JOINT TRAUMA SYSTEM CLINICAL PRACTICE GUIDELINE

Nursing Interventions, Wound Care, and Splint Management in Prolonged Casualty Care

The intent of this guideline is to provide non-medical and medical professionals who encounter extended casualty evacuation times in austere environments with evidence-based guidance for interventions necessary to improve casualty outcomes.

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TABLE OF CONTENTS

SUMMARY OF CHANGES

This CPG was updated to include guidance for both non-medical and medical responders. Where appropriate, these two were combined.

The introduction discusses changes to the Joint Trauma Lexicon regarding the distinction between Prolonged Casualty Care (PCC) and Prolonged Field Care (PFC). The title change from Nursing Interventions in PFC to PCC reflects these changes. In addition, the title reflects the Nursing Intervention, Wound Care, and Splint Management section titles in the PCC 2.0 Guidelines.

A PFC section was added for advanced procedures to be considered by properly trained individuals - advanced medical providers in the Role 1 environment.

Nursing Interventions (NI)/Wound Care/Splint Management in Prolonged Casualty Care (PCC) - Non-medical Personnel

#1 Be proficient in all aspects of Tactical Combat Casualty Care (TCCC)

PCC: Role 1 casualty care for extended periods of time due to delayed evacuation in any environment, location, or setting

Injured/Ill casualties are at a higher risk for complications due to impaired ability for basic activities of daily living

- NI/Wound Care/Splint Management reduce preventable complications without expensive heavy equipment.
- Pressure Sores/ Pneumonia/ Wound Infections/ Blood Clots are prevented with PCC responder capabilities.
- Cross-train all members of the team on the PCC interventions prior to deployment.

Assessment

- Reassess all MARCH-PAWS interventions
- Be familiar with PCC Flowsheet (Appendix A)
- Assist Medical Responder as needed

Nursing Interventions

Based on casualty's level of consciousness/condition

- **Hydration (oral if thirsty and can tolerate it)**
  - 2.1 – 2.6 L/day (100-125cc/hr at rest)
  - Oral rehydration solutions if available
- **Nutrition by mouth as tolerated**
- **Reposition/Check Padding every 1-2 hrs**
  - Pad bony prominences w/ pillow/clothes
  - Head of bed elevated 30 degrees if unconscious
  - Elevate all injured extremities
- **Oral Care**
  - Every 4 hours w/suction if unconscious
  - Brush teeth every 12 hours if awake
- **Skin Care**
  - Bed bath every 24 hours w/ spot cleaning as needed.
  - Check every 2 hour for soiling if unconscious
- **Mobilization/Ambulation**
  - Sit>stand>walk as able 2-3x/day
- **Deep Vein Thrombosis Prevention**
  - Exercises every 1-2 hours while awake
  - Dorsiflexion/Lower extremity massage (unconscious)
- **Range of motion exercises every 8 hours**
  - Every joint not impacted by injury
- **Cough, deep breathe x10 every hour**

Wound Care

- **Clean hands/clean environment/pain control**
- **No packaged dressing → clean cloth/soap/water**
- **Min: Wash wounds w/ soap/potable water**
- **Better: Dressing change every 24 hour**
  - Irrigate with potable water
  - Antimicrobial dressing for burns/contamination
- **Best: Dressing change as often as needed**
  - Sterile water/NS for irrigation
  - Examine wound for color/odor/drainage

Splint Management

- **Periodically reassess any TCCC splint for:**
  - Pressure points
  - Irritation
  - Excessive tightening
  - Missed underlying wounds
  - Unrecognized fractures
- **Any pain besides the fracture that is being stabilized → notify medical responder immediately**

Documentation

- DD1380(min) Frequency varies w/casualty severity
- SF600 for documenting care
- PCC Flowsheet + Nurse tracker (Appendix B) best
- Vital signs: pulse/resp/pain scale/skin color/temp
- Intake: Oral, intravenous, intraosseous, nasogastric, oral gastric (in cc)
- Output: Urine output, bowel movement, wound drainage, sweat

METRICS

- ✓ An initial assessment documented.
- ✓ Serial vital signs documented.
- ✓ Nursing interventions documented.
- ✓ Wound/dressing checks documented every 24 hours
- ✓ A splint assessment documented every 6 hours

This information is pulled from the evidence-based Joint Trauma System (JTS) Nursing Interventions Wound Care/Splint Management in PCC CPG. JTS CPGs can be found at the JTS CPG website or the JTS Deployed Medicine site.

Nursing Interventions (NI)/Wound Care/Splint Management in Prolonged Casualty Care (PCC) - Trained Medical Personnel

#1 Be proficient in all aspects of Tactical Combat Casualty Care (TCCC)

Prolonged Field Care (PFC): A continuation of PCC into aspects of care that can only be performed by trained medical personnel. ALL hands required to cover both PCC and PFC.

The interventions below build upon those covered for non-medical personnel

Assessment

- Verbal report/review TCCC documentation
- Reassess all MARCH-PAWS interventions
- Periodically reassess: improving/not-improving?
- Head-to-toe primary + secondary assessment
- Detailed problem list/care plan
- Teleconsultation

Nursing Interventions

- Hydration: U.O. > 0.5cc/kg/hr (200/hr if rhabdo)
- DVT signs/symptoms:
  - Swelling/ ↑warmth/ red discolored skin
  - Pain/ tenderness/ cramp/ ache
- Inspect/Monitor Tubes for position and function:
  - ETT/Cric/ OG/ NG/ IV/ Chest tube/ Foley
- Line Maintenance: flush lines with NS q8 minimum
- Suction Oral Airway
- Change IV Line, Bag, Tubing
  - IV: evidence of infection/block/infiltration
  - IO: discontinue 24hrs (48 max if IV issue)
  - Primary Tubing: q 7 days
- Appendix B

Documentation

- 1380 (min) → Appendix A + Appendix B (best)
- Vital Signs: frequency varies w/ casualty severity
  - Critical to monitor progress of casualty
- Min: Trend on flow sheet
  - BP est. via pulses/Mental status/GCS
  - HR via pulse check/ RR/ pain scale
  - Color /condition/ temp of skin
- Better: Manual BP and Temp
- Best: Portable monitor/automatic VS/ EtCO2

Wound Care

- Pain management prior to wound care:
- Examine & Irrigate wound q 24 hours
- Topical antimicrobial dressing for burns and contaminated wounds

Splint Management

- Periodic reassessment for unrecognized injuries
- Expect increased swelling for 2-5 days
- Re-check pulses at least every 6 hours or PRN pain
  - Every 2 hours if casualty unconscious
- Readjust or replace splints prn—stabilize joint above/below the fracture
- Examine skin around splint for pressure injuries
- Monitor for hypersensitivity/allergic reactions to tape
- Monitor for S/S of compartment syndrome

PFC Considerations

- **Suction advanced airway**
  - IV tube/60cc syringe (minimum)
  - Suction machine closed inline tube (best)
- **Foley catheter care (remove if possible)**
  - Daily + after BM / prn secretion buildup
  - Warm water/non-irritating soap
  - Ensure no kink in drainage tube
- **Nutrition for intubated casualties**
  - Consider feeding tube/ OG / NG for enteral nutrition, not always feasible
- **Analgesia and sedation via multimodal approach**
  - Risk of apnea with cumulative doses
  - Naloxone/Flumazenil on hand
- **Monitor blood glucose level q8h if NPO**
  - <80mg/dl treat with juice/IV glucose

METRICS

- ✓ An initial assessment documented.
- ✓ Serial vital signs documented.
- ✓ Nursing interventions documented.
- ✓ Wound/dressing checks documented every 24 hours
- ✓ A splint assessment documented every 6 hours

This information is pulled from the evidence-based Joint Trauma System (JTS) Nursing Interventions Wound Care/Splint Management in PCC CPG. JTS CPGs can be found at the JTS CPG website or the JTS Deployed Medicine site.

INTRODUCTION

Prolonged Casualty Care (PCC) - The need to provide Role 1 casualty care for extended periods of time when the tactical situation may limit or prevent prompt and/or optimal medical care.

Prolonged Field Care (PFC) is a continuation of PCC, conducted by advanced trained personnel, that continues until a casualty arrives at the appropriate level of care. PFC is addressed in a later section of this guideline.

The PCC guidelines are designed to guide nonmedical and medical responders to plan, prepare, and perform casualty care that immediately follows Tactical Combat Casualty Care (TCCC) management when evacuation to a higher role of care is delayed or denied due to operational constraints or limitations. PCC is focused on the casualty regardless of the environment, location, or setting. PCC conceptually replaces the Joint Trauma Lexicon definition for prolonged field care (PFC) in that the PCC guidelines apply to all Role 1 non-medical and medical responders across the Joint force's full range of military operations. **A provider of PCC must first be proficient in all aspects of TCCC**. The intent of this guideline is to provide Role 1 non-medical and medical responders, who encounter delayed, denied, or prolonged casualty evacuation with an evidence-based and expert-based approach for **assessing, managing, and monitoring** injured or ill casualties to optimize medical and operational outcomes. Pursuant to the PCC guidelines, this nursing intervention, wound care, and splint management, this CPG recommends actions and resource utilization following the "**minimum, better, best**" format that provides alternate or improvised methods of delivering PCC when more ideal treatment options are unavailable.

Nursing interventions, wound care, and splint management may be the most important, yet overlooked, capabilities PCC responders can and must develop. Critically injured and ill casualties are at higher risk for complications such as pressure sores and wound infections that can lead to unfavorable outcomes, potentially increasing morbidity and mortality. Nursing interventions, wound care, and splint management are core principles of PCC because they reduce the risk of preventable complications without requiring costly or burdensome equipment. All providers of PCC must practice nursing care skills to help maintain proficiency.

