



## Tactical Emergency Casualty Care (TECC) Guidelines for BLS/ALS Clinicians



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## PREAMBLE

In environments with real or perceived threat(s), traditional response paradigms that prioritize scene safety before patient care may result in treatment delays that negatively affect patient and rescuer outcomes.

***To address this gap, the Tactical Emergency Casualty Care (TECC) guidelines describe patient care standards for persons of all age groups in an all-hazards, high-threat environment.***

The TECC construct consists of three dynamic phases of care:

1. Direct Threat
2. Indirect Threat
3. Evacuation

These phases are intended to correlate directly with the contemporaneous threat level and are not solely geographic in nature.

Paramount considerations to reduce mortality and morbidity throughout all phases of TECC are:

- Immediate access to the injured
- Rapid life-saving interventions at or near the point of injury and
- Early extraction of those needing transport to definitive medical care

In addition to treating physical injuries, key principles for addressing the mental health needs of patients, survivors, and responders include:

- Limiting exposure of personnel to the incident
- Providing appropriate early psychological support

The TECC system of care is applied during incidents where operational threats (e.g., active violence, hazardous material, fire, structural instability, etc.) shape the medical response. This system of care is based upon principles, not protocols. While the TECC principles are universal, application of the principles is agency, provider, practitioner, and resource specific.

The TECC guidelines are agnostic to specific commercial products, scope of practice dependent, and require a systems approach that accounts for the totality of the event, including available resources and clinical capabilities. The Committee for Tactical Emergency Casualty Care does not endorse specific training programs or instructors but encourages all end users to appropriately employ these guidelines.

The Committee for Tactical Emergency Casualty Care was originally convened to speed the transition of military medical lessons learned from the battlefield to evidenced- and best-practiced based operational medical guidance for medical response and treatment of the injured during high risk and atypical civilian operational scenarios.

The Tactical Emergency Casualty Care (TECC) guidelines are a set of best practice recommendations for casualty management during civilian tactical and rescue operations. Based upon the principles of Tactical Combat Casualty Care (TCCC), TECC accounts for the differences in the civilian environment, resources, patient population, and scope of practice from the military combat environment of TCCC.



**TECC Guidelines for the BLS/ALS Clinicians**

<b>Direct Threat Care (DTC)/Hot Zone</b>	
<i>Note: Care provided within the DTC/Hot Zone guidelines is based upon individual first responder training, available equipment, local medical protocols, and medical director approval.</i>	
<b>Primary Goals:</b>	<ul style="list-style-type: none"><li>• Accomplish the mission with minimal casualties.</li><li>• Prevent any casualty from sustaining additional injuries.</li><li>• Keep operational response maximally engaged in addressing/neutralizing the immediate and any existing threat (e.g., fire/smoke, unexploded ordinance, active shooter, impending collapse).</li><li>• Minimize public harm.</li></ul>
<b>Operational Principles:</b>	<ul style="list-style-type: none"><li>• Establish <i>operational control of the immediate incident</i> and defer in-depth medical interventions if engaged in <i>ongoing direct threat mitigation</i> (e.g., active fire suppression, dynamic explosive scenario).</li><li>• <i>Threat mitigation</i> techniques will minimize risk to casualties and the providers. These should include techniques and tools for rapid access to the patient and rapid patient egress.</li><li>• Formal Triage should be deferred to a later phase of care. Prioritization for extraction is based on resources available and the tactical situation.</li><li>• Minimal trauma interventions are warranted in this phase of care.<ul style="list-style-type: none"><li>• Consider hemorrhage control before evacuation to a safer area.</li><li>• Tourniquet application is the primary medical intervention to be considered in this phase of care.<ul style="list-style-type: none"><li>○ For response personnel, tourniquet should be readily available and accessible with either hand.</li></ul></li><li>• Consider placing unresponsive victims with signs of life in the recovery position</li></ul></li></ul>
<b>Required Skill Set</b> (applied per approved SOP/protocol only):	<ul style="list-style-type: none"><li>• Direct pressure and hasty tourniquet application.<ul style="list-style-type: none"><li>○ Primary, Alternate, Contingency, Emergency (PACE) methodology.</li><li>○ Commercially available tourniquets.</li><li>○ Field expedient tourniquets.</li></ul></li><li>• Methods for rapid and efficient patient extraction.</li><li>• Rapid placement in recovery position.</li></ul>

**I. Direct Threat Care (DTC)/Hot Zone Guidelines**

- A. Mitigate any immediate threat and move to a safer position (e.g., initiate fire attack, coordinated ventilation, move to safe haven, evacuate from an impending structural collapse). Recognize that threats are dynamic and may be ongoing, requiring continuous threat assessments.
- B. Direct the other responders to stay engaged in the operation if able and appropriate.
- C. Move the patient to a safer position:
  1. Instruct the alert, capable patient to move to a safer position and apply self-aid.
  2. If the patient is responsive but is injured to the point that he/she cannot move, a rescue plan should be devised.
  3. If a patient is unresponsive, weigh the risks and benefits of an immediate rescue attempt in terms of available personnel and likelihood of success. Remote medical assessment techniques should be considered to identify patients who are dead or have non-survivable wounds.



