).
7. Push the **PACER** button.
8. Push the **EVENT** button to quick log CPR, medication administration, ETT placement etc.
9. Hold the **PAUSE** button to stop the pacing so you can assess the patient's underlying rhythm.

GENERAL CONSIDERATIONS:

- The Life Pak 12 will begin pacing immediately once the pacer is turned on.
- Monitor the patient for ventricular fibrillation.

MEDICAL PROCEDURES
MEDICAL
BLOOD GLUCOSE ANALYSIS

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.) Medical Alert Tags Drug / Toxic Ingestion 	<ul style="list-style-type: none"> Decreased mental status Change in baseline mental status Bizarre behavior Hypoglycemia (cool, diaphoretic skin) Hyperglycemia (warm, dry skin, fruity breath, Kussmal respirations, signs of dehydration) 	<ul style="list-style-type: none"> Insufficient training

PROCEDURE:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis may be obtained simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.
- Low glucose (less than 80 with symptoms), normal glucose (80 - 120), high glucose (greater than 200).
- Consider restraints if necessary for patient's and/or personnel's protection per the restraint procedure.
- Conduct and document weekly (or manufacturer's recommendations) Q.I. checks for glucometers.

MEDICAL PROCEDURES

MEDICAL

PAIN ASSESSMENT AND MANAGEMENT

B	EMT-B	B
I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Injury requiring pain management 	<ul style="list-style-type: none"> Abdominal pain Chest pain secondary to infarction or angina Acute urinary retention Fractures Severe burns Kidney stones Musculoskeletal trauma 	<ul style="list-style-type: none"> Altered level of consciousness Head injuries Chest injuries (blunt or penetrating) Intoxication Maxillofacial injuries Psychiatric problems COPD (because of the 50% oxygen mixture) Pediatric patients under 12 years of age Pregnancy Respiratory distress

PROCEDURE:

- Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
- Pain should be assessed and documented during initial assessment, before starting pain control treatment, and with each set of vitals.
- Pain should be assessed using the appropriate approved scale.
- Two pain scales are available:
 - 0-10 Scale:** the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
 - Wong-Baker "faces" scale:** this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-5. This scale can be documented with the numeric value or pain description.

KEY POINTS

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

The Wong-Baker Faces Pain Rating Scale
 Designed for children aged 3 years and older, the Wong-Baker Faces Pain Rating Scale is also helpful for elderly patients who may be cognitively impaired. It offers a visual description for those who don't have the verbal skills to explain how their symptoms make them feel.

The diagram shows six faces representing pain levels from 0 to 5. Face 0 is smiling (No Hurt), Face 1 is slightly smiling (Hurts little bit), Face 2 is neutral (Hurts little more), Face 3 is neutral with a slight frown (Hurts even more), Face 4 is frowning (Hurts whole lot), and Face 5 is crying (Hurts worst). To the right is a vertical scale from 0 (No Pain) to 10 (Worst Possible Pain).

To use this scale, your doctor should explain that each face shows how a person in pain is feeling. That is, a person may feel happy because he or she has no pain (hurt), or a person may feel sad because he or she has some or a lot of pain.

A Numerical Pain Scale
 A numerical pain scale allows you to describe the intensity of your discomfort in numbers ranging from 0 to 10 (or greater, depending on the scale). Rating the intensity of sensation is one way of helping your doctor determine treatment. Numerical pain scales may include words or descriptions to better label your symptoms, from feeling no pain to experiencing excruciating pain. Some researchers believe that this type of combination scale may be most sensitive to gender and ethnic differences in describing pain.

