JOINT TRAUMA SYSTEM CLINICAL PRACTICE GUIDELINE (JTS CPG)

Prolonged Casualty Care Guidelines (CPG ID:91)

The Prolonged Casualty Care (PCC) guidelines are a consolidated list of casualty-centric knowledge, skills, and best practices intended to serve as the DoD baseline clinical practice guidance to guide casualty management over a prolonged amount of time in austere, remote, or expeditionary settings, and/or during long-distance movements.

Contributors

Lead Authors:
MSG Michael Remley, NRP, SO-ATP, USA
SFC Paul Loos, 18D, USA
COL Jamie Riesberg, MC, USA

Editors:
MSG Michael Remley, NRP, SO-ATP, USA
Dan Mosely, MD

MSG (Ret) Harold Montgomery, SO-ATP, USA
CAPT Brendon Drew, DO, USN
Sean Keenan, MD
CPT John Maitha, PA-C, USA*
HMC Wayne Papalski, FP-C, USN
SMSgt Brit Adams, USAF, NRP, FP-C*
SCPO Tyler Scarborough, ATP, USN*
CAPT Michael S. Tripp, MC, USN
Shelia C Savell, PhD, RN
CDR Brendan Byrne, MC, USN
MAJ Andrew D. Fisher, SP, ANG
John Fruendt, MD
Col John Wightman, USAF, MC
CPT Steven Benavides, USA
Walter Engle, PA-C
MAJ Laura Tilley, MC, USA*
Edward Otten, MD, FACMT
CDR Shane Jensen, MC, USN

COL Matthew Martin, MC, USA
SFC Justin C. Rapp, 18D, USA*
LT Dana Flieger, RN, USN*
LTC Christopher VanFosson, PhD, RN, USA
MAJ Sabas Salgado, MC, USA
CPT Jeffrey Maler, RN, USA
CMSgt (Ret) Tom Rich, NRP, USAF
Don Adams, MD
MSG Kaleb Twilligear, NRP, SO-ATP, USA*
Don L. Parsons, PA
COL Sandra Wanek, MC, USA*
CDR Levi Kitchen, MC, USN
CAPT Matthew D. Tadlock, MC, USN
Maj Erica Simon, USAF, MC
COL Cord Cunningham, MC, USA
COL Jennifer Gurney, MC, USA
Col Stacy A. Shackelford, USAF, MC
* Denotes a sub-working group chair

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Rapid Update (Jun 2023): removal of Promethazine recommendation in accordance with DHA Policy Memo 23-001 Discontinuation of Injectable Promethazine Usage at MTFs.

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PROLONGED CASUALTY CARE BACKGROUND

***Prolonged Casualty Care (PCC)**: The need to provide patient care for extended periods of time when evacuation or mission requirements surpass available capabilities and/or capacity to provide that care.*

The PCC guidelines are a consolidated list of casualty-centric knowledge, skills, abilities, and best practices intended to serve as the DoD baseline clinical practice guidance (CPG) to direct casualty management over a prolonged period of time in austere, remote, or expeditionary settings, and/or during long-distance movements. These PCC guidelines build upon the DoD standard of care for non-medical and medical first responders as established by the Committee on Tactical Combat Casualty Care (CoTCCC), outlined in the Tactical Combat Casualty Care (TCCC) guidelines,[1] and in accordance with (IAW) DoDI 1322.24.

The guidelines were developed by the PCC Work Group (PCC WG). The PCC WG is chartered under the Defense Committee on Trauma (DCoT) to provide subject matter expertise supporting the Joint Trauma System (JTS) mission to improve trauma readiness and outcomes through evidence-driven performance improvement. The PCC WG is responsible for reviewing, assessing, and providing solutions for PCC-related shortfalls and requirements as outlined in DoD Instruction (DoDI) 1322.24, *Medical Readiness Training, 16 Mar 2018*, under the authority of the JTS as the DoD Center of Excellence pursuant to DoDI 6040.47, *JTS*, 05 Aug 2018.

Operational and medical planning should seek to avoid categorizing PCC as a primary medical support capability or control factor during deliberate risk assessment; however, an effective medical plan always includes PCC as a contingency. Ideally, forward surgical and critical care should be provided as close to casualties as possible to optimize survivability.[2] DoD units must be prepared for medical capacity to be overwhelmed, or for medical evacuation to be delayed or compromised. When contingencies arise, commanders' casualty response plans during PCC situations are likely to be complex and challenging. Therefore, PCC planning, training, equipping, and sustainment strategies must be completed prior to a PCC event. The following evidence-driven PCC guidelines are designed to establish a systematic framework to synchronize critical medical decisions points into an executable PCC strategy, regardless of the nature of injury or illness, to effectively manage a complex patient and to advise commanders of associated risks.

The guidelines build upon the accepted TCCC categories framed in the novel MARC^{2}H^3-PAWS-L treatment algorithm, (Massive Hemorrhage/MASCAL, Airway, Respirations, Circulation, Communications, Hypo/Hyperthermia and Head Injuries, Pain Control, Antibiotics, Wounds (including Nursing and Burns), Splinting, Logistics).

The PCC guidelines prepare the Service Member for "what to consider next" after all TCCC interventions have been effectively performed and should only be trained after having mastering the principles and techniques of TCCC.

The guidelines are a consolidated list of casualty-centric knowledge, skills, abilities, and best practices are the proposed standard of care for developing and sustaining DoD programs

MARC^{2}H^3-PAWS-L

Massive Hemorrhage/MASCAL
Airway
Respirations
Circulation
Communication
Hypothermia/Hyperthermia
Head Injury
Pain Control
Antibiotics
Wounds (+ Nursing/Burns)
Splinting
Logistics

required to enhance confidence, interoperability, and common trust among all PCC-adept personnel across the Joint force.

The JTS CPGs are foundational to the PCC guidelines and will be referenced throughout this document in an effort to keep these guidelines concise. General information on the Joint Trauma System is available on the JTS website (https://jts.health.mil/) and links to all of the CPGs are also available by using the following link: https://jts.health.mil/index.cfm/PI_CPGs/cpgs.

The TCCC guidelines are included in these guidelines as an attachment because they are foundational AND prerequisite to effective PCC. Remember, the primary goal in PCC is to get out of PCC!!!

PCC Principles

The principles and strategies of providing effective prolonged casualty care are meant to help organize the overwhelming amount of critical information into a clear clinical picture and proactive plan regardless of the nature of injury or illness. The following steps can be implemented in any austere environment from dispersed small team operations in permissive environments to large scale combat operations to make the care of a critically ill patient more efficient for the medic and their team. These mimic the systems and processes in typical intensive care units without relying on technology while leaving the ability to add technological adjuncts as they become available. The following checklist is meant to emphasize some of the most important principles in efficient care of the critically ill patient.

Figure 1. Steps of PCC Principles

1. **Perform initial lifesaving care using TCCC guidelines and continue resuscitation.**
   The foundation of good PCC is mastery of TCCC and a strong foundation in clinical medicine.
2. **Delineate roles and responsibilities, including naming a team leader.**
   A leader should be appointed who will manage the larger clinical picture while assistants focus on attention intensive tasks.
3. **Perform comprehensive physical exam and detailed history with problem list and care plan.**
   After initial care and stabilization of a trauma or medical patient, a detailed physical exam and history should be performed for the purpose of completing a comprehensive problem list and corresponding care plan.
4. **Record and trend vital signs.**
   Vital signs trending should be done with the earliest set of vital signs taken and continued at regular intervals so that the baseline values can be compared to present reality on a dedicated trending chart.
5. **Perform a teleconsultation.**
   As soon as is feasible, the medic should prepare a teleconsultation by either filling out a preformatted script or by writing down their concerns along with the latest patient information.
6. **Create a nursing care plan.**
   Nursing care and environmental considerations should be addressed early to limit any provider-induced iatrogenic injury.
7. **Implement team wake, rest, chow plan.**
   The medic and each of their first responders should make all efforts to take care of each other by insisting on short breaks for rest, food, and mental decompression.
8. Anticipate resupply and electrical issues
9. **Perform periodic mini rounds assessments.**
   Stepping back from the immediate care of the patient periodically and re-engaging with a mini patient round and review of systems can allow the medic to recognize changes in the condition of the patient and reprioritize interventions.
   - Is the patient stable or unstable?
   - Is the patient sick or not sick?
   - Is the patient getting better or getting worse?
   - How is this assessment different from the last assessment?
10. **Obtain and interpret lab studies.**
    When available, labs may be used to augment these trends and physical exam findings to confirm or rule out probable diagnoses.
11. **Perform necessary surgical procedures.**
    The decision to perform invasive and surgical interventions should consider both risks and benefit to the patient's overall outcome and not merely the immediate goal.
12. **Prepare for transportation or evacuation care.**
    If the medic is caring for the patient over a long tactical move or strategic evacuation, they should be prepared with ample drugs, fluids, supplies and be ready for all contingencies in flight.

13. **Prepare documentation for patient handover.**
    The preparation for transportation and evacuation care should begin immediately upon assuming care for the patient and should include hasty and detailed evacuation requests up both the medical and operational channels with the goal of getting the patient to the proper role of care as soon as possible.

Guideline User Notes

PCC operational context uses the following paradigm for phases of care for different periods of time one is in a PCC scenario:

Table 1. Roles of Care

Role	Definition	Time Period
1a	Carried/Point of Need/Ruck	<1 Hour
1b	Mission-specific transportation platform/Truck	1-4 Hours
1c	Mission support site/House	>4 Hours
1d	Evacuation platform/Plane (as planned or available)	No Timeframe

Where appropriate, a minimum-better-best format is included for situations in which the operational reality precludes optimal care for a given scenario:

- **Minimum**: This is the minimum level of care which should be delivered for a specified level of capability
- **Better**: When available or practical, this includes treatment strategies or adjuncts that improve outcomes while still not considered the standard of care.
- **Best**: This is the optimal medical for a given scenario based on the level of medical expertise of the provider

Expectations of prehospital care, based on TCCC's role-based standard of care, are included within each section:

- **Tier 1**: This is the basic medical knowledge for all service-members.
- **Tier 2**: Those who have been through approved CLS training are expected to be able to meet the standards at this level of care.
- **Tier 3** (Combat Medics/Corpsmen [CMC]): Those who are trained medics/corpsmen are expected to meet the medical standards for this tier.
- **Tier 4** (Combat Paramedic/Provider [CPP]): This is the highest level of prehospital capability and will have a significantly expanded scope of practice.

MASCAL/TRIAGE - PCC

Background

The foundation of effective PCC is accurate triage for both treatment in the PCC setting and for transportation to a higher level of care, as well as effective resource management across the entire trauma system. Resource management includes the appropriate utilization of medical and non-medical personnel, equipment and supplies, communications, and evacuation platforms. Like most Mass Casualty incidents (MASCAL), the purpose of triage in a PCC setting is to swiftly identify casualty needs for optimal resource allocation in order to improve patient outcomes. However, PCC presents unique and dynamic triage challenges while managing casualties over a prolonged period with a low likelihood of receiving additional medical supplies or personnel with enhanced medical capabilities apart from pre-established networks. MASCAL in a PCC environment will necessitate more conservative resource allocation than traditional MASCAL in mature theaters or fixed medical facilities where damage control surgery, intensive care, and medical logistical support are more readily available, and resupply is more likely. PCC dictates the need for implementing various triage and resource management techniques to ensure the greatest good for all. The objectives and basic strategies are the same for all MASCAL; however, tactics will vary depending on the available resources and situations.

MASCAL Decision Points

1. Determine if a PCC MASCAL is occurring – do the requirements for care exceed capabilities?
    - What is the threat? Has it been neutralized or contained? If not, security takes priority.
    - What is the total casualty estimate?
    - Are there resource limitations that will affect survival?
    - Can medical personnel arrive at the casualty location, or can the casualty move to them?
    - Is evacuation possible?
    - Communicate the situation to all available personnel conducting or enabling PCC.
    - Assess requirements for which class of triage you are facing (see Appendix C) and scale medical action to maximize lethality then survivability.
    - Remain agile and be ready to move based on the mission.
2. Determine if conditions require significant changes in the commonly understood and accepted standards of care (Crisis Standards of Care)[3] or if personnel who are not ordinarily qualified for a particular medical skill will need to deliver care. MASCAL in PCC requires both medical and non-medical responders initially save lives and preserve survivable casualties. Both groups will need skills traditionally outside existing paradigms, such as non-medical personnel taking and record vital signs or Tier 3 TCCC medical personnel maintaining vent settings on a stable patient. The MASCAL standard of care will be driven by the volume of casualties, resources, and risk or mortality/morbidity due to degree of injury/illness; as such, remain agile throughout the MASCAL and trend in both directions based upon resources available.
3. MASCAL management is often intuitive and reactive (due to lack of full mission training opportunities) and should rely on familiar terminology and principles. Treatment and casualty movement should be rehearsed to create automatic responses.

4. The tactical and strategic operational context will underpin every facet of MASCAL in a PCC environment, operational commanders MUST be involved in every stage of MASCAL response (The mere fact that a medical professional or team of medical professionals is forced to hold a casualty longer than doctrinal planning timelines means there is a failure in the operational/logistical evacuation chain. Battle lines, ground-to-air threat, etc. levels may have shifted.)
5. Logistical resupply may need to include non-standard means and involve personnel and departments not typically associated with Class VIII in other situations (i.e. aerial resupply, speedballs, caches, local national market procurement).
6. The most experienced person should establish MASCAL roles and responsibilities, as appropriate.

Key Considerations in MASCAL

- Usually, simpler is better.
- Focus on those that will preserve scarce resources, such as blood.
- Triage is a continuous process and should be repeated as often as is clinically and operationally practical.
- Avoid high resource and low yield interventions.
- Emergency airway interventions should prioritize REVERSIBLE pathology in salvageable patients.
- Decisions will depend on available resources and skillsets (i.e. penetrating traumatic brain injury [TBI] triaged differently if no neurosurgery is available in a timely manner or at all in theater).
- Conserve, ration, and redistribute additional scarce resources (i.e. blood, drug).

MASSIVE HEMORRHAGE - PCC

Background

Early recognition and intervention for life-threatening hemorrhage are essential for survival. The immediate priorities are to control life-threatening hemorrhage and maintain vital organ perfusion with rapid blood transfusion.[4]

Pre-deployment, Mission Planning, and Training Considerations

1. Conduct unit level blood donor testing (for blood typing, transfusion transmitted diseases and Low Titer blood type O titers) and develop operational roster.
2. Define Cold Chain Stored Whole Blood (CSWB) distribution quantities in area of responsibility.
3. Manage and equip prehospital blood storage program if unit policies and procedures allow for prehospital blood storage.

Table 2. PCC Role-Based Guidelines for Massive Hemorrhage Management

PCC Role-based Guidelines for Massive Hemorrhage Management	
TCCC-ASM, TCCC-CLS, TCCC-CMC, TCCC-CPP	**** All Personnel - Complete Basic TCCC Management Plan for Massive Hemorrhage then:*** ▪ Identify life-threatening bleeding that may have started or was not adequately controlled with initial interventions in TCCC Basic Management Plan for Massive Hemorrhage. ▪ Check tourniquets to ensure that they have not shifted or loosened.
TCCC-CLS, TCCC-CMC, TCCC-CPP	▪ Re-assess and re-apply MARCH interventions. ▪ Perform all recommended interventions from guidelines for above tier level.
TCCC-CMC, TCCC-CPP	▪ Ensure all interventions noted above are completed by TCCC ASM and CLS personnel. ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include:
Role 1a	▪ Conduct Triage – Time Assessment. ▪ Assess extremities distal to pressure dressings to ensure that they are not acting as a venous tourniquet which could result in compartment syndrome by checking pulses and the skin color distal to the dressing. ▪ Communicate evacuation and re-supply requirements (i.e. Blood resupply/Speedball). ▪ Administer Calcium and Tranexamic Acid (TXA) per TCCC guideline.
Role 1b	▪ Re-assess and re-apply MARCH interventions. ▪ Consider tourniquet conversion (> 2 hours but before 6 hours). ▪ Assess for refractory shock – see Circulation Section.
Role 1c	▪ Evaluate for compartment syndrome. ▪ Consider teleconsultation. ▪ Continue resuscitation until: min: palpable radial pulse or improved mental status better: SBP > 90 mmHg best: SBP between 100-110 mmHg. Discontinue fluid administration when one of the above end points have been achieved.

	▪ Ensure interventions noted above are completed by TCCC ASM, CLS and Combat Medic/Corpsmen (CMC) personnel. ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include:
	Role 1a Re-assess all prior MARCH interventions.
	Role 1b ▪ Assess using ultrasound (if available) including Extended Focused Assessment with Sonography in Trauma, Central Venous Pressure. ▪ Determine hypovolemia vs. refractory shock to drive decision on further resource utilization.
	Role 1c ▪ Convert to type-specific blood replacement, if testing available. ▪ Establish Foley catheter with goal Urine Output (UOP) of > ½ ml/kg per hour.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

Link to Damage Control Resuscitation (DCR) in Prolonged Field Care CPG, 01 Oct 2018 [5]

AIRWAY MANAGEMENT - PCC

Background

Airway compromise is the second leading cause of potentially survivable death on the battlefield after hemorrhage.[6] Complete airway occlusion can cause death from suffocation within minutes. Austere environments present significant challenges with airway management. Limited provider experience and skill, equipment, resources, and medications shape the best management techniques. Considerations include: limited availability of supplemental oxygen; medications for induction/rapid sequence intubation, paralysis, and post-intubation management; and limitations in available equipment. Another reality is limitations in sustainment training options, especially for advanced airway techniques. Due to these challenges, some common recommendations that may be considered "rescue" techniques in standard hospital airway management may be recommended earlier or in a non-standard fashion to establish and control an airway in a PCC environment. Patients who require advanced airway placement tend to undergo more interventions, be more critically injured, and ultimately have a higher proportion of deaths. The ability to rapidly and consistently manage an airway when indicated, or spend time on other resuscitative needs when airway management is not indicated, may contribute to improved outcomes.[7,8]

Table 3. PCC Role-based Guidelines for Airway Management

PCC Role-based Guidelines for Airway Management				
TCCC-ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP	**** All Personnel - Complete Basic TCCC Management Plan for Airway then:*** Assess for airway problem; use patient positioning per TCCC guidelines to maintain open airway.
				▪ Re-assess airway interventions performed in TCCC. ▪ Positive end-expiratory pressure (PEEP) valves should be used anytime you are using a bag valve mask. ▪ Use nasal pharyngeal airway (NPA). ▪ Ensure all interventions noted above are completed by TCCC ASM and CLS personnel. ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include: **Role 1a** ▪ Airway adjuncts should be assessed for efficacy by checking the patient's work of breathing, end-tidal CO2 (ETCO2) and pulse oximetry levels. ▪ Level of sedation should be continuously assessed every 5 minutes for patients sedated deep enough for endotracheal intubation.
				Role 1b ▪ Re-asses airway before, after and during any patient movement. ▪ Airway adjuncts with an inflatable cuff such as ET or cricothyrotomy tube or inflatable laryngeal mask airways (LMA) should be assessed for proper inflation levels to ensure that they are not under or over inflated. ▪ Inflate the cuff with a 10cc syringe and then releasing your thumb from the plunger to let the plunger equalize.