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- D. Stop life-threatening external hemorrhage if present and reasonable depending on the immediate threat and the extraction distance to safety.
- E. Consider moving to reasonable safety prior to application of the tourniquet if the situation warrants.
  - 1. Apply direct pressure to wound or direct a capable patient to apply direct pressure to his/her own wound.
  - 2. Apply a tourniquet or direct a capable patient to apply his/her own tourniquet:
    - a) Apply the tourniquet as high on the limb as possible, including over the clothing if present.
    - b) Tighten until cessation of bleeding and move to safety.
    - c) Consider the PACE (Primary, Alternate, Contingency, Emergency) methodology in executing tourniquet placement. The PACE methodology, often used by military and defense organizations, can be used by responders to develop multiple contingencies for tourniquet placement if one plan fails to stop bleeding or stops working during treatment.
- F. Consider quickly placing the unresponsive patient, or directing the patient to be placed, in recovery position to protect airway.



<b>Indirect Threat Care (ITC)/Warm Zone</b>	
<i>Care provided within the TECC guidelines is inherent upon individual first responder training, available equipment, local medical protocols, and medical director approval.</i>	
<b>Primary Goals:</b>	<ul style="list-style-type: none"> <li>• DTC/Hot Zone care primary goals are also applicable here.</li> <li>• Stabilize the patient as required to permit safe evacuation to dedicated treatment area or medical evacuation assets.</li> </ul>
<b>Operational Principles:</b>	<ul style="list-style-type: none"> <li>• Maintain <i>operational control</i> to stabilize the immediate scenario.</li> <li>• Conduct <i>dedicated patient assessment</i> and initiate appropriate life-saving interventions as outlined in the ITC/Warm Zone guidelines. <b>DO NOT DELAY</b> casualty extraction/evacuation for non-lifesaving interventions.</li> <li>• <i>Consider establishing a casualty collection point</i> if multiple patients are encountered or there is a large operational footprint.</li> <li>• Unless in a fixed casualty collection point, formal triage in this phase of care should be limited to the following categories:               <ul style="list-style-type: none"> <li>○ Uninjured or minimally injured and capable of ambulation/self-extraction,</li> <li>○ Deceased or when death is imminent, and</li> <li>○ All others.</li> </ul> </li> <li>• Establish <i>communication</i> with incident command to inform of need for patient evacuation.</li> <li>• Prepare casualties for extraction and document care rendered for continuity of care purposes.</li> </ul>
<b>Required Skill Set</b> (applied per approved SOP/protocol only):	<ul style="list-style-type: none"> <li>• Hemorrhage Control:               <ul style="list-style-type: none"> <li>○ Application of direct pressure</li> <li>○ Application of tourniquet                   <ul style="list-style-type: none"> <li>▪ PACE methodology.</li> <li>▪ Commercially available tourniquets.</li> <li>▪ Field expedient tourniquets.</li> <li>▪ Junctional tourniquets.</li> </ul> </li> <li>○ Perform wound packing with gauze or hemostatic agent.</li> <li>○ Application of pressure dressing.</li> </ul> </li> <li>• Airway:               <ul style="list-style-type: none"> <li>○ Perform manual maneuvers (chin lift, jaw thrust, recovery position).</li> <li>○ Insert nasal pharyngeal airway.</li> <li>○ Placement of supraglottic airway.</li> <li>○ Placement of endotracheal tube under direct visualization.</li> <li>○ Perform surgical cricothyrotomy.</li> </ul> </li> <li>• Breathing:               <ul style="list-style-type: none"> <li>○ Application of effective occlusive or non-occlusive (vented/channeled) chest seal.</li> <li>○ Apply oxygen if available.</li> <li>○ Recognize the symptoms of tension pneumothorax.</li> <li>○ Perform needle thoracostomy (anterior chest location or lateral chest location).</li> <li>○ Perform manual burp of vented seal.</li> </ul> </li> <li>• Shock management/fluid resuscitation:               <ul style="list-style-type: none"> <li>○ Recognize the symptoms of hemorrhagic shock.</li> <li>○ Obtain intravenous and/or intraosseous access.</li> <li>○ Resuscitate hemorrhagic shock using the principles of hypotensive resuscitation.</li> </ul> </li> <li>• Hypothermia prevention: Apply available materials to prevent heat loss.</li> <li>• Wound management: Initiate basic burn treatment.</li> </ul>





	<ul style="list-style-type: none"><li>• Traumatic brain injury: Position patient appropriately and apply appropriate resuscitative principles for TBI patient.</li><li>• Prepare patient for evacuation:<ul style="list-style-type: none"><li>○ Move patient (drags, carries, lifts).</li><li>○ Identify patient at risk and apply commercial/improvised spinal motion restriction devices.</li><li>○ Properly secure patient to litter.</li></ul></li><li>• Other Skills:<ul style="list-style-type: none"><li>○ Perform hasty decontamination.</li><li>○ Initiate patient monitoring.</li><li>○ Recognize need and requirements for establishing a Casualty Collection Point.</li></ul></li></ul>
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## II. Indirect Threat Care (DTC)/Warm Zone Guidelines

