

KETAMINE PROTOCOL FOR PAEDIATRIC PROCEDURAL SEDATION

**Department of Emergency Medicine,
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(VERSION 1.0)

By

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Ketamine Sedation Guidelines, Royal College of Emergency Medicine, UK.

Ketamine Protocol for Paediatric Procedural Sedation

This protocol is to assist experienced Emergency Physicians in administering Ketamine sedation for minor procedures in the Emergency Department.

Before Procedure

Avoid Sedation

Before procedural sedation, all other options should be fully explored. These include reassurance, distraction and analgesia.

- Reassurance (Involve Parents and Pediatric Nurses)
- Distraction (toys, teddy bears, favourite cartoon/game on parent's phone / tablets)
- Analgesic options include
 - Paracetamol (15mg/kg) & Ibuprofen (7.5mg/kg)
 - Oral Morphine (0.2mg/kg)
 - Entonox
 - Fentanyl (Intra Nasal / Lollipops)

If all of these techniques fail, Ketamine sedation should be considered.

Consultant Approval / Presence

Every child that requires ketamine sedation should be discussed with and approved by the Consultant prior to administering ketamine sedation. ED consultant's presence during the procedure is mandatory unless the consultant thinks otherwise. Ketamine sedation will not be administered if the ED consultant is not physically present in the department.

Sedation Timings

Ketamine sedation will only be given during the hours 0830 – 1730 Monday to Friday. Patients presenting after hours should be admitted under appropriate specialities.

A select population of patients with minor injuries may be brought back the next morning to have the procedure done under ketamine sedation in the Emergency Department. This will require consultant approval over telephone.

Parental Involvement

Parental involvement at all stages is mandatory. Parents and the child (if of age) should be briefed about Ketamine sedation and recovery. A formal information leaflet should be given prior to the procedure. Any queries should be answered and clarified. Encourage the child and parents to talk (dream) about happy topics. This helps minimise unpleasant emergence phenomena.

Consent

A formal written consent should be taken from the parents prior to the procedure. Generic UNHG consent form should be used.

Age

The minimum age for ketamine sedation is 1 year. Children less than 1 year of age will be should be referred to the appropriate speciality.

Fasting Status

The fasting state of the child should be considered in relation to the urgency of the procedure. There is no evidence that complications are reduced if the child is fasted. However traditional anaesthetic practice favours a period of fasting prior to any sedative procedure. Recent food intake should not be considered as an absolute contraindication to Ketamine sedation. A risk / benefit analysis should be done.

Staff Competence

Anyone administering ketamine sedation should be competent with paediatric airway management. They should also be competent to manage any airway related complications. All registrars should have a minimum of up-to-date Advanced Paediatric Life Support (APLS) certification to administer ketamine sedation.

Duration of Procedure

There is a risk of failure of sedation if the procedure is prolonged more than 20 minutes. Such procedures should be pre-empted and should be referred to appropriate speciality for General Anaesthesia.

Procedures Suitable for Ketamine Sedation in ED

- a. Repair of Simple Wounds
- b. Manipulation of Fractures & Dislocations
- c. Foreign Body Removal
- d. Incision and Drainage of abscess
- e. Application of splints
- f. Burns dressings

Contraindications

Contraindications should be actively sought.

- Age less than 12 months due to an increased risk of laryngospasm and airway complications. Children aged between 12 and 24 months should only receive ketamine sedation from expert staff (usually a consultant)
- A high risk of laryngospasm (active respiratory infection, active asthma)
 - Unstable or abnormal airway. Tracheal surgery or stenosis.
 - Active upper or lower respiratory tract infection
 - Proposed procedure within the mouth or pharynx
- Patients with severe psychological problems such as cognitive or motor delay or severe behavioural problems.
- Significant cardiac disease (angina, heart failure, malignant hypertension)
- Recent significant head injury or reduced level of consciousness
- Intracranial hypertension with CSF obstruction.
- Intra-ocular pathology (glaucoma, penetrating injury)

- Previous psychotic illness
- Epilepsy
- Hyperthyroidism on Antithyroid medication
- Porphyria
- Prior adverse reaction to Ketamine

During Procedure

Setting (Procedure Room in Paeds / Resus)

The child should be managed in an area with immediate access to full resuscitation facilities. Monitoring should include Pulse, BP, Respiration, ECG, Pulse Oximetry and End Tidal Co2. Supplemental Oxygen should be given and suction should always be available.