In PCC, a casualty's basic activities of daily living can become impaired or nonexistent depending on the severity of their wounds. Simple tasks such as oral hygiene, hydration, skin care, moving extremities, and turning become impossible for an injured or unconscious casualty. Thus, the casualty requires regular assessments and interventions to monitor the condition and prevent the development of further acute or chronic complications. The PCC flowsheet, Appendix A, can be used to track vital signs, medications, and other interventions. Using a nursing care checklist assists with developing a schedule of ongoing and future actions for performing appropriate assessments and interventions. See Appendix B for a sample nursing care checklist.

Non-medical to medical responder ratios vary in any operational unit, but generally non-medical responders vastly outnumber their medical counterparts within the Role 1 environment. Fortunately, many of the PCC tasks and skills recommended in this CPG can be successfully performed by non-medical responders, allowing medical responders to focus on the myriad of medical tasks and skills they are trained to provide. Cross-training all team members on these recommended PCC interventions prior to deployment will ultimately optimize outcomes, especially when responders are forced to manage multiple casualties.

***Important Note:** The authors acknowledge that not everything discussed in this CPG will be applicable to all providers and care settings. These are recommendations taken from best practices with consideration given to a resource-limited environment.*

ASSESSMENT AND DOCUMENTATION

ASSESSMENT

After initial stabilization, every casualty requires regular head-to-toe reassessments. Regular assessments allow providers to gain an understanding of the casualty's baseline, changes to that baseline, and help to dictate treatment and the plan of care.

Non-medical Responders

- Reassess all interventions completed previously during the MARCH-PAWS assessment at the responder's level of training.
- Become familiar with the PCC Flowsheet (Appendix A).
- Assist the medical responder as needed.

M	Massive hemorrhage
A	Airway
R	Respiration
C	Circulation
H	Hypothermia/Head injury
P	Pain
A	Antibiotics
W	Wounds
S	Splints

Medical Responders

- Minimum:
  - If appropriate, receive verbal reports from TCCC non-medical or other medical personnel on all interventions completed on the casualty.
  - Briefly review any casualty documentation provided(verbal or handwritten and note method conveyed).
  - Assess any interventions for appropriateness and effectiveness using the MARCH-PAWS sequence in accordance with PCC Guidelines:
    - **Massive Hemorrhage** - Assess all interventions for continued hemorrhage control.
    - **Airway** - Assess the airway for patency and check any adjuncts for proper placement and securement.
    - **Respiratio**n - Assess any interventions for tension pneumothorax, assess breathing for rate and depth, and check pulse oximetry if available.
    - **Circulation** - Assess pelvic compression device, if present. Check tourniquets, if present, and determine if conversion is indicated, check all dressings for effectiveness, and check pulses.
    - **Hypothermia/Head Injury** – Assess any interventions for hypothermia for ongoing necessity and effectiveness. Assess reported head injury for change in casualty's status.
    - **Pain** - Reassess pain control - note the last time pain medications were administered and determine based on pain score if the casualty needs to be redosed.
    - **Antibiotics** - Reassess the need for antibiotics, either initial or repeat doses.
    - **Wounds** - Reassess and treat additional wounds.
    - **Splints** - Check any splints for proper fit and assess pulses distal to the splint.
- **Better**: Perform periodic re-assessment rounds. Include the following observations in ongoing clinical decision-making:
  - Is the casualty sick or not sick? (acutely ill, decompensating, or experiencing a serious medical/surgical condition requiring ongoing management?)
  - Is the casualty stable or unstable?
  - Is the casualty getting better or getting worse?

- How is that assessment different from the last assessment?

- **Best:** Complete head-to-toe primary and secondary assessment. Perform comprehensive physical exam and detailed history with problem list and care plan. As soon as it is feasible, perform teleconsultation.

DOCUMENTATION

Document the casualty assessment and monitor trends to identify signs of decompensation. Quantity and severity of casualties may restrict the level of documentation the responder is able to complete.

Non-medical Responders

- **Minimum:** DD 1380 , SF 600
- **Best**: If trained by medical responder, assist in completion of more thorough documentation, such as the PCC flowsheet (Appendix A) and PCC nursing care tracker (Appendix B).

Medical Responders

- **Minimum**: DD 1380, SF 600
- **Better**: PCC flowsheet
- **Best**: PCC flowsheet, PCC nursing care tracker

VITAL SIGNS

Obtaining vital signs and trending them via documentation helps the medical responder to adequately assess casualty's condition, assess treatment effectiveness, and determine future care needed. Frequency of vital signs is determined by the severity of the casualty's condition.

Frequency

- **Non-critical casualty**: Obtain vital signs every 12 hours.
- **Stable but serious**: Obtain vital signs every 4 hours.
- **Critical Casualty**: Obtain vital signs every 15-30 minutes with ongoing resuscitation until stability is established.

Non-medical Responders

- **Minimum**: Heart rate via pulse check, manual respiratory rate, pain scale, and checking color, condition, and temperature of skin. Mental status – alert or not alert.

Medical Responders

- **Minimum**: Systolic blood pressure (BP) estimation using presence of pulses, mental status (perform Glasgow Coma Scale [GCS] for any abnormality noted), heart rate via pulse check, pain scale, respiratory rate, and checking color, condition, and temperature of skin. Trend and document all vital signs in the PCC Flowsheet in Appendix A.
- **Better**: Above + temperature and manual BP.
- **Best**: Portable monitor providing ongoing or automatic periodic vital signs display, end-tidal carbon dioxide (ETCO2) monitoring (when appropriate), consider internal temperature monitors depending on patient condition, necessity, and supplies.

INTAKE AND OUTPUT

Recording fluid intake and output is an important clinical care process that helps the medical responder determine the progress of the disease and the effects of the treatment. Recording of intake and output helps to ensure that the casualty has a proper intake of fluid. Recording of output helps to determine whether there is an adequate output of urine and normal defecation. Correct recording of fluid balance helps ensure safe and effective nursing care to identify abnormalities in casualty conditions, proper resuscitation response, and fluid maintenance requirements over time. Critical casualties will typically have a Foley catheter (in-dwelling catheter,[IDC]) placed and may be getting hourly fluids or blood, which need to be monitored on a more frequent basis. Input and output is typically recorded in cubic centimeters (cc) or milliliters (mL). If trying to estimate input or output without measuring tools, think of common items to help estimate fluid volumes. For example, a standard soda can contains about 350 cc.

Intake

- Oral, intravenous (IV), intraosseous (IO), via nasogastric (NG) or orogastric (OG) tube

Output

- Drainage from wounds, urine, and bowel movements

Frequency

- **Non-critical casualties**: Monitor and document throughout the day as intake and output occurs, totaling after 24 hours. (*Non-medical and medical responders*)
- **Critical casualties**: Monitor and document every 1-2 hours, making changes to IV fluids as needed. Total after 24 hours to determine overall fluid status. (*Medical responders*)

Equipment

- **Minimum**: Collect urine output in available container, such as an empty water bottle.
- **Better**: Graduated cylinder such as an empty IV fluid bag, fluid collection pan, urinary collection bottle, Nalgene bottle or similar container
- **Best**: Urinary catheter (if indicated based on casualty condition)

NURSING INTERVENTIONS

Applicable nursing interventions are identified and adjusted after every assessment is completed. Interventions are individualized based on each casualty's illness or injury. Different interventions may be required depending on a casualty's level of consciousness, noting that a previously conscious casualty may become unconscious.[1] Positioning a casualty in a comfortable position with head and injured extremities elevated is a basic and important intervention. One positioning method is to use a trifold lawn chair, or similar improvised support, to maintain elevation of the casualty's head and legs as needed.

The PCC nursing care tracker (Appendix B) is a recommended chart of scheduled nursing interventions with suggested intervals that should be used by the primary medical professional to build a care plan. This will allow for work/rest cycle management of the care team. Before deployment, medical professionals should use this tool to train teammates on nursing interventions so they can actively assist with casualty care.[2]

HYDRATION AND NUTRITION

Nutrition and hydration are critical for the outcome and survival of trauma patients. Adequate nutrition and hydration are necessary to modulate the catabolic and inflammatory response associated with trauma and critical illness. Early nutrition intervention provides exogenous fuel to support the preservation of lean body mass and attenuate the body's stress response.[3]

For reference, the average weight and height of military members are 187 pounds (85 kilograms (kg)) and 69 inches (175 centimeters) for men and 152 pounds (69 kg) and 64 inches (163 centimeters) for women.[3] We use these reference weights throughout this section for ease of calculations.

Non-medical Responders

Oral hydration should be provided to any non-intubated casualty that can tolerate it. For reference, the minimum fluid needs for the average male Service Member is 2.6L/day and 2.1 L/day for female Service Members, respectively – approximately 100-125 cc per hour at rest. Injured casualties, including those with burns, wounds, diarrhea, and patients in extreme climates, may require more. As a general rule, if a casualty complains of being thirsty, they are likely dehydrated, and fluid intake should be regularly encouraged.

Hydration by mouth

- **Minimum**: Potable water as tolerated.
- **Better**: Potable water + improvised oral rehydration solution (in 1 liter of potable water: ½ tsp of table salt + 5-6 tsp of table/granulated sugar)
- **Best**: Potable water + commercially available balanced oral rehydration solution. If a commercial oral rehydration solution is not available, the following recipe is optimal:
  1L Water + 9 tsp sugar + 1 tsp salt + 1 tsp baking soda + ¼ tsp potassium chloride (per Nutrition and Diet Therapy Branch, U.S. Army Medical Center of Excellence)

Nutrition

- **Minimum**: If casualty is alert, encourage food intake, protein shake, or oral nutrition supplement (ONS) every 4-6 hours
- **Better**: Casualty consumes 50-70% of meals by mouth. Encourage the use of oral nutrition supplements and high protein food items to help meet their needs. Small, frequent (5-6) meals throughout the day are often better tolerated than three regular meals.
- **Best**: Casualty consumes at least 75% of their meals by mouth. If casualty cannot consume regular-sized meals, encourage small meals throughout the day. Recommend the use of ONS to supplement intake in order to meet increased nutritional demands.

