

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

Current as of March 2019

## **DIRECT THREAT CARE (DTC) / HOT ZONE**

### **Guidelines:**

1. 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, etc). Recognize that threats are dynamic and may be ongoing, requiring continuous threat assessments.
2. Direct the injured first responder to stay engaged in the operation if able and appropriate.
3. Move patient to a safer position:
  - a. Instruct the alert, capable patient to move to a safer position and apply self-aid.
  - b. If the patient is responsive but is injured to the point that he/she cannot move, a rescue plan should be devised.
  - c. If a patient is unresponsive, weigh the risks and benefits of an immediate rescue attempt in terms of manpower and likelihood of success. Remote medical assessment techniques should be considered to identify patients who are dead or have non-survivable wounds.
4. Stop life threatening external hemorrhage if present and reasonable depending on the immediate threat, severity of the bleeding and the evacuation distance to safety. Consider moving to safety prior to application of the tourniquet if the situation warrants.
  - a. Apply direct pressure to wound, or direct capable patient to apply direct pressure to own wound and/or own effective tourniquet.
  - b. Tourniquet application:
    - i. Apply the tourniquet as high on the limb as possible, including over the clothing if present.
    - ii. Tighten until cessation of bleeding and move to safety.
5. Consider quickly placing patient, or directing the patient to be placed, in a position to protect airway.

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

Current as of March 2019

## **INDIRECT THREAT CARE (ITC) / WARM ZONE**

### **Guidelines:**

1. Any injured person or responder with a weapon should have that weapon made safe/secured once the threat is neutralized and/or if mental status is altered.
2. Perform systematic assessment and intervention. Mnemonics such as MARCH or X-ABCDE to guide priorities may be of assistance.
3. **Massive Hemorrhage (Bleeding)**
  - a. Assess for and control any unrecognized major bleeding.
  - b. Extremity hemorrhage:
    - i. Use a tourniquet or an appropriate pressure dressing with deep wound packing to control life-threatening bleeding in an extremity:
      - Apply the tourniquet over the clothing as proximal as possible and tighten as much as possible, or if 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).
      - For any traumatic total or partial amputation, a tourniquet should be applied in an appropriate location regardless of bleeding.
      - A pressure dressing with deep wound packing (either plain gauze or, if available, hemostatic dressing) applied directly to the skin is an acceptable alternative for moderate to severe hemorrhage
    - ii. If available, immediately apply a junctional tourniquet device for anatomic junctional areas where bleeding cannot easily be controlled by direct pressure and hemostatics/dressings.
  - c. Junctional hemorrhage
    - i. Use direct pressure and an appropriate pressure dressing with deep wound packing (plain gauze or, if available, hemostatic gauze).
    - ii. If available, immediately apply a junctional tourniquet device for anatomic junctional areas where bleeding cannot easily be controlled by direct pressure and hemostatics/dressings.
  - d. Reassess all tourniquets that were hastily applied during Direct Threat/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.
    - i. Tourniquets that are determined to be both *necessary and effective* in

controlling hemorrhage should remain in place if the patient can be evacuated within 2 hours to definitive medical care.

- ii. If 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 and, if possible, proximal to the first to eliminate the distal pulse.
  - iii. If a tourniquet is determined based on wound assessment *to not be necessary*, use other techniques to control bleeding and remove the tourniquet.
- e. Consider tourniquet downgrade/conversion if there will be a delay in evacuation more than 2 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.
- i. Downgrade: Expose the wound fully, identify an appropriate location at least 2-3 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.
  - ii. 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.
  - iii. If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.
- f. Expose and clearly mark all tourniquet sites with the time of tourniquet application.

#### **4. Airway Management:**

- a. If the patient is conscious and able to follow commands:
  - i. Allow the patient to assume any position of comfort, including sitting up and leaning forward. Do not force to lie down.
- b. If the patient is unconscious or conscious but unable to follow commands:
  - i. Clear mouth of any foreign bodies (vomit, food, broken teeth, gum, etc.).
  - ii. Apply basic chin lift or jaw thrust maneuver to open airway.
  - iii. Consider placing a nasopharyngeal airway.
  - iv. Place patient in the recovery position to maintain the open airway.
- c. If previous measures are unsuccessful, the operational situation allows, and equipment is available under an approved protocol, consider:
  - i. Supraglottic Devices (e.g. King LT, LMA, iGel)
  - ii. Oro/nasotracheal intubation
  - iii. Surgical cricothyroidotomy (with lidocaine if conscious)
- d. Consider applying oxygen if available.

