Worcestershire Acute Hospitals NHS Trust

Sedation of Children and Young people

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Key Amendments to this Guideline

Date	Amendment	Approved by (name of committee or group approving
20/05/2018	Children over 1 month and up to 6 months of age now receive 50 mg/kg of Chloral Hydrate.	T.Dawson
19th Nov 2020	Document extended for 1 year	Dr J West/Paediatric QIM
26th March 2021	Approved with no amendments	Paediatric QIM
Feb 24	Document extended whilst approved through MSC	Paediatric Guideline Review Day
9/2/2024	Re-written for all diagnostic and therapeutic procedures. Alternative medications added	Paediatric Governance and MSC

Introduction

The purpose of this guideline is to ensure sedation is prescribed and administered safely to children and young people prior to a painful or distressing diagnostic or therapeutic procedure. Whenever it is practical and possible children should be prepared for procedures by the appropriate specialist staff (i.e. children's nurses, play specialist, radiography staff) in order for the procedure to be carried out without sedation. The needs, abilities and physical condition of the child must be assessed in each individual case and if sedation is required this should be undertaken using the best available evidence to optimise safe and effective sedation.

Sedation may be required for, but not limited to, the following procedures:

Imaging tests such as USS, CT, MRI or MAG3
ABR
Enemas
Venepuncture or cannula insertion

Contraindications

Sedation may be contraindicated in certain cases.
The medical practitioner will assess the suitability for sedation and document when requesting the procedure that it is safe for it to be carried out under sedation. If any of the following are present, then a thorough assessment is required alongside discussion with an anaesthetist before a decision can be made to safely prescribe sedation.

- Abnormal airway
- Sleep apnoea

- Respiratory failure
- Respiratory disease
- Respiratory disease with significant functional compromise
- Active respiratory tract infection
- Cardiac failure
- Cardiovascular instability
- Recent head injury
- Raised intracranial pressure
- Decreased conscious level
- Neuromuscular disease
- Uncontrolled epilepsy
- Bowel obstruction
- Significant gastro-oesophageal reflux
- Renal impairment
- Liver impairment
- Metabolic instability
- Previous adverse reaction to sedation
- Very distressed child
- Minor inter-current illness e.g. UTI, pyrexia, diarrhoea and vomiting, rash
- Not fasted
- On other medications such as opioids, anti-psychotics or antidepressants

Potential Difficulties

Sedation may be difficult in children:

- taking anti-epileptic medication (can result in increased or reduced effect of sedating medicine)
- already taking sedating medicines
- with behavioural difficulties

PREPARATION FOR SEDATION

Take a full history to include:

- age
- weight
- previous sedation history
- medications
- other significant medical history
- current health – including coughs, colds, pyrexia
- oral intake status

Consent must be gained and documented prior to sedation being given in all cases

Discuss with parents:

- unpredictable response to medication
- paradoxical excitation (if benzodiazepines are used)
- over sedation
  - airway compromise
  - risk of aspiration
- Side effects of sedation (see table below)
- sedation failure

Fasting

Prior to sedation being administered, the child will be fasted as per the Trust's paediatric fasting guideline:

- No food may be taken for 6 hours before the procedure (infants may be given breast milk up to 4 hours before anaesthesia or sedation).
- Water or dilute squash should be consumed up until 2 hours before the procedure. Tea and coffee with a small amount of milk is also acceptable. Essential medicines should also be given at this time. Please see 'WHAT-TP-054 Nil by Mouth and Perioperative medicines use guideline' for more information (available on the intranet).
- For 2 hours before the procedure, no food or drinks may be consumed or chewing gum chewed. However, a small amount (30ml) of water to take tablets prescribed as a premed may be permitted.

ADMINISTRATION AND MONITORING

- An Advanced Nurse Practitioner or nurse experienced in sedation with APLS, EPLS or PILS skills will assess the patient on the day of the procedure to be carried out and ask for medical advice if any contraindications are identified.
- Sedation for the procedure will only be administered once the child is assessed as fit to undergo sedation.
- Heart rate and oxygen saturations of the child will be monitored continuously and recorded on a PEWS chart from the time sedation is administered until the child is fully alert following the procedure.
- A nurse with current APLS/EPLS/PILS training will accompany the sedated child for the procedure if it's to be carried out away from the paediatric department.
- Portable oxygen, portable suction, an appropriately sized face mask and self-inflating resuscitation bag should be made available for the patient prior to administration of sedation.
- Resuscitation equipment should be always available and easily accessible until the child is awake.
- If change in breathing pattern or concern of aspiration then arrange review by paediatric registrar or consultant. A CXR may be required
- Topical anaesthetic must also be used for painful procedures such as venepuncture or cannulation

MEDICINE REGIME

The choice of medicine will be made based on the type of procedure and age of the child/young person.

