

USE OF ORAL KETAMINE & MIDAZOLAM FOR CONSCIOUS SEDATION IN THE BURN PATIENT	Clinical Guideline Register No: 06043 Status: Public
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1.0 Purpose

To clarify when and how to safely administer Oral Ketamine and Midazolam to conscious patients in the Burns Unit.

2.0 Scope

2.1 Appropriate patients for this method of sedation in the Burns Unit are:

- Children and young people over the age of 3 years
- Adults under the age of 65

2.2 All patients must be undergoing burns related procedures in a burns sedation room (adult or paediatric) or a room on Burns ITU.

2.3 All patients are required to fast 6 hours for solids. In addition adults should be fasted 2 hours for clear fluids. Children < 16 years may drink 5mls/kg of clear fluids up to an hour before the procedure (4 hours for breast milk).

2.4 Contra-indications to this method of sedation are

- Age less than 3 (This requires continuous consultant anaesthetic and ODP. These cases may be best managed in theatre)
- Age over 65 (suitability to be assessed by Anaesthetic Consultant.)
- Significant co-existing morbidity
- Decreased conscious level prior to procedure
- Lack of informed consent
- Unsatisfactory experience with ketamine/midazolam for prior procedures
- Not suitably starved. (See above)

3.0 Team Member Responsibilities

3.1 Junior Burns Doctor Responsibilities

To ensure that all ward patients requiring conscious sedation are placed in the sedation section on the Burns Theatre Operating List.

3.2 Anaesthetic Responsibilities

3.2.1 Supervision of the sedation will be the responsibility of the ITU anaesthetic team, led by the consultant anaesthetist. Patients will have a formal anaesthetic review based on information documented at previous procedures and the Anaesthetic Consultant will advise on the safety and appropriateness of this method of analgesia. It must be noted that the Children's sedation room is in a separate area, further from Burns ICU than the Adult sedation room.

3.2.2 The Anaesthetist will ensure that both ketamine and midazolam are safe and appropriate to use. They will also explicitly state whether the sedation practitioner may administer Entonox during the procedure if it is needed to augment analgesia.

3.2.3 The drugs will be prescribed by the Anaesthetist who will take overall responsibility for the procedure and be immediately available to help.

- 3.2.4 They will liaise with the named nurse to agree a time for the procedure and ensure it is safe and appropriate to proceed. Their contact details must be documented on the sedation chart, in the relevant box. The anaesthetist must remain in the near vicinity of the burns wards for the duration of the procedure.
- 3.2.5 The anaesthetist will inform the burns ODP that an oral sedative procedure will take place; their presence, may be required if iv top-ups are given. To contact an ODP, 'phone Theatre 9 (ext. 6259) and speak to the ODP in charge ('floor ODP) or the Burns ODP in burns theatre 6195. The numbers are additionally given on laminated sheet on the wall of the sedation room. Please note most ODPs do not carry a bleep and so communication, in advance, with the burns ODP is advised if they are likely to be needed.
- 3.2.6 There are 2 sedation rooms; one in the adult burns ward and one on the children's burn ward. An anaesthetist may not simultaneously supervise more than one 'nurse-led sedation'. Under normal circumstances this means that only one oral ketamine-midazolam sedation may be undertaken in either room at one time.

