General Trauma

Protocol

Douglas County KS EMS System **March 2021**

Reference Procedures: Chest Seal, Cricothyroidotomy, Generalized Splinting, Intraosseous Infusion, Needle Thoracotomy, Sager Splint, Spinal Motion Restriction, Tourniquet, Wound Packing

Goals for patient care:

- Identification and treatment of immediate life threats to the trauma patient
- Rapid transport to appropriate facility
- Appropriate destination for patient with prehospital alert to assure preparedness
- Improve patient comfort

Medications:

ADULT Medications:	PEDIATRIC Medications: Refer to HandTevy
• **TXA:** 2g IV slow or IO given as soon as possible after injury but not after 3 hours	• **TXA:** Not Recommended in pediatrics
• **Normal Saline:** 500mL, IV/IO for dehydration, hemodynamic instability	• **Normal Saline:** 20mL/kg, IV/IO for dehydration, hemodynamic instability

Procedures/Interventions

Identify the number of patients and other resources that may be needed. When there is more than one adult trauma patient, consider evenly distributing patients among more than one trauma center. If this is not feasible, contact dispatch for routing assistance.

Trauma Routing- Any trauma patient with any of the following criteria should be considered for preferential routing to a verified (by state or national criteria) Level I or II trauma center.

- KUMC Level I
- St. Luke's Plaza Level I
- Truman Level I
- Research Level I
- Overland Park Level II (adult/pediatric)
- Stormont Vail Level II
- CMH ≤ 18 y/o Level I (pediatric)

Burn Routing- Any pt with ≥ 5% third degree OR ≥ 20% second degree burn OR cosmetic burns (hands, face, feet, genitalia)

- KUMC Level I
- CMH ≥ 18 y/o Level I (pediatric)

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Physiologic Criteria for Level 1 or 2 transport with a traumatic event as the cause

- GCS <13
- BP <90 systolic (adults)
- Respiratory distress
- RR >29 or <10 (adults) or need for ventilator support
- RR <20 (1 year old and under)

Anatomic Injury Criteria for Level 1 or 2 transport

- All penetrating injuries to head, neck, torso and extremities proximal to elbow or knee
- Chest wall instability or deformity (e.g., flail chest)
- Airway burns
- 20% 2nd degree burns and/or 5% 3rd degree burns
- Two or more proximal long bone fractures
- Pelvic fracture
- Limb paralysis
- Amputation proximal to wrist or ankle
- Open or depressed skull fracture
- Crushed, degloved, mangled or pulseless extremity

Mechanism of injury Concerns for Level 1 or 2 transport

- High risk auto crash such as intrusion into passenger or any occupant compartment (including roof) >12 inches, ejection from vehicle, death in same compartment, etc.
- Auto vs. pedestrian/bicyclist thrown, run over or with significant (>20 mph) impact
- SPECIAL POPULATIONS – OLDER ADULTS
    - Risk of injury/death increases after age 55 years
    - SBP <110 may represent shock after age 65
    - Low impact mechanisms (ground level falls) may result in severe injury
- SPECIAL POPULATIONS – CHILDREN
    - Should be triaged preferentially to pediatric capable trauma centers
- SPECIAL POPULATIONS – BURNS
    - Without other trauma mechanisms: triage to burn facility
    - With trauma mechanism: triage to trauma center
- Pregnancy >20 weeks
- Motorcycle crash > 20 mph or with separation of rider from bike
- Fall from height > 20ft for adults, Peds >10ft or 2X height
- EMS provider judgment

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Notes:

Patients who are anticoagulated and undergo head trauma may have rapid deterioration

If a delay in transport is expected (e.g.: distance, multiple victims, or prolonged extrication) transport to a tertiary trauma facility by helicopter may be indicated

Primary Survey – search for immediate life threats by accessing the ABCDEs and treating the problems as they are found

A- Assess airway with simultaneous cervical spine stabilization. Note: Patient's ability to speak, and any evidence of actual or potential airway obstruction including vomitus, bleeding, dentures, loose teeth or foreign bodies. Transport of the unstable trauma patient should not be delayed by attempts at intubation unless the patient cannot be adequately ventilated with BVM

- BLS Maneuvers
  - Jaw thrust, (head tilt- chin lift only if no concern about cervical spine injury)
  - Oral or nasal airway
  - Suction
  - BVM
  - ET or supraglottic airway (i-gel) if indicated
- ALS Maneuvers
  - Oral endotracheal intubation- consider if unable to adequately ventilate the patient with BVM because of severe facial trauma or excessive blood or secretions. Maintain inline spine motion restriction
  - Nasal endotracheal intubation
  - Cricothyroidotomy

B- Assess Breathing: Note rate, depth and quality of ventilations, abnormal noises/stridor, retractions, accessory muscle use, nasal flaring or cyanosis