- A. Any injured person, including law enforcement with a weapon, should have that weapon made safe/secured once the threat is neutralized and/or if mental status is altered.
- B. Perform systematic assessment and intervention. Mnemonics such as MARCH or X-ABCDE to guide priorities may be of assistance.<sup>1</sup>
- C. Massive Hemorrhage (Bleeding):
  1. Assess for and control any uncontrolled/unrecognized major bleeding.
  2. Extremity hemorrhage:
    - a) Use a tourniquet or an appropriate pressure dressing with deep wound packing to control life-threatening bleeding in an extremity.
    - b) Apply the tourniquet over the clothing as proximal as possible from the injury site and tighten as much as possible; if the situation allows, fully expose and evaluate the extent of the wound before applying tourniquet directly to the skin, 2-3 inches above the most proximal wound. (DO NOT APPLY OVER THE JOINT!)
    - c) For any traumatic total or partial amputation, a tourniquet should be applied in an appropriate location regardless of bleeding.
    - d) A pressure dressing with deep wound packing (either plain gauze or, if available, hemostatic dressing) is an acceptable alternative for moderate to severe hemorrhage. Other available materials can be used for wound packing if gauze or a hemostatic agent is not available. Then, properly apply the pressure dressing directly over the wound to generate constant direct pressure.
  3. Junctional hemorrhage:
    - a) Use direct pressure and an appropriate pressure dressing with deep wound packing (plain gauze or, if available, hemostatic gauze) following the manufacturer's recommendation if applicable.

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<sup>1</sup> MARCH (massive hemorrhage, airway, respirations, circulation, head injury/hypothermia) is an acronym used by TECC-trained individuals to help remember the proper order of treatment. X-ABCDE is another acronym that may be used and stands for exsanguination, airway, breathing, circulation, disability, exposure/environment.



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- b) If available, immediately apply a junctional tourniquet device for anatomic junctional areas where bleeding cannot easily be controlled by direct pressure and/or hemostatics/dressings.
  4. Reassess all tourniquets that were applied during DTC/Hot Zone Care and evaluate the wound for continued bleeding or a distal pulse in the extremity. If the situation allows, fully exposing the injury to evaluate the wound for effective hemorrhage control and to determine if the tourniquet is needed.
    - a) Tourniquets that are determined to be both *necessary and effective* in controlling hemorrhage should remain in place if the patient can be evacuated within two hours to definitive medical care.
    - b) If the existing tourniquet is *necessary but ineffective* (continued bleeding or a palpable distal pulse), either tighten the existing tourniquet further, or apply a second tourniquet, side-by-side with the first to eliminate the distal pulse.
    - c) If a tourniquet is determined based on wound assessment *to not be necessary*, use other techniques to control bleeding and remove the tourniquet.
  5. Consider tourniquet downgrade/conversion if there will be a delay in evacuation more than two hours. On any patient who is receiving resuscitation for hemorrhagic shock, ensure a positive response to resuscitation efforts (e.g., improving mentation and peripheral pulses normal in character) before downgrading/converting a tourniquet.
    - a) Downgrade: Expose the wound fully, identify an appropriate location at least two to three inches above the most proximal injury (not over a joint), and apply a new tourniquet directly to the skin; once properly applied, the prior tourniquet can be loosened but should be left in place.
    - b) Conversion: Expose the wound fully, fully pack the wound with hemostatic or plain gauze, and properly apply a pressure dressing; once properly applied, the prior tourniquet can be loosened but should be left in place. Other available materials can be used for wound packing if gauze or a hemostatic agent is not available.
    - c) If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.
  6. Expose and clearly mark all tourniquet sites with the time of tourniquet application.
- D. Airway Management:
  1. If the casualty is conscious and able to follow commands, allow casualty to assume position of comfort, including sitting up. Do not force to lie down.
  2. If the casualty is unconscious or is conscious but unable to follow commands:
    - a) Clear mouth of any foreign bodies (e.g., vomit, food, teeth, gum.).
    - b) Apply basic chin lift or jaw thrust maneuver to open airway.
    - c) Consider placing a nasopharyngeal airway.
    - d) Place casualty in the recovery position to maintain the open airway.
  3. If previous measures are unsuccessful, the operational situation allows, and equipment is available under an approved protocol, consider:



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- a) Supraglottic Devices (e.g., King LT, LMA, iGel).
  - b) Oro/nasotracheal intubation.
  - c) Surgical cricothyroidotomy (with local or systemic anesthesia if available and conscious).
4. Consider applying oxygen if available.
- E. Respiration (Breathing):
1. Immediately apply a non-occlusive (vented) seal to cover the defect from any open and/or sucking torso wounds.
  2. Monitor any casualty with penetrating torso trauma for the potential development of a tension pneumothorax. The most common presentation will be penetrating chest injury with subsequent increasing shortness of breath, difficulty breathing and/or increasing anxiety/agitation, often after the application of a chest seal.
    - a) If tension pneumothorax appears to be developing, decompress the chest on the side of the injury:
      - (1) **BLS providers:** Remove the non-occlusive (vented) dressing and burp the wound by applying gentle pressure around the wound to allow any air to escape.
      - (2) **ALS providers:** Needle decompression should be performed (minimum 14-gauge, 3.25-inch needle/catheter) at the second intercostal space mid-clavicular lateral to the nipple line and not directed towards the heart or the fourth/fifth intercostal space perpendicular to the chest wall anterior to the mid-axillary line.
      - (3) Casualties with concern for developing tension pneumothorax should be prioritized to a higher level of care.
    - b) If suspected severe traumatic brain injury (GCS < 9), monitor oxygenation saturation and end tidal CO<sub>2</sub> (etCO<sub>2</sub>) if available. Apply oxygen if available to maintain Oxygen saturation >90% and maintain etCO<sub>2</sub> in the ventilated patient between 35-45 mmHg.
      - (1) Avoid any hyperventilation as evidenced by an etCO<sub>2</sub> below 35 mmHg.
      - (2) If available, consider positive end-expiratory pressure (PEEP) of 5-12 cm H<sub>2</sub>O.
- F. Intravenous (IV) Access: If immediate fluid resuscitation is required and is available, consider starting at least an 18-gauge IV or obtaining intraosseous (IO) access.
- G. Tranexamic Acid (TXA):
1. If the patient has injuries that could potentially require significant blood transfusion (e.g., presents in hemorrhagic shock in the setting of penetrating torso trauma, multiple amputation(s), and/or evidence of severe uncontrolled internal or external bleeding) consider administration of 2 grams of TXA as soon as possible.
  2. Do not administer TXA later than three hours after injury.
- H. Circulation (Shock Management/Resuscitation):
1. Assess for hemorrhagic shock: Altered mental status (in the absence of head injury)





and weak or absent radial pulses are the best austere field indicators of shock.

- a) If equipment available, assess for abnormal vital signs (e.g., systolic blood pressure (SBP) <90 mmHg with/without heart rate >100 bpm) or a shock index >1 (HR/SBP).
  2. No IV fluids are necessary but consider intravascular access with saline lock.
  3. If hemorrhagic shock is present:
    - a) Resuscitate using permissive hypotension in the non-head injured patient; use permissive hypotension strategies with caution in obviously pregnant patients. Administer IV fluid bolus (per agency protocol) to a goal of improving mental status, radial pulses, or, if available, measured SBP>80 mmHg. Repeat bolus once after 30 minutes if still in shock.
    - b) If available, infuse 1 gram 10% Calcium Chloride (CaCl) or 3 grams of 10% Calcium Gluconate (CaGlu) slow IV push.
      - (1) 1g of CaCl 10% in 10 ml is 13.65 meq/10 ml
      - (2) 1g of CaGlu 10% in 10 ml is 4.65 meq/10 ml.
  4. In a patient who has altered mental status due to suspected or confirmed severe traumatic brain injury (GCS<9), avoid any hypotension.
    - a) Resuscitate aggressively with fluid boluses to a goal of improving mental status, strong peripheral pulses or, if monitoring is available, maintain measured SBP>110 mmHg.
    - b) Position patient with head elevated 30 degrees, if possible, with neck neutral. Avoid overly tight cervical collar or airway securing devices that may impede venous outflow from the head.
  5. Consider blood products for a patient in suspected hemorrhagic shock:
    - a) If in hemorrhagic shock and blood products are available with appropriate training, provider scope of practice, and an approved medical protocol:
      - (1) Resuscitate with plasma and packed red blood cells (PRBCs) in a 1:1 ratio or fresh whole blood through one line with a fluid warmer.
      - (2) Infuse 1 gram 10% Calcium Chloride or 3 grams 10% Calcium Gluconate slow IV push.
        - (a) 1g CaCl 10% in 10 ml is 13.65 meq/10 ml.
        - (b) 1g of CaGlu 10% in 10 ml is 4.65 meq/10 ml.
    - b) Continue resuscitation as needed to maintain target BP or clinical improvement.
  6. Prioritize for rapid evacuation any patient with traumatic brain injury or any patient, especially those with penetrating torso injury, that is displaying signs of shock.
- I. Hypothermia Prevention:
1. Minimize patient's exposure and subsequent heat loss.
    - a) Avoid cutting off or removing clothes unless absolutely necessary for wound



evaluation.

- b) For injured public safety personnel, keep equipment on or with patient if feasible.
2. Keep the patient covered, warm, and dry.
    - a) Place the patient onto an insulated surface to reduce conductive heat loss as soon as possible.
    - b) Replace wet clothing with dry if possible.
    - c) Cover casualty with commercial warming device, blankets, jackets, or anything that will retain heat and keep the casualty dry.
    - d) Warm fluids are preferred if IV fluids are administered.

J. Reassess Patient:

1. Perform a rapid blood sweep, front and back, checking for additional injuries. Tearing or cutting clothes, or otherwise exposing the wound may be necessary. Balance this with the goal of preventing heat loss.
2. Consider splinting known/suspected fractures, including the application of pelvic binding devices/techniques for suspected pelvic fractures.