Medical Responders

Adequacy of hydration should be judged by the amount of urine the casualty is making. Adult casualties' urinary output should be approximately 0.5 ml/kg/hr.[4,5]

Hydration via IV or IO

Casualties who are intubated and/or sedated should receive fluids via IV or IO to meet their estimated fluid needs. These fluid needs are in addition to fluids provided for resuscitation. It is recommended to replete the volume of urine output to maintain euvolemic status. If urine output decreases, fluid provided by IV/IO may need to be adjusted/restricted to prevent fluid overload, though it is important to consider fluid losses from other sources including diarrhea, emesis, burns, wound vacs, sweat, etc. Urine color may not be an accurate indicator of hydration status in this population.

- **Minimum**: Normal saline maintenance infusion, typically around 100-150 mL/hr depending on goal urine output
- **Better**: Lactated Ringer's maintenance infusion, typically around 100-150 mL/hr depending on goal urine output
- **Best**: Plasma-lyte A maintenance infusion, typically around 100-150 mL/hr depending on goal urine output

Nutrition

- **Minimum**: If casualty is alert, encourage food intake or protein (oral nutrition supplement) shake every 4-6 hours.
- **Better**: Casualty consumes 50-70% of the meals by mouth. Encourage the use of oral nutrition supplements and high protein food items to help meet their needs. Small, frequent (5-6) meals throughout the day are often better tolerated than three regular meals.
- **Best**: Casualty consumes at least 75% of their meals by mouth. If casualty cannot consume regular-size meals, encourage small meals throughout the day. Recommend the use of ONS to supplement intake in order to meet their increased nutritional needs.

For casualties who are intubated, please refer to Considerations for Prolonged Field Care section.

REPOSITION AND CHECK PADDING

Non-medical and Medical Responders

Identify casualties who cannot reposition themselves or have difficulty doing so. Reposition the casualty and check padding at least every 2 hours.[6] If laying on a harder surface, they may need to be repositioned as frequently as every 1 hour to prevent skin breakdown. To prevent ischemic tissue injury and the formation of pressure sores, frequent movement of the casualty is necessary. Relieving pressure from superficial capillaries allows the skin to recover from the temporary ischemia.[7] Some of the most vulnerable areas to pressure include the back of the head, elbows, heels, and sacrum. Casualties who can reposition themselves should be encouraged to do so every 2 hours. If possible, ensure the casualty's head of bed is elevated to about 30 degrees. This is especially important for unconscious patients, as it helps to reduce the risk of pneumonia.

Unconscious Casualties

- **Minimum**: Use extra clothing, blankets, and other soft items to pad bony prominences and create a wedge under the casualty, rolling them to one side every 1-2 hours. Use extra blankets to safely raise the casualty's head 30 degrees.
- **Best**: Use pillows and wedges to achieve pressure relief and turn the casualty every 1-2 hours. Use a wedge to raise their head 30 degrees.

*** Maintain spinal/log roll precautions during reposition if there is concern for spinal injuries, but the patient should still be repositioned carefully despite spinal injury concerns*

Guide for changing linen and repositioning

- First, ensure there is enough slack on any lines (IV, foley, etc.) or wires/cords prior to rolling.
- Carefully remove pillows, blankets, or soft items being used for positioning.
- With two personnel, if possible, roll the casualty onto one side (if concerned about spine injury, carefully log roll while maintaining spine stabilization).
- Roll the old linen inward to the middle of the bed (long ways). Place new linen down and tuck under the old linen roll.
- Gently roll casualty in the opposite direction. Pull out the old linen and pull through the new linen.
- Place pillows, blankets, or soft items under casualty for positioning.

- Ensure the casualty's ankles, knees, and elbows are not resting on top of each other and arms are not resting on the abdomen, by placing padding between them.
- Ensure the casualty's head and neck are in line with the spine.
- Use additional padding items to relieve pressure from boney prominences. For example, pillows or other soft items can be placed underneath the casualty's calves to prevent pressure on heels.
- Ensure creases and bumps in clothing, sheets, and blankets are smoothed out under the casualty.
- If any areas of non-blanchable erythema are noted, outline area with marker and prevent placing casualty on the affected area until it recovers or add additional padding if that is not possible.
- Burned and injured extremities should be slightly elevated and slightly flexed to optimize venous return and maintain adequate peripheral pulses.

ORAL CARE

Non-medical and Medical Responders

Good oral hygiene reduces oropharyngeal colonization which is associated pneumonia. Pneumonia can be acquired regardless of whether or not the casualty is intubated. Casualties who are conscious should brush their teeth a minimum of every 12 hours. For unconscious casualties, perform oral care at least every 4 hours.[7] Ensure some type of suction is available (e.g., manual suction device, syringe with IV tubing).

Supplies

- **Minimum**: Gloves, lip moisturizer (i.e., petroleum jelly), tongue depressor, tape, self-made suction (60 mL syringe with tubing attached), gauze, and water
- **Better**: Gloves, gauze, lip moisturizer, tongue depressor, tape, hand-held suction, toothbrush, and toothpaste (use sparingly)
- **Best**: Gloves, gauze, lip moisturizer, tongue depressor, tape, commercial oral cleansing and suction system, and wall suction or suction machine

Guide for oral care using gauze

- To keep the casualty's mouth open, make a padded tongue depressor by wrapping gauze around one end of it and securing with tape. Use foam tape, if available, for additional padding. Ensure depressor is only inserted just past the casualty's teeth/gums.
- Wrap a gauze around a gloved finger and hold firmly with the rest of hand.
- Moisten the gauze with mouthwash or water (ensuring not to oversaturate) and gently clean the teeth and mouth cavity. The gums, hard palate, and tongue should also be cleaned.
- Clean teeth and oral cavity for approximately 1 minute. Multiple gauze swabs may be needed depending on the level of contamination in the mouth.
- Use suction as needed to clear secretions.
- Apply lip moisturizer.

SKIN CARE

Non-medical and Medical Responders

A bath should occur at least once every 24 hours with spot cleaning as necessary. Unconscious patients should be checked every 2 hours in case of involuntary bowel or bladder emptying. Cleaning the skin is an opportunity to evaluate additional injuries and visualize any new areas of erythema or skin breakdown. This includes a complete wipe down on all non-injured areas using the minimum, better, best method as stated below.[8] Conscious patients should actively assist with baths and may use a shower if available. In the event that a shower is used, care should be taken to prevent introduction of water into dressings or invasive lines. Plastic covering and tape may be used to protect these areas.

Unconscious or bedbound casualties:

- **Minimum**: Use rinsed "baby" wipes*. Be sure to cleanse skin folds, armpits, and groin.
- **Best**: Full bath with soap, gauze or washcloths, and warm water, followed by changing linen, applying pads to bony areas, applying compression stockings, using pillows to elevate extremities, and providing padding around the casualty.

Guide for bed bath:

- Remove any additional pillows or wedges being used to position casualty.
- Wash face first and genitalia last. (Cleaning genitalia is detailed under Foley care.)
- Prepare a basin or bowl with warm water and a small amount of soap.
- Obtain multiple 4×4 gauze pads or clean washcloths and place in water.
- Expose body part to be washed, keeping the rest of the casualty covered, and place absorbent pad or towel under the area to absorb water.
- Take one gauze or washcloth out of the basin and wring out excess water. Wash small areas of skin at a time starting with the face. Gently wipe the casualty's face, being sure to clean the eyelids, nose, mouth, and ears. Work your way down the rest of the body.
- Throw away dirty gauze and replace washcloths as you progress to different areas of the body or once contaminated. DO NOT place contaminated gauze or washcloths back into basin or bowl. If supplies are limited, different areas of the washcloth can be used to clean once one section is dirty.
- Alternate cleaning option: Wash/clean the casualty using two-gauge bandage rolls. Dip both rolls into clean water. Dip the second roll into soapy water and wrap around gloved hand. Keep unrolling the cleaned gauge bandage roll while using the opposite hand to clean the skin until the casualty is clean. Use the same method to rinse the casualty.
- Note skin condition, especially areas of reddening or skin breakdown. These areas will need to be checked frequently, and pressure should be relieved from these areas if possible. Document these areas and include size and characteristics.
- Dry skin after cleaning each area, taking extra care to ensure skin folds are dry.
- Comb casualty's hair. Female hair should be braided on the side to prevent excessive tangling. Braids should not be placed down the back of the head (such as a single French braid) since this can lead to pressure spots.
- Consider changing out old tape and EKG leads every 24 hours, taking available resources into consideration.
- Ensure the skin is dry and apply lotion.
- Replace any pillows or wedges being used to position casualty.

***Caution**: If baby wipes or skin wipes are used to wash the skin, the wipes should be thoroughly rinsed with water first, because most contain alcohol and residues that can irritate the skin.*

MOBILIZATION AND AMBULATION

Early ambulation of critically ill casualties has been shown to decrease acquired weakness, increase functional capacity, and increase the number of ventilator-free days in Intensive Care Unit (ICU) patients.[9] Mobilization exercises, such as active and passive range of motion exercises or even as simple as sitting on the side of the bed/cot have also proven to be beneficial in decreasing muscle weakness.[10] The tolerance and appropriateness of mobilization and walking will differ depending on the casualty's condition.

Non-medical and Medical Responders

The following recommendations for conscious casualties are dependent on their ability to sit and walk safely. Medical responders should decide what each casualty can tolerate based on their condition.

