EMS Services

PRE-HOSPITAL CARE

MEDICAL CONTROL

PROTOCOLS AND PROCEDURES
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TRAUMA

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:
  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 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:

**Physiologic conditions**
- 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

**Anatomic conditions**
- 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:
  - Visible crush injury
  - Abdominal tenderness, distention, or seatbelt sign
  - Pelvic fracture
  - Flail chest
- Injuries to the extremities where the following physical findings are present:
  - Amputations proximal to the wrist or ankle
  - Visible crush injury
  - Fractures of proximal long bones
- Evidence of neurovascular compromise
  - 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

**Co-Morbid Diseases and Special Considerations:**
- 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

**Mechanisms of Injury (MOI):**
- 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

<table>
<thead>
<tr>
<th>Infant (Birth to age 4)</th>
<th>Adult (Age 4 to Adult)</th>
</tr>
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<tbody>
<tr>
<td>4 Spontaneously</td>
<td>Eye Opening</td>
</tr>
<tr>
<td>3 To speech</td>
<td>Spontaneously 4</td>
</tr>
<tr>
<td>2 To pain</td>
<td>To command 3</td>
</tr>
<tr>
<td>1 No response</td>
<td>To pain 2</td>
</tr>
<tr>
<td></td>
<td>No Response 1</td>
</tr>
<tr>
<td>5 Coos, babbles</td>
<td>Best Verbal Response</td>
</tr>
<tr>
<td>4 Irritable cries</td>
<td>Oriented 5</td>
</tr>
<tr>
<td>3 Cries to pain</td>
<td>Confused 4</td>
</tr>
<tr>
<td>2 Moans, grunts</td>
<td>Inappropriate words 3</td>
</tr>
<tr>
<td>1 No response</td>
<td>Incomprehensible 2</td>
</tr>
<tr>
<td></td>
<td>No response 1</td>
</tr>
<tr>
<td>6 Spontaneous</td>
<td>Best Motor Response</td>
</tr>
<tr>
<td>5 Localizes pain</td>
<td>Obey commands 6</td>
</tr>
<tr>
<td>4 Withdraws from pain</td>
<td>Localizes pain 5</td>
</tr>
<tr>
<td>3 Flexion (decorticate)</td>
<td>Withdraws from pain 4</td>
</tr>
<tr>
<td>2 Extension (decerebrate)</td>
<td>Flexion (decorticate) 3</td>
</tr>
<tr>
<td>1 No response</td>
<td>Extension (decerebrate) 2</td>
</tr>
</tbody>
</table>

**Glasgow Coma Scale**

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</tr>
<tr>
<td>1 No response</td>
<td>Extension (decerebrate) 2</td>
</tr>
</tbody>
</table>

GCS less than 8? Intubate!  
TOTAL = [___]
ABDOMINAL TRAUMA

SCENE SAFETY

Determine if Load & Go

Control Bleeding / Direct Pressure with Hemorrhage Control Bandage

Evisceration: Cover, clean saline dressing to loosely stabilize

Penetrating Object: Cover, clean saline dressing – Immobilize Object. If too large to transport – attempt to cut with care not to further injure tissue.

Penetrating Wounds: Cover, clean saline dressing. Look for exit wound.

Blunt Trauma: Assess for change – distention. Note mechanism.

