



Ketamine Infusion (Low Dose Intravenous Analgesia) in the Acute Care Setting Procedure

1. Guiding Principles

“The primary role of low-dose ketamine is as an ‘anti-hyperalgesic’, ‘anti-allodynic’ and ‘tolerance-protective’, rather than as a primary analgesic”¹

- Ketamine has preventive but not pre-emptive analgesic effects
- Low-dose ketamine does not produce a clinically significant decrease in pain scores and is therefore not indicated for ‘routine’ peri-operative use
- Peri-operative low-dose ketamine is opioid-sparing and reduces the incidence of nausea and vomiting, but not other opioid-adverse effects
- The addition of low-dose ketamine does not increase the incidence of side effects (sedation, confusion or nausea) compared with opioids alone
- Side effects are dose dependent and respond to a reduction in the ketamine infusion dose
- Psycho-cognitive effects (hallucinations or confusion) occur in 10-20% of patients. They’re usually not distressing and improve with a reduction in the infusion dose or administration of a benzodiazepine
- Ketamine should be administered as a separate, continuous intravenous infusion. There is no clear benefit in adding ketamine to an opioid (in the same syringe) for Patient Controlled Intravenous Analgesia (PCIA)

2. Procedure

Indication for use

- Severe acute pain not responsive to opioids.
- Opioid-tolerant patients (e.g. opioid addiction or prescribed opioids for chronic cancer pain)
- As an ‘adjuvant’ in the treatment of severe neuropathic (e.g. phantom limb, radicular or CRPS/RSD), ischaemic-limb, visceral (e.g. pancreatitis) or cancer pain (e.g. mucositis).

Contra-Indications

- Raised intracranial pressure, psychosis, schizophrenia.

Precautions

- Sedation, confusion, elderly, psychiatric conditions (anxiety, PTSD), seizure disorders, coronary artery disease, severe hypertension.
- Severe liver disease (Higher doses may cause abnormalities in LFTs)

Prescription

- Only Anaesthetic Consultants, Anaesthetic Registrars, GP Anaesthetists, Intensivists and Emergency Physicians can prescribe ketamine infusions
- Ketamine is a Schedule 8 medicine and is to be managed in accordance with the WACHS [Medication Administration Policy](#)

Continuous Intravenous Infusion Regimen

- Ketamine 200mg diluted in Sodium Chloride 0.9%. Total volume = 100 mL
- A higher dose may be required, as determined by the clinical judgement of a consultant. High Dependency Unit (HDU) admission may need to be considered with higher doses.

Dosage and administration

- Ketamine infusions are not to be prescribed for children under 12 years
- Ketamine dose of 0.1mg to 0.2mg/kg/hr (an average of 5-10 mg/hr in adults) intravenously
- May be considered for children under 12 years old, only in consultation with PMH
- Administered as a separate intravenous infusion via the Computerised Ambulatory Drug Delivery pump (CADD pump)
- Labelling of medication cassette and lines is in accordance with OD 0647/16 [National Standard for User-Applied Labelling of Injectable Medicines, Fluids and Lines](#)
- Oxygen (if indicated) is to be charted on the National Inpatient Medication Chart (NIMC) using an oxygen sticker.
- The infusion must be run at a prescribed **fixed Dose**. Dose change may **only** occur following consultation with the prescriber/APS Medical Officer/Anaesthetist on call, senior intensive care/emergency physician.
- A new prescription is required for each change to the dose.
- After 24hours a new CADD medication cassette should be commenced and line change is to occur every 72 hours as per WACHS [Medication Administration Policy](#)
- IV access to be maintained for 3hours after ketamine infusion has been ceased.

Side Effects and Management

- Side effects may include:
 - Sedation
 - Dysphoria or confusion (feeling 'strange', 'unwell', 'spaced out', 'light headed', 'floating')
 - Nightmares, insomnia, hallucinations ('seeing or hearing things' altered perception, 'out of body' or 'near death' experiences)
 - Tremor, vertigo, diplopia, nystagmus, headache, sweating, nausea, vomiting, salivation, hypertension, tachycardia.
- Management of side effects:
 - Escalate as per age appropriate observation and response chart for vital signs, and in addition:
 - stop the infusion
 - contact APS/anaesthetist on call for review
 - For side effects (non-vital sign related):
 - contact the prescriber for review
 - Consider benzodiazepines (e.g. diazepam, midazolam or lorazepam) if psycho-cognitive side effects occur (hallucinations, insomnia, mild confusion, anxiety)