K. Burns:

1. Stop the burning process.
2. Cover the burn area with dry, sterile dressings and initiate aggressive measures to prevent heat loss and hypothermia.
3. Facial burns, especially those that occur in closed spaces, are likely associated with inhalation injury. Aggressively monitor airway status and, if available, oxygen saturation in such patients and consider early definitive airway management for respiratory distress, oxygen desaturation, or other signs of inhalational injury (e.g., hoarseness, stridor, throat pain).
4. Smoke inhalation, particularly in a confined space, may be associated with significant carbon monoxide and cyanide toxicity.
  - a) Significant symptoms of smoke inhalation and carbon monoxide toxicity should be treated with high flow oxygen if available.
  - b) Significant symptoms of smoke inhalation and cyanide toxicity should be considered candidates for cyanide antidote administration. See *TECC Guidelines for BLS/ALS Medical Provider Response to Chemical Warfare Agents/Events* for specific drugs and dosing.
5. Estimate total body surface area (TBSA) burned to the nearest 10% using the appropriate locally approved burn calculation formula.
  - a) If burns are greater than 20% of TBSA, resuscitation should be initiated as soon as IV/IO access is established.
  - b) If hypotension is also present, fluid resuscitation as per the guidelines above in *Circulation (Shock Management/Resuscitation)*. Permissive hypotension resuscitation principles for hemorrhagic shock take precedence over burn resuscitation.



6. All previously described patient care interventions can be performed on or through burned skin in a burn patient.

L. Analgesia:

1. Provide adequate analgesia as necessary for the patient. Adequate pain control can reduce physiologic stress, may decrease post-traumatic stress, and may help to prevent chronic pain syndromes.
2. For mild to moderate pain:
  - a) Motion restriction may be effective as the initial intervention.
  - b) Consider oral non-opioid medications. Avoid the use of traditional nonsteroidal anti-inflammatory medications (e.g., aspirin, ibuprofen, naproxen, ketorolac, etc.) as these medications interfere with platelet functioning and may exacerbate bleeding.
  - c) Celecoxib, a selective Cox-2 inhibitor, has no effect on platelets and may be considered as a non-sedating oral analgesic.
  - d) Acetaminophen, either oral or intravenous, can provide effective pain control especially when combined with other non-opioid medications.
3. For moderate to severe pain:
  - a) Consider use of opioid medications (fentanyl, morphine, etc.). The side effect profile requires careful titration and increased monitoring for adverse effects (respiratory depression/hypotension).
    - (1) Weigh the benefits of opioid pain control versus the operational effect of opioid-induced altered mental status on the need for required resources to manage these patients.
    - (2) Have naloxone readily available whenever administering opiates.
  - b) Consider the use of ketamine at analgesic dosages. Ketamine may be administered by any route, although the dosing changes depending on the exact administration route and is no longer contraindicated in traumatic brain injury.
    - (1) When used as a single agent, ketamine does not induce hypotension or respiratory depression therefore requires less monitoring.
    - (2) Consider initial dose of 0.3-0.4 mg/kg IN/IM or 0.1-0.2 mg/kg IV/IO titrated every 15 minutes until pain control achieved.
    - (3) Low dose benzodiazepines may be added for subsequent dysphoria.
  - c) Strong consideration should be given to administering analgesia using a multimodal approach to pain control. By using analgesics with different, but potentiating, mechanisms of action, lower doses may be used with less side effects, with the same or better pain control than using a single modality.
  - d) In traumatic brain injury use caution administering opioid analgesics for pain control to avoid hypotension.
  - e) Consider co-administering anti-emetic medications with pain medications.

- M. Monitoring: Apply appropriate monitoring devices and/or diagnostic equipment if available. Obtain and record vital signs.



- N. Prepare patient for movement:
  - 1. Consider operational and environmental factors for safe and expeditious evacuation.
  - 2. Secure patient to a movement-assist device when available.
  - 3. If vertical extraction required, ensure casualty is secured appropriately.
- O. Communicate with the casualty if possible. Encourage, reassure, and explain care. If not altered, awake, and able to follow commands, patient may drink clear liquids if conscious, can swallow, and there is a confirmed delay in evacuation to care.
- P. Cardiopulmonary Resuscitation:
  - 1. CPR within this phase of care for victims of blast or penetrating trauma who have no pulse, no ventilations, and no other signs of life will likely not be successful and should not be attempted.
    - a) Consider bilateral needle decompression for victims of torso or polytrauma with no respirations or pulse to ensure tension pneumothorax is not the cause of cardiac arrest prior to discontinuation of care.
  - 2. In other circumstances (e.g., electrocution, drowning), performing CPR may be of benefit and may be considered in the context of the operational situation.
- Q. Documentation of Care:
  - 1. Document clinical assessments, treatments rendered, and changes in the patient's status in accordance with local protocol. Forward this information with the patient to the next level of care.