- **Minimum**: Help casualty to sit on the edge of the bed/cot 2-3 times a day.
- **Better**: Have casualty sit in a chair during the day, taking care to rotate pressure spots if they are not able to self-adjust.
- **Best**: Have casualty sit in a chair during the day and walk 2-3 times a day with assistance.

DEEP VEIN THROMBOSIS PREVENTION

The most common locations for deep vein thrombosis (DVT) include the lower leg, thigh, and pelvis. Recognition and treatment of a DVT require specific medical training and can only be accomplished by a medical responder. However, the prevention of DVTs is not a medical task and should be performed by any available Service Member. If available, compression stockings, or elastic bandages (wrapped starting from the toes upward) should be placed on immobile or unconscious casualties, ensuring toes remain exposed for capillary refill assessment. Casualties who are conscious and able may perform the following exercises, completing 10 repetitions of each exercise every hour while awake. This may be done in burned extremities or in the presence of open wounds but should be avoided when fractures or severe extremity injuries are present.[7,11]

Signs and Symptoms of DVT

- Swelling
- Pain or tenderness
- Cramping, aching, or increased warmth
- Red or discolored skin

Non-medical and Medical Responders

Conscious Casualties: 10x every 2 hours, while awake

- **Foot pumps**. Have the casualty stretch toes up and back, flexing feet, and hold for a few seconds. Then point toes and hold before repeating.
- **Ankle circles**. Have casualty raise both feet and trace a circle or each letter of the alphabet with their toes.
- **Leg raises**. With left leg straight, have the casualty raise foot off the bed/cot or floor, then lower. Repeat with right leg. Alternatively, slowly have casualty lift left knee up to chest, then bring foot back to the bed/cot or floor; repeat with right leg.

- **Hamstring stretches**. While casualty is lying on their back with straight legs, have them raise one leg to 90°. Instruct casualty to pull the leg gently toward the head and hold for up to 30 seconds. Slowly bring the leg back down to a flat position and repeat with the other leg.
- **Shoulder rolls**. Although developing a clot in the upper body is less likely, venous stasis should be avoided. Have the casualty raise shoulders and circle them back and down five times. Then reverse direction for five more repetitions.

Unconscious Casualties: 10x every two hours

- **Ankle plantarflexion-dorsiflexion**. Hold the ankle and heel of one foot and alternately bend the foot forward into plantarflexion and then push the foot upward into dorsiflexion. Hold each position for 5–10 seconds.
- **Lower extremity massage**. Using both hands and starting at the ankle, apply consistent pressure, massaging the leg in an upward motion through the thigh. (Items such as a plastic bottle may be used to roll the skin toward the head.) Ensure deep pressure is avoided when massaging behind the knee or over bony prominences. Alternate legs (to simulate walking) for five times on each leg.

RANGE OF MOTION EXERCISES

Non-medical and Medical Responders

At least every 8 hours, perform a range of motion exercise on all movable joints such as ankles, knees, hips, wrists, fingers, elbows, and shoulders, except where joint mobility is restricted by injury. Perform 5 to 10 repetitions of moving the joint through a full range of motion and have the casualty perform the movement unassisted when possible.

COUGH, DEEP BREATHE

To help prevent pneumonia, conscious casualties should be encouraged to take deep breaths every hour while awake. Sustained maximal inspiration helps to maintain inflation of the alveoli and is as effective as using an incentive spirometer.[12] If the casualties have increased secretions, they should also be encouraged to cough and clear their airway hourly.

Non-medical and Medical Responders

Guide for deep breathing instruction:

- Instruct the casualty to breathe in deeply and slowly through their nose, expanding lower rib cage, and letting abdomen move forward.
- Hold for a count of 3 to 5 seconds.
- Instruct casualty to breathe out slowly and completely through pursed lips.
- Have casualty rest and repeat 10 times every hour.

INSPECT AND MONITOR TUBES

Medical Responders

Examine all tubes (e.g., endotracheal tube [ETT] or cricothyroid tube, orogastric or nasogastric [OG/NG] tube, intravenous [IV] line, chest tube, urinary catheter) for correct placement and appropriate function, and ensure they are secured properly and labeled.

LINE MAINTENANCE

Vascular access devices, such as IVs and IOs, should be assessed for patency (i.e., flushed) prior to each infusion to assess catheter function and prevent complications. They are flushed after each medication administration with sufficient volume

and appropriate rate to complete the medication administration and to reduce the risk of contact between incompatible medications.

- **Minimum**: Flush access site with Normal Saline (NS) every 8 hours. Use a minimum volume equal to twice the internal volume of the catheter system (e.g., catheter plus add- on devices), typically 5 mLs for peripheral IVs.[13]
- **Best**: Flush access site with NS every 4 hours.

If only half of a prefilled NS syringe is used and saved for later, it should be labeled with the time and date first used and only used on one casualty. It should be discarded after 24 hours. Ensure the syringe is capped in between uses to prevent contamination and infection.

If prefilled NS syringes are unavailable, draw up NS into an unused, empty syringe from a bag of NS using the needle access port. Ensure the needle access port on the NS bag is cleaned using alcohol prior to access.

Procedure to flush peripheral line

- Gather equipment.
- Using aseptic technique, clean the access port with an alcohol prep pad.
- Take prefilled 10mL syringe of NS and needle (if applicable) or attach syringe to port.
- With constant pressure, inject NS into the port to flush the catheter to ensure the line remains open.
- If resistance is met, gently use pulsating pressure on the end of the syringe until NS flows freely.
- Carefully observe the IV site and discontinue any IV line that causes swelling, pain, or redness.
- Detach syringe and dispose; place needle in sharps container (if applicable).

SUCTION ORAL AIRWAY

Perform oral airway suction when needed to clear secretions from the mouth. Casualties should also be encouraged to cough up and spit out secretions, if possible.

- **Minimum**: Manual suction device or improvised suction device, such as a 25cm length portion of IV tubing connected to a 60mL syringe
- **Best**: Rigid suction tube, suction machine, or wall suction

Guide for oral suctioning

- Gather necessary equipment.
- Ensure casualty's head is elevated.
- Perform hand hygiene.
- Place a clean towel under casualty's chin.
- Don additional Personal Protective Equipment (PPE) based on the casualty's need for isolation precautions or risk of exposure to bodily fluids.
- Introduce the suction device into the casualty's mouth along the gumline to the pharynx.
- If using manual suction, apply suction while withdrawing the device slowly, working from the back to the front of the mouth. If using a suction machine, use the lowest setting appropriate for the thickness of secretions.
- If needed, clear the suction device with sterile water or 0.9% NS, if available.
- Repeat as needed, paying attention to casualty tolerance and oxygen saturation.

CHANGE INTRAVENOUS LINE, BAG, AND TUBING

Access sites, tubing, and bags may need to be changed to prevent infection; however, a PCC situation may not allow unnecessary expenditure of limited medical resources. Consider basic PCC principles regarding supplies, number of casualties, and potential evacuation time when deciding on frequency while using new supplies.

- **Peripheral intravenous access**: Do not replace unless there is evidence of infection, blockage, or infiltration.[14]
- **Intraosseous access**: Discontinue after 24 hours, a maximum of 48 hours if difficulty obtaining IV access.[13]
- **Primary continuous infusion tubing**: Change every 7 days (i.e., administering Lactated Ringers continuously for IV hydration).
- **Primary intermittent infusion tubing**: Change every 24 hours (i.e., administering an IV antibiotic intermittently).
- **Secondary infusion tubing**: Change every 24 hours (i.e., administering an IV antibiotic via a secondary line connected to primary tubing).
- **Blood tubing**: Change after every 4 units of products.
- **Propofol**: Change tubing every 12 hours due to lipid base.

WOUND CARE

For detailed wound care see Acute Traumatic Wound Management in the Prolonged Field Care Setting . For burn wounds, refer to the Burn Wound Management in Prolonged Field Care.

To prevent infection, it is crucial to prioritize wound care and dressing changes.[15]

- Pain management is paramount during wound care and dressing changes. Ideally, casualties will be medicated with long-acting analgesia medications at least 60 min by mouth or 15-30 min IV before responders begin any wound care. For Ketamine dosing, procedural (higher) dose may be needed; use 0.5-1mg/kg IV/IO (use lower dosing if using multiple medications) and give 2-3 minutes prior to wound care. Local anesthesia such as injectable lidocaine or bupivacaine may be used if available (inject 10-15 minutes prior to procedure). Reference current JTS CPGs for appropriate Analgesia and Sedation Management During Prolonged Field Care recommendations. If you are in an austere environment and analgesia medication is limited, distract the casualty and consider taking breaks during wound care.
- Wound type (by exposure). All wounds are considered dirty in the deployed environment.
    - **Clean**: A simple wound (e.g., cut produced by a blade) in an area of the body with low bacterial count, treated shortly after the wound occurred. This would be the minority of wounds obtained in a field or deployed setting.
    - **Dirty**: A wound in an area with a high bacterial count (e.g., axilla, groin) or presenting late (>6 hours after wounding) in which case bacterial counts are expected to be at levels that could increase risk of infection.
    - **Contaminated**: A wound impregnated with organic soil (swamps, jungle), claylike soil, or fecal material, or a wound already infected.

Non-medical Responders and Medical Responders

- Wash smaller wounds with soap and potable water.
- Keep dressings clean and dry. Change soiled dressings as needed.
- Assist medical responder with wound care and dressing changes.
- If packaged medical dressings are not available, a clean piece of cloth may be used. If used as an alternate, the cloth should not be visibly soiled and should be dry. Cloth may be hand-washed with soap and water, rinsed thoroughly, and dried.

Ensure you gather all supplies and administer proper pain medication before conducting wound care.

