

## Ketamine in acute pain management

Reference Number: SA0104

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<b>Version:</b>	3
<b>Supersedes :</b>	2
<b>Approval Group:</b>	Speciality Governance
<b>Ratified by:</b>	Drugs and Therapeutic Committee
<b>Date ratified:</b>	30/11/2018
<b>Date issued:</b>	14/12/2018
<b>Review date:</b>	30/11/2020

## Contents

1. Introduction .....	3
2. Purpose/Scope.....	3
3. Responsibilities .....	3
4. Guideline/Procedure .....	3
I. Indications	
II. Contraindications	
III. Cautions	
IV. Low dose intravenous ketamine infusion	
i. Monitoring	
ii. Adverse effects	
iii. Discontinuing the ketamine infusion	
V. Oral ketamine	
i. Dose	
VI. Availability and supply	
Appendices .....	6

## **1. Introduction**

There has been an increase in the use of ketamine in acute pain management recently. Evidence of improved analgesia, reduced opioid requirements and reductions in nausea and vomiting, amongst other benefits, have been demonstrated.

Many studies have been published looking at ketamine, given at low (sub-anaesthetic) doses, as an analgesic adjunct in acute pain. It appears to reduce opioid consumption, as measured by Patient Controlled Analgesia (PCA) morphine use, and in some studies to reduce post-operative nausea and/or vomiting (PONV). It has a small, and somewhat variable effect on pain scores, but appears to have more effect in patients with severe postoperative pain, and may be helpful in opioid tolerant patients

A recent review, concentrating solely on intravenous (IV) use of ketamine post operatively reported significant reductions in pain scores and reductions in opioid usage in patients who had severe pain (pain scores >7/10 on visual analogue scoring (VAS)) but not in those who had mild pain (pain scores <4/10 on VAS). They also noted it was particularly helpful in thoracic, upper abdominal and major orthopaedic surgery.

## **2. Purpose/Scope**

This document aims to define where it might be appropriate to use ketamine in acute pain management within BTHFT and will outline approaches supported by the Acute Pain Service (APS).

To aid with the prescribing, administration and monitoring of patients prescribed IV or oral ketamine.

## **3. Responsibilities**

Those responsible for the prescribing, administration and monitoring of patients receiving IV or oral ketamine should read and understand this guideline.

## **4. Guideline/Procedure**

### **I. Indications**

Ketamine may be considered in the following patients:

- Poor pain control despite conventional approaches
- High opioid requirements in the perioperative period
- Opioid tolerance
- Patients undergoing particularly painful surgery e.g. thoracic surgery

## **II. Contraindications**

- Allergy to ketamine
- Acute porphyria

## **III. Cautions**

- Raised intracranial pressure
- Raised intraocular pressure
- Uncontrolled hypertension
- Ischaemic heart disease
- Known psychiatric conditions, especially schizophrenia
- Confusion
- Epilepsy

## **IV. Low dose IV ketamine infusion**

IV ketamine must only be used in a critical care setting due to monitoring requirements

IV ketamine must be prescribed on the main drug chart

### **i. Dose:**

- 0.2mg/kg/hour (maximum 10mg/hour) via syringe pump
- 50mg ketamine in 50mls sodium chloride 0.9%. (Concentration: 1mg/ml).
- Use ketamine 10mg/ml injection

### **ii. Monitoring**

Heart rate, blood pressure, respiratory rate, oxygen saturations, pain scores and sedation score measured hourly for the first 4 hours then 4 hourly thereafter.

### **iii. Adverse effects**

Central nervous system effects:

Sedation:

- Ketamine is used in combination with opioids in almost all cases. Both ketamine and opioids can cause sedation.
- If sedation is significant (patient un-rousable) then discontinue both drugs and contact an ICU anaesthetist

Vivid dreams, hallucinations and psychiatric symptoms:

- Possible with intravenous ketamine but should be uncommon within recommended doses.
- Reduce the rate –(suggestion to 0.1mg/kg/hour, ie halve the rate) or stop the infusion and ask the APS for advice if they occur. Only continue if the ketamine is significantly benefitting the patient's pain
- Intravenous midazolam 0.5-2 mg, titrated according to response. or oral haloperidol 0.5 -1.5 mg , 1 to 4 hourly, may be helpful if ketamine is to be continued.

Respiratory depression

- Stop the ketamine infusion if respiratory rate <8 bpm
- Stop any concomitant opioids
- Consider administration of naloxone 100 micrograms as an intravenous bolus; if no response after 2 minutes repeat dose, repeat again if still no response every 2 minutes until respiratory rate >10bpm and/or awake.

Cardiovascular effects

Hypertension and tachycardia

- Reduce –(suggestion to 0.1mg/kg/hour, ie halve the rate) or stop the ketamine infusion. Only continue if the ketamine is significantly benefitting the patient's pain control.

This is not an exhaustive list. For further details consult product literature, APS or medicines information

#### **iv. Discontinuing the ketamine infusion**

IV ketamine is for short term use only, usually for a maximum of three days. It may be stopped when pain control, particularly opioid requirements are satisfactory.

IV ketamine must be discontinued when discharged from a critical care setting.

#### **V. Oral ketamine**

Ketamine may be used orally as an adjunct to postoperative pain management on any surgical ward. The indications for use, cautions, contraindications and adverse effects are the same as with IV ketamine.

Oral ketamine has a poor bioavailability (approximately 20%). Therefore doses are usually larger than those used IV.

Oral ketamine must be prescribed on the main drug chart.

#### **i. Dose**

Before commencing oral ketamine the patient must receive an IV test dose:

- Draw up 10mg ketamine in 10ml sodium chloride 0.9%
- Give 2.5mg increments by IV injection every 5 minutes (max 10mg)
- Monitor pain levels. Pain should settle rapidly within 10-15 minutes.

Oral ketamine dose following positive IV test dose:

- 25mg QDS (increased incrementally to 50mg QDS if necessary)
- Use 10mg/ml injection orally (unlicensed use)
- May be administered in fruit juice to mask bitter taste

Patients' prescribed oral ketamine will be reviewed daily by the APS.

Oral ketamine will be stopped when pain control is satisfactory or if adverse effects are unacceptable to the patient

Patients must not be discharged with oral ketamine

### **VI. Availability and supply**

Ketamine is a class B, schedule 2 controlled drug (CD) and must be stored in a locked CD cabinet with the receipt and administered doses recorded in the CD register.

Ketamine must be ordered from pharmacy in the ward stock CD order book with the red CD bag.

- If presented to Pharmacy Reception the drug chart must accompany the CD order to be clinically checked by a pharmacist
- The ward pharmacist can complete the clinical check on the ward if present

## VII. References

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