Ketamine for the Management of Acute Pain in VHA Emergency Departments and Urgent Care Centers

National Protocol Guidance
Revised March 2024

VA Pharmacy Benefits Management Services, Medical Advisory Panel, VISN Pharmacist Executives, and the VHA National Emergency Medicine Office

Purpose: To establish a protocol for the administration of intravenous (IV) ketamine for the management of acute pain for non-sedation purposes in VHA Emergency Departments and Urgent Care Centers that is consistent with VHA Directive 1073(1)—Parameters for the Safe Administration of Ketamine for non-Sedation Purposes; Appendix E.[1] VHA Directive 1073(1) - Moderate Sedation by non-Anesthesia Providers DEC 2022

Disclaimer: To be consistent with the purpose of this general guidance and not to be overly proscriptive, this guidance allows facilities the flexibility to exercise modifications to the protocol as necessary to operationalize the use of parenteral (IV or IM) ketamine for treating acute pain.

Background

When clinically indicated, ketamine may be recommended for pain control when conventional modes of treatment have failed or when ketamine is determined to be a more suitable agent. Due to its unique pharmacological properties, sub-dissociative doses (SDK) do not produce many of the potentially adverse respiratory or hemodynamic effects of other analgesics and may be used as a safe and effective alternative or adjunct to opioids.

This protocol does not apply to the use of ketamine for the purposes of deep sedation or when used for the purposes of securing an endotracheal airway (e.g. rapid sequence intubation) or when used in the care of mechanically ventilated patients.

Ketamine is a noncompetitive inhibitor of the N-methyl-D-aspartate (NMDA) receptor. Ketamine reduces hyperalgesia and opioid tolerance and provides analgesia by blocking N-methyl- D-aspartate (NMDA) receptors to reduce glutamate release and by binding to sigma-opioid receptors. Ketamine has been studied in patients who are opioid tolerant, as an adjunct to opioid therapy for acute pain, and may be advantageous in patients on partial opioid or opioid antagonist therapy who have acute tissue trauma related pain.

Departments Affected

Pharmacy, Nursing, Emergency Departments/Urgent Care

Pharmacokinetics

a. Onset – IV: within 30 seconds; IM: onset variable (approximately 15 minutes)
b. Duration – Up to 60 minutes
c. Half-life – 2 to 3 hours

Indication

a. Acute Pain
b. Intractable Pain

Contraindications

a. Hypersensitivity to ketamine or any excipient

Precautions

a. Active or history of psychosis
b. Patients for whom significant elevations in blood pressure would constitute a serious hazard
c. Myocardial ischemia
d. Pregnancy or lactation
e. Consider IVPB and lower dosing for older patients or patients with comorbidities to mitigate adverse effects

Dosing -- Intravenous

a. Initial dose: Intravenous: 0.1 to 0.3mg/kg Ideal Body Weight (IBW): may be administered via IVPB over 10-15 minutes (preferred) or via slow IV push (5 minutes)
    - Maximum dose of 30mg given once
    - IV Compatibility: Dextrose 5% in Water (D5W), Normal Saline (NS) or Sterile Water for Injection
b. Additional dose: If an additional dose is indicated, options include:
    - Repeat IV dose via IVPB or slow IV push as per above OR
    - Start continuous infusion at 0.15 to 0.2 mg/kg/hr
    - Titrate every 30 minutes until pain is relieved
c. Total dose should not exceed 1mg/kg of Ideal Body Weight (IBW)

Dosing -- Intramuscular (when intravenous access not available)

a. *Initial dose: 0.35 to 0.7mg/kg intramuscularly
    - Analgesic onset is more variable than with IV administration. In one clinical trial average onset was 22 minutes (range 5-30minutes)
b. Additional dose: If an additional dose is indicated, options include:
    - Repeat IM dose as per above OR
    - If intravenous access established
        1. repeat via IV dosing as per above OR
        2. Start continuous infusion at 0.15 to 0.2 mg/kg/hr
    - Titrate every 30 minutes until pain is relieved
c. Total dose should not exceed 1mg/kg of Ideal Body Weight (IBW)

**NOTE – Intramuscular dosing for ketamine is not well established with dose ranges that are significantly higher in certain references. For example, Micromedex cites initial dose of 0.5mg/kg and Department of Defense Trauma Combat Casualty Care guidelines recommend an initial IM dose of 0.5-1mg/kg.*

Adverse Effects (at Sub-Dissociative Doses)

a. Common – dizziness, sedation, sense of unreality, nausea
    i. *NOTE: Adverse effects requiring additional management were rare in adults in the ED SDK clinical trials reviewed. Dizziness and perceptual changes were attenuated with 15-minute infusion vs. IV push*
b. Rare – excess sedation, respiratory compromise

Minimum Monitoring, Equipment, and Personnel Requirements

Each facility will be responsible for developing and operationalizing a procedure to administer ketamine in the ED/UCC for the management of acute/intractable pain but at a minimum should include:

a. Bag Mask Valve (BVM) device must be available immediately at the bedside
b. A Licensed Independent Practitioner (LIP) with Out of Operating Room Airway Management (OOORAM) privileges must be available in the ED or UC to immediately respond to the bedside
c. Non-invasive blood pressure monitoring, cardiac monitoring, continuous pulse oximetry and respiratory rate monitoring is recommended to be in place during, and for at least 15 minutes after completion of ketamine administration
d. The ED/UCC LIP is responsible for ensuring that the patient is appropriate to receive ketamine for treatment of acute or intractable pain, obtaining informed consent and immediately attending to the patient in the event of adverse effect
e. The ED/UCC RN is responsible for patient monitoring activities and may administer the medication under an appropriate order from an ED/UCC LIP consistent with applicable state licensure requirements
f. Facilities using ketamine for acute behavioral pain will participate in an ongoing VA MedSafe Medication Use Evaluation (MUE)

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