- Administer oxygen to maintain O2 SaO2 >92%
- Assist ventilation as required
- If evidence of open pneumothorax
  - Seal with occlusive dressing
  - Monitor for tension pneumothorax
- If evidence of tension pneumothorax
  - Perform Needle decompression

C- Assess Circulation: Note pulses, level of consciousness, skin abnormalities (color, temperature, capillary refill and moisture), and blood sweep. Assist circulation as required

- If major bleeding is present, control with sterile dressing, direct pressure, elevation, pressure point, or tourniquet use may be indicated
- ☎ If no pulse, follow Criteria of Death protocol or *contact medical control*
- Initiate CPR if indicated
- A cardiopulmonary arrest secondary to trauma cannot be adequately resuscitated in the field and must reach definitive care without delay for any chance of survival so begin resuscitative efforts and transport immediately
- Initiate IVs with NS
- Give TXA if appropriate
- Fluid bolus if needed to maintain BP ≥ 90
- Transport of the unstable patient should not be delayed by initiating IV therapy
- Begin IV in route to the hospital

D-Assess Neurological function (disability):

- Note level of consciousness, Glasgow Coma Scale or AVPU scale, movement of each extremity

E- Exposure

- Exposure of the trauma patient is critical to finding all injuries. Remove as much clothing as necessary to determine the presence or absence of a condition or injury
- Once the body has been examined the patient should be recovered to conserve body heat

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Spinal Restriction- *REFER TO SPINAL CARE PROTOCOL*

The following patient(s) should be treated for possible spinal injuries. Initiate cervical motion restriction procedures, unless C-spine is cleared per protocol

- Violent mechanism of injury (witness, scene, situation)
- Head injury with altered state of consciousness
- Any unconscious victim of trauma
- Significant blunt injury above the level of the clavicles
- Any history of sudden violent movement/deceleration or spine, or signs of spinal injury
- Any patient ejected from an automobile
- Any patient with helmet damage in a motorcycle accident or sports injury

OR

- Significant neck pain, with or without movement
- Point tenderness surrounding spine
- Deformity or guarding of head, neck or back
- Paralysis, partial paralysis, numbness or tingling

Secondary Survey - A detailed systemic history and physical examination, focused on the patient's complaints, searching for problems that may not be immediate life or limb threatening

- Obtain chief complaint
- Obtain "SAMPLE" history
    - Symptoms (including Pertinent positives and negatives)
    - Allergies
    - Medications
    - Past Medical history
    - Last Meal
    - Events/Environment leading to this episode
- Obtain baseline vital signs every 5 or 15 minutes based on patient's condition
- Perform focused physical examination (this evaluation is dependent on the above history as well as the findings from the primary survey and may be detailed depending on the situation.)
- Application of cardiac monitor on all patients with cardiac history or complaint of chest pain/back pain
- Obtain blood glucose
- Consider establishing 2nd IV access for critical patients
- Consider administering drug therapies (if indicated)

Transport Decisions-

- ☎ Contact Medical control as needed (TRAUMA ALERT)
- ☎ LMH ED is 785.505.6161 or 785.505.6162 if Biocom does not work
- Emergent or Opticom transport to the hospital may be indicated if the patient is physiologically unstable:
    - Unable to establish or maintain an airway
    - Unable to ventilate
    - Unremitting shock (including cardiac arrest)
    - Provider discretion
- Transport while monitoring vital signs and patient condition
- Patient destination as determined by appropriate protocol

SPECIAL CONSIDERATIONS

Head Trauma-

- Obtain brief history noting mechanism of injury, use of safety devices and level of consciousness
- The neurological exam should include assessing the level of consciousness (Glasgow Coma Scale/AVPU scale), pupil size and reactivity, and presence of posturing or paralysis
- Be alert of associated injuries. Assume that cervical spine injury is present in all patients with significant head trauma

Head Trauma Interventions:

- As per primary and secondary survey
- Ascertain if patient is on blood thinners (apixaban, warfarin, etc.) or antiplatelet agents (aspirin, Plavix, etc.)
- Treat Seizures as per Seizure protocol
- If signs and symptoms of increased intracranial pressure (blurry vision, mental confusion, restlessness, purposeless movements, and increased respiratory effort)
    - Ventilate to maintain ETCO2 30-35mmHg
- Transport while monitoring vital signs every 5 minutes

Spinal Trauma-

- Assess for spinal injury (step-offs or obvious deformity, etc.) and neurologic deficit (sensory and motor changes, etc.)

