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MICHIGAN MEDICINE

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Applicability: UMHS Clinical

UMHS Use of Low-Dose Ketamine for Analgesia

Policy, 07-02-027

I. POLICY STATEMENT, PURPOSE AND SCOPE

The University of Michigan Health System is committed to the safe and efficacious use of low-dose ketamine for pain management.

The purpose of this policy is to provide a framework for the use of low-dose (sub-anesthetic) ketamine to treat pain.

The policy identifies standards for low-dose ketamine use in adult, pediatric, and neonatal patients.

- **Out of Scope**
 - Ketamine administration for the purpose of providing an anesthetic regimen
 - Ketamine used specifically for procedural sedation, sedation, and/or ventilator tolerance. For use in procedural sedation, see [Guidelines for the Use of Moderate Sedation Analgesia for Diagnostic, Therapeutic and Minor Surgical Procedures by Non-Anesthesiologists, 62-11-001](#).
 - Ketamine administration in the Emergency Department for the purpose of providing pain management.

II. DEFINITIONS

Pain - An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (Internal Associate for the Study of Pain). Pain is subjective and can be expressed verbally, by nonverbal behaviors, or both.

Pain Assessment - The process of analyzing the data collected and integrating it to formulate goals and a plan of care.

Analgesia - Insensibility to pain without loss of consciousness.

Opioid-induced Hyperalgesia - Paradoxical increase in pain sensitization as a result of opioid exposure, usually when opioids are used at high doses and/or over an extended period of time.

Neuropathic Pain - Pain caused by damage or disease that affects the somatosensory system.

Low-dose Ketamine - Ketamine in sub-anesthetic doses for analgesia (doses <0.3mg/kg/hr up to a maximum dose of 30 mg/hr).

III. POLICY STANDARDS

- A. The ordering of ketamine infusions will be restricted to the Acute Pain Service.
- B. The ordering of ketamine for oral administration will require authorization by the Pain Pharmacist Service, Acute Pain Service, or Palliative Care.
- C. Benefits of/indications for low-dose ketamine include the following:
 - Improved pain management of postoperative pain, cancer-related pain, and other acute pain conditions, especially in patients with high opioid requirements or non-opioid responsive pain conditions
 - Improved analgesic benefit for neuropathic pain
 - Use in combination with additional analgesics to maintain alertness, calmness, and appropriate responsiveness while providing analgesia.
- D. Ketamine infusions will be administered via a locked infusion device.
- E. Monitoring of low-dose ketamine infusions will follow the monitoring parameters within the Low-Dose Ketamine Order Set.
- F. Ketamine is a controlled substance. The administration, storage, and handling, including waste, follow all controlled substance requirements including wasting procedures (see [Department of Pharmacy Policy 170.00: Controlled Substances Management](#)).

IV. PROCEDURES AND ACTIONS

- A. **Authorized Prescribers**
 - 1. Complete an assessment of pain and suitability of low-dose ketamine selection based on patient's prior history of opioid use, the degree of pain, and the intended goal.
 - 2. Assess patients to determine the effectiveness of low-dose ketamine therapy, presence of side effects, the need for dose adjustments, supplemental doses, or the addition of adjuvant drugs.
- B. **Pharmacy**
 - 1. Low-dose ketamine infusion will be dispensed via medication cartridge.
- C. **Nursing**
 - 1. Primary responsibility for bedside nursing is to monitor for any ketamine-related side effects (for example, hallucinations, increased salivation, hypertension). Refer to [Exhibit A](#) for specific information.
 - 2. APS physician/nurse will be present for initiation of therapy, changes in programming, and administration of bolus doses of a low-dose ketamine infusion.
 - 3. Administration of low-dose ketamine infusions will follow the orders as indicated in the electronic health record.
 - 4. Low-dose ketamine infusions will be administered via a locked infusion device.
 - 5. Monitoring of the low-dose ketamine infusion will follow the orders as indicated in the electronic health record.

V. EXHIBITS

[Exhibit A: Low-Dose Ketamine Infusion Reference Guide](#)

VI. REFERENCES

Bohnert AS, Valenstein M, Bair MJ, Ganoczy D, McCarthy JF, Ilgen MA, Blow FC. Br J Anaesth. 2007;99:396-403. Adding ketamine to morphine for patient-controlled analgesia after thoracic surgery; influence on morphine consumption, respiratory function, and nocturnal desaturation.

Dullenkopf A, Muller R, Dillmann F, Wiedemeier P, Hegi TR, Gautschi Anaesth Intensive Care. 2009 Sep;37(5):753-7. An intraoperative pre-incision single dose of intravenous ketamine does not have an effect on postoperative analgesic requirements under clinical conditions.

Eikermann M, Grosse-Sundrup M, Zaremaba S, Henry ME, Bittner EA, Hoffmann U, Chamberlin NL. Anesthesiology. 2012 Jan;116(1):35-46. doi: 10.1097/ALN.0b013e31823d010a. Ketamine activates breathing and abolishes the coupling between loss of consciousness and upper airway dilator muscle dysfunction.

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Michele P, Guervilly C, He'laine A. et al. JAMA. 2011 Apr 6;305(13):1315-21. doi: 10.1001/jama2011.370. Association between opioid prescribing patterns and opioid overdose-related death.

Slatkin NE, Rhiner M.J Support Oncol 2003;1:287-293. All three dosing regimens seem reasonable, although obviously the protocol currently used at Maine Medical Center seems like the ideal starting point.

Zakine J, Samarcq D, Lorne E, Moubarak M, Montravers P, Beloucif S, Dupont H. Anesth Analg. 2008 June;106(6): 1856-61. doi: 10.1213/ane.0b013e3181732776. postoperative ketamine administration decreases morphine consumption in major abdominal surgery; a prospective randomized, double-blind, controlled study.

Policies/Guidelines

[Nursing Services Policy: PCA Patient Controlled Analgesia \(PCA\)](#)

[Nursing Services Policy: Epidural and Peripheral Nerve Catheters: Guidelines for Analgesia by Catheter Techniques Adult UMHS](#)

[End of Life Exception Policy, 62-10-005](#)

[Guidelines for the Use of Moderate Sedation Analgesia for Diagnostic, Therapeutic and Minor Surgical Procedures by Non-Anesthesiologists, 62-11-001](#)

[Department of Pharmacy Policy 170.00: Controlled Substances Management](#)

[Nursing Management of Controlled Substances](#)

Authors:

Acute Pain Service
Pain Management Committee

Approved by:

Pain Management Committee - May 2014, Addendum update May 2015, January 2018
Pharmacy and Therapeutics Committee - August 2014, February 2018
Acting Chief Executive Officer and Chief Operating Officer - October 5, 2015

Endorsed by:

Nurse Evidence-Based Standards Committee - June 2015, February 28, 2018
Nurse Executive Council - July 2015, May 21, 2018

Attachments

[A: Low-Dose Ketamine Infusion Reference Guide](#)

Applicability

UMHS Clinical