

SECTION IV

SPECIAL PROCEDURES

IV. SPECIAL PROCEDURES

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ENDOTRACHEAL INTUBATION

INDICATION

Endotracheal intubation is to be utilized for any victim with respiratory arrest and/or insufficiency to achieve complete control over the airway. It protects the airway from aspiration of foreign material and it allows for intermittent positive pressure ventilation to be achieved with 100% oxygen. It makes the trachea and the respiratory tract available for suctioning, and also eliminates the problem of gastric distention.

HAZARDS

- A. Esophageal intubation.
- B. Tracheal rupture.
- C. Right mainstem bronchus intubation.
- D. Broken teeth.
- E. Laryngospasms.
- F. Trauma to the oral-pharynx.
- G. Trauma or puncture of trachea due to misplacement of stylet.

ORAL-TRACHEAL INTUBATION

- A. Always begin artificial ventilation as soon as possible using mouth-to-mouth, nose-to-nose, bag-valve-mask or oxygen powered manually triggered ventilation device.
- B. Assemble and ready equipment:
 - 1. Endotracheal tubes of various sizes
 - 2. Laryngoscope and blades
 - 3. Malleable stylet
 - 4. Magill forceps
 - 5. 10cc syringe
 - 6. Suction apparatus and catheters
 - 7. Water soluble lubricant
 - 8. ET tube tape
 - 9. Oropharyngeal airway
- C. Check cuff on tube for leaks and lubricate tube. First attempt should be without stylet. Insert stylet into tube, if necessary.

ENDOTRACHEAL INTUBATION (cont)

- D. Assemble laryngoscope and check bulb.
- E. Put victim's head in sniffing position. Do not allow the head to hang over the end of the table or bed; the occiput of the head should be on the same horizontal plane as the back of the shoulders, with the neck somewhat elevated.
- F. Holding the laryngoscope in the left hand, insert the blade to the right of the midline, moving the tongue up and to the left, with the blade ending up in the midline, giving clear visualization of the glottic opening.
- G. Suction the mouth and the pharynx.
- H. Visualize the epiglottis and vocal cords.
- I. Select the proper size tube and insert in with the right hand, starting at the corner of the mouth down into the trachea, past the vocal cords approximately 2 inches.
- J. Remove laryngoscope and stylet (if used), holding the tube securely with the right hand.
- K. Attempt to ventilate with mouth-to-tube or bag-valve-mask and check for breath sounds in BOTH lungs.
- L. If breath sounds are heard, inflate the tube's cuff with 4-6cc of air and secure the tube in place with oropharyngeal airway used as bite block.
- M. Maintain ventilation until adequate respirations resume or victim is delivered to an emergency department.
- N. Recheck lungs sounds and verify tube placement each time patient is moved or every 10 minutes.
- O. Document the intubation by noting the following:
 - 1. Number of attempts.
 - 2. Person(s) making attempts.
 - 3. Size of tube used.
 - 4. Type of laryngoscope blade used on each attempt.
 - 5. Lung sounds before intubation.
 - 6. Lung sounds after intubation and time of each check.
 - 7. Measurement on tube at lips of patient when lung sounds are present.
 - 8. Any complications.

NASOTRACHEAL INTUBATION

- A. Nasotracheal intubation of the airway may be used when the patient has an unprotected, inadequate airway creating hypoxia.
- B. Nasotracheal intubation is indicated in:
 - 1. Patients with spontaneous breathing when all other methods of airway control and oxygenation proved to be inadequate.

ENDOTRACHEAL INTUBATION (cont)

2. Trauma patients when C-spine manipulation must be kept to a minimum and all other methods of airway control and oxygenation prove to be inadequate.
- C. Nasotracheal intubation is contraindicated in patients with fractures in the base of the skull or face, and in any patients who are apneic.
- D. Hazards of nasotracheal intubation include:
1. Nasal hemorrhage.
 2. Laryngeal damage due to increased manipulation.
 3. Rupture of cuff balloon from use of Magill forceps.
- E. When attempting nasotracheal intubation:
1. Always begin basic airway control and oxygenation as soon as possible.
 2. Assemble and ready equipment:
 - a. Endotracheal tubes of various sizes. (ENDOTROL type)
 - b. Laryngoscope and blades.
 - c. Magill forceps.
 - d. 10cc syringe.
 - e. Water soluble lubricant.
 3. Determine size of tube based on size of nasal opening.
 4. Check tube cuff for leaks and lubricate tube; seat 15mm connector firmly into tube.
 5. Holding tube in dominant hand, place thumb against the 15mm connector and index finger in the ring loop.
 6. Insert the tube into the right nostril and advance tube gradually, anterior to posterior, avoiding superior movement which will be met with resistance and could cause injury.
 7. As the tube enters the pharynx, listen for breathing 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. Confirm tube placement with breath sounds, fogging of tube and end tidal CO₂ monitoring.
 10. Intubation attempt should not take longer than 30 seconds.
 11. If any resistance is encountered during insertion, abandon procedure and utilize another method of airway control and oxygenation.
 12. Recheck lung sounds / verify tube placement each time patient is moved or every 10 minutes.
 13. Document the intubation by noting the following:
 - a. Number of attempts.
 - b. Person(s) making attempts.

ENDOTRACHEAL INTUBATION (cont)

- c. Size of tube used.
- d. Lung sounds before intubation.
- e. Lung sounds after intubation and time of each check.
- f. Measurement on tube at nose of patient when lung sounds are present.
- g. Any complications.

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:

- A. Explain procedure to victim.
- B. Prepare suction equipment with large-bore catheter and suction secretions from endotracheal tube, mouth and pharynx.
- C. 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:
 - 1. 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; or
 - 2. Positive pressure is administered with a hand-held ventilator and, at the end of deep inspiration, the cuff is deflated and the tube rapidly removed.
- D. Prepare to suction secretions and gastric content if vomiting occurs.
- E. Appropriate oxygen is then administered.
- F. 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.
- G. The patient is not to be left unattended until there is no doubt of their ability to function without the artificial airway.

TUBE SIZING

The size of tube that can be passed easily into most adults is 8.0 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) |

All the above tube sizes are still dependent on the child's size in consideration of age.

Children before puberty should have a uncuffed tube, or if the tube has a cuff it should not be inflated after insertion.

ENDOTRACHEAL INTUBATION (cont)

ADMINISTRATION OF MEDICATION THROUGH ET TUBE

In the event an intravenous or intraosseous route for administration of medication cannot be established, but an endotracheal tube has been properly put in place, medications such as Narcan, Atropine, Epinephrine and Lidocaine can effectively be administered through the tube.

It is suggested that personnel use the Emergency Medication Tube "EMT" endotracheal tube for all adult patients needing oral-tracheal intubation. For pediatric patients, personnel will use the "Endo-Ject" adapter and catheter. Both of these systems will allow for the administration of medication in accordance with current guidelines, and allow for simultaneous ventilation and medication administration.

The current guidelines state a catheter should be passed beyond the tip of the endotracheal tube, compressions stopped, and the medication sprayed quickly into the lower airway.

Medications should be administered at two (2) times the IV dosage and diluted with 10 ml of saline or sterile water before administration.

If the "EMT" or "Endo-Ject" is not used, the following procedure should be followed:

1. Remove needle from syringe.
2. Hyperventilate patient and make sure ET tube and airway are clear of mucous.
3. Disconnect ventilation device from tube and squirt medication rapidly into tube.
4. Reconnect ventilation device and rapidly ventilate patient to assure passage of medication down the tube and airway.

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

END TIDAL CO₂ MONITORING

In order to assure placement of the ET tube into the trachea after intubation, end tidal CO₂ monitoring will be done. This procedure will be achieved by using the Nellcor "Easy Cap" device on adults and the "Pedi-Cap" devices on children under 30 lbs.

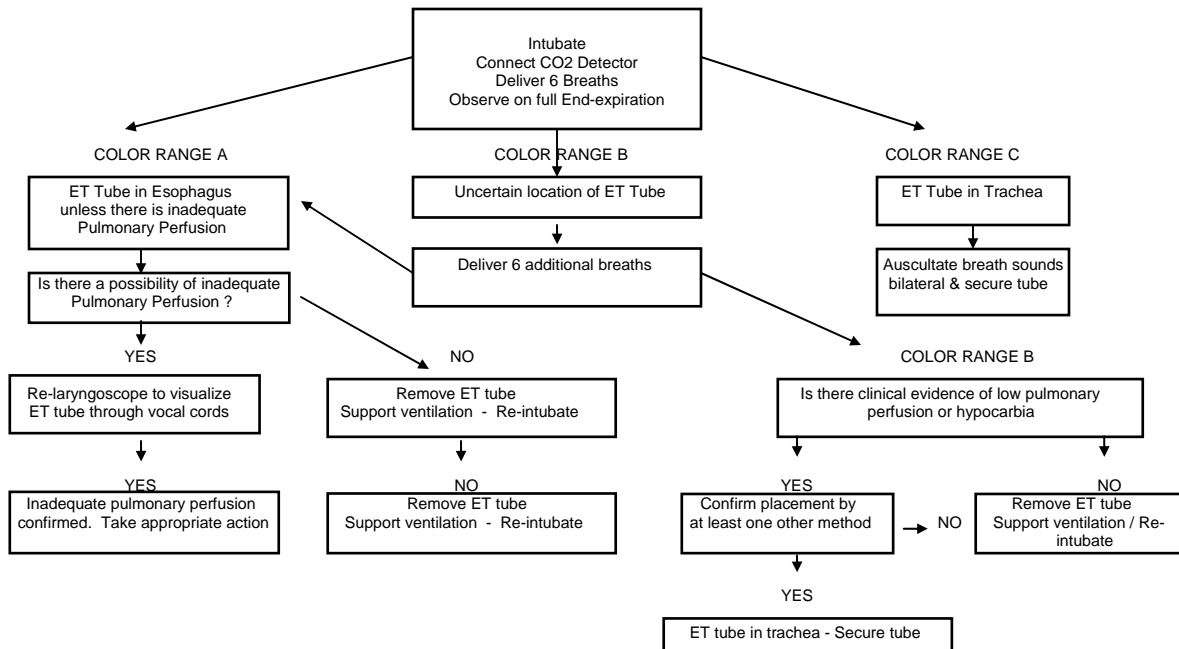
This will be achieved through the use of a FEF end tidal CO₂ detector after each intubation attempt.

Procedure for use:

- A. Remove FEF detector from package. (Do not remove end caps until ready to use device)
- B. Remove end caps immediately before use and shake device to introduce room air.
- C. Match initial color of the indicator to the purple color labeled "CHECK" on the product dome. If the purple indicator color is not the same or darker, do not use.
- D. Insert endotracheal tube. (Inflate cuff if tube is equipped with one)
- E. Firmly attach FEF detector between the endotracheal tube and the breathing device.

ENDOTRACHEAL INTUBATION (cont)

- F. Ventilate patient with six breaths of moderate tidal volume (may be done quickly). Interpreting result with less than six breaths can yield false results.
- G. Compare color of indicator on full end-expiration to color chart on product dome. SEE ALGORITHM.
- H. If initial intubation attempts fail, the FEF detector can be used for re-intubation on the same patient provided the indicator color still matches the "CHECK" color standard on product dome.
- I. The FEF detector may left in place during ventilation to assist monitoring tube placement.
- J. This device is not to be used for:
 1. Detection of hypercarbia.
 2. Detect mainstem bronchial intubation.
 3. During mouth to tube ventilations.



ESOPHAGEAL INTUBATION DETECTOR PROTOCOL

A. Indications:

To be used during all endotracheal intubation procedures to supplement, but not replace clinical evaluation for inadequate esophageal intubation.