Shock Protocol

Monitor and Reassess

CONTACT MEDICAL CONTROL

Initial Trauma Alert if indicated

TRANSPORT
# TRAUMA

## ABDOMINAL TRAUMA

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Signs and Symptoms</th>
</tr>
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<tbody>
<tr>
<td><strong>Blunt</strong></td>
<td>• Altered mental status</td>
</tr>
<tr>
<td></td>
<td>• Shock</td>
</tr>
<tr>
<td></td>
<td>• Distention</td>
</tr>
<tr>
<td></td>
<td>• Swelling</td>
</tr>
<tr>
<td></td>
<td>• Bulging</td>
</tr>
<tr>
<td></td>
<td>• Nausea and vomiting</td>
</tr>
<tr>
<td><strong>Penetrating</strong></td>
<td>• Altered mental status</td>
</tr>
<tr>
<td></td>
<td>• Bleeding</td>
</tr>
<tr>
<td></td>
<td>• Tenderness</td>
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<tr>
<td></td>
<td>• Pain</td>
</tr>
<tr>
<td></td>
<td>• Distention</td>
</tr>
<tr>
<td></td>
<td>• Evisceration</td>
</tr>
<tr>
<td></td>
<td>• Discoloration</td>
</tr>
<tr>
<td></td>
<td>• Entrance / Exit wounds</td>
</tr>
<tr>
<td></td>
<td>• Nausea and vomiting</td>
</tr>
</tbody>
</table>

**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.
TRAUMA

BURNS

UNIVERSAL PATIENT CARE PROTOCOL

See Airway Protocol

Consider Spinal Immobilization

Remove rings, bracelets, and other constricting items

Thermal

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

Cover burn with dry sterile sheet dressings

IV / IO PROTOCOL

NORMAL SALINE IV BOLUS

Pain Control Protocol

CONTACT MEDICAL CONTROL

TRANSPORT

Chemical

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

Remove clothing and/or expose area

Flush area with NORMAL SALINE for 10 – 15 minutes
GENERAL CONSIDERATIONS:

- Type of exposure (heat, gas, chemical)
- Chemical 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.
- 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.
  - Determine severity of burn, contact Medical Control and transport accordingly.
- Inflation 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.

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential Diagnosis</th>
</tr>
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<tbody>
<tr>
<td>Type of exposure (heat, gas, chemical)</td>
<td>Burns, pain, swelling</td>
<td>Superficial (1°) red and painful</td>
</tr>
<tr>
<td>Inhalation injury</td>
<td>Dizziness</td>
<td>Partial thickness (2°) superficial</td>
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<tr>
<td>Time of injury</td>
<td>Loss of consciousness</td>
<td>Partial thickness, deep partial thickness, blistering</td>
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<tr>
<td>Past medical history</td>
<td>Hypotension / shock</td>
<td>Full thickness (3°) painless and charred or</td>
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<tr>
<td>Medications</td>
<td>Airway compromise / distress</td>
<td>leathery skin</td>
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<tr>
<td>Other trauma</td>
<td>Singed facial or nasal hair</td>
<td>Chemical</td>
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<tr>
<td>Loss of consciousness</td>
<td>Hoarseness / wheezing</td>
<td>Thermal</td>
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<tr>
<td>Tetanus / Immunization status</td>
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<td>Electrical</td>
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<td></td>
<td></td>
<td>Radiation</td>
</tr>
</tbody>
</table>
TRAUMA

RULE OF NINES

RULE OF NINES

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
**CHEST TRAUMA**

**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

↓

**Quick Trach procedure if needed. Load and Go.**

↓

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

↓

**Consider Intubation. 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. Load & Go.

↓

**Massive Hemothorax:** Shock, then difficulty breathing. No JVD, decreased breath sounds, dull to percussion. True Load & Go.

IV to keep BP @ 90 systolic.

Load and Go.

↓

**Open Pneumothorax:** Close wound with occlusive dressing secured on THREE SIDES, allowing air escape. (Asherman Chest Seal®). Load and Go.

↓

**Tension Pneumothorax:** Patient is decompensated (cyanotic, respiratory distress, no radial pulse, decreasing LOC). Decompress affected side of chest wall. Load and Go.

↓

**Suspected:** Traumatic Aortic Rupture, Tracheal or Bronchial Tree Injury, Myocardial Contusion, Diaphragmatic Tears, Esophageal Injury, Pulmonary Contusion: Ensure an Airway, Administer Oxygen, Load & Go to a Trauma Center / Call Med Control.

Load and Go.