		Role 1c ▪ Airway adjuncts with an inflatable cuff such as ET or cricothyrotomy tube or inflatable LMA should be assessed for proper inflation levels to ensure that they are not under or over inflated. ▪ Mechanical suction device and yankauer suction for suctioning out the oropharynx. ▪ Airway adjuncts should be assessed for efficacy by checking the patient's work of breathing, ETCO2 and pulse oximetry levels. ▪ Mouth care should be performed per the attached nursing care checklist in appendix.
	▪ Ensure above interventions are completed by TCCC ASM, CLS and CMC personnel. ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include: **Role 1a** Re-assess all prior MARCH interventions.	
		Role 1b ▪ Re-assess cuff pressures per above. ▪ Continued assessment of patient's work of breathing, ETCO2 and pulse oximetry levels.
		Role 1c ▪ Inflate and periodically check cuff pressures with a cuff manometer to a goal of 20 mmHg. ▪ Use heat moisture exchanger to keep contaminants out and endogenous heat and moisture in the lungs. ▪ Inline suction catheter for suctioning airway adjunct as indicated.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

Link to Airway Management in Prolonged Field Care, 01 May 2020 [9]

RESPIRATION AND VENTILATION - PCC

Background

Respiration is the process of gas exchange at the cellular level. Oxygen is conducted into the lung and taken up by the blood via hemoglobin to be transported throughout the body. In the peripheral tissues, carbon dioxide is exchanged for oxygen, which is transported by the blood to the lungs, where it is exhaled. This process is essential to cellular and organism survival. Dysfunction of this process is a feature of multiple-injury patterns that can lead to increased morbidity and mortality.

Table 4. PCC Role-based Guidelines for Respiration Management

PCC Role-based Guidelines for Respiration Management				

TCCC-ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP	**** All Personnel - Complete Basic TCCC Management Plan for Respiration then:***
				▪ Identify Respiratory distress.
				▪ Some Level 1 providers may be trained in Basic Life Support (BLS), and if so, may offer the following interventions:
				  ▪ Open the airway using Head Tilt or Jaw Thrust maneuver.
				  ▪ Provide rescue breaths per BLS.

				▪ Perform all recommended interventions from guidelines for above Tier level
				▪ Additional interventions include:
				  ▪ Use Bag Valve Mask with PEEP Valve.
				  ▪ Use NPA.

				▪ Ensure all interventions noted above are completed by TCCC ASM and CLS personnel.
				▪ Conduct inventory of all resources.
				▪ Document all pertinent information on PCC Flowsheet (attached).
				▪ Additional interventions include:
				  ▪ Target ventilation to pulse oximetry level of 92%; use supplemental oxygen if available.
				  ▪ Use end-tidal carbon dioxide monitor and maintain ETCO2 between 35-45 mmHg.
				  ▪ If definitive airway is required, consider cricothyrotomy tube as less sedation and pain management is required to facilitate a patent and secure method for respirations.

				▪ Ensure interventions noted above are completed by TCCC ASM, CLS, and CMC personnel. ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include: **Mechanical Ventilation (For trained providers)** ▪ Use of mechanical ventilators in the PCC environment requires experience and training, best accomplished under board-certified medical personnel and sustained routinely. ▪ Ensure appropriate amount of induction, sedation, and pain management to sustain the patient for up to 96 hours in a PCC environment.
				Role 1a ▪ BVM, NPA, Pulse oximetry to maintain >92%. ▪ Intubate if no gag reflex and casualty is salvageable (TBI).
				Role 1b Add ETCO2 monitoring, goal 35-45 mmHg; initiate mechanical ventilation.
				Role 1c ▪ Establish sedation, pain management maintenance plan for >96 hours; use non-invasive ventilation as able. ▪ Monitor ABGs.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

Additional Considerations

- When in a PCC environment, simple monitoring technologies are able to be used by most providers in each of the provider categories to ensure adequate gas exchange and oxygen delivery. Peripheral oxygen saturation can be measured using a pulse oximeter which provides a measurement of hemoglobin saturation and, by inference, the effectiveness of measures to oxygenate a patient. Ventilation can be monitored with end-tidal carbon dioxide. The use of these tools together in a PCC environment provides estimates of oxygen transport to the cells, tissue metabolism, and adequacy of ventilation.
- Providers in the PCC environment can adopt, implement, monitor, and sustain respiration using concepts of manipulating minute ventilation (respiratory rate multiplied by tidal volume). Put simply, it is the number of times a patient is breathing each minute multiplied by the amount of air breathed in with each breath.
- Support of adequate minute ventilation can be performed in an escalating algorithm with rescue breathing, bag valve mask assisted ventilation, and mechanical ventilation. Each of these methods may require escalation of airway management skills and respiratory skills. Manipulation of any of the variables of minute ventilation will alter gas exchange. Therefore, medical providers in the PCC environment at all levels will need to be competent with the monitoring devices appropriate to their level of training. At a minimum, all providers with specific medical training should be competent to use and interpret the previous paragraph's monitoring devices.
- The causes of respiratory failure can overlap and become confusing. When in doubt and whenever possible, initiate a Telemedicine Consultation for further guidance and input.

CIRCULATION AND RESUSCITATION - PCC

Background

PCC presents a unique challenge for implementing damage control resuscitation (DCR) as defined by the JTS guideline. PCC goes beyond DCR and should bridge the gap between the prevention of death, the preservation of life, and definitive care. The goals are a return to a normal level of consciousness (LOC), increase and stabilization of systolic blood pressure at 100 - 110 mm Hg when appropriate, and stabilization of vital signs – Heart rate, respiratory rate, oxygen saturation, etc.

Table 5. PCC Level for Circulation and Resuscitation

PCC Level for Circulation and Resuscitation				
TCCC-ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP	**** All Personnel - Complete Basic TCCC Management Plan for Massive Hemorrhage then:***
				Role 1a ▪ Re-assess all tourniquets and wound dressings. ▪ Ensure that bleeding has stopped. ▪ If bleeding persists, consider additional tightening of the tourniquet, the use of an additional tourniquet, or the use of hemostatic dressings with wound packing to stem the hemorrhage. ▪ Conduct the principles of wound care to avoid infection and possible follow-on sepsis. ▪ Initiate hypothermia prevention measures.
				Role 1b/1c ▪ Continue and/or initiate above circulation interventions. ▪ Initiate hypothermia prevention measures, if not already completed.

				▪ Perform all recommended interventions from guidelines for above Tier level.
				▪ Additional interventions include:
				Role 1a
				▪ Re-assess all tourniquets and wound dressings.
				▪ Ensure that bleeding has stopped.
				▪ If bleeding persists, consider additional tightening of the tourniquet, the use of an additional tourniquet or the use of hemostatic dressings with wound packing to stem the hemorrhage.
				▪ Replace any limb tourniquet placed proximal over the uniform with one applied directly to the skin 2-3 inches above the wound.
				▪ Assess extremities distal to pressure dressings.
				  ▪ Check pulses and the skin color distal to the dressing.
				  ▪ Decreased pulses or skin mottling may indicate the dressing is acting as a venous tourniquet.
				  ▪ If present, dressing may need to be replaced or readjusted.
				  ▪ Ongoing venous tourniquet could result in limb damage or development of compartment syndrome.
				▪ Conduct the principles of wound care to avoid infection and possible follow-on sepsis.
				▪ Initiate hypothermia prevention measures.

				Role 1b/1c ▪ Continue and/or initiate above circulation interventions. ▪ Initiate hypothermia prevention measures, if not already completed.
				▪ Re-assess and re-apply MARCH interventions. ▪ Review transfusion transmitted disease (TTD)/titer of present unit members. ▪ Ensure all interventions noted above are completed by TCCC ASM and CLS personnel

PCC Level for Circulation and Resuscitation

- Conduct inventory of all shock treatment supplies including whole blood, testing equipment, IVs, and other resources.
- Document all pertinent information on PCC Flowsheet (attached).
- Additional interventions include:

Role 1a

- Re-assess tourniquets and wound dressings as noted in above tier recommendations.
- Convert tourniquets per TCCC guidelines.
  - In less than 2 hours if bleeding can be controlled with other means.
  - DO NOT remove a tourniquet that has been in place more than 6 hours.
- Initiate hypothermia prevention measures.
- If present, assess pelvic compression device and verify placement and tightness.
- IV or intraosseous (IO) access if not already initiated in MARCH interventions:
  - If the casualty remains in hemorrhagic shock or at significant risk of shock.
  - If the casualty needs medications, but cannot take them by mouth.
- Initiate resuscitation with fluid replacement:
  - For casualties in hemorrhagic shock.
  - Give blood products per DCoT and TCCC guidelines.
  - Give calcium per TCCC guidelines.
  - If not already done, give TXA per TCCC guidelines.
  - Re-assess the casualty after each unit of blood and note on PCC FC vitals tracker.
- The goals of resuscitation:
  - Return to a normal LOC.
  - Return of palpable radial pulse
  - Continue resuscitation until:
    - **Minimum**: palpable radial pulse or improved mental status
    - **Better**: SBP > 90 mmHg
    - **Best**: SBP between 100-110 mmHg.
  - Stabilization of vital signs – Heart rate, respiratory rate, oxygen saturation.
- If the patient has signs of ongoing shock despite hemorrhage control:
  - Re-assess look for bleeding!
  - Consider alternate causes of shock – hypovolemic (burn, sepsis, diarrheal illness and other causes of non-hemorrhagic shock), obstructive (tension pneumothorax or cardiac tamponade), distributive (spinal cord injury, sepsis, anaphylaxis, etc.).
  - If shock is not hemorrhagic, then treat for alternate cause of shock: judicious crystalloid for sepsis and burns, chest tube for tension pneumothorax; crystalloid and vasopressors* for evidence of spinal cord injury with neurogenic shock.
- If resuscitation goals can all be met, maintain crystalloid IV or discontinue IV/IO resuscitation and have the casualty orally rehydrate (avoid free water due to risk of hyponatremia) until 0.3 – 0.5 mL/kg/hr. UOP is achieved.
- Initiate hypothermia prevention measures.
- Differentiate between transient responder, non-responder, and refractory shock.
- Communicate evacuation and re-supply requirements (i.e. blood resupply/speedball).

PCC Level for Circulation and Resuscitation	
Roles 1b/1c	▪ Continue and/or initiate above circulation and resuscitation interventions. ▪ Manage IV or IO access for ongoing resuscitation. ▪ Initiate hypothermia prevention measures. ▪ Differentiate between transient responder, non-responder, and refractory shock. ▪ Communicate evacuation and re-supply requirements (i.e. blood resupply/speedball). ▪ Initiate teleconsultation to medical control.
	▪ Re-assess and re-apply MARCH interventions. ▪ Review TTD/titer of present unit members. ▪ Ensure all interventions noted above are completed by TCCC ASM, CLS and CMC personnel ▪ Conduct inventory of all shock treatment supplies including whole blood, testing equipment, IVs, and other resources etc. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include: **Role 1a** Interventions for both Tier 3 and Tier 4 level providers at this phase are the same.
Role 1b	▪ Ultrasound may be used to further refine the cause of ongoing hemorrhage or other causes of shock if available and medical provider is trained in its use. ▪ If ultrasound is available, teleconsultation can also be used to guide the provider in its implementation. ▪ Continually observe for changes in patient status, signs of clinical deterioration, alternate causes of shock, and need for change in resuscitation strategies. ▪ Continue resuscitation until: ・ **Minimum**: palpable radial pulse or improved mental status ・ **Better**: SBP > 90 mmHg ・ **Best**: SBP between 100-110 mmHg.
Role 1c	▪ Convert to type-specific blood replacement. ▪ Ultrasound may be used to further refine the cause of ongoing hemorrhage or other causes of shock if available and medical provider is trained in its use. ▪ If ultrasound is available, teleconsultation can also be used to guide the provider in its implementation. ▪ Continually observe for changes in patient status, signs of clinical deterioration, alternate causes of shock and need for change in resuscitation strategies. ▪ Continue resuscitation until: ・ **Minimum**: palpable radial pulse or improved mental status ・ **Better**: SBP > 90 mmHg ・ **Best**: SBP between 100-110 mmHg. ▪ If SBP remains less than 100-110 mmHg despite appropriate resuscitation and hemorrhage control, a vasopressor agent should be started if available*.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

** All use of pressors should be administered by role-based approved protocols or teleconsultation approval:*

- *norepinephrine continuous infusion 0.1–0.4 mcg/kg/min*
- *vasopressin continuous infusion 0.01-0.04 units*

COMMUNICATION AND DOCUMENTATION - PCC

Background

Communication and documentation in PCC are linked priorities as they are activities that are synergistic. For instance, the standard documentation forms (see below) that are used to track the important medical interventions and trends are the recommended scripts that are used in a teleconsultation. Effective documentation leads to effective communication, both in the immediate PCC environment and as a long-term medical management tool for the casualty.

Communication

- Communicate with the casualty if possible. Encourage, reassure, and explain care.
- Communicate with tactical leadership as soon as possible and throughout casualty treatment as needed. Provide leadership with casualty status and evacuation requirements to assist with coordination of evacuation assets.
- Verify evacuation request has been transmitted and establish communication with the evacuation platform as soon as tactically feasible relaying: mechanism of injury, injuries sustained, signs/symptoms, treatments rendered, and other information as appropriate. Have a rehearsed script to relay vital information to the next echelon of care prioritize interventions that cannot be seen by the next provider, such as medications.
- Ensure appropriate notification up the chain of command that PCC is being conducted; requesting support based on the MASCAL decision points.
- Call for teleconsultation as early and as often as needed (e.g., higher medical capability in the Chain of Command, the Advanced VIrtual Support for OpeRational Forces system line, etc.).
- Remember, communication of the situation and medical interventions that have been done and are ongoing includes both teleconsultation and the “handoff report.”

Documentation of Care

- There are 3 levels of documentation, categorized in a minimum, better, best format:
  - Minimum - Documentation of care on the TCCC card (DD1380).
  - Better - Utilization of a standard PCC flowsheet (if available), example attached.
  - Best - Completion of a formal After Action Report (AAR) after patient handoff.
- Transfer documented clinical assessments and treatments rendered. If the availably to scan and/or transmit this information to all parties involved teleconsultation (using all approved and available means), do so for them to have as much of the information as possible.
- Perform a detailed head-to-toe assessment and record all findings as a problem list so that a comprehensive care plan can then be constructed using the attached flow sheet.

Table 6. PCC Role-based Guidelines for Communications and Documentation

PCC Role-based Guidelines for Communication and Documentation				
TCCC-ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP	*Complete Basic TCCC Communication and Documentation Principles then:* ▪ Identify requirements for communicating care to the casualty, leadership, and medical personnel in accordance with TCCC Guidelines. ▪ Document casualty information on the DD Form 1380 TCCC Card and ensure proper placement of that card on the casualty, in accordance with DHA-PI 6040.01. ▪ Initiate scripted teleconsultation.
				▪ Monitor the documentation for each casualty and ensure that it is completed by those service members assisting with care. ▪ Initiate scripted teleconsultation.
				Ensure documentation and communication is completed for each casualty in accordance with PCC standards: ▪ Ensure that communication is established with evacuation assets and/or receiving facilities. ▪ Prepare evacuation request and set up priorities for evacuation for each casualty. ▪ Ensure DD1380 TCCC Cards are completed for every casualty. ▪ Initiate scripted teleconsultation. ▪ Complete AAR.
				Ensure documentation and communication is completed for each casualty in accordance with PCC standards: ▪ Ensure communication is established with evacuation assets and/or receiving facilities. ▪ Initiate scripted teleconsultation, if needed. ▪ Prepare evacuation request and set up priorities for evacuation for each casualty. ▪ Ensure DD1380 TCCC Cards are completed for every casualty. ▪ Complete After Action Report with an emphasis on the scenario's impact on future unit-level medical training and logistics requirements.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

*Link to Documentation in Prolonged Field Care, 13 Nov 2018 CPG [10]

* Link to Documentation Requirements for Combat Casualty Care, 18 Sep 2020 CPG [11]

HYPOTHERMIA - PCC

Background

Prevention of hypothermia must be emphasized in combat operations and casualty management at all levels of care. Hypothermia occurs regardless of the ambient temperature; hypothermia can, and does, occur in both hot and cold climates. Because of the difficulty, time, and energy required to actively re-warm casualties, significant attention must be paid to preventing hypothermia from occurring in the first place. Prevention of hypothermia is much easier than treatment of hypothermia; therefore prevention of heat loss should start as soon as possible after the injury. This is optimally accomplished in a layered fashion with rugged, lightweight, durable products that are located as close as possible to the point of injury, and then utilized at all subsequent levels of care, including ground and air evacuation, through all levels of care.[12]

Table 7. PCC Role-based Guidance for Hypothermia Management

PCC Role-based Guidance for Hypothermia Management					
TCCC-ASM	**TCCC-CLS**	**TCCC-CMC**	**TCCC-CPP**		
				Complete Basic TCCC Management Plan for Hypothermia then:	
				Role 1a	▪ Take early and aggressive steps to prevent further body heat loss and add external heat when possible for both trauma and severely burned casualties. ▪ Minimize casualty's exposure to cold ground, wind and air temperatures. Place insulation material between the casualty and any cold surface as soon as possible. ▪ Keep protective gear on or with the casualty, if feasible. ▪ Replace wet clothing with dry clothing, if possible, and protect from further heat loss. If unable to replace the dry clothing, wrap an impermeable layer around the casualty. ▪ Place an active heating blanket on the casualty's anterior torso and under the arms in the axillae. ▪ **Caution**: DO NOT place any active external heating directly on the skin or in areas of skin which are under pressure or have poor blood flow as this increases risk of injury and/or skin burns. ▪ Enclose the casualty with the exterior impermeable enclosure bag, if available. ▪ Protect the casualty from exposure to wind and precipitation on any evacuation platform.
				Role 1b	▪ Continue and/or initiate above hypothermia interventions. ▪ Pre-stage an insulated hypothermia enclosure system with external active heating for transition from the non-insulated hypothermia enclosure systems; seek to improve upon existing enclosure system when possible. ▪ Upgrade hypothermia enclosure system to a well-insulated enclosure system using a hooded sleeping bag or other readily available insulation inside the enclosure bag/external vapor barrier shell. ▪ **Best**: Improvised hypothermia wrap with high-quality insulation with cold-rated sleeping bag combined with heat source, internal vapor barrier, outer impermeable enclosure. ▪ When using the Hypothermia Prevention and Management Kit (HPMK) ready-heat-blanket, perform frequent skin checks to monitor for contact burns. ▪ Protect the casualty from exposure to wind and precipitation on any evacuation platform.

PCC Role-based Guidance for Hypothermia Management
Role 1c ▪ Continue and/or initiate the Role 1a/Role 1b phases as detailed above. ▪ Replace ready-heat-blanket when using >10 hours.
▪ Perform all recommended interventions from guidelines for above Tier level ▪ Additional interventions include: **Role 1a** Communicate re-supply requirements.
Role 1b Protect the casualty from exposure to wind and precipitation on any evacuation platform.
Role 1c ▪ Continue and/or initiate the Role 1a/Role 1b phases as detailed above ▪ Replace ready-heat-blanket when using >10 hours.
▪ Interventions for both CMC and CPP are the same. ▪ Ensure all interventions noted above are completed by TCCC ASM and CLS personnel ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include: **Role 1a** ▪ Use a battery-powered warming device to deliver IV resuscitation fluids, in accordance with current TCCC guidelines, at flow rate up to 150 ml/min with a 38°C output temperature. ▪ Communicate re-supply requirements.
Role 1b ▪ Convert to continuous temperature monitoring. ▪ **Minimum**: Scheduled temperature measurement with vital sign evaluations. ▪ **Better**: Continuous forehead dot monitoring. ▪ **Best**: Continuous core temperature monitoring. ▪ Protect the casualty from exposure to wind and precipitation on any evacuation platform.
Role 1c ▪ Continue and/or initiate the Role 1a/Role 1b phases as detailed above. ▪ Replace ready-heat-blanket when using >10 hours.
Interventions for both CMC and CPP are the same.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

*Link to Hypothermia Prevention, Monitoring and Management, 18 Sep 2012 CPG [12]

HYPERTHERMIA - PCC

Background

1. Hyperpyrexia is elevated body temperature.
2. Fever is elevated body temperature in response to a change in hypothalamic set point (infections).
3. Hyperthermia is elevated body temperature without a change in hypothalamic set point (heat illness, hyperthyroid, drugs).
4. The Second Law of Thermodynamics states that heat flows from hot to cold.
5. Heat transfer can occur through several processes:
    a. Radiation
    b. Conduction
    c. Convection
    d. Evaporation

Heat exhaustion

Symptoms: weak, dizzy, nauseated, headache, sweating, normal mental status. Heat exhaustion requires replacement of fluids and electrolytes.