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Spinal Trauma Interventions:

- Using manual in-line stabilization, apply appropriately sized cervical collar
- Spinal motion restrictions:
    - In the unstable patient, transport should not be delayed by the application of a short spine board prior to patient removal. Appropriate rapid patient removal techniques using appropriate collar and long spine board or scoop stretcher with manual spinal motion restriction should be used
    - In the stable patient, spinal motion restriction as indicated by mechanism of injury per the spinal motion restriction procedure
    - In pregnant patients, if the uterus is palpable above the umbilicus, then roll the long spine board 10˚ to 15˚ to the left to prevent compression of the vena cava and hypotension. If unable to roll the long spine board, the uterus should be gently, manually displaced to the left with the palm of your hand Have suction immediately available if patient is immobilized on a spine board

Chest Trauma-

- The chest exam should include specifically assessing for open wounds, flail segments, tracheal deviation, unequal breath sounds, subcutaneous emphysema and adequacy of ventilation

Chest Trauma Interventions:

- A flail chest with respiratory distress is best treated with positive pressure ventilation
- Cover an open chest wound with non-porous material secured on all sides (Preference is chest seal >AED pad> improvised material)
- Tension pneumothorax can occur with or without a penetrating chest injury. If suspected, treat per the needle thoracostomy procedure
- Monitor cardiac rhythm and treat dysrhythmias per the appropriate protocol
- Transport while monitoring vital signs every 5 minutes

Abdominal Trauma-

- The abdominal exam should include specifically assessing for open wounds, eviscerations, ecchymosis, distention and pulsatility.

Abdominal Trauma Interventions:

- If evisceration is present, cover the exposed viscera with sterile saline soaked pads. Do not attempt to replace the exposed viscera in the abdominal cavity
- Transport while monitoring vital signs every 5 minutes

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Extremity Trauma-

- Assess the injured extremity noting neurovascular adequacy (color, temperature, deformity, open wounds, and distal sensation and movement)
- Fractures, dislocations and sprains:
    - Apply the appropriate splints (the joint above and below suspected injury)
    - If neurovascularly intact, splint in position found. Severely angulated fractures may be straightened by gentle continuous traction if necessary for immobilization, extrication, or if significant neurovascular compromise is present Recheck neurovascular status immediately after splinting and then every 5 minutes
- Apply sterile saline moistened dressing to all open wounds
- Chemical cold packs may be applied after splinting
- For pelvic fracture consider pelvic stabilization

Complete Amputations:

- Search for and control external bleeding
- Apply direct pressure with sterile gauze pads and elevation at the amputation site. DO NOT CLAMP BLEEDING VESSELS.
- If significant extremity bleeding exists, apply tourniquet. If bleeding persists, apply 2nd tourniquet just distal to the first.
- Apply sterile dressing to proximal amputation site
- Use appropriate narcotic to provide pain relief
- Rinse amputated part briefly with saline DO NOT SCRUB
- Wrap part in thin layer of dry or saline moistened gauze
- Place part in plastic bag and seal. DO NOT PUT ANY FLUID INTO BAG
- As time is of the greatest importance to assure viability of the amputated part, direct transport should be considered and proceed as promptly as possible to the nearest trauma facility

Incomplete amputations

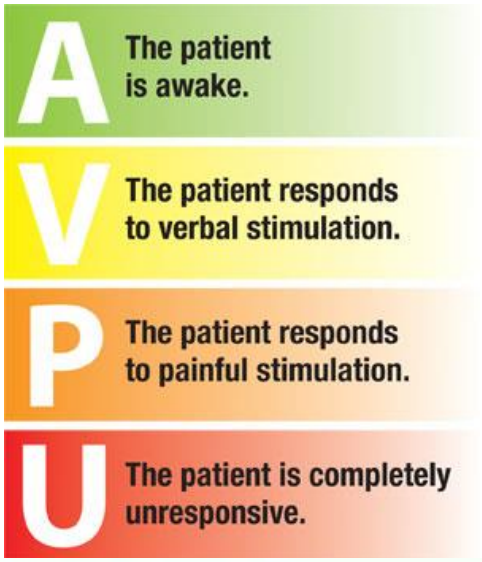
- Rinse part briefly with saline and DO NOT SCRUB
- Splint part in as normal a position as possible, and apply sterile pressure dressing
- Place amputated part on ice bags or cold packs (no direct contact with ice, do not allow tissue to freeze) and replace ice as needed to keep cold
- DO NOT CUT ANY EXISTING ATTACHMENTS no matter how small or thin

Epistaxis

- Have the patient hold pressure on the lower nose for 20 minutes
- If patient is unable to hold pressure apply nosebleed clip over lower nose for 20 minutes or until bleeding is controlled

Penetrating extremity wounds

- Apply pressure with sterile gauze pads and elevate to control external bleeding
- In the rare instance when direct pressure fails to control bleeding and the patient may exsanguinate, use a tourniquet on the proximal part of the extremity and tighten sufficiently to control the bleeding
- Splint extremity
- Do not attempt to remove penetrating object
- Transport while monitoring vital signs every 5 minutes



Glasgow coma scale		Score
Eye opening	spontaneously to speech to pain none	4 3 2 1
Verbal response	orientated confused inappropriate incomprehensible none	5 4 3 2 1
Motor response	obeys commands localises to pain withdraws from pain flexion to pain extension to pain none	6 5 4 3 2 1
Maximum score		15