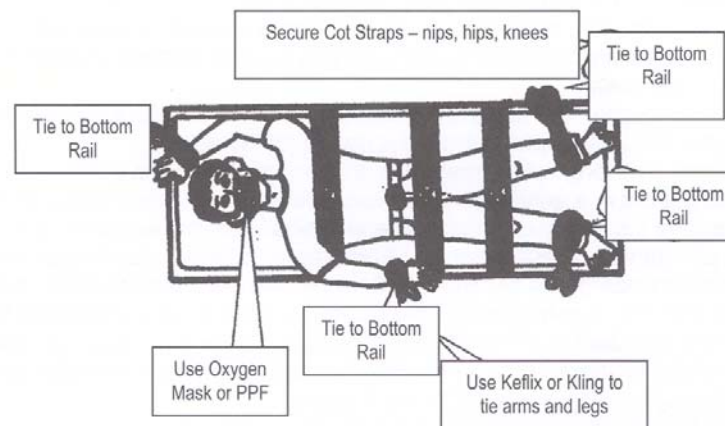
MEDICAL

PATIENT RESTRAINT

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury. • Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters. • Protection of EMS and patient for treatment 	<ul style="list-style-type: none"> • Patient out of control and may cause harm to self or others. • Necessary force required for patient control without causing harm. • Head Trauma • Alcohol / Drug related problems, metabolic disorders (i.e., hypoglycemia, hypoxia, etc.) • Psychiatric / Stress related disorders 	<ul style="list-style-type: none"> • None if warranted.

PROCEDURE:



GENERAL CONSIDERATIONS:

- Soft restraints are to be used only when necessary in situations where the patient is potentially violent and may be of danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of medical conditions such as but not limited to:
- Patient health care management remains the responsibility of the EMS provider. The method of restraint shall not restrict the adequate monitoring of vital signs, ability to protect the patient's airway, compromise peripheral neurovascular status or otherwise prevent appropriate and necessary therapeutic measures. It is recognized that evaluation of many patient parameters, requires patient cooperation and thus may be difficult or impossible.
- All restraints should have the ability to be quickly released, if necessary.
- Restraints applied by law enforcement (i.e., handcuffs) require a law enforcement officer to remain available to adjust restraints as necessary for the patient's safety. This policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control.
- Patients shall not be transported in a face down prone position to endure adequate respiratory and circulatory monitoring and management. Frequent distal neurovascular checks are required.
- Restrained extremities should be monitored for color, nerve and motor function, pulse quality.
- Place mask on patient for body secretion protection. May use TB mask, or Non-rebreather if patient needs oxygen.
- Use supine or lateral positioning ONLY and DOCUMENT methods used.

MEDICAL PROCEDURES
TRAUMA
CERVICAL SPINE IMMOBILIZATION

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Need for spinal immobilization as determined by protocol 	<ul style="list-style-type: none"> Traumatic Injury Suspected Traumatic Injury Unresponsive / Altered LOC of Unkown Origin Mechanism of Injury 	<ul style="list-style-type: none"> Insufficient training

PROCEDURE:

- Gather a backboard, straps, C-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head.
- Explain the procedure to the patient.
- Place the patient in 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 applied the collar.
- Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself).
- Place the patient on a long spine board with the log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard by the safest method available that allows maintenance of inline spinal stability.
- 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.
- NOTE:** Some patients, due to size or age, will not be able to be immobilized through inline 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.
- Document the time of the procedure in the patient care report.

GENERAL CONSIDERATIONS:

- Use of a backboard for stabilization injuries other than the neck or to move the patient, does not automatically require cervical immobilization.
- Use of cervical immobilization in adult trauma patients, should always be followed with long board immobilization, including straps.
- Never leave patients alone if they are fully immobilized. Be prepared to turn the long board while maintaining c-spine stabilization if the patient begins to vomit.
- A C-collar by itself does NOT adequately immobilize the patient.
- PROPERLY DOCUMENT THE DECISION TO NOT PROVIDE CERVICAL SPINE IMMOBILIZATION.**

TRAUMA

CERVICAL SPINE IMMOBILIZATION con't.**Trauma:**

In trauma cases, the neck should be immobilized under any of the following circumstances:

- The patient complains of neck pain, pain on palpitation, or pain with range of motion.
- The patient complains of numbness, tingling, or motor weakness in any extremity.
- Mechanism of injury with other distracting injuries.
- The patient has a head injury, altered mental status, or language barrier, which limits the patient's ability to describe pain, numbness or weakness.
- The patient has a head injury or altered mental status that limits their ability to describe pain, numbness or weakness.
- Mechanism of injury with patient intoxication.
 - If the history suggests a mechanism of injury, which could result in cervical injury in a patient who is intoxicated, cervical immobilization must be provided whether or not the patient is alert and oriented.
- Anytime the Paramedic or EMT judges that cervical immobilization is necessary.