Heat stroke

Symptoms: Hyperthermia + mental status changes. Heat stroke requires immediate cooling.

Table 8. PCC Role-based Guideline for Hyperthermia Management

PCC Role-based Guidance for Hyperthermia Management				
TCCC-ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP	***Complete Basic TCCC Management Plan for Hyperthermia then:***
				Role 1a ▪ Move the casualty to the shade if possible. ▪ Insulate the casualty from the ground (conduction). ▪ Remove the casualty from a vehicle (radiation). ▪ If situation allows, remove the casualty's helmet and vest (evaporation). ▪ Fan the casualty (convection). ▪ If the casualty is conscious and not vomiting, give liquids. ▪ Protect the casualty from exposure to sources of heat if possible. ▪ DO NOT give acetaminophen, aspirin or ibuprofen for hyperthermia, only for fever. ▪ Prevent heat illness/injury in casualties by maintaining hydration, adding salt to food, resting in shade, staying off hot surfaces (ground or vehicle), removing tactical gear when possible.
				Role 1b Continue and/or initiate above hyperthermia interventions.
				Role 1c Continue and/or initiate the Role 1a/Role 1b phases as detailed above.
				▪ Perform all recommended interventions from guidelines for above tier level ▪ Additional interventions include:

PCC Role-based Guidance for Hyperthermia Management	
Role 1a	▪ If the casualty is unconscious or vomiting, use IV/IO fluids. ▪ Communicate re-supply requirements.
Role 1b	Continue and/or initiate above hyperthermia interventions.
Role 1c	Continue and/or initiate the Role 1a/Role 1b phases as detailed above.
	▪ Interventions for both CMC and CPP providers are the same. ▪ Ensure all interventions noted above are completed by TCCC ASM and CLS personnel. ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include:

Role 1a	▪ If the casualty is unconscious or vomiting, use IV/IO fluids.
	▪ Monitor for signs and symptoms of heat exhaustion - if present: Immediately replace fluids and electrolytes.
	▪ Monitor for signs and symptoms of heat stroke - if present:
	  ▪ Immediate cooling must be initiated.
	  ▪ **Minimum**: Wetting clothing.
	  ▪ **Better**: Fanning the casualty after wetting clothing.
	  ▪ **Best**: Immersion in water.
	▪ Casualties should eat, if possible, to prevent sodium loss, which may lead to dilutional hyponatremia (low sodium).
	▪ Dilutional hyponatremia may look like heat illness, but is due to drinking and not eating.
	▪ Seizures should be treated with benzodiazepines.
	▪ Communicate re-supply requirements.

Role 1b	▪ Convert to continuous temperature monitoring.
	  ▪ **Minimum**: Scheduled temperature measurement with vital sign evaluations.
	  ▪ **Better**: Continuous forehead dot monitoring.
	  ▪ **Best**: Continuous core temperature monitoring.
	▪ Prevent heat illness/injury in casualties by maintaining hydration, adding salt to food, resting in shade, staying off hot surfaces (ground or vehicle), removing tactical gear when possible.

Role 1c	▪ Continue and/or initiate the Role 1a/Role 1b phases as detailed above.
	Interventions for both CMC and CPP are the same.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

HEAD INJURY/TBI - PCC

Background

TBI occurs when external mechanical forces impact the head and cause an acceleration/deceleration of the brain within the cranial vault which results in injury to brain tissue. TBI may be closed (blunt or blast trauma) or open (penetrating trauma).[13] Signs and symptoms of TBI are highly variable and depend on the specific areas of the brain affected and the injury severity. Alteration in consciousness and focal neurologic deficits are common. Various forms of intracranial hemorrhage, such as epidural hematoma, subdural hematoma, subarachnoid hemorrhage, and hemorrhagic contusion can be components of TBI. The vast majority of TBIs are categorized as mild and are not considered life threatening; however, it is important to recognize this injury because if a patient is exposed to a second head injury while still recovering from a mild TBI, they are at risk for increased long-term cognitive effects. Moderate and severe TBIs are life-threatening injuries.

Pre-deployment, Mission Planning, and Training Considerations

1. Conduct unit level TTD/Titer testing and develop an operational roster.
2. Conduct baseline neurocognitive assessment per Service guideline.
3. When possible and practical, keep patient in an elevated orientation to approximately 30 degrees while maintaining C-spine precautions (as clinically indicated) and airway control (don't just elevate the head by bending the neck).
4. Define CSWB distribution quantities in area of responsibility.
5. Determine feasibility and requirement for pre-deployment unit level blood draw.
6. Conduct unit level pre-deployment blood draw as required.
7. Ensure critical head-injury adjunct medications appropriately stocked and storage requirements met.

Treatment Guidelines

Table 9. PCC Role-based Guideline for Head Injury/TBI Management

PCC Role-based Guidance for Head Injury/TBI Management				
TCCC-ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP	***Complete Basic TCCC Management Plan for Heat Injury/TBI then:***
				Role 1a ▪ Identification and local wound management of any open head wounds/skull fractures. Priorities should include hemorrhage control, removal of gross contamination, and protection/coverage of any exposed dura or brain matter. ▪ Military Acute Concussive Evaluation 2 (MACE2) (*See Appendix E) examination per DoD/TCCC guideline. ▪ Communicate evacuation requirements (need for TBI evaluation, neurosurgery) ▪ Communicate re-supply requirements.
				Role 1b/1c ▪ Re-assess and re-apply MARCH interventions. ▪ Serial neurologic checks, including pupil exam and identify signs of elevated or rising intracranial pressure (Appendix E) - at least hourly. ▪ Identify catastrophic/non-survivable brain injury. ▪ Upgrade evacuation priority and destination (facility with neurosurgical capabilities) for any patient with initial mild TBI who deteriorates to moderate/severe TBI category.
				▪ Re-assess and re-apply MARCH interventions. ▪ Conduct inventory of all treatment supplies. ▪ Document all pertinent information on PCC Flowsheet (attached).
				Role 1a ▪ Identification and local wound management of open head wounds/skull fractures. Priorities should include hemorrhage control, removal of gross contamination, and protection/coverage of any exposed dura or brain matter. ▪ MACE2 examination per TCCC guideline. ▪ Communicate evacuation requirements (need for TBI evaluation, neurosurgery). ▪ Communicate re-supply requirements.
				Role 1b/1c ▪ Re-assess and re-apply MARCH interventions. ▪ Serial neurologic checks and identify signs of elevated or rising intracranial pressure (Appendix E). ▪ Administer appropriate antibiotics for any open head wounds or skull fracture (see antibiotics section). ▪ Identify the critical observations that should be reported to medical personnel for trauma casualties with a suspected head injury, in accordance with the MACE2. ▪ Teleconsultation with trauma surgeon and/or neurosurgeon as available. ▪ Upgrade evacuation priority and destination (facility with neurosurgical capabilities) for any patient with initial mild TBI who deteriorates to moderate/severe TBI category.
				▪ Re-assess and re-apply MARCH interventions. ▪ Ensure all interventions noted above are completed by non-medical TCCC ASM and CLS personnel and CLS-trained service members. ▪ Conduct inventory of all treatment supplies. ▪ Document all pertinent information on PCC Flowsheet (attached).
				Role 1a ▪ Identification and local wound management of any open head wounds/skull fractures. Priorities should include hemorrhage control, removal of gross contamination, and protection/coverage of any exposed dura or brain matter.

PCC Role-based Guidance for Head Injury/TBI Management	
	▪ Identify signs of elevated or rising intracranial pressure (ICP) per Appendix E. Initiate immediate treatment for signs of elevated ICP including initial bolus of 3% hypertonic saline (HTS) 250-500 ml if available. Alterative: 23.4% sodium chloride. ▪ Administer TXA as single 2gram IV or IO bolus (no second dose required). ▪ Communicate evacuation requirements (need for TBI evaluation, neurosurgery). ▪ Communicate re-supply requirements.

Role 1b	▪ Re-assess and re-apply MARCH interventions.
	▪ Administer appropriate antibiotics for any open head wounds or skull fracture (see antibiotics section).
	▪ Maintain goal SBP >90 mmHg with initial fluid/blood product resuscitation.
	▪ Serial neurologic checks and identify signs of elevated or rising intracranial pressure (Appendix E); If noted, the following interventions are recommended, if possible:
	  ▪ HTS administration (intermittent bolus versus continuous infusion) per Appendix E. Alterative: 23.4% sodium chloride.
	  ▪ Supplemental oxygen to maintain O2 sats > 94% and <99%, ETCO2 if intubated with goal of mild hyperventilation to 35-40.
	  ▪ Brief (less than 30 minutes) moderate hyperventilation to goal pCO2/ETCO2 20-30 may be performed for signs of impending/active herniation (pupil becomes fixed and dilated); if there is a neurosurgical capability.
	  ▪ ** Note: Use hyperventilation only as a temporizing measure while additional ICP treatments are being administered or tactical evacuation is in process.
	▪ Repeat primary and secondary survey for any abrupt decline in the Glasgow Coma Scale (GCS) or change in pupil exam to rule out non-neurologic causes.
	▪ Minimize analgesia and sedation agents, and avoid paralyses, if possible, to preserve ability to obtain neurologic exam, but medical and operational considerations should take priority if deeper sedation or paralysis required.
	▪ Teleconsultation with Trauma Surgeon and/or Neurosurgeon as available.
	▪ Upgrade evacuation priority and destination (facility with neurosurgical capabilities) for any patient with initial mild TBI who deteriorates to moderate/severe TBI category.
	▪ Repeat triage evaluation and identification of likely non-survivable condition (or associated injuries) based on injury types/severity and required vs available resources.

Role 1c	▪ Continue serial neurologic checks including GCS and pupil exam at least hourly. ▪ Immediate seizure treatment with benzodiazepines, consider ketamine for refractory seizures. ▪ Temperature management and aggressive fever control. ▪ Teleconsultation with trauma surgeon and/or neurosurgeon as available. ▪ Upgrade evacuation priority and destination (facility with neurosurgical capabilities) for any patient with initial mild TBI who deteriorates to moderate/severe TBI.
	▪ Re-assess and Re-apply MARCH interventions. ▪ Ensure all basic nursing interventions noted above are completed by non-medical TCCC ASM and CLS personnel, CLS-trained service members and medics/corpsmen. ▪ Conduct inventory of all treatment supplies. ▪ Document all pertinent information on PCC Flowsheet (attached).
Role 1a	▪ Identification and local wound management of any open head wounds/skull fractures. Priorities should include hemorrhage control, removal of gross contamination, and protection/coverage of any exposed dura or brain matter. ▪ MACE2 examination per TCCC guideline. ▪ Serial GCS exams (Appendix E.) ▪ Identify signs of elevated or rising ICP per Appendix E.

PCC Role-based Guidance for Head Injury/TBI Management	
	▪ Initiate immediate treatment for signs of elevated ICP including initial bolus of 3% hypertonic saline (HTS) 250-500 ml. Alterative: 23.4% sodium chloride. ▪ Administer TXA as single 2gram IV or IO bolus (no second dose required). ▪ Communicate evacuation requirements (need for TBI evaluation, neurosurgery). ▪ Communicate re-supply requirements.

Role 1b	▪ Re-assess and re-apply MARCH interventions.
	▪ Administer antibiotics for any open head wounds or skull fracture. (See Antibiotics). Continue resuscitation until:
	  ▪ **Minimum**: palpable radial pulse or improved mental status
	  ▪ **Better**: SBP > 90 mmHg
	  ▪ **Best**: SBP between 100-110 mmHg
	  ▪ If SBP remains less than 100-110 mmHg despite appropriate resuscitation and hemorrhage control, a vasopressor agent should be started if available.
	  ▪ norepinephrine continuous infusion 0.1–0.4 mcg/kg/min
	  ▪ vasopressin continuous infusion 0.01-0.04 units
	** All use of pressers should be administered by role-based approved protocols or teleconsultation approval*
	▪ Serial neurologic checks and identify signs of elevated or rising intracranial pressure (Appendix E); If noted, the following interventions are recommended, if possible:
	  ▪ HTS administration (intermittent bolus versus continuous infusion) per Appendix E. Alternative: 23.4% sodium chloride.
	  ▪ Administer seizure prophylaxis (1G Levetiracetam), if available.
	  ▪ Supplemental oxygen to maintain O2 sats > 94%, ETCO2 if intubated with goal of norocapnia with pCO2 of 35-40.
	  ▪ Brief (less than 30 min) moderate hyperventilation to goal pCO2/ETCO2 20-30 may be performed for signs of impending/active herniation (pupil becomes fixed and dilated).
	  ▪ ** **Note**: Use hyperventilation only as a temporizing measure while additional ICP treatments are being administered or tactical evacuation is in process.
	▪ Repeat primary and secondary survey for any abrupt decline in the GCS or change in pupil exam to rule out non-neurologic causes.
	▪ Minimize analgesia and sedation agents, if possible, to preserve ability to obtain neurologic exam, but medical and operational considerations should take priority if deeper sedation or paralysis required.
	▪ Teleconsultation with trauma surgeon and/or neurosurgeon as available.
	▪ Upgrade evacuation priority and destination (facility with neurosurgical capabilities) for patients with initial mild TBI who deteriorates to moderate/severe TBI category.
	▪ Repeat triage evaluation and identification of non-survivable condition (or associated injuries) based on injury types/severity and required vs available resources.

Role 1c	▪ Continue serial neurologic checks including GCS and pupil exam at least hourly. ▪ Immediate seizure treatment with benzodiazepines, consider ketamine for refractory seizures. ▪ Temperature management and aggressive fever control. ▪ Teleconsultation with trauma surgeon and/or neurosurgeon as available. ▪ Upgrade evacuation priority and destination (facility with neurosurgical capabilities) for patients with initial mild TBI who deteriorates to moderate/severe TBI category.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

See Appendix E for additional TBI resources.

*Link to Traumatic Brain Injury in Prolonged Field Care, 6 December 2017 CPG [14]

PAIN MANAGEMENT (ANALGESIA AND SEDATION) FOR PCC

Background

A provider of PCC must first and foremost be an expert in TCCC and then be able to identify all the potential issues associated with providing analgesia with or without sedation for a prolonged (4-48 hr.) period.

These PCC pain management guidelines are intended to be used after TCCC Guidelines at the Role 1 setting, when evacuation to higher level of care is not immediately possible. They attempt to decrease complexity by minimizing options for monitoring, medications, and the like, while prioritizing experience with a limited number of options versus recommending many different options for a more customized fashion. Furthermore, it does not address induction of anesthesia before airway management (i.e. rapid sequence intubation).

Remember, YOU CAN ALWAYS GIVE MORE, but it is very difficult to take away. Therefore, it is easier to prevent cardiorespiratory depression by being patient and methodical. TITRATE TO EFFECT.

Priorities of Care Related to Analgesia and Sedation

1. Keep the casualty alive. DO NOT give analgesia and/or sedation if there are other priorities of care (e.g., hemorrhage control).
2. Sustain adequate physiology to maintain perfusion. DO NOT give medications that lower blood pressure or suppress respiration if the patient is in shock or respiratory distress (or is at significant risk of developing either condition).
3. Manage pain appropriately (based on the pain categories below).
4. Maintain safety. Agitation and anxiety may cause patients to do unwanted things (e.g., remove devices, fight, fall). Sedation may be needed to maintain patient safety and/or operational control of the environment (i.e. in the back of an evacuation platform).
5. Stop awareness. During painful procedures, and during some mission requirements, amnesia may be desired. If appropriate, disarm or clear their weapons and prevent access to munitions/ mission essential communications.

General Principles

- Consider pain in three categories:
    1. Background: the pain that is present because of an injury or wound. This should be managed to keep a patient comfortable at rest but should not impair breathing, circulation, or mental status.
    2. Breakthrough: the acute pain induced with movement or manipulation. This should be managed as needed. If breakthrough pain occurs often or while at rest, pain medication should be increased in dose or frequency as clinically prudent but within the limits of safety for each medication.
    3. Procedural: the acute pain associated with a procedure. This should be anticipated and a plan for dealing with it should be considered.

- Analgesia is the alleviation of pain and should be the primary focus of using these medications (treat pain before considering sedation). However, not every patient requires (or should receive) analgesic medication at first, and unstable patients may require other therapies or resuscitation before the administration of pain or sedation medications.
- Sedation is used to relieve agitation or anxiety and, in some cases, induce amnesia. The most common causes of agitation are untreated pain or other serious physiologic problems like hypoxia, hypotension, or hypoglycemia. Sedation is used most commonly to ensure patient safety (e.g., when agitation is not controlled by analgesia and there is need for the patient to remain calm to avoid movement that might cause unintentional tube, line, dressing, splint, or other device removal or to allow a procedure to be performed) or to obtain patient amnesia to an event (e.g., forming no memory of a painful procedure or during paralysis for ventilator management).
- In a Role 1 (or PCC) setting, intravenous (IV) or interosseous (IO) medication delivery is preferred over intramuscular (IM) therapies. The IV/IO route is more predictable in terms of dose-response relationship.
- Each patient responds differently to medications, particularly with respect to dose. Some individuals require substantially more opioid, benzodiazepine, or ketamine; some require significantly less. Once you have a "feel" for how much medication a patient requires, you can be more comfortable giving it to patient with a broad range of injuries.
- Similar amounts during redosing. In general, a single medication will achieve its desired effect if enough is given; however, the higher the dose, the more likely the side effects.
- Additionally, ketamine, opioids, and benzodiazepines given together have a synergistic effect: the effect of medications given together is much greater than a single medication given alone (i.e., the effect is multiplied, not added, so go with less than what you might normally use if each were given alone).
- Pain medications should be given when feasible after injury or as soon as possible after the management of MARCH and appropriately documented (medication administered, dose, route and time). Factors for delayed pain management (other than Combat Pill Pack) are need for individual to maintain a weapon/security and inability to disarm the patient.
- PCC requires a different treatment approach than TCCC. Go slowly, use lower doses of medication, titrate to effect, and re-dose more frequently. This will provide more consistent pain control and sedation. High doses may result in dramatic swings between over sedation with respiratory suppression and hypotension alternating with agitation and emergence phenomenon.

Drips and Infusions

For IV/IO drip medications: Use normal saline to mix medication drips when possible, but other crystalloids (e.g., lactated Ringer's, Plasmalyte, and so forth) may be used if normal saline is not available. DO NOT mix more than one medication in the same bag of crystalloid. Mixing medications together, even for a relatively short time, may cause changes to the chemical structure of one or both medications and could lead to toxic compounds.

If a continuous drip is selected, use only a ketamine drip in most situations, augmented by push doses of opioid and/or midazolam if needed. Multiple drips are difficult to manage and should only be undertaken with assistance from a Teleconsultation with critical care experience. Multiple drips are

most likely to be helpful in patients who remain difficult to sedate with ketamine drip alone and can "smooth out" the sedation (e.g., fewer peaks and troughs of sedation with corresponding deep sedation mixed with periods of acute agitation).

Other medications that should be available when providing narcotic pain control is Naloxone. If the patient receives too much medication, consider dilution of 0.4mg of naloxone in 9ml saline (40mcg/mL) and administer 40mcg IV/IO PRN to increase respiratory rate, but still maintaining pain control.