Sedation for MRI and CT scans

For short painless procedures such as CT or MRI, give infants <6 months normal milk feed only and allow them to sleep naturally ('Feed and wrap')

- Chloral hydrate should be used first line

- Melatonin may be used in combination with chloral hydrate in the followiing cases:
  - if adequate sedation is not likely to be achieved with chloral hydrate alone
  - >2years
  - if chloral dose has been spat out
  - if given PR and bowels opened after dose administered

- For children older than 3 years old or greater than >15kg then it is unlikely that chloral hydrate will work and so discussion should be held to consider the procedure being organised under a General Anaesthetic.

Alternative Options for Other Painful or Distressing Procedures

- **See table below for options available**
- Chloral hydrate +/- melatonin is usually used first line for children <3 years of age
- Oral or rectal midazolam can be used for children >2 years
- Buccal midazolam should only be used if oral and rectal routes are not tolerated. The decision for this should be made by the paediatric consultant in liaison with the anaesthetic team.
- Temazepam can be used in young people >12 years old and can be used if a longer duration of sedation is required.

Medicine (strength and formulation)	**Route**	**Onset**	**Duration**	**Dose**	**Comments**	**Fasting Required (Y/N)**	**Side Effects**
Chloral Hydrate 1g/5mL oral solution	PO/PR	45-60mins	4-8hrs	Neonate: 30-50mg/kg 1 month to 11 years: 30-50mg/kg (Max per dose =1g) n.b. can use up to 100mg/kg if needed max per dose= 2g) 12-17 years: 1-2g	In children older than 3years of age or >15kg then sedation with chloral hydrate is unlikely to be effective. An alternative form of sedation could be used or a general anaesthetic could be considered.	Y	Gastro intestinal irritation, Hypersensitivity reaction including skin rashes. Respiratory depression. Airway patency may be compromised occasional ataxia, loss of co-ordination, headache, confusion and a disinhibited state occur
Melatonin 1mg/mL oral solution	PO	30mins	2-5hrs	<5yrs: 4mg >5yrs: 8mg	If used alone then fasting is not required.	N	Headache, pain, dizziness, GI upset, prolonged drowsiness
Temazepam 10mg tablets or 10mg/5mL oral solution	PO	45min-90mins	Up to 8hrs	12-18yrs: 10-20mg 1hr prior to procedure	Only if ≥12yrs	Y	Ataxia, confusion, drowsiness, hypotension, respiratory depression, nausea
Midazolam 5mg/mL oral solution	PO	30mins	1-2hrs	1month-18years: 500microgram/kg (max. 20mg)	Ensure flumazenil available and ready to give for all routes More suitable for older children or young people Buccal and IV routes – consultant led only (anaethetist or ICU discussion)	N	Agitation (rarely aggression), ataxia, tremor, dizziness, headache, confusion, hypotension, drowsiness, respiratory depression, muscle weakness
Midazolam 2.5mg, 5mg, 7.5mg or 10mg Oromuscosal syringes	Buccal	15mins	1-2hrs	6months-9yrs: 200-300microgram/kg (max. 5mg per dose) 10yrs-17yrs: 6-7mg		Y	

SUBSEQUENT MANAGEMENT

Failed sedation

- Only repeat maximum dose of the initial dose after expected period of onset if patient spat out initial dose
- If repeat dose fails:
    - Call anaesthetist who may give IV sedation or
    - Reschedule procedure for a later time/date under general anaesthetic

If paradoxical excitement occurs do not repeat dose and reschedule procedure for a later time/date under general anaesthetic

REFERENCES

BAUMAN L.A., CANNON M.L., McCLOSKEY J., ALLEN S., JAMES RL., TOBIN RS., POLITIS GD. (2002) Unconscious Sedation in children: a Prospective multi-arm Clinical Trial. *Paediatric Anaesthesia.* 12(8) 674-9

BNFC

Oxford Radcliffe Trust (2003) *Children's Sedation Guidelines.*

Royal College of Paediatrics of Child Health (RCPCH) (2003) *Medicines for Children*. London:RCPCH Publications.

Royal College of Anaesthetists (2001) *Safe Sedation Practice.*

Scottish Intercollegiate guideline network (2004) *Safe Sedation of children Undergoing Diagnostic and Therapeutic Procedures.* SIGN guideline 58 www.sign.ac.uk

SURY M., HATCH D., DEELEY T., DICKS-MIREAUZ C., CHONG W., (1999) Development of a Nurse Led Sedation Service for Paediatric Magnetic Resonance Imaging. *Lancet.* 353(9165) pp.1667-71.

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