Pediatric Considerations:

Small children (less than 7 years of age) have relatively large heads. Use of standard cervical immobilization and backboards will result in cervical flexion. Use an immobilization method that avoids flexion of the neck. Current approved methods include, but are not limited to:

- Devices which have a recess for the child's occiput (Pedipak with padding applied)
- Placing the patient into the sniffing position by placing padding under the shoulders and lower back.
- Cervical collars should be used along with any of these modifications, unless there is not an appropriate size c-collar. If a circumstance prevents the use of a c-collar, other approved methods of immobilization include:
 - * Manual immobilization
 - * Blanket or towel rolls immobilization
 - * Tape immobilization

MEDICAL PROCEDURES**TRAUMA****HELMET REMOVAL**

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> Need for spinal immobilization as determined by protocol 	<ul style="list-style-type: none"> Traumatic Injury Suspected Traumatic Injury Unresponsive / Altered LOC of Unknown Origin Mechanism of Injury 	<ul style="list-style-type: none"> Insufficient training

REMOVAL OF HELMET	LEAVE HELMET IN PLACE
<ul style="list-style-type: none"> Inability to access, assess and maintain airway and breathing. Improperly fitted helmet allowing for excessive head movement within helmet. Proper C-spine alignment and immobilization cannot be achieved. Cardiac arrest. EMTs are trained in technique. 	<ul style="list-style-type: none"> Helmet fits well with little or no movement of head in helmet. No impending airway or breathing problems. Removal may cause further injury. Proper C-spine alignment and immobilization can be achieved with helmet in place. There is no interference with the ability to assess and reassess airway and breathing.

Helmet Types:**Sport B** (Football, Ice Hockey, Field Hockey, Fencing, Baseball)

- Typically open anteriorly
- Easier to access airway
- If shoulder pads are used in conjunction with helmet and helmet is removed, then shoulder pads need to be removed simultaneously for proper C-spine alignment.

Motorcycle / Bike / Skateboarding

- When full-faced, airway is harder to access and maintain.
- Face shield may be removed for airway access.

SPORTS HELMETS PROCEDURE:

- Most fit athlete tightly, especially football. They should be left in place.
- All are equipped to have face piece removed separate from helmet. In most cases, removal of facemask is all that is needed, as the alignment of c-spine can be done with shoulder pads and helmet in place.
- Removal of facemask may be done by cutting rubber straps that hold it in place to access airway.

HELMET REMOVAL con't.**4. Removal:**

- If helmet must be removed due to unusual circumstances, at least 4 people are needed.
- Shoulder pads need to simultaneously be removed (when shoulder pads are involved is to use forearms to stabilize helmet and place hands at base of neck grasping the shoulder area).
- While maintaining manual c-spine, helmet's inside face pads may be loosened by use of a tongue blade to unsnap them with a twisting motion. Then cut the shoulder pads laces and straps and all shirts and jerseys from end of sleeve to center to allow for quick removal.
- Lift patient flat up for removal of equipment. Helmet should be grasped and tilted slightly to remove. **DO NOT SPREAD SIDES OR BACK EDGE OF HELMET, WILL IMPINGE UPON NECK.**
- At same lift, pull off shoulder pads and clothing.
- Lower patient down and apply c-collar.

MOTORCYCLE / BIKE / SKATEBOARDING PROCEDURE:

1. Usually do not fit tightly and may allow movement of head inside helmet.
2. If head can move, no c-spine immobilization is possible.
3. Some have separate face piece that can be moved for airway access.
4. Some have full face design that is not moveable where chin section is a rigid continuation of the helmet.
5. C-spine alignment difficult due to no shoulder padding. Must create pad to form straight alignment.
6. If unable to secure c-spine of airway, the helmet should be removed at the scene.