The PCC Pain Management Guideline Tables

These tables are intended to be a quick reference guide but are not standalone: you must know the information in the rest of the guideline. The tables are arranged according to anticipated clinical conditions, corresponding goals of care, and the capabilities needed to provide effective analgesia and sedation according to the minimum standard, a better option when mission and equipment support (all medics should be trained to this standard), and the best option that may only be available in the event a medic has had additional training, experience, and/or available equipment.

Medications in the table are presented as either give or consider:

- **Give**: Strongly recommended.
- **Consider**: Requires a complete assessment of patient condition, environment, risks, benefits, equipment, and provider training.

Use these steps when referencing the tables:

Step 1. Identify the clinical condition

- Standard analgesia is for most patients. The therapies used here are the foundation for pain management during PCC. Expertise in dosing fentanyl (OTFC or IV) and ketamine IV or IO is a must. Intramuscular and intranasal dosing of medications isn't recommended in a PCC setting.
- Difficult analgesia or sedation needed is for patients in whom standard analgesia does not achieve adequate pain control without suppressing respiratory drive or causing hypotension, OR when mission requirements necessitate sedating a patient to gain control over their actions to achieve patient safety, quietness, or necessary positioning.
- Protected airway with mechanical ventilation is for patients who have a protected airway and are receiving mechanical ventilatory support or are receiving full respiratory support via assisted ventilation (i.e. bag valve).
- Shock present is for patients who have hypotension, active hemorrhage, and/or tachycardia.

Step 2. Read down the column to the row representing your available resources and training.

Step 3. Provide analgesia/sedation medication accordingly.

Step 4. Consider using the Richmond Agitation-Sedation Scale (RASS) score (Appendix E) as a method to trend the patient's sedation level.

Table 10. PCC Role-based Guideline for Pain Management (Analgesia and Sedation)

PCC Role-based Guideline for Pain Management (Analgesia and Sedation)

TCCC-ASM | TCCC-CLS | TCCC-CMC | TCCC-CPP

Complete Basic TCCC Communication Plan for Pain Management then:

- Administer meloxicam and acetaminophen (pain medications in Joint First Aid Kit [JFAK]) per TCCC guidelines if not already given.
- Identify painful conditions that can be treated without the use of medications.
  - Fractures - apply splint per TCCC guidelines.
  - Exposed burns - burn care per TCCC guidelines.
  - Tourniquets will cause significant pain - DO NOT remove a tourniquet in an attempt to alleviate pain unless directed to do so by a higher medical authority.

Drug/Interactions/Dose	Onset	Duration	Side Effects
Acetaminophen ▪ Mild-moderate pain, able to fight ▪ Use with meloxicam ▪ 1 gram every 6 hours	<1 hr when given by mouth	4-6 hours	▪ Allergic Reaction (rare) ▪ Liver damage: limit daily dose of acetaminophen and acetaminophen-containing products (e.g., Percocet) to 4,000mg/day
Meloxicam ▪ Mild-moderate pain, able to fight ▪ Use with acetaminophen ▪ 15 mg daily	<1 hr when given by mouth	24 hours	▪ Reflux ▪ Abdominal pain ▪ Nausea/vomiting ▪ Diarrhea and/or constipation

Administer meloxicam and acetaminophen (in JFAK) per TCCC guidelines if not already given.

- Pain medications should be given when feasible after injury or as soon as possible after the management of MARCH and appropriately documented (medication administered, dose, route and time).
- Pain meds initiated in TCCC can often be continued in the PCC environment for both ongoing analgesia and sedation, as long as the duration and cumulative side effects are well understood and mitigated.

Drug/Interactions/Dose	Onset	Duration	Side Effects
OTFC (Oral Transmucosal Fentanyl Citrate) ▪ Moderate to severe pain, unable to fight without hemorrhagic shock or respiratory distress ▪ 800 mcg every 30 min	5 mins when given by mouth	20-40 minutes	▪ Respiratory/cardiac/mental status depression ▪ Nausea/vomiting ▪ Pruritus (itching) ▪ Constipation
Ketamine ▪ Moderate to severe pain, unable to fight with hemorrhagic shock or respiratory distress ▪ 30 mg (or 0.3 mg/kg) slow IV or IO push every 20 min ▪ May repeat ▪ Ketamine 50-100 mg (or 0.5-1 mg/kg) IM or IN every 20-30 min	30 secs IV or 1-5 mins IM	10-15 mins IV or 20-30 mins IM	▪ Cataleptic-like state (dissociated from the surrounding environment) ▪ Respiratory depression at higher doses (>1mg/kg), especially with fast administration IV/IO ▪ Hypersalivation (can be problematic in an austere setting) ▪ Increased blood pressure and heart rate. ▪ Nausea/vomiting

PCC Role-based Guideline for Pain Management (Analgesia and Sedation)			
▪ May repeat **For Sedation** ▪ 1-2 mg/kg slow IV push initial dose ▪ 300 mg IM (or 2-3 mg/kg IM) initial dose ▪ May repeat			
Ondansetron (Zofran) ▪ For nausea/vomiting ▪ 1-2 tabs PO/SL every 4-6 hours PRN ▪ 4 mg IV, may repeat 1 time in 2 hours if N/V returns	30 min - hr when given PO or SL, 5-10 mins when given IV	3-6 hours	▪ Drowsiness ▪ Fatigue ▪ Anxiety
Naloxone (Narcan) ▪ For complete or partial reversal of opioid depression (respiratory/cardiac/mental) ▪ 0.4-2 mg IV/IM/IO ▪ May repeat every 2-3 minutes (MAX dose 10 mg)	1-2 minutes IV or 2–5 minutes IM/IO	30-90 mins Note: some opioids have longer duration so naloxone may need to be repeated	▪ Abrupt withdrawal reaction from opioid depression should be anticipated and preparations should be made. ▪ This reaction may include vomiting, sweating, tachycardia, increased blood pressure, agitation.
▪ Pain medications should be given when feasible after injury or as soon as possible after the management of MARCH and appropriately documented (medication administered, dose, route and time). ▪ Pain meds that are initiated in TCCC can often be continued in the PCC environment for both ongoing analgesia and sedation, as long as the duration and cumulative side effects are well understood and mitigated.			
Drug/Interactions/Dose	Onset	Duration	Side Effects
Fentanyl ▪ Moderate to severe pain, unable to fight without hemorrhagic shock or respiratory distress ▪ 50 mcg IV (0.5-1 mcg/kg) or 100 mcg IN, may repeat every 1-2 hours	1-2 minutes when given IV	30-60 minutes	▪ Respiratory/cardiac/ mental status depression ▪ Nausea/vomiting ▪ Pruritus (itching) ▪ Constipation
Ketamine ▪ Moderate to severe pain, unable to fight with hemorrhagic shock or respiratory distress ▪ 30 mg (or 0.3 mg/kg) slow IV or IO push every 20min ▪ May repeat ▪ Ketamine 50-100 mg (or 0.5-1 mg/kg) IM or IN every 20-30 min	30 secs IV or 1–5 mins IM	10–15 mins IV or 20–30 mins IM	▪ Cataleptic-like state (dissociated from the surrounding environment) ▪ Respiratory depression at higher doses (>1mg/kg), especially with fast administration IV/IO ▪ Hypersalivation (can be problematic in an austere setting) ▪ Increased blood pressure and heart rate. ▪ Nausea/vomiting

PCC Role-based Guideline for Pain Management (Analgesia and Sedation)			
▪ May repeat **For sedation** ▪ 1-2 mg/kg slow IV push initial dose ▪ 300 mg IM (or 2-3 mg/kg IM) initial dose **For longer duration analgesia** ▪ Slow IV infusion 0.3 mg/kg in 100 ml 0.9% sodium chloride over 5-15 minutes every 45 minutes prn for IV or IO			
▪ When available and applicable, other medications can be considered. ▪ These medications should be used based on local protocols and policies put in place by your medical director or through direct teleconsultation guidance.			
Drug/Interactions/Dose	Onset	Duration	Side Effects
Midazolam (Versed) ▪ For sedation and anxiolysis; will also cause anterograde amnesia ▪ 2-4 mg IM ▪ 0.5-1mg IV (push slowly over 1-2 minutes)	15-20 mins when given IM, 2 mins when given IV	1-6 hrs when given IM, 15 min-6 hrs (HIGH variability)	▪ Drowsiness ▪ Respiratory depression ESPECIALLY when used with any narcotic ▪ Nausea/vomiting
Acetaminophen/Hydrocodone (Norco) ▪ For moderate-severe pain ▪ Comes in multiple strengths of hydrocodone - 5/7.5.10 mg ▪ 1-2 tabs PO every 4-6 hours PRN for 5mg hydrocodone strength	10-20 minutes	3-4 hours	▪ Drowsiness ▪ Respiratory depression ▪ Sedation ▪ Nausea/vomiting ▪ Itching Note: contains acetaminophen. Be aware of total dose when given with other drugs that contain acetaminophen
Acetaminophen/Oxycodone (Percocet) ▪ For moderate-severe pain ▪ Comes in multiple strengths of oxycodone - 5/7.5/10 mg ▪ 1-2 tabs PO every 4-6 hours PRN for 5mg oxycodone dose	10-20 minutes	3-4 hours	▪ Drowsiness ▪ Respiratory depression ▪ Sedation ▪ Nausea/vomiting ▪ Itching Note: contains acetaminophen. Be aware of total dose when given with other drugs that contain acetaminophen
Hydromorphone (Dilaudid) ▪ For severe pain ▪ 1-2 mg IM ▪ 0.5 - 1 mg IV	15-20 mins when given IM, 2 mins when given IV	3-4 hours	▪ Drowsiness ▪ Respiratory depression ▪ Sedation ▪ Nausea/vomiting ▪ Itching
Morphine ▪ For severe pain ▪ 5-10 mg IM	15-20 mins when given IM, 2-5	3-4 hours	▪ Drowsiness ▪ Respiratory depression ▪ Sedation

PCC Role-based Guideline for Pain Management (Analgesia and Sedation)				
	▪ 2 - 4 mg IV	mins when given IV		▪ Nausea/vomiting ▪ Itching
	Tramadol (**Ultram**) ▪ For moderate-severe pain ▪ 1-2 tabs PO every 4-6 hours PRN (DO NOT exceed 400 mg tramadol/day)	10-20 minutes	4-6 hours	▪ Drowsiness ▪ Respiratory depression ▪ Sedation ▪ Nausea/vomiting ▪ CNS stimulation including seizures at high doses ▪ Note: Some preparations (i.e., Ultram) contain acetaminophen. Be aware of total dose when given with other drugs that contain acetaminophen.
	Codeine/acetaminophen ▪ For moderate-severe pain ▪ 1-2 tabs PO every 4-6 hours PRN (for tabs with 15mg Codeine)	30 minutes - 1 hour	4-6 hours	▪ Drowsiness ▪ Respiratory depression ▪ Sedation ▪ Nausea/vomiting ▪ Itching ▪ Note: Contains acetaminophen. Be aware of total dose when given with other drugs that contain acetaminophen.
	▪ In some cases, local anesthetics or even limited regional anesthesia is the best option for pain control (For more information, see Military Analgesia Regional Anesthesia Guidelines.) ▪ While side effects are real and toxic levels of these drugs must be understood and avoided, the benefit can often be achieved without sedation when appropriate for the tactical environment.			

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

Special Considerations

Patient Monitoring During Sedation

Patients receiving analgesia and sedation require close monitoring for life-threatening side-effects of medications.

- **Minimum**: Blood pressure cuff, stethoscope, pulse oximeter; document vital signs trends.
- **Better**: Capnography in addition to minimum requirements
- **Best**: Portable monitor providing continuous vital signs display and capnography; document vital signs trends frequently.

Analgesia and Sedation for Expectant Care (i.e. End-of-Life Care)

An unfortunate reality of our profession, both military and medical, is that we encounter clinical scenarios that will inevitably end in a patient's death. In these situations, it is a healthcare provider's obligation to give palliative therapy to minimize the person's suffering. In these circumstances, the use of opioid analgesics and sedative medications is therapeutic and indicated, even if these medications worsen a patient's vital signs (i.e., cause respiratory depression and/or hypotension). If a patient is expectant:

- Teleconsultation
- Prepare to:
  - Give opioid until the patient's pain is relieved. If the patient is unable to communicate their pain, give opioid medication until the respiratory rate is less than 20/min.
  - If the patient complains of feeling anxious (i.e., is worrying about the future but not complaining of pain) or he cannot express himself but is agitated despite having a respiratory rate less than 20/min, give a benzodiazepine until the anxiety is relieved or the patient is sedated (i.e., is not feeling anxious or is no longer agitated).
- Position the patient as comfortably as possible. Pad pressure points.
- Provide anything that gives the patient comfort (e.g., water, food, cigarette).
- Under no circumstances should paralytics be used without analgesia/sedation

*Link to Analgesia and Sedation Management in Prolonged Field Care, 11 May 2017 CPG [15]

*Link to Pain, Anxiety and Delirium, 26 April 2021 CPG [16]

ANTIBIOTICS, SEPSIS, AND OTHER DRUGS - PCC

Background

Complete Basic TCCC Management Plan for Antibiotics then:

Antibiotics should be given immediately after injury or as soon as possible after the management of MARCH and Pain Management and appropriately documented (medication administered, dose, route and time).

Confirm that initial TCCC dose of moxifloxacin (Avelox®) or Ertapenem (Invanz®) have already been given for any penetrating trauma. If available, administer tetanus toxoid IM as soon as possible.

Antibiotics should be given daily for seven to 10 days, depending on the type of antibiotic given (see below tables for antibiotics). When able/available, transition IV/IO antibiotics to PO as soon as possible to conserve supplies and equipment.

Table 11. TCCC Antibiotics

TCCC Antibiotics	
Moxifloxacin (Avelox®)	Administer 400mg PO daily for 10 days
Ertapenem (Invanz®)	Administer 1g daily IV/IO/IM for 10 days
IV/IO to PO transition	When transitioning from Ertapenem to Moxifloxacin, begin Moxifloxacin immediately after the final dose of Ertapenem for antibiotic overlap

Table 12. Alternative Antibiotics

(used if supplies of TCCC antibiotics are limited, or as directed by medical control)

Alternate Antibiotics			
	Good	**Better**	**Best**
Soft Tissue Injury	Cefalexin PO or Bactrim DS PO Topical: Bacitracin	Cefazolin IM/IV/IO	Moxifloxacin PO or Ertapenem IV/IO Topical: Mupriocin
Suspected MRSA	Topical: Mupirocin	Ertapenem IV/IO	Moxifloxacin PO or Ertapenem IV/IO + Vancomycin
Open Fx (I/II)	Beta-lactam Allergy: Clindamycin IV/IO	Cefazolin IV/IO	Ertapenem IV/IO or Moxifloxacin PO
Open Fx (III) no contamination	Beta-lactam Allergy: Clindamycin IV/IO + Levofloxacin IV/IO	Ceftriaxone IV/IO	Ertapenem IV/IO or Moxifloxacin PO
Open Fx (III) soil or fecal contamination	Beta-lactam Allergy: Levofloxacin IV/IO + Metronidazole IV/IO	Ceftriaxone IV/IO + Metronidazole IV/IO	Ertapenem IV/IO or Moxifloxacin PO
Penetrating Head Injury		Ceftriaxone IV/IO + Metronidazole IV/IO	Ertapenem IV/IO or Moxifloxacin PO
Penetrating Chest Injury			Ertapenem IV/IO or Moxifloxacin PO
Penetrating Abdominal Injury		Ceftriaxone IV/IO + Metronidazole IV/IO	Ertapenem IV/IO or Moxifloxacin PO

Alternate Antibiotics			
Burns (*only* when sepsis is suspected)			Ertapenem IV/IO or Moxifloxacin PO
Eye Injuries	Erythromycin ointment/drops	Ciprofloxacin drops (or if penicillin allergy)	Moxifloxacin PO or Ertapenem IV/IO
Dental Injuries	Pen-VK or Augmentin PO	Clindamycin PO (or IV/IO) or if penicillin allergy	Moxifloxacin PO or Ertapenem IV/IO

Sepsis Management

- Blunt or penetrating injuries may cause sepsis in untreated or undertreated patients
- Early recognition of impending sepsis and immediate treatment are imperative to improve changes of survival
- Maintain a high degree of suspicion for signs of early and/or progressing sepsis while performing continuous triage
- Sepsis is defined as suspected or proven infection plus evidence of end organ dysfunction.
- The National Early Warning Score (NEWS)[17] is an aggregate scoring system indicating early physiologic derangements:

Table 13. Physiologic Parameters and NEWS Score

Physiologic Parameters	**3**	**2**	**1**	**0**	**1**	**2**	**3**
Respiratory Rate	≤8		9-11	12-20		21-34	≥25
Oxygen Saturation	≤91	92-93	94-95	≥96			
Temperature	≤35.0		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	
Systolic BP	≤90	91-100	101-110	111-219			
Heart Rate	≤40		41-50	51-90	91-110	111-130	≥131
Level of Consciousness				A			V,P,U

- For the purposes of this guideline, a NEWS score of >2 is used to increase the sensitivity for detection of and evaluation for sepsis.
- Early teleconsultations should be used for any signs of sepsis
- Additional parenteral antibiotics may be required to treat sepsis as well as vasopressors.
- All use of pressers should be administered by role-based approved protocols or teleconsultation approval.

NOTE: Surgical telemedicine consultation is highly recommended to guide management of intra-abdominal infections (i.e. appendicitis, cholecystitis, diverticulitis, abdominal abscess).

Sepsis Treatment

Table 14. Sepsis Treatments/Interventions

Intervention	Paradigm
Antimicrobial Therapy	▪ **Minimum** - Moxifloxacin 400 mg PO daily ▪ **Better** - Ertapenem 1 gram IV/IO every 24 hours OR ceftriaxone 2 grams IV/IO every 24 hrs ▪ **Best -** ceftriaxone 2 grams IV/IO every 24 hrs., PLUS vancomycin 1.5 mg/kg IV/IO every 12 hours, PLUS metronidazole 500 mg IV/PO/IO every 8 hours
Antiparasitic Regimens	▪ **Minimum** - Atovaquone/progauanil (Malarone) 4x3 regimen - 4 tablets PO daily for 3 days ▪ **Better/Best** - Artemether/lumefantrine (Coartem) 4 tablets PO initially, then 4 tablets after 8 hours, then 4 tablets PO twice daily for 2 more days (24 tablets total)
Antifungal Regimens	▪ **Minimum/Better/Best** - Fluconazole 400 mg PO/IV daily

Fluid Resuscitation	▪ **Minimum** - In the absence of IV/IO capability, have the patient drink water
	▪ If available, include electrolyte oral rehydration solution, especially for patients who cannot consume food
	▪ **Better** - IV/IO crystalloids:
	  ▪ Initial rapid infusion of 30 ml/kg should be given upon identification of sepsis
	  ▪ LR or NS to maintain SBP > 90mmHg or MAP ≥ 65 mmHg
	  ▪ If plasma is being given that volume can count toward the 30 ml/kg goal
	▪ **Best** - The same fluid resuscitation strategy as above with the addition of a urinary catheter for more precise measuring of UOP

Vasopressors	▪ After fluid resuscitation, if there is no observed positive change in SBP, MAP, UOP and/or mental status, vasopressor medications should be given ▪ *All use of pressers should be administered by role-based approved protocols or teleconsultation approval* ▪ **First-line** - norepinephrine infusion ▪ **Second-line** - epinephrine infusion ▪ Refer to Drip table below for preparation, starting dose, and drip rates
Additional Medications	▪ Consider hydrocortisone or dexamethasone administration for possible adrenal insufficiency if there is a poor response to vasopressor initiation/titration ▪ Administer antipyretics (acetaminophen, if available. Non-steroidal anti-inflammatory drugs [NSAIDs] should be avoided as they may impair renal function)

Table 15. Epinephrine 1:10,000 (Adrenaline) or Norepinephrine (Levophed) Drip

0.9% NaCl IVF Bag Size	Add to bag: EPI (or NOREPI): 1:10,000 (0.1 mg or 100mcg)/mL	Starting Dose (mcg/min)	DRIP SET:10gtts (Drops/mL) DRIP RATE: (Drops/min or gtts/min)	DRIP SET: 15gtts (Drops/mL) DRIP RATE: (Drops/min or gtts/min)
50 mL	1mL (100mcg)	4 mcg/min	20 drops/min	30 drops/min
100 mL	2mL (200mcg)	4 mcg/min	20 drops/min	30 drops/min
250 mL	5mL (500mcg)	4 mcg/min	20 drops/min	30 drops/min
500 mL	10mL (1mg)	4 mcg/min	20 drops/min	30 drops/min
1000 mL (1L)	20mL (2mg)**	4 mcg/min	20 drops/min	30 drops/min

**This is the least recommended approach as it commits a high volume of epinephrine to a large bag. If the patient's vital signs (BP/MAP/HR) stabilize, the bag must be discontinued and the medic risks wasting some of their resources – "you can mix a drug in an IV bag, but you can't take it out."