3.3 Sedation Practitioner

- 3.3.1 A trained nurse, competent in and familiar with nurse-led sedation, should be identified as the sedation practitioner. There will have fulfilled the Burns Unit sedation competency training as drawn up by Dr Patricia Richardson, Consultant Anaesthetist, SN Julie Hatch, Burns Unit Facilitator and Senior Sister Jo Myers. Information regarding the drugs, read as part of this training is attached as Appendix 4
- 3.3.2 They will co-ordinate the entire procedure, be responsible for liaising with the medical staff and ensuring it is safe and appropriate to proceed at every stage.
- 3.3.3 Prior to administration of the sedative agents a check list must be completed to identify any risks. This is on the front of the sedation record and includes the following.
- Evidence of informed consent
 - Site of venous access. Venous access is preferable but not obligatory in this group of patients who are notoriously difficult. It is important to note if none has been obtained.
 - Location of arrest trolley and evidence of daily check
 - Location of Resuscitation drugs
 - Starvation times
- 3.3.4 The following must be available in the sedation room before starting. There is a corresponding tick box checklist on the sedation chart
- A minimum room temperature of 22°C. The appropriate room temperature will vary with the age of patient and area of skin loss. Medical advice should be sought if necessary.
 - A minimum of 2 trained nurses (one being the sedation practitioner), and one support worker. There should be sufficient staff to ensure the procedure is completed within 90 minutes.
 - Suitably stocked dressing trolley (checked and compiled by those doing the dressing)
 - All linens and consumables required for the procedure.
 - AMBU bag + mask of correct size for patient
 - Oximetry, temperature monitoring.
 - Availability of ECG and blood pressure monitoring
 - Entonox equipment

- Oxygen source
- Suction equipment
- Reversal agents (if appropriate)
- Telephone in the room
- Contact details of anaesthetist (surgical, therapy staff if appropriate) on the white board in the sedation room.

3.3.5 The sedation practitioner should ensure that infection control measures appropriate for the patient, are followed by all members of the team and that the room and shower trolley have been cleaned in accordance with the trust decontamination policy prior to the procedure and are cleaned in this way at the end. There is a log book for documentation of this in the sedation room.

3.4 Surgical / Therapists Responsibilities

3.4.1 It is often necessary for the surgical team to view the wounds, therapies to be performed or staples to be removed during the procedure.

3.4.2 Clear instructions must be given prior to the procedure including contact details. They must be aware of the timing of the procedure and available to attend within 5 minutes when called. A white board is available in the sedation room where such information may be noted.

4.0 Drugs to be Administered

4.1 The only sedative drugs to be used in relation to this guideline by are oral ketamine with oral midazolam.

4.2 Single agent opiates may be used in the ward setting to provide analgesia for procedures and are not subjected to these guidelines.

4.3 General anaesthesia or iv opiate infusions may be administered in the sedation room only by an anaesthetist with an ODP and this practice is not subject to these guidelines. This will be the responsibility of the theatre anaesthetist who may prefer to undertake these cases in theatre.

4.4 The required dose will vary between patients and therefore previous doses used must be noted. Suggested starting doses are ketamine 7-10 mg/kg with midazolam 0.5mg/kg (max 30mg) orally.

5.0 Management of Patients with specific needs

Tracheostomies

5.1 Patients with tracheostomies may present for oral ketamine/ midazolam sedation. Only those patients who have been ventilator independent for at least 48hours are suitable for consideration for this form of sedation. Their fenestrated inner cannula should be in situ and tracheostomy capped off, thus allowing the patient the ability speak.

5.2 The cuff should remain deflated at all times.

- 5.3 The sedation nurse must have attended a tracheostomy management teaching session in the last 2 years and feel competent in this area.
- 5.4 The tracheostomy trolley must be present in the sedation room and contain the white, unfenestrated inner cannula, tracheal dilators, suction catheters and a spare tracheostomy tube of the same size (as in use in the patient) and one size below

Diabetic Patients

- 5.5 Diabetic patients required to fast for this form of sedation should be managed in accordance with the trust policy as outlined in the Adult Drug chart. A variable rate intravenous infusion of insulin may be required. Seek the advice of the Anaesthetist if unsure.

The elderly

- 5.6 The elderly can be sensitive to the sedative actions of drugs and lower doses should be considered.

6.0 Pre-procedure

- 6.1 The need to undertake a procedure under oral sedation should be discussed on the evening ward round prior to the procedure taking place, and it should be documented on the theatre list, to aim communication with anaesthetic support and theatre staff.
- 6.2 All staff should be aware of their roles (see above) and the sedation practitioners will co-ordinate this.
- 6.3 Following administration of ketamine and midazolam, please wait at least 20 minutes for the drugs to become effective prior to starting cut down of the dressings. The analgesic effect is variable in onset and so efficacy should be assessed with the stimulation. During the 20 minute wait time please maintain a quiet and tranquil environment.