<b>Evacuation Care (EC)/Cold Zone</b>	
<i>Care provided within the TECC guidelines is inherent upon individual first responder training, available equipment, local medical protocols, and medical director approval.</i>	
<b>Primary Goals:</b>	<ul style="list-style-type: none"><li>• Maintain any lifesaving interventions conducted during DTC/Hot Zone and ITC/Warm Zone phases of care.</li><li>• Provide rapid and secure evacuation to an appropriate (level of care) medical receiving facility.</li><li>• Provide good communication and patient care data between field clinicians and fixed medical receiving facility.</li><li>• Avoid additional preventable causes of death.</li></ul>
<b>Operational Principles:</b>	<ul style="list-style-type: none"><li>• Reassess the patient or patients for efficacy of all applied medical interventions.</li><li>• Use a formal triage system/criteria per local policy that considers priority AND destination to ensure proper distribution of patients.</li><li>• Use available additional resources to maximize advanced care.</li><li>• Avoid hypothermia and/or address developing hypothermia.</li><li>• Communication is critical, especially between different operational disciplines and with medical resources.</li><li>• Maintain situational awareness; in dynamic events, there are NO threat-free areas.</li></ul>
<b>Required Skill Set</b> (applied per approved SOP/protocol only):	<ul style="list-style-type: none"><li>• Same as ITC/Warm Zone Care.</li><li>• Apply triage prioritization and appropriate destination/distribution of patients.</li><li>• Simple spinal motion restriction as needed.</li><li>• Familiarization with advanced monitoring equipment and techniques.</li><li>• Implement damage control resuscitation.</li><li>• Apply multimodal pain control principles.</li><li>• Splinting as resources permit</li><li>• Effective communication between non-medical, pre-hospital and hospital medical assets</li></ul>

### III. Evacuation Care (EVAC)/Cold Zone Guidelines

- A. *Reassess all interventions* applied in previous phases of care.
- B. If a multi-patient event, perform formal *primary triage* per local protocols for priority and destination.
- C. Airway Management:
  1. The principles of airway management in Evacuation Care/Cold Zone are the same as that in Indirect Threat Care/Warm Zone with the addition of increased utility of supraglottic devices and definitive airway control with endotracheal intubation.
  2. If the patient is conscious and able to follow commands: Allow the patient to assume any position of comfort, including sitting up and leaning forward. Do not force to lie down.
  3. If the patient is unconscious or conscious but unable to follow commands:
    - a) Clear mouth of any foreign bodies (vomit, food, broken teeth, gum).



- b) Apply basic chin lift or jaw thrust maneuver to open airway.
  - c) Consider placing a nasopharyngeal airway.
  - d) Place patient in the recovery position to maintain the open airway.
4. If previous measures are unsuccessful and equipment is available under an approved protocol:
    - a) Supraglottic Devices (e.g., King LT, LMA, iGel).
    - b) Oro/nasotracheal intubation.
    - c) Surgical cricothyroidotomy (with local or systemic anesthesia if available and conscious).
  5. Consider applying oxygen if available.
  6. If intubated and attached to a mechanical ventilator, consider lung protective strategies and reassess for respiratory decline in patients with potential pneumothoraces.
  7. Consider the mechanism of injury and the need for selective spinal motion restriction.
    - a) Full spinal motion restriction is not recommended and may be harmful for casualties with penetrating face or neck trauma.
    - b) Maintain high clinical suspicion for casualties over the age of 65 years old with blunt mechanism.
    - c) Adequate spinal motion restriction may be maintained by keeping the patient calm, coaching of the patient to limit movement and by positioning in a supine position on a firm surface.
    - d) Patients may be clinically cleared from spinal motion restriction under a locally approved protocol.
- D. Breathing:
1. All open and/or sucking chest wounds should be treated by immediately applying an occlusive seal to cover the defect. Monitor the patient for the potential development of a subsequent tension pneumothorax. Any developing tension pneumothorax should be treated as in ITC/Warm Zone.
  2. Reassess casualties who have had chest seals applied or had needle decompression. If there are signs of continued or progressive respiratory distress:
    - a) Consider repeating the needle decompression or uncovering and burping the chest wound. If this results in improved clinical status, the decompression can be repeated multiple times.
    - b) Consider placing a chest tube if appropriate provider scope of practice and approved local protocol for situations with prolonged evacuation delay, long transport time, or air transport.
    - c) Administration of oxygen may be of benefit for all traumatically injured patients, especially for the following types of casualties:
      - (1) Low oxygen saturation by pulse oximetry.





- (2) Conditions associated with impaired oxygenation.
  - (a) Unconscious or altered mental status.
  - (b) Torso injuries with dyspnea.
  - (c) Chest injury with known/suspected pneumothorax.
  - (d) Hemorrhagic shock.
  - (e) Patient at altitude.
- d) If suspected severe traumatic brain injury (GCS < 9), monitor oxygenation saturation and end tidal CO<sub>2</sub> if available. Apply oxygen if available to maintain oxygen saturation >90% and maintain etCO<sub>2</sub> in ventilated patient between 35-45 mmHg.