↓

**Establish IV access NS to maintain BP @ 90 systolic, monitor EKG.**

↓

**CONTACT MEDICAL CONTROL Initiate Trauma Alert**

→ **TRANSPORT**
CHEST TRAUMA

Signs and Symptoms

<table>
<thead>
<tr>
<th>Simple Pneumothorax</th>
<th>Open Pneumothorax</th>
<th>Tension Pneumothorax</th>
<th>Hemorrhax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortness of Breath</td>
<td>Dyspnea</td>
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<tr>
<td>Dyspnea</td>
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<tr>
<td>Tachypnea</td>
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<td></td>
</tr>
<tr>
<td>Cyanosis</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chest Pain</td>
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<td></td>
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<tr>
<td>Absent / diminished lung sounds on the affected side</td>
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<td></td>
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<td>Dyspnea</td>
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</tr>
<tr>
<td>Cyanosis</td>
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<td></td>
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<tr>
<td>Sucking Chest Wound</td>
<td>Shock</td>
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<td>Shock</td>
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<td>Tachycardia</td>
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<td></td>
<td></td>
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<tr>
<td>Dyspnea (late sign)</td>
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CARDIAC TAMPONADE | TRAUMATIC ASPHYXIA | FLAIL CHEST
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Hypotension</td>
<td>Bloodshot, Bulging Eyes</td>
<td>Paradoxic Chest Wall movement</td>
</tr>
<tr>
<td>Decreasing Pulse Pressure</td>
<td>Blue, Bulging Tongue</td>
<td>Asymetric Chest Movement upon Inspiration</td>
</tr>
<tr>
<td>Elevated Neck Veins</td>
<td>JVD</td>
<td>Dyspnea</td>
</tr>
<tr>
<td>Muffled Heart Tones</td>
<td>Cyanotic Upper Body</td>
<td>Unstable Chest Segment</td>
</tr>
<tr>
<td>Bruising over the Sternum</td>
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<td>Significant Chest Wall Pain</td>
</tr>
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<td>Tachycardia</td>
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</table>

GENERAL CONSIDERATIONS:
Thoracic injuries have been called the deadly dozen. The first six are obvious at the primary assessment:
1. Airway Obstruction
2. Flail Chest
3. Cardiac Tamponade
4. Massive Hemothorax
5. Open Pneumothorax
6. Tension Pneumothorax

The second six injuries may be more subtle and not easily found in the field:
7. Traumatic Aortic Rupture
8. Esophageal Injury
9. Myocardial Contusion
10. Diaphragmatic Tears
11. Tracheal / Bronchial Tree Injury
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.
TRAUMA

DROWNING / NEAR DROWNING

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.

IV / IO PROTOCOL

Apply Cardiac Monitor
If V-Fib – defibrillate per ACLS (AED)

IF HYPOTHERMIC – Refer to Protocol
If Cardiac Arrest – May attempt Defib.
BLS only for all else.

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

Monitor and Reassess

CONTACT MEDICAL CONTROL

TRANSPORT
To appropriate facility
## TRAUMA

### DROWNING / NEAR DROWNING

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Submersion in water regardless of depth</td>
<td>• Period of unconsciousness</td>
<td>• Trauma</td>
</tr>
<tr>
<td>• Possible trauma i.e., fall, diving board</td>
<td>• Unresponsive</td>
<td>• Pre-existing medical problem</td>
</tr>
<tr>
<td>• Duration of immersion</td>
<td>• Mental status changes</td>
<td>• Barotrauma (diving)</td>
</tr>
<tr>
<td>• Temperature of water</td>
<td>• Decreased or absent vital signs</td>
<td>• Decompression sickness</td>
</tr>
<tr>
<td>• Salt or fresh water</td>
<td>• Vomiting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Coughing</td>
<td></td>
</tr>
</tbody>
</table>

### 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.**
EXTREMITY / AMPUTATION TRAUMA

UNIVERSAL PATIENT CARE PROTOCOL

Wound Care / Control Bleeding with Hemmorage Control bandage and direct pressure.

Multiple Trauma Protocol

Life or Limb Threatening Event?

Wound Care / Bleeding Control / Splinting
Risk of Exsanguination?
Internally or Externally?
Apply tourniquet around the injured appendage above the level of bleeding. *LABEL/DATE/TIME/direct verbal report to receiving hospitals physician as to: TIME/LOCATION of tourniquet application.