7. Removal:

- Take eyeglasses off before removal of the helmet.
- One EMT stabilizes the helmet by placing hands on each side of the helmet with fingers on mandible to prevent movement.
- Second EMT removes any straps by cutting them.
- Second EMT places one hand on the mandible at the angle of the jaw and the other hand posteriorly at the occipital region.
- The EMT holding the helmet pulls the sides of the helmet outwards away from the head and gently slips the helmet halfway off and stops.
- The EMT maintaining stabilization of the neck, repositions hold by sliding the posterior hand superiorly to secure the head from falling back after complete helmet removal.
- Helmet is then completely removed.

MEDICAL PROCEDURES
OBSTETRICS
NORMAL CHILDBIRTH

B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Imminent delivery with crowning 	<ul style="list-style-type: none"> • Urge to push • Visible crowning 	<ul style="list-style-type: none"> • See Gynecological Emergencies

PROCEDURE:

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe. Mouth then nose.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the Newly Born Protocol for further treatment.
11. The placenta will deliver spontaneously, within 5-15 minutes of the infant. Do not force the placenta to deliver. Contain all tissue in plastic bag and transport.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

MEDICAL PROCEDURES

PHARMACOLOGY

NITRONOX -NITROUS OXIDE ADMINISTRATION

I	EMT – I	I
P	EMT – P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Acute urinary retention • Fractures • Severe burns • Kidney stones • Chest pain secondary to infarction or angina • Musculoskeletal trauma • Abdominal pain • Back pain 	<ul style="list-style-type: none"> • Injury requiring pain management • Patient able to self-administer 	<ul style="list-style-type: none"> • Altered level of consciousness • Head injuries • Chest injuries (blunt or penetrating) • Intoxication • Maxillofacial injuries • Psychiatric problems • COPD • Pediatric patients under 12 years of age or less than 75 pounds • Pregnancy • Respiratory distress • Abdominal pain related to possible bowel obstruction or traumatic abdominal injury.

PROCEDURE:

1. Instruct patients to administer Nitronox to themselves by placing the mask tightly against their face and breathing deeply and slowly.
2. Allow mask to fall away from face spontaneously when effects are felt.
3. Check Blood Pressure - Nitronox may cause BP to drop in some cases.

GENERAL CONSIDERATIONS:

- Nitronox is a self-administered analgesic gas containing a mixture of 50% oxygen and 50% nitrous oxide.
- Nitronox is supplied in a carrying case containing two cylinders, one of nitrous oxide and one containing oxygen, with a mixing valve and supply tubing. These agents are mixed on administration to deliver a 50% concentration of each to the patient. Negative pressure is required to open the valve, so the patient must have an airtight seal at the face mask.
- Nitronox should be given to any patient who is alert and complaining of severe pain.
- Nitronox should never be administered by the EMTI or Paramedic. Only self-administration by the patient is to be used.
- Upon administration of Nitronox, constantly monitor patient to see he does not fall asleep with mask in place.
- The side effects of Nitrous Oxide, in addition to analgesia, include light-headedness, drowsiness, and very occasionally nausea and vomiting. Changes in heart rate and respiratory rate are minimal.
- Nitrous Oxide and Oxygen are both non-flammable gases, but both support combustion. For this reason do not use Nitronox in areas where there is a combustion hazard.

There is an increased risk of liver cancer and birth defects to individuals who are exposed repeated applications of Nitrous-Oxide. For this reason Nitronox should be used in a well ventilated environment .