E. Circulation/Bleeding:

1. Fully expose wounds to reassess for/control any unrecognized hemorrhage and to assess effectiveness and clinical indications for all tourniquets that were applied during previous phases of care.
  - a) If not already done, use a tourniquet or an appropriate pressure dressing with deep wound packing to control life-threatening external hemorrhage that is anatomically amenable to such treatment.
    - (1) Apply the tourniquet directly to the skin 2-3 inches above wound (not over a joint).
    - (2) For any traumatic total or partial amputation, a tourniquet should be applied regardless of bleeding.
2. Tourniquets that are determined to be both clinically indicated and effective in controlling hemorrhage should remain in place if the patient can be evacuated within two hours to definitive medical care.
3. If any existing tourniquet is clinically indicated but ineffective (continued bleeding or a palpable distal pulse), either tighten the existing tourniquet further, or apply a second tourniquet immediately side-by-side and, if possible, proximal to the first to eliminate the distal pulse.
4. If a tourniquet is determined based on wound assessment to not be *clinically indicated*, use other techniques to control bleeding and then remove the tourniquet.
5. Consider tourniquet relocation or downgrade/conversion if there will be a delay in evacuation of more than two hours.
  - a) For any patient who is receiving fluid resuscitation (including blood products) for hemorrhagic shock, ensure a positive response to resuscitation efforts (e.g., improving mentation and peripheral pulses normal in character) before downgrading/converting a tourniquet. Criteria for tourniquet downgrade/conversion are:
    - (1) Patient is not currently in hemorrhagic shock.
    - (2) Able to subsequently monitor wound closely.
    - (3) The tourniquet is not on an amputated or partially amputated limb.
    - (4) No prior unsuccessful attempts to remove the tourniquet.



- b) Relocation: Expose the wound fully, identify an appropriate location at least two to three inches above the injury (not over a joint), and apply a new tourniquet directly to the skin. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.
  - c) Downgrade/conversion: Expose the wound fully, pack the wound completely with hemostatic or plain gauze, and properly apply a pressure dressing. Once the pressure dressing is properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.
  - d) If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.
6. Expose and clearly mark all tourniquet sites with the time of tourniquet application, if able.
- F. Tranexamic Acid (TXA):
1. If patient has injuries that could potentially require significant blood transfusion (e.g., presents in hemorrhagic shock in the setting of penetrating torso trauma, multiple amputation(s), and/or evidence of severe uncontrolled internal or external bleeding) consider administration of 2 grams of TXA as soon as possible.
  2. Do not administer TXA later than three hours after injury.
- G. Shock Management/Fluid Resuscitation:
1. Reassess for hemorrhagic shock (altered mental status in the absence of brain injury, weak or absent peripheral pulses, and/or change in pulse character). In this phase, BP monitoring should be available. If so, maintain permissive hypotension in the non-head injured patient using a target systolic BP above 80–90 mmHg; use permissive hypotension strategies with caution in obviously pregnant patients.
  2. Establish intravenous or intraosseous access if not performed in ITC/Warm Zone phase and if access is required for either resuscitation or medication administration.
  3. Hemodynamic resuscitation should be performed as in ITC/Warm Zone with the following additions:
    - a) If in hemorrhagic shock and blood products are not available or not approved under scope of practice/local protocols, fluid resuscitate as per ITC/Warm Zone.
    - b) If in hemorrhagic shock and blood products are available with appropriate training, provider scope of practice, and an approved medical protocol:
      - (1) Resuscitate with plasma and packed red blood cells (PRBCs) in a 1:1 ratio or fresh whole blood through one line with a fluid warmer.
      - (2) Infuse 1 gram 10% Calcium Chloride or 3 grams 10% Calcium Gluconate slow IV push.
        - (a) 1g CaCl 10% in 10 ml is 13.65 meq/10 ml.
        - (b) 1g of CaGlu 10% in 10 ml is 4.65 meq/10 ml.
    - c) Continue resuscitation as needed to maintain target BP or clinical improvement.
  4. In a patient who has altered mental status due to suspected or confirmed severe



traumatic brain injury (GCS <9), avoid any hypotension.

- a) Resuscitate aggressively with fluid boluses to a goal of improving mental status, strong peripheral pulses or, if monitoring available, maintain measured SBP > 110 mmHg.
- b) Position patient with head elevated 30 degrees, if possible, with neck in neutral position. Avoid overly tight cervical collar or airway securing devices that may impede venous outflow from the head.

#### H. Hypothermia Prevention:

1. Minimize the casualty's exposure to the elements. Move into a vehicle or warmed structure if possible. Avoid cutting off or removing dry clothes unless necessary for wound exposure.
  - a) For public safety casualties, keep protective gear on or with the patient if feasible.
2. Replace wet clothing with dry if possible.
3. Place the patient onto an insulated surface as soon as possible to decrease conductive heat loss to the cold ground.
4. Cover the patient with dry blankets, jackets, poncho liners, sleeping bags, commercial warming devices or anything that will retain heat and keep the patient dry.
5. Warm fluids are preferred if IV fluids are required.

#### I. Monitoring:

1. Initiate electronic monitoring if available, including pulse oximetry, cardiac monitoring, blood pressure, and etCO<sub>2</sub> (if intubated).
2. Obtain and record vital signs.

#### J. Reassess Patient:

1. Complete secondary survey checking for additional injuries. Inspect and dress known wounds that were previously deferred.
2. Determine mode and destination for evacuation to definitive care.
3. Splint known/suspected fractures and recheck pulses.
4. Apply pelvic binding techniques for suspected unstable pelvic fractures.