Staffing

1. At least three staff member are required
 - a. Clinician 1 to administer sedation
 - b. Clinician 2 to perform the procedure
 - c. Nurse to monitor the sedation

Dosing

Ketamine Dose

1mg/kg Ketamine **slow intravenous injection** over one minute

2.5mg/kg Ketamine **IM (Intramuscular)** single injection in the lateral aspect of thigh

Correct dosing and calculation is paramount. In UCHG ED Ketamine is available in ampules of **200mg in 20ml which is equivalent to 10mg/1ml** concentration. Please check the ampule before preparing the drug as higher concentration 500mg in 20ml are also available in the hospital.

Use 1cc/ml syringe from preparing doses less than 15mg.

The doses advised for analgesic sedation are designed to leave the patient capable of protecting their airway.

At the end of the procedure ensure that any remaining ketamine is discarded, and that this is witnessed.

Adjunctive Medication

Always adjunct sedation with local anaesthesia (LAT Gel / Local Infiltration / Nerve block) where appropriate.

Duration

Adequate sedation is usually indicated by loss of response to verbal stimuli and nystagmus: heart rate, blood pressure and respiration rate may all increase slightly. Lacrimation or salivation may be observed. The effects of the drug are usually apparent 1-2 minutes after an IV dose, and 5 minutes after an IM dose.

Parental Presence

Parents should be encouraged to stay with the child during the procedure and talk to them about happy things prior to and during the procedure as this will help encounter the emergence phenomenon.

Complications

Severe Agitation 15%

Moderate Agitation 10%

Airway:

- Noisy breathing is usually due to airway mal-position and occurs at an incidence of <1%. This can normally be corrected by routine airway position management.
- In rare cases laryngospasm may occur (0.3%).

Vomiting: 5 - 10% incidence. This usually occurs during the recovery phase. Usually settles without any intervention. If need be oral / intravenous Ondansetron can be given.

Lacrimation and salivation: 10% incidence. Settles on its own. If salivation is excessive frequent suctioning should be done to keep the airway patent.

Transient rash: 10% incidence. Usually settles on its own. Needs to be differentiated from allergic reaction / anaphylaxis. If any signs of allergic reaction / anaphylaxis occur, appropriate medical management should be immediately given and the procedure should be discontinued. Patient should be observed for longer than usual.

Transient clonic movements: <5%. Parents need to be counselled beforehand as these increase parental anxiety. These are also self-settling. If don't settle on their own, specialist paediatric help should be sought.

If any complication arises which needs medical intervention, an incident form should be filled on Q-Pulse.

Post Procedure

Monitoring

The child should be nursed in a monitored area which is quiet and should be under continuous observation of a staff member. **Premature stimulation should be avoided under all circumstances.** Recovery should be complete between 60 and 120 minutes depending on the dosage and route used.

Discharge

The child can be safely discharged once they are able to ambulate and vocalise/converse at pre-sedation levels. An advice sheet should be given to the parent or guardian advising rest and quiet, supervised activity for the remainder of that day. The child should not eat or drink for three hours after the procedure because of the risk of nausea and vomiting.

Documentation

A formal procedure note should be written in patients ED notes. A Patient sticker should be placed in the sedation log book for audit purposes. Sedation form should be filled both by the doctor and nurse.

**KETAMINE SEDATION
INFORMATION SHEET
FOR PARENTS**

Department of Emergency Medicine, University Hospital Galway
KETAMINE & PROCEDURAL SEDATION
WHAT YOU NEED TO KNOW

Your child may become distressed or have pain when having certain procedure. Sedation for procedures aims to reduce your child's pain and anxiety. The sedation may make your child feel sleepy and relaxed, meaning the procedure can be performed more easily and with less distress for you and your child. Your child may not remember the procedure at all or only remember small amounts only. This is normal.