MEDICAL PROCEDURES
SPECIAL OPERATIONS
NERVE AGENT EXPOSURE - MARK 1 KIT

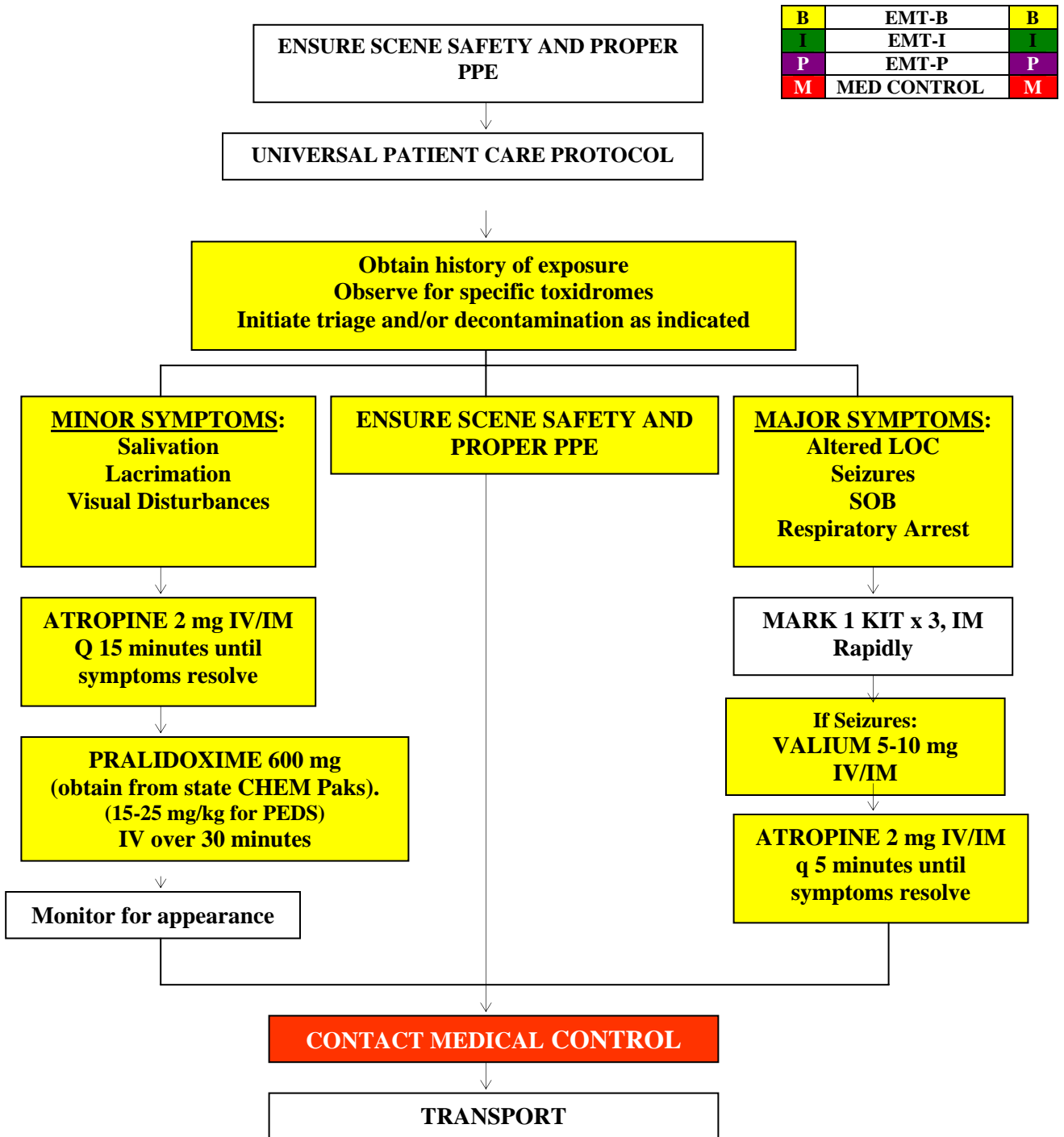
B	EMT-B	B
I	EMT - I	I
P	EMT - P	P

INDICATIONS	SIGNS AND SYMPTOMS	CONTRAINDICATIONS
<ul style="list-style-type: none"> • Exposure to chemical, biologic, radiologic, or nuclear hazard • Potential exposure to unknown substance / hazard • For use of Fire, EMS, and Police personnel only • Nerve agent exposure (e.g., VX, Sarin, Soman, etc.) • Organophosphate exposure (pesticide) 	<ul style="list-style-type: none"> • Visual Disturbances • Headache • Nausea / Vomiting • Salivation • Lacrimation • Respiratory Distress • Diaphoresis • Seizure Activity • Respiratory Arrest 	<ul style="list-style-type: none"> • Vesicant exposure (e.g., Mustard Gas, etc.) • Respiratory Irritant Exposure (e.g., Hydrogen Sulfide, Ammonia, Chlorine, etc.)

