

TRAUMA PROTOCOLS

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TRAUMA

TRAUMA EMERGENCIES

The Golden Hour

GUIDELINES FOR LOAD AND GO TRAUMA TRANSPORTS

INDICATIONS

- Uncorrectable airway obstruction
- Tension pneumothorax
- Pericardial tamponade
- Penetrating chest wounds with shock
- Hemothorax with shock
- Head trauma with unilaterally dilated pupils
- Head trauma with rapidly deteriorating condition
- Unconsciousness

KEY POINTS

- A trauma victim is considered to be a pediatric patient if they are younger than 16 years old.
- 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.
 2. Ground transportation directly to an appropriate facility. Bypass of nearest facility must be approved by Medical Control.
- Major Trauma patients are to be transported to the closest Trauma Center, if possible.
- 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 access patient 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, an IV(s), and cardiac monitoring.
- Provide a documented reason if an intervention could not be performed.
- Consider Ohio Geriatric Trauma criteria.

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

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:

<p><u>Physiologic conditions</u></p> <ul style="list-style-type: none"> • Glasgow Coma Scale < 13 • Loss of consciousness > 5 greater minutes • Deterioration in level of consciousness at the scene or during transport • Failure to localize to pain • Respiratory rate < 10 or > 29 • Requires endotracheal intubation • Requires relief of tension pneumothorax • Pulse > 120 in combination with evidence of hemorrhagic shock • Systolic blood pressure < 90, or absent radial pulse with carotid pulse present 	<p><u>Anatomic conditions</u></p> <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 two or more proximal long bones • Evidence of neurovascular compromise • Signs or symptoms of spinal cord injury • 2nd or 3rd Degree > 10% total BSA or other significant burns involving the face, feet, hands, genitalia, or airway
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Field Trauma Triage Criteria: Mechanism of Injury (MOI) & Special Considerations

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

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:

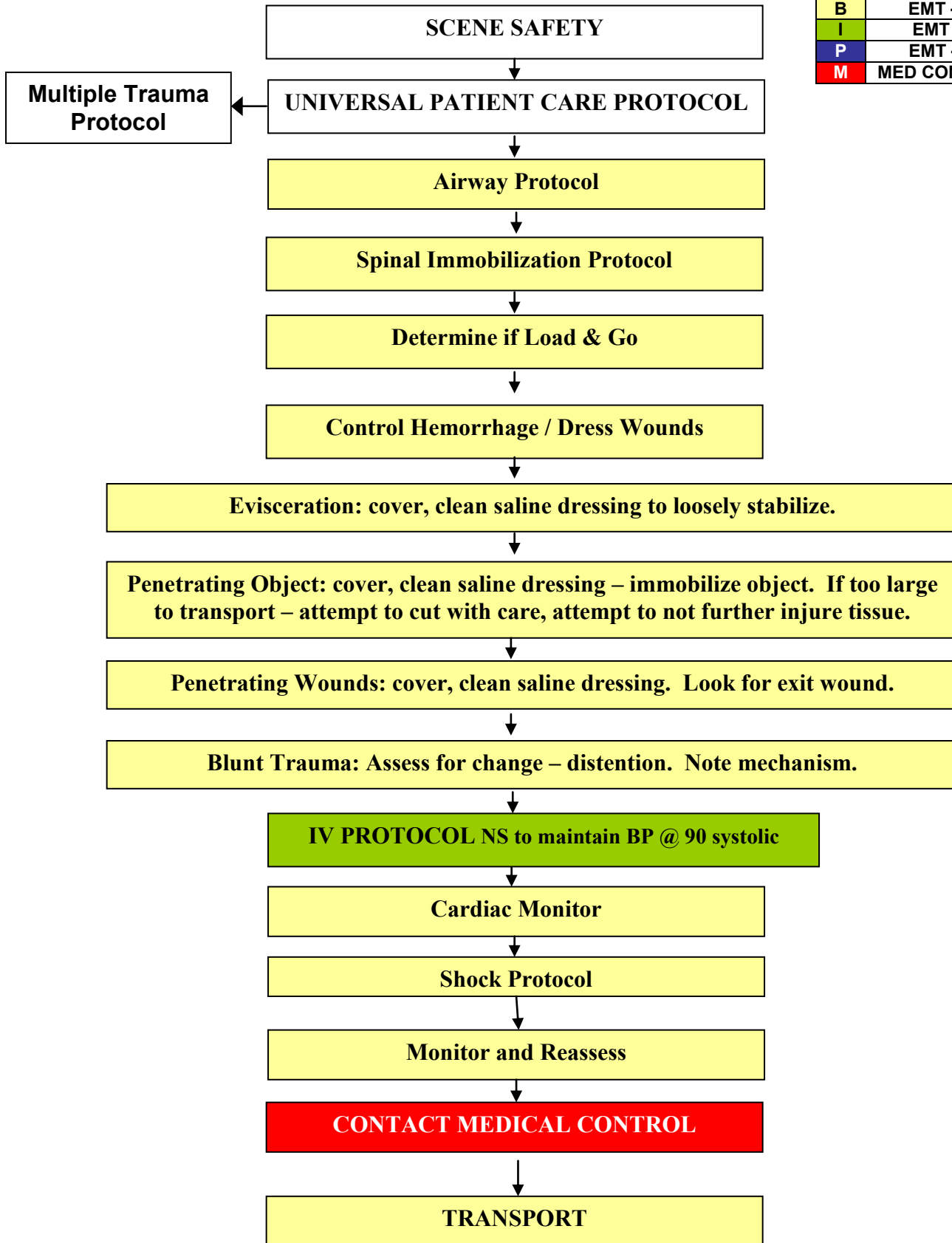
- It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center
- It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time
- Transporting the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources
- 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
- 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

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

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TRAUMA
ABDOMINAL TRAUMA

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



TRAUMA

ABDOMINAL TRAUMA

MECHANISM	SIGNS & SYMPTOMS
<ul style="list-style-type: none">• Blunt	<ul style="list-style-type: none">• Altered mental status• Shock• Distention• Swelling• Bulging• Nausea and vomiting• Discoloration• Tenderness• Pain
<ul style="list-style-type: none">• Penetrating	<ul style="list-style-type: none">• Altered mental status• Bleeding• Tenderness• Pain• Distention• Eviseration• Discoloration• Entrance/exit wounds• Nausea & vomiting

KEY POINTS

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.