IV / IO PROTOCOL

Pain Management Protocol

Nitrous Oxide per protocol
Self-administered with mask

Morphine Sulfate 2 mg every 4-5 min IVP Titrated to response and resp. rate

Amputation?
Clean amputated part with NS or sterile water. Wrap part in Sterile Dressing and place in plastic bag if able. Place on Ice if available – no direct contact to tissue

CONTACT MEDICAL CONTROL

TRANSPORT
EXTREMITY / AMPUTATION TRAUMA

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of injury</td>
<td>Pain, swelling</td>
<td>Abrasion</td>
</tr>
<tr>
<td>Mechanism: crush / penetrating / amputation</td>
<td>Deformity</td>
<td>Contusion</td>
</tr>
<tr>
<td>Time of injury</td>
<td>Altered sensation / motor function</td>
<td>Laceration</td>
</tr>
<tr>
<td>Open vs closed wound / fracture</td>
<td>Diminished pulse / capillary refill</td>
<td>Sprain</td>
</tr>
<tr>
<td>Wound contamination</td>
<td>Decreased extremity temperature</td>
<td>Dislocation</td>
</tr>
<tr>
<td>Medical history</td>
<td></td>
<td>Fracture</td>
</tr>
<tr>
<td>Medications</td>
<td></td>
<td>Amputation</td>
</tr>
</tbody>
</table>

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:
  1. Cleanse an amputated extremity with normal saline.
  2. 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.
UNIVERSAL PATIENT CARE PROTOCOL

Determine type of injury

Remove Contact Lenses (If Applicable)

Trauma

Non - Penetrating

Soft Tissue

Apply Dressing

Flush with Normal Saline

Tetracaine Eye Drops several drops to eyes prior to and every few minutes during flush

Penetrating

Dust Dirt

Secure Object (Do Not Remove)

Burn

Flush areas with NORMAL SALINE for 10 – 15 minutes

Eye extractions cover with sterile 4 x 4, normal saline and stabilize

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

Flush eyes with NORMAL SALINE for 10 – 15 minutes

Remove clothing and/or expose area

CONTACT MEDICAL CONTROL

TRANSPORT
EYE INJURIES

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
</table>
| • Trauma of any type that results in injury to one or both eyes. | • Irritation to Eye  
• Visual Disturbances  
• Obvious Penetrating Injury  
• Burn (Chemical, Thermal)  
• Loss of Vision  
• Dizziness  
• Loss of Consciousness  
• Nausea | • 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

UNIVERSAL PATIENT CARE PROTOCOL
Oxygen for all head traumas

Spinal Immobilization Protocol

Control Bleeding/ Apply Hemorrhage Control Bandage

Determine and Trend GCS

Multiple Trauma Protocol
If not isolated head trauma

Consider altered mental status protocol

Seizure Protocol if seizure activity

Isolated Uncomplicated Head Trauma

Airway Protocol – Do not hyperventilate

IV PROTOCOL
Limit IV fluids due to cerebral edema
Maintain BP 90 systolic

Evidence of or Suspect Traumatic Brain Injury (TBI)

Airway Protocol
Do not allow patient to become hypoxic during ANY airway management. Maintain SpO2 greater than 94% at all times. Apply EtCo2 if advanced airway used and Capnography

Herniation = Unilateral or bilateral dilation of pupils, posturing

If Herniation: Ventilate to maintain CO2 30-35 or 14-16 breaths / minute
If Non-Herniation: Ventilate to maintain CO2 35-45 or 10-12 breaths / minute

IV / IO PROCEDURE
Normal Saline Bolus to maintain BP of 90 systolic

Do Not allow patient to become hypotensive

Monitor and Reassess

CONTACT MEDICAL CONTROL

TRANSPORT to a Trauma Center

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. Co2 monitoring is critical! Maintain the Co2 ranges indicated in protocol, 1 point of Co2 change = 3% decrease in cerebral perfusion.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- The most important item to monitor, trend and document is a change in the level of consciousness / GCS.
- Consider CVRR if necessary for patient’s protection per the CVRR Procedure.
- DO NOT allow patients to become hypoxic or hypotensive.

