

**TRAUMA**

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**Updated: 1-01-10**

# **TRAUMA**

## **INTRODUCTION**

MEDICAL COMMAND SHOULD BE CONTACTED IN ALL CASES IN THIS PROTOCOL AT THE EARLIEST OPPORTUNITY. If medical control cannot be contacted, the EMS provider should document this on the run sheet and proceed with written protocols until such time that medical control can be reached.

The goal in the stabilization and transport of the severely traumatized patient is to provide optimum patient safety consistent with speed of transportation. There will be some patients who must be transported without assurance that ABC's are optimally secure.

### **ITLS GUIDELINES FOR LOAD AND GO SITUATIONS:**

1. Airway obstruction that cannot be quickly relieved by mechanical means, such as suction or forceps.
2. Trauma cardiorespiratory arrest.
3. Tension pneumothorax.
4. Pericardial Tamponade.
5. Penetrating wounds of the chest with shock.
6. Massive hemothorax with shock.
7. Head injury with unilaterally dilated pupil.
8. Head injury with rapidly deteriorating condition.

**MEDICAL DIRECTION SHOULD BE CONTACTED AS SOON AS POSSIBLE**

## TRAUMA

### **TRANSPORT OF TRAUMA PATIENT**

1. Hold in-line cervical immobilization
2. Maintain airway, breathing and circulation
3. Full backboard with straps
4. C-Collar and head immobilizer, KED extrication device if sitting
5. Control bleeding
6. Oxygen and pulse oximetry
7. IV Normal Saline Wide Open rate, blood draw
8. EKG monitor (if dysrhythmias, begin ACLS protocols)
9. Cover with blanket
10. Transport
11. Monitor MSP's, motor skills, and ABC's every 5 minutes.
12. Watch for shock.

### **HEAD INJURIES**

Consider other reasons for ALOC (? ↓ glucose levels, etc)  
Monitor respiratory depression, level of consciousness and protect airway

### **MOUTH AND JAW INJURIES**

Assess missing or loose teeth and clear airway of blood and debris.

### **EXTREMITY TRAUMA AND FRACTURES**

Assess neuro-vascular status  
Dress wounds.  
Immobilize injury. And consider pain management  
Immobilize above and below joints  
Never straighten joints  
Do not push back bone ends protruding through skin  
Except for open femur fractures, apply traction splint  
Stabilize before moving patient  
Reassess neuro-vascular status

### **AMPUTATED EXTREMITY/BODY PART**

1. Put amputated part in saline-soaked gauze
2. Place in dressing then in plastic bag (label with patient's name)
3. Place plastic bag on ice
4. Do not allow the extremity to directly contact the ice
6. Do not freeze
7. Care for affected extremity with saline soaked dressing.

## TRAUMA

### **SUCKING CHEST WOUND/OPEN PNEUMOTHORAX**

- Close sucking wound IMMEDIATELY.
- Cover with non-porous occlusive dressing taped on 3 sides.
- Re-open immediately if signs of tension pneumothorax.
- High flow oxygen and support ventilation (as needed).
- Monitor and assess for tension pneumothorax

### **TENSION PNEUMOTHORAX**

- **\*\*Look for signs of JVD, ↓BP, ↑HR, ↑dyspnea\*\***
- Decompress chest.
  - Site - Midclavicular 2<sup>nd</sup> intercostal space
  - Above the 3<sup>rd</sup> rib with large bore IV catheter
- Look out for absent breath sounds

### **ABDOMINAL BLUNT TRAUMA**

- Give nothing by mouth

### **EVISCERATION**

- Do not place organs back into abdominal cavity
- Cover and dress protruding organs with gauze saturated in Normal Saline

### **PENETRATING INJURIES**

- Do not remove penetrating object, immobilize in place (unless airway is compromised).

### **LIGHTNING INJURIES**

- C-Spine immobilization from muscle contractions.
- 12 Lead EKG/Cardiac monitor (if dysrhythmias, begin ACLS protocols).
- Treat entrance and exit burns (per Burns protocol).

## TRAUMA

### **INJURIES TO EYES**

1. DO NOT REMOVE FOREIGN BODY EMBEDDED IN EYE/ORBIT  
DO NOT EXERT PRESSURE ON GLOBE
2. Stabilize foreign bodies in place.
3. Administer Tetracaine (Pontocaine Ophthalmic) 2 drops in the eye prior to irrigation  
(except for penetrating trauma)
4. Irrigate large particles with IV tubing and Normal Saline.  
(Utilize Morgan Lens if available)
5. Transport while irrigating.