**TRAUMA
BURNS**

UNIVERSAL PATIENT CARE PROTOCOL

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

Airway Protocol – Intubate inhalation burn patients as soon as possible

Consider Spinal Immobilization

Remove rings, bracelets, and other constricting items

Thermal

Chemical

**If burn < 10% body surface area (using Rule of Nines)
Cool down wound with NORMAL SALINE and dressings**

**Eye Injury
Continuous flushing with Normal Saline**

Cover burn with dry sterile sheet or dressings

Remove clothing and/or expose area

IV PROTOCOL- NS to maintain BP @ 90 systolic

Flush area with NORMAL SALINE for 15 - 20 minutes

**NORMAL SALINE IV BOLUS
500 mL**

Pain Control Protocol

CONTACT MEDICAL CONTROL

Consider transport to burn center

TRANSPORT

TRAUMA

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

KEY POINTS

- Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro.
- Critical Burns: >25% body surface area (BSA); full thickness burns >10% BSA; partial thickness superficial partial thickness, deep partial thickness and full thickness burns to face, eyes, hands or feet; 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.
- Potential CO exposure should be treated with 100% oxygen via non-rebreather mask.
- Circumferential burns to extremities are dangerous due to potential vascular compromise.
- Burn patients are prone to hypothermia – Never apply ice or cool burns that involve >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.
- Handle patients 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.
- Patients with large surface burns lose the ability to regulate their body temperature. Avoid heat loss by covering the patient.
- Types of burns
 - Thermal (dry and moist)
 - Stop burning process: 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. Determine seriousness of burn. Contact Medical Control and transport accordingly.
 - Cover burn areas with sterile dressing.
 - 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.
 - 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, contact Medical Control and transport accordingly.
 - Relay type of substance involved to Medical Control.
 - 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 (vascular damage, tissue damage, fractures) and treat accordingly.
 - Determine severity of burn, contact Medical Control and transport accordingly.
 - Inhalation Burns:
 - Always suspect inhalation burns when the patient is found in a closed smoky 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.

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

Jaw Thrust Airway Maneuver
Give High Flow Oxygen

Needle CRIC procedure
if needed and if trained

Flail Chest: Stabilize flail segment with manual pressure then apply bulky dressing and tape.

Intubate. Watch for Tension Pneumothorax to develop.

Cardiac Tamponade: Assess for Beck's Triad (Hypotension, JVD and muffled heart sounds). Paradoxical Pulse (no radial pulse when breathing in) is likely. EKG monitor. This is a Load & Go.

Massive Hemothorax: Shock, then difficulty breathing. No JVD, decreased breath sounds, dull to percussion. This is a Load & Go. IV to keep BP @ 90 systolic.

Open Pneumothorax: Close wound with occlusive dressing secured on THREE SIDES, allowing air to escape.

Tension Pneumothorax: Patient is decompensating (cyanotic, respiratory distress, no radial pulse, decreasing LOC). Decompress affected side of chest wall if trained.

Suspected: Traumatic Aortic Rupture, Tracheal or Bronchial Tree Injury, Myocardial Contusion, Diaphragmatic Tears, Esophageal Injury, Pulmonary Contusion: Ensure an Airway, Administer Oxygen. This is a Load & Go.

Cardiac Monitor

IV Protocol - NS to maintain BP @ 90 systolic

CONTACT MEDICAL CONTROL

TRANSPORT

TRAUMA

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

KEY POINTS

- Thoracic injuries have been called the deadly dozen. The first six are obvious at the primary assessment:
 - Airway Obstruction
 - Massive Hemothorax
 - Flail Chest
 - Open Pneumothorax
 - Cardiac Tamponade
 - Tension Pneumothorax
- The second six injuries may be more subtle and not easily found in the field:
 - Traumatic Aortic Rupture
 - Esophageal Injury
 - Myocardial Contusion
 - Diaphragmatic Tears
 - Tracheal/Bronchial Tree Injury
 - 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. 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 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 midclavicular (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. You may attach the finger of a glove to the outside end of the catheter to assist in watching air movement.

TRAUMA
DROWNING/NEAR DROWNING

B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL

**Airway Protocol – Initiate ventilation while patient is still in water if not breathing.
Provide high flow oxygen ASAP.**