Ancillary Medications

During PCC, additional medications may be required during the extended treatment of casualties, in addition to pain and antibiotic medications. These medications may have synergistic effects to further reduce pain or fever. Some medications may be utilized to treat side-effects of medications, to include nausea or other GI related issues.

Deep vein thrombosis (DVT) prophylaxis is also recommended for patients that are expected to be in a PCC setting for greater than 48 hours that have achieved hemostasis from wounds or are not at risk for further hemorrhage.

Table 16. Ancillary Medications

	Minimum	Better	Best
Airway	Albuterol MDI Suctioning: Sterile water or 0.9% saline	Albuterol (Neb)	Albuterol (Neb) + Atrovent (Neb)
*Antipyretic	Meloxicam	Acetaminophen PO/PR or Ibuprofen	Acetaminophen IV/IO or Ketoralac IM/IV/IO
Anxiety / Behavioral	See "Pain and Sedation"		
DVT Prophylaxis	Aspirin PO	Heparin SQ	Lovenox SQ
Hydration (PO)	Water	Water + salt + sugar	Water + Gatorade (or other oral rehydration salt)
Hydration (IV/IO)	0.9% Saline or Lactated Ringers	Plasma-Lyte	
Nausea / Vomiting	Alcohol Pad (inhale vapor)	Ondansetron PO or ODT	Ondansetron IV/IO or Metoclopramide IV/IO
GI Medications	Ranitidine PO	Prilosec PO	Protonix IV/IO H1/H2 Blockers IV/IO
GI - Constipation	Bisacodyl PO Glycerin Suppository	Mirilax PO Senna PO	Enema
Sleep	Melatonin PO	Diphenhydramine PO	Zolpidem PO Temazepam PO
Other Medications:	▪ Oral Care (toothbrush/tooth paste and chapstick) ▪ Eye drops (intubated/sedated) ▪ Multi-Vitamins (PO daily) ▪ Animal Bites: Rabies Vaccine and Rabies Immunoglobulin ▪ HIV Prophylaxis (exposure from combat: civilians or enemy forces): PEP Guidance ▪ Regional Medications: Ensure continuing prophylaxis (malaria, etc)		

*Antipyretic: Use caution with NSAIDs with urgent or priority patients. Ensure patient can void normally (no impaired renal function).

*Link to Infection Prevention in Combat-related Injuries, 27 Jan 2021 CPG [18]

*Link to Sepsis Management in Prolonged Field Care, 28 Oct 2020 CPG [19]

WOUND CARE AND NURSING - PCC

Background

Nursing interventions may not appear important to the medical professionals caring for a patient, but such interventions greatly reduce the possibility of complications such as DVT, pneumonia, pressure sores, wound infection, and urinary tract infection; therefore, essential nursing and wound care should be prioritized in the training environment. Critically ill and injured casualties are at high risk for complications that can lead to adverse outcomes such as increased disability and death. Nursing care is a core principle of PCC to reduce the risk of preventable complications and can be provided without costly or burdensome equipment.[20]

- Using a nursing care checklist assists with developing a schedule for performing appropriate assessments and interventions.
- Cross training all team members on these interventions prior to deployment will lessen the demand on the medic, especially when caring for more than one patient.
- Prolonged Casualty Care Flowsheets, Nursing Care Checklists, Nursing Care Plans, Assessment/Intervention Packing List, and Recommended Nursing Skill Checklist for Clinical Rotations are included as a PCC Guidelines Appendix. (Also located in JTS Nursing Intervention in Prolonged Field Care CPG, 22 Jul 2018 [18]).

Pre-deployment, Mission Planning, and Training Considerations

- Hands-on experience is optimal; simulation is a reasonable substitute
- Practice with minimal technology so you are prepared when you lose access to electricity, water
- Regular monitoring, reassessment, and intervention is lifesaving but can be resource-intensive
- Utilize the Recommended Nursing Skill Checklist for Clinical Rotations included in Appendix B to maximize training opportunities.

Table 17. PCC Role-based Guidelines for Nursing Care and Wound Management

PCC Role-based Guidelines for Nursing Care and Wound Management						
TCCC-ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP	**** All Personnel - Complete Basic TCCC Management Plan for Nursing/Wound Management then:*** ▪ Many "nursing" interventions are actually basic soldier skills that need to be performed on those casualties who cannot perform them on themselves. ▪ Therefore, many traditional non-medical tasks are listed at the Tier 1 level since they can essentially be performed by anyone, but the activity can be overseen by medical personnel.		
				Interventions	Frequency	Paradigm
				Lip care	Every hour	▪ **Minimum**: Commercial lip balm ▪ **Better**: Moisturizing lotion ▪ **Best**: Petroleum jelly
				Oral/Nasal Care	24 hours	▪ **Minimum**: Rotate site around mouth/nares, as feasible. ▪ **Better**: Rotate site and suction. ▪ **Best**: Rotate and suction with commercial device.
				Oral/Dental Care	Every 12 hours	▪ **Minimum**: Brush with gauze, water and gloved finger ▪ **Better**: Brush with tooth brush with toothpaste. ▪ **Best**: Use tooth brush with Chlorhexidine rinse.
				Cough/Deep Breathing	Every hour	▪ **Minimum**: Encourage deep breathing/forced cough x 10. ▪ **Better**: Sit up. Encourage deep breathing/forced cough x 10. ▪ **Best**: Sit up, turn, and encourage deep breathing with incentive spirometer/forced cough x 10.
				Repositioning/ Check Padding	Every 2 hours	▪ **Minimum**: Turn to opposite side, pad with clothing or textiles. ▪ **Better**: Turn to opposite side, pad with pillows or blankets. ▪ **Best**: Turn to opposite side, pad with pillows to all bony prominences and between legs.
				Splint Care	Every 2 hours	▪ **Minimum**: Use improvised splints (i.e. wood fence, plank). ▪ **Better**: Use commercial splinting device (e.g., SAM splint). ▪ **Best**: Use ortho-fiberglass splint with fluffing and elastic wrap. ▪ ** Re-check all pulses after splint placemen.t
				Hypothermia Prevention	Continuous	▪ **Minimum**: Wrap patient in dry clothes or blankets. ▪ **Better**: Wrap patient in commercially available hypothermia prevention kit, using air-activated heating element. ▪ **Best**: As above, add use of warmed, forced air and infusion of warmed fluids using commercially available devices.
				Head Injury	Continuous	Elevate head of bed 30 degrees and then: ▪ **Minimum**: Lay patient against ruck sack/backpack ▪ **Better**: Pillows or blankets ▪ **Best**: NATO litter back rest
				Non-medical Interventions	Every hour	▪ **Minimum**: Distract the patient and perform guided imagery. ▪ **Better**: Splint wounds, pad boney prominences, provide ice packs to injured/swollen areas (or, alternate with warm packs). ▪ **Best**: As above, combine both elements.
				Psycho-social Needs	Continuous	▪ **Minimum**: Speak in calm tone, addressing casualty concerns, to reduce fear and anxiety. ▪ **Better**: Support with caring touch, listening to fears/concerns; explain all procedures. ▪ **Best**: Institute rest/sleep cycle system to minimize delirium.

Nutrition	Every 4-6 hours	▪ **Minimum**: If patient is alert, encourage oral food/water intake. ▪ **Better**: As above, use MRE protein powder mixed with water. ▪ **Best**: As above, use commercially available tube feeding products or protein shakes.
Hygiene	Every 24 hours	▪ **Minimum**: Rinse face, armpits, and groin with warm water, soap, and gauze roll. ▪ **Better**: As above, use baby wipes or wash cloth. ▪ **Best**: As above, use chlorhexidine-impregnated cleansing wipes.
Bowel Management	As required	▪ **Minimum**: Cleanse soiled skin as described for bath; reapply new dressings/hypothermia management as appropriate. ▪ **Better**: As above, add a cloth/linen/plastic barrier to protect wounds/hypothermia management kit from future soiling. ▪ **Best**: As above, add barrier cream to skin for protection against breakdown.

▪ Perform all recommended interventions from guidelines for above Tier level.
▪ Additional interventions include:

Intervention	Frequency	Paradigm
IV/IO Site Care		▪ **Minimum**: Flush intravenous catheter every 12 hours; change intravenous infusion tubing every 96 hours. ▪ **Better**: Flush intravenous catheter every 8 hours; change intravenous infusion tubing every 72 hours. ▪ **Best**: Flush intravenous catheter every 4 hours. Change intravenous infusion tubing every 48 hours. ▪ For IO: monitor the site closely for skin compromise (underneath the hub of the IO); if possible, convert to an IV within 24 hours.
Wound Irrigation	Every 24 hours	▪ **Minimum**: Irrigate wound with potable water (cooled before use if boiled) poured across wound ▪ **Better**: As above, use 10cc syringe and 18-gauge angio-catheter. ▪ **Best**: As above, using sterile saline or sterile water or appropriate antimicrobial cleaning solution (i.e. Dankins).
Dressing Change		▪ **Minimum**: Reinforce dressings. ▪ **Better**: Replace when soiled. ▪ **Best**: Change every 24 hours.

▪ Ensure above nursing interventions are completed by non-medical TCCC ASM and CLS personnel.
▪ Conduct inventory of all resources.
▪ Document all pertinent information on PCC Flowsheet (attached).
▪ Additional interventions include:

Intervention	Frequency	Paradigm
Suction mouth/airway, if indicated	As often as required	▪ **Minimum**: Toomey syringe attached to thin tubing ▪ **Better**: Manual suction device ▪ **Best**: Powered suction device
Monitor assisted ventilation	Continuous: every hour	▪ **Minimum**: Use bag-valve-mask ventilation. ▪ **Better**: Mechanical ventilator (without oxygen support), titrate settings based on pulse oximetry. ▪ **Best**: Mechanical ventilator (with oxygen support).
IV Fluid Calculation		▪ **Minimum**: Estimate fluid rate using infusion drip rate calculation. ▪ **Better**: Use “dial-a-flow” technology to control rate of infusion. ▪ **Best**: Use commercial infusion pump.

Deep Vein Thrombosis Prevention ***Pay attention to any wounds to the affected limb***	Every 1-2 hours	▪ **Minimum**: Massage lower extremities ▪ **Better**: As above; add application of compression stockings or elastic bandages to improve venous return. ▪ **Best**: As above; add application of commercial mechanical compression stockings.
Head Injury (Serial Neuro Exams)		▪ **Minimum**: Assess pupillary response, GCS and level of consciousness/orientation, every 8-12 hours; MACE Exam x 1. ▪ **Better**: Neuro exam (as above) every 4 hrs; MACE exam every 24 hrs. ▪ **Best**: Neuro exam (as above) every 1 hr, MACE exam every 24 hrs.
Hyperthermia Prevention/ Treatment		▪ **Minimum**: Expose skin to air. ▪ **Better**: Place cold, wet cloths to groin, neck, armpits (ice packs may cause hypothermia). ▪ **Best**: Use of cooled, forced air and infusion of cooled fluids using commercially available devices.
Administer Antibiotics		▪ **Minimum**: Provide oral or intramuscular injection of antibiotics per CPG. ▪ **Better**: Administer intravenous infusion of broad-spectrum antibiotics, per CPG. ▪ **Best**: Administer wound- or mechanism-specific antibiotics via intravenous infusion, as directed by provider oversight.
Pain Control		▪ **Minimum**: Intermittent dosing of analgesics, given: oral/intramuscular/intravenous/subcutaneous ▪ **Better**: Continuous infusion of analgesics ▪ **Best**: Regional nerve blocks

- Ensure nursing interventions noted above are completed by non-medical TCCC ASM and CLS personnel
- Conduct inventory of all resources
- Document all pertinent information on PCC Flowsheet (attached)
- Additional interventions include:

Intervention	Frequency	Paradigm
Suction Advanced Airway	Every hour	▪ **Minimum**: Manual suction device or improvised suction device, such as a 25cm length portion of IV tubing connected to a 60mL syringe ▪ **Better**: Open suction tube, suction machine ▪ **Best**: Closed inline suction tube, suction machine
Oro/naso-gastric Tube Management		▪ **Minimum**: Cleanse area and rotate position every 12 hours; flush with water every 12 hours (check residuals prior) ▪ **Better**: As above, every 8 hours (check residuals prior) ▪ **Best**: As above, every 4 hours (check residuals prior)
Foley Care	24 hours	▪ **Minimum**: Cleanse around catheter insertion site as part of bath, every 24 hours. ▪ **Better**: Cleanse around catheter insertion site using soap and water, every 12 hours. ▪ **Best**: Cleanse around catheter insertion site using chlorhexidine-impregnated cleansing wipes, every 12 hours.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

*Link to Nursing Intervention in Prolonged Field Care, 22 Jul 2018 CPG [20]
*Link to Acute Traumatic Wound Care in the Prolonged Field Care Setting, 24 Jul 2017 CPG [21]

SPLINTING AND FRACTURE MANAGEMENT - PCC

Table 18. Splinting and Fracture Treatment

Intervention	Paradigm
Litter Padding	▪ **Minimum** - Excess uniforms or other textiles ▪ **Better** - Blankets or military sleep pad ▪ **Best -** Blankets or military sleep pad
Splint Placement	▪ **Minimum** - Improvised splints (wood fence, metal plank, etc.) ▪ **Better** - Commercial splinting device (e.g., SAM splint) ▪ **Best -** Commercial splinting device (e.g., SAM splint) ▪ *Re-check all pulses after splint placement*
Pressure Injury Prevention	▪ Examine skin, including nares and mouth, for changes and ensure splints are fitted properly and pulses are present below splint. ▪ Monitor for allergic reactions to tape, developing erythema, excessive dryness, pressure indenting the skin, cracking, or breakdown. ▪ **Minimum** - As described above, every 2 hours ▪ **Better** - As above, adding padding to elevate bony prominences off of ground/litter/bed ▪ **Best -** As above, adding commercial barrier creams and pressure injury dressings (e.g., Mepilex) to bony prominences

Straps	▪ Patient secured for transport with padding/hypothermia considerations
	▪ All patient care items secured for flight or seaboard transport
	  ▪ Waterproof outer shell (HPMK)
	  ▪ Packaged to resist heavy wind from rotor wash and wind

Litter Padding	▪ **Minimum** - Allow casualty to maintain airway ▪ **Better** - Facial burns may be associated with inhalation injury. Aggressively monitor airway status and place the casualty in a recovery position IAW TCCC Guidelines ▪ **Best -** Given a trauma casualty who is unresponsive or has an airway obstruction, perform a Head-Tilt Chin Lift or Jaw-thrust maneuver to open the airway IAW with TCCC guidelines

Link to JTS Orthopaedic Trauma: Extremity Fractures CPG, 26 Feb 2020[22]

BURN TREATMENT - PCC

Background

- Interrupt the burning process
- Address any life-threatening process based on MARCH assessment as directed by TCCC.
- A burned trauma casualty is a trauma casualty first
- All TCCC skills can be performed through burned tissue

Burn Characteristics

- **Superficial burns (1st degree)** appear red, do not blister, and blanch readily.
- **Partial thickness burns (2nd degree)** are moist and sensate, blister, and blanch.
- **Full thickness burns (3rd degree)** appear leathery, dry, non-blanching, are insensate, and often contain thrombosed vessels

Table 19. PCC Role-Based Guidelines for Burn Management

▪ PCC Role-based Guidelines for Burn Management					
TCCC-ASM	**TCCC-CLS**	**TCCC-CMC**	**TCCC-CPP**	▪ Perform primary and secondary surveys for any trauma patient. Acute injuries found in the primary and secondary survey should be addressed as per standard trauma protocols ▪ Avoid becoming distracted by the appearance of burned tissues.	
				Intervention	Paradigm
				Airway (Roles 1a/1b/1c)	▪ **Minimum** - Allow casualty to maintain airway. ▪ **Better** - Facial burns may be associated with inhalation injury. Aggressively monitor airway status and place the casualty in a recovery position IAW TCCC Guidelines. ▪ **Best** - Given a trauma casualty who is unresponsive or has an airway obstruction, perform a Head-Tilt Chin Lift or Jaw-thrust maneuver to open the airway in accordance with TCCC guidelines.
				Fluid Resuscitation (Roles 1a/1b/1c)	▪ Estimate body total surface area (TBSA) burned using the Rule of Nines initially (DD Form 1380). ▪ Note - Superficial (First-degree burns) are NOT used in the TBSA calculation. ▪ If burns >20% TBSA, fluid resuscitation should be initiated as soon as IV/IO access is established. ▪ **Minimum** - Oral intake of water ▪ **Better** - Oral intake of electrolyte solution ▪ **Best** - Oral intake of electrolyte solution
				Hypothermia (Roles 1a/1b/1c)	▪ Hypothermia prevention is extremely important for burn patients. ▪ For Burns >20%, place the casualty in the Heat-Reflective Shell or Blizzard Survival blanket for the Hypothermia Prevention Kit to both cover the burned areas and prevent hypothermia.

Pain Control	Analgesia in accordance with the PCC Guidelines may be administered to treat burn pain.
Wounds (Roles 1a/1b)	▪ **Minimum** - Cover with clean sheet or dry gauze. Leave blisters intact. Avoid wet dressings. ▪ **Better** - Clean wounds by washing with any clean water (preferably with antibacterial soap if available), dress wounds with any available dressings; optimize wound and patient hygiene to the extent possible given the environment. ▪ **Best** - Clean wounds by scrubbing gently with gauze and clean water, followed by gauze dressing.
Wounds (Role 1c)	▪ **Best** - Clean wounds by scrubbing gently with gauze and **chlorhexidine gluconate solution (if available)** in clean water, followed by gauze dressing. Repeat daily. ▪ Monitor vital signs.
▪ Ensure all interventions noted above are completed by TCCC ASM and CLS personnel. ▪ Conduct inventory of all resources. ▪ Document all pertinent information on PCC Flowsheet (attached). ▪ Additional interventions include:	

Intervention	Paradigm
Airway (Roles 1a/1b/1c)	▪ **Minimum** - Allow casualty to maintain airway. ▪ **Better** - Facial burns may be associated with inhalation injury. Aggressively monitor airway status and consider early surgical airway for respiratory distress or oxygen saturation and/or EtCO2 (purple-gold colorimetric device). ▪ **Best** - Given a trauma casualty who is unresponsive or has an airway obstruction, consider early surgical airway.
Fluid Resuscitation (Roles 1a/1b/1c)	▪ **Minimum** - Oral intake of water. Rectal infusion of up to 500mL/h can be supplemented with oral hydration. ▪ **Better** - Oral intake of electrolyte solution. ▪ **Best** - Start intravenous (IV) or intraosseous (IO) administration immediately. NOTE - an IV/IO can be placed through burned skin if necessary. ▪ Use isotonic crystalloids (i.e. Lactated Ringers). ▪ DO NOT circumferentially tape lines around extremities; this may further impede circulation and cause limb ischemia as extremities swell during resuscitation. ▪ NO bolus (unless hypotensive, in which case, bolus only until palpable pulses are restored). ▪ Initial IV rate 500mL/h; start while completing initial assessment ▪ Give fluids per TCCC burn treatment guidelines. ▪ If resuscitation is delayed, DO NOT try to “catch up” by giving extra fluids. ▪ Blood products may be used in major burn resuscitation due to coagulopathy, anemia, and bleeding from escharotomy sites or other traumatic injuries. ▪ Maintain a UOP of 30-50mL/hr. in adults; decrease or increase isotonic fluid rate by 20-25% per hour. ▪ If UOP > 50 mL/hr., then decrease the fluid rate by 20-25% for the next hour and reassess. ▪ Minimize fluid administration while maintaining organ perfusion; hour-to-hour fluid management is critical.

