

Sedative Premedication for Children - Full Clinical Guideline

Reference no.:CG-ANAES/3530/23

1. Introduction

Children are often anxious prior to surgery and this guidance will provide a suggestion on how to use sedatives preoperatively to improve the perioperative experience for children. Pre-operative anxiety can lead to an uncooperative and upset child in the anaesthetic room, which can subsequently lead to maladaptive behaviour post operatively and can cause issues for the child with future healthcare professional interaction. This guideline also gives advice when sedative premedication fails or the child refuses to take it.

2. Aim and Purpose

This guidance will provide staff a safe process on how to give sedative premedication and how to approach a child who is refusing sedation or it has failed.

3. Definitions, Keywords

Amnesia – temporary lack of memory

Anxiolysis – reduction in anxiety

Clonidine – a drug which reduces anxiety and causes drowsiness.

Dexmedetomidine – a drug similar to clonidine in action that reduces anxiety and causes drowsiness

'Little Journey' App – a free-to-download smartphone app for children and their families/carers to use before surgery. It includes a virtual 3-D tour of relevant parts of our hospital ward and theatre suite, and other information such as fasting instructions. It is of proven benefit in preparing children for anaesthesia.

Ketamine – a potent sedative, amnestic, analgesic and dissociative anaesthetic

Midazolam – a short-acting drug in the benzodiazepine family. It reduces anxiety and induces amnesia. It tastes bitter, so children will not always take it.

Sedative premedication – calming medication given before anaesthesia

Keywords; premedication, sedation, sedative, anxiolysis, autism, learning difficulties, additional needs, midazolam, clonidine, dexmedetomidine, ketamine, nasal

4. Main body of Guidelines

The majority of children presenting for surgery do not need sedative premedication. It is extremely unlikely to be required for infants and those who are older, a sympathetic, age-appropriate explanation with or without digital aids is often enough. Prior to the use of sedative premedication it is important, where possible, to involve the Play Specialist Team, they have extensive experience in guiding children through surgery and will assist in the decision for sedative medication preoperatively. When the below interventions are not adequate it is appropriate to use sedative medication to improve the perioperative experience for children. Preoperative interventions to reduce anxiety may include:

- Pre-operative information, resources include:
 - Viewing the hospital video (QR code on Pre-operative letter)
 - Accessing the Royal College of Anaesthesia website with videos for children and information for parents (QR code on Pre-operative letter)
 - Using the 'Little Journey' App (QR code on Pre-operative letter)
 - Pre-operative visit to outpatients to address the child's fears directly with the surgeon or anaesthetist
- Work with a Play Specialist
- Adjustment of environment, relaxation techniques and distraction techniques
- Ward/theatre familiarisation visit

It is also possible for the surgery to be cancelled or re-visited at a later date.

Please see Appendix 1 for: The Anaesthetic approach to Autistic Children

Sedative medication

It is necessary that all staff involved in the use of preoperative sedation are able to monitor for and recognise the signs of airway insufficiency, and take appropriate steps to support the child's airway, breathing and circulation during this period.

All children should be appropriately starved as per pre-operative fasting guidelines

Contraindications to sedative medication

- Anticipated difficult airway
- Obstructive or central sleep apnoea
- Upper respiratory tract infection and respiratory disease
- New or unexplained reason for reduced oxygen saturations on air
- Increased risk of aspiration
- Severe renal/hepatic impairment
- Altered level of consciousness or increased intracranial pressure
- Acute systemic illness

Preoperative sedation options:

Drug	Route	Dose	Onset (mins)	Duration	Note	Effects
Midazolam – GABA _A receptor agonist	oral (avoid in <6months)	0.5mg/kg (max 20mg)	20 to 30	1 to 2hrs	sweet taste	Sedation, anxiolysis, anterograde amnesia, paradoxical reaction in some children
	intranasal	0.2mg/kg	5 to 15	1 to 2hrs	mild stinging	
Clonidine – central α_2 adrenoceptor agonist	Oral (avoid in <6months)	4-5 micrograms/kg (max dose 450micrograms)	45 to 60	6hrs	tasteless, DO NOT use with Dexmedetomidine	Sedation, analgesia, anxiolysis, no amnesia, potential bradycardia and hypotension
Dexmedetomidine – selective α_2 adrenoceptor agonist	Intranasal (avoid in <1yrs)	2-4 micrograms/kg (max dose 200micrograms)	30 to 45	45 to 90 mins	DO NOT use with clonidine and see drug monograph for further dosing/administration instructions	Sedation, analgesia, anxiolysis, no amnesia, bradycardia (20% drop from baseline expected), hypotension
Ketamine – NMDA receptor antagonist	Oral (avoid in <2yrs)	5-10mg/kg	10 to 20	4-6hrs	time to peak concentration 30-45mins	sedation, analgesia, increased salivation, nystagmus and dissociative state
	Intramuscular (avoid in <2yrs)	5mg/kg	3 to 5	1 to 3hrs	Anaesthetist/ODP/Airway equipment present	

Depending on the clinical scenario, co-morbidities and contraindications Oral Midazolam and/or Oral Clonidine are a good first line option, but where necessary and appropriate Intranasal Dexmedetomidine is a good alternative. Contraindications and cautions for specific drugs below:

- **Midazolam**

Contraindications – emergency surgery, upper airway disease, severe respiratory depression, neuromuscular disease with or without respiratory weakness, previous hyper-excitability to benzodiazepines

Cautions – severe renal failure and hepatic failure – reduce the dose

- **Clonidine**

Contraindications – bradyarrhythmias secondary to 2nd/3rd degree heart block or sick sinus syndrome (unless pacemaker fitted), uncontrolled hypotension

Cautions – mild to moderate bradyarrhythmia, constipation, polyneuropathy, cerebrovascular disease, heart failure, Raynaud's syndrome or other occlusive peripheral vascular disease, history of depression

- **Dexmedetomidine**

Contraindications – acute cerebrovascular disorder, bradyarrhythmias secondary to 2nd/3rd degree heart block or sick sinus syndrome (unless pacemaker fitted), uncontrolled hypotension

Cautions – bradycardia, hypotension, ischaemic heart disease, severe cerebrovascular disease (especially higher doses), severe neurological disorders, spinal cord injury, abrupt withdrawal after prolonged use, malignant hyperthermia

- **Ketamine**

Contraindications – hypertension, severe cardiac disease, stroke, raised intracranial pressure, head trauma, acute porphyria

Cautions – lowers seizure threshold, acute circulatory failure, cardiovascular disease, fixed cardiac output, hypovolaemia, hypertension, respiratory tract infection, hallucinations/nightmares, psychotics disorders, head injury, intracranial mass, increased intracranial pressure, thyroid dysfunction, raised intraocular pressure and glaucoma.

Where sedation has failed or the child is unable/unwilling to cooperate with administration of sedation there are the following options:

- Postpone/cancel surgery – a discussion of the risks/benefits of pursuing this option must be had with the surgeon/dentist and the parent/care giver, involving the child where possible.
- Use alternative method/dose of sedation either on same day or on a future visit.

For children with whom communication is not possible, there may be no benefit in postponement, and possibly actual harm (eg ongoing dental pain, dental abscess formation, or strangulation of a hernia). Examples of such children may include those with severe learning difficulties or autism.

The aims of further management should be:

- the child's safety and the safety of all care-givers
- minimise stress to the child, and avoidance (where possible) of the child remembering a bad experience. Bad experiences tend to be remembered for a long time, even by children with severe learning difficulties. This makes future management even more challenging.

For children who are unable to cooperate and have refused oral sedatives and intranasal dexmedetomidine, if appropriate, there are 2 further options:

1. Intramuscular Ketamine (5mg/kg) – given on the ward, painful, this will work within 5 mins, use a high concentration solution (50mg/ml or 100mg/ml). Consideration needs to be given about the overall volume and in obese patients whether IM injection is achievable. Care required during administration as there is a risk of needle stick injury or a snapped needle.

Or

2. Intranasal Midazolam (0.2mg/kg, kept in paediatric recovery controlled drug cupboard) – the dose can be doubled if significant mucous in the nose. If possible agreement should be sort with patient, but if not the ODP and anaesthetist will both need to be present. When the child appears 'glazed' then amnesia can be assumed. Amnesia can cover administration, hence why this may be the preferred option.

Both options above need to be discussed and agreed with the parent/consent giver, and to assist consent they should be given the information sheet (See Appendices). They both aim to minimise distress by acting quickly, but facilities need to be in place to promptly transfer patient to anaesthetic room. A tipping trolley, oxygen and a suitably sized bag-valve-mask must be available.

Restraint in the anaesthetic room for a gas induction is possible, but this is used rarely, apart from in very young children. It can be distressing for a child and parent/caregiver with long lasting effects, it also carries a risk of injury to all involved.

5. References

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6. Documentation Controls

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	2	Dec 23	Steven Sarno	Update to failed oral sedation guideline
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Training and Dissemination: How will you implement the Clinical Guideline, cascade the information and address training				
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Contact for Review			Dr Steven Sarno	

7. Appendices

Appendix 1 – The Anaesthetic Approach to Austistic Children

- Be aware of the correct terminology, for example avoid using the term 'disorder' when speaking to the patient/parent/caregiver – a useful resource is www.autism.org.uk
- Appreciate autism has a large spectrum of neurodivergence – every child will have different strengths and challenges with either: Language, Sensation, Motor Skills, Executive Function and Perception. Each child will therefore need different support and adjustments pre and post -operatively.