Observations

- As per the [WACHS SW MR113a Ketamine Infusion Record](#)
- Vital signs are recorded on the age appropriate observational and response chart (ORC). Local escalation procedures are aligned with the “actions required” described on the escalation protocol section / zone criteria section (paediatric charts), in line with the WACHS [Clinical Escalation of Acute Physiological Deterioration including Medical Emergency Responses Policy](#).
- Additional observations and recordings (nausea score, infusion dose and cumulative dose) are charted on the [SW MR140aa Additional Observation Chart](#)
- The handover check of the 6 rights of medication administration is recorded on the [SW MR140aa Additional Observation Chart](#) at each shift change or where a change in responsibility of care occurs between staff
- Changes to infusion dose and commencement of new medication cassettes are recorded on the [WACHS SW MR113a Ketamine Infusion Record](#)
- Patients on ketamine infusion may not leave the ward unless accompanied by a nursing staff member. Staff member is to remain with the patient at all times. If the patient is non-compliant with remaining on the ward the infusion is to be discontinued and the appropriate Medical Officer/APS notified.
- Patients with a ketamine infusion should be cared for in a quiet environment where possible
- Management and observation of intravenous cannula is in accordance with the WACHS [Peripheral Intravenous Cannulae \(PIVC\) Management Clinical Practice Standard](#) and the WACHS [Central Venous Access Device \(CVAD\) Management Clinical Practice Standard](#). PIVAS is recorded on the [MR179 WACHS Peripheral Intravenous Cannula Observation Record](#).

Discharge and transfer from areas:

- Refer to the WACHS [Admission, Discharge and Intra-hospital Transfer Clinical Practice Standard](#)
- Oxygen may be required for transfer, as determined by the patient’s condition.
- If observations are within safe parameters, patients for transfer to another area (including for investigations such as X-ray or CT scan) must be escorted by a nurse/midwife, who should remain with the patient
- For intra/inter-hospital transfer patients being escorted where additional support is **not** available (e.g. imaging departments or ambulance transfers), the nurse/midwife escort must be current in advanced life support and have airway support equipment available, including oxygen, suction and bag/valve/mask.
- Discharge information:
 - a) WA Therapeutics Advisory Group (WATAG) website (search under [clinical guidelines and advisory notes](#)) provides two resources:
 - [Recommendations for prescribing analgesia on discharge following surgery or acute injury](#) (Information for health practitioners preparing the patient for discharge)
 - [Pain relief medications following surgery and injury](#) (Information for patients preparing for discharge)

3. Definitions

Ketamine	An N-methyl-D-aspartate (NMDA) receptor antagonist used for many years as a dissociative anaesthetic and more recently as an adjunct 'analgesia' by low dose (0.1-0.2 mg/kg/hr) intravenous infusion.
PCIA	Patient controlled intravenous analgesia

4. Roles and Responsibilities

Regional Medical Directors and Regional Nurse Directors

Are responsible for ensuring that all medical, nursing and midwifery staff involved with ketamine infusion administration and management have access to, and work within this policy

All staff prescribing, preparing and administering Schedule 8 medications must undertake this procedure in accordance with their scope of practice and adhere to WA health operational directives and all other related WACHS policies and local procedures related to this procedure

Nurses/Midwives: Enrolled nurses (EN) may care for a patient receiving a ketamine infusion where a Registered Nurse (RN) / Midwife has: already measured or commenced administering that medication, the EN is delegated to do so, and is under the supervision of the responsible RN/Midwife. The RN/Midwife has sole responsibility for the ketamine infusion.

All Staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

5. Compliance

Failure to comply with this procedure may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the [Employment Policy Framework](#) issued pursuant to section 26 of the [Health Services Act 2016](#) (HSA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

6. Evaluation

Evaluation, audit and feedback processes are to be in place to monitor compliance.

The Clinical Incident Management System – CIMS Datix is to be used to review trends and investigate incidents as required.

To assist with trending, use Tier 1: Medications and identify relevant Tier 2 and 3 categories. Include "opioid" in the free text description box.

7. Standards

National Safety and Quality Health Care Standards:

Clinical Governance Standard: 1.7, 1.23
Medication Safety Standard 4.1, 4.3, 4.13-15

8. Legislation

Medicines and Poisons Act 2014 (and Medicines and Poisons Regulations 2016)

9. References

1. Visser, E., & Schug, S. (2006). The role of ketamine in pain management. *Biomedicine & pharmacotherapy*, 60(7), 341-348
2. WA Health Fiona Stanley Hospital (2017) *Acute Pain Service Manual v1.3*. [Accessed: 8 December 2017]

10. Related WACHS Policy Documents

Admission, Discharge and Intra-hospital Transfer Clinical Practice Standard
Central Venous Access Device (CVAD) Management Clinical Practice Standard
Clinical Escalation of Acute Physiological Deterioration including Medical Emergency Responses Policy
Intravenous Opioid Administration Policy
Medication Administration Policy
MR179 Peripheral Intravenous Cannula Observation Record
Peripheral Intravenous Cannulae (PIVC) Management Clinical Practice Standard
WACHS SW MR113a Ketamine Infusion Record
SW MR140aa Additional Observation Chart

11. Related WA Health System Policies

Prescription and Management of Patient Controlled Intravenous Analgesia
National Standard for User-Applied Labelling of Injectable Medicines, Fluids and Lines.

12. Policy Framework

Clinical Governance, Safety and Quality Policy Framework

**This document can be made available in alternative formats
on request for a person with a disability**

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