B. Procedure:

1. Test the device for air leaks.
2. Insert endotracheal tube.
3. Attach EID to endotracheal tube.
4. Retract the syringe plunger over 2-3 seconds.
 - a. If air returns and fills the syringe completely;
 1. Remove EID and inflate endotracheal tube balloon.
 2. Ventilate and check for breath sounds bilaterally over the chest and confirm the lack of sounds in the epigastric region.
 - b. If air **DOES NOT** return;
 1. Resistance to retraction: remove endotracheal tube and repeat steps 2 through 4.
 2. Vomit returns: leave endotracheal tube in place and repeat steps 2 through 4.

COMBITUBE

INDICATIONS

- A. The Combitube Airway is to be inserted in any patient in respiratory and/or cardiac arrest to prevent aspiration of gastric contents.
- B. The Combitube can also be utilized in cases of respiratory insufficiency when the patient is totally unconscious and unresponsive to outside stimuli.
- C. Paramedics should only use the Combitube after attempts at endotracheal intubation have not been successful.
- D. EMT-A's and ADV EMT-A's may use the Combitube as a primary airway in the above stated situations.

CONTRAINDICATIONS

- A. In responsive victims. (gag reflex present)
- B. In children under 15 years of age and/or under five feet tall.
- C. In cases of known esophageal disease or cirrhosis.
- D. In cases of caustic poison ingestion.
- E. Foreign body in the trachea.
- F. History of esophageal trauma or injury.
- G. Presence of a tracheostomy or laryngectomy.
- H. Suspected narcotic overdose or hypoglycemia prior to the administration of Narcan and/or Glucose.

HAZARDS

- A. Rupture of the esophagus.
- B. Edema as a result of facial trauma or respiratory burns may obstruct the airway.
- C. Damage to the proximal cuff by broken teeth or dentures.

APPLICATION

- A. Always begin artificial ventilation immediately using an oral or nasal airway and mouth-to-mask, bag valve mask, or manually triggered oxygen delivery device.
- B. Remove dentures and/or suction any secretions from the mouth and oropharynx.

COMBITUBE (cont)

- C. Hyperoxygenate the patient with several ventilations by BVM or manually triggered oxygen delivery device.
- D. Remove oral airway if in use; place the head and neck in a neutral position.
- E. Grasp the jaw between your thumb and index finger and lift the jaw straight upward.
- F. With the other hand, hold the Combitube so that it curves in the same direction as the natural curvature of the pharynx.
- G. Insert the tip into the mouth and advance gently until the printed rings are aligned with the teeth or alveolar ridges.

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

- H. Inflate line one pilot balloon leading to the pharyngeal cuff with 100 ml of air using the 140 ml syringe.

This may cause the Combitube to move slightly from the patient's mouth

- I. Inflate the line two pilot balloon leading to the distal cuff with approximately 15 ml of air using the 20 ml syringe.
- J. Begin ventilation through the longer blue connecting tube; if the chest rises and falls and auscultation of lung sound is positive and auscultation of gastric sounds is negative, continue to ventilate through this tube.

Under this usage condition, the second clear connecting tube may be used for the removal of gastric air and/or fluid with the suction catheter provided with the airway.

- K. If auscultation of lung sounds is negative and gastric sounds are positive, IMMEDIATELY begin ventilation through the shorter clear connecting tube.

Confirm tracheal ventilation by auscultation of lung and gastric sounds; if the chest rises and falls and auscultation of lung sounds is positive and auscultation of gastric sounds is negative, continue to ventilate with this tube.

- L. Secure the Combitube with appropriate securing device.
- M. Monitor SpO₂ and/or end tidal CO₂.
- N. Document the procedure by noting the following:
 - 1. Number of attempts / person(s) making attempts.
 - 2. Lung sounds before insertion.
 - 3. Time of insertion.

COMBITUBE (cont)

4. Presence of lung sounds and absence of gastric sounds immediately after insertion and every 10-15 minutes or after each significant movement of the patient. (i.e. moving the patient up/down stairs, placing the patient on a backboard/cot, moving the patient to the ambulance)
5. If longer blue port or shorter clear port is being used for ventilations.
6. SpO2 / End Tidal CO2 readings every 10-15 minutes.
7. Any complications.

Example of documentation: "1850: Combitube inserted by _____ without difficulty on first attempt. Lung sounds present bilaterally with no gastric sounds noted with ventilations through the blue port."

REMOVAL OF THE COMBITUBE

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

It is preferred that the patient be endotracheally intubated first, but it is not necessary. If the Combitube is in the esophageal position, the clear tube should be used to suction the gastric contents.

The following procedure will be followed:

1. Turn the 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), and attempt endotracheal intubation if applicable.
4. Deflate the distal cuff (white pilot bulb) and remove the airway.
5. Aspirate any emesis. A significant number of patients will vomit at this point.

GENERAL CONSIDERATIONS

- A. The Combitube is a single patient use device and is not to be cleaned and reused.
- B. You should not take more than ten (10) seconds during any one attempt at inserting the Combitube, this will prevent hypoxia.
- C. Insertion of the suction catheter may be initiated any time it is desirable to evacuate the stomach contents.
- D. 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.
- E. If lung sounds are present and gastric sounds are absent with the ventilations being delivered through the longer blue port, the Combitube has been placed in the esophagus and endotracheal medication CAN NOT be delivered down the tube.
- F. It is desirable to have the patient endotracheally intubated before attempting to remove the Combitube. This will help protect the airway in the event of vomiting.

LARYNGEAL MASK AIRWAY

DESCRIPTION

- A. The Laryngeal Mask Airway is an alternative airway device used for anesthesia and airway support. It consists of an inflatable silicone mask and rubber connecting tube. It is inserted blindly into the pharynx, forming a low-pressure seal around the laryngeal inlet and permitting gentle positive pressure ventilation. All parts are latex-free.

INDICATIONS

- A. Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- B. Appropriate intubation is impossible due to patient access or difficult airway anatomy

CONTRAINDICATIONS

- A. Certain designs of the LMA that are not approved for pre-hospital use.
- B. Morbidly obese patients
- C. Obstructive or abnormal lesions of the oropharynx, ex. Pulmonary Fibrosis

ADVANTAGES

- A. Allows rapid access
- B. Does not require laryngoscope
- C. Relaxants not needed
- D. Provides airway for spontaneous or controlled ventilation
- E. Tolerated at lighter anesthetic planes

DISADVANTAGES

- A. Does not fully protect against aspiration in the non-fasted patient
- B. Standard LMA does not allow high positive pressure ventilation

EMT-B, EMT-I, EMT-P

- A. Check the tube for proper inflation and deflation.
- B. Lubricate with a water-soluble jelly.
- C. Pre-Oxygenate the patient with 100% Oxygen
- D. Insert the LMA into the hypopharynx until resistance is met.
- E. Inflate the cuff until a seal is obtained.
- F. Connect the LMA to an ambu bag and assess for breath sounds, air entry, and end tidal CO₂.
- G. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
- H. Re-verify LMA placement after every move and upon arrival in the ED
- I. Document procedure, time, and result (success) on/with the patient care report (PCR)

CONTINUOUS POSITIVE AIRWAY PRESSURE

GENERAL CONSIDERATIONS

- A. The use of CPAP has long been recognized as an effective treatment for patients suffering from exacerbation of congestive heart failure and COPD. CPAP has recently shown promise in the out-of-hospital setting as well, by demonstrating favorable results in the treatment of acute congestive heart failure.
- B. The use of CPAP for the treatment of patients who might otherwise receive endotracheal intubation holds several benefits:
 - 1. CPAP is a less invasive procedure with lesser risk of infection. This eliminates the possibility for adverse reactions following the administration of any antibiotics given for infection.
 - 2. CPAP eliminates the necessity of weaning the patient off an ET tube and ventilator.
 - 3. CPAP eliminates the necessity of sedating or paralyzing an alert patient by ALS or the emergency department staff in order to perform laryngoscopy.
 - 4. CPAP allows the alert patient to have a continued dialogue with his / her caregivers. This allows for the exchange of additional medical history. It also allows for the patient to be involved in the decision-making process for his / her care.

INDICATIONS

- A. Respiratory distress or failure, due to cardiogenic pulmonary edema or COPD / Asthma in which the patient demonstrates spontaneous respirations and a patent, self-maintained airway.
- B. Patients 15 years of age or older.
- C. CPAP may be considered for non-cardiogenic pulmonary edema.

CONTRAINDICATIONS

- A. Circumstances in which Endotracheal intubation or a surgical airway is preferred or necessary to secure a patent airway.
- B. Circumstances in which the patient does not improve or continues to deteriorate despite CPAP administration.

PROCEDURE

- A. Assure there is a patent airway.
- B. Administer 100% oxygen via appropriate delivery system.
- C. Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter reading, and cardiac rhythm.
- D. Apply CPAP device per the manufacturer's recommendations.
- E. Continuously reassess the patient.
- F. Monitor continuous pulse oximetry.
- G. Monitor continuous end tidal carbon dioxide monitoring (with nasal prongs if available).
- H. Follow the appropriate set of standing orders for your specific device for continued treatment.
- I. Contact medical control as soon as possible to allow for prompt availability of hospital CPAP equipment and respiratory personnel.

Note: For circumstances in which the patient does not improve or continues to deteriorate despite CPAP and/or medicative therapy, terminate CPAP administration and perform BVM ventilation and endotracheal intubation if necessary.

12-LEAD ECG

INDICATIONS

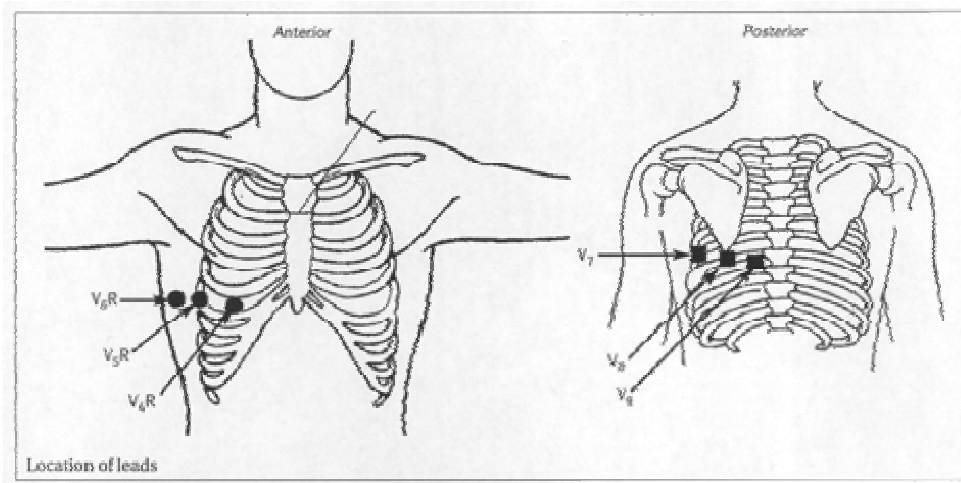
- A. Suspected cardiac patient
- B. Suspected tricyclic overdose
- C. Electrical injuries
- D. Syncope

EMT-P

- A. Assess patient and monitor cardiac status.
- B. Administer oxygen as patient condition warrants.
- C. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG.
- D. Prepare ECG monitor and connect patient cable with electrodes.
- E. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
- F. Expose chest and prep as necessary (Drying, shaving, roughing up, etc.). Modesty of the patient should be respected.
- G. Apply chest leads and extremity leads using the following landmarks:
 - 1. RA -Right arm
 - 2. LA -Left arm
 - 3. RL -Right leg
 - 4. LL -Left leg
 - 5. V1 -4th intercostal space at right sternal border
 - 6. V2 -4th intercostal space at left sternal border
 - 7. V3 -Directly between V2 and V4
 - 8. V4 -5th intercostal space at left midclavicular line
 - 9. V5 -Level with V4 at left anterior axillary line
 - 10. V6 -Level with V5 at left midaxillary line
- H. Instruct patient to remain still.
- I. Press the appropriate button to acquire the 12 Lead ECG.
- J. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.
- K. Monitor the patient while continuing with the treatment protocol.
- L. Interpret the results of the 12-lead.
- M. Print the 12-lead and attach a copy of the 12 lead to the PCR.
- N. If the original 12-lead shows ST segment elevation in the inferior leads (II, III, and AvF) perform a right sided chest lead ECG.
 - 1. RA – Right arm
 - 2. LA – Left arm
 - 3. RL – Right leg
 - 4. LL – Left leg
 - 5. V1R – 4th intercostal space at the left sternal border
 - 6. V2R – 4th intercostal space at the right sternal border
 - 7. V3R – Directly between V2 and V4
 - 8. V4R – 5th intercostal space at the right midclavicular line
 - 9. V5R – Level with V4 at the right anterior axillary line
 - 10. V6R – Level with V5 at the right midaxillary line
- O. Clearly label the printout as a right sided 12-lead.