- **Minimum**: Wash smaller wounds with soap, if available, and potable water. Irrigate larger wounds with potable water (cooled before use if boiled) and pour across the wound. If unable to irrigate because dressings are limited, leave the original dressing and reinforce/secure it. Ensure dressings are not wrapped too tightly, leading to restricted blood flow.
- **Better**: Inspect dressing at least every 24 hours and change as needed. Remove and replace soiled dressings at least every 24 hours. Irrigate the wound with potable water using a 10cc syringe and 18-gauge angio-catheter. If available, use a topical antimicrobial dressing for burns and wounds that may be contaminated. If only gauze is available, use that. If dressings are available, replace the old dressings with new at least every 24 hours and as needed.
- **Best**: As above, using sterile water or normal saline to irrigate the wounds. Change the dressing at least every 24 hours and as needed and examine the wound for any change in color, drainage, pain or odor.

***CAUTION**: Exposing any wounds to a relatively dirty environment in an austere setting may expose a casualty to further contamination. When possible, move the casualty to a location away from the elements, have the provider wash their hands, and make the environment as clean as possible before starting any wound care and dressing changes.*

SPLINT MANAGEMENT

Any splint placed in TCCC must be periodically reassessed for complications, such as pressure points, irritation, excessive tightening, and missed underlying wounds. Additionally, all extremities and palpable bony structures must be thoroughly assessed for any unrecognized fractures that may have been missed during the initial TCCC treatments.

Non-medical Responders

If a splint was placed in TCCC, ensure that it is still in place and not causing additional pain beyond the fracture it is stabilizing. Refer any issues with the splint to the medical responder immediately.

Medical Responders

Any suspected fractures or significant extremity injuries identified but not previously treated will be managed IAW the TCCC Guidelines. Injured and splinted extremities will tend to initially have increased swelling for 2-5 days after a significant injury. Continual reassessment is mandatory for all applied splints. Basic steps for evaluating previously applied splints include:

- If the casualty is verbal, ask if the splint (and not the fracture) is causing pain.
- Recheck pulses distal to any splint at least every 6 hours when the casualty is conscious, more frequently if there are any complaints of pain due to the splint. If the casualty is unconscious, pulses distal to the splint must be checked every 2 hours.

- Ensure that the splints are fitted properly and have not shifted. Readjust or replace the splint as needed.
- Ensure that the splints are adequately stabilizing the fracture, ideally immobilizing one joint above and below the injury. Improve or replace the splint as needed.
- Check for pressure injuries by examining the skin around the splint. Skin should blanch within 2-3 seconds. If there is non-blanchable erythema, changes in sensation, or the skin feels warmer to the touch, the casualty could have a stage 1 pressure injury.
- Look for possible hypersensitivity or allergic reactions to tape applied directly to the skin by checking for developing erythema, excessive dryness, cracking, or breakdown.
- Assess for any signs of compartment syndrome. If present, adjust or loosen the splint and reassess. If the symptoms are still present, remove the splint and contact your higher medical authority.

***NOTE**: The first and most important symptom of compartment syndrome is pain, particularly when worsening, pain with passive motion or pain out of proportion to the injury. If the casualty is non-verbal, then it is critical to continually reassess any splinted extremity for other signs indicative of developing compartment syndrome and address the problem immediately.*

CONSIDERATIONS FOR PROLONGED FIELD CARE

Prolonged field care builds upon the Joint baseline interoperability medical standards listed within the PCC guidelines for advanced trained medical personnel. The following recommendations are intended to assist advanced trained medical personnel with the continuation of more advanced procedures.

SUCTION ADVANCED AIRWAY

Perform advanced airway suction only when needed (e.g., copious secretions, colored secretions, change in oxygenation status, suspected mucus plug). Use sterile technique for advanced airways (e.g., endotracheal tubes) or clean technique for the mouth and throat.

- **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

Guide for advanced airway suctioning

- Gather necessary equipment.
- Ensure casualty's head is elevated.
- Perform hand hygiene.
- Place a clean towel under casualty's chin.
- Don additional PPE based on the casualty's need for isolation precautions or risk of exposure to bodily fluids.
- Determine the appropriate depth to advance the suction catheter. (Generally, this is the total length of the artificial airway and the adapter.)
- If indicated based on casualty tolerance to procedure, increase Fi02 to 100% for 30 to 60 seconds.
- Insert the suction catheter to the appropriate depth, ensuring that the tip of the catheter does not touch nonsterile surfaces.

- **Do not** suction while advancing the catheter. Ensure suctioning is performed while withdrawing the catheter for no longer than 15 seconds at a time.
- Allow at least 30 seconds before repeating suctioning, if needed.

FOLEY CATHETER CARE

If possible, remove the catheter. Consider use of a condom catheter (for males) or urinary wicking device (for females).

> ***External (non-indwelling) catheters may not effectively collect output, since they do not necessarily empty the bladder immediately. Therefore, output measurements may be falsely low if using an external-collection catheter to measure active resuscitation efforts.****

Catheter care should be performed as a part of daily bathing routine, after bowel incontinence, and if secretions build up around the urinary meatus. It should be completed at least every 24 hours. This helps to reduce the risk of catheter-associated urinary tract infection. The drainage bag should be emptied every 24 hours or whenever the main chamber becomes full. A securement device included in the foley bag kit or tape should be used to secure the tubing to the casualty's thigh to prevent the foley from being accidentally removed if pulled.

Use a basin, warm water, non-irritating soap, and towels to perform catheter every 24 hours.

Guide for performing catheter care:

- Wash hands thoroughly with soap and water, apply gloves, and place a dry towel under the casualty.
- Using mild soap and water, clean genital area.
- For male casualties: retract the foreskin, if needed, and clean the area, including the penis.
- For female casualties: separate the labia and clean the area from front to back.
- Clean urethra (urinary opening), where the catheter enters the body.
- Clean the catheter from where it enters the body and then down, away from urethra. Hold the catheter at the point it enters the casualty so that tension is not placed on it.
- Rinse the area well, dry gently, and remove the towel under the casualty.
- Secure the drainage bag and tubing loop below the level of the bladder. Ensure the tubing is not kinked and nothing is impeding the flow of urine.
- Empty the contents of the drainage bag at least every 24 hours and document the amount of urine output each time.

NUTRITION FOR INTUBATED CASUALTIES

Casualties who are intubated and/or sedated and held at the Role 1 for up to 48-72 hours should receive a feeding tube (nasogastric or orogastric) to initiate enteral nutrition. If there is concern for facial fractures/skull base fracture, place orogastric tube and avoid nasogastric tube placements. Although a controversial topic, feeding at the Role 1 – is possible, as demonstrated by Frizzi, et al.[16] Evidence shows that delaying nutrition in large burn patients (≥20% TBSA) increases odds of mortality by 2% for each hour delayed in enteral feeding initiation.[17] This translates to an increased mortality risk of 96% in 48 hours, emphasizing the importance of early enteral feeds when possible. Before tube feeds are initiated, it is imperative to ensure proper tube position, with x-ray confirmation being the gold standard. If x-ray is not available and tube feeds are deemed necessary, the following methods should be used to clinically confirm proper position: 1) quickly push air through the tube while auscultating the left upper quadrant (over the stomach) to confirm a "whoosh" AND 2) return of gastric or bile aspirate.

- **Better**: If casualty is hemodynamically stable, consider placement of a feeding tube and provide trophic feeds using a standard formula (10-20 ml/hr). If enteral formula is not available, an improvised tube feeding can be made by mixing ultra-high temperature milk alone or mixed with the protein drink powder found in Meals-Ready-to-Eat. To maintain tube patency, ensure 30 ml free water flush completed every 4 hours.

- **Best**: If able and comfortable consider increasing tube feed rate by 10 ml/hr Q4hr until optimal rate of 60 ml/hr is achieved. Provide a polymeric, high-protein enteral nutrition formula, if able; otherwise provide improvised tube feeding.

For enteral nutrition contraindications, please refer to the JTS CPG for Nutritional Support Using Enteral and Parenteral Methods.

****Placement of a feeding tube, particularly in a patient with altered mental status without appropriate confirmation of proper positioning may lead to significant morbidity or mortality from aspiration risk.*

ANALGESIA AND SEDATION

Refer to the PCC guidelines and Analgesia and Sedation Management during Prolonged Field Care CPG for a thorough guide to pain and sedation management.

Pearls

- Utilization of a multimodal (i.e., local anesthetics, ketamine, dexmedetomidine, etc.) approach to analgesia in the polytrauma casualty is advised to avoid oversedation and the risk of apnea associated with ever increasing doses of opioids and benzodiazepines.[18]
- When possible, have on hand reversal agents for opioids (Naloxone) and benzodiazepines (Flumazenil), and be familiar with their dosing.[19]
- Consider duration of action and the effects of cumulative dosing during procedural sedation; anticipate the need for prolonged monitoring in the post-procedural period.[19]
- Consider decreasing standard dosing in the shock casualty, and always anticipate potential cardiovascular collapse with drugs that decrease sympathetic tone, particularly in the catecholamine depleted casualty (i.e., the under resuscitated casualty, or one with a prolonged extraction time, etc.).

CHECK BLOOD GLUCOSE LEVEL

If available, check blood glucose level (BGL) every 8 hours or more frequently as dictated by casualty status for casualties that are NPO. A low BGL (less than 80 mg/dL) must be treated immediately with oral sugar, juice, or IV glucose. A high BGL (greater than 200 mg/dL) is less dangerous than low glucose and may be treated if the capability is available.[20]

PERFORMANCE IMPROVEMENT (PI) MONITORING

POPULATION OF INTEREST

Patients with traumatic injuries requiring on-going nursing casualty care, following initial Role 1 TCCC management, due to delayed, denied or prolonged casualty evacuation.