Ketamine is commonly used in hospitals for sedation in children. There are some special features about sedation with ketamine for you to know:

- Your child will be cared for by a senior doctor and nurse
- It is given by injection into a vein or into the muscle of the thigh
- Your child may seem to be awake after receiving ketamine
- Your child may move a little without obvious cause, this is normal
- Your child's eyes may twitch, this is normal
- Your child may report odd dreams on waking up, and may become a little agitated (less than 20% of children experience this). This tends to improve if you comfort your child in a quiet area until they are fully awake
- One in ten children develop a rash
- One in ten children vomit
- One in ten children will have some eye watering, or may drool
- One in twenty children have some twitching movements
- Rarely (0.3%) there can be laryngospasm (vocal cords close)
- In 0.02% of cases your child may need to be given a general anaesthetic with a breathing tube placed in their windpipe.
- Complete recovery usually happens between 60 and 120 minutes.

***IF YOU HAVE ANY QUERIES OR QUESTIONS AT ALL, PLEASE FEEL FREE TO ASK YOUR NURSE
OR DOCTOR BEFORE THE PROCEDURE.***

Department of Emergency Medicine, University Hospital Galway
KETAMINE & PROCEDURAL SEDATION
WHAT YOU NEED TO KNOW

How to help your child?

Before the procedure

- Ask the doctor/ nurse to explain the procedure to you and to your child. If you do not understand please tell us
- Talk to your child about some ways to cope (for example — looking at a book, game on mobile phone, using their imagination to be in a nice place or blowing bubbles)
- Try not to be too upset or nervous yourself as your child will notice this.

During the procedure

- A parent (or another adult) who knows your child may stay with them and this is usually helpful for your child
- Depending on how deeply sedated your child becomes, they may need reminders of the coping methods you decided upon earlier. This sort of distraction is very helpful
- Giving your child a sense of control with some simple choices is helpful. We can allow them to choose things they may like e.g. music and which finger the oxygen probe may be placed on
- It is not helpful to allow your child to decide the exact moment the procedure is going to happen.

***IF YOU HAVE ANY QUERIES OR QUESTIONS AT ALL, PLEASE FEEL FREE TO ASK YOUR NURSE
OR DOCTOR BEFORE THE PROCEDURE***

Ketamine Sedation Performa

PATIENT ADDRESSOGRAPH 	Date: _____ Time: _____ ED Consultant: _____ Doctor (Sedation): _____ Staff Nurse: _____ Clinician (Procedure): _____
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PATIENT DEMOGRAPHICS	INDICATION	MONITORING
Age _____	Wound Repair <input type="radio"/>	Cardiac <input type="radio"/>
Weight (kg) _____	Joint Relocation <input type="radio"/>	BP <input type="radio"/>
NPO (hrs) _____	Fracture Reduction <input type="radio"/>	SpO2 <input type="radio"/>
Allergies _____	Burns Dressing <input type="radio"/>	EtCO2 <input type="radio"/>
Medical History _____	Other _____	Resus / Procedure Room <input type="radio"/>

PRE PROCEDURE CHECK LIST
(to be completed before starting the procedure)

Written Consent	Contraindications Reviewed (Over Leaf)	Information Leaflet Given	Consultant Present	Emergency Technique Discussed	Duration < 20 minutes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

AIRWAY ASSESSMENT (LEMON) Look Externally Evaluate (3 – 3 – 2) Mallampatti Obstruction Neck Mobility Mallampatti Class: _____ ASA Class: _____	Analgesia Administered Prior to Sedation (Dose) Paracetamol _____ Ibuprofen _____ Oral Morphine _____ IV Morphine _____ Entonox _____ IV Paracetamol _____
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Local Anaesthesia(encircle): INFILTRATION LAT GEL BLOCK Not Applicable