	▪ **8-12 hours post-burn**, if the hourly IV fluid rate exceeds 1500mL/hr. or if the projected 24- hour total fluid volume approaches 250 mL/kg consult burn team or medical director. ▪ **24–48 hours post burn**, plasma is lost into the burned and unburned tissues, causing hypovolemic shock (when burn size is >20%). The goal of burn-shock resuscitation is to replace these ongoing losses while avoiding over-resuscitation. ▪ **48-72 hours post-burn**, completion of the resuscitation is marked by stabilizing hemodynamic parameters and reduction of IV fluid rate to a maintenance level.
Hypothermia (Roles 1a/1b/1c)	▪ Hypothermia prevention is extremely important for burn patients. ▪ For Burns >20%, place the casualty in the Heat-Reflective Shell or Blizzard Survival blanket for the Hypothermia Prevention Kit to both cover the burned areas and prevent hypothermia. ▪ Use Blood/Fluid Warmer as needed and if available.
Pain Control (Roles 1a/1b/1c)	Analgesia in accordance with the PCC Guidelines may be administered to treat burn pain.
Medications (Roles 1a/1b)	▪ Prophylactic antibiotics (oral or IV) are not indicated for burn injury in the absence of infection. ▪ Penetrating wounds or open fractures should be treated with antibiotics according to current TCCC guidelines.
Medications (Role 1c)	▪ After several days, if the patient develops cellulitis (spreading erythema around edges of burn), treat for gram-positive organisms, (e.g., cefazolin or clindamycin). ▪ If patient develops invasive burn wound infection (signs: sepsis/septic shock, changes in color of wound, possible foul smell of wound), treat with broad-spectrum antibiotics.
Wounds (Role 1a)	▪ **Minimum** - Cover with clean sheet or dry gauze. Leave blisters intact. Avoid wet dressings. ▪ **Better** - Clean wounds by washing with any clean water (preferably with antibacterial soap if available), dress wounds with any available dressings; optimize wound and patient hygiene to the extent possible given the environment. ▪ **Best** - Clean wounds by scrubbing gently with gauze and clean water, followed by gauze dressing. ▪ DO NOT debride blisters until the patient has reached a facility with surgical capability. ▪ Every patient with facial burns should have a thorough eye exam. Conduct an eye exam early, before edema begins. ▪ If a corneal injury is identified, use a rigid shield to cover the eyes and apply ophthalmic erythromycin or neomycin ointment every 2 hours.
Wounds (Roles 1b/1c)	▪ **Better** - Clean wounds and **debride loose skin** by washing with any clean water (preferably with antibacterial soap if available), dress wounds with any available dressings; optimize wound and patient hygiene to the extent possible given the environment. ▪ **Best** - Clean wounds by scrubbing gently with gauze and **chlorhexidine gluconate solution (if available**) in clean water, apply topical antimicrobial cream followed by gauze dressing.

Monitoring	▪ Monitor vital signs and urine output (UOP) closely. ▪ **Minimum** - Use other measures If unable to measure UOP, adjust IV rate to maintain HR less than 140, palpable peripheral pulses, good capillary refill, intact mental status. ▪ **Better** - Capture all spontaneously voided urine in premade or improvised (i.e. Nalgene® water bottle) graduated cylinder; >180mL every 6 hours is adequate for adults. ▪ **Best** - Measure UOP with Foley catheter (burns to the penis are NOT a contraindication to catheter placement).

- Ensure all above interventions are completed by TCCC ASM, CLS and CMC personnel.
- Conduct inventory of all resources.
- Document all pertinent information on PCC Flowsheet (attached.)
- Additional interventions include:

Intervention	Paradigm
Airway (Roles 1a/1b/1c)	▪ **Minimum** - Allow casualty to maintain airway. Edema after burn injury causes most supraglottic airway devices such as LMAs to be inadequate. ▪ **Better** - Facial burns may be associated with inhalation injury. Aggressively monitor airway status and consider early surgical airway for respiratory distress or oxygen saturation and/or EtCO2 (purple-gold colorimetric device). ▪ **Best** - Indications for endotracheal intubation include: a comatose patient, symptomatic inhalation injury, deep facial burns, and burns over 40% TBSA. ▪ Utilize an EMMA (or other Capnography) EtCO2 device if possible. ▪ Use a large-bore endotracheal tube if inhalation injury is suspected (Size 8 ETT or larger is preferred for adults). ▪ Secure ETT with cotton umbilical ties (standard adhesive ETT holders do not work around burned skin). ▪ Frequently reassess position of the ETT during the acute resuscitation period as edema waves and wanes.

Legend:	TCCC - ASM	TCCC-CLS	TCCC-CMC	TCCC-CPP

*Link to Burn Wound Management in Prolonged Field Care, 13 Jan 2017 CPG [23]

Special Considerations in Burn Injuries

Chemical Burns

NOTE: Refer to the JTS Inhalation Injury and Toxic Industrial Chemical Exposure CPG for additional information.

- Expose body surfaces, brush off dry chemicals, and copiously irrigate with clean water. Large volume (>20L) serial irrigations may be needed to thoroughly cleanse the skin of residual agents. Do not attempt to neutralize any chemicals on the skin.
- Use personal protective equipment to minimize exposure of medical personnel to chemical agents.
- White phosphorous fragments ignite when exposed to air. Clothing may contain white phosphorous residue and should be removed. Fragments embedded in the skin and soft tissue should be irrigated out if possible or kept covered with soaking wet saline dressings or hydrogels.
- Seek early consultation from the USAISR Burn Center (DSN 312-429-2876 (BURN); Commercial (210) 916-2876 or (210) 222-2876; email usarmy.jbsa.medcom-aisr.list.armyburncenter@health.mil).

Electrical Burns

- TCCC ASM and CLS personnel should remove the patient from the electricity source while avoiding injury themselves.
- For cardiac arrest due to arrhythmia after electrical injury, follow advanced cardiac life support (ACLS) protocol and provide hemodynamic monitoring if spontaneous circulation returns.
- Small skin contact points (cutaneous burns) can hide extensive soft tissue damage.
- Observe the patient closely for clinical signs of compartment syndrome.
- Tissue that is obviously necrotic must be surgically debrided.

NOTE: Escharotomy, which relieves the tourniquet effect of circumferential burns, will not necessarily relieve elevated muscle compartment pressure due to myonecrosis associated with electrical injury; therefore, fasciotomy is usually required.

- Compartment syndrome and muscle injury may lead to rhabdomyolysis, causing pigmenturia and renal injury.
- Pigmenturia typically presents as red-brown urine. In patients with pigmenturia, fluid resuscitation requirements are much higher than those predicted for a similar-sized thermal burn.
- Isotonic fluid infusion should be adjusted to maintain UOP 75-100 mL/hr. in adult patients with pigmenturia.
- If the pigmenturia does not clear after several hours of resuscitation consider IV infusion of mannitol, 12.5 g per liter of lactated Ringer's solution, and/or sodium bicarbonate (150 mEq/L in D5W). These infusions may be given empirically; it is not necessary to monitor urinary pH. In patients receiving mannitol (an osmotic diuretic), close monitoring of intravascular status via CVP and other parameters is required.

- Seek early consultation from the USAISR Burn Center (DSN 312-429-2876 (BURN); Commercial (210) 916-2876 or (210) 222-2876; email usarmy.jbsa.medcom-aisr.list.armyburncenter@health.mil).

Pediatric Burn Injuries

- Children with acute burns over 15% of the body surface usually require a calculated resuscitation.
- Place a bladder catheter if available (size 6 Fr for infants and 8 Fr for most small children).
- The Modified Brooke formula (3 mL/kg/%TBSA LR or other isotonic fluid divided over 24 hours, with one-half given during the first 8 hours) is a reasonable starting point. This only provides a starting point for resuscitation, which must be adjusted based on UOP and other indicators of organ perfusion. Goal UOP for children is 0.5-1mL/kg/hr.
- Very young children do not have adequate glycogen stores to sustain themselves during resuscitation. Administer a maintenance rate of D5LR to children weighing < 20 kg. Utilize the 4-2-1 rule: 4ml/kg for the first 10kg + 2ml/kg 2nd 10kg + 1ml/kg over 20kg.
- In children with burns > 30% TBSA, early administration may reduce overall resuscitation volume.
- Monitor resuscitation in children, like adults, based on physical examination, input and output measurements, and analysis of laboratory data.
- The well-resuscitated child should have alert sensorium, palpable pulses, and warm distal extremities; urine should be glucose negative.
- Cellulitis is the most common infectious complication and usually presents within 5 days of injury. Prophylactic antibiotics do not diminish this risk and should not be used unless other injuries require antimicrobial coverage (penetrating injury or open fracture).
- Most antistreptococcal antibiotics such as penicillin are successful in eradicating infection. Initial parenteral administration is advised for most children presenting with fever or systemic toxicity.
- Nutrition is critical for pediatric burn patients. Nasogastric feeding may be started immediately at a low rate in hemodynamically stable patients and tolerance monitored. Start with a standard pediatric enteral formula (i.e. Pediasure) targeting 30-35 kcal/kg/day and 2g/kg/day of protein.
- Children may rapidly develop tolerance to analgesics and sedatives; dose escalation is commonly required. Ketamine and propofol are useful procedural adjuncts.
- When burned at a young age, many children will develop disabling contractures. These are often very amenable to correction which may be performed in theater with adequate staff and resources.
- Seek early consultation from the USAISR Burn Center (DSN 312-429-2876 (BURN); Commercial (210) 916-2876 or (210) 222-2876; email burntrauma.consult.army@mail.mil).
- Opportunities for pediatric surgical care provided by Non-Governmental Organizations (NGOs) may be the best option but require the coordinated efforts of the military, host nation, and NGOs.

Rule of Nines

On the DD Form 1380 the percentage of coverage on the casualty's body will need to be documented. The Rule of Nines will help with the estimation. The below figure shows the approximation for each area of the body:

- Eleven areas each have 9% body surface area (head, upper extremities, front and backs of lower extremities, and front and back of the torso having two 9% areas each).
- General guidelines are that the size of the palm of the hand represents approximately 1% of the burned area.
- When estimating, it is easiest to round up to the nearest 10.
- If half of the front or rear area is burned, the area would be half of the area value.
- For example, if half of the front upper/lower extremity is burned, it would be half of 9%, or 4.5%. If half of the front torso is burned, say either the upper or lower part of the front torso, then it would be half of 18%, or 9%.
- Remember, the higher the percentage burned, the higher the chance for hypothermia.
- For children, the percentage of BSA is calculated differently due to the distinctive proportion of major areas.

Figure 2. Adult Rule of Nines

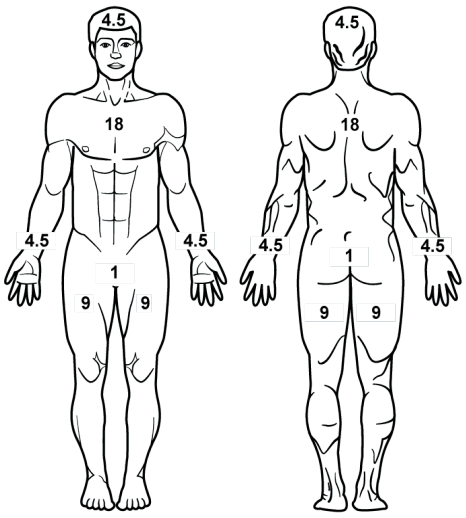
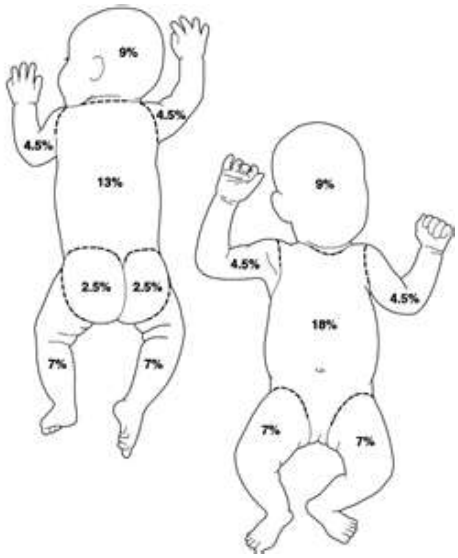


Figure 3. Pediatric Rule of Nines



Link to Burn Wound Management in Prolonged Field Care, 13 January 2017 CPG [23]

LOGISTICS - PCC

Background

Reducing the time to required medical or surgical interventions prevents death in potentially survivable illness, injuries and wounds. When evacuation times are extended, en route care (ERC) capability must be adequately expanded to mitigate the delay. In January 2010, the J*oint Force Health Protection Joint Patient Movement Report stated* "the current success of the medical community is colored by the valiant ability to overcome deficiencies through 'just-in-time workarounds;' many systemic shortfalls are resolved and become transparent to patient outcomes. However, future operations may not tolerate current deficiencies." [24]

- Patient packaging is highly dependent upon the transportation or evacuation platform that is available
- If possible, rehearse patient packaging internally and with the external resources.
- Train with all possible assets, familiarizing them with standard operating procedures
- Ensure the patient is stable before initiating a critical patient transfer

Table 20. Logistics Interventions

Intervention	Paradigm
Prepare Documentation	▪ **Minimum** - TCCC Card - DA1380 ▪ **Better** - Prolonged Field Care Casualty Work Sheet ▪ **Best** - PCC Card with TCCC Card and any additional information, reference DA Form 4700 (SMOG 2021) for transport documentation standard.
Prepare Report	▪ Report should give highlights, expected course, and possible complications during transport. ▪ *The hand-off is the most dangerous time for the patient;* it is as important as treatments or medications. ▪ If it is rushed, things can easily be missed. ▪ Make sure you highlight non-obvious interventions and aspects of care (drugs given, repeat doses, etc.). ▪ **Minimum** - Verbal report describing the patient from head to toe with interventions or a SOAP note. ▪ **Better -** MIST (Mechanism, Interventions, Symptoms, Treatments) ▪ **Best** - MIST with appropriate SBAR (Situation, Background, Assessment, Recommendations) and pertinent labs and other diagnostic information
Prepare Medications	▪ **Minimum** - Prepare medication list with doses and time of next dose. ▪ **Better** - Above with additionally preparing next dose of medication for transport crew appropriately labeled. ▪ **Best** - Above with fresh IV fluids if indicated and fresh bags of drip medications with appropriate labeling and 72 hours of antibiotic for extended transports..
Hypothermia Management	▪ **Minimum** - Blankets ▪ **Better** - Sleep system and blankets. ▪ **Best** - HPMK with Ready Heat or Absorbent Patient Litter System (APLS). ▪ If possible, identify with tape the location of interventions or access points *on top of* hypothermia management to allow transport teams quick identification of location.

Intervention	Paradigm
Flight Stressor/ Altitude Management	▪ **Minimum** - Ear Protection and Eye Protection, if nothing available sunglasses and gauze may be used, if patient is sedated and intubated eyes can be taped shut. ▪ **Better** - Ear Pro and Eye Pro and blankets in all bony areas, Ear Protection and Eye Protection – foam ear plugs or actual hearing protection inserts, goggles. ▪ **Best** - Above with gastric tube (NG/OG) or chest tube for decompression, if indicated. Depending on altitude/platform, consider bleeding air of out bags of fluid.

Secure Interventions and Equipment	▪ **Minimum** - Tape:
	  ▪ Securely tape all interventions to include IVs, IOs, airway interventions, gastric tubes and TQs).
	  ▪ Oxygen tanks should be placed between the patients' legs and the monitor should be secured on the oxygen cylinder to prevent injury to the patient.
	  ▪ Pumps should be secured to the litter.
	▪ **Better** - Additional litter straps to secure equipment and extend the litter with back support as indicated for vented patients to prevent VAP
	▪ **Best** - Above. Use the Special Medical Emergency Evacuation Device (SMEED) to keep the monitor and other transport equipment off patient.

Prepare Dressings	▪ AE and Other MEDEVAC assets *do not routinely change dressings during transport*; therefore, ensure all dressings are changed, labeled, and secured before patient pick up. ▪ **Minimum** - Secure and reinforce dressings with tape, date, and time all dressings. ▪ **Better** - Change dressings within 24 hours of departure, secure as above. ▪ **Best** - Change and reinforce dressings within 4 hours of departure. Ensure additional Class VIII is available for any unforeseen issues in flight. ▪ **CAUTION -** Circumferential/constricting dressings MUST be limited/monitored due to swelling during prolonged aerial transport.
Secure the Patient	▪ **Minimum** - Litter with minimum of 2 litter straps. ▪ **Better** - Litter with padding (example: AE pad or Sleep Mat) with minimum of 3 litter straps. ▪ **Best -** Litter with padding and flight approved litter headrest with minimum of 3 litter straps. ▪ Additional litter straps can be used to secure patient or equipment.
Moving a Critical Care Patient	▪ **Minimum** - Two-person litter carry to CASEVAC/MEDEVAC platform. ▪ **Better** - Three-person litter carry to CASEVAC/MEDEVAC platform. ▪ **Best -** Four-person litter carry to CASEVAC/MEDEVAC platform.