**Spinal Immobilization Protocol
Place backboard while still in water if able.**

Cardiac Monitor

IV PROTOCOL

If V-Fib – defibrillate per ACLS or use AED

**HYPOTHERMIC – Appropriate Protocol
If Cardiac Arrest – May attempt Defib.
BLS only for all else.**

**DECOMPRESSION – give oxygen – no positive pressure unless NOT breathing.
Position on left side with head down.**

Monitor and Reassess

CONTACT MEDICAL CONTROL

TRANSPORT

TRAUMA

DROWNING/NEAR DROWNING

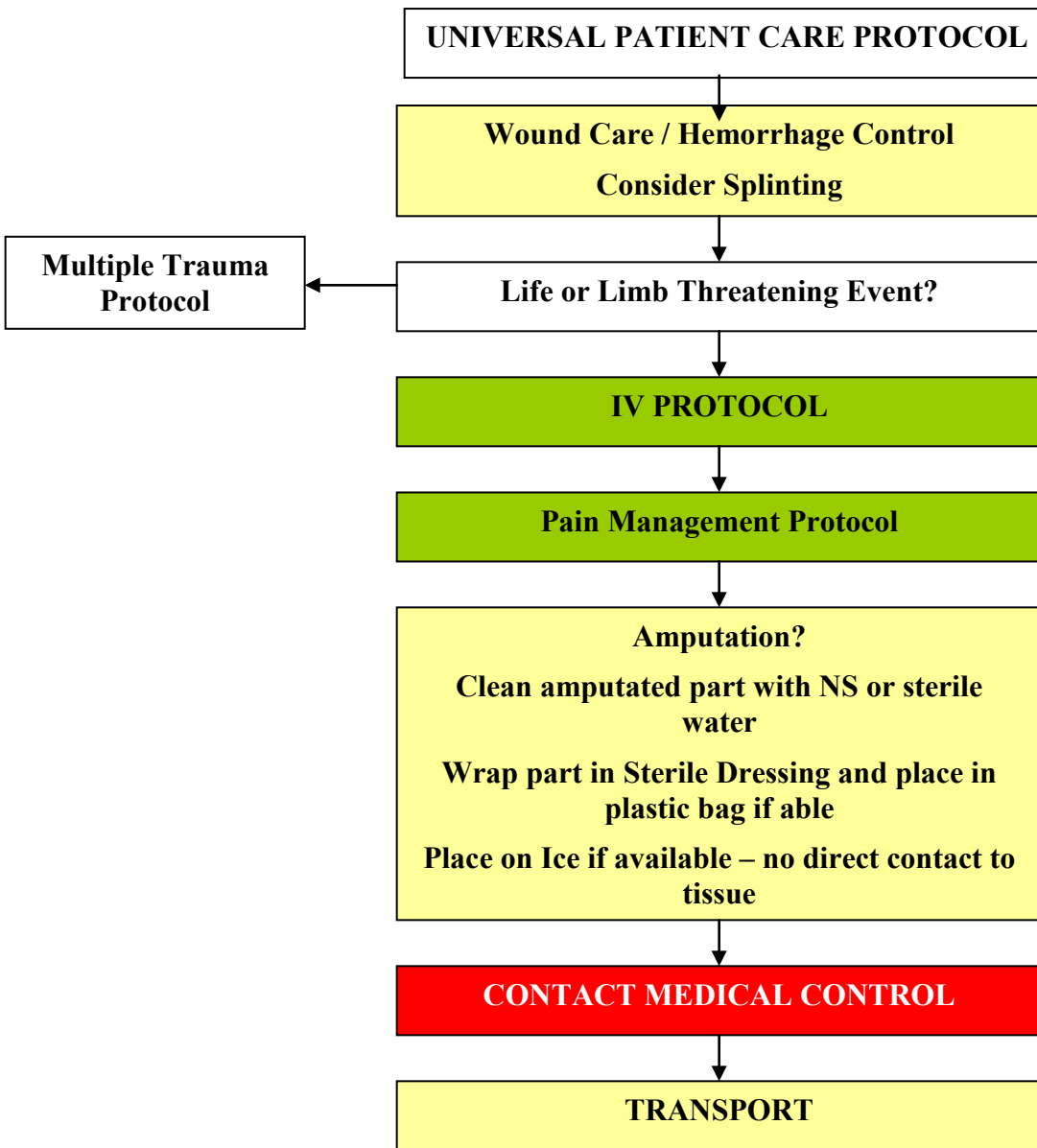
HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none">• Submersion in water regardless of depth• Possible trauma: fall, diving board• Duration of immersion• Temperature of water• Salt or fresh water	<ul style="list-style-type: none">• Period of unconsciousness• Unresponsive• 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

KEY POINTS

- Exam: Trauma Survey, Head, Neck, Chest, Lungs, Abdomen, Pelvis, Back, Extremities, Skin, Neuro
- Drowning due to suffocation from submersion in water.
- 2 causes – breath holding which leads to aspiration of water & 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 drowning/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.
- 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

KEY POINTS

- 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.