113 **5. Respiration (Breathing):**

- 114 a. Immediately apply a vented or non-vented occlusive seal to cover the
- 115 defect from any open and/or sucking chest wound.
- 116 b. Monitor any patient with penetrating torso trauma for the development of
- 117 a subsequent tension pneumothorax. Most common presentation will be a
- 118 penetrating chest injury with subsequent progressive dyspnea/respiratory
- 119 distress, hypoxia and/or hypotension, and/or increasing anxiety/agitation,
- 120 often after the application of a chest seal.
- 121 i. If tension pneumothorax is suspected to be developing, decompress the
- 122 chest on
- 123 the side of the injury:
- 124 - ALS providers: Needle decompression should be performed
- 125 (minimum a 14- gauge, 3.25 inch needle/catheter) at the 2nd
- 126 intercostal space mid-clavicular lateral to the nipple line and is not
- 127 directed towards the heart or the 4<sup>th</sup>/5<sup>th</sup> intercostal space
- 128 perpendicular to the chest wall anterior to the mid-axillary line.
- 129 ii. BLS providers: remove the occlusive dressing and physically “burp” the
- 130 wound by applying gentle pressure around the wound to allow any air to
- 131 escape.
- 132 iii. Casualties with concern for developing tension pneumothorax
- 133 should be prioritized for evacuation to higher level of care.
- 134 c. If suspected severe traumatic brain injury (GCS < 9), monitor oxygenation
- 135 saturation and end tidal CO<sub>2</sub> if available. Apply oxygen if available to maintain
- 136 saturation >90% and maintain etCO<sub>2</sub> in ventilated patient between 35-45
- 137 mmHg.
- 138 i. Avoid any hyperventilation as evidenced by an etCO<sub>2</sub> below 35 mmHg.
- 139 ii. If available, consider PEEP 5-12 cm H<sub>2</sub>O.

140 **6. Intravenous (IV) access:**

- 141 i. If immediate fluid resuscitation is required and is available, consider
- 142 starting at least an 18-gauge IV or obtaining intraosseous (IO) access.

143 **7. Tranexamic Acid**

- 144 a. If patient has injuries that could potentially require significant blood
- 145 transfusion (e.g. presents in hemorrhagic shock in the setting of penetrating
- 146 torso trauma, multiple amputation(s), and/or evidence of severe
- 147 uncontrolled internal or external bleeding) consider administration of 1 gram
- 148 of TXA as soon as possible.
- 149 i. Do **not** administer TXA later than 3 hours after injury.

150 **8. Circulation (Shock Management/Resuscitation):**

- 151 a. Assess for hemorrhagic shock: Altered mental status (in the absence of head
- 152 injury) and weak or absent radial pulses are the best austere field indicators
- 153 of shock.
- 154 i. If equipment available, assess for abnormal vital signs (e.g. systolic blood

pressure (SBP) <90mmHg with/without heart rate >100 bpm) or a shock index >1 (HR/SBP).

- b. If not in shock:
  - i. Patient may drink clear liquids if conscious, can swallow, and there is a confirmed delay in evacuation to care.
  - ii. No IV fluids necessary but consider intravascular access with saline lock.
- c. If hemorrhagic shock is present:
  - i. Resuscitate using permissive hypotension in the non-head injured patient. Administer IV fluid bolus (per agency protocol) to a goal of improving mental status, radial pulses, or, if available, measured SBP>80mmHg. Repeat bolus once after 30 minutes if still in shock.
  - ii. If available, infuse 1 gram 10% Calcium chloride or 3 grams of 10% Calcium Gluconate
    - 1g of CaCl 10% in 10mL is 13.65 meq / 10mL
    - 1g of CaGlu 10% in 10mL is 4.65 meq/ 10 mL.
- d. In a patient who has altered mental status due to suspected or confirmed severe traumatic brain injury (GCS<9), avoid any hypotension.
  - i. 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.
  - ii. 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.
- e. 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.

