

Utah EMS Protocol Guidelines: Trauma



Version 1 / November 1, 2013

Trauma Patient Care Guidelines

These guidelines were created to provide direction for each level of certified provider in caring for trauma patients. The Online Medical Consulting/Consultation (OLMC) physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OLMC physician these should be documented and brought to the attention of the physician at the receiving hospital or the agency Medical Director for review.

General Approach to Medical Patient Care Guidelines

- Assess your patient prior to initiating a guideline.
- Early notification allows the receiving physician to activate the receiving hospital's trauma alert system.
- Providers should describe vitals signs including GCS, injuries, mechanism of injury and any complicating factors that will affect treatment (step 4 Utah Trauma Field Triage Guidelines) so that the hospital may activate the appropriate level of trauma response.
- Consider stopping at a lower level trauma center if you have a prolonged transport and the patient has a compromised airway that you cannot secure.
- Pediatric reference tape-based dosing is preferred over calculated doses for infants and children.
- Pediatric lowest acceptable systolic blood pressures are: birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg. These are the blood pressures to use for Pediatrics (<15 years old) under step one of the Utah Trauma Field Triage Guidelines.
- More than one guideline may apply.
- If conflicts arise between treatment guidelines contact OLMC for clarification.
- Providers may provide treatment up to the level of their certification only.
- Air Medical Transport Service personnel function under their own clinical guidelines.
- Contact your receiving hospitals and OLMC as soon as clinically possible for each patient.
- OLMC with a physician may change your treatment plan.
- Any variations to a guideline by the OLMC physician should be clarified to insure that the provider has properly characterized the situation.
- The OLMC Physician has the final word on treatment once contact is made.
- The OLMC Physician must approve usage of dosages in excess of the guidelines.

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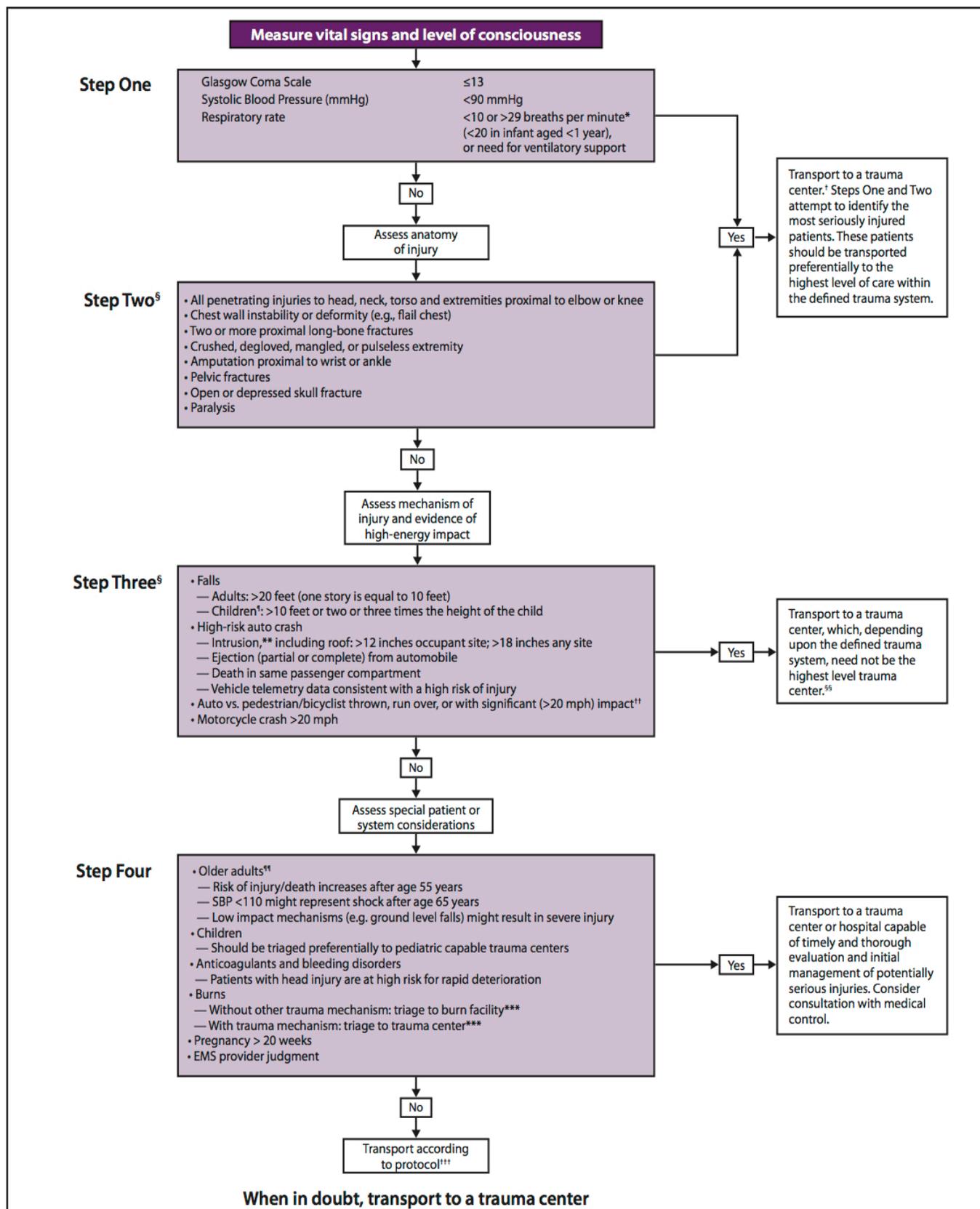
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Key to Symbols used in Guidelines