INTENT (EXPECTED OUTCOMES)

- All patients in the population of interest have an initial patient assessment documented using the recommended DD 1380, SF 600 or PCC Flowsheet.
- All patients in the population of interest have serial vital signs documented using the recommended DD 1380, SF 600 or PCC Flowsheet. At a minimum, vital signs will include heart rate/pulse, respiratory rate, and pain level.
- All patients in the population of interest have appropriate nursing interventions identified on the PCC Nursing Care Tracker to track ongoing and future nursing care.

- Patients requiring wound care management have dressings inspected every 24 hours (minimum) and changed or reinforced/secured if needed.
- Patients with splints will have serial reassessment for pain (minimum) beyond the fracture it is stabilizing at least every 6 hours.

PERFORMANCE/ADHERENCE METRICS

- Patients in the population of interest who have an initial assessment documented on a DD 1380, SF 600 or PCC Flowsheet.
- Patients in the population of interest who have serial vital signs documented on a DD 1380, SF 600 or PCC Flowsheet.
- Patients in the population of interest who have nursing interventions documented on the PCC Nursing Care Tracker.
- Patients requiring wound care management who have wound/dressing checks documented on the PCC Nursing Care Tracker every 24 hours (minimum).
- Patients with splints who have a splint assessment documented on the PCC Nursing Care Tracker every 6 hours (minimum).

DATA SOURCE

- Patient Record
- Department of Defense Trauma Registry (DoDTR)
- PCC Flowsheet
- PCC Nursing Care Tracker

SYSTEM REPORTING & FREQUENCY

The above constitutes the minimum criteria for PI monitoring of this CPG. System reporting will be performed annually; additional PI monitoring and system reporting may be performed as needed.

The system review and data analysis will be performed by the Joint Trauma System (JTS) Chief and the JTS PI team.

RESPONSIBILITIES

It is the trauma team leader's responsibility to ensure familiarity, appropriate compliance, and PI monitoring at the local level with this CPG.

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APPENDIX A: PROLONGED CASUALTY CARE FLOWSHEET

Page 1 of 2

Prolonged Field Care Casualty Card v25 (8July2023)

Name:	Date:	Time:	Weight kg:	Ideal Body Weight:	Blood type:	Triage Category:
ID Number:		Time Zone:	Weight lbs:	Height:	Titer:	EVAC Category:

Signs/symptoms:

Allergies:

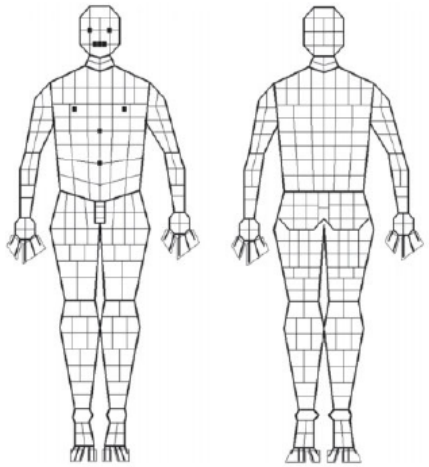
Medications:

Past Pertinent History:

Last Oral Intake:

Events Leading Up To Illness/Injury:

Modified Lund and Browder Chart or an Adult Patient
Shade figure according to casualty burn pattern Each square is .25%
Count the squares and divide by 4 for TBSA



M.I.S.T. Report Time:

MOI:

Stable or Unstable

PROBLEMS	PLANS	GOALS	CONCERNS

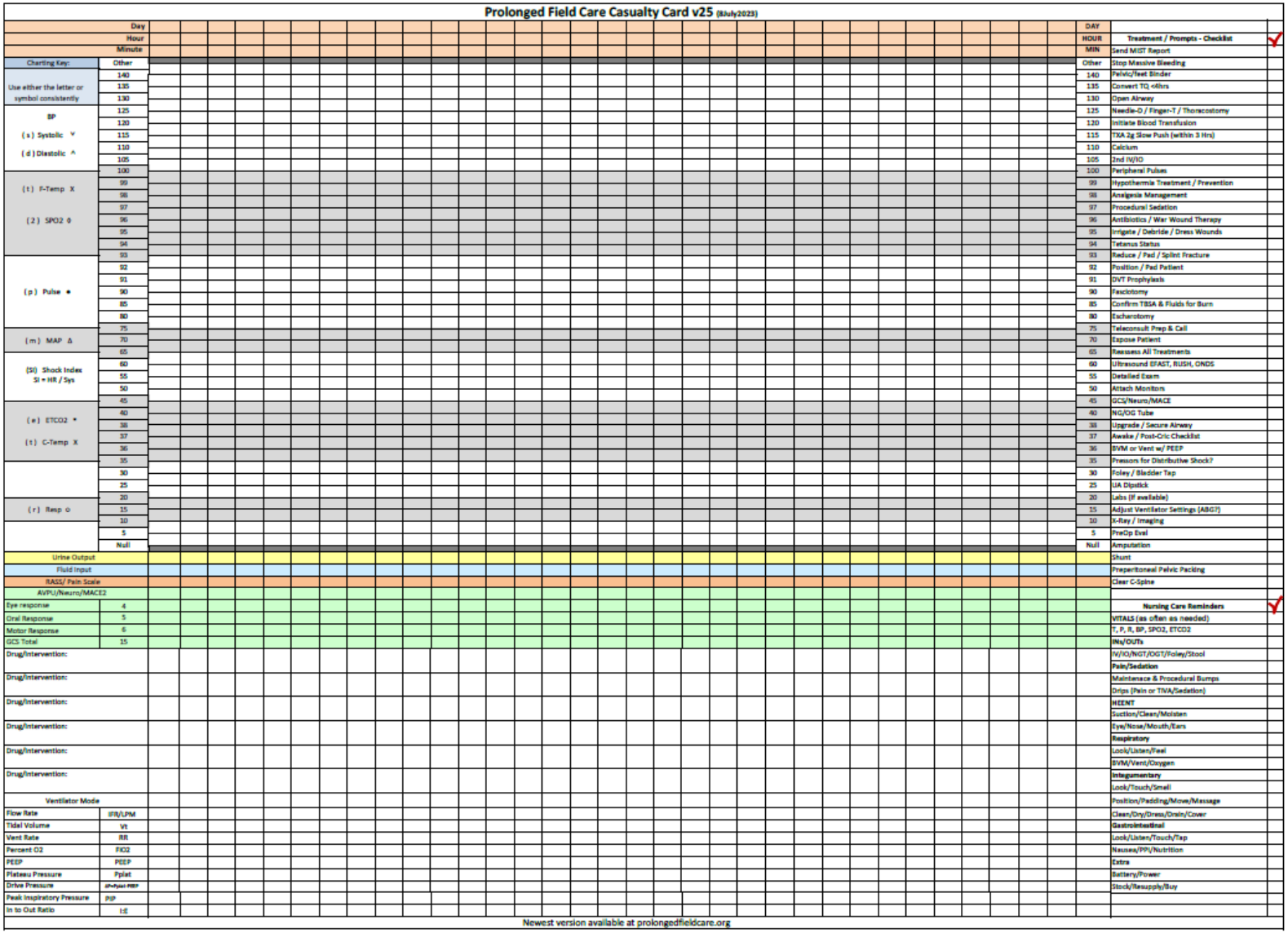
TQ 1 time on:_____ **TQ 2 time on:**_____ **TQ 3 time on:**_____ **TQ 4 time on:**_____ **2g TXA slow push time on:**_____

TQ 1 Converted:_____ **TQ 2 Converted:**_____ **TQ 3 Converted:**_____ **TQ 4 Converted:**_____ **1g Calcium given at:** _____ (1g of elemental Ca = 10cc Ca Chloride (or) 30cc Ca Gluconate)

Time	Art	Ven							Notes-Serial Physical Assessments-Wake/Rest Plan-Telemedicine Recommendations-Red Flags and Standing Orders:
pH	7.38-7.44	.32-.41							
pCO2 (mmHg)	38-42	42-53							
pO2 (mmHg)	75-100	35-42							
HCO3 (mEq/L)	23-26	24-28							
SO2 %	>95	70-75							
Base D/E (mEq/L)	(acid) -2 to 2 (alk)								
NA+ (mEq/L)	136-145								
K+ (mEq/L)	3.5-5.0								
Ca++ (mg/dL)	8.6-10.2								
Cl- (mEq/L)	98-106								
BUN (mg/dL)	8-20								
Creat (mg/dL)	m: 0.7-1.3/f: 0.5-1.1								
Gluc (mg/dL)	70-99								
WBC (mm3)	3,200-9,800								
PLT (mm3)	150-450								
HCT %	M:42-50/F:37-47								
cHgb (g/dL)	M:14-18/F:12-16								
Agap (mEq/L)	7-13								
PT (seconds)	11-13								
INR	0.8-1.2								
Lact (mEq/L)	0.4-2.3								

Priorities and Principles
Complete initial life saving TCCC
Initiate Palliative care plan for expectants
Delineate roles and responsibilities
Perform comprehensive exam and history
Make problem list
Chart and trend vital signs
Perform telemedical consult
create a nursing care plan
Plan for resupply and electrical issues
Perform tactical timeout-mini rounds
Implement wake rest chow plan
Obtain and interpret lab studies if available
Make detailed analgesia & sedation plan
Perform necessary surgical procedures
Prepare handover documentation & supply
Prepare team for evac care
Submit medical AAR to JTS
Submit operational AAR to Command
Send lessons learned to www.prolongedfieldcare.org