#### **9. Hypothermia Prevention:**

- a. Minimize patient's exposure and subsequent heat loss.
  - i. Avoid cutting off or removing clothes unless absolutely necessary for wound evaluation.
  - ii. For injured public safety personnel, keep protective gear on or with the patient if feasible.
- b. Keep the patient covered, warm and dry.
  - i. Place the patient onto an insulated surface as soon as possible to decrease conduction from cold ground temperatures.
  - ii. Replace wet clothing with dry if possible.
  - iii. Cover the patient with dry blankets, jackets, commercial warming devices or anything that will retain heat and assist in keeping the patient dry.
  - iv. Warm fluids are preferred if IV fluids are administered.

#### **10. Reassess patient:**

- a. Perform a rapid blood sweep/secondary survey, front and back, checking for

- 197 additional injuries. Tearing or cutting clothes, or otherwise exposing the  
198 wound may be necessary. Balance this with the goal of preventing heat loss.  
199 b. Consider splinting known/suspected fractures, including the application  
200 of pelvic binding devices/techniques for suspected pelvic fractures.

## 201 **11. Burns:**

- 202 a. Stop the burning process.  
203 b. Cover the burn area with dry, sterile dressings and initiate aggressive  
204 measures to prevent heat loss and hypothermia.  
205 c. Facial burns, especially those that occur in closed spaces, are likely  
206 associated with inhalation injury. Aggressively monitor airway status and, if  
207 available, oxygen saturation in such patients and consider early definitive  
208 airway management for respiratory distress, oxygen desaturation, or other  
209 signs of inhalational injury (e.g. hoarseness, stridor, throat pain).  
210 d. Smoke inhalation, particularly in a confined space, may be  
211 associated with significant carbon monoxide and cyanide toxicity.  
212 i. Significant symptoms of smoke inhalation and carbon monoxide toxicity  
213 should be treated with high flow oxygen if available.  
214 ii. Significant symptoms of smoke inhalation and cyanide toxicity  
215 should be considered candidates for cyanide antidote  
216 administration.  
217 e. Estimate total body surface area (TBSA) burned to the nearest 10%  
218 using the appropriate locally approved burn calculation formula.  
219 i. If burns are greater than 20% of Total Body Surface Area, fluid resuscitation  
220 should be initiated as soon as IV/IO access is established.  
221 ii. If hypotension is also present, fluid resuscitation as per the  
222 guidelines #7. Permissive hypotension resuscitation principles for  
223 hemorrhagic shock take precedence over burn resuscitation.  
224 f. All previously described patient care interventions can be performed on or  
225 through burned skin in a burn patient.

## 226 **12. Analgesia:**

- 227 a. Provide adequate analgesia as necessary for the patient. Adequate pain  
228 control can reduce physiologic stress, may decrease post-traumatic stress,  
229 and may help to prevent chronic pain syndromes.  
230 i. For mild - moderate pain:  
231 - Immobilization may be effective as the initial intervention.  
232 - Consider oral non-narcotic medications. Avoid the use of traditional  
233 non-steroidal anti-inflammatory medications (e.g. aspirin,  
234 ibuprofen, naproxen, ketorolac, etc) as these medications interfere  
235 with platelet functioning and may exacerbate bleeding.  
236 (a) Celecoxib, a selective Cox-2 inhibitor, has no effect on platelets  
237 and may be considered as a non-sedating oral analgesic.  
238 (b) Acetaminophen, either oral or intravenous, can provide effective

pain control especially when combined with other non-narcotic medications.

ii. For moderate – severe pain:

- Consider use of narcotic medications (fentanyl, morphine, etc.). The side effect profile requires careful titration and increased monitoring for adverse effects (respiratory depression/hypotension).
  - (a) 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.
  - (b) Have naloxone readily available whenever administering opiates.
- Consider the use of Ketamine at analgesic dosages (up to 1mg/kg). 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.
  - (a) When used as a single agent, ketamine does not induce hypotension or respiratory depression therefore requires less monitoring.
  - (b) Consider initial dose of 25-50 mg IV, IM or IN titrated every 15 min until pain control.
  - (c) Low dose benzodiazepam may be added for subsequent dysphoria.
- Strong consideration should be given to administering analgesia using a multi- modal approach to pain control. By using analgesics with different, but potentiating, mechanisms of action, lower doses and therefore less side effects may be used with the same or better pain control than using a single modality alone.
- In Traumatic Brain Injury anticipate possible hypotension if opioid analgesics are being used for pain control.
- Consider co-administering anti-emetic medications with pain medications.