7.0 The Procedure

- 7.1 The Sedation Practitioner will take charge over the procedure and will administer the sedatives to the patient.
- 7.2 All staff must wear scrubs, theatre hats, blue disposable gown and gloves throughout the procedure.
- 7.3 Monitoring should be started from the time of administration of the sedative agents until recovery criteria are met (see below).
- 7.4 The observations should be recorded at baseline and every 5 minutes on the Burns Unit Sedation Chart (attached Appendix 1 and 2). These are pulse, respiratory rate, oxygen saturation, sedation score and worst pain score. Lowest/worst values should be recorded in event of variation. The temperature should be recorded every 15 minutes. Onset and duration of action will vary from patient to patient but the patient would be expected to reach a suitability sedated state within 30 minutes.

- 7.5 Sedative drugs may be given either at the normal bed space or in the sedation room, whichever is considered most appropriate. The dressing change or shower will normally take place in the sedation room and monitoring must continue during transfer.
- 7.6 Pulse oximetry should be used and the heart rate and oxygen saturations readings recorded every 5 mins. It should be noted that the pulse oximeter will not give any indication of ventilatory function; i.e. CO₂ removal. Respiratory rate, depth of respiration and the patients colour (i.e. pink rather than cyanosed) must be observed to ensure adequacy of ventilation. Unlike opiate drugs, ketamine acts to increase ventilatory drive.
- 7.7 The sedation practitioner may direct the dressing procedure or delegate responsibility for this to another member of the dressing team. However, the sedation practitioner will take no 'hands-on' role in the shower or dressing procedure and will be entirely responsible for ensuring the well being of the patient and recording observations.
- 7.8 Audit is vital for the safety of the practice of conscious sedation and the procedure book in the sedation room must be completed fully.

8.0 Length of Procedure

- 8.1 The procedure (start to cut dressings to last dressing applied) should be anticipated to take no longer than 90 minutes. Most should be completed in under 60 minutes.
- 8.2 A total of 15 minutes will be employed removing staples. It may be necessary to use extra helpers for a short period in order to achieve this.
- 8.3 A total of 5 minutes of inactivity will be allowed whilst waiting for photography, therapist or medical staff review, whilst still achieving a total procedure time of 90 minutes maximum.
- 8.4 An excessively lengthy procedure risks the effects of the ketamine wearing off and more significant drops in temperature.

9.0 Temperature Change

- 9.1 A normo-thermic patient should not suffer a temperature drop of more than 1 °c during the course of the procedure. A pyrexial patient should not drop their temperature below normal. In the event of this happening, the procedure must be terminated as soon as possible.

10.0 Trouble Shooting

- 10.1 The on call anaesthetist should attend within 5 minutes when requested by the sedation practitioner – pager #6555 2413 followed by department extension number. Re-bleep if they do not respond within 5 minutes. The on-call ODP is contacted via Theatre 9 on 6259
- 10.2 The Anaesthetist should attend if pain scores are unacceptable. This requires the judgement of the sedation practitioner. In general the scores should only reach 2 for a minority of the procedure. If a patient has severe pain during a dressing-related procedure, do not repeat the procedure without reviewing the analgesic dose. (4)

- 10.3 In the event of the following the patient should be given facial oxygen and the anaesthetist called.
- Loss of verbal contact with the patient
 - Significant oxygen de-saturation (<90% or significant drop below baseline)
 - Vomiting/regurgitation. Tip trolley head down as possible and use suction to clear the patient's airway.
- 10.4 If verbal contact is lost or intra-venous agents are required, the patient requires a level of care identical to that needed for general anaesthesia
- 10.5 In event of emergency as defined by
- Loss of pulse
 - Loss of airway
 - Absent breathing
 - Serious concerns by sedation practitioner

The red emergency button should be pulled and a member of the dressing team should fast beep the anaesthetist and consider calling the cardiac arrest team on 2222. (Note: The cardiac arrest team will need access through the security doors into the unit and directions to the sedation room. A member of the team should be allocated to do this.)