Extremity Trauma

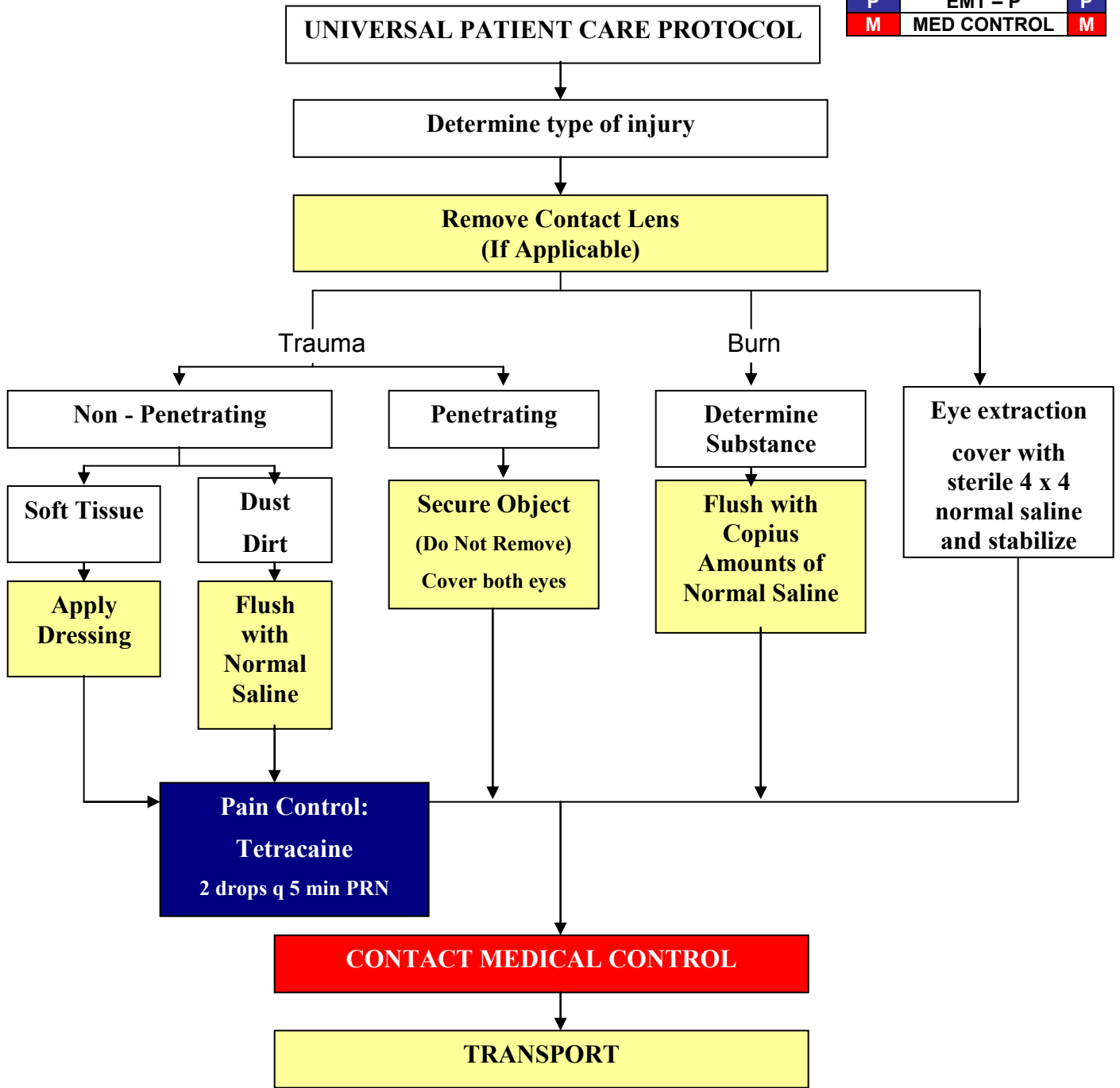
- In cases of major trauma, the backboard can work as a whole body splint.
- DO NOT take the time to splint injured extremities in major trauma patients unless it does not delay the scene time or prevents you from performing more pertinent patient care.
- Splint the extremity if the patient has signs 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 MSPs 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 or sterile water.
 - DO NOT place any amputated tissue directly on ice or cold pack. Instead, place the amputated limb into a plastic bag. Put the bag into a container of cool water with a few ice cubes (if available).
- 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



TRAUMA
EYE INJURY

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

KEY POINTS

- If unsure if something can be flushed with water, contact Medical Control.
- A low pressure water source can be used to help flush the patient's eye(s) if available. **DO NOT** use a high-pressure hose or at a high force. If needed, irrigate the patient's eyes for approximately 5-15 minutes.
- Begin irrigating immediately; irreversible damage can occur in a few minutes.

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.

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 it be brought to the hospital as soon as possible.

CONTACT LENSES

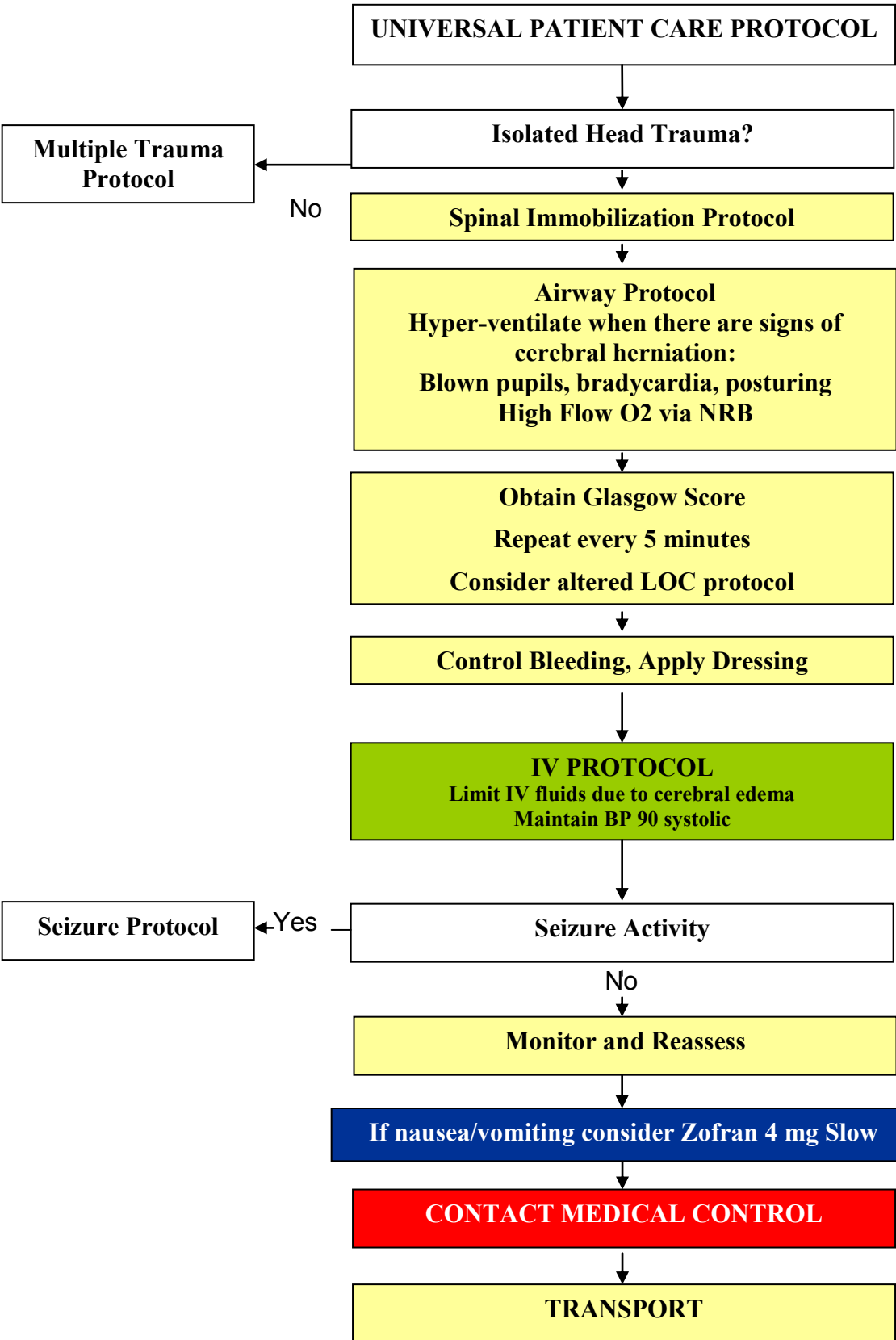
- If possible, contact lenses should be removed from the eye; be sure to transport them to the hospital with the patient. If the lenses cannot be removed, notify ED personnel as soon as possible.
- If the patient is conscious and alert, it is much safer and easier to have the patient remove their lenses