<table>
<thead>
<tr>
<th>Head Trauma History</th>
<th>Signs and Symptoms</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of injury</td>
<td>Pain, swelling, bleeding</td>
<td>Skull fracture</td>
</tr>
<tr>
<td>Mechanism: blunt / penetrating</td>
<td>Altered mental status</td>
<td>Brain injury (concussion, contusion</td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td>Unconscious</td>
<td>hemorrhage, or laceration)</td>
</tr>
<tr>
<td>Bleeding</td>
<td>Respiratory distress / failure</td>
<td>Epidural hematoma</td>
</tr>
<tr>
<td>Medical history</td>
<td>Vomiting</td>
<td>Subdural hematoma</td>
</tr>
<tr>
<td>Medications</td>
<td>Significant mechanism of injury</td>
<td>Subarachnoid hemorrhage</td>
</tr>
<tr>
<td>Evidence of multi-trauma</td>
<td></td>
<td>Spinal injury</td>
</tr>
<tr>
<td>Helmet use or damage to helmet</td>
<td></td>
<td>Abuse</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trauma</th>
<th>History</th>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Glasgow Coma Scale**

<table>
<thead>
<tr>
<th>INFANT: Birth to age 4</th>
<th>ADULT: Age 4 to Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Spontaneously</td>
<td>Spontaneously 4</td>
</tr>
<tr>
<td>3 To speech</td>
<td>To command 3</td>
</tr>
<tr>
<td>2 To pain</td>
<td>To pain 2</td>
</tr>
<tr>
<td>1 No response</td>
<td>No Response 1</td>
</tr>
<tr>
<td>5 Coos, babbles</td>
<td>Oriented 5</td>
</tr>
<tr>
<td>4 Irritable cries</td>
<td>Confused 4</td>
</tr>
<tr>
<td>3 Cries to pain</td>
<td>Inappropriate words 3</td>
</tr>
<tr>
<td>2 Moans, grunts</td>
<td>Incomprehensible 2</td>
</tr>
<tr>
<td>1 No response</td>
<td>No response 1</td>
</tr>
<tr>
<td>6 Spontaneous</td>
<td>Obeys commands 6</td>
</tr>
<tr>
<td>5 Localizes pain</td>
<td>Localizes pain 5</td>
</tr>
<tr>
<td>4 Withdraws from pain</td>
<td>Withdraws from pain 4</td>
</tr>
<tr>
<td>3 Flexion (decorticate)</td>
<td>Flexion (decorticate)3</td>
</tr>
<tr>
<td>2 Extension (decerebrate)</td>
<td>Extension (decerebrate) 2</td>
</tr>
<tr>
<td>1 No response</td>
<td>No response 1</td>
</tr>
</tbody>
</table>

**Differential Diagnosis**

- **Skull fracture**
- **Brain injury (concussion, contusion** hemorrhage, or laceration)
- **Epidural hematoma**
- **Subdural hematoma**
- **Subarachnoid hemorrhage**
- **Spinal injury**
- **Abuse**

## MULTIPLE TRAUMA

### History
- 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

### Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

### Differential Diagnosis *(Life threatening)*:
- 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:
- Burns
- Dislocation
- Blunt Trauma
- Musculoskeletal / Fracture Pain

MORPHINE 2-4 mg IV/IM titrated to pain and respirations
Under age 12: call Medical Control
*Not for: Altered Mentation, Head Trauma and Hypovolemia*

ONDANSETRON (ZOFRA) as Needed
4 mg IM/IV over 2-4 minutes
May Repeat x1 if Needed in 15 minutes
*OR*
ONDANSETRON (ZOFRA) Dissolving Tabs
4 mg Oral

Repeat in 5 minutes if pain persists and vital signs remain stable
MORPHINE 2-4 mg IV/IM

Monitor and Reassess
Monitor: Airway, Breathing, Vitals

CONTACT MEDICAL CONTROL

TRANSPORT

MEDICAL:
- Intractable Flank Pain
- Musculoskeletal
- Sickle Cell Pain Crisis (Use Supplemental O₂)