- 10.6 In the event of an emergency related to over-sedation, the following drug (flumazenil) antagonises the effects of benzodiazepines and may be useful. If antagonism is required, an anaesthetist should be called and must attend urgently. Doses are given to assist in an emergency.
- Flumazenil (Anexate) antagonises the specific actions of the benzodiazepines (eg midazolam, diazepam). **Adult dose:** 200mcg iv over 15 sec – total doses of 500 mcg may be needed. **Paediatric Dose:** 1month -12 years 10mcg/kg (max single dose 200mcg, repeated at 1 min intervals if required).

There is no specific antidote for ketamine

11.0 Post-Procedure

- 11.1 The patient should be allowed to recover in a quiet area. The sedation practitioner should stay with the patient and continue to monitor and document observations until the patient is easily rousable and physiological parameters have returned to baseline.
- 11.2 The sedation practitioner must ensure that any concerns or comments relating to the procedure are documented on the sedation record and fed back to the anaesthetist to assist with planning for subsequent procedures. In addition the sedation nurse will:
- Return the patient to bed space.
 - Remove all dirty linen, waste and any other rubbish from the room.
 - Discard all unused dressings or place in patient's room for future use.
 - Dispose of O2 tubing and mask/nasal spec, and suction equipment
 - Ensure that the room and equipment used is cleaned with Tristel in accordance with Trust policy

11.3 Each case undertaken will be documented in the sedation room log book. Information collected will include patient details, name of supervising anaesthetist, sedation practitioner, drugs administered and time span of the procedure.

12.0 Reporting Incidents

12.1 Adverse incidents or untoward incidents relating to this service should be reported using the online Datix system. Please discuss with Dr Patricia Richardson via email or verbally.

13.0 Communication

13.1 This document is available in paper form in the adult and paediatric burn units and is available via the intranet. Senior ward sister and the clinical facilitators will take responsibility for ensuring all staff are aware of it.

14.0 References

Standing Dental Advisory Committee. General Anaesthesia, Sedation and Resuscitation in Dentistry – Report of an Expert Working Party 1990

U.K. Academy of Medical Royal Colleges and their Faculties. Implementing and ensuring Safe Sedation Practice for healthcare procedures in adults. Report of an Intercollegiate Working Party chaired by the Royal College of Anaesthetists 2001

Scottish Intercollegiate Guidelines Network. Safe Sedation of Children Undergoing Diagnostic and Therapeutic Procedures. A National Clinical Guideline 2004

Minimising pain at wound dressing- related procedures. A consensus document Principles of Best Practice; A World Union of Wound Healing Societies' Initiative

The BNF - www.bnf.org

Burns Unit Sedation Chart

Appendix 1

Surname	First Name	Date	Weight
Hospital No		Procedure	
DOB			

Past Medical History (include burn details)

Past sedation history (include location & distraction therapies)