**13. Monitoring:**

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

**14. Prepare patient for movement:**

- a. Consider operational and environmental factors for safe and expeditious evacuation.
- b. Secure patient to a movement assist device when available.
- c. If vertical extraction required, ensure patient is secured appropriately.

**15. Communicate with the patient if possible.**

- a. Encourage, reassure and explain care.

**16. Cardiopulmonary resuscitation:**

- a. CPR within this phase of care for victims of blast, penetrating or blunt trauma who have no pulse, no ventilations, and no other signs of life will likely not be successful and should not be attempted.
- i. 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.
- b. In other circumstances (e.g. electrocution, drowning), performing CPR *may be* of benefit and should be considered in the context of the operational situation.

**17. Documentation of Care:**

- a. 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.

## **Tactical Emergency Casualty Care (TECC) Guidelines for BLS/ALS Medical Providers**

**Current as of March 2019**

### **EVACUATION CARE (EVAC) Guidelines:**

1. **Reassess all interventions** applied in previous phases of care.
2. If multi-patient event, perform **primary triage** per local protocols for priority and destination.
3. **Airway Management:**
  - a. 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.
  - b. If the patient is conscious and able to follow commands:
    - i. Allow the patient to assume any position of comfort, including sitting up and leaning forward. Do not force to lie down.
  - c. If the patient is unconscious or conscious but unable to follow commands:
    - i. Clear mouth of any foreign bodies (vomit, food, broken teeth, gum, etc.)
    - ii. Apply basic chin lift or jaw thrust maneuver to open airway
    - iii. Consider placing a nasopharyngeal airway
    - iv. Place patient in the recovery position to maintain the open airway
  - d. If previous measures are unsuccessful and equipment is available under an approved protocol:



- i. Supraglottic Devices (e.g. King LT, LMA, iGel)
- ii. Oro/nasotracheal intubation
- iii. Surgical cricothyroidotomy (with lidocaine if conscious)
- e. Consider applying oxygen if available.
- f. If intubated and attached to a mechanical ventilator, consider lung protective strategies and reassess for respiratory decline in patients with potential pneumothoraces.
- g. Consider the mechanism of injury and the need for selective spinal immobilization.
  - i. Full spinal immobilization is not recommended and may be harmful for casualties with penetrating face or neck trauma.
  - ii. Maintain high clinical suspicion for casualties over age of 65yo with blunt mechanism.
  - iii. 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.
  - iv. Patients may be clinically cleared from spinal immobilization under a locally approved protocol.

#### 4. Breathing:

- a. All open and/or sucking chest wounds should be treated by immediately applying a vented or non-vented 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.
- b. Reassess casualties who have had chest seals applied or had needle decompression. If there are signs of continued or progressive respiratory distress:
  - i. 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.
  - ii. 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.
  - iii. Administration of oxygen may be of benefit for all traumatically injured patients, especially for the following types of casualties:
    - Low oxygen saturation by pulse oximetry
    - Conditions associated with impaired oxygenation
      - ⇒ Unconscious or altered mental status
      - ⇒ Torso injuries with dyspnea
      - ⇒ Chest injury with known/suspected pneumothorax
      - ⇒ Hemorrhagic shock
      - ⇒ Patient at altitude
  - iv. If suspected severe traumatic brain injury (GCS < 9) monitor oxygenation

saturation and end tidal CO2 if available. Apply oxygen if available to maintain saturation >90% and maintain etCO2 in ventilated patient between 35-45 mmHg.

## 5. Bleeding:

- a. 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.
  - i. 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.
    - Apply the tourniquet directly to the skin 2-3 inches above wound (not over a joint).
    - For any traumatic total or partial amputation, a tourniquet should be applied regardless of bleeding.
  - ii. 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 2 hours to definitive medical care.
  - iii. If 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 side-by-side and, if possible, proximal to the first to eliminate the distal pulse.
  - iv. If a tourniquet is determined based on wound assessment *to not be clinically indicated*, use other techniques to control bleeding and remove the tourniquet.
  - v. Consider tourniquet relocation or downgrade/conversion if there will be a delay in evacuation more than 2 hours. On 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:
    - Patient is not in hemorrhagic shock
    - Able to subsequently monitor wound closely
    - TQ is not on an amputated or partially amputated limb
    - No prior unsuccessful attempts to remove the TQ
  - vi. Relocation: Expose the wound fully, identify an appropriate location at least 2-3 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.
  - vii. Downgrade/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. Assess for bleeding.
- viii. If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.
- b. Expose and clearly mark all tourniquet sites with the time of tourniquet application.