Covering both eyes when only one eye is injured may help to minimize trauma to the injured eye. In some cases, the patient is too anxious to tolerate this. Patients with penetrating eye injuries should be transported supine.

In blunt eye trauma, examination of the globe should be done if time permits and the lids may be opened without exerting any pressure upon the globe. If these conditions are met, paramedic examination may be helpful, since the lid may be swollen shut by the time of arrival at the hospital.

A light sterile wet dressing may be used to cover the eye for transport - covered with a protective shield (metal patch, drinking cup). Do not delay transport by covering the eye if the patient has other life-threatening injuries.

### **FIRST AND SECOND DEGREE BURNS (Superficial & Partial Thickness)**

1. Remove patient from burning source and expose burned area.
2. Keep burned area sterile.
3. Immerse burned area in cold water or apply cold compresses. **NO ICE!**
4. If chemical burns, irrigate skin while enroute to hospital.

**DO NOT USE OINTMENTS**  
**DO NOT RUPTURE BLISTERS**  
**REMOVE JEWELRY**  
**FOLLOW PAIN MANAGEMENT PROTOCOL (Trauma-15)**

## TRAUMA

### **THIRD DEGREE BURNS (Full Thickness)**

1. Remove patient from burning source and expose burned area.
2. INTUBATE INHALATION BURNS AS SOON AS POSSIBLE
3. Keep burned area sterile.
4. Cover in sterile burn sheets.
5. IV Normal Saline Wide Open, blood draws. Place 2<sup>nd</sup> IV.
6. Treat for shock.

#### **CONSIDER THE PARKLAND FORMULA**

( 4cc/NS x pt weight in kg x total BSA burned = total amount of fluid over 24 hours - half over first 8 hours)

**WATCH FOR RESPIRATORY INSUFFICIENCY**

**DO NOT USE OINTMENTS**

**DO NOT RUPTURE BLISTERS**

**CONTACT MEDICAL DIRECTION FOR PAIN CONTROL MANAGEMENT**

**NOTIFY HOSPITAL EARLY**

**FOLLOW PAIN MANAGEMENT PROTOCOL (Trauma-15)**

### **TRAUMA ARREST**

Patient is pulseless and apneic with a history of blunt or penetrating trauma. Patients that are obviously dead; i.e., decapitation, injuries incompatible with life should not be considered in this protocol.

1. Begin CPR.
2. Maintain airway, intubation preferred with C-spine immobilization.
3. Begin ACLS protocol.
4. Control obvious bleeding.
5. Place patient on backboard and immobilize.
6. Consider bilateral needle decompression
7. Rapid transport, on scene time less than 10 minutes.
8. Two large bore IV s Wide Open rate, blood draws enroute.
7. Monitor ABC's.

**NOTIFY HOSPITAL EARLY**

## TRAUMA

### **CERVICAL SPINE IMMOBILIZATION**

#### **PURPOSE**

- a. This protocol is intended to provide the pre-hospital care provider with a rational approach to cervical spinal immobilization.

#### **INDICATIONS TO IMMOBILIZE**

- a. The patient complains of neck pain.
- b. The patient complains of pain on palpation to the neck.
- c. The patient complains of pain on movement of the neck.
- d. The patient complains of weakness or tingling of an extremity.
- e. The patient has an altered level of consciousness either through injury, intoxication, medications alcohol drugs, and has a history consistent with trauma.

#### **CAUTIONS**

- a. Use of a backboard for stabilization of some other injury than to the neck, or to move the patient does not automatically require cervical immobilization.
- b. Use of cervical immobilization in adults should always be followed with long board immobilization.
- c. WHEN IN DOUBT, PERFORM CERVICAL SPINE IMMOBILIZATION

# TRAUMA

## **SURGICAL AIRWAYS**

### **PURPOSE**

This protocol is intended to provide the pre-hospital care provider with a rational approach to perform an advanced surgical airway in a patient, which otherwise the paramedic would not be able to obtain a patent airway.