Current Medications	Paracetamol Clexane Vitamins PPI/H2 Antagonist	Other
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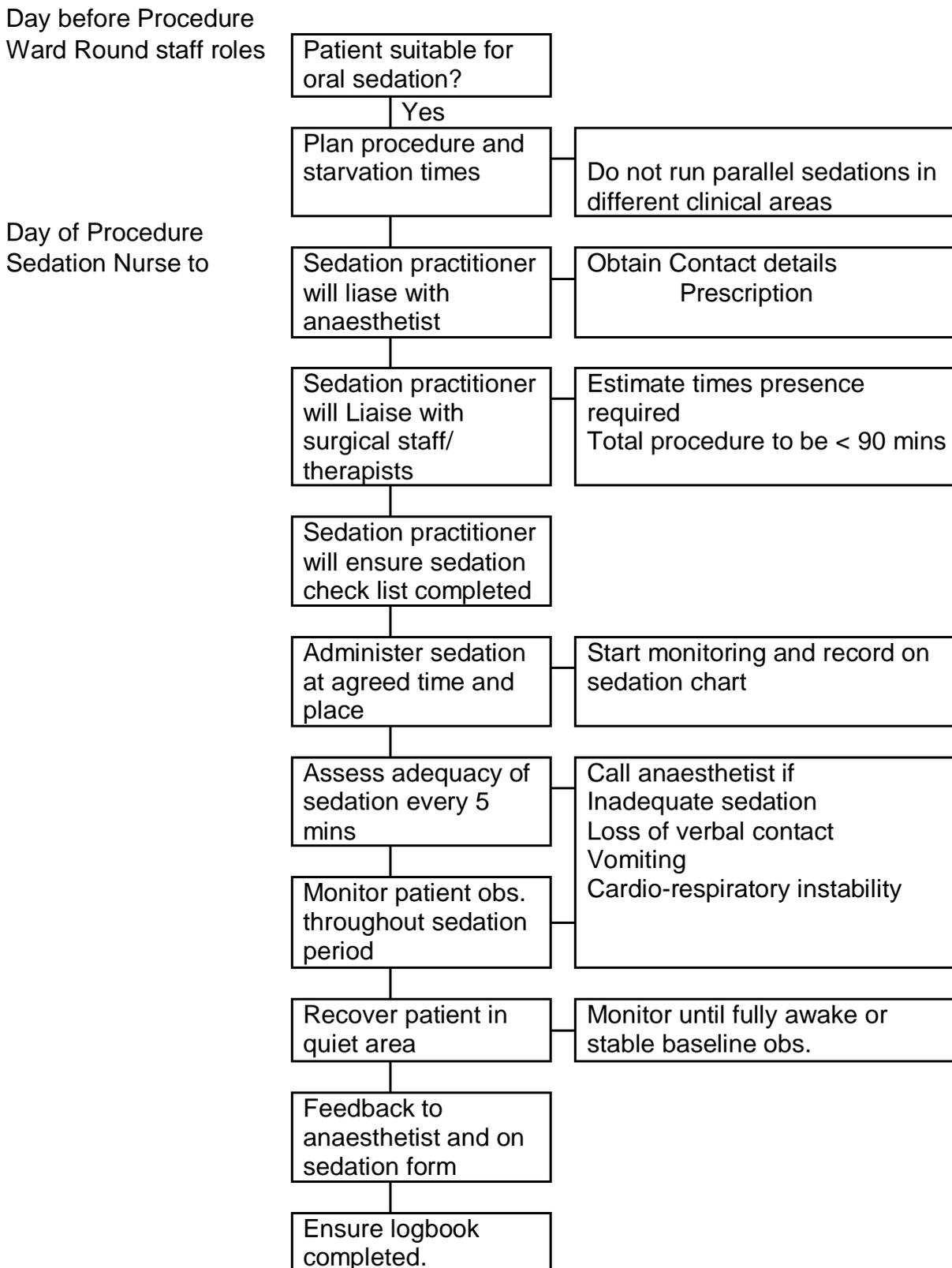
Allergies	Fasting Times: Solids	Clear Fluids
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Prescription of Sedative Agents Entonox inhaled prn (delete if inappropriate)	Time of Administration Nurse signature Anaesthetist Name and contact details
Drs Signature Print Name /Grade	

CHECKLIST please tick each box

Adequate staff and equipment for dressing	Site of venous access _____/ None	Resuscitation Trolley
Ambu bag	Consent	Entonox equipment
O2 source	Suction	Room > 22°c.
MONITORING Oximetry	Core temp	ECG available
		BP available

Flowchart for Administration of Oral Ketamine/Midazolam



CONSCIOUS SEDATION INFORMATION SHEET FOR BURNS UNIT NURSING STAFF

Conscious sedation is a technique whereby drugs produce a state of depression of the central nervous system enabling treatment to be carried out, but during which verbal responsiveness with the patient is maintained throughout the period of sedation.

If verbal responsiveness is lost, the patient requires a level of care identical to that needed for general anaesthesia.

DRUGS USED IN BURNS PATIENTS

Ketamine

The known effects and side effects of ketamine are:

- Analgesia
- Sedation
- Dissociation from environment
- Cardiovascular stimulation leading to tachycardia and increased blood pressure. The anaesthetic assessment with determine suitability of the patient with cardiovascular disease
- Salivation which may stimulate vocal cords causing laryngospasm
- Nystagmus
- Emergent (ie during recovery) hallucinations

The respiratory system is relatively unaffected and laryngeal and pharyngeal reflexes are generally well preserved during oral ketamine. Apnoea may occur after an intravenous bolus.

