



Southwest General

Partnering with



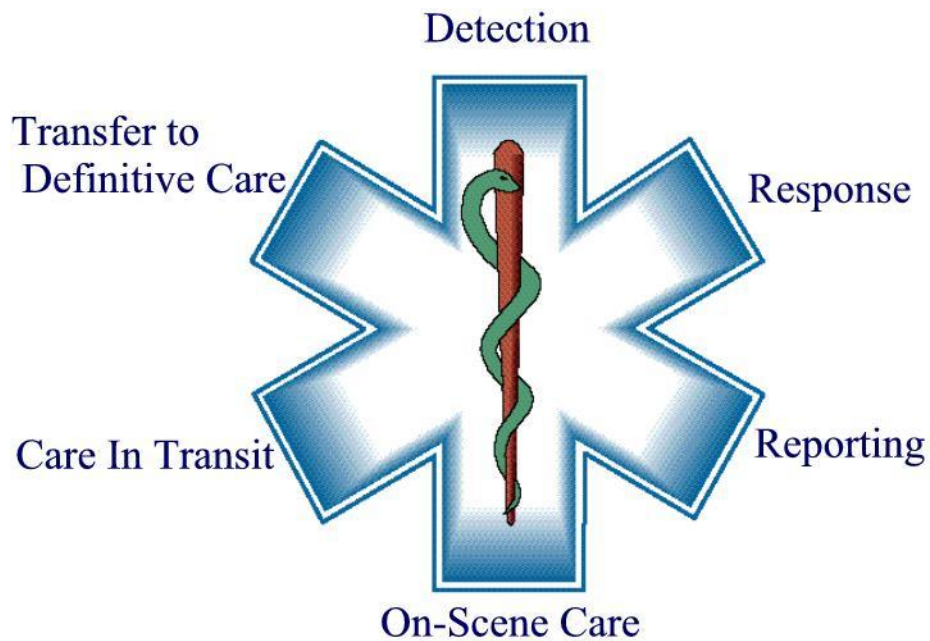
University Hospitals

EMS Services

PRE-HOSPITAL CARE

MEDICAL CONTROL

PROTOCOLS AND PROCEDURES



TRAUMA EMERGENCIES**The Golden Hour**

**THE GOLDEN HOUR FOR THE PATIENT BEGINS WHEN THE TRAUMA HAPPENS.
DO NOT WASTE VALUABLE TIME ON SCENE.**

International Trauma Life Support (ITLS)**GUIDELINES FOR LOAD AND GO TRAUMA TRANSPORTS:****Initial Assessment reveals:**

- Altered mental status
- Abnormal respirations
- Abnormal circulation

Signs discovered during the Rapid Trauma Survey of conditions that rapidly lead to shock:

- Abnormal chest exam (flail, open, tension, pneumothorax)
- Tender, distended abdomen
- Pelvic instability
- Bilateral femur fractures
- Significant mechanism of injury and/or poor general health of patient.

GENERAL CONSIDERATIONS:

- A trauma victim is considered to be a pediatric patient if they are 15 years old or younger.
- Once the patient is determined to be an actual or potential major trauma / multiple system patient, personnel on scene and/or Medical Control must quickly determine the appropriate course of action including:
 1. Requesting aeromedical evacuation from scene. See: Aeromedical Transport Procedure.
 2. Ground transportation directly to an appropriate facility.
- Major Trauma patients are to be transported to the closest Trauma Center.
- Contact the receiving hospital for all major trauma or critical patients.
- Cover open wounds, burns, and eviscerations.
- With the exception of airway control, initiate ALS enroute when transporting major trauma patients.
- If the EMT is unable to establish an airway and ventilate, transport to the closest facility for airway stabilization.
- The on scene time for major trauma patients should not exceed 10 minutes without a documented, acceptable reason for the delay.
- All major trauma patients should receive oxygen administration; large bore IV(s), cardiac monitoring and capnography.
- Provide a documented reason if an intervention could not be performed.

Mass Casualty Incidents (MCI)

- 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.
- If nerve agent / terrorist incident is suspected, consider use of the DuoDote®.
- 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.

TRAUMA

TRAUMA GUIDELINES

Emergency medical service personnel shall use the following criteria, 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 according to the State of Ohio Trauma Triage Guidelines.

An Adult Trauma Victim is a person 16 years of age or older exhibiting one or more of the following physiologic or anatomic conditions:

<u>Physiologic conditions</u>	<u>Anatomic conditions</u>
<ul style="list-style-type: none"> • Glasgow Coma Scale less than 13 • Loss of consciousness greater than 5 minutes • Deterioration in level of consciousness at the scene or during transport • Failure to localize to pain • Respiratory rate less than 10 or greater than 29 • Requires endotracheal intubation • Requires relief of tension pneumothorax • Pulse greater than 120 in combination with evidence of hemorrhagic shock • Systolic blood pressure less than 90, or absent radial pulse with carotid pulse present 	<ul style="list-style-type: none"> • Penetrating trauma to the head, neck, or torso • Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise • Injuries to the head, neck, or torso where the following physical findings are present: <ul style="list-style-type: none"> • Visible crush injury • Abdominal tenderness, distention, or seatbelt sign • Pelvic fracture • Flail chest • Injuries to the extremities where the following physical findings are present: <ul style="list-style-type: none"> • Amputations proximal to the wrist or ankle • Visible crush injury • Fractures of proximal long bones • Evidence of neurovascular compromise <ul style="list-style-type: none"> • Signs or symptoms of spinal cord injury • 2nd or 3rd degree greater than 10% total BSA, or other significant burns involving the face, feet, hands, genitalia, or airway • Injury sustained in two or more body regions

Field Trauma Triage Criteria: Mechanism of Injury (MOI) & Special Considerations

<u>Co-Morbid Diseases and Special Considerations:</u>	<u>Mechanisms of Injury (MOI)</u>
<ul style="list-style-type: none"> • Age less than 5 or greater than 55 • Cardiac disease • Respiratory disease • Diabetes • Immunosuppression • Morbid obesity • Pregnancy • Substance abuse / intoxication • Liver disease • Renal disease • Bleeding disorder / anticoagulation 	<ul style="list-style-type: none"> • High speed MVC • Ejection from vehicle • Vehicle rollover • Death in same passenger compartment • Extrication time greater than 20 minutes • Falls greater than 20 feet • Vehicle versus bicycle / pedestrian • Pedestrian struck, thrown or run over • Motorcycle crash greater than 20 mph with separation of rider from bike • Fall from any height, including standing with signs of traumatic brain injury

TRAUMA GUIDELINES

GENERAL CONSIDERATIONS:

Exceptions to Mandatory Transport to a Trauma Center:

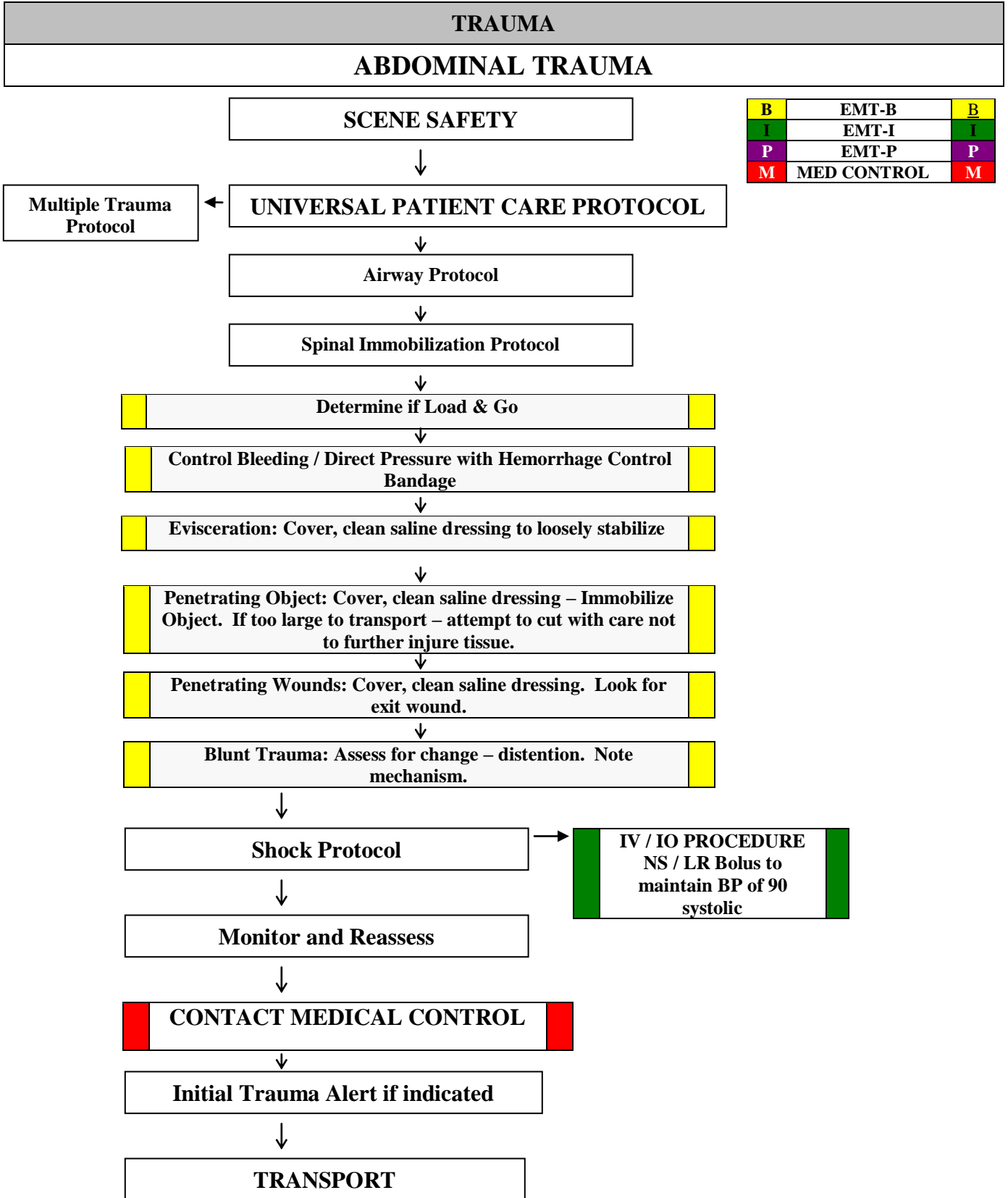
Emergency medical service personnel shall transport a trauma victim directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:

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.

TRAUMA ALERT PROCEDURE

1. EMS Pre-hospital response – verbalize “trauma” initially when placing call
2. EMS Notifies ED of Potential Trauma Victim(s)
3. EMS Notifies ED - Trauma patient(s) Report / GCS given / destination decided
4. ED Charge Nurse notifies ED Doctor activates “Trauma Alert”
5. Patient Enroute to Hospital - ETA given
6. Arrival of patient(s)
7. Team Care / treatment

Glascow Coma Scale					
INFANT <i>Birth to age 4</i>				ADULT <i>Age 4 to Adult</i>	
4	Spontaneously	<u>Eye Opening</u>		4	Spontaneously
3	To speech			3	To command
2	To pain			2	To pain
1	No response			1	No Response
_____				_____	
5	Coos, babbles	<u>Best Verbal Response</u>		5	Oriented
4	Irritable cries			4	Confused
3	Cries to pain			3	Inappropriate words
2	Moans, grunts			2	Incomprehensible
1	No response	1	No response	_____	
_____				_____	
6	Spontaneous	<u>Best Motor Response</u>		6	Obeys commands
5	Localizes pain			5	Localizes pain
4	Withdraws from pain			4	Withdraws from pain
3	Flexion (decorticate)			3	Flexion (decorticate)
2	Extension (decerebrate)			2	Extension (decerebrate)
1	No response	1	No response	_____	
_____				_____	
_____ = TOTAL		GCS less than 8? Intubate!		TOTAL = _____	



TRAUMA	
ABDOMINAL TRAUMA	
Mechanism	Signs and Symptoms
<ul style="list-style-type: none"> • Blunt • Penetrating 	<ul style="list-style-type: none"> • Altered mental status • Shock • Distention • Swelling • Bulging • Nausea and vomiting • Altered mental status • Bleeding • Tenderness • Pain • Distention • Evisceration • Discoloration • Entrance / Exit wounds • Nausea and vomiting

GENERAL CONSIDERATIONS:

Trauma to the abdomen is either Blunt or Penetrating. Blunt injuries are harder to detect and diagnose, and have a death rate twice that of penetrating wounds. Key signs and symptoms of blunt trauma include a patient in shock with no obvious injuries. Distention of the abdomen is an indication of internal hemorrhage. Pain may not be a significant factor. Many abdominal trauma injuries are Load & Go cases.

- Look for both an entrance and exit wound for all penetrating trauma, and treat accordingly.
- For all major trauma patients, the on scene time should be less than ten minutes.

BURNS

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL

See Airway Protocol

Consider Spinal Immobilization

Remove rings, bracelets, and other constricting items

Thermal

Chemical

If burn less than 10% body surface area (using rule of nines)
Cool down wound with NORMAL SALINE

Eye Injury, Tetracaine eye drops then continuous flushing with Normal Saline.

Cover burn with dry sterile sheet dressings

Remove clothing and/or expose area

IV / IO PROTOCOL
NORMAL SALINE IV BOLUS

Flush area with NORMAL SALINE for 10 – 15 minutes

Pain Control Protocol

CONTACT MEDICAL CONTROL

TRANSPORT

BURNS

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> Type of exposure (heat, gas, chemical) Inhalation injury Time of injury Past medical history Medications Other trauma Loss of consciousness Tetanus / Immunization status 	<ul style="list-style-type: none"> Burns, pain, swelling Dizziness Loss of consciousness Hypotension / shock Airway compromise / distress Singed facial or nasal hair Hoarseness / wheezing 	<ul style="list-style-type: none"> Superficial (1°) red and painful Partial thickness (2°) superficial partial thickness, deep partial thickness, blistering Full thickness (3°) painless and charred or leathery skin Chemical Thermal Electrical Radiation

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- Critical Burns: greater than 25% body surface area (BSA), full thickness burns greater than 10% BSA, partial thickness superficial partial thickness, deep partial thickness and full thickness burns to face, eyes, hand or feet, genitals, joints, electrical burns, respiratory burns, deep chemical burns, burns with extremes of age or chronic disease, and burns with associated major traumatic injury. These burns may require hospital admission or transfer to a burn center.
- Early intubation is required in significant inhalation injuries; also apply cardiac monitor and treat arrhythmia, especially with electrical burns.**
 - Potential CO exposure should be treated with 100% oxygen. Provide endotracheal intubation per procedure protocol.
 - Circumferential burns to extremities are dangerous due to potential vascular compromise partial thickness to soft tissue swelling.
 - Burn patients are prone to hypothermia – Never apply ice or cool burns that involve greater than 10% body surface area.
 - Do not overlook the possibility of multiple system trauma.
 - Do not overlook the possibility of child abuse with children and burn injuries.
 - Morphine 2mg IVP every 5 minutes until pain relieved. (Maximum dose of 10mg in the field.) See appendix for rule of nines.
 - Administer IV fluids per the Parkland Burn Formula: Fluid for first 24 hours (mL) = 4x patient's weight in kg x %BSA.

1. Thermal (dry and moist):

- Stop burning process: i.e., remove patient from heat source, cool skin, remove clothing
- If patient starts to shiver or skin is cool, stop cooling process
- Estimate extent (%) and depth of burn (see chart). Determine seriousness (see chart) of burn. Contact Medical Control, transport accordingly. Cover burn areas with sterile dressing.