### **INDICATIONS TO PERFORM A SURGICAL AIRWAY**

- a. The surgical airway shall be performed only after all other appropriate airway procedures have failed.
- b. The airway is completely obstructed.  
The patient has massive head injuries & the airway is not controlled by conventional means.

### **CONTRAINDICATIONS IN PERFORMING SURGICAL AIRWAYS**

- a. The airway can be managed with convention means.
- b. Not trained in the procedure.
- c. Proper Equipment not available

### **COMPLICATIONS**

- a. Barotrauma from over inflation.
- b. Cricoid and/or thyroid cartilage damage.
- c. Thyroid Gland damage.
- d. Laryngeal nerve damage.
- e. Vocal cord damage.
- f. Infection.
- g. Hypoventilation from improper equipment.

## TRAUMA

### **COMBATIVE PATIENT / CHEMICAL RESTRAINT**

#### **PURPOSE**

This protocol is intended to provide the pre-hospital care provider with a rational approach to perform a chemical assisted restraint with a patient, which otherwise the paramedic would not be able to restrain.

#### **INDICATIONS TO PERFORM A CHEMICAL RESTRAINT**

- a. The chemical restraint shall be performed only after all other appropriate restraint procedures have failed.
- b. The patient requires chemical restraint for either airway control or the patient / EMS providers' safety.
- c. The patient who has head injuries and the airway is not controlled by conventional means.
- d. Drug overdoses
- e. Seizures
- f. Psychiatric patients

#### **CONTRAINDICATIONS IN PERFORMING CHEMICAL RESTRAINT**

- a. The patient can be managed with conventional means.
- b. Not trained in the procedure.
- c. Risk of inability to control the patient's airway

#### **COMPLICATIONS**

- a. Cardiac arrest in patients that are not monitored adequately

#### **CAUTIONS**

- a. Patient will require airway support.
- b. Continuous monitoring of the patient's condition is imperative.

## TRAUMA

### **COMBATIVE PATIENT / CHEMICAL RESTRAINT (continued) PROCEDURE**

- a. Protect yourself. Have adequate rescuers/resources
- b. If the patient is a threat to themselves or the EMS provider.
- c. Administer 5 mg Haldol (Haloperidol) IM/IV/IO and Versed (Midazolam) 2.0-4.0 IV/IM/IO/nasally or Valium (Diazepam) 5-10mg
- e. Reassess patient. Monitor respiratory and heart rates
- f. Repeat as necessary
- d. Reassess patient. Monitor respiratory and heart rates
- e. Contact Medical Direction for additional orders.
- f. Soft restraints such as roller bandages or cravats can be used for extremity restraints. Sheets maybe used to limit upper body or lower extremity movement.

Once the patient is sedated, reassess vital signs (including Pulse Ox) every 2-3 minutes.

All restrained patients shall have a cardiac monitor in place at all times.

Administer Valium (Diazepam) or Versed (Midazolam) to keep the patient sedated as needed.

### **CRUSH INJURIES**

#### **PROCEDURE**

1. Confirmed prolonged entrapment (>1 hour) of one or more full extremities by crushing object (vehicle, building rubble, hanging in harness, self).
2. Complete trauma assessment to evaluate patient for other injuries and treatments.
3. If accessible, check extremity for decreased sensation, motor function, skin color, and distil pulses.

#### **Pre-Extrication:**

1. Administer High flow Oxygen via NRB
2. Start large bore IV with NS x2. Bolus 2L NS followed by 500ml/hr
3. Control pain per pain management protocol (Trauma-15).
4. Consider EKG monitoring (if accessible)
5. Prior to extrication, consider Sodium BiCarbonate 2 mEq/Kg IV up to 100 mEq.

#### **Post extrication:**

1. Suspect hyperkalemia if T-waves become peaked, QRS becomes prolonged (> 0.12 sec or hypotension develops.
2. Consider Calcium Chloride 1Gm IV over 5 minutes for dysrhythmias.
3. Consider additional Sodium BiCarbonate (Contact Medical Command).
4. Contact Medical Command for persistent hyperkalemia or dysrhythmias.