*Link to Interfacility Transport of Patients between Theater Medical Treatment Facilities, 24 Apr 2018 CPG

REFERENCES

1. TCCC Guidelines. Deployed Medicine, 15 Dec 2021.
2. Kotwal RS, Howard JT, Orman JA, Tarpey BW, Bailey JA, Champion HR, Mabry RL, Holcomb JB, Gross KR. The effect of a Golden Hour Policy on the morbidity and mortality of combat casualties. JAMA Surg. 2016 Jan;151(1):15-24.
3. Kuckelman, J., Derickson, M., Long, W.B. et al. MASCAL Management from Baghdad to Boston: Top Ten Lessons Learned from Modern Military and Civilian MASCAL Events. Curr Trauma Rep 4, 138–148 (2018).
4. Gurney JM, Spinella PC. Blood transfusion management in the severely bleeding military patient. Curr Opin Anesthesiol. 2018;31: 207–214.
5. JTS, Damage Control Resuscitation (DCR) in Prolonged Field Care, 01 Oct 2018 CPG.
6. Eastridge BJ, Mabry RL, Sequin P, et al. Death on the battlefield (2001-2011): implications for the future of combat casualty care. J Trauma Acute Care Surg. 2012;73(6 Suppl 5):S431-7.
7. Hudson I, Blackburn MB, Mann-salinas EA, et al. Analysis of casualties that underwent airway management before reaching Role 2 facilities in the Afghanistan conflict 2008-2014. Mil Med. 2020;185(Suppl 1):10-18.
8. Blackburn MB, April MD, Brown DJ, et al. Prehospital airway procedures performed in trauma patients by ground forces in Afghanistan. J Trauma Acute Care Surg 2018;85(1S Suppl 2):S154-S160.
9. JTS, Airway Management in Prolonged Field Care, 01 May 2020 CPG
10. JTS, Documentation in Prolonged Field Care, 13 Nov 2018 CPG
11. JTS, Documentation Requirements for Combat Casualty Care, 18 Sep 2020 CPG
12. JTS, Hypothermia Prevention, Monitoring, and Management, 18 Sep 2012 CPG

13. Marr AL, Coronado VG, eds. Central Nervous System Injury Surveillance. Data Submission Standards-2002. Atlanta, GA: Centers for Disease Control and Prevention; 2004.
14. JTS, Traumatic Brain Injury Management in Prolonged Field Care, 06 Dec 2017 CPG
15. JTS, Analgesia and Sedation Management During Prolonged Field Care, 11 May 2017 CPG
16. JTS, Pain, Anxiety and Delirium, 26 Apr 2021 CPG
17. Keep JW, Messmer AS, Sladden R et al. National Early Warning Score at Emergency Department triage may allow earlier identification of patients with severe sepsis and septic shock: a retrospective observational study. Emerg Med J 2016;33:37–41.
18. JTS, Infection Prevention in Combat-Related Injuries, 27 Jan 2021 CPG
19. JTS, Sepsis Management in Prolonged Field Care, 28 Oct 2020 CPG
20. JTS, Nursing Intervention in Prolonged Field Care, 22 Jul 2018 CPG
21. JTS, Acute Traumatic Wound Management in the Prolonged Field Care Setting, 24 Jul 2017 CPG
22. JTS Orthopaedic Trauma: Extremity Fractures CPG, 26 Feb 2020
23. JTS, Burn Wound Management in Prolonged Field Care, 13 Jan 2017 CPG
24. Walrath, B. Searching for systems-based solutions to enhance readiness. Navy Medicine Live online blog.

APPENDIX A: TCCC GUIDELINES

TCCC Guidelines

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://deployedmedicine.com/market/31/content/40

APPENDIX B: AIRWAY RESOURCES

Nursing Care Checklist

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://prolongedfieldcare.org/wp-content/uploads/2018/05/PFC-Nursing-Care-Plan_.pdf

APPENDIX C: MASCAL RESOURCES

Triage Guiding Principles

- Priorities change based on time from injury
- Activities in first hour are **CRITICAL**
- Don't waste time with formal triage tools
  Just extricate/stop threat, stop external bleeding, clear airway
- Transfusion and ventilator support within the first hour identify a resource-intensive patient
- Damage control surgery has little impact after the first hour

Figure 4. TRIAGE cheat cards START

<table>
<tr><td colspan="5">START TRIAGE: Assess, Treat (use bystanders)
When you have a color: STOP – TAG – MOVE ON</td></tr>
<tr><td rowspan="8">MINOR</td><td colspan="4">Move walking wounded</td></tr>
<tr><td rowspan="7">DECEASED</td><td colspan="3">No RESPIRATIONS after head tilt</td></tr>
<tr><td rowspan="6">IMMEDIATE</td><td colspan="2">Breathing but UNCONSCIOUS</td></tr>
<tr><td colspan="2">Respirations over 30</td></tr>
<tr><td colspan="2">Perfusion capillary refill > 2 or NO RADIAL PULSE
Control bleeding</td></tr>
<tr><td colspan="2">Mental Status: unable to follow simple commands</td></tr>
<tr><td rowspan="2">DELAYED</td><td>Otherwise</td></tr>
<tr><td>Remember:
Respirations – 30
Perfusion – 2
Mental Status – Can Do</td></tr>
</table>

Table 21. Triage Assessment

Each Patient Triage Assessment Should Be Complete in Less Than 60 Seconds	
Category	**Examples**
Category I: Immediate (red chemlite)	▪ (Any MARCH issue) ▪ Airway obstruction ▪ Flail/open chest wound ▪ Tension- Pneumothorax/hemothorax ▪ Massive hemorrhage ▪ 20-70% Burns ▪ Unstable Vital Signs ▪ Severe TBI (unconscious alive Pt)
Category II: Delayed (green chemlite)	▪ Open fractures w/PMS intact ▪ Soft tissue injuries ▪ Moderate TBI (stable vital signs) ▪ Open abdominal wounds
***Category III: Minimal (no chemlite) remain armed continue to engage**	▪ Minor abrasions, burns, sprains lacerations ▪ Moderate/Mild anxiety ▪ Fractures/dislocations w/PMS ▪ Mild TBI
****Category IV: Expectant or Hero (blue chemlite)**	▪ Massive head or spinal injury ▪ Third degree burns > 70% BSA ▪ Injuries incompatible with life

** In combat, it is assumed that minimals will continue to stay armed/engaged if no mental status altering pharmaceuticals are given for pain.*

**Expectant category is ONLY used in combat operations and/or when the requirements to adequately treat these patients exceed the available resources. In peacetime, it is generally assumed that all patients have a chance of survival.

Source: Special Operations Force Medic Handbooks (PJ, Ranger)

Triage Class 1 (MASCAL)

Adequate medics to treat critical patients and handle the rest

- Many casualties
- Threat controlled
- Resources not severely limited
- Medical personnel can arrive
- Evacuation possible

Table 22. Triage Class 1 Actions and Goals

<1 Hour After Injury	1 – 4 Hours After Injury	>4 Hours After Injury
Goals	**Goals**	**Goals**
▪ Eliminate Threat ▪ Establish CCP ▪ Blood transfusion within 30 minutes ▪ Evacuate to DCR/DCS within 1 hour	▪ DCR/DCS as soon as possible ▪ Use advanced resuscitation to "extend the Golden Hour"	Evacuate
Actions	**Actions**	**Actions**
▪ Stop external bleeding ▪ Clear airway ▪ Ensure ventilation ▪ Formal triage ▪ Transfuse	▪ MARCH PAWS ▪ Transfuse	Use prolonged care to optimize outcomes

Triage Class 2 (MASCAL)

Unable to manage the number of critical patients

- Numerous casualties or MASCAL (i.e. < 100 Casualties)
- Threat has been controlled or partially controlled
- Resources are very limited
- Medical personnel can arrive (may be delayed > 1 hour)
- Evacuation is possible (may be delayed > 1 hour)

Table 23. Triage Class 2 Actions and Goals

<1 Hour After Injury	1 – 4 Hours After Injury	>4 Hours After Injury
Goals	**Goals**	**Goals**
▪ Eliminate threat ▪ Get medical personnel on scene ▪ Begin evacuation of urgent but survivable patients	▪ Evacuate urgent and priority patients ▪ DCR/DCS as soon as possible	Evacuate remainder of patients
Actions	**Actions**	**Actions**
▪ Stop external bleed ▪ Clear airway ▪ Reserve intubation/transfusion ▪ CCP if able, otherwise get a count	▪ Formal triage ▪ MARCH PAWS if able ▪ Transfuse ▪ Establish CCP ▪ Utilize minimals/returns to duty	▪ Re-triage ▪ Complete MARCH PAWS ▪ Use prolonged care to optimize outcomes ▪ Wound/fracture management

Triage Class 3 (Ultra-MASCAL)

Absolutely overwhelming number of casualties

- Ultra-MASCAL (i.e. >100, possibly thousands of casualties)
- Threat is ongoing
- Resources are severely limited
- Medical personnel unable to arrive in < 1 Hour
- Evacuation not possible in < 1 Hour

Table 24. Triage Class 3 Actions and Goals

<1 Hour After Injury	1 – 4 hours After Injury	>4 Hours After Injury
Goals	**Goals**	**Goals**
▪ Respond to threat ▪ Self-aide, buddy care ▪ Separate ambulatory/ non-ambulatory	▪ Eliminate threat ▪ Get medical personnel on scene ▪ Begin evacuation	▪ Evacuate ▪ Distribute patients
Action	**Action**	**Action**
▪ Stop external bleed ▪ Clear airway ▪ Reverse intubation/ transfusion ▪ Get a count	▪ Stop external bleed ▪ Reserve intubation/transfusion ▪ Begin to establish CCPs ▪ Utilize minimals/return to Duty	▪ Formal triage ▪ Use prolonged care to optimize outcomes ▪ Wound/fracture management ▪ Utilize minimals/return to duty

MASCAL/Austere Team Resuscitation Record

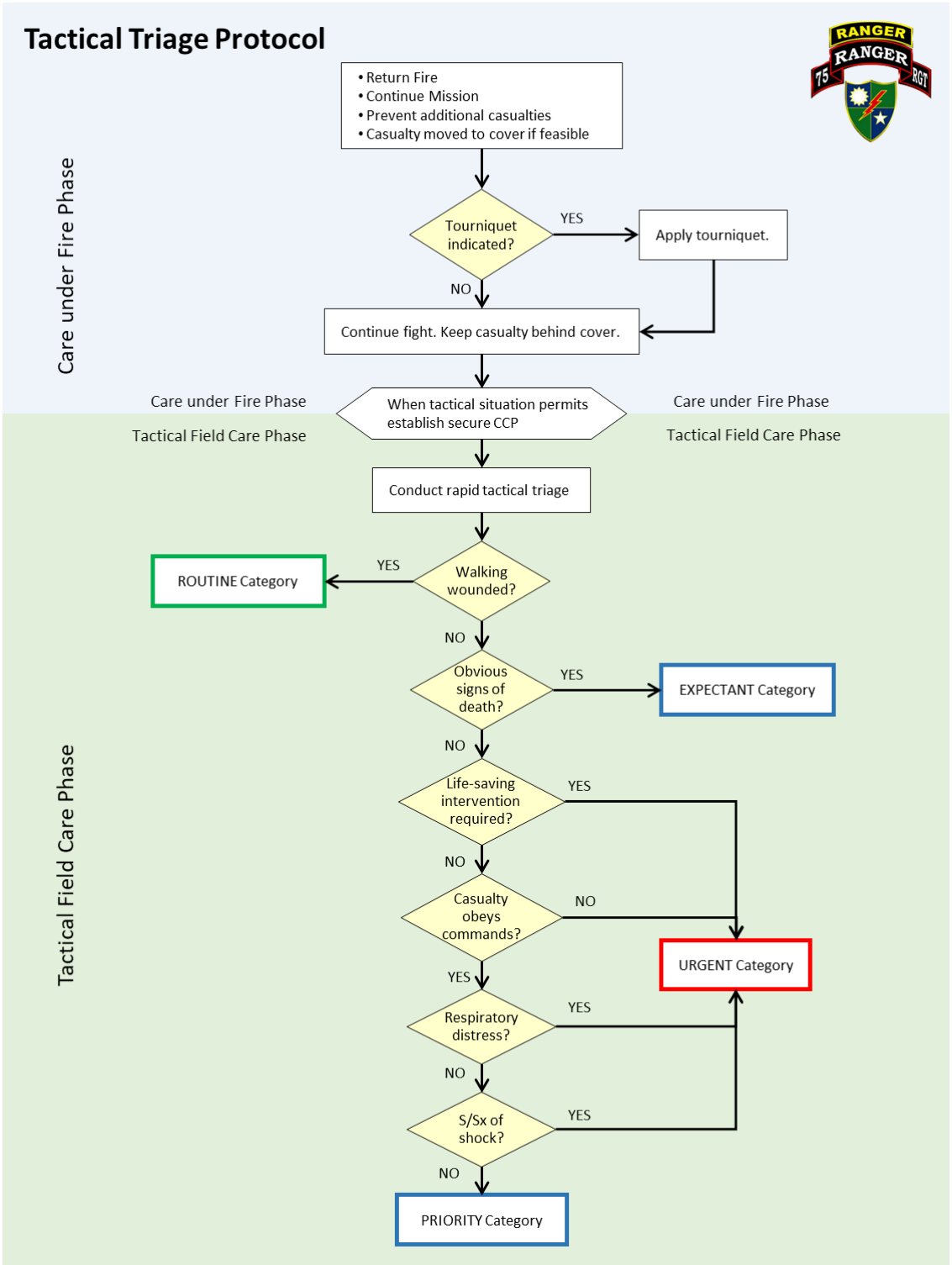
Open the attachment on the side menu or open the below link to print or fill out electronically.

https://jts.amedd.army.mil/assets/docs/forms/MASCAL_Austere_Trauma_20_Jan_2020.pdf

Instructions: https://jts.amedd.army.mil/assets/docs/forms/MASCAL_Form_Instructions.pdf

Tactical Triage Protocol (algorithm)

Figure 5. Tactical Triage Protocol



APPENDIX D: DOCUMENTATION RESOURCES

The following resources and associated links are included in this CPG as attachments.

- DD 1380 TCCC Card and accompanying POI TCCC After Action Report
- DD 3019 Resuscitation Record
- DA 4700 TACEVAC form
- Nursing care grid (See Appendix B.)
- Teleconsultation Script

DD 1380 TCCC Card

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://jts.health.mil/index.cfm/documents/forms_after_action

DD 1380 - POI TCCC After Action Report

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://jts.health.mil/index.cfm/documents/forms_after_action

DD 3019 Resuscitation Record

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd3019.pdf

DA 4700 TACEVAC Form

Open the attachment on the side menu or open the below link to print or fill out electronically.

Instructionshttps://jts.health.mil/index.cfm/documents/forms_after_action

Prolonged Field Care Casualty Card v22.1, 01 Dec 2020

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://jts.health.mil/assets/docs/forms/Prolonged_Field_Care_Casualty_Card-Worksheet.pdf

Virtual Critical Care Consultation Guide

Guide is to be used with the Prolonged Field Care Card.

1. Before calling, E-mail image of the casualty (wounds, environment, etc.), "capabilities" (back of page), & vital signs trends to _____ **2. If call not answered: a) call next number on PACE or call back in 5 – 10 min.** **3. If unable to provide information due to operational security, state so.**

P: **A:** **C:** **E:**

This is _____ I am a (job/ position) _____ **My best** contact info is: _____ **YOUR best** contact info is (Consultant's number): _____Alternate e-mail: _____

****** PAUSE POINT to CONFIRM CONTACT INFO******

I have a _____ year–old _____(sex) _____ (active duty/foreign national/OGA,etc.), who has the following:
Mechanism of Injury or known diagnosis(es) that occurred in (location)
The injury/start of care occurred *hours ago*. Anticipated *evacuation time* is (range)
Injuries/Problems/**S**ymptoms:
Treatments:
He/she is currently (circle) stable/ unstable, getting better/ getting worse/ getting worse rapidly
Known Medication Allergies/Past medical/Surgical history is:
I need help with (*be specific if possible, i.e. "I need help reading this ECG," or "I need help stabilizing this patient," etc.)*
Other Consultants have recommended:

****** PAUSE POINT for Remote Consultant to ask clarification questions ******

VITALS (*current* & *trend* as of): HR		BP	RR	SpO2	ETCO2
Temp…….					
UOP(ml/hr)	over		(# hours) Mental Status (GCS/ AVPU)		
EXAM: Neuro			Ext/ MSK		
Heart			Pulses		
Lungs			Skin/ Wounds		
Abd					
LABS: ABG:		Lactate:	Other:		

*** PAUSE POINT for Remote Consultant to ask clarification questions **

Virtual Critical Care Consultation Guide – page 2

Plans/Recommendations		
PRIORITY	**SYSTEM/PROBLEM**	**RECOMMENDATION**
	Neuro or problem #1	
	CV or problem #2	
	Pulm or problem #3	
	GI or problem #4	
	Renal or problem #5	
	Endocrine or problem #6	
	MSK/ Wound or problem #7	
	Tubes, lines, drains or problem #8	
	Prophylaxis/prevention or prob#9	
	Other	

TO-DO/ FOLLOW-UP/TO-STOP	**NOTES**
1.	
2.	
3.	
4.	
5.	
6.	

****** PAUSE POINT, for Medic/Local Caregiver to ask clarification questions/READBACK******

Available "kit" (supplies, equipment, medications) !! IF POSSIBLE PHOTOGRAPH AND SEND VIA EMAIL BEFORE CALLING !!

IV access: IV Central line IO (location) Other:_____

Monitor: Propaq Tempus Foley Graduated urinal PulseOx only Exam Only
Other:_____

Commo: Tempus i2i ID: _____THIAB:_____SAT#_____Local Cell#_____
Web VTC Address_____
Other (e.g. "FaceTime, VSee, Skype, etc.):_____

IV Fluids: Plasma-Lyte LR Normal Saline 3% saline
Other:_____

Colloids: Hetastarch Albumin
Other:_____

Blood products: Whole blood PRBC Plasma FDP Platelets
Other:_____

Medications: Antibiotics: name/route/dose_____
Morphine IV/ PO Other opioid (name/ IV/ PO):
_____
Fentanyl IV/ PO (pop) Ketamine
Midazolam Diazepam (IV/ PO)
TXA Other(s):
_____

Airway supplies: ETT Cric kit LMA Ventilator BVM O2 Suction

Misc:

APPENDIX E: TBI RESOURCES

Neurological Examination

MENTAL STATUS

Level of Consciousness: Note whether the patient is:

- Alert/responsive
- Not alert but arouses to verbal stimulation
- Not alert but responds to painful stimulation
- Unresponsive

Orientation: Assess the patient's ability to provide:

- Name
- Current location
- Current date
- Current situation (e.g., ask the patient what happened to him/her)

Language: Note the fluency and appropriateness of the patient's response to questions. Note patient's ability to follow commands when assessing other functions (e.g., smiling, grip strength, wiggling toes). Ask the patient to name a simple object (e.g., thumb, glove, watch).

Speech: Observe for evidence of slurred speech.

CRANIAL NERVES

All patients:

- Assess the pupillary response to light.
- Assess position of the eyes and note any movements (e.g., midline, gaze deviated left or right, nystagmus, eyes move together versus uncoupled movements).
- Noncomatose patient:
- Test sensation to light touch on both sides of the face.
- Ask patient to smile and raise eyebrows, and observe for symmetry.
- Ask the patient to say "Ahhh" and directly observe for symmetric palatal elevation.
- Comatose patient:
- Check corneal reflexes; stimulation should trigger eyelid closure.
- Observe for facial grimacing with painful stimuli.
- Note symmetry and strength.
- Directly stimulate the back of the throat and look for a gag, tearing, and/or cough.

MOTOR

Tone: Note whether resting tone is increased (i.e. spastic or rigid), normal, or decreased (flaccid).

Strength: Observe for spontaneous movement of extremities and note any asymmetry of movement (i.e. patient moves left side more than right side). Lift arms and legs, and note whether the limbs fall immediately, drift, or can be maintained against gravity. Push and pull against the upper and lower extremities and note any resistance given. Note any differences in resistance provided between the left and right sides.

(NOTE: it is often difficult to perform formal strength testing in TBI patients. Unless the patient is awake and cooperative, reliable strength testing is difficult.)

Involuntary movements: Note any involuntary movements (e.g., twitching, tremor, myoclonus) involving the face, arms, legs, or trunk.

SENSORY

If patient is not responsive to voice, test central pain and peripheral pain.

Central pain: Apply a sternal rub or supraorbital pressure, and note the response (e.g., extensor posturing, flexor posturing, localization).

Peripheral pain: Apply nail bed pressure or take muscle between the fingers, compress, and rotate the wrist (do not pinch the skin). Muscle in the axillary region and inner thigh is recommended. Apply similar stimulus to all four limbs and note the response (e.g., extensor posturing, flexor posturing, withdrawal, localization).

NOTE: In an awake and cooperative patient, testing light touch is recommended. It is unnecessary to apply painful stimuli to an awake and cooperative patient.

GAIT

If the patient is able to walk, observe his/her casual gait and note any instability, drift, sway, and so forth.