Ketamine can be given orally by the nurse or IM or IV by the anaesthetist

The dose needs to be titrated to effect and the dose reassessed as tolerance may develop.

Starting doses would be:

- po. 7mg – 10mg/kg
- I.M 10mg/kg
- I.V. 1mg – 2mg/kg

Midazolam

Midazolam is a benzodiazepine. Its effects and side effects include:

- Sedation
- Anxiolysis
- Apnoea may occur with larger doses or in combination with other sedatives or opiates
- Hypotension

The normal oral dose is 0.5mg/kg to a maximum of around 30mg in an adult.

In the event of apnoea commence basic life support and summon help. The specific antagonist for midazolam is flumazaniol, which is available in the sedation room and in the outer CD cupboard. It is used with extreme caution as it may precipitate withdrawal reaction in patients on long term benzodiazepine treatment.

Troubleshooting

Laryngospasm:

This is a potential side effect of sedative use. It usually resolves spontaneously.

Laryngospasm is when the vocal cords go into spasm and close the laryngeal inlet, hence preventing airflow into the lungs. The most common cause in this setting is saliva, or excessive secretions touching the vocal cords. It is more likely in patients who are more heavily sedated. There may or may not be accompanying stridor, and there is a see-sawing motion of the chest and abdomen (ie they move alternately) as the patient tries hard to breath against the closed larynx. Air movement through the mouth is minimal or absent.

Treatment is to give 100% oxygen via AMBU Bag or other closed circuit. Call for anaesthetic help immediately. Avoid stimulating the patient. You may need to give gentle oral suction (do not cause the larynx to go into further spasm by prodding it with suction catheters).

PRIOR TO A SEDATIVE PROCEDURE

Fasting

Any patient should not have received solid food for 6 hours prior to a sedative procedure. Adults (>16 years) may receive clear fluids for up to 2 hours prior to the procedure. Children <16 years should be offered 5mls/kg of clear fluid 1 hour before the procedure (4 hours for breast milk).

Assessment

All patients must be assessed by the duty anaesthetist for suitability of ketamine/ midazolam sedation. This anaesthetist must prescribe the drugs, be aware of the time of the procedure and will take ultimate responsibility for it.

Explanation of the procedure

It is important to explain the procedure to the patient/relative (informed consent). The explanation should include information regarding the drugs and that they will provide excellent analgesia and have an amnesic action, thereby altering recall of the procedure. The aim is not to induce sleep. The nurses will constantly monitor and evaluate the effect of the medication and call the named doctor if needed.

Regular pain scores will be taken and recorded. The patient must have the 0-3 pain score explained to them prior to starting the procedure. If the conscious sedation is not adequate then the doctor will proceed to a general anaesthetic.

The procedure is done in the sedation room. A parent may accompany their child to the room, but will be asked to leave when the sedation has taken effect and the procedure commences.

DURING A SEDATIVE PROCEDURE

The patient must be monitored and observation sheet filled in accurately throughout the procedure and comments to help plan for the next sedation made. Ensure that the sedation observer signs the box.

Use distraction therapy such as television, radio, music and conversation as appropriate for the patient.

FOLLOWING A SEDATIVE PROCEDURE

- The sedation room log book must be completed. A critical incident form may need to be completed to suggest service improvement.
- Document any suggestion for the team who may undertake any subsequent sedative procedures such as dose increases or decreases
- Return patient to bed space
- Continue to monitor patient using sedation chart
- Increase time between observations gradually as the patient stabilises.
- Clean sedation room

OTHER POINTS

Insulin

Insulin sliding scale should stop when sedation is given and hourly BM's recorded. If BM drops below 4mmols inform lead anaesthetist.

Arrest Trolley

The arrest trolley must stay 'parked' in usual place so that it is easily located by all staff.