### **CONSIDER ONECALL PROGRAM FOR AEROMEDICAL TRANSPORT**

# TRAUMA

## **Introduction to Restraints and less-than-lethal adjuncts**

At any time, EMS Personnel may be called to an emergency scene or police facility to assist with the care of a person in the custody of law enforcement. At times, confusion may exist as to who has the authority to authorize or refuse care. Anytime a patient who is not in custody is being evaluated, standard procedures should prevail for the patient's condition and subsequent transport to a medical facility. If the patient is in custody, the patient becomes the responsibility of the arresting officer. Every effort should be made to provide a complete examination of the patient and make an appropriate recommendation to the police officer as to the needs of the patient.

Always be cautious of these patients and consider the following when attempting to provide care:

1. Is this patient only trying to avoid going to jail?
2. Does this patient have violent tendencies?
3. Will this patient allow EMS to evaluate and care for his/her medical problem?
4. Is it possible to restrain the patient care for their injuries if needed?

Your judgment and common sense must be used to make appropriate decisions in these circumstances. At times, physically restraining a violent patient may become necessary. Make sure prior to attempting restraints, that an adequate number of personnel are assembled and equipment is ready to expedite the application of the restraints.

As always, EMS Personnel should thoroughly document all findings and events.

# TRAUMA

## **Rapid Blood Coagulation**

Rapid Blood Coagulation (ie TraumaDex, QuickClot, etc...) is a blood clotting agent that provides rapid hemostasis at the wound site in times of profuse bleeding. When the agent is applied directly to the source of bleeding in a wound, with direct pressure, the particles of blood coagulant acts as a sieve to extract the fluid from the blood and enhance the formation of a clot.

1. Attempt to control bleeding with direct pressure, elevation and pressure points.
2. Open package and remove the bellows applicator, twist, and bend the nozzle to remove the cover.
3. Remove excess blood from the wound using sterile gauze
4. Identify the source of bleeding, remove the excess blood and then thoroughly cover the source and wound bed with TraumaDex powder.
5. Immediately reapply gauze to the wound and maintain direct pressure to the source of bleeding.
6. Follow proper wound dressing techniques
7. Continue to use direct pressure, elevation and pressure points for supportive measures after TraumaDex is applied.

Approximately 2 grams from the applicator covers 4 square inches of the wound.  
If bleeding is not controlled, repeat procedure.

# TRAUMA

## **Handcuffs / Restraints**

Patients that are in custody at times may be handcuffed or restrained with additional restraints. The transport of these patients while restrained with hand cuffs or additional restraints may be necessary. If this situation exists, a law enforcement officer with the ability to remove and control the handcuffs or restraint devices should transport with the EMS Unit to the medical facility.

## **Handcuffs / Restraints**

1. Always use common sense when dealing with patients in custody.
2. The EMS Provider may allow the arresting officer to sign a medical refusal on behalf of the patient providing they do not pose a serious threat to the EMS crew or themselves.
3. Anytime a question arises about the patient's needs or in determining the transport decision for a patient in custody, EMS should contact Medical Direction.

## **Stinger balls / Rubber bullets / Beanbag shotguns**

These types of devices are deployed in a various situations with the hopes of giving the law enforcement officer the tactical advantage when securing subjects. These types of less-than lethal devices can result in blunt or penetrating trauma.

1. Treat patients following the protocols outlined by blunt or penetrating injury.
2. Groin and facial injuries are to be supportive care.
3. Consider c-spine immobilization if injuries reflect spinal injury.
4. If injuries are located on the torso, consider an EKG due to blunt force trauma.

## **Flashbangs / Concussion grenade / Flash diversionary-incendiary devices**

These types of devices are deployed in a various situations with the hopes of giving the law enforcement officer the tactical advantage when securing subjects. These types of less-than lethal devices can result in possible:

Temporary loss of vision as the patient is exposed to a large amount of blinding light.  
Temporary hearing loss as the patient is exposed to a loud deafening sound

1. Assess patients for inhalation/flash burns due to high heat emitted by devices.
2. Reassure patients that hearing and vision will return upon due time.
3. Consider the use of hand signals to communicate effectively with the patient
4. Consider immobilizing patients due to combative nature.
5. Consider EKG monitoring of patients due to blunt chest trauma.

# TRAUMA

## **TASER WOUNDS**

Tasers create a temporary neuron-muscular inhibition which causes a momentary loss of muscle control. Although there have been no proven cases to show as primary cause of death by Taser use, EMS Providers should complete a thorough medical examination on every Taser patient.