Newest version available at prolongedfieldcare.org


Prolonged Field Care Casualty Card v25 (JJuly2023)
Day
Hour
Minute
Charting Key:
Other
Use either the letter or symbol consistently
140
135
130
BP
(s) Systolic ˅
(d) Diastolic ^
125
120
115
110
105
100
(t) F-Temp X
(2) SPO2 ◊
99
98
97
96
95
94
93
(p) Pulse ●
92
91
90
85
80
75
(m) MAP Δ
70
65
(SI) Shock Index SI = HR / Sys
60
55
50
45
(e) ETCO2 *
(t) C-Temp X
40
38
37
36
35
30
25
(r) Resp ○
20
15
10
5
Null
Urine Output
Fluid Input
RASS/ Pain Scale
AVPU/Neuro/MACE2
Eye response
Oral Response
Motor Response
GCS Total
4
5
6
15
Drug/Intervention:
Drug/Intervention:
Drug/Intervention:
Drug/Intervention:
Drug/Intervention:
Drug/Intervention:
Ventilator Mode
Flow Rate
IFR/LPM
Tidal Volume
Vt
Vent Rate
RR
Percent O2
FIO2
PEEP
PEEP
Plateau Pressure
Pplat
Drive Pressure
Peak Inspiratory Pressure
PIP
In to Out Ratio
I:E
DAY
HOUR
MIN
Treatment / Prompts - Checklist
Send MIST Report
Other
Stop Massive Bleeding
140
Pelvic/feet Binder
135
Convert TQ <4hrs
130
Open Airway
125
Needle-D / Finger-T / Thoracostomy
120
Initiate Blood Transfusion
115
TXA 2g Slow Push (within 3 Hrs)
110
Calcium
105
2nd IV/IO
100
Peripheral Pulses
99
Hypothermia Treatment / Prevention
98
Analgesia Management
97
Procedural Sedation
96
Antibiotics / War Wound Therapy
95
Irrigate / Debride / Dress Wounds
94
Tetanus Status
93
Reduce / Pad / Splint Fracture
92
Position / Pad Patient
91
DVT Prophylaxis
90
Fasciotomy
85
Confirm TBSA & Fluids for Burn
80
Escharotomy
75
Teleconsult Prep & Call
70
Expose Patient
65
Reassess All Treatments
60
Ultrasound EFAST, RUSH, ONDS
55
Detailed Exam
50
Attach Monitors
45
GCS/Neuro/MACE
40
NG/OG Tube
38
Upgrade / Secure Airway
37
Awake / Post-Cric Checklist
36
BVM or Vent w/ PEEP
35
Pressors for Distributive Shock?
30
Foley / Bladder Tap
25
UA Dipstick
20
Labs (if available)
15
Adjust Ventilator Settings (ABG?)
10
X-Ray / Imaging
5
PreOp Eval
Null
Amputation
Shunt
Preperitoneal Pelvic Packing
Clear C-Spine
Nursing Care Reminders
VITALS (as often as needed)
T, P, R, BP, SPO2, ETCO2
INs/OUTs
IV/IO/NGT/OGT/Foley/Stool
Pain/Sedation
Maintenace & Procedural Bumps
Drips (Pain or TIVA/Sedation)
HEENT
Suction/Clean/Moisten
Eye/Nose/Mouth/Ears
Respiratory
Look/Listen/Feel
BVM/Vent/Oxygen
Integumentary
Look/Touch/Smell
Position/Padding/Move/Massage
Clean/Dry/Dress/Drain/Cover
Gastrointestinal
Look/Listen/Touch/Tap
Nausea/PPI/Nutrition
Extra
Battery/Power
Stock/Resupply/Buy
Newest version available at prolongedfieldcare.org

APPENDIX B: PCC NURSING CARE TRACKER

Page 1 of 2

DATE:														
			Initial triangle below for the time the task was completed											
	TIME:		*0000 / 1200*	*0100 / 1300*	*0200 / 1400*	*0300 / 1500*	*0400 / 1600*	*0500 / 1700*	*0600 / 1800*	*0700 / 1900*	*0800 / 2000*	*0900 / 2100*	*1000 / 2200*	*1100 / 2300*
Tasks	Non-Critical	Critical												
Give food/nutrition	Q4-6	*												
Reposition	Q2	Q1-2												
Check padding	Q2	Q1-2												
Oral care	Q12	Q4												
Nasal care	Q12	Q4												
Apply lip balm	Q12	Q4												
Bathe and dry skin	Q24	Q24												
Perform lower extremity massage	Q2	Q2												
Range of Motion exercises	Q8	Q8												
Encourage coughing/deep breathing	Q1	**												
Inspect & monitor tubes	Q4	Q4												
Flush unused intravenous lines	Q4-8	Q4-8												
Perform oral suctioning	PRN	PRN												
Perform foley care	Q24	Q24												
Change IV line/bag/tubing	***	***												
Check splints	Q6	Q2												
Check wounds/dressings	Q24	Q12												
Other:														

Date: _____ *Battle Roster # _____* *Care Provider Name _____*

Splint Management		**N/A** ◯
Time	**Location of splint:**	
	Pulses:	Skin Condition:
	Interventions:	
Time	**Location of splint:**	
	Pulses:	Skin Condition:
	Interventions:	
Time	**Location of splint:**	
	Pulses	Skin Condition:
	Interventions:	

Wound Management Pre-medicate as needed **N/A** ◯

Time	**Location of wound:**	Time	**Location of wound:**
	Irrigate ◯ Debride ◯ Solution Type:		Irrigate ◯ Debride ◯ Solution Type:
	Dressing Change (circle all that apply): Kerlix Gauze Combat Gauze Pressure		Dressing Change (circle all that apply): Kerlix Gauze Combat Gauze Pressure
Time	**Location of wound:**	Time	**Location of wound:**
	Irrigate ◯ Debride ◯ Solution Type:		Irrigate ◯ Debride ◯ Solution Type:
	Dressing Change (circle all that apply): Kerlix Gauze Combat Gauze Pressure		Dressing Change (circle all that apply): Kerlix Gauze Combat Gauze Pressure
Time	**Location of wound:**	Time	**Location of wound:**
	Irrigate ◯ Debride ◯ Solution Type:		Irrigate ◯ Debride ◯ Solution Type:
	Dressing Change (circle all that apply): Kerlix Gauze Combat Gauze Pressure		Dressing Change (circle all that apply): Kerlix Gauze Combat Gauze Pressure

Comments/Notes:

APPENDIX C: CLASS VIII MEDICAL MATERIEL LIST

The following list incorporates equipment categorized as "Best" although item substitutions categorized as "Minimum" may be described throughout performance steps.

Equipment
• Oropharyngeal airway (OPA) • Nasopharyngeal airway (NPA) • Endotracheal tubes 5.0-8.0 cuffed • Cricothyroidotomy kit: a standardized kit should include at a minimum a #10 scalpel, a tracheal hook (or small, curved hemostat), an airway tube, a 10mL syringe, and a securing strap. The airway tube may be a prefabricated cricothyroidotomy tube such as that included in the Cric- Key (Control Cric), a Shiley tracheostomy tube, or a 6.0-sized endotracheal tube. • Bag valve mask (BVM) • PEEP valve: either separate device, or affixed to the BVM • Capnography/capnometry device • Bougie

Donor Testing	Transfuse to Casualty
• Eldon military kit – 2 x Eldon bags, 50 Eldon cards – 200 x Eldon sticks – 50 x Standard lancets – 50 x Skin cleansing swabs – 50 x Cotton balls – 2 x Plastic droppers – 2 x Set of instructions • 25 x 10mL prefilled NS syringe • 25 x Point-of-care disease testing kit – HIV, HCV, HBV, RPR, malaria, area specific (e.g. Ebola) • 50 x red top and 100 x purple top tubes for confirmatory laboratory testing • 2 x Permanent marker • 5 x Nitrile glove, L • 2 x Surgical tape	• Fluid warming device • 25 x IV catheter, 18G x 1.25" • 25 x IV catheter, 20G • 10 x IV catheter, 22G • 10 x Cordis central line kit 7Fr single lumen • 10 x Rapid infusion catheter kit • 25 x IO catheter, 18G • 25 x IV start kits • 25 x 100mL NS • 25 x Y-type administration set with filter • 2 x Pressure infusing device • 25 x OPSITE wound dressing

Donor Blood Draw	**Monitor Casualty**
• 25 x Single collection 450mL CPD/CPDA-1 blood pack • 25 x 1mL syringes with 25G needles • 5 x Kelly forceps for tube clamping • 1 x 10" 550 cord • 200 x Alcohol pads • 25 x 18G needle • 200 x Woven gauze sponges • 25 x OPSITE wound dressing • 25 x Blood bag labels	• 2 x thermometer • 1 x BP cuff • 1 x stethoscope • 2 x SpO_2 monitor • 2 x CO_2 monitor • 2 x Foley catheter • Watch/stopwatch • Glucometer • Arterial line set up
Storage	**Drugs**
• Cooling unit (maintain 6°C) • White board (to record blood types and draw dates)	• 10 x 1:1,000 epinephrine • 10 x 50mg diphenhydramine • 10 x 1g calcium chloride • 25 x gm TXA • 10 x 10mg phenylephrine • 10 x 50mg ephedrine • 10 x 20 unit vasopressin · 25 x 10mL syringe · 25 x 18G needle · 25 x 100mL NS · 25 x administration set
Miscellaneous	Hygiene
• Urinary catheters • Urine test strips • Urinal • Lip Balm • Nasal mist • Eye lubricant • Headlamp • Compression stockings • Tape • Postmortem bags • Infusion pumps	• Disposable pads • Cleansing/toothbrush/toothpaste/mouthwash/ tongue decompressor • Baby/mild wash • Washing wipes • Unscented lotion • Basin/bowl • Suction device • Pressure sore prevention dressing • Bed linen, blanket, towels, washcloth

For additional information including National Stock Number (NSN), please contact dha.ncr.med-log.list.lpr-cps@health.mil

***DISCLAIMER:** This is not an exhaustive list. These are items identified to be important for the care of combat casualties.*

