Trauma Administrative Guideline

History	Signs and Symptoms	Differential
• Time/mechanism/speed • Damage/intrusion • Restraints or protective equipment	• Pain • Deformity • Bleeding • ALOC • Shock	• Chest injuries • Intraabdominal injuries • Pelvic fractures/bleeding • Head injury • Extremity trauma

Dead on Scene AG or Traumatic Cardiac Arrest AG if indicated

B	Hemorrhage control Airway maintenance Breathing and ventilation Circulation Time critical procedures as part of primary survey *****Minimize scene times*****
P	18 g IV/IO placement Cardiac monitor

Shock Index = HR/SBP

For peds, use age-appropriate BP goals

Blunt trauma at risk for hemorrhage	
B	Apply Spinal Motion Restriction
P	≥14 years: Administer **TXA 2 g** slow IV/IO push (over at least 2 minutes) if shock index >1 or SBP <90 mmHg Peds <14 years: Administer **TXA 30 mg/kg (max 2 g)** slow IV/IO push (over at least 2 minutes) for patients with shock (per age-based cutoff) Administer **NS/LR fluid bolus** to keep SBP >110 mmHg

Penetrating or isolated extremity trauma at risk of hemorrhage	
B	If isolated penetrating trauma to head, follow **EPIC TBI for fluid resuscitation** BP goals
P	≥14 years: Administer **TXA 2 g** slow IV/IO push (over at least 2 minutes) if shock index >1 or SBP <90 mmHg Peds <14 years: Administer **TXA 30 mg/kg (max 2 g)** slow IV/IO push (over at least 2 minutes) for patients with shock (per age-based cutoff) Administer **NS/LR fluid bolus** to keep SBP >70 mmHg

EPIC TBI GCS <15 or loss of consciousness	
B	O_2 to target saturation of 100% **20 mL/kg NS/LR fluid bolus** to keep SBP >110 mmHg [70+(agex2) for peds] $EtCO_2$ target for all mechanically or manually ventilated patients 40 (range 35-45)
P	Advanced airway management only if unable to oxygenate/ventilate with BLS airway interventions

Trauma Procedures
Control massive hemorrhage
Needle decompression for tension pneumothorax
Pelvic binder
Splint obvious fractures

Education/Pearls

The treatment of traumatic injury focuses on ABCs and prevention of further or secondary injury. Interventions are aimed at preventing overt hypoxemia, hypotension, and hyperventilation.

- Transport patients based on **SAEMS Regional Trauma Triage Guidelines.**
- **Airway/Breathing:** Prepare for a difficult airway, as traumatic airways are made difficult by trauma conditions, including spinal motion restriction, patient mentation, and bloodied airways.
  - For advanced airway, anticipate the need for suction and video laryngoscopy, if available.
  - Use care during intubation to maintain in-line stabilization, as cervical spine fractures may be present.
- **Circulation:** The most common cause of shock following trauma is hemorrhage. Scalp wounds, abdominal organ injury, and long-bone fractures can cause rapid blood loss.
  - Shock: For any evidence of shock, obtain two points of access (IV/IM/IO).
  - Bleeding - apply anticoagulant gauze wound packing until resistance is met and/or apply tourniquet until bleeding is stopped.
  - Pulseless - refer to **Traumatic Cardiac Arrest AG**; may terminate as per **Dead on Scene AG** if blunt trauma mechanism or for penetrating trauma if transport will take > 15 min to Level 1 Trauma Center.
- **Immobilization:**
  - Long spine board use in trauma patients should be restricted to extrication procedures only and should be avoided in patients with penetrating trauma.
  - Spinal motion restriction procedure should be followed for all trauma patients with neck or back pain, neurologic deficit, or other risk factor for spine trauma. The elderly are at high risk for spinal injury with lower mechanism injury.
  - Patients with isolated blunt injuries may not warrant SMR or pelvic binder placement.
- **Temperature:** Prevent hypothermia, as this contributes to a harmful acid/base status and bleeding abnormalities.
  - Expose the patient for rapid trauma assessment/treatment only.
  - Cover patient and rewarm as soon as possible.

Moderate or severe TBI: defined as anyone with physical trauma and a mechanism consistent with the potential to have induced a brain injury, and:

i. Any injured patient with loss of consciousness, especially those with GCS <15 or confusion OR
ii. Multisystem trauma requiring intubation whether the primary need for intubation was from TBI or from other potential injuries OR
iii. Post-traumatic seizures, whether ongoing or not
iv. *(Pediatric)* Infants (where GCS may be difficult to obtain or interpret): any evidence of decreased level of consciousness, decreased responsiveness, or deterioration of mental status

See next page (**EPIC TBI**) for TBI management guidelines.

Emergency Surgical Airway

- In the event oxygenation and ventilation of the patient cannot be achieved either by BLS maneuvers, placement of a SGA or Endotracheal Intubation, perform surgical cricothyrotomy.
  - *Surgical Cricothyrotomy*: 12 years of age and above
  - *Needle Cricothyrotomy*: Under 12 years of age

Prevent hypoxia, hypotension, and hyperventilation

B	All patients - Supplemental oxygen therapy to **maintain O_2 saturation 100%** - Monitor HR, BP and O_2 every 3-5 minutes
P	IV access with 18g IV (document exceptions, e.g. pediatric patient)

B	Monitor vital signs closely and initiate treatment before the patient becomes hypoxic or hypotensive.

Prevent hypoxia

B	Treat all TBI patients with a goal saturation of 100% Provide positive pressure ventilation with BVM with 100% O2 at age appropriate ventilation rate **Avoid hyperventilation** Maintain age appropriate ventilation rate Target EtCO2 40 mmHg (range 35-45)
P	If patient is failing BVM and remains hypoxic, consider endotracheal intubation or supraglottic airway placement (if age >8 years old) If O2 saturation <90% despite intubation or other advanced airway management, consider tension pneumothorax **Avoid hyperventilation** Maintain age appropriate ventilation rate Target EtCO2 40 mmHg (range 35-45)

Age Appropriate Ventilation Rates:
- Infants (0-24 mos) **25 bpm**
- Children (2-14 yrs) **20 bpm**
>14 yrs **10 bpm (same as adults)**

Prevent hypotension (SBP <110 or downtrending)

Patients with TBI are often hemodynamically unstable

Recheck vital signs every 3-5 minutes and address any changes

P	Administer **NS fluid bolus 20 ml/kg** to patient with any SBP reading <110 mmH (or below age specific SBP) Repeat until hypotension resolves Consider Shock AG

	Age > 14 yr	Age 6-13 yr	Age 1 w-5 yr	Age < 1 w
Heart Rate	**60-130**	**60-150**	**60-160**	**100-180**
SBP	**> 90**	**> 80**	**> 70 + (Age x2)**	**> 70**