## 6. Tranexamic Acid:

- a. 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 1 gram of TXA as soon as possible.
- i. Do **not** administer TXA later than 3 hours after injury.

## 7. Shock Management / Fluid resuscitation:

- a. 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 80-90mmHg .
- b. Establish intravenous or intraosseous access if not performed in Indirect Threat Care / Warm Zone phase.
- c. Management of resuscitation as in Indirect Threat Care / Warm Zone with the following additions:
- i. If in hemorrhagic shock and blood products are not available or not approved under scope of practice/local protocols, fluid resuscitate as in ITC/ Warm Zone.
- ii. If in hemorrhagic shock and blood products are available with appropriate training, provider scope of practice, and an approved medical protocol:
- 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.
- iii. Infuse 1 gram 10% Calcium chloride or 3 grams of 10% Calcium Gluconate
- 1g of CaCl 10% in 10mL is 13.65 meq / 10mL
  - 1g of CaGlu 10% in 10mL is 4.65 meq/ 10 mL
- iv. Continue resuscitation as needed to maintain target BP or clinical improvement.
- d. In a patient who has altered mental status due to suspected or confirmed severe traumatic brain injury (GCS<9), avoid any hypotension.
- i. Resuscitate aggressively with fluid boluses to a goal of improving mental status, strong peripheral pulses or, if monitoring available, maintain measured SBP>110 mmHg.

- i. 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.

## **8. Prevention of hypothermia:**

- a. Minimize patient's exposure to the elements. Move into a medic unit, vehicle, or warmed structure if possible. Avoid cutting off or removing clothes unless necessary for wound exposure.
  - i. For public safety casualties, keep protective gear on or with the patient if feasible.
- b. Replace wet clothing with dry if possible.
- c. Place the patient onto an insulated surface as soon as possible to decrease conductive heat loss to the cold ground.
- d. 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.
- e. Warm fluids are preferred if IV fluids are required.

## **9. Monitoring**

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

## **10. Reassess patient:**

- a. Complete secondary survey checking for additional injuries. Inspect and dress known wounds that were previously deferred.
- b. Determine mode and destination for evacuation to definitive care.
- c. Splint known/suspected fractures and recheck pulses.
- d. Apply pelvic binding techniques for suspected unstable pelvic fractures.

## **11. Analgesia:**

- a. 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.
  - i. For mild - moderate pain:
    - Non-pharmacologic interventions such ice, elevation and immobilization may be effective as the initial intervention.
    - Consider oral non-narcotic medications. Avoid the use of traditional non-steroidal anti-inflammatory medications (e.g. aspirin, ibuprofen, naproxen, ketorolac, etc) as these medications interfere with platelet functioning and may exacerbate bleeding. Celecoxib, a selective Cox-2 inhibitor, has no effect on platelets and may be considered as a non-sedating oral analgesic.
    - Acetaminophen, either oral or intravenous, can provide effective pain control especially when combined with other non-narcotic

487 medications.

488 ii. For moderate – severe pain:

- 489 - Consider use of narcotic medications (hydrocodone, oxycodone,  
490 fentanyl, etc.) The side effect profile requires careful titration and  
491 increased monitoring for adverse effects (e.g. respiratory depression /  
492 hypotension). Have naloxone readily available whenever  
493 administering opiates. Weigh the benefits of opioid pain control  
494 versus the operational effect of opioid-induced altered mental status  
495 on the need for required resources to manage these patients.
- 496 - Consider the use of Ketamine at analgesic dosages (up to 1mg/kg).  
497 Ketamine may be administered by any route, although the dosing  
498 changes depending on the exact administration route, and is no  
499 longer contraindicated in traumatic brain injury. As a sympathetic  
500 mimic, ketamine does not induce hypotension or respiratory  
501 depression when used as single agent therefore requires less  
502 monitoring. Doses should be titrated starting at 25-50 mg IV, IM or IN  
503 titrated every 15 min until pain control. Consider adding low dose  
504 benzodiazepam for dysphoria.
- 505 - Strong consideration should be given to administering analgesia using  
506 a multi- modal approach to pain control. By using analgesics with  
507 different, but potentiating, mechanisms of action, lower doses and  
508 therefore less side effects may be used with the same or better pain  
509 control than using a single modality alone.
- 510 - In Traumatic Brain Injury anticipate possible hypotension if opioid  
511 analgesics are being used for pain control.
- 512 - Consider co-administering anti-emetic medications with pain  
513 medications.
- 514 - With proper training and under proper scope of practice,  
515 peripheral nerve blocks (wrist, ankle, digit) can be considered for  
516 excellent pain control without causing respiratory depression or  
517 change in mentation.