- P. If the original 12-lead shows ST segment depression in the anterior leads (V1, V2, V3, and V4) perform a posterior lead EKG.
1. RA – Left in place
 2. LA – Left in place
 3. RL – left in place
 4. LL – Left in place
 5. V1 – Left in place
 6. V2 – Left in place
 7. V3 – Left in place
 8. V4 – move to become V7 – level with V6 at the posterior axillary line
 9. V5 – move to become V8 – level with V7 at the mid scapular line
 10. V6 – move to become V9 – level with V8 paravertebral
- Q. Clearly label the printout as a posterior 12-lead
- R. Follow device specific procedure for transmission of the 12-lead to the receiving facility.
- S. Document the procedure, time, and results on/with the patient care report (PCR).



EXTERNAL PACEMAKER

INDICATIONS

An external pacemaker may be used in the following situations:

A. Patients with symptomatic bradycardia, unresponsive to Atropine.

NOTE: Depending on the clinical severity of the patient, pacing may be initiated prior to atropine.

B. May pace without a direct order provided the patient's:

- Heart rate is less than 60 and SBP < 60; or the
- Heart rate is less than 40 and the patient is symptomatic.

APPLICATION

Consider sedation (2-4mg Versed), then in the conscious patient with bradycardia, the rate is to be set at 70 beats per minute and the current at 20 milliamperes, which is to be increased by 20 milliamperes every 10 seconds until complete capture is obtained.

Once complete electrical capture is obtained, check for mechanical capture (pulse).

The external pacemaker is only to be used on pediatric patients with On-line Medical direction.

Nitroglycerine patches are to be removed before pacing.

IV PROCEDURES

GENERAL CONSIDERATIONS

IVs will be started by the EMT-Intermediate and/or the 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 five 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.

Blood draws for hospital laboratory testing will not be required under this protocol.

IV SOLUTION

0.9% Sodium Chloride will be the only fluid used in the pre-hospital setting under this protocol. Sodium Chloride solution is provided in 250ml bags and 3cc syringes for TKO IVs and 1000ml bag for fluid replacement.

The solution is to be infused as directed by specific treatment protocols.

IV TUBINGS

The following tubing will be used for this protocol:

- A. For all adult fluid lines, use regular administration set (10 drop) tubing.
- B. For child and infant patients, use 10 drop set with 3-way stopcock and extension tubing.
- C. For all patients needing TKO lines, use extension tubing with pre-pierced adapter as saline lock.

MECHANICS FOR STARTING PERIPHERAL IV

- A. Prepare equipment.
- B. The initial attempt should be the dorsum of hand. Further attempts should proceed to the forearm; do not use the antecubital fossa unless necessary.
- C. Apply tourniquet.
- D. Cleanse site with Betadine solution and alcohol. (The only time Betadine is not required is when the patient has an allergy to Betadine type solutions.)
- E. First attempt at insertion on an adult patient should be:

IV PROCEDURES (cont)

1. 16ga IV catheter for trauma patients.
 2. 18ga IV catheter for medical patients.
- F. Canulate the vein checking for a flash and proper filling of the vacuum portion of the needle.
 - G. Attach IV tubing.
 - H. Secure IV using appropriate measures to insure stability of the line.
 - I. Check for signs of infiltration.
 - J. Adjust flow rate.
 - K. Document IV procedure on run sheet.

| |
|--|
| MECHANICS FOR STARTING EXTERNAL JUGULAR IV LINE |
|--|

- A. Locate external jugular vein.
- B. Cleanse site with Betadine solution and alcohol. (The only time Betadine is not required is when the patient has an allergy to Betadine type solutions.)
- C. Select IV catheter.
 1. On adults, a large bore (16ga or 18ga) may be used.
 2. Use 2" IV catheter when available.
- D. Position yourself at patient's head.
- E. Turn patient's head so as to maximally expose vein and minimize interference of jaw.
- F. Canulate the vein by directing the needle caudal at an angle nearly parallel to the neck.
- G. Attach IV tubing.
- H. Secure IV using appropriate measures to insure stability of the line.
- I. Check for signs of infiltration.
- J. Adjust flow rate.
- K. Document IV procedure on run sheet.

IV PROCEDURES (cont)

DOCUMENTATION

ALL IV attempts must be recorded on run sheet and include the following:

A. When successful:

- i. Time IV was started.
- ii. Type and amount of solution hung and infused during run.
- iii. Flow rate.
- iv. Size of catheter or needle used.
- v. Location of IV site.
- vi. Initials of all EMTs who attempted and/or started IV.
- vii. Signature of EMT In-charge of run.

B. When unsuccessful:

- i. Time IV was attempted.
- ii. Type of solution.
- iii. Size of catheter or needle used.
- iv. Location of attempted site.
- v. Initials of all EMTs who attempted and/or started IV.
- vi. Signature of EMT In-charge of run.

C. Record all IV medications given.

- i. Name of medication.
- ii. Dosage and amount given.
- iii. Time ordered (if applicable).
- iv. Time given.
- v. Initial of all EMTs who administered medication.
- vi. Signature of EMT In-charge of run.

PEDIATRIC INTRAOSSEOUS INFUSION

INDICATIONS

- A. To establish parenteral means to administer fluids, blood products and parenteral medications, and to draw blood. (Except for CBC's)
- B. May be used in any instance that an IV route would be appropriate.
- C. Its use should be considered after two IV attempts have failed or if no peripheral IV sites are found.
- D. This procedure is indicated primarily in children.

CONTRAINDICATIONS

- A. Osteomyelitis or cellulitis over the proposed site.
- B. Fracture at or above the proposed site.
- C. Previous IO attempt at the proposed site.

EQUIPMENT

- A. 16ga intraosseous needle.
- B. Betadine and Alcohol.
- C. IV setup.
- D. Syringe for aspiration.
- E. Lidocaine prn.

PROCEDURE

- A. Prepare as for a surgical procedure, using sterile technique.
- B. Attempt to have feet in flexed position against board or sandbag.
- C. If the patient is alert, consider using a local anesthetic.
- D. The preferred site is the proximal anteromedial tibia, 1-3 cm below the tibial tuberosity. Secondary site is the distal femur, midline, 3 cm above condyle.
- E. Needle insertion varies between seventy and ninety degree angle to the skin surface, approximately one to two finger breadths distal to the tibial tuberosity. With a straight steady push and/or rotary motion, push needle through subcutaneous tissue and bone until a drop or pop is felt.
- F. Once the needle has reached the bone marrow, saline should be injected via syringe to clear needle and then aspiration should be attempted. The infusion should flow freely without evidence of subcutaneous infiltration.

INTRAOSSSEOUS INFUSION (cont)

- G. The needle should feel firm in position and stand upright without support.
- H. Infusion via this route is the same as venous access without limit to rate of administration, drugs pushed or fluid type infused.
- I. After removing needle (for successful or unsuccessful attempt), apply pressure to area for five minutes and apply dressing to area.
- J. Intraosseous infusions of fluid may cause subcutaneous infiltration, osteomyelitis or subcutaneous infections.

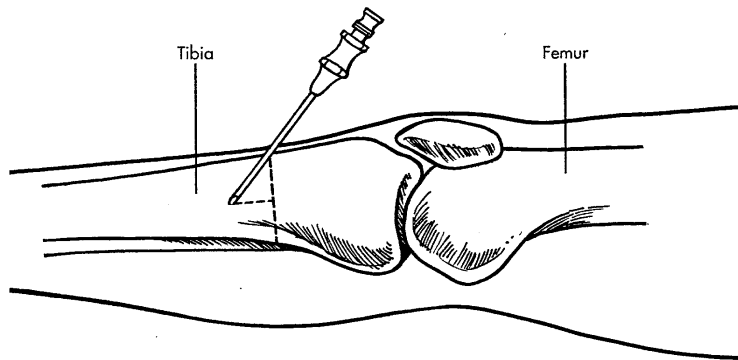


Fig. 1 Medial tibial site for intraosseous infusion.

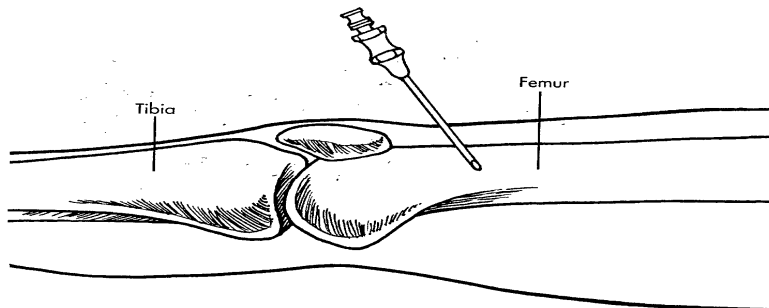


Fig. 2 Medial femur site for intraosseous infusion.

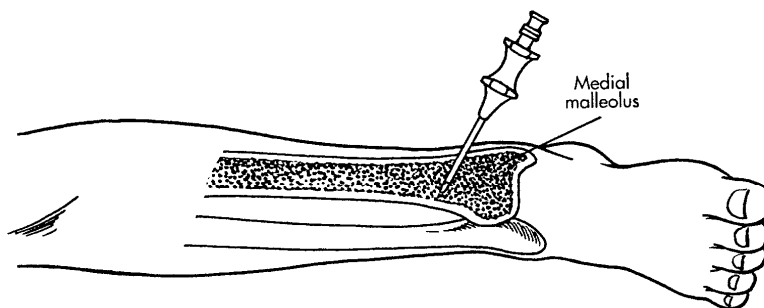


Fig. 3 Distal tibial site for intraosseous infusion.

ADULT INTRAOSSEOUS DEVICE

GENERAL CONSIDERATIONS

Any medications or fluids that can be administered using IV infusion can be infused with an adult IO.

IO medication dosages and fluid boluses are the same as those used in IV infusion, as both procedures route directly into the patient's bloodstream.