2. Radiation Burns:

- Treat as thermal burns except when burn is contaminated with radioactive source, then treat as chemical burn.
- Wear appropriate protective clothing when dealing with contamination.
- Contact HAZ MAT TEAM for assistance in contamination cases.

3. Chemical Burns:

- Wear appropriate protective clothing and respirators.
- Remove patient from contaminated area to decontamination site (NOT SQUAD).
- Determine chemicals involved; contact appropriate agency for chemical information.
- Remove patient's clothing and flush skin.
- Leave contaminated clothes at scene. Cover patient over and under before loading into squad.
- Patient should be transported by personnel not involved in decontamination process.
- Determine severity (see chart), contact Medical Control and transport accordingly.
- Relay type of substance involved to Medical Control.

4. Electrical Burns:

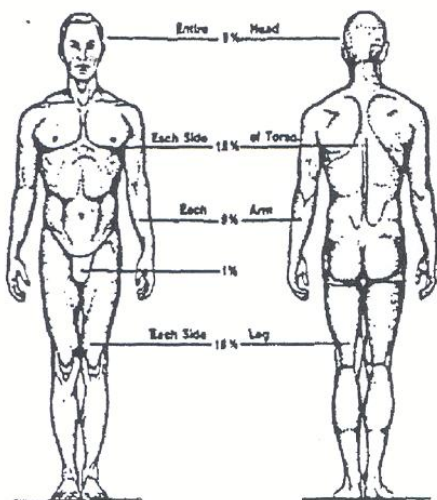
- Shut down electrical source; do not attempt to remove patient until electricity is CONFIRMED to be shut off.
- Assess for visible entrance and exit wounds and treat as thermal burns.
- Assess for internal injury, i.e., vascular damage, tissue damage, fractures, and treat accordingly.
- Determine severity of burn, contact Medical Control and transport accordingly.

5. Inhalation Burns:

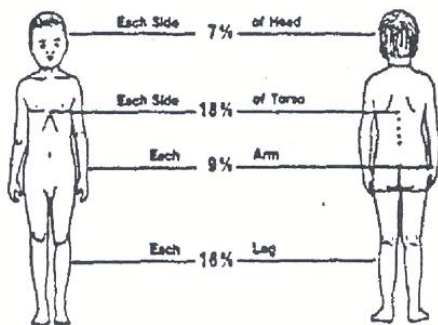
- Always suspect inhalation burns when the patient is found in closed smokey environment and/or exhibits any of the following: burns to face/neck, singed nasal hairs, cough and/or stridor, soot in sputum.
- Provide oxygen therapy, contact Medical Control and transport.
 - Handle patient gently to avoid further damage of the patient's skin.
 - If the patient is exposed to a chemical, whenever possible, get the name of the chemical, and document it on the patient run report. **DO NOT** transport any hazardous materials with the patient.
 - Look for signs of dehydration and shock.
 - Initiate early intubation for symptomatic patients with inhalation burns.
 - Patients with major burns should be transported to the MetroHealth Medical Regional Burn Center.
 - Patients with unstable airway or who are rapidly deteriorating should be transported to the closest appropriate facility.
 - Patients with large surface burns lose the ability to regulate their body temperature. Avoid heat loss by covering the patient.

RULE OF NINES

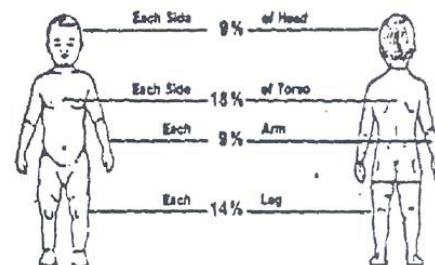
RULE OF NINES



Percentage of Adult Body Surface



Percentage of Child Body Surface



Percentage of Infant Body Surface

1% is equal to the surface of the palm of the patient's hand. If unsure of %, describe injured area.

SERIOUSNESS OF BURNS

MINOR

- 1st degree < 70%
- 2nd degree < 10%
- +3rd degree < 2%

MODERATE

- 1st degree > 70%
- +2nd degree 10-30%

CRITICAL

- 2nd degree > 30%
- 3rd degree > 2%
- Any burns with trauma.
- Any burns with head, face, feet, genitalia involved.

+ Only if hands, face, feet or genitalia are NOT involved

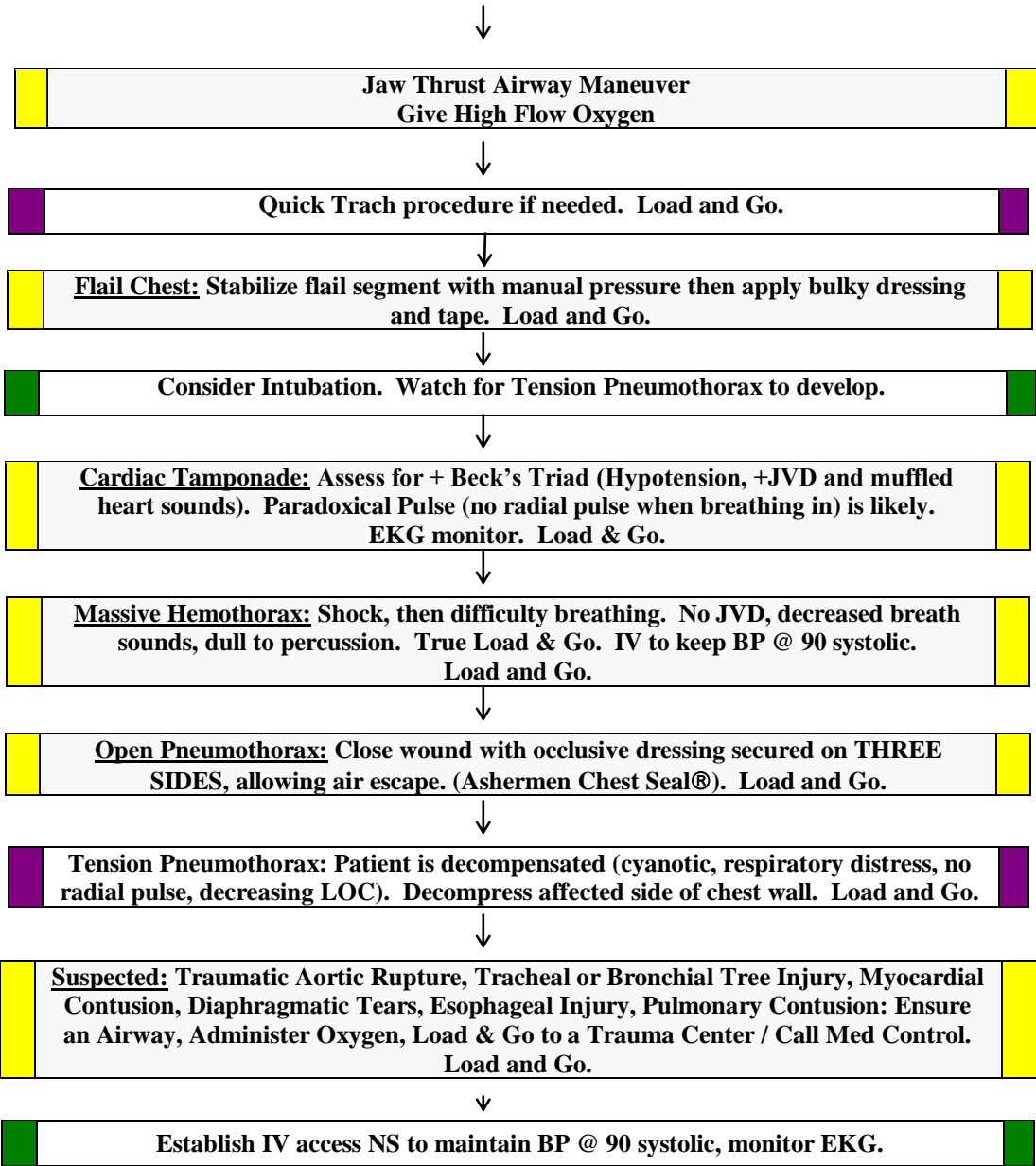
MAJOR BURN CRITERIA

- 2° and 3° burns more than 10% surface area
- burns of the face, hands feet genitalia
- electrical shock with burn injury
- burn with inhalation injury any burn with potential functional or cosmetic impairment

TRAUMA
CHEST TRAUMA

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL
C-Spine Immobilization
Evidence of Trauma – Blunt or Penetrating
Abnormal breath sounds, inadequate respiratory rate, Unequal symmetry.
Diminished chest excursion. Cyanosis.