1. If Prongs or barbs are still penetrating the skin:
  - a. Cut the wire line from the Taser module close to the barb
  - b. Using a pair of hemostats, grasp firmly the skin around the entry point
  - c. Remove Taser prongs from skin
2. Bandage the affected areas with an alcohol prep pad and bandage as needed
3. Consider 12-Lead EKG Interpretation with transmission to hospital

**Note: Prongs do not constitute a penetrating traumatic injury**

Due to potentially dangerous/litigious locations:

EMS Providers are forbidden to remove Taser prongs from the genitalia area, neck, face or eyes.

\*\*\*These specific situations require transport to medical care facility\*\*\*

## **PEPPER SPRAY / MACE**

1. Assess patient for allergic reactions and/or difficulty breathing.
2. Flushing of patient's sprayed areas with normal saline
3. After flushing the affected areas, patient continues to have difficulty breathing, or other medical problems, continue to provide supportive medical care as necessary.
4. Prior to transport, consider gross decontamination of patient by
  - a. flushing eyes
  - b. Nose
  - c. Mouth
  - d. Mucosal membranes
5. Remove and seal any contaminated clothing

Normally patients have a "burning feeling": Consider this a valid medical complaint  
This does require a transport to a medical facility

Effects from substance can remain active for up to 6 hours.

Take necessary precautions for proper BSI/PPE in treatment due to patient's exposure to substance.

## TRAUMA

### PAIN MANAGEMENT

#### **INDICATIONS**

Paramedic care and management of the adult patient with pain associated with the Skeletal, Chest, Abdominal, and Burn Trauma, and/or medical conditions not included in the exclusion criteria.

#### **PROCEDURE**

1. Maintain Airway, Breathing and Circulation
2. Pulse Oximetry, High Flow Oxygen
3. EKG Monitor if possible (If dysrhythmias, begin ACLS protocols)
4. IV Normal Saline TKO rate, blood draws
5. Assess for definite pain with specific attention of documentation of:
  - a. Onset of events and/or possible origin of mechanism of pain/discomfort
  - b. Provocation of pain/discomfort
  - c. Quality of pain (i.e. sharp, stabbing, dull, crushing, squeezing, etc.)
  - d. Region and radiation of pain/discomfort
  - e. Scale - Rate pain on numeric pain scale (scale of: 0 to 10)
  - f. Time of onset for pain/discomfort
  - g. Any other complaints that may be associated with patients pain/discomfort
6. Consider administration of (Paramedics may administer per standing orders) (**EMT-Intermediates must consult Medical Direction for the following**):
  - a. **Morphine Sulfate (Standing order):** Administer up to 5 mg of Morphine Sulfate IVP for obvious orthopedic compromises and/or 2<sup>nd</sup> or 3<sup>rd</sup> degree burns.
    - Follow Morphine with Zofran 4mg to with nausea
  - b. **Fentanyl (Sublimaze)** 25-50 mcg IM, Slow IVP, or Intranasal over 1-2 minutes every 20-30 minutes PRN, titrated to Systolic BP of < 90 mm/HG or for proper analgesic effect.
  - c. **Toradol (Ketorolac)** 30 mg IVP or 60 mg IM x 1
7. Monitor patient for adverse reactions including sedation, hypotension, nausea and/or vomiting, or respiratory depression.
8. Be prepared to secure an airway, assist ventilations and administer narcotic antagonist medication in the event of respiratory depression or failure as a result of analgesic medication administration:
  - a. Administer Naloxone HCl (Narcan) 4 mg IV, IM, SQ
    - \*\* **Be aware of possible combative behavior post administration.** \*\*Administer antiemetic (Vomiting) medication in the event of acute nausea and vomiting as a result of analgesic medication administration.
  - b. Zofran (Ondansetron) 4 mg undiluted slow IVP.
9. Contact Medical Directions for inquiries as needed.
10. Continual monitoring of patient's ABC's and mental status.

#### **CONTRAINDICATIONS**

1. Allergies and/or Adverse Reactions to Morphine Sulfate, Fentanyl (Sublimaze), and/or Toradol (Ketorolac).
2. Absolute or impending Hypovolemic Shock (Adult Systolic BP < 90 mm/HG).

#### **EXCLUSIONS**

CHF or ACS (Refer to proper protocols)

**DO NOT HESITATE TO CONTACT MEDICAL DIRECTION**

TRAUMA-15