This symbol and yellow highlighted instructions precedes any treatment that requires OLMC prior to initiating the treatment unless otherwise specified.

Utah Trauma Field Triage Guidelines



AMPUTATIONS

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Continuous ECG, ETCO₂, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
 - Maintain airway, administer 10-15 lpm of oxygen.
 - Unless this is an isolated injury, consider spinal motion restriction per the **Selective Spinal Immobilization Guidance**.
 - Apply direct pressure to control hemorrhage. Also consider tourniquets and hemostatic agents, if needed.
 - Amputated Body Parts and/or Tissue
 - If amputation is incomplete, cover stump with sterile dressing saturated in NS, splint affected digit or limb in baseline physiologic position.
 - All retrievable tissue should be transported (do not delay transport by spending an excessive amount of time looking for an amputated part).
 - Rinse part(s) with NS.
 - Wrap tissue in sterile gauze moistened with NS.
 - Place tissue into plastic bag or container.
 - Place bag/container into separate container filled with ice.
 - Do not allow tissue to come into direct contact with ice, do not freeze, and do not submerge in water.
 - Tooth Avulsion that are out over 30 minutes, partial or cannot be re-implanted on scene.
 - Handle tooth by chewing surface only (avoid touching the root).
 - Rinse with water. Do not scrub, dry, or wrap tooth in tissue or cloth.
 - Place tooth in container of (**in order of preference**)
 - Patient's Saliva
 - Milk
 - Normal Saline
 - Water
 - Re-Implantation of **permanent teeth** on scene within the first 30 minutes of injury (Primary or baby teeth should not be re-implanted).
 - Do not try to re-implant if more than 2 teeth are involved.
 - The tooth must be cleanly avulsed with the entire root present.
 - Only re-implant if it is one of the front 6 upper or lower teeth.
 - Patient must be conscious and cooperative.
 - Gently insert tooth back into the appropriate location without forcing it. Do not worry about positioning well.
 - Monitor closely for signs of shock, especially in amputations above the wrist or ankle.
 - Treat for pain and anxiety per the **Pain and Anxiety Management Guideline**.
- ❑ **Key Considerations**
 - Time to re-implantation for most limbs is critical.
 - Generally toe re-implantation from lawnmower accidents is not done.