CONTACT MEDICAL CONTROL
Initiate Trauma Alert

→ **TRANSPORT**

CHEST TRAUMA

Signs and Symptoms

Simple Pneumothorax	Open Pneumothorax	Tension Pneumothorax	Hemothorax
<ul style="list-style-type: none"> • Shortness of Breath • Dyspnea • Tachypnea • Cyanosis • Chest Pain • Absent / diminished lung sounds on the affected side 	<ul style="list-style-type: none"> • Shortness of Breath • Dyspnea • Cyanosis • Sucking Chest Wound • Shock • Absent / diminished lung sounds on affected side 	<ul style="list-style-type: none"> • Shortness of Breath • Cyanosis • Shock • Absent / diminished lung sounds • Tracheal deviation • Hypotension • JVD • Tachycardia • Dyspnea (late sign) 	<ul style="list-style-type: none"> • Shortness of Breath • Dyspnea • Cyanosis • Dullness to percussion sounds • Flat Neck Veins • Hypotension • Shock • Absent / diminished breath sounds • Tachycardia
CARDIAC TAMPONADE	TRAUMATIC ASPHYXIA	FLAIL CHEST	
<ul style="list-style-type: none"> • Hypotension • Decreasing Pulse Pressure • Elevated Neck Veins • Muffled Heart Tones • Bruising over the Sternum • Tachycardia 	<ul style="list-style-type: none"> • Bloodshot, Bulging Eyes • Blue, Bulging Tongue • JVD • Cyanotic Upper Body 	<ul style="list-style-type: none"> • Paradoxical Chest Wall movement • Asymmetric Chest Movement upon Inspiration • Dyspnea • Unstable Chest Segment • Significant Chest Wall Pain 	

GENERAL CONSIDERATIONS:

Thoracic injuries have been called the deadly dozen. The first six are obvious at the primary assessment:

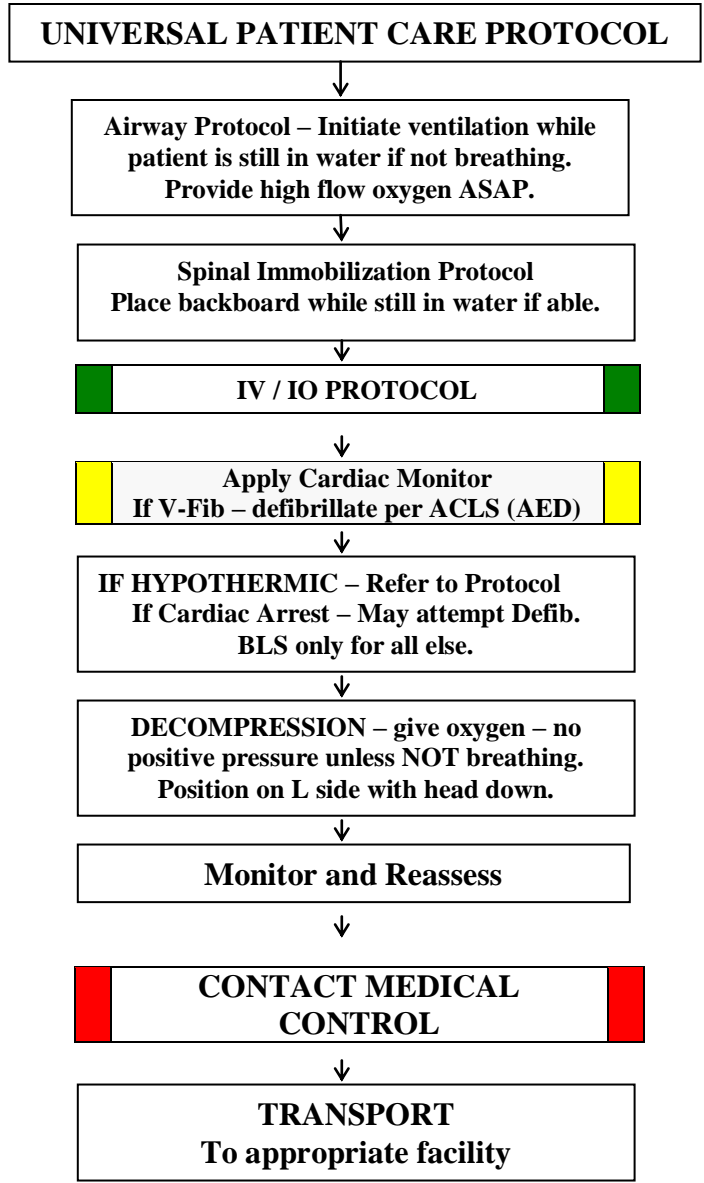
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|-----------------------|-------------------------|
| 1. Airway Obstruction | 4. Massive Hemothorax |
| 2. Flail Chest | 5. Open Pneumothorax |
| 3. Cardiac Tamponade | 6. Tension Pneumothorax |

The second six injuries may be more subtle and not easily found in the field:

- | | |
|-----------------------------|--------------------------------------|
| 7. Traumatic Aortic Rupture | 10. Diaphragmatic Tears |
| 8. Esophageal Injury | 11. Tracheal / Bronchial Tree Injury |
| 9. Myocardial Contusion | 12. Pulmonary Contusion |

- **A sucking chest wound** is when the thorax is open to the outside. The occlusive dressing may be anything such as petroleum gauze, plastic, or a defibrillator pad. Asherman Chest Seal® Tape only 3 sides down so that excess intrathoracic pressure can escape, preventing a tension pneumothorax. May help respirations to place patient on the injured side, allowing unaffected lung to expand easier.
- **A flail chest** is when there are extensive rib fractures present, causing a loose segment of the chest wall resulting in paradoxical and ineffective air movement. This movement must be stopped by applying a bulky pad to inhibit the outward excursion of the segment. Positive pressure breathing via BVM will help push the segment and the normal chest wall out with inhalation and to move inward together with exhalation, getting them working together again. Do not use too much pressure to prevent additional damage or pneumothorax.
- **A Penetrating Object** must be immobilized by any means possible. If it is very large, cutting may be possible, with care taken not to move it about when making the cut. Place an occlusive and bulky dressing over the entry wound.
- **A Tension Pneumothorax** is life threatening, look for hypotension and unequal breath sounds, JVD, increasing respiratory distress, decrease mental status, and lastly, tracheal displacement. The pleura must be decompressed with a needle to provide relief. Use either the mid-clavicular (2nd or 3rd intercostals space) or the midaxillary (5th or 6th space) landmarks, going in on the top side of the rib. Once the catheter is placed, watch closely for reocclusion. Repeat if needed.