PROCEDURAL SEDATION

Route to be used (Please encircle) INTRAVENOUS INTRAMUSCULAR CALCULATED DOSE: _____ mg of Ketamine CALCULATED DOSE: _____ ml of 200mg/20ml vial of Ketamine Checked and Signed by Doctor(sedation) & Staff Nurse _____	Intravenous Dose Calculation (Preferred Route) 1 x patient's weight _____ = _____ mg Ketamine Calculated dose x 0.1 = _____ ml of Ketamine to be drawn from 200mg/20ml vial
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Ketamine Dose 1mg/kg Intravenous (Preferred) 2.5mg/kg Intramuscular 200 mg / 20ml vial = 10mg / 1ml = 1mg/0.1ml preparation Calculate & draw the right dose using 1ml syringe and triple check before administration	Intramuscular Dose Calculation 2.5 x patient's weight _____ = _____ mg Ketamine Calculated dose x 0.1 = _____ ml of Ketamine to be drawn from 200mg/20ml
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Ketamine Sedation Performa

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- Prior adverse reaction to Ketamine

Ketamine Sedation Performa

Observation and Monitoring

Pre Sedation Observations: Time _____ Pulse: _____ BP ____/____ SpO2 _____ R/R _____ GCS/AVPU _____

Observations During Procedure / Sedation

Time	Ketamine dose	Other drugs	AVPU/GCS	SpO2	R/R	BP	Pulse	signature

Observations During Recovery / Post Procedure (Recover in a Quiet & Monitored Space)

Time	Drug Administered / Reason	AVPU /GCS	SpO2	R/R	BP	Pulse	signature

Normal Observations Post Procedure / Recovery: Time _____ Pulse: _____ BP ____/____ SpO2 _____ R/R _____ GCS/AVPU _____

Post Procedure Check List				
Recover in a quiet & monitored space <input style="width: 40px; height: 20px; border: 1px solid green;" type="checkbox"/>	Information Leaflet to parents <input style="width: 40px; height: 20px; border: 1px solid green;" type="checkbox"/>	NPO for 3 hours post procedure <input style="width: 40px; height: 20px; border: 1px solid green;" type="checkbox"/>	Observe until back to pre-sedation state <input style="width: 40px; height: 20px; border: 1px solid green;" type="checkbox"/>	Organise appropriate follow up / referral <input style="width: 40px; height: 20px; border: 1px solid green;" type="checkbox"/>
Adverse Effects / Complications			Action Taken	

PATEINT STICKER PLACED IN KETAMINE AUDIT BOOK <input style="width: 60px; height: 20px; border: 2px solid black;" type="checkbox"/>

**DISCHARGE
ADVISE SHEET
FOR PARENTS**

Emergency Department, University Hospital Galway. Post Ketamine Sedation Discharge Advice

PATENT ADDRESSOGRAPH

- Your child has been given a medication to make them sleepy to carry out a procedure. Your child will not remember what happened.
- Sometimes the delayed effects of the medicines may make your child a bit confused, sleepy or clumsy for the next 24 hours.
- Let your child sleep. Sometimes children sleep more because of the sedation medication.
- Check on your child's sleeping pattern the night you go home from hospital. If your child is sleeping heavily or strange, wake them up gently. If you cannot wake them up or something seems wrong in their appearance or breathing, call an ambulance.
- Sometimes children may vomit or feel sick if they eat a big meal too soon after sedation. Don't give them anything to eat or drink up-to 3 hours after procedure. Start with clear liquids (water and clear juices) and increase as tolerated.
- Supervise all playing and bathing for the next 24 hours. Do not let your child do high risk activities e.g. swings, monkey bars or climbing ropes etc. Avoid cycling, roller skating, swimming, kayaking for next 24 hours as well.
- If you feel your child is in pain, give them calpol and nurofen in doses advised by hospital staff pre-discharge.
- If your child has any more than 2 vomiting episodes or has strange or unusual behaviour please return to the emergency department.
- If you have any concerns at all, please call the Emergency Department at **091-543545** or **091-544763** and ask for '*Emergency Department Registrar*' or the '*In-Charge Nurse*'.