ADULT

EMT
AEMT

- ❑ Advanced airway, vascular access and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**

PARAMEDIC

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT
AEMT

- ❑ Advanced airway, vascular access and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**

PARAMEDIC

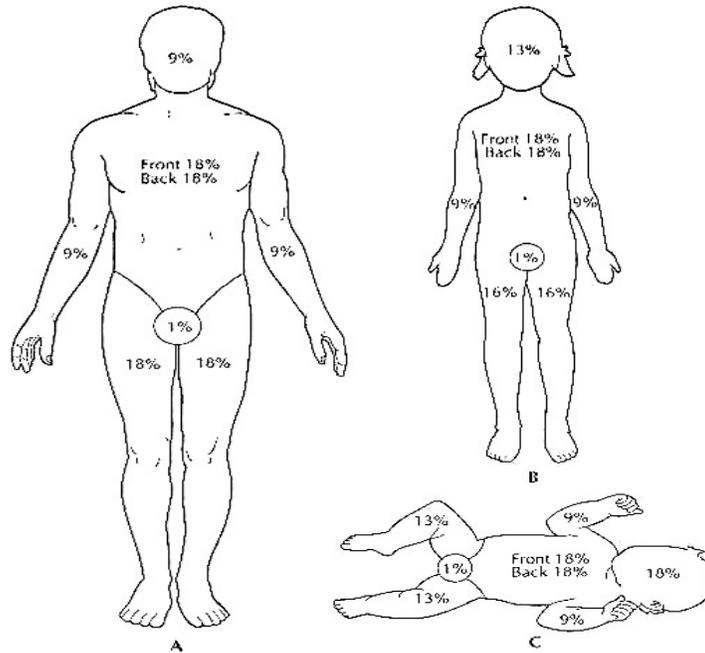
BURNS – ELECTRICAL/THERMAL

ALL PROVIDERS

- ❑ Scene and patient management
 - Thermal Burns
 - Stop the burning process.
 - Do not pull material out of the wound but cut clothing around it.
 - Electrical Burns
 - Safely evacuate patient from electrical source.
 - Do not touch the patient until you are sure that the electrical source is disconnected.
 - When multiple patients are struck simultaneously by lightning or a high voltage source, those in respiratory and/or cardiac arrest should be given the highest priority of care, even those who appear dead on initial evaluation.
- ❑ Focused history and physical exam
 - Identify potential entry and exit wounds for electrical burns – both sites will generally be a full thickness burn site.
- ❑ Continuous ECG, ETCO₂, and Pulse Oximetry monitoring when available.
 - Avoid placing monitor attachments over burned skin if possible.
 - Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.
- ❑ 12 lead ECG where appropriate and if possible, avoid placing electrodes over burned skin.
- ❑ **Treatment Plan**
 - Monitor for developing airway compromise.
 - Initiate early oxygen therapy with high flow O₂, this is critical despite level of respiratory distress.
 - In the unconscious patient, implement spinal motion restriction per the **Selective Spinal Immobilization Guidance**.
 - With electrical burns anticipate heart rhythm irregularities (both ventricular and atrial).
 - Assess for circulatory compromise from circumferential extremity burns or ventilator compromise from circumferential chest burns.
 - Remove items that may constrict swelling tissue.
 - Estimate size and depth of burn using the percentage chart (below).
 - Dressings
 - Partial or Full Thickness (2nd or 3rd degree) <10% BSA - Wet sterile dressings.
 - Partial or Full Thickness (2nd or 3rd degree) >10% BSA - Dry sterile dressings.
 - Closely monitor patient's temperature and prevent hypothermia.
 - Treat for pain and anxiety per the **Pain and Anxiety Management Guideline**.
 - Consider AMTS (Air Medical Transport from the Scene) to a designated burn center for the following:
 - Inhalation injuries
 - Partial or Full Thickness (2nd or 3rd degree) burns (>20% BSA in adults or >15% in pediatrics).
 - Major trauma with burns
 - Circumferential burns
 - Burns covering significant portions of the face, hands, or perineum
- ❑ **Key Considerations**
 - Electrical Burns are frequently more serious than they appear.
 - Identifying the source as AC or DC voltage with the amperage will be helpful in the treatment.
 - Burn patients are TRAUMA patients. Care for traumatic injuries should precede care for the burn.
 - Potential CO and/or Cyanide exposure (closed space smoke exposure) should receive 100% oxygen by NRB.
 - Patients are prone to hypothermia due to heat loss from the burns.
 - Consider Child Abuse as a cause. Circumferential scald burn to hands, feet, buttocks, and genitalia are common burns seen in child abuse (especially in children <5 years old)
 - Definitions:
 - Superficial (1st Degree) Burns – red, painful, without blisters.
 - Partial Thickness (2nd Degree) Burns – red, painful/hypersensitive, swollen, with either intact

or ruptured blisters.

