Treatment Protocol: TRAUMATIC INJURY **Ref. No. 1244-P**

Base Hospital Contact: Required for patients who meet Trauma Center criteria or guidelines. ❶❷ Notify the receiving Pediatric Trauma Center as soon as possible for all patient transports.

1. Immediately control major bleeding *(MCG 1370)*
   Apply tourniquet prn

2. Assess airway and initiate basic and/or advanced airway maneuvers prn *(MCG 1302; 1309)* ❸

3. For traumatic arrest, treat per *TP 1243-P, Traumatic Arrest*

4. Provide spinal motion restriction (SMR) if indicated *(MCG 1360)*
   For alert patients, logroll patient off the backboard (if used during extrication) and onto gurney prior to transport ❹

5. Administer **Oxygen** prn *(MCG 1302)*
   High flow Oxygen 15L/min for all patients with shock or with suspected traumatic brain injury

6. If patient has an Unmanageable Airway: *(MCG 1302)*
   Initiate immediate transport to EDAP and **CONTACT BASE** en route

7. For anticipated prolonged extrication (> 30 minutes)
   Consider activating the Hospital Emergency Response Team (HERT), *Ref. 817*

8. For crush injury, treat in conjunction with *TP 1242, Crush Injury/Syndrome*

9. Initiate cardiac monitoring prn *(MCG 1308)*

10. Establish vascular access prn *(MCG 1375)*

11. Apply blanket to keep patient warm ❺

12. Consider medical condition preceding accident and refer to appropriate treatment protocol prn ❻

MULTI-SYSTEM TRAUMA

13. Perform needle thoracostomy for suspected tension pneumothorax *(MCG 1335)*

14. For an open or sucking chest wound, cover with a commercially available vented chest seal or vented (3-sided) occlusive dressing ❼

15. For poor perfusion *(MCG 1355)* with hypotension per *MCG 1309*:
    Normal Saline 20mL/kg IV/IO rapid infusion per *MCG 1309* ❽
    CONTACT BASE to discuss further fluid resuscitation

16. Cover eviscerated organs with a moist non-adhering dressing

17. For pain management: refer to *MCG 1345, Pain Management*
    Dose per *MCG 1309*

18. For nausea or vomiting in patients ≥ 4 years old:
    Ondansetron 4mg ODT ❾

ISOLATED HEAD INJURY

19. Administer **high flow Oxygen 15L/min** ❿
    Continually assess patient's airway and ventilation status, assist prn ⓫

20. For poor perfusion *(MCG 1355)* or hypotension per *MCG 1309*:
    Normal Saline 20mL/kg IV rapid infusion per *MCG 1309* to maintain normal SBP per *MCG 1309* ⓬
    CONTACT BASE for persistent poor perfusion *(MCG 1355)* to obtain order for additional **Normal Saline 20mL/kg IV**

21. For nausea or vomiting in patients ≥ 4 years old: ❾
    Ondansetron 4mg ODT

22. Transport with head of gurney elevated to 30 degrees when possible ⓭

23. If patient develops seizure activity, treat in conjunction with *TP 1231-P, Seizure*

24. For pain management: refer to *MCG 1345, Pain Management*
    Dose per *MCG 1309*

ISOLATED EXTREMITY INJURY

25. For pain management: refer to *MCG 1345, Pain Management*
    Dose per *MCG 1309*

26. For poor perfusion *(MCG 1355)*:
    Normal Saline 20mL/kg IV rapid infusion per *MCG 1309*
    CONTACT BASE for persistent poor perfusion to obtain order for additional **Normal Saline 20mL/kg IV**

27. Splint and dress injuries prn
    For distal extremity fractures with poor neurovascular status distal to injury – realign and stabilize extremity
    Mid-shaft femur – apply traction splint per manufacturer guidelines ⓮
    All other fractures/dislocations – splint in position of comfort
    For amputations – rinse off debris (do not manually debride), wrap with saline-moistened sterile gauze and ace wrap, then apply a splint for potential underlying fracture