#### K. Analgesia:

1. Provide adequate analgesia as necessary for the patient. Adequate pain control can reduce physiologic stress, may decrease post-traumatic stress, and may help to prevent chronic pain syndromes.
2. For mild to moderate pain:
  - a) Non-pharmacologic interventions such as ice, elevation and motion restriction may be effective as the initial intervention.
  - b) Consider oral non-opioid medications. Avoid the use of traditional nonsteroidal anti-inflammatory medications (e.g., aspirin, ibuprofen, naproxen, ketorolac, etc.) as these medications interfere with platelet functioning and may



exacerbate bleeding.

- c) Celecoxib, a selective Cox-2 inhibitor, has no effect on platelets and may be considered as a non-sedating oral analgesic.
  - d) Acetaminophen, either oral or intravenous, can provide effective pain control especially when combined with other non-opioid medications.
3. For moderate to severe pain:
- a) Consider use of opioid medications (fentanyl, morphine, etc.). The side effect profile requires careful titration and increased monitoring for adverse effects (respiratory depression/hypotension).
    - (1) Weigh the benefits of opioid pain control versus the operational effect of opioid-induced altered mental status on the need for required resources to manage these patients.
    - (2) Have naloxone readily available whenever administering opiates.
  - b) Consider the use of ketamine at analgesic dosages. Ketamine may be administered by any route, although the dosing changes depending on the exact administration route and is no longer contraindicated in traumatic brain injury.
    - (1) As a sympathetic mimic, ketamine does not induce hypotension or respiratory depression when used as single agent, therefore, requires less monitoring.
    - (2) Doses should be titrated starting at 25-50 mg IV, IM, or IN titrated every 15 min until pain control achieved.
    - (3) Consider adding low dose benzodiazepines for dysphoria.
  - c) Strong consideration should be given to administering analgesia using a multimodal approach to pain control. By using analgesics with different, but potentiating, mechanisms of action, lower doses and therefore fewer side effects may be used with the same or better pain control than using a single modality alone.
  - d) In traumatic brain injured patients anticipate possible hypotension if opioid analgesics are being used for pain control.
  - e) Consider co-administering anti-emetic medications with pain medications.
  - f) With proper training and under proper scope of practice, peripheral nerve blocks (wrist, ankle, digit) can be considered for excellent pain control without causing respiratory depression or change in mentation.

L. Burns:

1. Burn injury resuscitation and care is consistent with the principles described in ITC/Warm Zone.
2. Smoke inhalation, particularly in a confined space, may be associated with significant potential for carbon monoxide and cyanide toxicity.
  - a) Significant symptoms of smoke inhalation and carbon monoxide toxicity should be treated with high-flow oxygen if available.
  - b) Patients with significant symptoms of smoke inhalation and potential cyanide



toxicity should be considered candidates for cyanide antidote administration if available and within scope of practice.

- c) Be cautious of off gassing from patient in the evacuation vehicle if there is suspected chemical exposure (e.g., cyanide) from the fire.
- d) Consider early airway management if the patient has signs of significant airway thermal injury (e.g., oral edema, hoarseness, stridor, throat pain, carbonaceous material in the posterior pharynx, and respiratory difficulty) or if there is a prolonged evacuation period.

M. Traumatic Brain Injury (TBI):

1. Prevention of hypotension (SBP <110 mmHg) and hypoxia (SpO<sub>2</sub> <90%) are critical in management of TBI.
2. TBI patients should have available monitoring equipment applied and should be resuscitated to a minimum SBP > 110 mmHg.
3. Raise the head of the bed or stretcher 30 degrees if patient is not in hemorrhagic shock. Keep neck in a midline neutral position and avoid overly tight cervical collar application or airway securing devices that may impede venous outflow from the head.
4. For hard physical signs of herniation syndromes, consider:
  - a) Hypertonic saline 3%—3 to 5 cc/kg IV bolus.
  - b) Mannitol 20%—1g/kg IV bolus.
  - c) Hyperventilation: PaCO<sub>2</sub> 30-35mmHg.
5. Consider seizure prophylaxis/treatment if available.

N. Prepare patient for movement:

1. Consider environmental factors for safe and expeditious evacuation.
2. Secure patient to a movement-assist device when available.
3. If vertical extraction required, ensure patient secured appropriately.

O. Communications:

1. Encourage, reassure, and explain care to patient.
2. Notify receiving facility of wounds, patient condition, and treatments applied.

P. Cardiopulmonary resuscitation:

1. CPR may have a larger role during Evacuation Care, especially for patients with electrocution, hypothermia, non-traumatic arrest, or drowning.
2. Consider bilateral needle decompression/finger thoracostomy for victims of torso or polytrauma with no respirations or pulse to ensure tension pneumothorax is not the cause of cardiac arrest prior to discontinuation of care.

Q. Documentation of Care:

1. Initiate or continue documentation of clinical assessments, treatments rendered, and changes in the patient's status in accordance with local protocol.
2. Forward information with the patient during transition to the next echelon of care.