- Full Thickness (3rd Degree) Burns – dark, leathery, painless, waxy, and does not blanch.



ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT
AEMT

- ❑ Advanced airway, vascular access per **IV-IO Access and Fluid Therapy Guideline**
 - If possible, avoid placing IV through burned skin
- ❑ Partial or Full Thickness (2nd or 3rd degree) >10% BSA – Fluid therapy following Parkland Burn Formula
 - NS 4 ml per kg body weight per % burn during the first 24 hours
 - To calculate: multiply 4ml X kg X % burn = total fluid requirement
 - Give half of this amount during the first 8 hours from the time of injury

PARAMEDIC

- ❑ High voltage electrical injury or direct lightning strike with significant tissue destruction
 - **Sodium Bicarbonate 1 mEq/kg (maximum of 100 mEq)** in 1000 mL NS wide open

EMT
AEMT

- ❑ Advanced airway, vascular access per **IV-IO Access and Fluid Therapy Guideline**
 - If possible, avoid placing IV through burned skin
- ❑ Partial or Full Thickness (2nd or 3rd degree) >10% BSA – Fluid therapy following Parkland Burn Formula
 - NS 4 ml per kg body weight per % burn during the first 24 hours
 - To calculate: multiply 4ml X kg X % burn = total fluid requirement
 - Give half of this amount during the first 8 hours from the time of injury

PARAMEDIC

- ❑ High voltage electrical injury or direct lightning strike with significant tissue destruction
 - **If diagnosed with rhabdomyolysis prior to transport from the hospital, increase fluid replacement to keep urine output >2ml/kg/hr.**
 - **Sodium bicarbonate per medical control**

CHEST TRAUMA

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Continuous ECG, ETCO₂, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
 - Maintain airway, administer 10-15 lpm of oxygen.
 - Consider spinal motion restrictions per the **Selective Spinal Immobilization Guideline**.
 - Apply direct pressure to any obvious external hemorrhage.
 - Cover open chest wounds with occlusive dressing.
 - Perform a needle decompression on the affected side for patient with chest injury and signs of shock.
 - Immobilize any obvious injuries and penetrating object, do not remove penetrating objects.
 - Maintain warmth to minimize heat loss.
 - Monitor for shock and hypovolemia. Assess mental status prior to and every 15 minutes during transport (GCS/AVPU).
 - Treat for pain and anxiety per the **Pain and Anxiety Management Guideline**.
- ❑ **Key Considerations**
 - Consider chest trauma as a cause in PEA arrest.
 - Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT

EMT

AEMT

AEMT

- ❑ Vascular access and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**
- ❑ Suspected Tension Pneumothorax
 - Immediate needle decompression of affected side
- ❑ Traumatic Arrest
 - Consider bilateral needle decompression based on mechanism of injury

- ❑ Vascular access and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**
- ❑ Suspected Tension Pneumothorax
 - Immediate needle decompression of affected side
- ❑ Traumatic Arrest
 - Consider bilateral needle decompression based on mechanism of injury

PARAMEDIC

PARAMEDIC

CRUSH INJURIES

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Continuous ECG, ETCO2, and Pulse Oximetry monitoring when available
- ❑ 12 Lead ECG where available, before and after extrication
- ❑ **Treatment Plan**
 - Crush Syndromes should be considered for the following:
 - Entrapped/compressed patients under a load for more than 30 minutes
 - Patients with little or no movement for more than 4 hours (e.g. older patient falls, overdoses)
 - Maintain airway, administer 10-15 lpm of oxygen via NRB.
 - Consider spinal motion restriction per the **Selective Spinal Immobilization Guidance**.
 - Anticipate possible cardiac arrest upon extrication.
 - Patients often quickly develop elevated levels of potassium. Watch for the following ECG changes as signs of Hyperkalemia: peaked T waves, prolonged PR intervals, ST segment depression, QRS widening, heart blocks, and ventricular arrhythmias.
 - Immediately prior to the extrication, provide the adult patient with both Sodium Bicarbonate and Calcium Chloride. Use of these medications for the pediatric patient should be directed by medical control.
 - Treat for pain and anxiety per the **Pain and Anxiety Management Guideline**.
- ❑ **Key Considerations**
 - Victims will often develop hypo or hyperthermia with prolonged environmental exposure.
 - Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90.

ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT
AEMT

EMT
AEMT

- ❑ Vascular access and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**
 - **NS 0.9%** only; 1 liter bolus, then reassess
 - When possible, **initiate IV prior** to patient being freed from object or removed from floor after a prolonged immobile period of time
- ❑ Constant crush injuries greater than 30 min duration
 - **Sodium Bicarbonate 1 mEq/kg (Maximum of 100 mEq)** IV push prior to beginning infusion and up to 2 additional times if patient develops cardiac arrhythmias or a prolonged QRS > 100ms
 - AND-
 - **Sodium Bicarbonate drip: 1 mEq/kg (maximum of 100 mEq)** in 1000 mL NS wide open.

- ❑ Vascular access and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**
 - **NS 0.9%** only; 20ml/kg then reassess
 - When possible, **initiate IV prior** to patient being freed from object or removed from floor after a prolonged immobile period of time
- ❑ Constant crush injuries greater than 30 min duration
 - **If diagnosed with rhabdomyolysis prior to transport, increase fluid replacement to keep urine output >2ml/kg/hr.**
 - **Sodium Bicarbonate per medical control**

PARAMEDIC

PARAMEDIC

HEAD INJURY (TRAUMATIC BRAIN INJURY)

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Continuous ECG, ETCO₂, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
 - Maintain airway. Administer oxygen 10-15 lpm via NRB.
 - Consider spinal motion restrictions per the **Selective Spinal Immobilization Guideline**.
 - Consider elevating head of spinal board or stretcher 30 degrees.
 - Monitor the level of consciousness during the transport.
 - Document a GCS for the patient.
 - If GCS ≤ 8 consider an advanced airway.
 - Do not hyperventilate excessively. If patient has an obvious unilateral pupillary dilation, increase respiratory rate by 10% above normal target respiratory rate (RR) until the patient improves. Hyperventilation below a ETCO₂ of 30mmHg is discouraged.
 - Open skull fractures should be covered with non-pressure dry sterile dressings.

Mild Hyperventilation Guide

Age	Normal Target RR	10% increase in RR
0 days - <2 mon	30	33
2 mon - <12 mon	25	28
12 mon - 3 yrs	20	22
4 yrs - <6 yrs	15	17
6 yrs – Adult	12	14

- ❑ **Key Considerations**
 - TBI may be painful; however, pain medications can cloud serial neurological assessments. Routine pain medications should not be administered to a patient with altered mental status after TBI.
 - Patients with TBI may be confused or combative. Consider restraints if needed to protect everyone.
 - Loss of memory, prolonged confusion or altered mental status associated with trauma may indicate a significant head injury.
 - Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT

- ❑ Administer supplemental oxygen for any saturation <90% or if unable to obtain a reliable pulse oximeter reading

EMT

- ❑ Administer supplemental oxygen for any saturation <90% or if unable to obtain a reliable pulse oximeter reading

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**
- ❑ Ventilate to maintain EtCO₂ between 35-40 mmHg when capnography is available
- ❑ Check blood pressure every 5-10 minutes.
- ❑ Follow the Traumatic Brain Injury pressure management under the **Shock and Fluid Therapy** guideline.
- ❑

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy per **IV-IO Access and Fluid Therapy Guideline**
- ❑ Ventilate to maintain EtCO₂ between 35-40mmHg when capnography is available
- ❑ Check blood pressure every 5-10 minutes.
- ❑ Initiate NS 20ml/kg for hypotension OR if unable to obtain blood pressure
- ❑ If hypotensive patient shows no improvement with initial treatment, may repeat NS 20ml/kg up to a total of 60 ml/kg