518 **12. Burns:**

- 519 a. Burn care and resuscitation is consistent with the principles described in  
520 Indirect Threat Care / Warm Zone.
- 521 b. Smoke inhalation, particularly in a confined space, may be  
522 associated with significant carbon monoxide and cyanide toxicity.
  - 523 i. Significant symptoms of smoke inhalation and carbon monoxide toxicity  
524 should be treated with high flow oxygen if available.
  - 525 ii. Significant symptoms of smoke inhalation and cyanide toxicity  
526 should be considered candidates for cyanide antidote  
527 administration.
- 528 c. Be cautious of off-gassing from patient in the evacuation vehicle if there is  
529 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.

### **13. Traumatic Brain Injury (TBI):**

- a. Prevention of hypotension (SBP <110) and hypoxia (SpO2 <90%) are critical in management of TBI.
- b. TBI patients should have available monitoring equipment applied and should be resuscitated to a minimum SBP > 110mmHg.
- c. 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 or airway securing devices that may impede venous outflow from the head
- d. For hard physical signs of herniation syndromes, consider:
  - i. Hypertonic saline 3% - 3 to 5 cc/kg IV bolus.
  - ii. Mannitol 20% - 1g/kg IV bolus.
  - iii. Hyperventilation: PaCO2 30-35 mmHg.
- e. Consider seizure prophylaxis/treatment if available

### **14. Prepare patient for movement:**

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

### **15. Communicate** with the patient if possible and with the receiving facility.

- a. Encourage, reassure and explain care to patient.
- b. Notify receiving facility of wounds, patient condition, and treatments applied.

### **16. Cardiopulmonary resuscitation:**

- a. CPR may have a *larger role* during the evacuation phase especially for patients with electrocution, hypothermia, non-traumatic arrest or near drowning.
- b. 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.

### **17. Documentation of Care:**

- a. Continue or initiate documentation of clinical assessments, treatments rendered, and changes in the patient's status in accordance with local protocol.
- b. Forward this information with the patient to the next level of care.

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

## Goals, Principles, and Skill sets

### I. DIRECT THREAT CARE (DTC) / HOT ZONE CARE

#### Primary Goals:

1. Accomplish the mission with minimal casualties.
2. Prevent any patient from sustaining additional injuries.
3. Keep operational response maximally engaged in addressing the immediate and any existing threats (e.g. fire/smoke, unexploded ordinance, active shooter, impending collapse).
4. Minimize public harm.

#### Operational Principles:

1. Establish *operational control of the immediate incident* and defer in-depth medical interventions if engaged in *ongoing direct threat mitigation* (e.g. active fire suppression, dynamic explosive scenario, etc).
2. *Threat mitigation* 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.
3. Triage should be deferred to a later phase of care. Prioritization for extraction is based on resources available and the tactical situation.
4. Minimal trauma interventions are warranted in this phase of care.
5. *Consider* hemorrhage control before evacuation to a safer area.
  - a. TQ application is the primary “medical” intervention to be *considered* in this phase of care.

#### Direct Threat / Hot Zone Skill Set (should be applied per approved SOP/protocol only):

1. Direct pressure and hasty tourniquet application
  - a. Consider PACE Methodology - Primary, Alternative, Contingency, Emergency
  - b. Commercially available tourniquets
  - c. Field expedient tourniquets
2. Methods for rapid and efficient patient extraction
3. Rapid placement in recover position

*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.*

## II. INDIRECT THREAT CARE (ITC) / WARM ZONE CARE

### Primary Goals:

1. Goals 1-4 as above with Direct Threat Care / Hot Zone care
2. Stabilize the patient as required to permit safe evacuation to a dedicated treatment sector or medical evacuation assets.

