Protocol 700-T4: Hemorrhage Control

Revision 11/11/19
Effective 1/1/20

BLS Treatment

- Treat life threats. (See Procedure 701 *Life Threats*)
- Apply substantial direct pressure using 4x4 gauze pads, abdominal, or trauma dressings.
  - If bleeding saturates the dressing, leave in place the dressing material that is in contact with the wound, and replace outer layers with fresh dressing. Secure with pressure dressing.
- Hemorrhage to a limb:
  - In cases where substantial bleeding to a limb cannot be controlled with direct pressure and plain gauze, apply a tourniquet 2 – 3 inches above the wound and tighten until bleeding stops.
  - Assess distal circulation for absence of a pulse and bleeding control.
  - Apply a visible tag (using two-inch tape, a triage tag, etc.) and mark it with a large "T" and the time that the tourniquet was applied.
  - Inform all subsequent care providers of the location of the tourniquet, its effectiveness and its time of application.
  - If the initial tourniquet does not control bleeding, a second tourniquet may be applied 2 – 3 inches above the first and marked accordingly.
  - If substantial bleeding persists despite the use of direct pressure, tourniquets, and pressure dressings, consider the patient in extremis and transport to the closest, most appropriate facility.
  - Prepare for transport/transfer of care.
- Hemorrhage to the head, neck, or trunk
  - Large, gaping wounds to the patient's head, neck, or trunk should have pooled blood cleared out and then packed with gauze and secured as needed.
  - Avoid bulky dressings that do not allow isolation of the actual location of the bleeding, and merely act as a blood sponge.
  - It is possible for a patient to exsanguinate into bulky dressings applied without regard to hemostasis.
  - If substantial bleeding persists despite the use of direct pressure and gauze, consider the patient in extremis and transport to the closest, most appropriate facility.

ALS Treatment

- Treat life threats. (See Procedure 701 *Life Threats*)
- Continue all BLS interventions listed above.
- If substantial external bleeding persists despite the use of direct pressure, place hemostatic gauze directly on the source of the bleeding and apply direct pressure for at least three minutes. Secure with a pressure dressing.
- Control internal bleeding (see also *Protocol 700-T1 Trauma*)
  - **Tranexamic Acid (TXA)**
    - Indications

- Blunt or penetrating traumatic injury with signs and symptoms of hemorrhagic shock (including SBP <90)
- Hemorrhage not controlled by direct pressure, hemostatic agents, or commercial tourniquet application

▪ Contraindications
- Any patient < 15 years old
- Time since injury > 3 hours
- Thromboembolic event (i.e., stroke, MI, PE, DVT) in past 24 hours
- Traumatic arrest with > 5 minutes of CPR without ROSC
- Hypotension secondary to suspected cervical cord injury with motor deficit or spinal shock
- Known hypersensitivity or allergy to TXA

▪ Adverse Reactions
- GI: Nausea, vomiting, diarrhea
- Visual: Blurry vision or changes in color perception
- CNS: Fatigue, dizziness, headache, seizure
- Thromboembolic: Deep venous thrombosis or pulmonary embolism

▪ Administration
- Mix 1 gram **TXA** in 100 ml or 250 ml **Normal Saline** or **D5W** and infuse IV/IO over 10 minutes
- Onset of action: 5-15 minutes
- Duration of action: 3 hours
- Single dose only

❖ P.A.M. the patient and expedite transport to the appropriate facility.
❖ Treat other injuries and complaints as needed.
❖ Transport.
❖ Contact Base Station as needed.

Special Considerations

❖ Elevating bleeding extremities or applying pressure to arteries (“pressure points”) has not been found to reduce substantial bleeding. These actions are not recommended in the treatment of significant external bleeding.
❖ Life threatening hemorrhage to a limb is better managed if it is splinted to reduce movement.
❖ Patients with major arterial bleeding can bleed to death in as little as two or three minutes. It is important to control external bleeding before the patient experiences shock.
❖ When a tourniquet is applied to an isolated wound on a patient that does not meet P.A.M. criteria, consult with the base station hospital for direction regarding patient destination.
❖ Any patient with a tourniquet applied should be considered to have a time dependent injury and should be transported C/3 to the appropriate hospital.
❖ Hemostatic gauze can be used prior to, or after, the use of tourniquets in managing severe limb hemorrhage.

- Tourniquets can be safely applied for at least 2 hours without causing irreversible, limb-threatening ischemia. In some cases, tourniquets have been applied for as long as four hours without causing irreversible limb ischemia.
- Most patients who require a tourniquet to manage bleeding should be transported to a trauma center.
- Tourniquets need to be accounted for on all patient hand-offs, and in all prehospital documentation. It is critical that the time of tourniquet application be accurately communicated to all care providers.
- Pressure dressings, tourniquets and hemostatic gauze should be reevaluated every time there is a change in the patient's status, or the patient is moved.
- **Tranexamic Acid (TXA)** is a Lysine analogue that works to inhibit the formation of plasmin, which is a molecule responsible for clot degradation. Plasmin works to break down already-formed blood clots in the human body by attacking and breaking down fibrin. This process of destroying clots is called fibrinolysis. It has had multiple medical applications in the past including pre-operative use, menorrhagia, hemophilia and hereditary angioedema. It has recently been shown in multiple studies to reduce mortality in trauma patients meeting specific physiologic criteria or who have obvious signs of massive hemorrhage.