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



TRAUMA

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

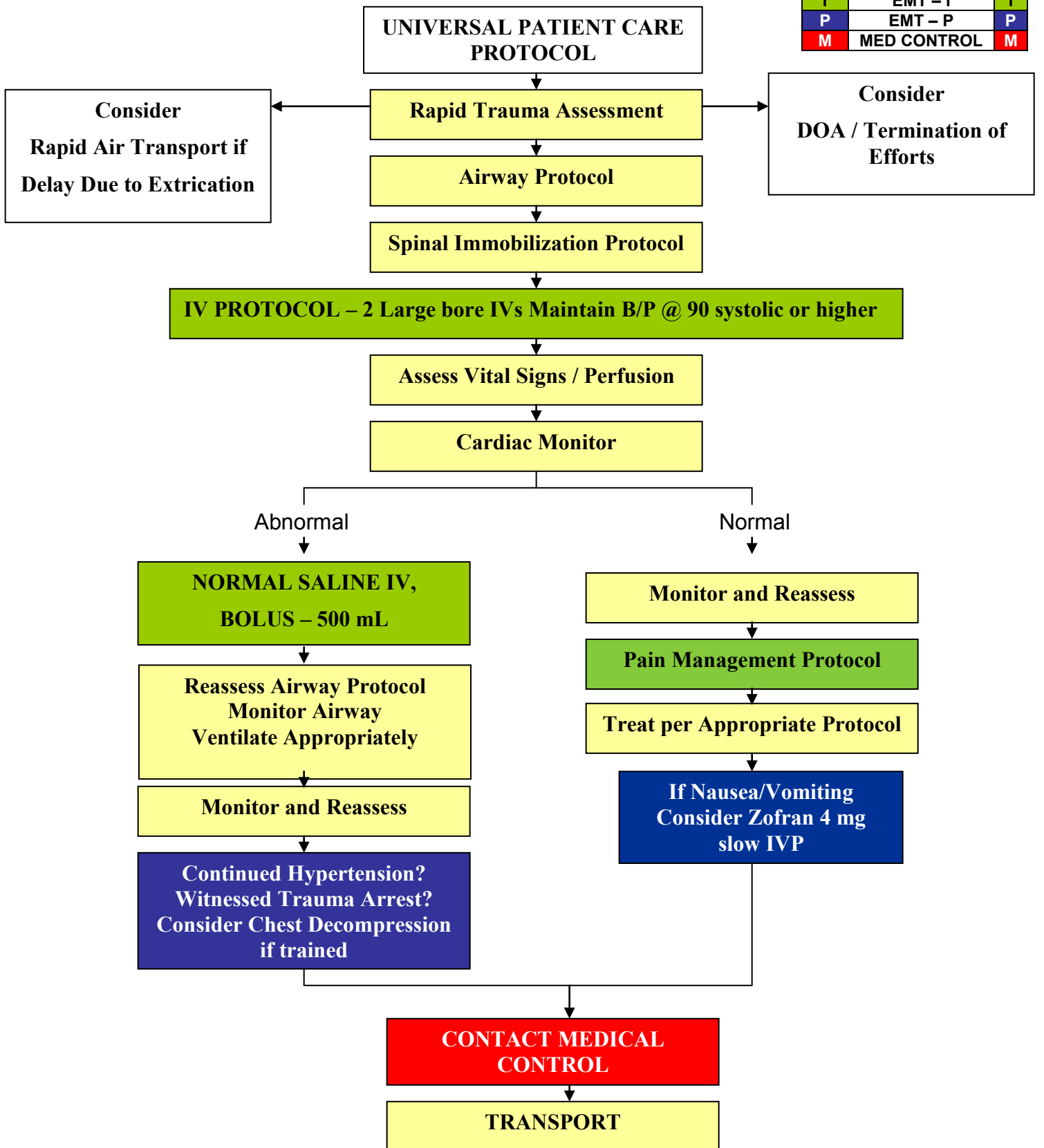
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6 Spontaneous 5 Localizes pain 4 Withdraws from pain 3 Flexion (decorticate) 2 Extension (decerebrate) ___ 1 No response ___ = TOTAL	GCS ≤ 8? Intubate!	Obeys commands 6 Localizes pain 5 Withdraws from pain 4 Flexion (decorticate) 3 Extension (decerebrate) 2 No response 1___ TOTAL = ___