### Operational Principles:

1. Maintain *operational control* to stabilize the immediate scenario.
2. Conduct *dedicated patient assessment* and initiate appropriate life-saving interventions as outlined in the Indirect Threat Care / Warm Zone guidelines.
  - a. DO NOT DELAY patient extraction/evacuation for non-life-saving interventions.
3. Consider establishing a *patient/casualty collection point* if multiple patients are encountered or there is a large operational footprint.
4. Unless in a fixed patient collection point, triage in this phase of care should be limited to the following categories:
  - a. Uninjured or minimally injured and capable of ambulation/self-extraction
  - b. Deceased / expectant
  - c. All others
5. Establish *communication* with unified command to inform of need for patient evacuation.
6. Prepare casualties for evacuation and document care rendered for continuity of care purposes.

### Indirect Threat / Warm Zone skill set (should be applied per approved protocol/SOP only):

1. Hemorrhage Control:
  - a. Application of direct pressure
  - b. Application of tourniquet
    - i. Commercially available
    - ii. Field expedient
  - c. Application of wound packing with gauze or hemostatic agent
  - d. Application of mechanical or improvised pressure dressing
2. Airway:
  - a. Perform Manual Maneuvers (chin lift, jaw thrust, recovery position)
  - b. Insert Nasal pharyngeal airway
  - c. Placement of supraglottic airway
  - d. Placement of endotracheal tube under direct visualization
  - e. Perform surgical cricothyrotomy
3. Breathing:
  - a. Application of effective occlusive chest seal



- b. Apply oxygen
- c. Recognize the symptoms of tension pneumothorax
- d. Perform needle thoracentesis
  - i. Anterior chest location
  - ii. Lateral chest location
- e. Perform manual “burp” of non-vented occlusive dressing
- 4. Shock Management/Fluid Resuscitation:
  - a. Recognize the symptoms of hemorrhagic shock
  - b. Obtain intravenous and/or intraosseous access
  - c. Resuscitate hemorrhagic shock using the principles of hypotensive resuscitation
- 5. Hypothermia Prevention:
  - a. Identify patient at risk for hypothermia
  - b. Apply techniques and available materials to control conductive and evaporative heat loss.
- 6. Wound management:
  - a. Initiate Basic Burn Treatment
- 7. Traumatic Brain Injury
  - a. Position patient appropriately
  - b. Apply appropriate resuscitative principles for TBI patient
- 8. Prepare Patient for Evacuation:
  - a. Move Patient (drags, carries, lifts)
  - b. Identify patient at risk and apply commercial/improvised spinal immobilization devices
  - c. Properly secure patient to litter
- 9. Other Skills:
  - a. Perform Hasty Decontamination
  - b. Initiate Patient Monitoring
  - c. Recognize need for and establish Patient Collection Point

*Note: Care provided within the ITC/Warm Zone guidelines is based upon individual first responder training, available equipment, local medical protocols, and medical director approval.*

### **III. Evacuation Care / Cold Zone**

#### **Primary Goals:**

1. Maintain any lifesaving interventions conducted during Direct Threat /Hot Zone and Indirect Threat /Warm Zone phases of care.
2. Provide rapid and secure evacuation to an appropriate (level of care) medical receiving facility.
3. Provide good communication and patient care data between field medical providers and fixed medical receiving facility.
4. Avoid additional preventable causes of death.

683 **Operational Principles:**

- 684 1. Reassess the patient or casualties for efficacy of all applied medical interventions.
- 685 2. Utilize a triage system/criteria per local policy that considers priority AND
- 686 destination to ensure proper distribution of patients.
- 687 3. Utilize available additional resources to maximize advanced care.
- 688 4. Avoid and/or address developing hypothermia.
- 689 5. Communication is critical, especially between different operational disciplines
- 690 and with medical resources.
- 691 6. Maintain situational awareness: in dynamic events, there are NO threat free areas.

692 **Evacuation Care / Cold Zone Skills (should be applied per**

693 **approved protocol/SOP only):**

- 694 1. Same as Indirect Threat / Warm Zone Care.
- 695 2. Apply triage prioritization and appropriate destination/distribution of patients.
- 696 3. Simple spinal immobilization as needed.
- 697 4. Familiarization with advanced monitoring equipment and techniques.
- 698 5. Implement damage control resuscitation.
- 699 6. Apply multimodal pain control principles.
- 700 7. Effective communication between non-medical, pre-hospital and hospital medical
- 701 assets

702 *Note: Care provided within the EVAC/Cold Zone guidelines is based upon individual first*

703 *responder training, available equipment, local medical protocols, and medical director*

704 *approval*