INDICATIONS

- A. Inability to obtain peripheral access in an adult patient that requires access in an emergency manner.
- B. May be used in any instance that an IV route would be appropriate
- C. Its use should be considered after two IV attempts have failed or if no peripheral IV sites are found

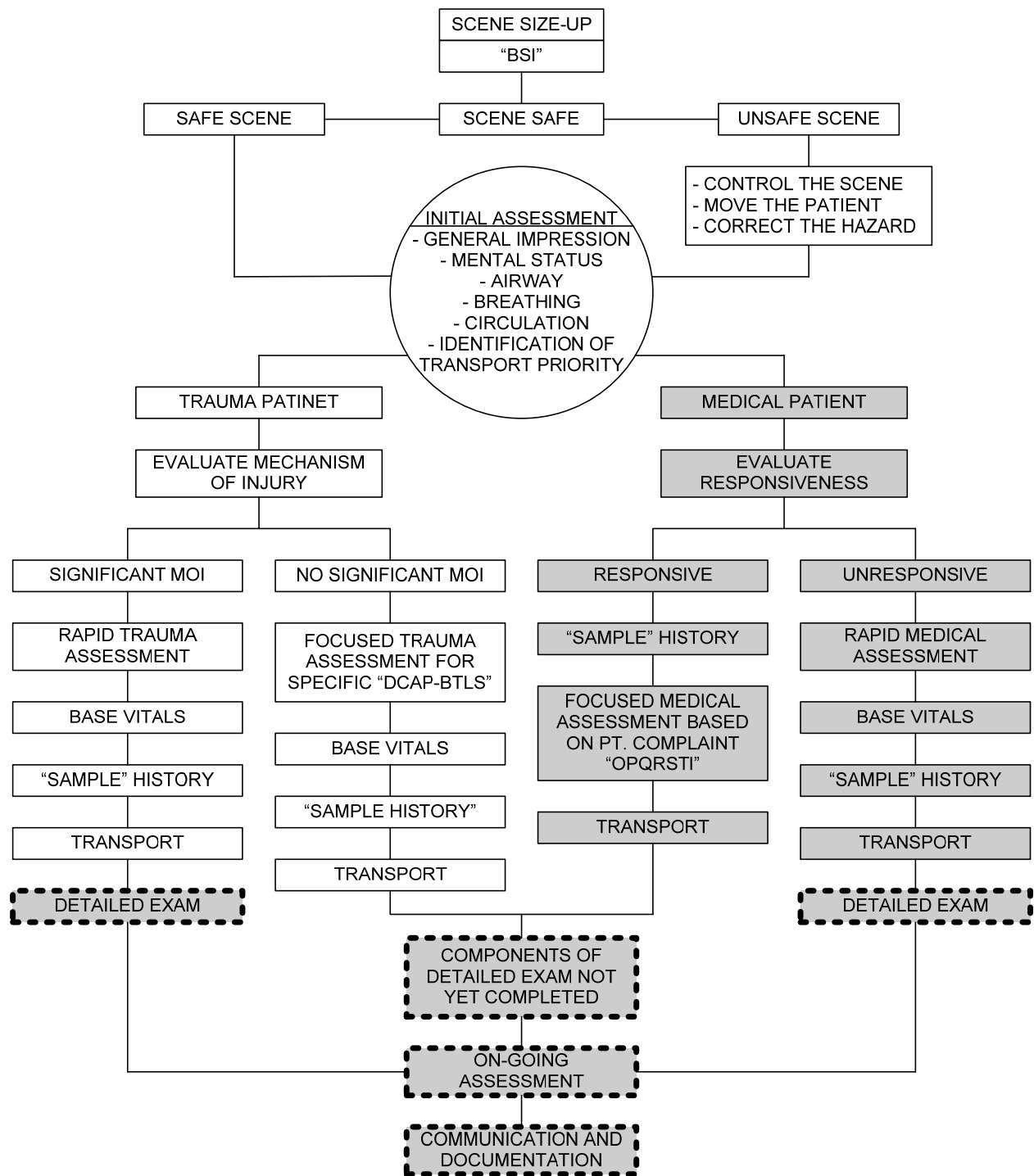
CONTRAINDICATIONS

- A. The contraindications of an adult IO are specific to the type of IO Infusion System selected.

EMT-I, EMT-P

- A. There is not a preferred adult IO device. The requirements of use are that the members of the department are intimately familiar with the device, they are comfortable with the device, and they have trained extensively with the device.
- B. See the Supplemental section of the protocol, your departments training manual, or your training officer for your device specific instructions for use.

PATIENT ASSESSMENT



ORTHOSTATIC BLOOD PRESSURE MEASUREMENT

GENERAL CONSIDERATIONS

- A. Patient situations with suspected blood / fluid loss / dehydration.
- B. Patients > 8 years of age: or patients larger than the Broselow tape

EMT-B, EMT-I, EMT-P

- A. Assess the need for orthostatics.
- B. Obtain patient's pulse and blood pressure while supine.
- C. Have the patient stand for one minute.
- D. Obtain patient's pulse and blood pressure while standing.
- E. If pulse has increased by 30 BPM **or** systolic blood pressure decreased by 30 mmHg, the orthostatics are considered positive.
- F. If the patient has an increase in dizziness, weakness, nausea, or other symptoms prior to standing for the whole minute stop the test. An increase or worsening of the symptoms is considered a positive test result. It is not necessary and not recommended to have these patients continue standing.
- G. If patient is unable to stand, orthostatics may be taken while the patient is sitting with feet dangling.
- H. If positive orthostatic changes occur while sitting, **DO NOT** continue to the standing position.
- I. Document the time and vital signs for supine and standing positions on/with the patient care report (PCR).
- J. Determine appropriate treatment based on protocol.

PULSE OXIMETRY

GENERAL CONSIDERATIONS

Pulse oximetry is used in conjunction with other assessment processes to determine the actual available oxygen in the blood for use by body tissue. Pulse oximetry measures the oxygen saturation of the red blood cells, (%SpO₂).

Studies have shown that EMS personnel are fairly accurate in the assessment and treatment of patients in profound hypoxia. However in mild to moderate hypoxic states, EMS personnel sometimes do not react until the patient has progressed to profound hypoxia. Signs of progressive hypoxia need to be identified rapidly and the condition treated before profound hypoxia occurs.

Use of pulse oximetry in conjunction with other assessment processes may sometimes identify those patients in mild to moderate hypoxia, and with proper intervention profound hypoxia can be prevented.

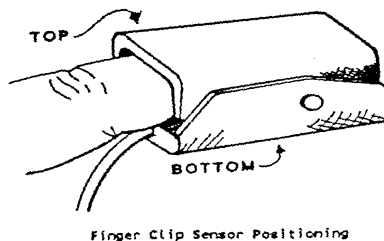
If available, pulse oximetry should be used on all patients. Pulse oximetry should be maintained and evaluated until the patient is delivered to the Emergency Department.

REMEMBER, INITIATE NORMAL AIRWAY AND OXYGENATION SUPPORT REGARDLESS OF THE AVAILABILITY OF PULSE OXIMETRY.

NEVER BASE ANY TREATMENT OR OXYGEN THERAPY SOLELY ON THE READING FROM THE PULSE OXIMETER.

PROCEDURE

- A. Select sensor and apply according to manufacturer's recommendations. The following should be noted:
 1. Finger Clip Sensors - These are designed for spot-check monitoring of older pediatric and adult patients and/or continuous monitoring less than 30 minutes where patient movement is not expected.
 - a. Insert finger (preferably left or right index finger) completely into sensor, keeping fingernail side facing the sensor top. It is specifically recommended that the thumb not be used in the finger clip sensor.
 - b. For best results when using the finger clip in longer term monitoring or with active patients, secure the sensor cable independently from the sensor, preferably around the base of the finger. Make sure blood supply to the finger is not impaired by the application of the tape.



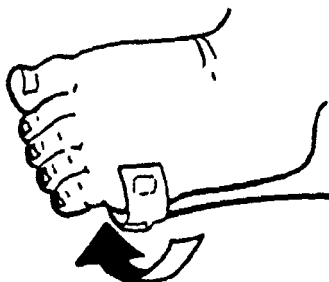
PULSE OXIMETRY (cont)

2. Flex Sensor - This sensor is designed for monitoring pediatric and adult patients in whom moderate patient movement is expected.
 - a. Position the sensor on the top and bottom of the end of the finger or toe. Place the light emitter portion on the finger/toe-nail side and the detector of the side opposite of the nail, making sure to align the emitter and detector through the tissue.
 - b. Secure the sensor with 3M Micropore tape, making sure not to restrict blood flow. Attach the sensor cable independently at the base of the finger, again being careful not to restrict blood flow.



Infant Sensor Placement on Big Toe

3. Infant and Neonatal Sensors - These sensors are designed for continuous monitoring of infants and neonates since fingertip monitoring is impractical.
 - a. The infant sensor is designed for application on the big toe of infants greater than 2 kilograms (5 pounds).
 - b. The neonatal sensor is designed for application on the foot of infants less than 2 kilograms in weight.
 - c. Apply and secure these sensors as described for the flex sensor, being sure not to restrict blood supply to the monitored area.



Infant and Neonatal Sensor Placement on Foot

PULSE OXIMETRY (cont)

4. Ear Clip Sensor - This sensor is used when finger clip sensing is not possible. Be sure to clean the ear lobe with alcohol before applying the sensor. Be aware pierced ears may allow some light to pass directly to the detector and result in an inaccurate reading.
 5. Reflectance Sensor - This sensor is used on well vascularized skin surfaces in adult patients only. This method is not preferred in the pre-hospital setting.
- B. Turn oximeter on and verify operation according to manufacturer's operating procedure.
 - C. A relative operation check can be achieved by applying the sensor to your own finger.
 - D. Always cleanse sensor site of blood and dirt for reliable reading. Some fingernail polishes may have to be removed to obtain a reading.
 - E. Apply sensor to patient and obtain reading.

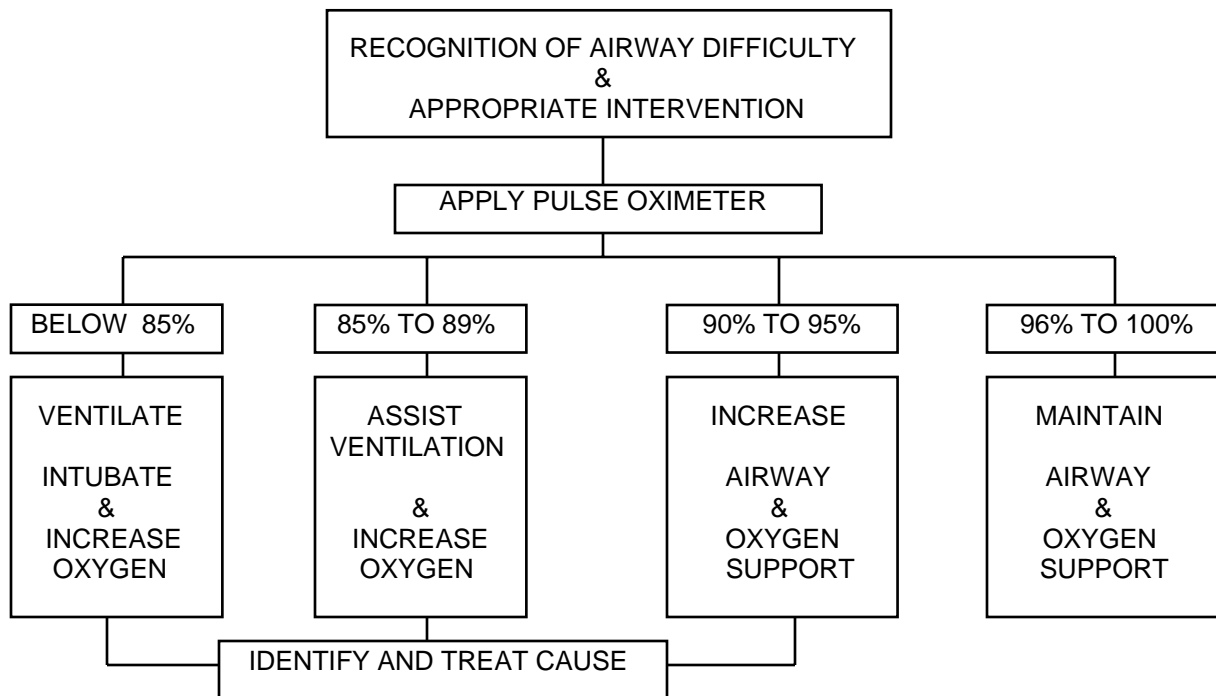
Interpretation of Reading:

100% to 96% Ideal Range - Maintain oxygen and airway support methods being used

95% to 90% Mild to Moderate Hypoxemia - Check airway and increase oxygen support until ideal range is achieved.