DROWNING / NEAR DROWNING



B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

DROWNING / NEAR DROWNING

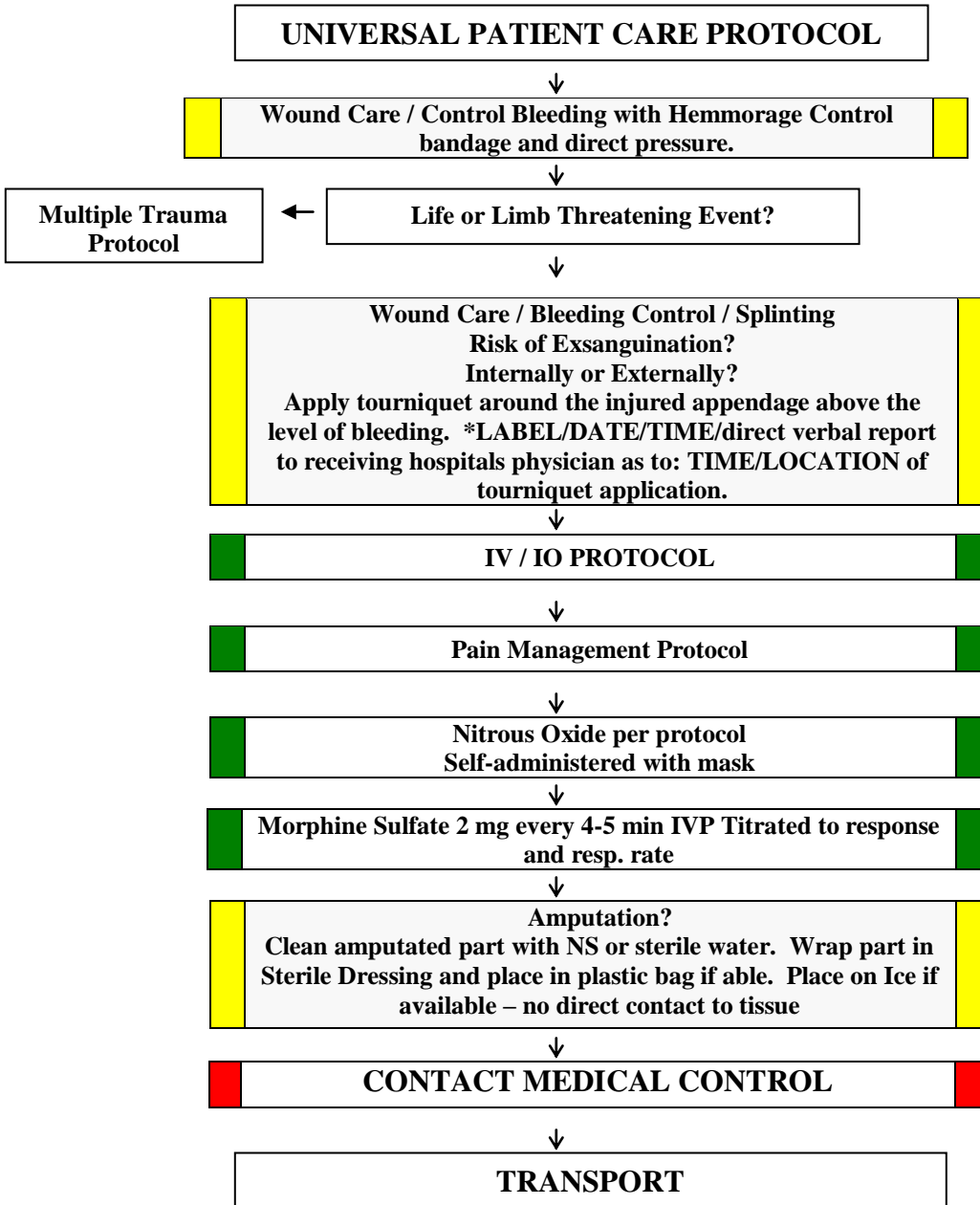
History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Submersion in water regardless of depth • Possible trauma i.e., fall, diving board • Duration of immersion • Temperature of water • Salt or fresh water 	<ul style="list-style-type: none"> • Period of unconsciousness • Unresponsive • Mental status changes • Decreased or absent vital signs • Vomiting • Coughing 	<ul style="list-style-type: none"> • Trauma • Pre-existing medical problem • Barotrauma (diving) • Decompression sickness

GENERAL CONSIDERATIONS:

- Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro
- Drowning due to suffocation from submersion in water.
- 2 causes – breath holding which leads to aspiration of water, and laryngospasm which closes the glottis.
- Both causes lead to profound hypoxia and death.
- Fresh water drowning ventricular fibrillation may be likely.
- Salt water drowning may cause pulmonary edema in time.
- Pulmonary edema can develop within 24-48 hours after submersion.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- Drowning is a leading cause of death among would-be rescuers.
- Allow appropriately trained and certified rescuers to remove victims from areas of danger.
- With pressure injuries (decompression / barotrauma), consider transport for availability of a hyperbaric chamber.
- All hypothermic / near-drowning patients should have resuscitation performed until care is transferred, or if there are other signs of obvious death (putrification, traumatic injury unsustainable to life).
- Consider a c-spine injury in all drowning cases. Always immobilize a drowning patient.
- In the absence of hypothermia, ACLS protocols are to be followed for drowning patients in cardiac arrest after the submersion.
- Patients with low core temperatures will not respond to ALS drug interventions. Maintain warming procedure and supportive care.
- DO NOT perform the Heimlich maneuver to remove water from the lungs prior to resuscitation.

TRAUMA
EXTREMITY / AMPUTATION TRAUMA

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



TRAUMA		
EXTREMITY / AMPUTATION TRAUMA		
History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> Type of injury Mechanism: crush / penetrating / amputation Time of injury Open vs closed wound / fracture Wound contamination Medical history Medications 	<ul style="list-style-type: none"> Pain, swelling Deformity Altered sensation / motor function Diminished pulse / capillary refill Decreased extremity temperature 	<ul style="list-style-type: none"> Abrasion Contusion Laceration Sprain Dislocation Fracture Amputation

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Extremity, Neuro
- In amputations, time is critical. Transport and notify Medical Control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- If a tourniquet is applied, give a direct verbal report to receiving hospital as to time and location of tourniquet application and document.

Extremity Trauma:

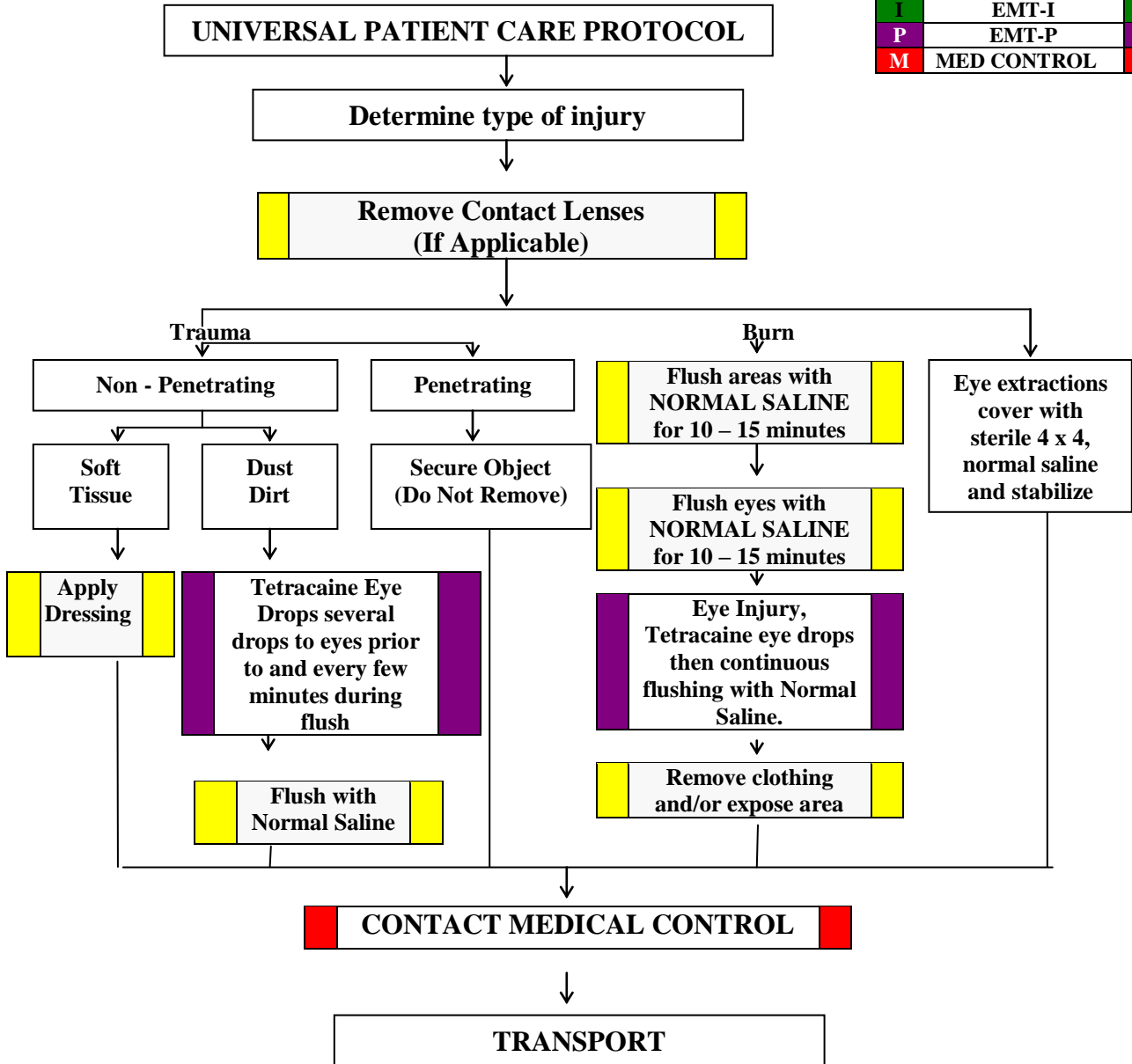
- In cases of major trauma, the backboard can work as a whole body splint.
- DO NOT take the time to splint injured extremities in major trauma patients unless it does not delay the scene time or prevents you from performing more pertinent patient care.
- Splint the extremity if the patient has signs and symptoms of a fracture or dislocation.
- Treat all suspected sprains or strains as fractures until proven otherwise.
- Splint the joint above and below for all suspected fractures.
- Splint the bone above and below for all suspected joint injuries.
- Check and document the patient's MSP's before and after splinting.
- A traction splint with a backboard is the preferred splint to use for femur fractures.