TORADOL (Ketorolac):
30-60 mg IM / 30 mg IV
*Not for: children under 8 yrs of age.*
*CAUTION: HX of asthma, aspirin or non-steroidal anti-inflammatory allergies, bleeding disorders, renal failure or hypotension, suspected AAA and pregnancy*

Adults over 65 yrs and older – Call Medical Control

*OR*
MORPHINE SULFATE:
2-4 mg every 4 – 5 minutes IV / IM titrated to pain and respirations
*Not for: Altered Mentation, Pain, Head and Trauma and Hypovolemia*

ONDANSETRON (ZOFRA) as Needed
4 mg IM/IV over 2-4 minutes
May Repeat x1 if Needed in 15 minutes
*OR*
ONDANSETRON (ZOFRA) Dissolving Tabs
4 mg Oral

USE MORPHINE FOR CARDIAC CHEST PAIN
REFER TO ACLS PROTOCOL
PAIN MANAGEMENT PROTOCOL

HISTORY

- Age / onset
- Location
- Duration
- Severity (0-10)
- Past medical history
- Medications
- Drug allergies

SIGNS AND SYMPTOMS

- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

DIFFERENTIAL DIAGNOSIS

- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleuritic (respiratory)
- Neurogenic
- Renal (colic)

PAIN SCALE

The Wong-Baker Faces Pain Rating Scale

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

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

A Numerical Pain Scale

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

KEY POINTS

- Exam: Mental Status, Area of Pain, Neuro
- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).
- Pain severity (0-10) is a vital sign to be recorded pre and post medication delivery and at disposition.
- Use Morphine for suspected cardiac chest pain within the ACLS Protocol.
- Abdominal pain patients must have a 12 lead EKG to rule out cardiac involvement.
- Vital signs should be obtained pre, 10 minutes post, and at disposition with all pain medications.
- Contraindications to Morphine use included hypotension, head injury, respiratory distress or severe COPD.
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive pain 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.
- Routine assessments and reassessments must be documented on the run report.
- Have Naloxone (Narcan) on hand if the patient has respiratory depression or hypotension after Morphine administration. Be prepared to ventilate.
- DO NOT administer narcotic analgesics if there is any suspicion of a head injury.
- Toradol (Ketoralac) 30 – 60 mg IM / 30 mg IV. Indicated for short term management of moderate to severe pain.
  **Caution:** 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, pregnancy. Adults over 65 yrs and older, call Medical Control first.
- Morphine Sulfate: 2 mg every 4-5 minutes IV, titrated to pain and respirations. **Not for:** Altered Mentation, Head Trauma and Hypovolemia.
TRAUMA

TRAUMA ARREST

UNIVERSAL PATIENT CARE PROTOCOL

- See Airway Protocol

- C-Spine Precautions

- IV / IO PROTOCOL

  Appropriate Protocol based on Signs and Symptoms

- Apply Cardiac Monitor

- CONTACT MEDICAL CONTROL

- TRANSPORT

If necessary, Consider Quick-Trach and Needle Decompression
TRAUMA

TRAUMA ARREST

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of injury</td>
<td>Excessive bleeding</td>
<td>Obvious DOA</td>
</tr>
<tr>
<td>Mechanism: blunt/penetrating</td>
<td>Unresponsive; not breathing</td>
<td>Death</td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td>Cardiac Arrest</td>
<td></td>
</tr>
<tr>
<td>Bleeding</td>
<td>Significant mechanism of injury</td>
<td></td>
</tr>
<tr>
<td>Medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence of multi-trauma</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 hemi/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

<table>
<thead>
<tr>
<th>GLASGOW COMA SCALE</th>
<th>RTS</th>
<th>RESPIRATORY RATE</th>
<th>RTS</th>
<th>SYSTOLIC BLOOD PRESSURE</th>
<th>RTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 – 15</td>
<td>4</td>
<td>LESS THAN 29</td>
<td>4</td>
<td>LESS THAN 89</td>
<td>4</td>
</tr>
<tr>
<td>9 – 12</td>
<td>3</td>
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Southwest General Health Center / EMS Services