SPECIAL CONSIDERATIONS

❶ EMS Personnel are mandated reporters of child abuse and neglect, and a report should be made when suspected as per *Ref. 822*. Communicate suspicion for child abuse and/or neglect to accepting ED staff when home suggests children could be at risk for harm (e.g., unkept home, evidence of drug or alcohol abuse, unsafe living conditions, known or suspected domestic violence), when the history does not match with the severity of physical findings (e.g., child posturing after a roll off the couch), when patterned injury or burns or noted (e.g., circular burns as from a cigarette, whip marks on the skin, burns of both hands or feet), or when child reports physical or sexual abuse. Children < 3 years of age and those with developmental delay are at increased risk of abuse. This must also be accompanied by notification to the Department of children and Family Services (DCFS).

❷ For patients requiring transport to a Pediatric Trauma Center per *Ref. 506*, which is also a Base Hospital, contact receiving Pediatric Trauma Center for Base Medical Direction and notification. If the Base Hospital is contacted and the Base redirects transport to a Pediatric Trauma Center, Base personnel will notify the Pediatric Trauma Center.

❸ Transport should be prioritized over advanced airway placement unless BMV is ineffective. Advanced airway may be placed during transport as authorized per *MCG 1302*; supraglottic airway (sizing per MCG 1309) is preferred unless contraindicated. Paramedics should use judgment based on patient characteristics, circumstances, and skill level when selecting the advanced airway modality for pediatric patients in whom multiple modalities are authorized.

❹ A backboard is not required for spinal motion restriction (SMR) and may cause harm as well as increased pain. Patients should not be transported on a backboard for the purpose of SMR. If a backboard is used for extrication, patients who are alert should then be logrolled onto the gurney prior to transport. The backboard may be used during patient transport for splinting of multiple simultaneous extremity fractures or to assist with maneuvering the unconscious patient. In all cases, the backboard should be removed immediately if causing respiratory compromise.

❺ Infants and small children are at high risk for hypothermia due to their large surface area to body mass ratio, reduced ability to shiver, and limited body fat.

❻ Traumatic events may be due to a medical emergency, e.g. seizure.

❼ Placement of a vented dressing can prevent conversion of an open pneumothorax to a tension pneumothorax. However, tension pneumothorax may still develop in the presence of a vented dressing and should be treated with needle thoracostomy. Furthermore, needle thoracostomy in a patient with evidence of tension pneumothorax should not be delayed for placement of dressing.

❽ Fluid resuscitation increases vascular pressure and dilutes clotting factors, which may increase internal bleeding. For patients at risk of internal hemorrhage, fluids should only be administered for hypotension **and** other signs of poor perfusion, titrated to maintain SBP within normal range for age. In patients with penetrating trauma, permissive hypotension (withholding fluids if patient has normal mental status) is preferred to reduce ongoing blood loss. Patients with ALOC or hypotension should receive fluids until their mental status and SBP improve. Permissive hypotension is contraindicated in patients with possible traumatic brain injury.

❾ Vomiting should be prevented and/or immediately treated in patients with head injury, since it increases intra-cranial pressure and can compromise the patient's airway.

❿ **Any** hypoxic episode, even brief, is associated with worse patient outcome for patients with traumatic brain injury.

⓫ Hyperventilation reduces blood flow to the brain by reducing CO_2 and is associated with worse outcomes in severe head injuries. Ventilate to maintain an $ETCO_2$ in the range 35-45mmHg.

⓬ Any hypotension increases mortality in patients with traumatic brain injury. Normal Saline should be initiated to maintain SBP within normal range for age at all times but can be withheld if the blood pressure is elevated. The level of systolic blood pressure varies by age. Those thresholds are found in *MCG 1309* and should be used in decisions for fluid resuscitation.

⓭ A head-elevated position at about 30 degrees reduces intra-cranial pressure and improves respiratory status. Reverse Trendelenburg is an option for patients that cannot be seated. Patients who are hypotensive should be maintained supine unless airway compromise requires repositioning.

⓮ Open femur fracture is not a contraindication to apply the traction splint. If the bone is protruding and there is gross contamination, wash with saline prior to applying the splint.