Traumatic Amputation:

- Care of the amputated extremity include:
 - Cleanse an amputated extremity with normal saline.
 - DO NOT place any amputated tissue directly on ice or cold pack. Instead, wrap amputated limb in moistened sterile dressing with normal saline and place in plastic bag. Put the bag into a container of cool water / ice.
- Contact the receiving hospital with the patient information, and include the status of the amputated limb.
- Focus on patient care and not on the amputated extremity.
- Tourniquets are a last resort.
- Remember to calm and reassure the patient. Do not give the patient or their family members false hope of re-attachment of the affected limb. A medical team at the receiving hospital makes this decision.
- Delegate someone to do an on scene search for the amputated part when it cannot be readily found and continue with patient care.

TRAUMA
EYE INJURY

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



EYE INJURIES

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Trauma of any type that results in injury to one or both eyes. 	<ul style="list-style-type: none"> • Irritation to Eye • Visual Disturbances • Obvious Penetrating Injury • Burn (Chemical, Thermal) • Loss of Vision • Dizziness • Loss of Consciousness • Nausea 	<ul style="list-style-type: none"> • Hypertension • Contact Lens Problem

GENERAL CONSIDERATIONS:

- If unsure if something can be flushed with water, contact Medical Control.
- A garden hose can be used to help flush the patient’s eye(s) if available. DO NOT use a high-pressure hose or flush at a high force. If needed, irrigate the patient’s eyes for approximately 5-15 minutes.
- Begin irrigating immediately, because irreversible damage can occur in a few minutes.
- Apply Tetracaine, a few drops to eyes every 4-5 minutes before irrigation.

TRAUMA:

- Do not allow eye injury to distract you from the basics of trauma care.
- Do not remove any foreign body imbedded in the eye or orbit. Stabilize any large protruding foreign bodies.
- With blunt trauma to the eye, if time permits, examine the globe briefly for gross laceration as the lid may be swollen tightly shut later. Sclera rupture may lie beneath an intact conjunctiva.
- Covering both eyes when only one eye is injured may help to minimize trauma to the injured eye, but in some cases the patient is too anxious to tolerate this.
- Transport patient sitting supine unless other life threats prohibit this from being done (this is based on physics, the goal of not letting the fluid within the eye drain out of the eye).

CHEMICAL BURNS:

- When possible, determine type of chemical involved first. The eye should be irrigated with copious amounts of water or saline, using IV tubing wide open for a minimum of 15 minutes started as soon as possible. Any delay may result in serious damage to the eye.
- Always obtain name and, if possible, a sample of the contaminant or ask that they be brought to the hospital as soon as possible.

CONTACT LENSES:

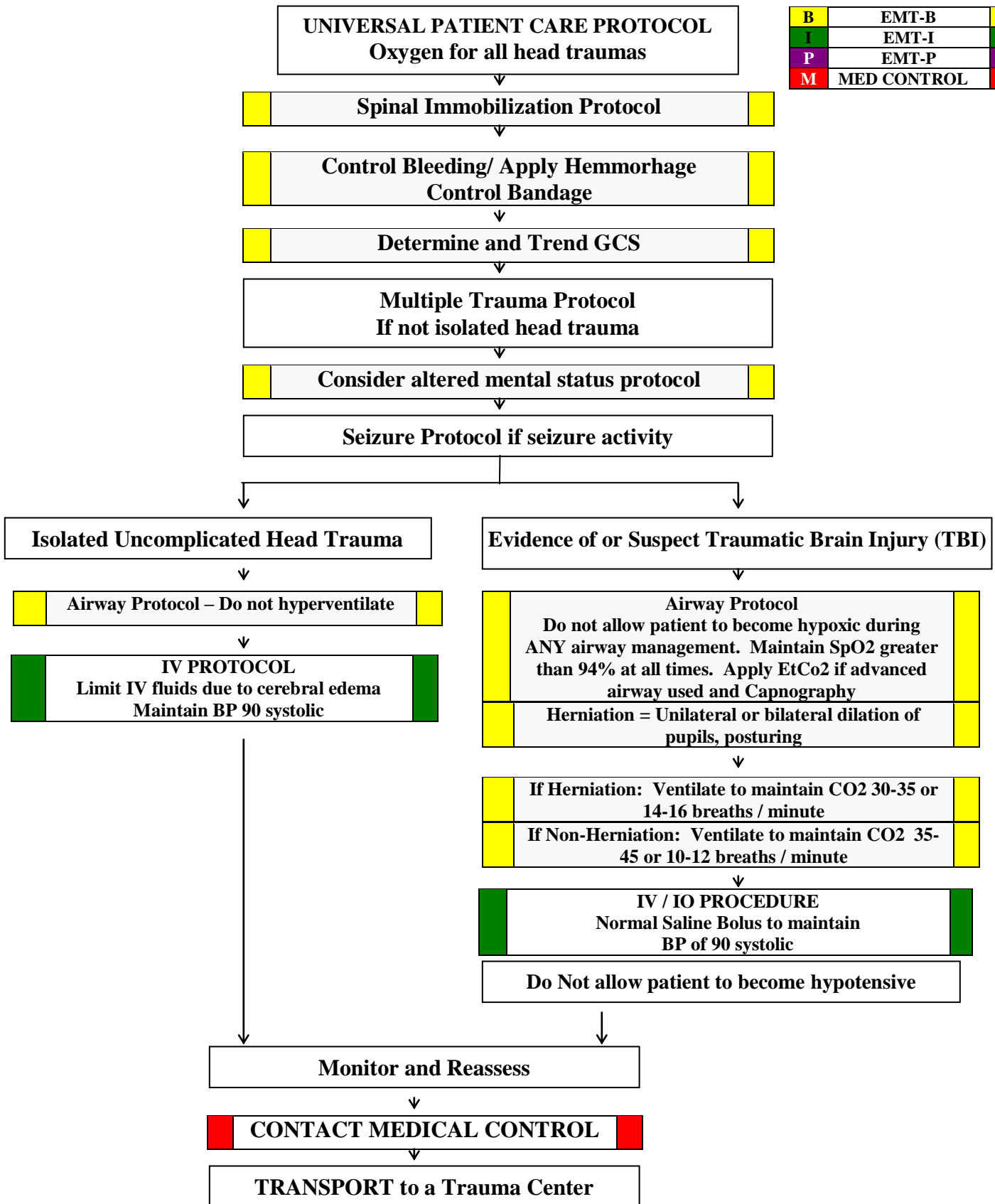
- If possible, contact lenses should be removed from the eye; be sure to transport them to the hospital with the patient. If the lenses cannot be removed, notify the ED personnel as soon as possible.
- If the patient is conscious and alert, it is much safer and easier to have the patient remove their lenses.

