

PAIN RELIEF

- Weigh all children to and prescribe analgesia based on weight. Always check the BNF.

Paracetamol: 15mg/kg orally QID

Ibuprofen: 5-10mg/kg orally TID

Oramorph: 0.4mg/kg orally

Morphine: 0.1mg/kg IV

Diamorph: Intranasal use. Use the following guide (also in resus). Add the appropriate amount of water to the diamorphine. The dose to be delivered is 0.2ml of the solution. Draw up extra so that you can prime the atomiser with the solution first.

AGE	EST WGT	MLS to add to 5MG of Diamorphine	MG in 0.2ml of solution
1	10	1.0	1mg
2	12	0.84	1.2mg
3	14	0.72	1.4mg
4	16	0.62	1.6mg
5	18	0.56	1.8mg
6	20	0.50	2mg
7	22	0.46	2.2mg
8	24	0.42	2.4mg
9	26	0.38	2.6mg
10	28	0.36	2.8mg
11	30	0.34	3.0mg
12	32	0.32	3.2mg
13	34	0.30	3.4mg

General Approach to the Distressed Child

A doctor's rapid but composed response to pain or distress will greatly improve parents' confidence and this will be passed on to their child.

Many children find hospitals terrifying. In addition they need to cope with the stress and pain of injury or illness. Parents are often as distressed as their child – this can start a vicious cycle. In this situation management of the whole family is required! Reassure parents that you are going to help and comfort their child and appear calm and reassuring. Children cry because of pain and fear but they will also cry with exhaustion, hunger and frustration! Nursing staff are experienced in helping you with this situation.

Non-Pharmacological techniques are an important part of caring for ill and injured children. These include:

- Simple comforting
- Distraction
- Relaxation
- Imagery

Pain must be adequately relieved as soon as possible –this may involve analgesia, splinting, topical treatment etc. Prior to undertaking a potentially distressing procedure such as suturing or changing dressings, sedation(anxiolysis) may be required. Guidelines are overleaf.

Remember that ENTNOX (N2O/O₂ 50/50) VIA BLUE&WHITE SHOULDERED CYLINDER is invaluable & can be given to babies and children of any age by self-administration or continuously-supervised parental administration as soon as a distressed child arrives. It wears on & off quickly and safely but is contra-indicated in head injury, systemic illness or pneumothorax/ respiratory illness (remove if any sign of drowsiness to prevent excessive sedation).

Femoral Nerve Block

Use levo-bupivacaine (Plain) 0.5%:

AGE	DOSE (MLS)
<5	1ml per year of life
5-12	5mls
>12	10mls

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SEDATION

- All children requiring sedation **MUST** be discussed with the Consultant.

Children who are very distressed may benefit from sedation prior to suturing, etc, under local anaesthetic. It is vital that informed consent is obtained from the child's parent prior to giving sedation – some parents will opt to simply comfort their child during the procedure and this is a perfectly acceptable option.

Remember to ensure there is adequate staff in the department to safely sedate.

All children will require observation in the Emergency Department for at least 90 minutes after the administration of the sedation and will require close parental supervision for a further two and a half hours at home. After sedation children require careful continuous monitoring of vital signs and SaO₂ by an experienced nurse.

Oral Midazolam

Oral Midazolam syrup can be used to provide anxiolysis without excessive sedation. Dose is 0.5mg/kg.

Ketamine

This should only be performed in the presence of Consultant Staff. The following is the CEM guidelines (due to be revised this year so may change).

Introduction

Ketamine is a unique dissociative drug introduced into clinical practice in 1970. It has anxiolytic, analgesic, amnesic and dissociative properties with a wide safety margin. It is most commonly used to facilitate short painful procedures, such as suturing under local anaesthetic, removal of a foreign body or brief orthopaedic manipulations.

Before ketamine is used all other options should be fully considered, including analgesia, reassurance, distraction, entonox, intranasal diamorphine, etc.

The doses advised for analgesic sedation are designed to leave the patient capable of protecting their airway. There is a significant risk of a failure of sedation if the procedure is prolonged, and the clinician must recognise that the option of general anaesthesia may be preferred in these circumstances.

