

JOINT TRAUMA SYSTEM CLINICAL PRACTICE GUIDELINE (JTS CPG)



Analgesia and Sedation Management During Prolonged Field Care (CPG ID: 61)

The intent of this guideline is to identify potential issues one must consider when providing analgesia with or /without sedation for an extended time. This guideline begins where Tactical Combat Casualty Care (TCCC) guidelines end.

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TABLE OF CONTENTS

Purpose	2
Priorities of Care	2
Principles.....	2
Principles of Medication Use in the PFC Setting.....	3
Monitoring	3
Medications	4
Regional Anesthesia.....	5
Analgesia and Sedation for Expectant Care (i.e. End- of –Life Care).....	5
References	6
About the Authors	7
Appendix A: PFC Analgesia and Sedation Guideline	8
Appendix B: Ketamine Drip Dosing Tables.....	9
Appendix C: Common IV Meds Cheat Sheet	10
Appendix D: Recommended Pain and Sedation Medication.....	11
Appendix E: Regional Anesthesia – Recommendations.....	14
Appendix F: The Richmond Agitation-Sedation Scale (RASS) ¹²	17
Appendix G: Planning Considerations.....	18
Appendix H: Additional Information Regarding Off-label Uses in CPGs.....	19

PURPOSE

This Role 1, prolonged field care (PFC) guideline is intended to be used after Tactical Combat Casualty Care (TCCC) Guidelines, when evacuation to higher level of care is not immediately possible. A provider of PFC first must be an expert in TCCC. The intent of this guideline is to identify potential issues one must consider when providing analgesia with or without sedation for an extended time (i.e. 4–72 hours). As a principle, the guideline attempts to decrease complexity by reducing options for monitoring, medications, and so forth. It prioritizes experience with a limited number of options rather than providing recommendations about many different options that can be used in a more customized way. It does not address induction of anesthesia before airway management (i.e. rapid sequence intubation). The CPG should be used by all clinicians providing analgesia and sedation in a Role 1 (R1) or PFC environment.

PRIORITIES OF CARE

Priorities of care as 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 hemorrhagic shock or respiratory distress (or is at significant risk of developing either condition).
3. Relieve pain. Give medications to treat pain first.
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.
5. Stop awareness. During painful procedures, and during some mission requirements, amnesia may be desired.

PRINCIPLES

- In an R1 or PFC 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.
- 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.**
- Smaller, more frequent doses of medications are preferred to single large doses to achieve a constant level of pain control and sedation over a longer time.
- The lower the blood volume, the less drug and time will be needed to achieve similar affects as compared with a normovolemic patient. **Start low, go slow.**



Engage telemedicine support early and often if you are inexperienced in delivering analgesia and sedation beyond TCCC or if you are having difficulty.

PRINCIPLES OF MEDICATION USE IN THE PFC SETTING

Comparative effectiveness data for one analgesia/sedation strategy versus another are lacking. The principles of medication use in the PFC setting include:

1. Consider pain in three categories:
 - a. **Background:** the pain that is always 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.
 - b. **Breakthrough:** the acute pain induced with movement or manipulation. This should be managed as needed. If breakthrough pain occurs often or while at rest, background pain medication should be increased.
 - c. **Procedural:** the acute pain associated with a procedure. This should be anticipated and managed periprocedurally.
2. Analgesia is the alleviation of pain and should be the primary focus of using these medications. In other words, treat pain before considering sedation. Remember, not every patient needs (or should receive) pain medication at first, and unstable patients may require other therapies or resuscitation before the administration of pain or sedation medications.
3. 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).
4. 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 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. Go with less than what you might normally use if each were given alone).
5. PFC requires a different treatment approach than TCCC. Go slow, use lower doses of medication, titrate to effect, and redose more frequently. This will provide more consistent pain control and sedation. High doses may result in dramatic swings between oversedation with respiratory suppression and hypotension alternating with agitation and emergence phenomenon.

MONITORING

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

- **Best:** Portable monitor providing continuous vital signs display and capnography; document vital signs trends frequently.
- **Better:** Capnography (if controlled airway) in addition to minimum requirements.

- **Minimum:** Blood pressure cuff, stethoscope, pulse oximeter; document vital signs trends.

MEDICATIONS

NOTE: Use the PFC Analgesia and Sedation Guideline table ([Appendix A](#)) for recommended treatments.

- Ketamine drip recommendations are detailed in [Appendix B](#).
- A “cheat sheet” of common IV medications is listed in [Appendix C](#).
- Providers using these guidelines should be intimately familiar with the medications in [Appendix D](#), including their pharmacology, and side-effects.

The PFC Analgesia and Sedation Guideline table in [Appendix A](#) is arranged according to anticipated clinical conditions, corresponding goals of care, and the capabilities needed to provide effective analgesia and sedation according to (1) the minimum standard, (2) a better option when mission and equipment support is available (all medics should be trained to this standard), and (3) the best option that may only be available in the event a medic has had additional training and experience, and/or equipment is available. The table is intended to be a quick reference guide but is not stand alone: you must also know the information in the rest of the guideline.

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.

Step 1. Identify the clinical condition.

- **Standard analgesia** is for most patients. The therapies used here are the foundation for pain management during PFC. Expertise in dosing oral transmucosal fentanyl citrate (OTFC) and augmenting it with low dose ketamine IV or IO is a must.
- **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 his/ her 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 and shock.

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 F](#)) as a method to trend the patient’s sedation level.

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 because this practice has not been studied and may not be safe. 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. There is ongoing research to determine the safety of such practices.
- 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 are generally not recommended. Multiple drips should only be undertaken with assistance from a telemedicine consultant 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 (i.e., fewer peaks and troughs of sedation with corresponding deep sedation mixed with periods of acute agitation).

REGIONAL ANESTHESIA

[\(Appendix E\)](#)

Regional anesthesia (e.g., local anesthetic such as ropivacaine or lidocaine injected adjacent to a large, extremity nerve bundle or on either side of a finger or toe) is a useful technique that can markedly reduce or eliminate limb pain without risk of opioid or benzodiazepine side-effects of respiratory depression, sedation, and hypotension. There are, however, serious potential morbidities (and mortality from proximal injections or injection directly into blood vessels) that may occur.

For these reasons, this guideline has attempted to balance the overall risks and potential benefits of this intervention by recommending optimal procedure technique (e.g., use of ultrasound), a limited number of block sites, and the safest medication and dose combination. It should be noted that even with optimal technique, the risk of systemic toxicity (e.g., seizure or cardiac arrest) is not eliminated. Toxicity occurs either with direct injection of anesthetic into the systemic blood circulation or by absorption over the first 15–20 minutes after injection. Close monitoring MUST be available during this time.

Regional anesthesia should only be used by trained individuals. There should be documentation of competency. Three techniques exist:

1. **Ultrasound-guidance:** used to visualize targeted nerves, needle placement, and the spread of local anesthetic in real time.
2. **Nerve stimulation:** requires an assistant, a nerve stimulator, specialized needles, and cannot be reliably applied in cases of partial or complete amputations, given the inability to elicit motor response in severed muscles.
3. **Blind or anatomical technique:** should be reserved for distal nerve blocks only (i.e. fingers or toes).

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:



Call a telemedicine consult.

- **Prepare to**
 - Give opioid (morphine is preferred, but hydromorphone, fentanyl, or other opioid can be given) 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).
- **Relief** of suffering, primarily through pain relief, is the goal during expectant care.



Call a telemedicine consult to discuss.

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