ACUTE, UNILATERAL VISION LOSS:

- When a patient suddenly loses vision in one eye with no pain, there may be a central retinal artery occlusion. Urgent transport and treatment is necessary.
- Patient should be transported flat.

TRAUMA
HEAD TRAUMA

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



HEAD TRAUMA

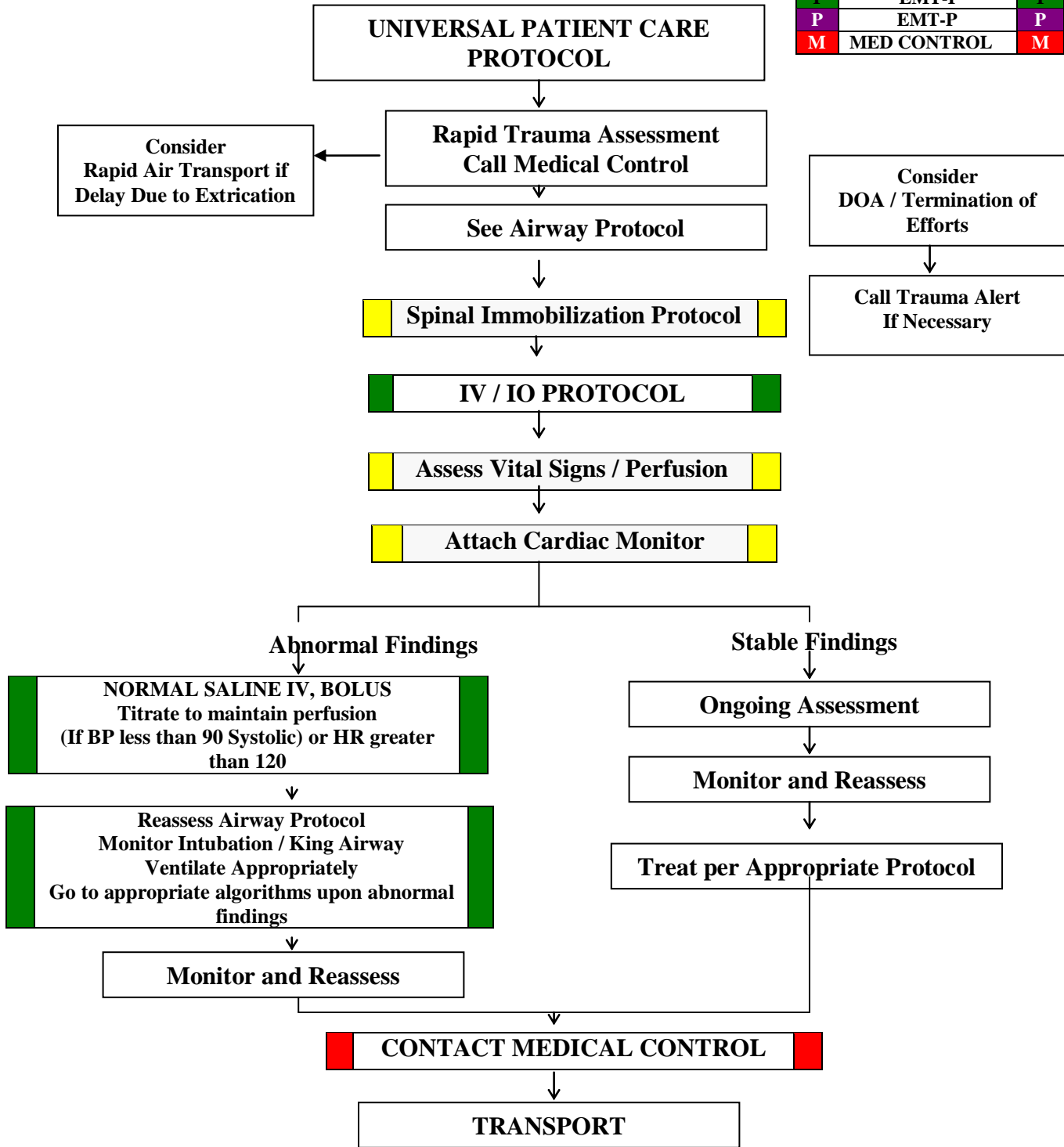
History		Signs and Symptoms		Differential Diagnosis	
<ul style="list-style-type: none"> • Time of injury • Mechanism: blunt / penetrating • Loss of consciousness • Bleeding • Medical history • Medications • Evidence of multi-trauma • Helmet use or damage to helmet 		<ul style="list-style-type: none"> • Pain, swelling, bleeding • Altered mental status • Unconscious • Respiratory distress / failure • Vomiting • Significant mechanism of injury 		<ul style="list-style-type: none"> • Skull fracture • Brain injury (concussion, contusion hemorrhage, or laceration) • Epidural hematoma • Subdural hematoma • Subarachnoid hemorrhage • Spinal injury • Abuse 	
Glasgow Coma Scale					
INFANT: Birth to age 4				ADULT: Age 4 to Adult	
4	Spontaneously	<u>Eye Opening</u>		Spontaneously	4
3	To speech			To command	3
2	To pain			To pain	2
1	No response			No Response	1
5	Coos, babbles	<u>Best Verbal Response</u>		Oriented	5
4	Irritable cries			Confused	4
3	Cries to pain			Inappropriate words	3
2	Moans, grunts			Incomprehensible	2
1	No response	No response	1		
6	Spontaneous	<u>Best Motor Response</u>		Obeys commands	6
5	Localizes pain			Localizes pain	5
4	Withdraws from pain			Withdraws from pain	4
3	Flexion (decorticate)			Flexion (decorticate)	3
2	Extension (decerebrate)	Extension (decerebrate)	2		
1	No response	No response	1		
= TOTAL		GCS less than 8? Intubate!		TOTAL =	

GENERAL CONSIDERATIONS:

- Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- If GCS less than 13 consider Air / Rapid Transport and if GCS less than 8 intubation should be anticipated.
- Increased intracranial pressure (ICP) may cause hypertension, bradycardia (Cushing's Response) and abnormal respirations.
- Hypotension usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- The most important item to monitor and document is a change in the level of consciousness.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- Limit IV fluids unless patient is hypotensive (systolic BP less than 90). IV Therapy must be used prudently and is restricted in most isolated head injuries. Too much fluid can increase intracranial pressure.
- Concussions are periods of confusion or LOC associated with trauma, which may have resolved by the time EMS arrives. A physician should evaluate **ASAP** any prolonged confusion or mental status abnormality, which does not return to normal within 15 minutes or any documented loss of consciousness.
- DO NOT Hyperventilate patients with head injuries. Ventilate at 12 - 20 breaths with high flow Oxygen.
- **Hyperventilate** patients with head injuries **only if:** evidence of brain *herniation*. Hyperventilate pt ongoing. (adult: 20 breaths/min, child: 30, infant: 35)
- *Herniation* may occur. Signs are:
 - Cushing's response. Bradycardia, widen pulse pressure (look for widened pulse pressure), altered mentation
 - Decreasing level of consciousness progressing towards coma
 - Dilation and outward—downward deviation of the pupil on the affected side.
 - Paralysis of the arm and leg on the opposite side of the injury or decerebrate posturing (arms and legs extended).
 - Be alert for c-spine injuries with head trauma.
 - Continually reassess the patient, including eyes, LOC, and neurological capabilities
- DO NOT allow patients to become hypoxic, maintain SpO2 greater than 94%, abandon intubation attempts if this cannot be maintained. Secure airway by other means.
- Hypotension usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- DO NOT attempt to lower the blood pressure in hypertensive head injured patients.
- Be alert for C-Spine injuries with head trauma.
- Continually reassess the patient, including pupils, LOC and neurological status.
- Any decrease in GCS suggests a TBI surgical emergency, transport to trauma center.
- Co2 monitoring is critical! Maintain the Co2 ranges indicated in protocol, 1 point of Co2 change = 3% decrease in cerebral perfusion.
- The most important item to monitor, trend and document is a change in the level of consciousness / GCS.