PARAMEDIC

Persistent hypotension unresponsive to fluids

- ① **Epinephrine (1:1000) 2–10 mcg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg. **And/or**
- ① **Dopamine 2-20 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg. *(Goal is to maintain a mean arterial*

PARAMEDIC

Persistent hypotension unresponsive to fluids

- ① **Epinephrine (1:1000) 0.1–2 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg. **And/or**
- ① **Dopamine 2-20 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >70 +

pressure (MAP) >70 mmHg)

(age in years x 2) mmHg

HEMORRHAGE CONTROL AND SOFT TISSUE INJURIES

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ **Treatment Plan**
 - Maintain airway, administer oxygen 10-15 lpm via NRB
 - Assess for deformity, swelling, tenderness, crepitus, open or closed fractures, hemorrhaging, lacerations, ecchymosis, instability, decreased function or pulses, loss of sensation of distal extremities.
 - Bleeding from the nose (epistaxis) should be controlled by first having the patient sit and lean forward (unless there is a need for spinal motion restriction). Apply direct pressure by pinching the fleshy portion of the nostrils.
 - Cover lacerations or puncture wounds on the neck near the great vessels or trachea with an occlusive dressing.
 - Cover abdominal eviscerations with a moist sterile dressing.
 - Do not attempt to replace organs.
 - Cover extruded eye or deflated globe with a moist sterile dressing and protective covering.
 - Do not apply pressure or attempt to replace in socket.
 - Cover both eyes.
 - In large, partially attached avulsions, the tissue should be returned to its' baseline position and stabilized whenever possible.
 - Elevate the limb such that the wound is above the heart.
 - Impaled objects should be stabilized in place and covered with dry sterile dressings. The exceptions would be:
 - Objects through the cheek where there is the possibility of airway compromise.
 - Objects that would interfere with chest compressions.
 - Treatment for pain and anxiety per the ***Pain and Anxiety Management Guideline***.
- ❑ **Key Considerations**
 - Sharp objects may need to be removed if their presence is causing ongoing injury, compromise, or inhibiting CPR.
 - Tourniquets should be used to control hemorrhage not controlled with direct pressure.

ADULT

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT
AEMT

- ❑ Advanced airway, vascular access and fluid therapy per ***IV-IO Access and Fluid Therapy Guideline***

PARAMEDIC

EMT
AEMT

- ❑ Advanced airway, vascular access and fluid therapy per ***IV-IO Access and Fluid Therapy Guideline***

PARAMEDIC

NON-ACCIDENTAL TRAUMA/ABUSE

ALL PROVIDERS

- ❑ Scene and patient management
 - Contact Law Enforcement if someone on scene is a threat to themselves or others.
 - Separate any possible assailants, including parents, from the patient.
 - Remove patient from the stressful environment and remove any possible weapons.
 - Non-accidental trauma includes any act of commission or omission that results in harm to a person's physical, developmental, or emotional state.
- ❑ Focused history and physical exam
 - Blood glucose, Temperature and Oxygen Saturation assessment.
 - Always consider the possibility of abuse when evaluating any medical condition or trauma.
- ❑ Continuous ECG, ETCO₂, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
 - Suspect: Look for suspicious circumstances or actions from patient or caregiver
 - Listen to and document circumstances of the event.
 - Evaluate the environment in which you find the patient.
 - Protect: Be the patient advocate
 - Make all efforts to remove patient from the situation.
 - Respect: Communicate appropriately with family
 - Avoid confrontation with caregivers.
 - Confrontation may lead to caregiver's refusal to allow you to care for the patient.
 - Be nonjudgmental and avoid accusations.
 - Consider law enforcement assistance.
 - Collect: Provide good documentation of incident.
 - Document using direct quotation when possible.
 - Document objectively without speculation.
 - Report: You have the responsibility to report suspected abuse and neglect to the ED **and also** to law enforcement or the Division of Family Services.
- ❑ **Key Considerations**
 - Non-accidental trauma can occur in patients of any age and in all ethnic and socio-economic groups.
 - Risk factors include children under age of 5, the elderly, drug or alcohol abuse, and a history of domestic violence.
 - In children under the age of two the most common form of child abuse is **Abusive Head Injury (AHI)**. Mortality of AHI is 25%. For those that live, there is significant morbidity, usually associated with traumatic brain injury.
 - Do not directly engage a hostile patient, parent, assailant or perpetrator. If situation becomes unsafe for EMS personnel, call for police assistance.
 - If anxious or agitated, attempt non-pharmacological options to calm a patient. Consider pain and anxiety management per the ***Pain and Anxiety Management Guideline***.