89% to 85% Severe Hypoxemia - Aggressive airway and oxygen support is essential Look for and treat cause: i.e. COPD, metabolic imbalance, peripheral vascular shutdown.

Below 85% BE PREPARED TO INTUBATE AND/OR ASSIST VENTILATION.



PULSE OXIMETRY (cont)

CONSIDERATIONS

- A. Hypovolemic, hypothermic, and peripheral vascular disease patients may not be suitable candidates for pulse oximetry due to peripheral shutdown.
- B. Be aware that there may be a 30 to 60 second delay between changes in %SpO₂ conditions and pulse oximetry readings.
- C. A pulse must be detected by the oximeter to determine the %SpO₂.
- D. Pulse oximetry is not indicated in carbon monoxide poisoning.
- E. COPD patients will normally have a low %SpO₂ and should not be treated in accordance with this guideline.

CARBON MONOXIDE PROTOCOL

A. Symptomatic Patients:

1. Signs and symptoms – headache, nausea, fatigue
EMS evaluation – yes
Treatment – high flow oxygen
Transport – non-emergency
2. Signs and symptoms – dizziness, shortness of breath
EMS evaluation – yes
Treatment – high flow oxygen, monitor
Transport – emergency
3. Signs and symptoms – altered level of consciousness, confusion
EMS evaluation – yes
Treatment – high flow oxygen, monitor
Transport – emergent transport to a hyperbaric oxygen capable facility (AGMC, Mercy)

B. Asymptomatic Patients:

1. Less than 10ppm
EMS evaluation – none
Treatment – none
Transport – none
2. Greater than 10ppm but less than 100ppm
EMS evaluation – interview for symptomatic patients
Treatment – remove from the environment
Transport - none
3. Greater than 100ppm
EMS evaluation – yes
Treatment – removal form the environment
Transport – none

Patients that show signs and symptoms at lower CO levels include: pregnant females, infants, children and the elderly.

Patients that demonstrate altered mental status may **NOT** sign refusals for treatment or transport.

Patients found to demonstrate signs or symptoms during the interview process or EMS evaluation shall be treated and transported as per part A above.

TRAUMA TRIAGE PROTOCOL

DEFINITIONS

- A. As used in this chapter and section 4765.01 of the Revised Code, "trauma" or "traumatic injury" means severe damage to or destruction of tissue that satisfies both of the following conditions:
1. It creates a significant risk of any of the following:
 - a. Loss of life;
 - b. Loss of a limb;
 - c. Significant, permanent disfigurement;
 - d. Significant, permanent disability; and
 2. It is caused by any of the following:
 - a. Blunt or penetrating injury;
 - b. Exposure to electromagnetic, chemical, or radioactive energy;
 - c. Drowning, suffocation, or strangulation;
 - d. A deficit or excess of heat.
- B. "Evidence of poor perfusion" means physiologic indicators of hemorrhage or decreased cardiovascular function, which may include any of the following symptoms:
1. Weak distal pulse;
 2. Pallor;
 3. Cyanosis;
 4. Delayed capillary refill;
 5. Tachycardia.
- C. "Evidence of respiratory distress or failure" means physiologic indicators of decreased ventilatory function, which may include any of the following symptoms:
1. Stridor;
 2. Grunting;
 3. Retractions;
 4. Cyanosis;
 5. Hoarseness;
 6. Difficulty speaking.
- D. "Evidence of hemorrhagic shock" means physiologic indicators of blood loss that may include any of the following symptoms:
1. Delayed capillary refill;
 2. Cool, pale, diaphoretic skin;
 3. Decreased systolic blood pressure with narrowing pulse pressure;
 4. Altered level of consciousness.
- E. "Seatbelt sign" means abdominal or thoracic contusions and abrasions resulting from the use of a seatbelt during a motor vehicle collision.
- F. "Signs or symptoms of spinal cord injury" mean physiologic indicators that the spinal cord is damaged, including, but not limited to, paralysis, weakness, numbness, or tingling of one or more extremities.
- G. "Evidence of neurovascular compromise" means physiologic indicators of injury to blood vessels or nerves including, but not limited to, pallor, loss of palpable pulses, paralysis, paresthesia, or severe pain.

TRAUMA TRIAGE PROTOCOL (cont)

DETERMINATION OF A TRAUMA VICTIM

Emergency medical service personnel shall use the criteria in this rule, consistent with their certification, to evaluate whether an injured person qualifies as an adult trauma victim or pediatric trauma victim, in conjunction with the definition of trauma in section 4765.01 of the Revised Code and this chapter.

A. An adult trauma victim is a person sixteen years of age or older exhibiting one or more of the following physiologic or anatomic conditions:

1. Physiologic conditions

- a. Glasgow coma scale less than or equal to thirteen;
- b. Loss of consciousness greater than five minutes;
- c. Deterioration in level of consciousness at the scene or during transport;
- d. Failure to localize to pain;
- e. Respiratory rate less than ten or greater than twenty-nine;
- f. Requires endotracheal intubation;
- g. Requires relief of tension pneumothorax;
- h. Pulse greater than one hundred twenty in combination with evidence of hemorrhagic shock;
- i. Systolic blood pressures less than ninety, or absent radial pulse with carotid pulse present;

2. Anatomic conditions

- a. Penetrating trauma to the head, neck, or torso;
- b. Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;
- c. Injuries to the head, neck, or torso where the following physical findings are present:
 - i. Visible crush injury;
 - ii. Abdominal tenderness, distention, or seat belt sign;
 - iii. Pelvic fracture;
 - iv. Flail chest;
- d. Injuries to the extremities where the following physical findings are present:
 - i. Amputations proximal to the wrist or ankle;
 - ii. Visible crush injury;
 - iii. Fractures of two or more proximal long bones;
 - iv. Evidence of neurovascular compromise.
- e. Signs or symptoms of spinal cord injury;
- f. Second degree or third degree burns greater than ten per cent total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway.

B. A pediatric trauma victim is a person under sixteen years of age exhibiting one or more of the following physiologic or anatomic conditions:

1. Physiologic conditions

- a. Glasgow coma scale less than or equal to thirteen;
- b. Loss of consciousness greater than five minutes;
- c. Deterioration in level of consciousness at the scene or during transport;
- d. Failure to localize to pain;
- e. Evidence of poor perfusion, or evidence of respiratory distress or failure.

2. Anatomic conditions

- a. Penetrating trauma to the head, neck, or torso;
- b. Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;
- c. Injuries to the head, neck, or torso where the following physical findings are present:
 - i. Visible crush injury;

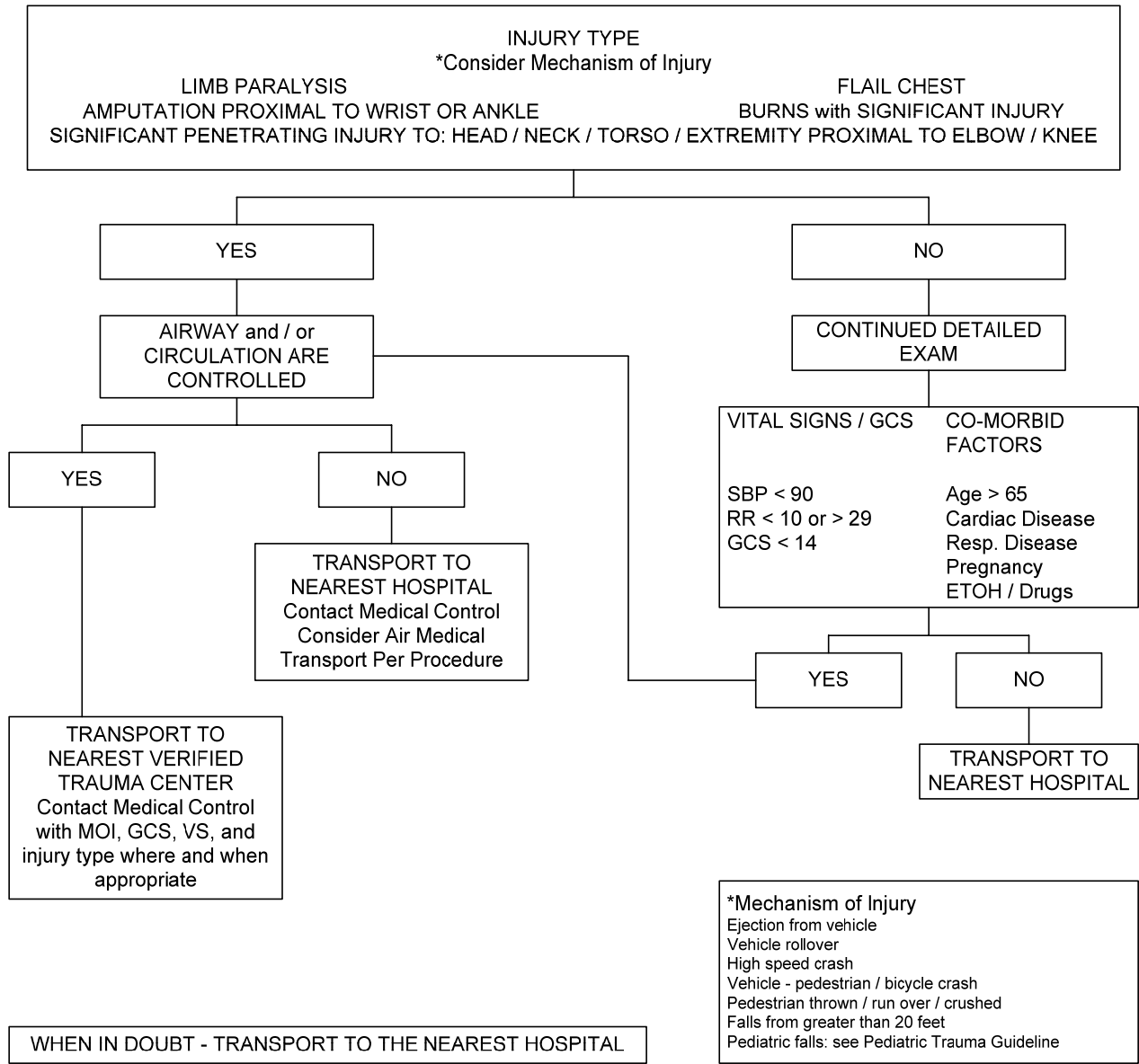
TRAUMA TRIAGE PROTOCOL (cont)

- ii. Abdominal tenderness, distention, or seat belt sign;
 - iii. Pelvic fracture;
 - iv. Flail chest;
 - d. Injuries to the extremities where the following physical findings are present:
 - i. Amputations proximal to the wrist or ankle;
 - ii. Visible crush injury;
 - iii. Fractures of two or more proximal long bones;
 - iv. Evidence of neurovascular compromise.
 - e. Signs or symptoms of spinal cord injury;
 - f. Second or third degree burns greater than ten per cent total body surface area, or other significant burns involving the face, feet, hands, genitalia, or airway.
- C. Emergency medical service personnel shall also consider mechanism of injury and special considerations, as taught in the EMT-basic, EMT-intermediate, or EMT-paramedic curriculum, when evaluating whether an injured person qualifies as a trauma victim.