KEY POINTS

- Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro.
- If GCS < 12 consider Air / Rapid Transport and if GCS < 8 intubation should be anticipated.
- Do not hyperventilate patients with head injuries. Ventilate at 12- 20 breaths with high flow Oxygen.
- In absence of capnometer, hyper-oxygenate the patient (adult: 20 breaths / min, child: 30, infant: 35) only if ongoing evidence of brain herniation (blown pupil, decorticate or decerebrate posturing, or bradycardia).
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Look for widened pulse pressure.
- 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 Protocol.
- Limit IV fluids unless patient is hypotensive (systolic BP < 90).
- Concussions are periods of confusion or LOC associated with trauma, which may have resolved by the time EMS arrives. A physician ASAP should evaluate any prolonged confusion or mental status abnormality, which does not return to normal within 15 minutes or any documented loss of consciousness.
- Herniation may occur. Signs are:
 - Cushing's response. Bradycardia, widen 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).
- IV therapy must be used prudently and is restricted in most isolated head injuries. Too much fluid can increase intracranial pressure.
- Continually reassess the patient.
- Consider Zofran if nausea/vomiting present.

TRAUMA
MULTIPLE TRAUMA

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



TRAUMA

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 trauma• 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	<ul style="list-style-type: none">• Tension pneumothorax• Flail chest• Pericardial tamponade• Open chest wound• Hemothorax• Intra-abdominal bleeding• Pelvis / Femur fracture• Spine fracture / spinal cord injury• Head injury• Extremity fracture / dislocation• Airway obstruction• Hypothermia

KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro.
- 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.

**TRAUMA
PAIN MANAGEMENT**

UNIVERSAL PATIENT CARE PROTOCOL

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

Treat per Appropriate Trauma Protocol

NITROUS OXIDE
Self Administered with Mask
Not for Abdominal Trauma, Altered Mentation,
Suspected Pneumothorax, Head Injury, COPD, SBO,
Psychiatric, Respiratory Distress

IV PROTOCOL

MORPHINE SULFATE
2 – 4 mg IV/IO/Nasal
Not for Altered Mentation, Head Trauma, Hypotension, Sever
Respiratory Distress
May repeat to a total of 10 mg - **contact med control for further dose**

Follow Morphine Sulfate with Zofran 4 mg slow IVP

OR

Toradol (NSAID)
30 IV, 60mg IM x1
Not for :Altered Mentation, Abdominal Pain, Head Trauma, Hypovolemia, Multiple Trauma, Use With or Hypersensitivity to Aspirin, Active or History of Peptic Ulcer Disease, GI Bleeding, Cerebrovascular Bleeding, Risk of Any Bleeding, Prior to Surgery, Possible Pregnancy

OR

Fentanyl
25-50 mcg IM, Slow IVP, or Intranasal every 20-30 minutes PRN, titrated to Systolic BP of < 90 mm/HG or for proper analgesic effect.

Monitor and Reassess

CONTACT MEDICAL CONTROL

TRANSPORT

TRAUMA

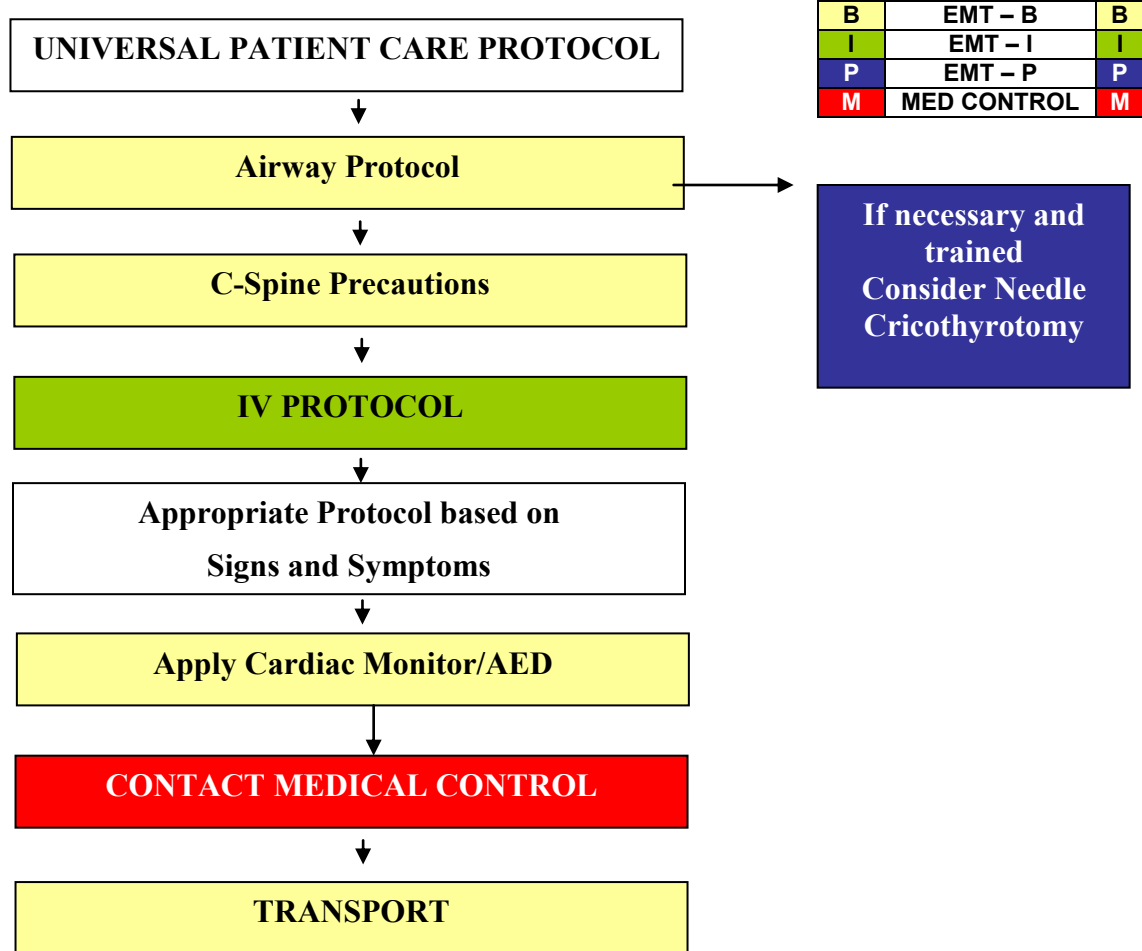
PAIN MANAGEMENT

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">• Musculoskeletal• Visceral (abdominal)• Cardiac• Pleural / Respiratory• Neurogenic• Renal (colic)