GENERAL CONSIDERATIONS:

- If Triage / MCI issues exhaust supply of Mark 1 kits, use Atropine. Give 2 mg dose for patients greater than 90 pounds (greater than 40kg).
- Follow local HAZMAT protocols for decontamination and use of personal protective equipment.
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they are not from other agents (e.g., narcotics, vesicants, etc.).
- Each Mark 1 kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine.
 - If the presence of a nerve agent is suspected by presentation of symptoms of large numbers of patients, personnel should immediately contact dispatch to notify other responding units and command staff.
- The patient and/or crew must be decontaminated prior to transport. DO NOT transport a contaminated patient to a treatment facility.
- SLUDGEM: Salivation, Lacrimation, Urination, Defecation Gastrointestinal upset, Emesis, Muscle twitching.
- When the nerve agent has been ingested, exposure may continue for some time due to slow absorption from the lower bowel, and fatal relapses have been reported after initial improvement.
- If dermal exposure has occurred, decontamination is critical and should be done with standard decontamination procedures. Patient monitoring should be directed to the same signs and symptoms as with all nerve or organophosphate exposures.
- Continued medical monitoring and transport is mandatory.
- Atropine must be given first, do not give anything else until the effects of atropine become apparent. Only when the effects of the atropine have been seen can you then give Pralidoxime (2 PAM CL).
- Pralidoxime (2-PAM CL) is most effective if administered immediately after the poisoning but not before Atropine, especially for severe exposures.

MEDICAL PROCEDURES
SPECIAL OPERATIONS
NERVE AGENT EXPOSURE – MARK 1 KIT



MEDICAL PROCEDURES
SPECIAL OPERATIONS
TASERED PATIENT

INDICATIONS:

- Any patient that was subjected to taser use.

PROCEDURE:

1. Follow Universal Patient Care Protocol.
2. Confer with Law Enforcement Officer regarding the patient's behavior prior to EMS arrival.
3. Refer to the appropriate medical protocol if the patient has a life-threatening injury or medical illness or continues to be combative.
4. Determine the location of the Taser probes. Do not remove probes unless they interfere with patient care.
5. Perform a 12-Lead EKG and continuously monitor the patient's EKG. If the patient has a dysrhythmia, refer to the appropriate protocol.

GENERAL CONSIDERATIONS:

- With the increased use and deployment of TASER's by our area's local law enforcement agencies, EMS providers must be aware of the appropriate medical assessment of the tasered patient. The TASER is designed to transmit electrical impulses that temporarily disrupt the body's central nervous system. Its Electro-Muscular Disruption (EMD) technology causes an uncontrollable contraction of the muscle tissue, allowing the TASER to physically debilitate a target regardless of pain tolerance or mental focus.
- All patients subjected to taser use must be assessed for trauma and medical causes for the combative behavior.
- Always apply the cardiac monitor and obtain a strip for patients with irregular / abnormal pulse, elderly, pacemaker, ASHD, known CAD, and Excited Delirium.
- The patient's vital signs must be reassessed every 5 minutes.
- Determine if the patient used any mind altering stimulants, has a cardiac history, and the date of their last Tetanus shot.
- The cord or wire may be cut, but leave the probes embedded in the patient.
- Removal of the probe (remove one at a time).
- Stabilize the skin surrounding the puncture site by placing one hand by where the probe is embedded.
- Pull the probe straight out from the puncture site in one fluid motion.
- TASER barbs that do penetrate the skin and are removed in the field are to be treated as "contaminated" sharps and are to be placed in an appropriate sharps container. Use small single use containers as law enforcement may wish to hold custody of the barbs after removal.