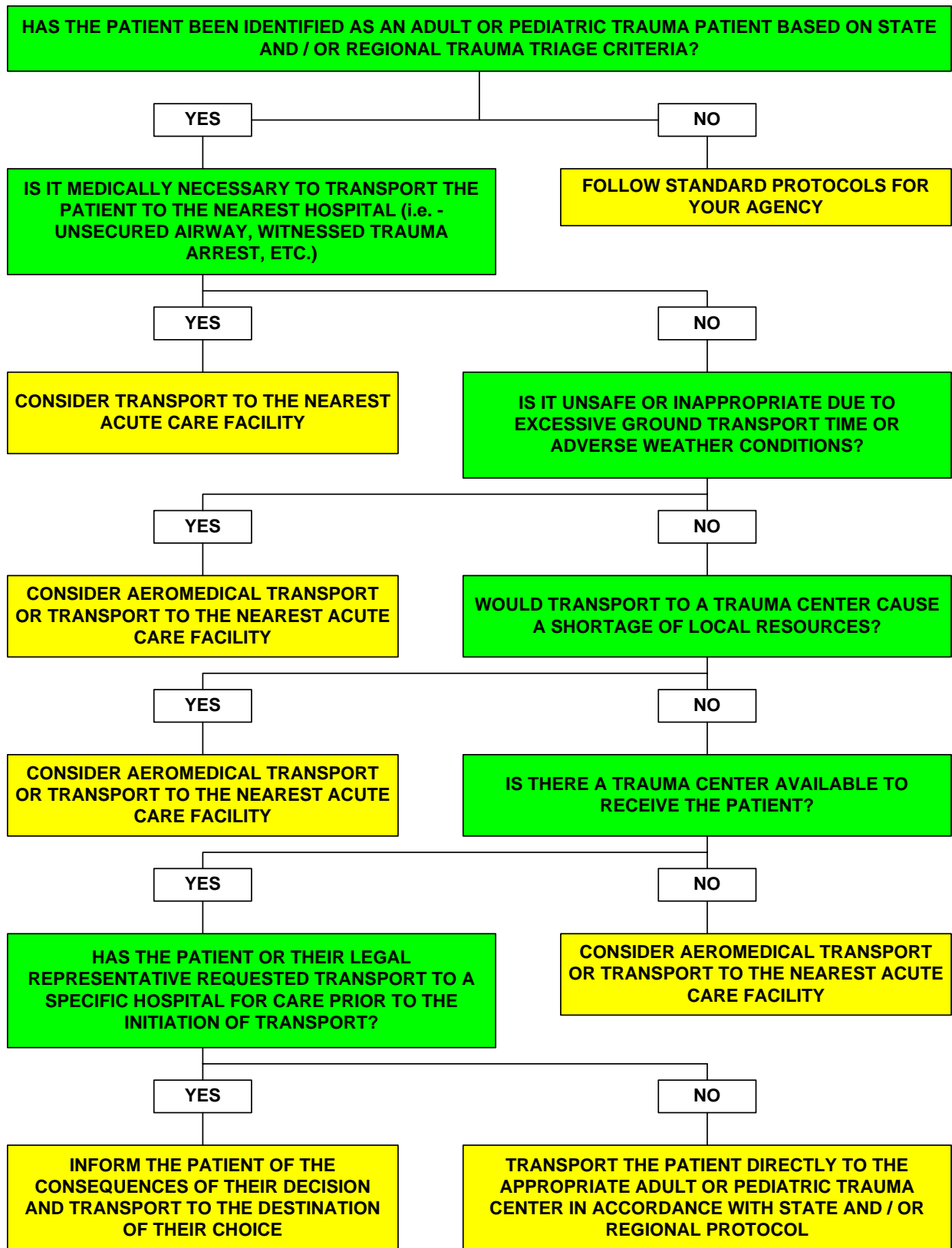
EXCEPTIONS TO MANDATORY TRANSPORT

- A. Emergency medical service personnel shall transport a trauma victim, as defined in section 4765.01 of the Revised Code and this chapter, directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:
1. It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center;
 2. It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time;
 3. Transporting the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources
 4. No appropriate adult or pediatric trauma center is able to receive and provide adult or pediatric trauma care to the trauma victim without undue delay;
 5. Before transport of a patient begins, the patient requests to be taken to a particular hospital that is not a trauma center or, if the patient is less than eighteen years of age or is not able to communicate, such a request is made by an adult member of the patient's family or a legal representative of the patient.

MAJOR TRAUMA DESTINATION GUIDELINES



EXCEPTIONS TO EMS FIELD TRIAGE TO A TRAUMA CENTER



CHEST DECOMPRESSION

GENERAL CONSIDERATIONS

The treatment of tension pneumothorax involves decompression of the affected chest cavity to release the pressure that has developed.

Decompression can be achieved, with minimal risk, by the insertion of a 14 or 16 gauge needle into the second inter-costal space at the midclavicular line. Also an approach in the mid-axillary line between the fifth and sixth rib is possible, and considered safer by some physicians.

The needle must be inserted superior to the rib because the intercostal artery, vein and nerve follow the inferior portion of the rib.

INDICATION

Tension pneumothorax indicated by:

- A. Diminished or absent lung sounds.
- B. Cyanosis and difficulty breathing.
- C. Distended neck veins.
- D. Tachycardia, tachypnea, hypotension, narrow pulse pressure.
- E. Tracheal shift to the unaffected side. (May not always be present)

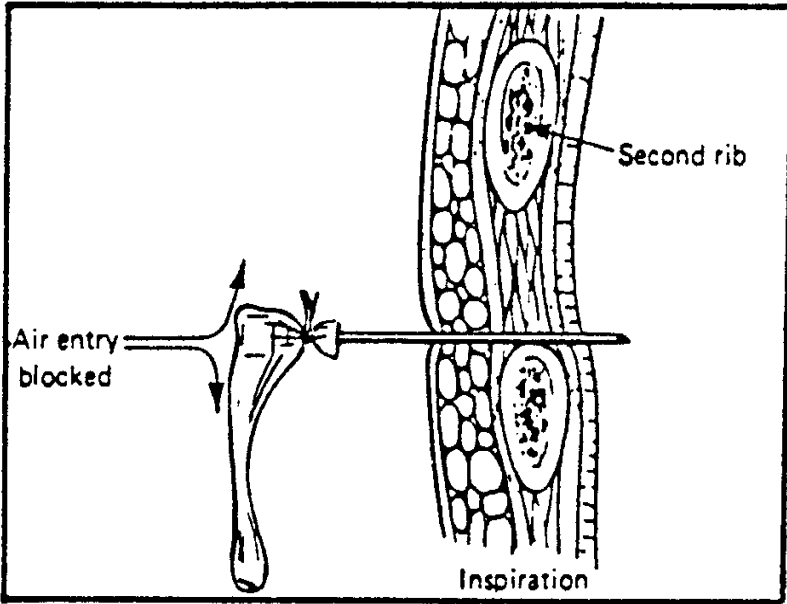
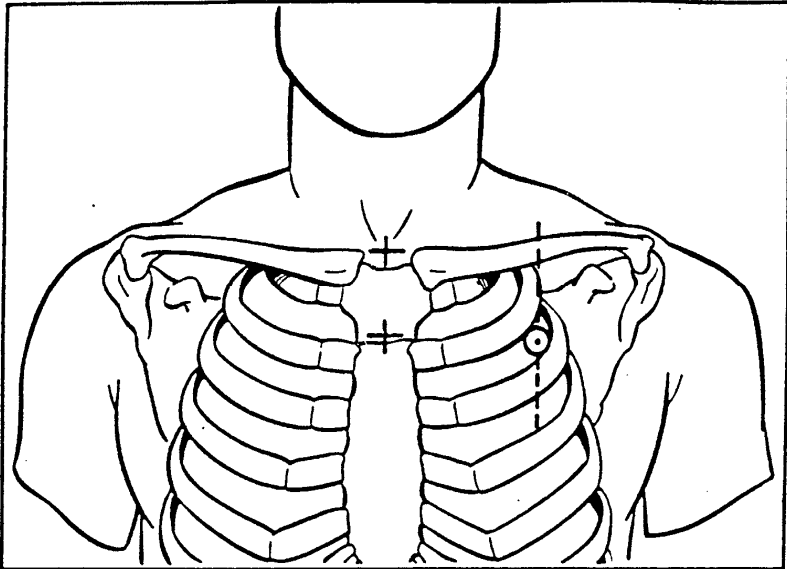
PROCEDURE

- A. Prepare equipment: 14 or 16 gauge needle, antiseptic solution. (Intracath needle with stylet removed is preferred, because sheath provides one-way valve.)
- B. Locate site:
 - 1. Second or third intercostal space, midclavicular.
 - 2. Fourth intercostal space between the fourth and fifth rib, midaxillary.
- C. Prep site, if time permits.
- D. Insert the needle just superior to the rib until a rush of air is felt and/or heard.
- E. Secure needle in place.
- F. Support patient with 100% oxygen and transport without delay.

CONTRAINDICATIONS

Insufficient training.

CHEST DECOMPRESSION (cont)



CRICOTHYROTOMY

INDICATIONS

Complete upper airway obstruction and unable to either relieve with manual maneuvers or intubate by another route. This may be seen with:

- A. Cervical spine injuries.
- B. Maxillo facial trauma.
- C. Laryngeal trauma.
- D. Oropharyngeal obstruction from:
 - 1. Edema from infection, caustic ingestion, allergic reaction, and/or inhalation injuries.
 - 2. Foreign body.
 - 3. Mass Lesion.
- E. Oral or nasotracheal intubation contraindicated for any reason.

COMPLICATIONS

- A. Postoperative bleeding.
- B. Late bleeding.
- C. Abscess behind packing.
- D. Cellulitis of neck.
- E. Subcutaneous emphysema.
- F. Voice change.
- G. Feeling of lump in throat.
- H. Persistent stoma.
- I. Obstructive problems.
- J. Misplacement of the airway.

REQUIREMENTS

There is no preferred device for Cricothyrotomy. The requirements of the Medical Director are that each department have a device that the members of the department are familiar with, are comfortable using, have trained extensively with, and preferable has a cuffed tube for better ventilation and tube security. See the Supplemental section of the protocol, your department's training officer, or your department's training manual for device specific instructions.

ADULT CRUSHING TRAUMA

- A. Follow the MULTIPLE TRAUMA PROTOCOL as indicated.
- B. If the patient has been trapped/pinned for more than 20-30 minutes, and/or exhibits signs/symptoms or relevant mechanism of injury to suspect crushing injury then do the following:

Prior to extrication:

COORDINATE TIME OF RELEASE WITH RESCUE PERSONNEL

2. Establish at least one (1) large bore IV of 0.9% normal saline.
3. Add one (1) amp of SODIUM BICARBONATE to each liter (1,000 cc NS) of IV solution infused.
4. Begin a maintenance infusion of 200 ml/hr, then administer a one (1) to one and a half (1.5) liter bolus just prior to extrication. Fluid infusion may be tailored to the patient's existing medical conditions.
5. Apply the cardiac monitor. Obtain monitor tracing prior to and sequentially during further treatment.
6. Contact receiving Emergency Department and notify them of the patient's crushing injury.
7. Anticipate Crushing Syndrome and possible cardiac arrest upon extrication of patient.