KEY POINTS

- Exam: Mental Status, Area of Pain, Neuro, Lungs.
- 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 pre, 15 minutes post, and at disposition with all pain medications.
- Contraindications to pain management include hypotension, head injury or severe respiratory distress.
- 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 narcotic administration (Dose-Narcan 0.4mg-2.0mg IV push).
- When in doubt, contact medical control!

TRAUMA
TRAUMA ARREST



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

KEY POINTS

- 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, pupillary 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 minutes after arrival of the ambulance on the scene

TRAUMA ASSESSMENT CHARTS

GLASCOW COMA SCALE

		GCS
EYES	SPONTANEOUSLY	4
	TO VERBAL COMMAND	3
	TO PAIN	2
	NO RESPONSE	1
BEST MOTOR RESPONSE	OBEYS VERBAL COMMAND	6
	LOCALIZES PAIN	5
	WITHDRAWAL FROM PAIN	4
	FLEXION – DECORTICATE	3
	EXTENSION - DECEREBRATE	2
	NO RESPONSE	1
BEST VERBAL RESPONSE	ORIENTED & CONVERSES	5
	DISORIENTED & CONVERSES	4
	INAPPROPRIATE WORDS	3
	INCOMPREHENSIBLE SOUNDS	2
	NO RESPONSE	1

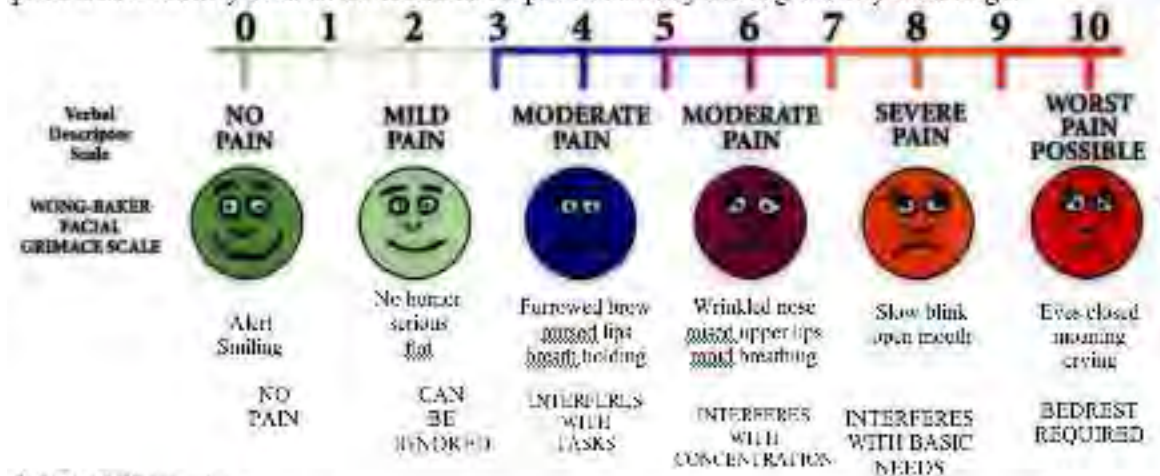
TRAUMA ASSESSMENT CHARTS

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
	MORE THAN 29	3
	6 – 9	2
	1 – 5	1
	0	0
SYSTOLIC BLOOD PRESSURE	MORE THAN 89	4
	76 – 89	3
	50 – 75	2
	1 – 49	1
	0	0

FACULTY PAIN ASSESSMENT TOOL

This pain assessment tool is intended to help faculty care providers assess pain according to individual faculty needs during faculty meetings. Explain and use 0-10 Scale for faculty self-assessment. Use the faces or behavioral observations to interpret expressed pain when faculty cannot communicate pain intensity during faculty meetings.



AXIS of Pain -->

Scheduling --> Curriculum --> Assessment --> Accreditation --> Diversity

Meeting length -->

5 min --> 15 min --> 30 min --> 45 --> 60 min or more

Time of meeting

mid-AM --> early AM --> PM --> weekends --> vacations

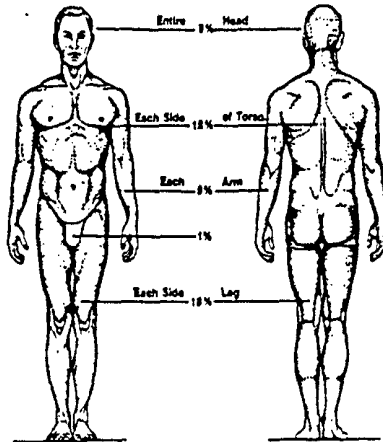
Numbers of references to parliamentary

none --> 1 --> 2 --> 3 --> 4 --> 5

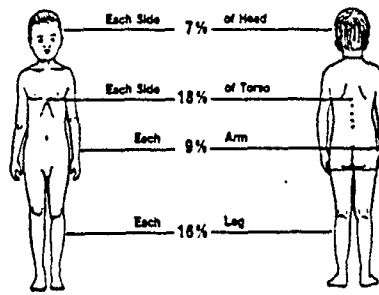
TRAUMA ASSESSMENT CHARTS

RULE OF NINES

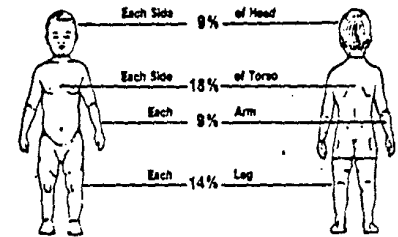
RULE OF NINES



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.