- Give information in an appropriate manner, using aides when needed (e.g. visual supports)
- Often it is wise to agree boundaries/rules and to find out how the child communicates pain/discomfort prior to an intervention
- Be alert to undiagnosed health conditions
- Use some/all of the pre-operative interventions described above to reduce anxiety
- At times it may be necessary to give oral diazepam at home on the morning of surgery, and even the night before. This can help reduce the distress of coming into hospital.
- At times it may not be possible to obtain pre-operative observations/weight
- If sedation required pre-operatively consider that benzodiazepines can cause paradoxical agitation, which can be distressing post-operatively, either avoid or use alongside clonidine or dexmedetomidine to reduce this side effect.
- Consider using Isoflurane if volatile required
- Consider using IV Clonidine up to 0.5-1micrograms/kg (up to a max of 3micrograms/kg) 20-30 mins prior to emergence (avoid if dexmedetomidine or clonidine used pre-operatively or adjust dose accordingly)
- Remove IV access in the recovery area after ensuring analgesia adequate and no airway support is needed.
- Ensure appropriate environment on ward to recover post-operatively. A quiet area and a large floor beanbag may be needed.
- Adapt discharging criteria for daycase surgery, it is appropriate for discharge to occur prior to all discharging criteria being met to reduce distress. The parent/caregiver should be given advice on how to manage common post-operative issues and how to access healthcare provision once discharged.

Appendix 2 – parent/consent giver information sheets

Please see next page for parent/consent giver informations sheets for intranasal midazolam and intramuscular ketamine:

Information for parents / care givers about nasal midazolam

Use of a nasal dose of midazolam is being considered for your child. This will be discussed with you further by the Anaesthetist, to confirm whether you agree to this procedure.

What is it and why is it used?

Nasal midazolam is generally used in children who need sedative medication before an operation, and in whom medicine given by mouth has either been refused or has not worked well enough.

The aim is to administer medication which causes temporary 'forgetfulness' in the safest and least alarming way possible. Experience has shown us that children do not appear to remember the midazolam being given up their nose, the trip to the anaesthetic room afterwards or parts of their immediate recovery period afterwards.

It is considered less frightening for a child than the alternative; being held down for about three minutes while anaesthetic gas is given via a mask. It is similar to having the nasal flu vaccination.

What will happen?

You and your child will be moved to a quiet area.

Rarely, a child may cooperate with receiving a spray of midazolam up the nose. More commonly in the children who require it, the child is not able to cooperate. In this case, it is generally least alarming if given with an element of surprise. A member of staff approaches the child and asks to check the name band, or check that the child's hands are clean. This question has two real purposes;

Firstly, to distract the child from noticing the Anaesthetist arriving from the other direction, and secondly, to make sure that the assistant's hands are in position to stop the child reaching up to his nose or grabbing the Anaesthetist during the 1-2 seconds needed to squirt the drug up the nose.

The two members of staff then leave the room. Another member of staff remains with you. The child spits out any drug which has trickled down the back of the nose, so some tissues can be helpful. Within usually 3-4 minutes the child starts to look rather vacant, which means the drug is working well enough to start the anaesthetic.

We do not expect parents to take part in holding their child still unless they want to do so. We find that telling the child in advance what is planned requires more staff to hold the child still while the midazolam is given. This is more intimidating for the child, even though it is not remembered afterwards.

What if I don't agree?

You have the right to refuse this procedure. For some children, it may be more appropriate to bring him/her back again on another day and try again with medication given by mouth. If you have any further questions or any objections, please do ask the Anaesthetist. Any of the ward staff can contact the Anaesthetist for you if they have already left the ward.

Information for parents / care givers about a ketamine injection

An injection of ketamine is being considered for your child. This will be discussed with you further by the Anaesthetist, to confirm whether you agree to this procedure.

What is it and why is it used?

Ketamine injection is generally used in children who need sedative medication before an operation, and in whom medicine given by mouth has either been refused or has not worked well enough. It is usually given as a last resort in children with limited ability to understand and cooperate.

It is considered less frightening for a child than the alternative; being held down for about three minutes while anaesthetic gas is given via a mask. It is similar to receiving a tetanus vaccination.

What will happen?

You and your child will be moved to a quiet area.

Your child will need to be held firmly for up to 5 seconds while the injection is given. We may need your help to do this, although other members of staff will also help – as many as needed to hold your child safely and avoid injury.

The injection is usually given in the leg or buttock.

One or two members of staff will remain with you. The rest will leave the room as soon as it is safe to do so, to allow your child to settle down.

Within a few minutes your child will start to look rather vacant and may start drooling. He/she will be moved to the theatre to complete the anaesthetic.

Waking up slowly in a quiet area afterwards will help to reduce the chance of agitation / bad dreams on waking.

What if I don't agree?

You have the right to refuse this procedure. For some children, it may be more appropriate to bring him/her back again on another day and try again with medication given by mouth. If you have any further questions or any objections, please do ask the Anaesthetist. Any of the ward staff can contact the Anaesthetist for you if they have already left the ward.