Upon extrication:

1. Continue aggressive fluid resuscitation with 0.9% normal saline.
2. Monitor ECG closely. Watch for:
 - a. Widened QRS complexes – 0.12 seconds or greater.
 - b. Presence of PVC's.
 - c. V-Tach / V-fib / Idioventricular rhythms.
3. If the patient has cardiac arrest, treat using the TRAUMA ARREST PROTOCOL as indicated.
4. MAST pants are **CONTRAINDICATED** in crushing injury patients.

NON-CARDIAC PAIN MANAGEMENT

A. Clinical indications for initiating pain management:

1. Most patients who complain of significant pain can be treated with this protocol.
2. Examples of patients whose pain may be treated include:
 - Suspected kidney stones
 - Sickle cell crisis
 - Isolated extremity trauma
 - Cancer patients

Note: Do NOT use narcotic pain medications on multi-system trauma patients or patients with abdominal pain of unknown etiology.

B. Definitions:

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

C. Documentation:

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
2. Pain should be assessed and documented during initial assessment, before starting pain control treatment, and with each set of vitals.
3. Pain should be assessed using the appropriate approved scale.
4. Two pain scales are available: the 0 - 10 and the Wong - Baker "faces" scale.
5. 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.
6. 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 0-10. This scale can be documented with the numeric value or the textual pain description.



NON-CARDIAC PAIN MANAGEMENT (Cont)

D. Treatment:

1. If the Patient's pain is described as a 5 or greater on the 1-10 scale or 6 or greater on the Wong-Baker "faces" scale, the patient's systolic blood pressure is greater than 100 mmHg, there are no signs of hypoperfusion, and the patient's Glasgow coma scale is equal to 15, then:
 - a. 2-4 mg Morphine IV every five minutes as needed provided systolic blood pressure remains above 100 mmHg. However, do not exceed 10 mg total. A second option for Morphine (i.e. if an IV is unavailable) is to administer 5-10 mg IM one time.

PNEUMATIC ANTI-SHOCK GARMENT

INDICATION

- A. Class I - Usually indicated, useful and effective.
 - *Hypotension due to ruptured AAA
- B. Class IIa - Acceptable, uncertain efficacy, weight of evidence favors usefulness and efficacy.
 - *Hypotension due to suspected pelvic fracture
 - *Anaphylactic shock (unresponsive to standard therapy)
 - *Otherwise uncontrollable lower extremity hemorrhage
 - *Severe traumatic hypotension (palpable pulse, blood pressure not obtainable)
- C. Class IIb - Acceptable, uncertain efficacy, may be helpful, probably not harmful.
 - *Elderly
 - *History of congestive heart failure
 - *Penetrating abdominal injury
 - *Paroxysmal supraventricular tachycardia (PSVT)
 - *Gynecologic hemorrhage (otherwise controlled)
 - *Hypothermia-induced hypotension
 - *Lower-extremity hemorrhage (otherwise uncontrolled)
 - *Pelvic fracture without hypotension
 - *Ruptured ectopic pregnancy
 - *Septic shock
 - *Spinal shock
 - *Urologic hemorrhage (otherwise uncontrolled)
 - *Assist intravenous cannulation
- D. Class III - Inappropriate option, not indicated, may be harmful.
 - *Adjunct to CPR
 - *Diaphragmatic rupture
 - *Penetrating thoracic injury
 - *Pulmonary edema
 - *To splint fractures of the lower extremities
 - *Extremity trauma
 - *Abdominal evisceration
 - *Acute myocardial infarction
 - *Cardiac tamponade
 - *Cardiogenic shock
 - *Gravid uterus

CONTRAINDICATIONS

- A. Acute cases of Pulmonary Edema.
- B. Pregnancy - Do not inflate abdominal section.

PASG (cont)

- C. Cardiogenic Shock.
- D. Open wounds of the chest.

APPLICATION

Unfold PASG completely and lay on a stretcher or backboard. Then:

- A. Put patient on the PASG face up (supine) so that the top of garment will be just below the last rib.
- B. Check the victim's vital signs and breath sounds. If symptoms of blood loss are present, inflate PASG. Attach foot pump to PASG at the valves and inflate each section, starting with the leg sections, until: patient's systolic BP reaches 100, velcro fasteners crackle, air escapes the safety valves and/or bleeding stops.
- C. IF USING A SPLINT, INFLATE ONLY UNTIL GARMENT IS FIRM.
- D. Close valves, leave hoses and pump attached for transport.

REMOVAL

PASGs should not be deflated until:

- A. A physician is present and has taken charge of the patient, and
- B. Fluids are available for transfusion.

The urge to deflate the garment to inspect the wounds should be suppressed. Electrocardiograms and x-rays can be taken and Foley catheters can be inserted while PASG is still on and inflated.

In cases where bleeding is initially present, or hypovolemia is suggested by evident external blood loss, the garment should not be deflated until replacement therapy has begun. Deflation before volume replacement may lead to further shock to a possibly irreversible degree. If the situation permits, gradual deflation with concurrent fluid administration is advisable.

AVULSED TEETH PROTOCOL

- A. Application.
1. Teeth that have been knocked out through trauma can be successfully re-implanted if re-implantation is accomplished soon enough and if the root material has not been damaged.
 2. In any case of facial or oral trauma, inspect the mouth for missing teeth. If teeth are missing and it appears that they have been avulsed (e.g. blood in the empty socket), then search both the patient's mouth and the scene for these teeth.
- B. Handling of avulsed teeth.
1. Minimize the handling and manipulation of any avulsed teeth. Do not attempt to wash or clean the teeth. Doing so will only jeopardize the remaining root material.
 2. Place the avulsed teeth in Hanks Balanced Salt Solution.
 - a. Use only a new, unopened bottle of Hanks Solution. Inspect the bottle. If the bottle has already been opened, do not use it. If there is particulate matter or cloudiness in the Solution, do not use it.
 - b. If there are avulsed teeth from more than one patient, place enough of the Hanks Solution from one bottle into as many other containers as are needed so that the teeth from each patient are in separate containers. The additional containers need not be sterile, but they should be clean and small enough so that the teeth are completely immersed in the Hanks Solution. Label each container with the patient's name. Once the bottle of Hanks Solution has been opened and used, it cannot be reused.
 - c. If the patient is transported, transport the teeth with the patient and turn the container over to Emergency Department personnel. If the patient is not transported, turn the container over to the patient and advise him/her to seek immediate dental treatment for re-implantation.
 3. If Hanks Solution is not available, the following solutions are acceptable alternatives, in decreasing order of preference. Note that regardless of the solution used, the teeth should not be handled any more than absolutely necessary to get them into a container and should in no case be cleaned or otherwise traumatized. Make no attempt to wrap the teeth in gauze or any similar substance before placing them in whatever liquid is used.
 - a. Milk: Use cold milk in a small container.
 - b. Saline.
 - c. Saliva: Saliva is a poor but acceptable transport media. Nevertheless, using it presents several problems, which make it less desirable than the other alternatives above.
 1. In order to use saliva, the tooth, or teeth, ordinarily must be transported in the patient's mouth. This always creates the risk of aspiration and therefore must never be considered in any patient who has any kind of decrease sensorium or any kind of airway problem.
 2. Saliva is heavily contaminated with bacteria and will thus quickly contaminate the root material of the teeth.
- C. Re-implantation.
1. As a general rule, re-implantation should not be attempted in the field because:
 - a. It is likely to be painful and will be difficult to accomplish successfully without anesthesia.
 - b. Without some means of stabilizing the re-implanted tooth, it is likely to come out again with the attendant risks of aspiration or further damage.

SELECTIVE SPINAL IMMOBILIZATION PROTOCOL

- A. Full spinal immobilization should be used if any of the following criteria are met.
1. The patient has penetrating trauma and a neurologic complaint or deficit.
 2. The patient complains of neck pain.
 3. The patient has pain on palpation of the neck.
 4. The patient complains of neurologic deficits or is found upon physical exam to have neurologic deficits.
 - a. Subjective – numbness, tingling, weakness.
 - b. Objective – loss or diminished sensation or motor weakness.
 5. The patient has an altered LOC and impaired competence whether from drugs, alcohol, or head injury and suggestive mechanism of injury for neck injury.
 6. The patient has a mechanism of injury that is suggestive of a neck injury and the patient has other major distracting injuries.
 - a. A mechanism of injury suggestive of a neck injury includes;
 - i. Any mechanism that produced a violent impact to the head, neck, torso, or pelvis. (e.g., assault, entrapment, structural collapse, etc.)
 - ii. Incidents that produce sudden acceleration, deceleration, or lateral bending forces to the neck or torso. (e.g., moderate to high speed MVA, pedestrian vs. auto, explosion, etc.)
 - iii. Any fall. (especially in the elderly)
 - iv. Ejection or fall from any motorized or human powered transportation device. (e.g., scooters, skateboards, bicycles, motor vehicles, motorcycles, ATVs, etc.)
 - v. Victims of shallow-water diving incidents.
 - b. Examples of distracting injuries are; long bone fractures, visceral injuries requiring surgical consultation, large lacerations, degloving injuries, crush injuries, large burns, or other injuries that cause any acute functional impairment.
 7. The patient has an inability to communicate.
 - a. Any patient who cannot clearly communicate so as to actively participate in their assessment.
 - i. Examples; a speech or hearing impediment, those who only speak a foreign language, small children (age 8 and less), geriatric patients with dementia / Alzheimer's, and the developmentally delayed or impaired.
 8. The patient has neck pain with any head motion.
- B. All patients that **DO** meet any of the above criteria shall have full cervical immobilization including, but not limited to, C-collar, backboard, head immobilizer / immobilization and backboard straps.
- C. Providers should use their clinical judgment and **if they are in doubt, immobilize the patient.**

HELMET REMOVAL

GENERAL ASSESSMENT

- A. Special assessment needs for patients wearing helmets.
 1. Is the helmet impeding the patient's airway or affecting their ability to breath?
 2. Is the helmet sized appropriately for the patient? In other words, does the patients head fit snugly inside the helmet or is there room for movement of the head inside the helmet?
 3. Does the helmet limit the EMTs access to manage the patient's airway or breathing?
- B. Indications for leaving the helmet in place.
 1. A good fit with little or no movement of the patient's head within the helmet.
 2. No impending airway or breathing problems.
 3. Removal of the helmet may cause further injury to the patient.
 4. Proper spinal immobilization can be performed with the helmet in place.
 5. The helmet does not cause interference with the EMTs ability to assess and reassess airway and breathing.
- C. Indications for removing the helmet.
 1. The helmet causes an inability to assess and / or reassess the patient's airway or breathing.
 2. The helmet causes an inability to or impedance to properly managing the airway and / or breathing.
 3. It is an improperly fitted helmet that allows for excessive movement of the patients head within the helmet.
 4. The helmet will not allow for proper spinal immobilization.
 5. The patient is in full cardiac arrest.
- D. Types of helmets.
 1. Sports - football, lacrosse, hockey, etc.
 - i. Typically open anteriorly
 - ii. Typically allow easier access to the airway.
 2. Motorcycle
 - iii. Full face – impede access to the airway.
 - iv. Shield
 3. Other recreational helmets – bicycle, skateboard, paintball, etc.

REMOVAL

- A. If dealing with a football helmet: consider the helmet and shoulder pads as a unit. If the helmet is removed, shoulder pads should also be removed. If the helmet is left on, shoulder pads should also be left on. This is to ensure proper c-spine alignment. Also, regardless of the patient's current condition, anytime a helmet is left in place the faceguard must be removed to allow access to the airway.

