



<b>REGION 11 CHICAGO EMS SYSTEM PROTOCOL</b>	Title: Extremity Trauma / External Hemorrhage Management – BLS/ALS
	Section: Trauma
	Approved: EMS Medical Directors Consortium
	Effective: July 10, 2024

## **EXTREMITY TRAUMA / EXTERNAL HEMORRHAGE MANAGEMENT – BLS/ALS**

### **I. PATIENT CARE GOALS**

1. Minimize blood loss from extremity hemorrhage.
2. Avoid hemorrhagic shock due to extremity hemorrhage.
3. Minimize pain and further injury due to fractures, dislocations, or soft-tissue injuries.

### **II. PATIENT MANAGEMENT**

#### **A. Assessment**

1. Assess degree of external bleeding from extremity or blood loss.
2. Vascular status of extremity
  - a. Pallor
  - b. Pulse
  - c. Capillary refill and skin temperature
3. Evaluate for obvious deformity, shortening, rotation, or instability.
4. Neurologic status of extremity
  - a. Sensation to touch
  - b. Distal movement of extremity

#### **B. Treatment and Interventions** (see Prehospital External Hemorrhage Control diagram below)

1. Manage bleeding
  - a. Expose the wound and apply direct pressure to bleeding site followed by pressure dressing.
  - b. If direct pressure/pressure dressing is ineffective or impractical:
    - i. If the bleeding site is amenable to tourniquet placement, apply tourniquet to extremity (see Hemorrhage Control Procedure)
      - Tourniquet should be placed 2-3 inches proximal to wound, not over a joint, and tightened until bleeding stops and distal pulse is eliminated.
      - If bleeding continues, place a second tourniquet proximal to the first.



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- ii. If the bleeding site is not amenable to tourniquet placement (i.e. junctional injury), pack wound tightly with a hemostatic gauze and apply direct pressure.
  - c. Wound packing
    - i. Indications: Groin/axillary injury (“junctional”) injury or any limb wound with persistent bleeding despite direct pressure and/or application of a tourniquet.
    - ii. Materials: Hemostatic gauze, regular gauze, or any available material
    - iii. Procedure: Pack tightly and fully to the depth of the wound until bleeding stops (may require significant packing for deep, large wounds), then apply direct pressure and/or pressure dressing; do not remove packing to assess bleeding.
  - d. Consider tranexamic acid (TXA) for injury associated with hemorrhagic shock if within three hours of injury.
- 2. Manage pain (see Pain Management Protocol)
  - a. Pain management should be strongly considered for patients with tourniquets and suspected fractures.
  - b. Do not loosen tourniquet to relieve pain.
- 3. Stabilize suspected fractures/dislocations.
  - a. Strongly consider pain management before attempting to move a suspected fracture.
  - b. If distal vascular function is compromised, gently attempt to restore normal anatomic position and reassess perfusion status.
  - c. Use splints as appropriate to limit movement of suspected fracture.
  - d. Elevate extremity fractures above heart level whenever possible to limit swelling.
  - e. Apply ice/cold packs to limit swelling in suspected fractures or soft tissue injury - do not apply ice directly to skin.
  - f. Reassess distal neurovascular status after any manipulation or splinting of fractures/dislocations.
  - g. Dress open wounds associated with fractures with saline-moistened gauze.
- 4. Amputations
  - a. Amputated body parts should be transported with patient for possible re-implantation.
  - b. Amputated parts should be covered with dry gauze.
  - c. Place the amputated part in a plastic bag.
  - d. Place the bag with the amputated part on ice in a second bag.
  - e. Do not let the amputated part come into direct contact with the ice.
  - f. The stump should be covered with saline moistened gauze.
- 5. Remove wet or blood-soaked clothing and use measures to prevent heat loss.
- 6. Remove jewelry and potentially constricting clothing from the injured limb.



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7. Do not remove impaled foreign bodies.

### **C. Patient Safety Considerations**

1. If tourniquet is placed:
  - a. Ensure that the tourniquet is sufficiently tight to occlude the distal pulse.
  - b. Ensure that the tourniquet is well marked and visible and that all subsequent clinicians are aware of the presence of the tourniquet.
  - c. Do not cover the tourniquet with clothing or dressings.
2. Mark time of tourniquet placement prominently on the patient and in the patient care report.
3. Without removing the tourniquet or dressing, reassess frequently for signs of ongoing or renewed bleeding such as:
  - a. Blood soaking through the dressing
  - b. Bleeding distal to the tourniquet

### **III. NOTES/EDUCATIONAL PEARLS**

- A. Tourniquets should be applied to bare skin, 2–3 inches proximal to the wound.
- B. Tourniquet should be reassessed at every stage of patient movement to ensure ongoing hemorrhage control.
- C. Survival is markedly improved when a tourniquet is placed *before* shock ensues.
- D. Properly-applied tourniquets in conscious patients are painful – treat pain with analgesics, but do not loosen a tourniquet to relieve discomfort.
- E. Arterial pressure points are not effective in controlling hemorrhage.
- F. Pediatric Considerations:
  1. External hemorrhage control to prevent shock is critical in infants and young children, due to their relatively small blood volume.
  2. Most commercial tourniquets can be used effectively on children over 2 years of age.
  3. Stretch-wrap-tuck elastic-type tourniquets can be used on any age patient.
  4. Direct pressure and wound packing may be more suitable for infants and young children.



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**Prehospital External Hemorrhage Control Protocol**