MAJOR BURN CRITERIA

- 2° and 3° burns less than 10% body surface area.
- Burns of the face, hands, feet, genitalia, or major joints.
- Electrical shock with burn injury.
- Burn with inhalation injury and/or any burn with potential functional or cosmetic impairment.
- Chemical Burns.
- Burns > 25% total body surface area.
- Burns in extremes of ages or chronic disease.
- Burns with associated trauma.

MEDICATIONS
Fentanyl (Sublimaze)

I	EMT – I	I
P	EMT – P	P

ACTIONS	Analgesic anesthetic narcotic
INDICATIONS	Pain Management Acute Coronary Syndrome STEMI
CONTRAINDICATIONS	Hypersensitivity Hemorrhage Shock
SIDE EFFECTS	Decreases in Respiratory Apnea Bradycardia Muscle Rigidity
ADULT DOSAGE	25-50mcg IV, IM, or Intranasal (May repeat @ 25mcg)
Pediatric Dose	Children 2-12 years of age 1mcg/kg IV, IM, or Intranasal

MEDICATIONS
KETOROLAC (Toradol)

I	EMT – I	I
P	EMT – P	P

<i>ACTIONS</i>	NSAID analgesic Reduces pain
INDICATIONS	Moderate pain Pain associated with kidney and gall stones
CONTRAINDICATIONS	Hypersensitivity including aspirin or other NSAIDS Advanced renal impairment Suspected cerebrovascular bleeding Recent GI bleeding Nursing mothers Labor and delivery Asthma
SIDE EFFECTS	Edema Hypertension Rash Nausea Drowning Dizziness
ADULT DOSAGE	30 mg IV, 60 mg IM
PEDIATRIC DOSAGE	0.15 mg/kg IV or 0.3 mg.kg IM

MEDICATIONS		
MORPHINE SULFATE		

I	EMT – I	I
P	EMT – P	P

ACTIONS	Narcotic Analgesic Causes peripheral vasodilation
INDICATIONS	Pulmonary edema MI pain unrelieved with nitro Pain management Pain secondary to burns
CONTRAINDICATIONS	Known hypersensitivity / Allergy Head injury or head trauma Hypotension Altered LOC Undiagnosed abdominal pain(consult Med Command) COPD Bradycardia Multiple trauma patients
PRECAUTIONS	If the patient responds with respiratory depression or hypotension, administer Narcan to reverse the effects Routinely monitor the patient’s respiratory effort and SpO ₂
SIDE EFFECTS	Respiratory depression Altered LOC, constricted pupils Bradycardia Nausea/Vomiting Hypotension
ADULT DOSAGE	2-4 mg slow IV/IO, Intranasal (If no relief, may repeat at 2 to 4 mg) For further doses over 10mg of Morphine, contact medical direction. Follow with 4mg Zofran
PEDIATRIC DOSAGE	<u>Pain Management:</u> 0.1-0.2 mg/kg slow IV, IM, SQ
KEY POINTS	

MEDICATIONS**NITROUS OXIDE**

I	EMT - I	I
P	EMT - P	P

ACTIONS	Provides rapid, easily reversible relief of pain
INDICATIONS	Abdominal pain Chest pain secondary to infarction or angina Acute urinary retention Fractures Severe exterior burns Kidney stones Musculoskeletal trauma
CONTRAINDICATIONS	Patients under 12 years of age Severe COPD Head injury ABD pain or trauma Intoxication or drug ingestion Shortness of breath Chest trauma with a possible pneumothorax (during prolonged transport)
SIDE EFFECTS	Discontinue if any of the following arise Apnea, cyanosis Nausea/vomiting Deteriorating vital signs (administer O2 100%) Ambulance crew may experience giddiness if the vehicle is not properly vented
SUPPLIED	Nitronox, a set containing an oxygen cylinder and a nitrous oxide cylinder joined by a valve that regulates flow to provide a 50:50 mixture of the two gases - the mixture is piped to a demand valve apparatus
ADULT DOSAGE	Invert cylinder several times before use; instruct the patient to inhale deeply through a patient-held demand valve mouthpiece
PEDIATRIC DOSAGE	
KEY POINTS	<ul style="list-style-type: none"> • Self-administered by mask: a good seal around the mouth and nose is important; the gas is breathed deeply and may give relief after about two minutes; the patient should stop when relief is obtained • The paramedic should not hold the face mask in place for the patient

MEDICATIONS
TETRACAINE (Pontocaine, Ophthalmic)

P	EMT – P	P
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<i>ACTIONS</i>	Local anesthesia for eyes
INDICATIONS	Irritation and/or pain of the eyes (With no penetrating trauma)
CONTRAINDICATIONS	Hypersensitivity or Allergy to tetracaine and other local anesthetics Penetrating or open eye injury
PRECAUTIONS	
SIDE EFFECTS	Burning sensation in eyes Redness, tearing
ADULT DOSAGE	1-2 drops in effected eye every 5-10 minutes prn for pain control
PEDIATRIC DOSAGE	
KEY POINTS	<ul style="list-style-type: none"> • Keep dropper sterile • Single patient use only

MEDICATIONS		
ONDANSETRON (Zofran)		
	P	EMT – P

<i>ACTIONS</i>	Antiemetic
INDICATIONS	Nausea & vomiting
CONTRAINDICATIONS	Hypersensitivity
SIDE EFFECTS	Drowsiness, vertigo Blurred vision, headache Hypotension
ADULT DOSAGE	4 mg slow IV, IM
PEDIATRIC DOSAGE	Contact Medical Control
KEY POINTS	