HELMET REMOVAL (Cont)

- B. Ill-fitting or oblong recreational helmets are typically removed to prevent flexion of the c-spine during immobilization.
- C. The specific technique for removal of a helmet depends on the actual type of helmet worn by the patient.
- D. Remove the patient's eyeglasses before removing the helmet.
- E. One EMT should stabilize the helmet by placing his hands on either side of the helmet with his fingers on the mandible to prevent movement.
- F. The second EMT loosens the strap.
- G. The second EMT places one hand on the mandible at the angle of the jaw and the other hand posteriorly at the occipital region.
- H. The EMT holding the helmet pulls the sides of the helmet apart and gently slips the helmet halfway off the patient's head and then stops.
- I. The EMT managing stabilization of the neck repositions, sliding the posterior hand superiorly to secure the head from falling back after complete helmet removal.
- J. The helmet is removed the rest of the way.
- K. The EMTs can now proceed with spinal immobilization.

TASERED PATIENT PROTOCOL

With the increased use and deployment of the TASER 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.

When assessing a patient who has been "hit" with a TASER, EMS evaluation shall include:

1. Possible underlying medical condition for aggressive / agitated behavior.
2. The presence of any injuries sustained from falling after being "tasered".
3. Any injuries from the barb of the TASER, or injuries from the removal of the barb.
4. Be aware of and suspect injury in the following at risk patient's:
 - a. The elderly
 - b. Pregnant women
 - c. Patients with known heart disease
 - d. Patients with a pacemaker or AICD
5. Be aware of and suspect injury with high risk barb strikes to the following areas:
 - a. Eye
 - b. Open mouth
 - c. Neck
 - d. Genitals
 - e. Large blood vessels in the groin
6. Always apply the cardiac monitor and obtain a strip for patients with irregular / abnormal pulse, elderly, pacer, AICD, known CAD.

Not all tasered patients need to be transported. Those that should be transported are:

1. Patients from the at risk group.
2. Patients with a at risk barb strike.
3. Patients with significant underlying predisposing medical condition.
4. Patients who sustained a significant injury from fall.
5. If you are unable to remove the barb.
6. If the patients has an abnormal monitor strip (when indicated).

These patients require:

1. Medical attention for their specific problem(s)
2. Cardiac monitor (when indicated as above)
3. Transport

Otherwise, patients may be treated at the scene and released with:

1. Local wound care
2. Tetanus immunization inquiry and recommendation
3. 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 "red box" sharps container. Use small single use containers as law enforcement may wish to hold custody of the barbs after removal.
4. Appropriate documentation of medical assessment and release to custody of given law enforcement agency.

TASERED PATIENT PROTOCOL

Attachment A

“Excited Delirium”

An important consideration for EMS in the pre-hospital management of the extremely combative patient is the condition known as Excited Delirium. These patients are generally extremely agitated and present with bizarre and potentially violent behavior. A stereotypical case would be the middle aged male who after stripping naked is a bloody mess from breaking out all of the windows in his house and is now running through traffic or wandering aimlessly in an unusual location. Law enforcement officers are often called upon to confront and control these patients and some of them may fall victim to a phenomenon known as sudden, unexpected in-custody death. Many standard law enforcement techniques have taken the blame for these deaths over the years, including pepper spray, post restraint prone positioning, and most recently, the TASER.

With that in mind, when EMS is called to evaluate a patient that has been subdued with a TASER, your primary reason for evaluating the patient is to consider underlying conditions (such as Excited Delirium) that led up to the TASER device needing to be applied and not just because of the TASER “hit” itself.

The components of Excited Delirium are:

- Bizarre behavior
- Nonsensical speech
- Constant motion
- Paranoia
- Attraction to shiny objects / lights
- Superhuman strength
- Decreased pain sensation
- Hyperthermia

It is not unusual for an Excited Delirium patient, once they are subdued, to exhibit difficulty breathing, hyperthermia, unresponsiveness, or other signs and symptoms of a medical emergency. Without prompt intervention and treatment, a certain number of these patients may progress to sudden, unexpected in-custody death.

The current explanatory theories behind these deaths and the things EMS providers need to be aware of are:

1. Underlying health problems:
Underlying health conditions put the patient at an increased risk of sudden death after such extreme exertion.
2. Illicit stimulant intoxication:
Long term abuse and/or severe overdose of illicit stimulants such as cocaine or methamphetamine seem to predispose the patient to Excited Delirium type behavior and can lead to metabolic acidosis.
3. Metabolic acidosis:
These patients tend to be functioning at a very high metabolic state. This can cause an un-survivable metabolic acidosis.
4. Hyperpyrexia:
These patients tend to have an elevated body temperature.
5. Psychiatric illness:
Certain psychiatric illnesses or conditions can lead to a hyper-manic state and again cause metabolic acidosis.
6. Ventilation problems:
The primary means by which the body corrects metabolic acidosis is through ventilation. It is debatable, but many believe that certain restraint devices or positions limit adequate ventilation and may exacerbate metabolic acidosis.

Patients who are in a state of Excited Delirium are at risk for sudden death and require medical intervention. Be prepared to support ventilation and resuscitate. If the patient requires further sedation, know that the physical restraint policy alone can intensify the patient's condition and the use of Haldol may result in seizures and should not be used. Therefore, Ativan is the drug of choice for sedation / restraint of the Excited Delirium patient.

Patients who are potentially in a state of Excited Delirium should be transported expediently to an ER for evaluation and treatment by a physician.

TASERED PATIENT PROTOCOL Attachment B

“Barb Removal”

Assessment and Treatment

Assessment will involve ascertaining why the person was “hit” with the TASER in the first place. A detailed interview with both the patient and the officers on scene is necessary as patients may be under the influence of drugs or have psychiatric problems. It is important for the EMTs to determine the individual's mental status before he or she was stunned, taking into account the usual causes of altered mental status such as hypoglycemia, drug use, or pre-existing head injury. Trauma assessment should involve a careful examination of the head and neck. If the individual has any pain or reports striking their head or back during the fall, proper C-spine precautions should be employed.

“Barbs can be safely removed just by pulling back on them,” says Mark Johnson, government affairs manager for TASER International, Inc. “The barbs are simply a number eight Eagle Claw fishhook, which is not bent.” Local protocols however will dictate whether these barbs can be removed in the field. TASER will be releasing a CD on barb removal by the end of the summer. Additional information can be obtained from the company's website (www.taser.com) or by e-mailing Johnson (mark@taser.com).

MASS CASUALTY INCIDENTS

EMS RESPONSE

- A. It is each agency's responsibility to have a thorough knowledge of their counties Mass Casualty Plan.
- B. It is recognized that when responding to a MCI, issues and situations may require modification to some part or parts of the plan.
- C. BCH EMS squads should utilize the START triage system when triaging the victims of a mass casualty incident.
- D. Upon arrival at a MCI, the first arriving unit should notify their dispatch of the need to implement the Mass Casualty Plan, call for additional resources, establish a safe staging area, and estimate the total number of victims.

NOTIFICATION OF COORDINATING HOSPITAL

- A. Each EMS service has a pre-defined coordinating hospital based on their county's mass casualty plan. It is the responsibility of the responding jurisdiction to notify their appropriate coordinating hospital as soon as possible, giving a brief description of the incident and the estimated number of victims. The coordinating hospital will then notify the receiving hospitals of the MCI. The transportation officer should maintain a constant contact with the coordinating hospital until the scene has been cleared of salvageable victims.

SIMPLE TRIAGE AND RAPID TREATMENT (START)

- A. In the event of multiple patients, the Simple Triage and Rapid Transport (START) system shall be utilized.
 1. Have all patients who can walk move to a designated and supervised area. These victims will be initially triaged GREEN (minor).
 2. Begin where you stand and move orderly through the remaining victims, quickly assessing and marking the victims with tags from the Mass Casualty Kit.
 3. Provide minimal treatment and consider using other victims to assist:
 - i. Airway.
 - ii. Bleeding control.
 4. Steps of assessment in the START system (**RPM**).
 - i. **Respiration**
 1. None – black tag.
 2. Greater than 30 per minute – red tag.
 3. Less than 30 per minute – go to next step.

MASS CASUALTY (Cont)

- ii. **Perfusion** (check radial pulse).
 - 1. Absent or capillary refill greater than 2 seconds – red tag.
 - 2. Present or capillary refill less than 2 seconds – go to next step.
- iii. **Mental status**.
 - 1. Altered level of consciousness – red tag.
 - 2. Can not follow commands – red tag.
 - 3. Follows commands – yellow or green tag.

B. START patient management.

- 1. In the patient treatment area:
 - i. Group the patients according to triage tag color.
 - ii. Maintain the airway and control the C-spine. Ensure adequate airway and provide oxygenation as the patient's condition requires and number of victims and rescuers allows. If the patient's respiratory rate is less than 12 or greater than 24 per minute, ventilate with 100% oxygen using a bag-valve-mask.
 - iii. Obtain incident history.
 - 1. Mechanism of injury.
 - 2. Integrity of vehicle if applicable.
 - 3. Ballistic or blast information if applicable.
 - 4. Loss of consciousness.
 - iv. Perform initial assessment (primary survey).
 - v. Evaluate patients for "Load and Go" conditions:
 - 1. Uncorrectable airway obstruction.
 - 2. Tension pneumothorax.
 - 3. Pericardial tamponade.
 - 4. Penetrating chest wounds with shock.
 - 5. Hemothorax with shock.
 - 6. Head trauma with unilaterally dilated pupils.
 - 7. Head trauma with rapidly deteriorating condition.
 - 8. Unconsciousness.
 - vi. Treat life threatening problems only.
 - vii. Re-triage (re-tag) as necessary or as patient condition changes.

HAZARDOUS MATERIALS INCIDENT

REFERENCE MATERIAL

- A. When responding and/or treating a patient who has been contaminated by a hazardous material, research must be done on the material to which the patient was exposed, in order to determine the proper procedures and / or treatment to take.
- B. The following reference materials should be available to EMS personnel:
 1. D.O.T. Emergency Response Guidebook.
 2. Chemtrec – 1-800-424-9300.
 3. Poison Control – 1-800-222-1222.
 4. On site MSDS.
 5. Summit County Technical Assistance Team – through your dispatch center.
 6. Summit County Hazardous Materials Response Team – through your dispatch center.

EMS RESPONSE

- A. General information:
 1. A hazardous materials incident is far different from normal emergencies. Emergency treatment of the patient must be done, but the EMS personnel must be a part of the solution and not get themselves contaminated and become a part of the problem.
 2. Emergency treatment and decontamination of the patient will be up to the Hazardous Materials responders on scene.
 3. EMS personnel should not be asked to do something that exceeds their level of Haz-Mat training or their available level of PPE protection.
- B. Responding to the scene:
 1. Determine the wind direction and respond from uphill and upwind.
 2. Be aware of other emergency vehicles that may be responding in your area.
- C. Arrival on scene:
 1. If you are the first responder to arrive on the scene, be sure to stop well away from the scene and identify the product before getting close. There are six clues to Haz-Mat recognition:
 - i. Occupancy and/or location.
 - ii. Container shapes.
 - iii. Markings and colors.
 - iv. Placards and labels.
 - v. Shipping papers.
 - vi. Senses.
 2. If a chemical is leaking, wait for the proper response personnel with the proper PPE before rescuing the victim. Do not become another victim.

HAZ-MAT (Cont)

3. Emergency decontamination must still be done by properly protected Haz-Mat response personnel.
 4. If personnel are already on scene, report to the Staging Officer or Incident Commander for instructions – NEVER freelance or self-deploy!
- D. Set up an EMS area in the Cold Zone, in a location designated by command.