SKELETAL INJURIES

ALL PROVIDERS

- ❑ Scene and patient management
- ❑ Focused history and physical exam
- ❑ Continuous ECG, ETCO₂, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
 - Treat for pain and anxiety per the ***Pain and Anxiety Management Guideline***.
 - Uncomplicated fractures/dislocations with adequate circulation
 - Splinted in a position of function/comfort.
 - Fractures/dislocations with circulation deficits or severely angulated
 - Treat with one attempt at placing the extremity in a position of function/comfort.
 - If unsuccessful, splint in position found and expedite transport.
 - Fractures and joint dislocations without palpable distal pulses are true orthopedic emergencies.
 - Potential pelvic fractures
 - Treatment of choice is application of the pelvic binder. If unavailable, a cloth sheet or blanket can be wrapped tightly around the pelvis to stabilize it.
 - Isolated proximal femur (hip) fractures (especially in the elderly)
 - Best managed with anatomical splinting utilizing a scoop stretcher. Traction splints are not appropriate for any proximal femur fractures.
 - Femoral shaft fractures
 - Immobilized utilizing a traction splint unless one of the situations listed below is present:
 - Injuries just proximal to or involving the knee joint
 - Injury to the pelvis
 - Partial amputation
 - Lower leg or ankle injuries
 - If use would delay transport of a patient with a life-threatening condition

ADULT

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT

AEMT

- ❑ Vascular access and fluid therapy per ***IV-IO Access and Fluid Therapy Guideline***

PARAMEDIC

EMT

AEMT

- ❑ Vascular access and fluid therapy per ***IV-IO Access and Fluid Therapy Guideline***

PARAMEDIC

SNAKE BITES

ALL PROVIDERS

- ❑ Focused history and physical exam
 - Identify and document the type of snake, appearance, location, and distinguishing marks.
 - Obtain an accurate time of injury.
 - Clarify any first aid provided by friends or family prior to arrival.
 - Coral Snakes in North America – “Red on Yellow = Poison Fellow, Red on Black = Safe with attack”.
 - Signs of envenomation include paresthesias, metallic taste, chills, nausea, vomiting, headache, dysphagia, cramps, hypotension, fever, local edema, blebs, and discoloration.
- ❑ Continuous ECG, ETCO₂, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
 - Ensure scene safety by moving the patient to a safe distance, away from the snake.
 - Splint limb and place below the level of the heart.
 - Keep patient calm and movement to a minimum. You may need to treat for pain and/or anxiety to help achieve this goal per ***Pain and Anxiety Management Guideline***.
 - Remove items that may constrict swelling tissue.
- ❑ **Key considerations**
 - Do not start the IV in the affected limb.
 - Do not apply ice to the limb.
 - Do not try to capture the snake.
 - Do not bring a live snake to the ED.
 - If you transport the snake make sure you do it safely. Remember that snakes can reflexively envenomate up to 1 hour after death.
 - Pictures of the snake can be helpful.
 - Any bite can be dangerous and should be evaluated in the ED.
 - Watch for signs of shock and allergic reaction.

ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMT
AEMT

EMT
AEMT

- ❑ Advanced airway, vascular access, and fluid therapy per ***IV-IO Access and Fluid Therapy Guideline***

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PARAMEDIC

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Persistent hypotension unresponsive to fluids

- ① **Epinephrine (1:1000) 2–10 mcg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
And/or
- ① **Dopamine 2-20 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg. (*Goal is to maintain a mean arterial pressure (MAP) >70 mmHg*)

Persistent hypotension unresponsive to fluids

- ① **Epinephrine (1:1000) 0.1–2 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
And/or
- ① **Dopamine 2-20 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg