**Clinical Guidelines for Safe Sedation in Children**

**This guideline is intended only for sedation on the General Paediatric wards and Children Assessment Unit for painless diagnostic radiology procedures**

#

# Introduction

These guidelines have been produced to help give a structure and continuity of care to patients requiring conscious sedation for a specific, painless, radiological procedure Eg: CT scan, Skeletal Survey, Bone Scan. These guidelines do not guarantee a successful outcome, however they should provide a basic level of instruction for nurses and doctors to follow, and adhere to for safe conscious sedation.

Currently there is no ideal sedative agent that is safe, effective and easy to administer. Excessive sedation can cause unintended loss of consciousness and dangerous hypoxia.

If initial sedation is unsuccessful and a child requires deeper or extended sedation the person in charge of sedating a child must liaise with a consultant paediatrician or seek assistance from an anaesthetic colleague.

# Aims

The aim of this policy is to ensure good practice across the Health Board when sedation is used by non-anaesthetists for healthcare procedures not withstanding existing guidelines specific to individual specialties. Another aim is to reduce fear, anxiety and minimising movement during diagnostic procedures.

# Levels of sedation

The definitions of minimal, moderate, conscious and deep sedation used in this guideline are based on those of the American Society of Anaesthesiologists (ASA).

**ASA levels of sedation**

| **Sedation level** | **Response to stimulation** | **Associated airway, breathing and cardiovascular effects** |
| --- | --- | --- |
| Minimal sedation  | * Awake and calm
* Responds normally to verbal command
* Cognitive function and coordination may be impaired
 | None  |
| Moderate sedation  | * Sleepy but easily roused
* Responds purposefully to verbal command or light tactile stimulation
* Reflex withdrawal from a painful stimulus is not a purposeful response
 | * Not appreciable
* Airway is maintained
* Spontaneous breathing is adequate Cardiovascular function is usually maintained
 |
| Deep sedation  | * Asleep and not easily roused
* Responds purposefully to repeated or painful stimulation.
 | * May be appreciable
* May require assistance to maintain a patent airway
* Spontaneous ventilation may be inadequate Cardiovascular function is usually maintained
 |

# Pre-sedation Patient Assessment and communication

* Trained health care professional (Doctor or Nurses trained in sedation) must carry out pre-sedation assessments and should document in the healthcare record.
* Ensure two healthcare professionals are available during sedation. (A separate APLS trained practitioner is essential to monitor airway in addition to the person doing procedure)
* Ensure immediate access to resuscitation and monitoring equipment available during sedation
* Establish suitability for sedation by completing the attached checklist
* Starvation time
* Current medication condition and any surgical problems
* Weight
* Past medical problems
* Current and previous medications
* Physical status
* Psychological and developmental status

**Do any of the following apply?**

* There is a concern about potential airway or breathing problem
* The child or young person is American Association of Anesthesiologists (ASA) grade 3 or greater
* The patient is a neonate or infant

**Seek advice from Consultant**

Yes

No

Give verbal and written information to parents, child or young person about proposed sedation technique and associated risks and benefits

Obtain written consent according to Health Board Policy

**ASA Grades (American Society of Anaesthesiologists)**

|  |  |
| --- | --- |
| **Grades** | **Definition** |
| **I** | Healthy individual with no systemic disease |
| **II** | Mild systemic disease not limiting activity |
| **III** | Severe systemic disease that limits activity but is not incapacitating |
| **IV** | Incapacitating systemic disease which is constantly life-threatening |
| **V** | Moribund, not expected to survive 24 hours with or without surgery |

# Psychological Preparation

* Ensure that the child or young person is prepared psychologically for sedation by offering information about:
	+ the procedure itself
	+ what the child should do and what the healthcare professional will do
	+ How to cope with the procedure.
* Ensure that the information is appropriate for the developmental stage of the child or young person and check they have understood.
* Offer parents and carers the opportunity to be present during sedation if appropriate. If a parent or carer decides to be present, offer them advice about their role during the procedure.

# Contraindications to Sedation

|  |  |
| --- | --- |
| **Contraindication** | **Caution** |
| * Not appropriately fasted
* Abnormal airway eg: large tonsils or craniofacial anamolies
* Raised intracranial pressure
* Decreased consciousness
* History of sleep apnoea
* Respiratory failure
* Neuromuscular disease
* Bowel obstruction
* Active respiratory tract infection
* Known allergy to sedative drug/ previous adverse reaction
* Child too distressed despite adequate preparation
* Older child with behavioural problems
 | * Neonates especially if prem or ex-prem
* Children with cardio-vascular instability or impaired cardiac function
* Renal impairment
* Hepatic impairment
* Children on anti-convulsant therapy
* Severe respiratory distress
* Gastro-oesophageal reflux impaired
* Emergency cases
* Children receiving opiods or other sedatives
* Child receiving drugs which potentiate the action of sedatives
 |

# Fasting

* Before starting sedation, confirm and record the time of last food and fluid intake in the healthcare record.
* Apply the 2-4-6 fasting rule for elective procedures using any sedation
	+ 2 hours for clear fluids
	+ 4 hours for breast milk
	+ 6 hours for solids.

**Resuscitation**

 Equipment for the maintenance of the airway, breathing and circulation and drugs for the treatment of medical emergencies, eg: anaphylaxis, cardiovascular or respiratory system emergencies, must be immediately available.

**S** - **Suction**: size appropriate functioning suction

**O** - **Oxygen**: adequate O2 supply (portable cylinder)

**A** - **Airway**: size appropriate and other equipment \*

**P** - **Pharmacy**: basic drugs needed to support life including flumazenil and naloxone.

**M** - **Monitors:** temperature, blood pressure and functioning pulse oximeters

**E** - **Equipments**: specific to patient or procedure.

\*Ensure you have access to a fully stocked and checked arrest trolley including resuscitation bags and masks of appropriate sizes, also oral, nasopharyngeal and laryngeal masks, airways and end tracheal tubes of appropriate sizes.

# Drugs and doses

It is the duty of the prescribing doctor to always confirm the doses and routes with latest BNFc as doses might change

**Chloral Hydrate:** It is a sedative and hypnotic medication with unpredictable onset and duration.

*Oral dose*

30-50mg/kg when child is <5kg or < 6months of age

75 -100mg/kg(maximum dose) when child is >6 months of age (Max 2 gm)

To be given at least 45-60 minutes before procedure

Full dose may be given or give an initial dose of 75mg/kg then an additional dose 25 mg/kg in twenty minutes if level of sedation is not achieved.

*Side effects:*

Hyperactivity

Impaired Liver function and Liver failure

Respiratory depression (less common than with other sedative)

**Midazolam:** It is an anxiolytic and sedative. CNS depressant with no analgesic properties

|  |  |
| --- | --- |
| *Oral* | *Buccal* |
| Onset 30-60 min500mcg/kg (0.5mg/kg) maximum dose of 20mg at least 30 min before the procedure | Onset 10-15min6months-10yrs: 200-300micrograms/kg (max5mg)10yrs-18yrs: 6-8mg (max8mg) |

*Side effects:*

Cardiac depression,

Apnoea and respiratory depression

Reversal agent: Flumazenil dose should be calculated, prepared and kept ready to administer.

# Monitoring during sedation

**Continuously monitor and document** – depth of sedation, resp rate, oxygen saturation, heart rate, pain, coping and distress. (Interpret and respond to changes)

# Discharge Criteria

* Airway patent and stable unsupported
* Easily arousable
* Oxygen saturation >95% in room air
* Haemodynamically stable
* Adequate hydration (eg: urine output)
* Returned to normal levels of responsiveness and orientation for age
* No nausea or vomiting
* Pain controlled

 **This is generally a minimum of 4 hours from when the sedation is given.**

**FOR ELECTIVE ADMISSION FROM NEONATAL TEAM**

1. NICU team would have requested for MRI head and obtained a date for the MRI.
2. Neonatal Colleague to provide a letter on CWS stating there is no known contraindication for sedation
3. NICU team would inform Sister in charge D6W (Either Cheryl Marasco or Charlotte Edinburgh) and Consultant of the Week about the admission.
4. Sedation policy of the general paediatric team would be followed.
5. Appropriate medical (APLS/NLS trained ) registrar and nursing staff to accompany the child with continuous monitoring . This is subject to the fact that a paediatric registrar is free to accompany the child. Neonatal colleagues have acknowledged that it may not always be possible to spare a registrar due to staffing issues and they have agreed to be the backup team to accompany children in such situations .