Ketamine should be only used by clinicians experienced in its use and capable of managing any complications, particularly airway obstruction, apnoea and laryngospasm. There should be a documentation and audit system in place within a system of clinical governance.

Indications: (Evidence Levels 2-3)

Ketamine can be used to induce analgesic sedation in children who will need a painful or frightening procedure during the course of their emergency care. It can be used instead of general anaesthesia for minor and moderate procedures in combination with local anaesthetic techniques.

It avoids the need to physically restrain a child.

Trials suggest over 90% efficacy for parenteral Ketamine.

There is no evidence of improved emergence phenomena if midazolam is used as a supplement. (Evidence level 2)

There is no evidence of reduced airway problems if atropine is used as a supplement with low dose ketamine. (Evidence level 3)

Contraindications: (Evidence levels 4 and 5)

- 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
- Uncontrolled epilepsy
- Hyperthyroidism or Thyroid medication
- Porphyria
- Prior adverse reaction to Ketamine

Procedure:

1. Discuss the proposed procedure and use of ketamine with parent or guardian and obtain written consent. The known risks are: mild agitation (20%), moderate/severe agitation (1.5%), rash (10%), vomiting (7%), transient clonic movements (5%), airway problems (1%). It is important to emphasise to the consenting adult that nystagmus, purposeless movements and some degree of dissociation are normal during ketamine sedation, so that these are expected.
2. The child should be managed in a high dependency or resuscitation area with immediate access to full resuscitation facilities. Monitoring should include ECG, blood pressure, respiration and pulse oximetry. Supplemental oxygen should be given and suction must be available.
3. At least three staff are required: a doctor to manage the sedation and airway, a clinician to perform the procedure and an experienced nurse to monitor and support the patient, family and clinical staff. Observations should be regularly taken and

recorded.

4. The doctor managing the ketamine sedation and airway should be suitably trained and experienced in ketamine use, with a full range of advanced airway skills.
5. 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. The fasting state of the child should be considered in relation to the urgency of the procedure, but recent food intake should not be considered as an absolute contraindication to ketamine use.
6. Where time permits, topical anaesthesia (EMLA, Amytop, etc.) should be used to reduce the pain of intravenous cannulation or intramuscular injection.
7. The dose of ketamine is 1.0 mg/kg by slow intravenous injection over at least one minute or 2.5mg/kg IM as a single injection in the lateral aspect of the thigh. The dose should be based on the child's actual weight, not age. Caution and careful checking are required in drawing up the correct dose since there are three different formulations of ketamine available (10mg/l, 50mg/ml and 100mg/ml). A dose chart showing the correct dose and volume to be given according to the child's weight is valuable in preventing errors (see Appendix Two for an example of such a chart).
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8. Encourage the child to child and parents to talk (dream) about happy topics. This helps minimise unpleasant emergency phenomena
9. 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.
10. Supplemental doses of 0.5mg/kg by slow IV injection or 1mg/kg IM may be given if required.
11. Local anaesthetic should be used where indicated.
12. After the procedure the child should recover in a quiet, observed and monitored area under the continuous observation of a trained member of staff. Recovery should be complete between 60 and 120 minutes, depending on the dose and route used.
13. 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 two hours after discharge because of the risk of nausea and vomiting.
14. The medical record and local audit documentation should be completed.
15. At the end of the procedure ensure that any remaining ketamine is discarded, and that this is witnessed. The empty bottle can then be placed in a sharps bin.

Potential Complications: (evidence level 2, 3, 4)

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%). The reported incidence of intubation for laryngospasm is 0.02%. A recent meta-analysis showed that low IM doses of ketamine (<3.0

mg/kg) exhibited significantly less overall airway and respiratory adverse events. There were

no occurrences of either laryngospasm or apnoea in the 682 children receiving lower IM doses. (Green et al, 2008)

Vomiting: 5 - 10% incidence. This usually occurs during the recovery phase.

Lacrimation and salivation: 10% incidence

Transient rash: 10% incidence

Transient clonic movements: <5%