APPENDIX D: NURSING SKILLS CHECKLIST FOR CLINICAL ROTATION

SKILLS CHECKLIST FOR CLINICAL ROTATION		
CASUALTY CARE	**DATE**	**PRECEPTOR INITIALS**
Perform head-to-toe assessment		
Monitor vital signs (BP, pulse, respirations, temperature)		
Perform finger stick blood sugar		
Provide appropriate padding to bony protrusions to prevent pressure sores		
Perform proper casualty positioning/body alignment/casualty turning		
Bed-making (unoccupied/ occupied)		
Bathing (conscious/unconscious casualty)		
Review casualty "packaging" for transport		
Isolation Procedures • Donning and Doffing of PPE		
Postmortem Care		
NEUROLOGICAL	**DATE**	**PRECEPTOR INITIALS**
Perform neuro exam		
AVPU assessment		
Pupil assessment		
Glasgow Coma Scale		
TBI/cerebral assessment		
TBI/cerebral edema interventions		
• Elevate the head of bed		
• Neck in neutral position to decrease ICP		
• Hypertonic solution (3%NaCl v. Sodium Bicarbonate)		
RESPIRATORY	**DATE**	**PRECEPTOR INITIALS**
Auscultate lung sounds		
Assess airway (open v. occluded)		
Airway positioning		
• Jaw thrust		
• Head-tilt, chin-lift		
• NPA		
General mouth care, teeth brushing		
Oral suctioning/ care		
Endotracheal suctioning/ care		

Trach suctioning/ care		
ET tube verification		
• Auscultate for bilateral lung sounds		
• Watch for bilateral rise and fall of the chest		
• ET waveform capnography		
• Measure cuff pressure		
Review ventilator setting (FiO2, Tidal Volume, PIP, PEEP, Respirations, Pressure Support)		
Monitor and identify s/s of respiratory distress		
Turn, cough, deep breath		
Chest tube		
• Dressing		
• Closed drainage system setup and management		
CARDIOVASCULAR	**DATE**	**PRECEPTOR INITIALS**
Assess for resuscitation need		
Fluid/blood product resuscitation		
Proper electrode lead placement		
Manual pulse checks		
EKG rhythm review (shockable rhythms)		
12 Lead ECG administration		
Insert peripheral IV • Management of peripheral saline lock • Ultrasound guided placement		
Arterial line management		
Central Line management		
GASTROINTESTINAL:	**DATE**	**PRECEPTOR INITIALS**
Nasogastric (NG)/ orogastric (OG)		
• Indication		
• Insertion		
• Removal		
Provide appropriate nutrition		
Perform swallow evaluation prior to PO intake		
GENITOURINARY	**DATE**	**PRECEPTOR INITIALS**
Foley catheter		
• Indication		
• Insertion		
• Care		
Monitor hourly urine output		

POCUS bladder imaging		
INTEGUMENTARY	**DATE**	**PRECEPTOR INITIALS**
Wound care/dressing changes		
Irrigate wounds		
Perform DVT prevention for unconscious casualty Q2H		
• Ankle plantarflexion-dorsiflexion		
• Lower extremity massage		
MEDICATIONS	**DATE**	**PRECEPTOR INITIALS**
Interpretation of medication order		
PO Medication		
Medication via feeding tube		
Eye drops/eye ointment		
Nose drops/spray		
Metered dose inhalers		
Topical medications		
Rectal/vaginal suppositories		
Intradermal (PPD)		
Subcutaneous Injection and sites		
Intramuscular Injections and sites		
Reconstituting medications		
Reassess casualty following medication administration for effectiveness		
Pain medications administration		
Vasopressor administration		
• Effectively titrate vasopressors for goal blood pressure or MAP		
Administer sedative medication		
Antibiotics		
Blood product administration		
PSYCHOSOCIAL	**DATE**	**PRECEPTOR INITIALS**
Develop teaching plan		
Implement teaching plan		
Utilizing telemedicine		

APPENDIX E: TELEMEDICINE / TELECONSULTATION

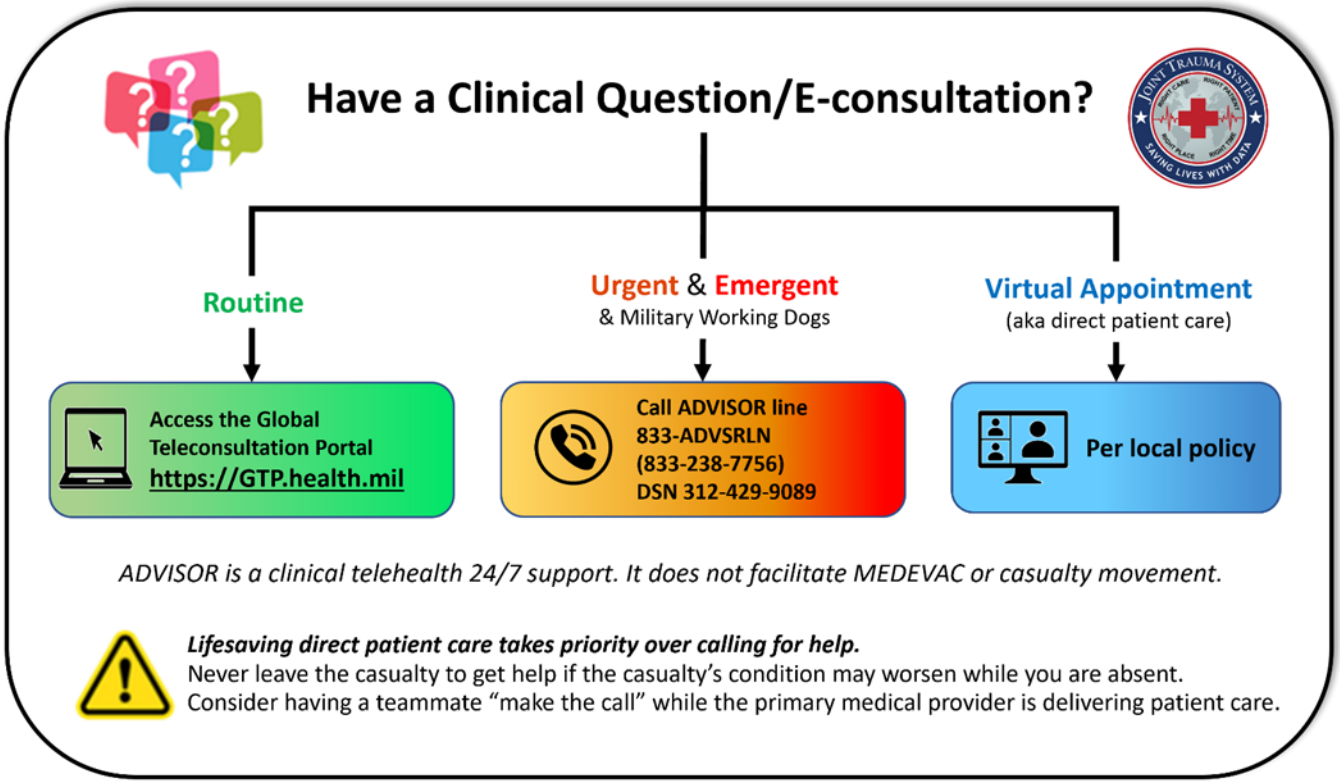


Illustration by Raymond Samonte

GTP: https://GTP.health.mil

Theater Patient Movement Requirements Center (TPMRC): to coordinate evacuation.

- TPMRC-Americas (NORTHCOM & SOUTHCOM), 618-817-4200
- TPMRC- East (EUCOM, AFRICOM, CENTCOM), DSN 314-480-8040
- TPMRC- West (INDOPACOM), DSN 315-448-1062

APPENDIX F: INFORMATION REGARDING OFF-LABEL USES IN CPGS

PURPOSE

The purpose of this Appendix is to ensure an understanding of DoD policy and practice regarding inclusion in CPGs of "off-label" uses of U.S. Food and Drug Administration (FDA)–approved products. This applies to off-label uses with patients who are armed forces members.

BACKGROUND

Unapproved (i.e., "off-label") uses of FDA-approved products are extremely common in American medicine and are usually not subject to any special regulations. However, under Federal law, in some circumstances, unapproved uses of approved drugs are subject to FDA regulations governing "investigational new drugs." These circumstances include such uses as part of clinical trials, and in the military context, command required, unapproved uses. Some command requested unapproved uses may also be subject to special regulations.

ADDITIONAL INFORMATION REGARDING OFF-LABEL USES IN CPGS

The inclusion in CPGs of off-label uses is not a clinical trial, nor is it a command request or requirement. Further, it does not imply that the Military Health System requires that use by DoD health care practitioners or considers it to be the "standard of care." Rather, the inclusion in CPGs of off-label uses is to inform the clinical judgment of the responsible health care practitioner by providing information regarding potential risks and benefits of treatment alternatives. The decision is for the clinical judgment of the responsible health care practitioner within the practitioner-patient relationship.

ADDITIONAL PROCEDURES

Balanced Discussion

Consistent with this purpose, CPG discussions of off-label uses specifically state that they are uses not approved by the FDA. Further, such discussions are balanced in the presentation of appropriate clinical study data, including any such data that suggest caution in the use of the product and specifically including any FDA-issued warnings.

Quality Assurance Monitoring

With respect to such off-label uses, DoD procedure is to maintain a regular system of quality assurance monitoring of outcomes and known potential adverse events. For this reason, the importance of accurate clinical records is underscored.

Information to Patients

Good clinical practice includes the provision of appropriate information to patients. Each CPG discussing an unusual off-label use will address the issue of information to patients. When practicable, consideration will be given to including in an appendix an appropriate information sheet for distribution to patients, whether before or after use of the product. Information to patients should address in plain language: a) that the use is not approved by the FDA; b) the reasons why a DoD health care practitioner would decide to use the product for this purpose; and c) the potential risks associated with such use.