**References**

**British National Formulary (2014) *BNF for children* BNFC.org RPS publishing. Bedfordshire.**

**National Guidelines Clearinghouse (2008) Guidelines for monitoring and management of pediatric patients during and after sedation for diagnostic and therapeutic procedures: an update. National Guidelines Clearinghouse. USA**

[**http://www.guideline.gov/summary/summary.aspx?doc\_id=10391&nbr=5437&ss=6&x1=999**](http://www.guideline.gov/summary/summary.aspx?doc_id=10391&nbr=5437&ss=6&x1=999)

**Scottish Intercollegiate Guidelines Network (2004) Safe Sedation of Children Undergoing Diagnostic and Therapeutic Procedures: a national clinical guideline. Scotland**

[**http://www.sign.ac.uk/pdf/sign58.pdf**](http://www.sign.ac.uk/pdf/sign58.pdf)

**NICE Sedation in children and young people (December 2010)**

**http://www.nice.org.uk/nicemedia/live/13296/52130/52130.pdf**

***PAEDIATRIC SEDATION RECORD***

Patient Label to be placed here / Addressograph

Date: Time:

Weight: \_\_\_\_\_\_\_\_ Kg Written Consent

Doctor responsible for Sedation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Named Nurse:\_\_\_\_\_\_\_\_\_\_\_\_\_­­­

Date & time of last oral intake: Solids:\_\_\_\_\_\_\_\_\_\_\_Liquids:\_\_\_\_\_\_\_\_\_\_\_\_

**History & Examination:**

Any adverse reactions to previous sedation:

If yes, Details:

**Medications: Allergies:**

**Examination:**

ENT: CVS:

RS: Abdomen:

CNS: Other:

**Contraindications to sedation:**

|  |  |
| --- | --- |
| Compromised airway(e.g. large tonsils, sleep apnoea, Craniofacial anomalies): Yes / No | Active infection: Yes / No |
| Active respiratory tract infections: Yes / No | Cardiac dysfunction: Yes / No |
| Respiratory failure: Yes / No | Neuromuscular disease: Yes / No  |
| Gastro oesophageal reflux: Yes / No | Hepatic dysfunction: Yes / No |
| Raised ICP: Yes / No | Renal dysfunction: Yes / No |

**Risk assessment:**

**ASA status: I / II / III / IV**

***ASA Classification (American Society of Anaesthesiologist)***

*I Healthy*

*II Mild systemic disease*

*III Severe systemic disease*

*IV Patient with severe systemic disease that is constant threat to life*

***(ASA grade III and above is a contraindication for sedation)***

Addressograph

**Patient Safety:**

**W (Weight):**

**E (Energy):**

**T (E T tube):**

**F (Fluids):**

**A (Adrenaline):**

**G (Glucose):**

**Flumazenil (if using Midazolam )**

I V Cannula

Emergency drugs drawn up

Suction available

Face mask with reservoir

**Medication:**

|  |  |  |
| --- | --- | --- |
| **Date and time** | **Drug and dose** | **Given by** |
|  |  |  |
|  |  |  |

If child is less than 6 months old alternatives should be used i.e feed and wrap.

* For neonatal MRI only - Chloral Hydrate 30-50mg/kg PO, when child is <5kg or < 6months of age
* *Chloral hydrate 75mg/kg PO or PR (max dose 1000mg) 45 mins prior to procedure for children > 6 months old* ***OR***

*Midazolam 200 to 300 micrograms/kg buccal (max dose 5 mg <10 years or 8 mg in 10 to 18 years)*

* *If patient is not sedated by 15 minutes, contact the consultant to check whether top-up sedation should be given.*
* *If patient disinhibited / restless, this may represent paradoxical sedation: do not give further sedation. AVOID multiple sedative agents.*

**Monitoring:**

Continue observations on ward observation chart every 15 minutes until criteria for

discharge met.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Time** | **Temp** | **HR** | **RR** | **SpO2** | **BP** |
| **Baseline** |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **At discharge** |  |  |  |  |  |

**Discharge Criteria:**

Airway stable Well hydrated, good urine output

Back to normal level of consciousness SpO2 > 95% on air

Haemodynamically stable Complications resolved? (eg. vomiting)

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_