Ultrasonic Assessment of Optic Nerve Sheath Diameter

If a patient is unconscious (i.e. does not follow commands or open eyes spontaneously), they may have elevated ICP. There is no reliable test for elevated ICP available outside of a hospital; however, optic nerve sheath diameter (ONSD) measurement is a rapid, safe, and easy-to-perform ultrasonographic assessment that may help identify elevated ICP when more definitive monitoring devices are not available.

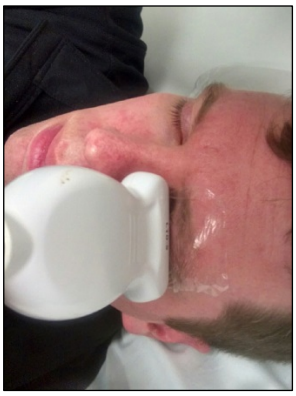
- The optic nerve sheath directly communicates with the intracranial subarachnoid space. Increased ICP, therefore, displaces cerebrospinal fluid along this pathway. Normal ONSD is 4.1–5.9mm.[30]
- A 10–5-MHz linear ultrasound probe can be used to obtain ONSDs. ONSD is measured from one side of the optic nerve sheath to the other at a distance of 3mm behind the eye immediately below the sclera.[31]
- In general, ONSDs >5.2mm should raise concern for clinically significant elevations in ICP in unconscious TBI patients.[5,32] The ONSD can vary significantly in normal individuals, so one single measurement may not be helpful; however, repeated measurements that detect gradual increases in ONSD over time may be more useful than a single measurement.
- ONSD changes rapidly when the ICP changes, so it can be measured frequently.[33] If ONSD is used, it is best to check hourly along with the neurologic examination.

Technique

1. Check to make sure there is no eye injury. A penetrating injury to the eyeball is an absolute contraindication to ultrasound because it puts pressure on the eye.
2. Ensure the head and neck are in a midline position. Gentle sedation and/or analgesia may be necessary to obtain accurate measurements.
3. Ensure the eyelids are closed.
4. If available, place a thin, transparent film (e.g., Tegaderm; 3M, http://www.3m.com) over the closed eyelids.
5. Apply a small amount of ultrasound gel to closed eyelid.
6. Place the 10(–5) MHz linear probe over the eyelid. The probe should be applied in a horizontal orientation (Figure 1) with as little pressure as possible applied to the globe.
7. Manipulate the probe until the nerve and nerve sheath are visible at the bottom of screen. An example of a proper ultrasonagraphic image of the optic nerve sheath can be seen in Figure 2.
8. Once the optic nerve sheath is visualized, freeze the image on the screen.
9. Using the device's measuring tool, measure 3mm back from the optic disc and then obtain a second measurement perpendicular to the first. The second measurement should cover the horizontal width of the optic nerve sheath (Figure 2). An abnormal ONSD is shown in Figure 3.
10. Repeat the previous sequence in the opposite eye. Annotate both ONSDs on the PFC Casualty Card.
11. ONSDs should be obtained, when possible, at regular intervals to help assess changes in ICP, particularly when the neurologic examination is poor and/or unreliable (i.e. with sedation). Serial measurements with progressive diameter enlargement and/or asymmetry in ONSDs should be considered indicative of worsening intracranial hypertension.

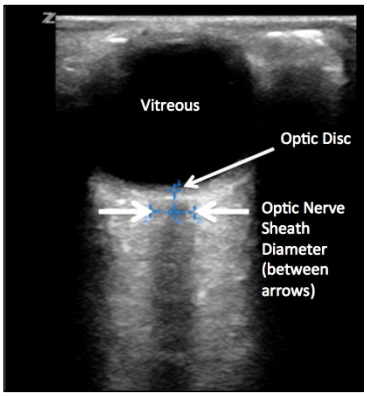
CAUTION: ONSD measurements are contraindicated in eye injuries. NEVER apply pressure to an injured eye.

Figure 1. *Appropriate placement of the linear probe.*



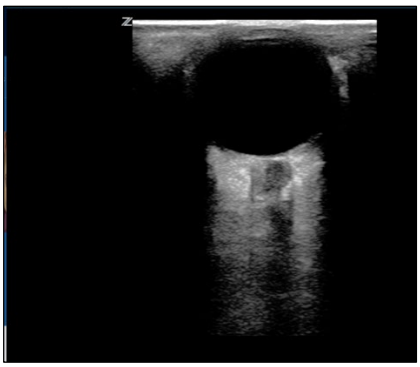
Ultrasound gel is placed over a closed eyelid and the probe placed horizontally over the eyelid, applying as little pressure to the globe as possible. If available, Tegaderm or other thin covering (e.g., Latex glove) should be placed over a closed eyelid for further protection.

Figure 2 *An ultrasonographic view of a normal eye and optic nerve sheath.*



To measure ONSD, apply the ultrasound measuring device to the optic disc and measure back 3mm along the length of the optic nerve. A second, perpendicular measurement is obtained at the previously measured point that spans the horizontal width of the optic nerve sheath. In this image, ONSD was determined to be 5.1mm, a normal value.

Figure 3*. Ultrasound image of the right optic nerve sheath of a 61-year-old man with a traumatic subdural hematoma.*



The optic nerve sheath measured 6.8mm in diameter. Elevated ICP was subsequently confirmed (26mmHg) after the placement of an ICP bolt monitor.

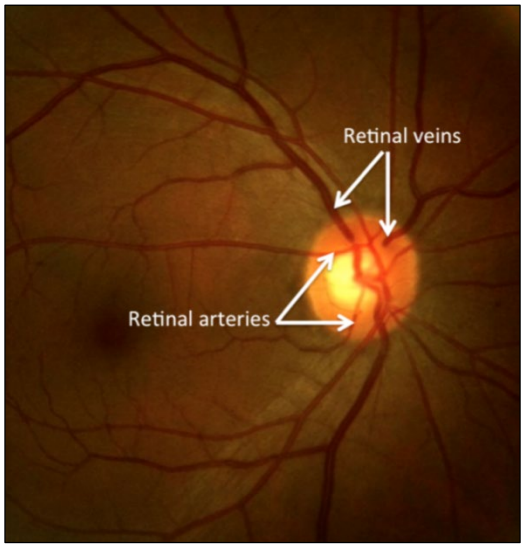
Spontaneous Venous Pulsations

- Spontaneous venous pulsations (SVPs) are subtle, rhythmic variations in retinal vein caliber on the optic disc and have an association with ICP.
- It is difficult to see SVPs without advanced equipment; however, if a handheld ophthalmoscope is available, it is worth an attempt to visualize the retinal veins.
- Don't worry if you cannot see SVPs; this may actually be normal. However, if you do see them, it is very reassuring that ICP is normal.[10]
- If SVPs are initially present and can no longer be seen on subsequent examinations, the provider should be concerned for increasing ICP.

Technique

1. Gently lift the eyelid until the pupil is in view.
2. Using a handheld ophthalmoscope, the provider should maneuver himself or herself to a position where the optic disc can be visualized.
3. Identify the retinal veins as they emerge from the optic disc. Retinal veins are typically slightly larger and darker than retinal arteries. Figure at right demonstrates the typical appearance of the retina.
4. Observe the retinal veins for pulsations. Note the presence or absence of spontaneous venous pulsations
5. Repeat the step 1–4 sequence in the contralateral eye.

Figure 6. Typical appearance of a healthy retina.



The retinal vessels can be seen emerging from the optic disc. Retinal veins can be identified by their slightly larger, thicker size and darker color. Retinal arteries are small, thin, and lighter in color than retinal veins.

Glasgow Coma Scale

TBI severity classification using the GCS score:

- Mild: 13–15
- Moderate: 9–12
- Severe: 3–8

Eye Opening	Verbal Response	Motor Response
4 – Spontaneous 3 – To verbal command 2 – To painful stimuli 1 – No response	5 – Oriented 4 – Confused 3 – Inappropriate words 2 – Incomprehensible sounds 1 – No response	6 – Obeys commands 5 – Localizes to painful stimuli 4 – Withdraws from pain 3 – Flexion to pain 2 – Extension to pain 1 – No response

Richmond Agitation Sedation Scale (RASS)

Score	Term	Description	
+4	Combative	Overtly combative, violent, immediate danger to staff.	
+3	Very Agitated	Pulls or removes tube(s) or catheter(s); aggressive.	
+2	Agitated	Frequent non-purposeful movement, fights ventilator.	
+1	Restless	Anxious but movements not aggressive vigorous.	
0	Alert, Calm		
-1	Drowsy	Not fully alert, but has sustained awakening (eye-opening/eye contact) to voice (≥10 seconds).	Verbal Stimulation
-2	Light Sedation	Briefly awakens with eye contact to voice (<10 seconds).	
-3	Moderate Sedation	Movement or eye opening to voice (but no eye contact).	
-4	Deep Sedation	No response to voice, but movement or eye opening to physical stimulation.	Physical Stimulation
-5	Unarousable	No response to voice or physical stimulation.	

Procedure for RASS Assessment	
1. Observe patient: Patient is alert, restless, or agitated.	Score 0 to+4
2. If not alert, state patient's name and say to open eyes and look at speaker	
- Patient awakens with sustained eye opening and eye contact.	Score -1
- Patient awakens with eye opening and eye contact, but not sustained.	Score -2
- Patient has any movement in response to voice but no eye contact.	Score -3
3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.	
- Patient has any movement to physical stimulation.	Score -4
- Patient has no response to any stimulation.	Score -5

*Sessler CN, Gosnell M. Grap MJ, Brophy GT, O'Neal PV, Keane KA et al. The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002; 166:1338-1344.
*Ely EW, Truman B, Shintani A., Thomason JWW, Wheeler AP, Gordon S et al. Monitoring sedation status over time in ICU patients: the reliability and validity of the Richmond Agitation Sedation Scale (RASS). JAMA 2003; 289:2983-2991.

Signs and Symptoms of Elevated Intracranial Pressure

- GCS<8 and suspected TBI
- Rapid decline in mental status
- Fixed dilated pupils(s)
- Cushing's triad hemodynamics (hypertension, bradycardia, altered respirations)
- Motor posturing (unilateral or bilateral)
- Penetrating brain injury and GCS <15
- Open skull fracture

Hypertonic Saline (HTS) Protocol (goal Na 140-165 meq/L)

- 3% HTS: 250-500 cc bolus, then 50 ml/hr infusion, rebolus as needed for clinical signs
- 7.5% HTS: decrease above doses by 50%
- 23.4%: dilute to 3% and use as above. If unable to dilute, can be given as 30 ml bolus and re-dose as needed.
- Central venous line (CVL) preferred for 3% (can be given initially via peripheral IV/IO)
- CVL **REQUIRED** for 7.5% or higher concentration

Military Acute Concussion Evaluation 2 (MACE 2) Form, 2021

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://www.health.mil/Reference-Center/Publications/2020/07/30/Military-Acute-Concussion-Evaluation-MACE-2

MHS Progressive Return to Activity Following Acute Concussion/Mild TBI

Open the attachment on the side menu or open the below link to print or fill out electronically.

https://jts.health.mil/index.cfm/documents/forms_after_action

APPENDIX F: LOGISTICS RESOURCES

Prolonged Field Care – Patient Packaging, 11 Aug 2021

Patient packaging is highly dependent upon the Casualty Evacuation (CASEVAC) / Medical Evacuation (MEDEVAC) platform that is operationally available. If possible, rehearse patient packaging internally and with the external resources. Train with MEDEVAC assets understand transporting teams' standard operating procedures in order to best prepare the patient for transport. (Example some teams want to secure the patient and interventions themselves while others may be okay with a fully wrapped patient).

Ensure the patient is stable before initiating a critical patient transfer. For POI/unstable patients ensure the appropriate transport team (MEDEVAC with en route critical care nurse or advanced provider). Interfacility transfers should meet the following minimum:

1. Hemorrhage control
2. Resuscitation adequate (SBP 70-80 mmHg, MAP >60, or UOP >0.5ml/kg/hr)
3. Initial post-op recovery as indicated
4. Stabilization of fractures

Prepare Documentation

- **Good**: TCCC Card - DA1380
- **Better**: Prolonged Field Care Casualty Work Sheet
- **Best**: PFC Card with TCCC Card and any additional information, reference DA Form 4700 (SMOG 2021) for transport documentation standard

*preference: secure to patient strip of 3in Tape with medications administered attached to blanket or HPMK

Prepare Report

Report should give highlights, expected course, and possible complications during transport. The hand-off is the most dangerous time for the patient it is as important as treatments or medications. If it is rushed things can easily be missed.

- **Good**: Verbal report describing the patient from head to toe with a SOAP note.
- **Best**: MIST (Mechanism, Interventions, Symptoms, Treatments)
- **Better**: MIST with appropriate SBAR (Situation, Background, Assessment, Recommendations) and pertinent labs and other diagnostic information

Prepare Medications

- **Good:** Prepare medication list with doses and time of next dose
- **Better**: Above with additionally preparing next dose of medication for transport crew appropriately labeled.
- **Best**: Above with fresh IV fluids if indicated and fresh bags of drip medications with appropriate labeling and 72 hours of antibiotic for extended transports.

Hypothermia Management

- **Good**: Blankets
- **Better**: Sleep system and blankets
- **Best**: HPMK with Ready Heat or Absorbent Patient Litter System (APLS)

Flight Stressor/ Altitude Management

- **Good**: Ear Protection and Eye Protection, if nothing available sunglasses and gauze may be used, if patient is sedated and intubated eyes can be taped shut
- **Better**: Ear Pro and Eye Pro and blankets in all bony areas, Ear Protection and Eye Protection – foamies or actual hearing protection inserts, goggles
- **Best**: Above with gastric tube (NG/OG) or chest tube for decompression, if indicated. Depending on altitude/platform, consider bleeding air of out bags of fluid.

Secure Interventions and Equipment

- **Good**: Tape (securely tape all interventions to include IVs, IOs, Airway interventions, Gastric Tubes and TQs). Oxygen tanks should be placed between the patients legs and the monitor should be secured on the oxygen cylinder to prevent injury to the patient. Pumps should be secured to the litter
- **Better**: Additional litter straps to secure equipment and extend the litter with back support as indicated for vented patients to prevent VAP.
- **Best**: Above and use the SMEED to keep the monitor and other transport equipment off patient

*if possible, identify with tape the location of interventions or access points on top of hypothermia management to allow transport teams quick identification of location.

Prepare Dressings

Air Evacuation and other MEDEVAC assets do not routinely change dressings during transport; therefore, ensure all dressings are changed, labeled, and secured before patient pick up

- **Good**: Secure and reinforce dressings with tape, date, and time all dressings.
- **Better**: Change dressings within 24 hours of departure, secure as above.
- **Best**: Change and reinforce dressings within 4 hours of departure. Ensure additional Class VIII is available for any unforeseen issues in flight.

Secure the Patient

- **Good**: Litter with minimum of 2 litter straps
- **Better**: Litter with padding (example: AE pad or Sleep Mat) with minimum of 3 litter straps
- **Best**: Litter with padding and flight approved litter headrest with minimum of 3 litter straps (additional litter straps can be used to secure patient or equipment)

Moving a Critical Care Patient

- **Good**: Two person little carry to CASEVAC/MEDEVAC platform
- **Better**: Three person little carry on a rickshaw to CASEVAC/MEDEVAC platform
- **Best**: Four person little carry on a rickshaw to CASEVAC/MEDEVAC platform

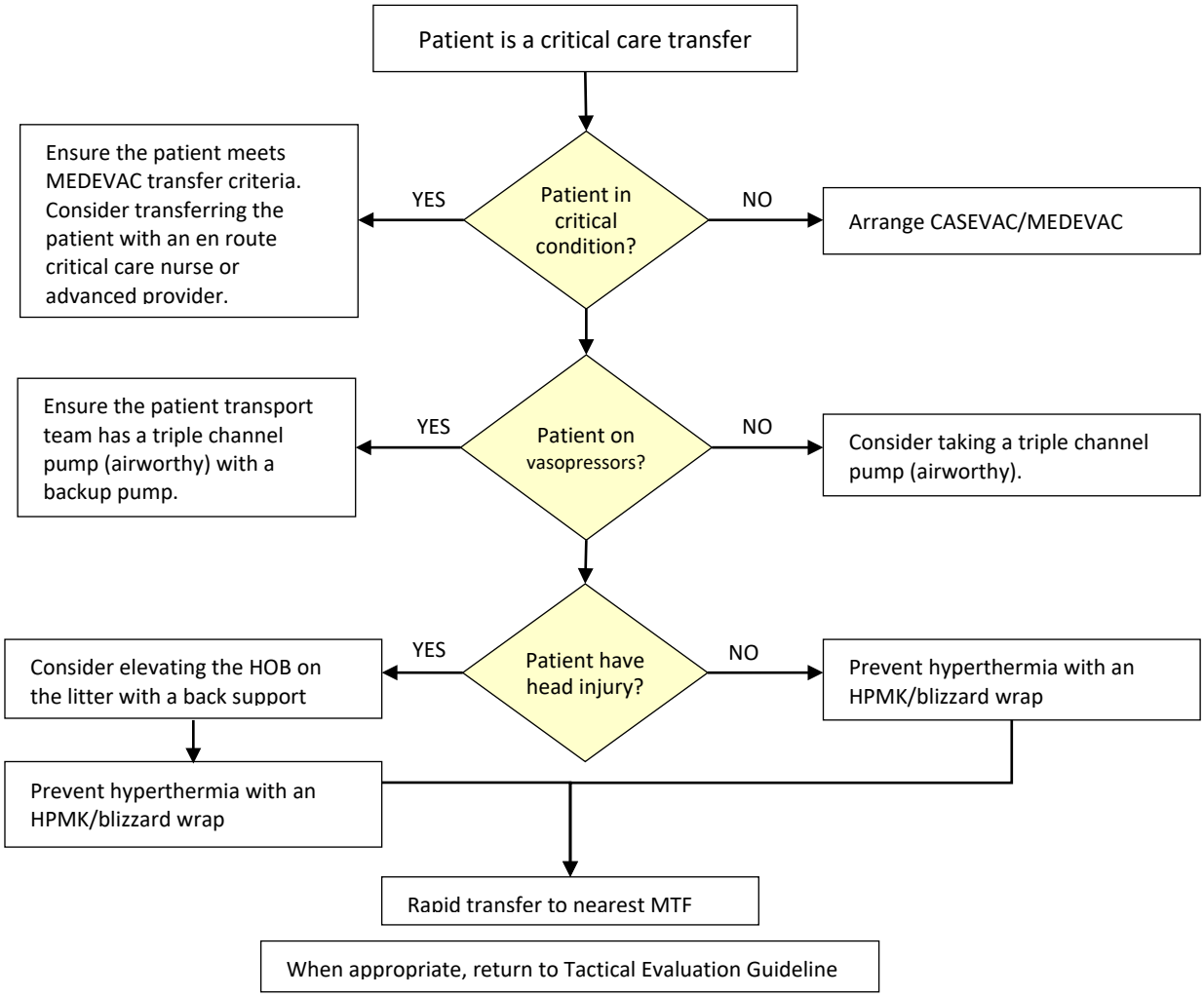
Prolonged Casualty Care Patient Packaging Flowchart

Equipment:

- Litter with at least three litter straps
- Three channel IV pump (airworthy)
- Cardiac monitor and cables
- Suction Device

Possible Complications:

- Inadequate medications
- Injuries not addressed before transport
- Inexperienced provider on flight
- Equipment issues



Pearls:

- Document all times – TCCC Card or DA4700.
- Assist Ensure the patient is stable before initiating a critical patient transfer.
- POI/unstable patients ensure the appropriate transport team (MEDEVAC W/ECCN or Advanced provider)
- Interfacility transfers should meet the following minimum:
  - Hemorrhage control
  - Resuscitation adequate (SBP 70-80 mmHg, MAP >60, or UOP >0.5ml/kg/hr)
  - Initial post-op recovery as indicated
  - Stabilization of fractures