TRAUMA
MULTIPLE TRAUMA

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M



TRAUMA

11A

MULTIPLE TRAUMA

History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Time and mechanism of injury • Damage to structure or vehicle • Location in structure or vehicle • Others injured or dead • Speed and details of MVC • Restraints / protective equipment • Past medical history • Medications 	<ul style="list-style-type: none"> • Pain, swelling • Deformity, lesions, bleeding • Altered mental status or unconscious • Hypotension or shock • Arrest 	<p><i>(Life threatening):</i></p> <ul style="list-style-type: none"> • Chest Tension pneumothorax • Flail chest • Pericardial tamponade • Open chest wound • Hemothorax • Intra-abdominal bleeding • Pelvis / Femur fracture • Spine fracture / Cord injury • Head injury (see Head Trauma) • Extremity fracture / dislocation • HEENT (Airway obstruction) • Hypothermia

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro
- Mechanism is the most reliable indicator of serious injury.
- In prolonged extrications or serious trauma, consider air transportation for transport times and the ability to give blood.
- Consider MAST in "load and go" situations with suspected pelvic or femur fractures.
- Do not overlook the possibility of associated domestic violence or abuse.
- Fluid administration sufficient to maintain peripheral perfusion

TRAUMA
PAIN MANAGEMENT

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UNIVERSAL PATIENT CARE PROTOCOL
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Treat per Appropriate Trauma Protocol

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

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	IV / IO PROTOCOL	
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	After pain scale assessment: For pain "5" or greater:	
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	Toradol (Ketorolac): 30 – 60 mg IM / 30 mg IV <i>Not for: children under 8 yrs. of age, HX of asthma, aspirin or non-steroidal anti-inflammatory allergies, bleeding disorders, renal failure or hypotension,</i> Adults over 65 yrs and older - call Med. Control	
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↓ OR

	MORPHINE SULFATE: 2 mg every 4 – 5 minutes IV / IM titrated to pain and Respirations <i>Not for: Altered Mentation, Abdominal Pain, Head Trauma, Hypovolemia, Multiple Trauma</i>	
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↓ OR

	Nitrous Oxide: Self Administered with Mask <i>Not for: Abdominal Trauma, Altered Mentation, Suspected Pneumothorax, Head Injury, COPD, SOB, Psychiatric, Respiratory Distress</i>	
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↓ OR

Monitor and Reassess

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	CONTACT MEDICAL CONTROL	
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TRANSPORT

TRAUMA		
PAIN MANAGEMENT		
History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Age • Location • Duration • Severity (0 - 10) • Past medical history • Medications • Drug allergies 	<ul style="list-style-type: none"> • Severity (pain scale) • Quality (sharp, dull, etc.) • Radiation • Relation to movement, respiration • Increased with palpation of area 	<ul style="list-style-type: none"> • Per the specific protocol • Musculoskeletal • Visceral (abdominal) • Cardiac • Pleural / Respiratory • Neurogenic • Renal (colic)

GENERAL CONSIDERATIONS:

- Exam: Mental Status, Area of Pain, Neuro
- Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.
- Vital signs should be obtained initially, prior medication administration and every 15 minutes post, and at disposition with all pain medications.
- Contraindications to Morphine use include hypotension, head injury, respiratory distress or severe COPD.
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- All patients who receive medication for pain must have continuous ECG monitoring, pulse oximetry, and oxygen administration.
- The patient's vital signs must be routinely reassessed. The routine reassessments must be documented on the run report.
- Have Narcan on hand if the patient has respiratory depression or hypotension after Morphine administration (slow IV push: Dose-Narcan 0.4mg-2 mg titrated to patient response).
- Toradol (Ketoralac) 30 – 60 mg IM / 30 mg IV. Indicated for short term management of moderate to severe pain, kidney stones, muscle sprains, hip and extremity injuries. Not for, children under 8 yrs. of age, HX of asthma, aspirin or non-steroidal anti-inflammatory allergies, bleeding disorders, renal disorders/failure or hypotension. Adults over 65 yrs and older, call Med. Control first.
- DO NOT administer Morphine if there is any suspicion of a head injury.
- MORPHINE SULFATE: 2 mg every 4 – 5minutes IV, titrated to pain and respirations. Not for: Altered Mentation, Abdominal Pain, Head Trauma, Hypovolemia, Multiple Trauma.
- Nitrous Oxide: Self Administered with Mask. Not for Abdominal Trauma, Altered Mentation, Suspected Pneumothorax, Head Injury, COPD, SOB, Psychiatric, Respiratory Distress.

TRAUMA
TRAUMA ARREST

UNIVERSAL PATIENT CARE PROTOCOL
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See Airway Protocol



C-Spine Precautions



	IV / IO PROTOCOL	
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Appropriate Protocol based on Signs and Symptoms



	Apply Cardiac Monitor	
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	CONTACT MEDICAL CONTROL	
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TRANSPORT

B	EMT-B	B
I	EMT-I	I
P	EMT-P	P
M	MED CONTROL	M

	If necessary, Consider Quick- Trach and Needle Decompression	
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TRAUMA		
TRAUMA ARREST		
History	Signs and Symptoms	Differential Diagnosis
<ul style="list-style-type: none"> • Time of injury • Mechanism: blunt/penetrating • Loss of consciousness • Bleeding • Medications • Evidence of multi-trauma 	<ul style="list-style-type: none"> • Excessive bleeding • Unresponsive; not breathing • Cardiac Arrest • Significant mechanism of injury 	<ul style="list-style-type: none"> • Obvious DOA • Death

GENERAL CONSIDERATIONS:

- Immediately transport traumatic cardiac arrest patients.
- With the exception of endotracheal intubation, traumatic cardiac arrests are “load and go” situations.
 - Resuscitation should not be attempted in cardiac arrest patients with hemicorporectomy, decapitation, or total body burns, nor in patients with obvious, severe blunt trauma that are without vital signs, papillary response, or an organized or shockable cardiac rhythm at the scene. Patients in cardiac arrest with deep penetrating cranial injuries and patients with penetrating cranial or truncal wounds associated with asystole and a transport time of more than 15 minutes to a definitive care facility are unlikely to benefit from resuscitative efforts.
 - Extensive, time-consuming care of trauma victims in the field is usually not warranted. Unless the patient is trapped, they should be enroute to a Medical Facility within 10 minute after arrival of the ambulance on the scene.

Trauma Assessment Charts	
REVISED TRAUMA SCORE	

		RTS
GLASGOW COMA SCALE	13 – 15	4
	9 – 12	3
	6 – 8	2
	4 – 5	1
	0 – 3	0
RESPIRATORY RATE	10 – 29	4
	LESS THAN 29	3
	6 – 9	2
	1 – 5	1
	0	0
SYSTOLIC BLOOD PRESSURE	LESS THAN 89	4
	76 – 89	3
	50 – 75	2
	1 – 49	1
	0	0