16.S.1 GUIDELINES FOR ANALGESIA AND SEDATION

1. INTRODUCTION

Pain occurs from illness, injury or as a consequence of therapeutic or diagnostic procedures. One of the most important roles of the Emergency Department team is to relieve pain, associated anxiety and fear.

When selecting the type of pain relief, one needs to consider not only the nature of the illness or injury and severity of the pain but also the child’s developmental level, previous pain experience and anxiety levels. Non-pharmacological techniques of pain relief, for coping with pain such as breathing, relaxation exercises and distraction techniques should be used in conjunction with pharmacological methods. There are also specific regimes, techniques and treatments, which may assist with analgesia. Examples of this are ice packs, splinting a fracture or installation of a nerve block.

2. Selection of appropriate analgesia/sedation and care of the child requires a coordinated team approach. The staff should have advanced skills in CPR, airway management, etc. If there is an inadequate level of skilled staff to perform a procedure, then that procedure should be deferred or an alternative method of analgesia or sedation used.

3. GENERAL

Fasting times: N₂O alone 2 hrs (solids, milk, liquids).

Deep sedation or anaesthesia

- 2 hrs water
- 4 hrs clear fluids, breast milk
- 6 hrs bottle milk, solids

eg; IV Opioid +/- Midazolam +/- N₂O.

For analgesia alone, fasting times are not relevant. Oral medications given are not taken into account with respect to fasting times.

Preparation: The procedure should be explained by the doctor and/or the Registered Nurse (RN). The Play Therapist may assist in the preparation by demonstration and role play.

Parents should be encouraged to stay and comfort their child, but not restrain.
Monitoring: A child receiving sedation and/or analgesia with Opiates or Benzodiazepines should remain on continuous pulse oxymetry throughout the procedure and until fully awake. Observation of vital signs should be done at 30 minute intervals and should include pulse rate and respiratory rate. Oximetry should be continuous. The child should be managed in an area where staff can respond to changes in level of consciousness.

4. ANALGESIA

NB: Fasting times are irrelevant.

4.1 Assess the severity of the pain with objective assessment of severity – whether the child appears in pain, how behaviour is affected, pulse rate, type of illness or injury as well as the child’s self assessment of pain using a pain rating scale such as numerical rating or faces scale as appropriate for the child’s level of development. The scales are on the standard nursing hourly observation charts and the intravenous opioid charts.

4.2 Mild Pain

- Paracetamol 15mg/kg orally or 25mg/kg per rectum
- Paracetamol plus Codeine – dose based on the Paracetamol content of 15mg/kg orally
- Ibuprofen 10mg/kg orally

Non drug methods to relieve pain may be used such as ice packs, positioning, splints.

4.3 Moderate to Severe Pain

- Morphine 0.1mg/kg intravenously with repeated doses if necessary (maximum of 0.2mg/kg).
- N₂O may be used temporarily whilst inserting an IV line.

Regional blocks and adjunctive medications may be considered after appropriate consultation with the anaesthetic and/or surgical service.

4.4 Contraindications to Analgesia

- Allergic reaction to drugs
- Associated depressed level of consciousness
- Raised intracranial pressure
4.5 Complications – Management of Respiratory Depression

- Cease further drug administration
- Open airway and maintain patency
- Assess effectiveness of breathing
- Give additional oxygen
- Support breathing with bag/valve/mask ventilation if breathing is inadequate
- Naxolone 5 microg/kg (max. 400 microg) for narcotic reversal

5. SEDATION

The regimes are designed to achieve conscious sedation and/or analgesia. A child should be able to respond to voice during the whole procedures.

Time permitting, **EMLA cream or patches** should be used on both the potential IV sites (maximum of 2 sites) and/or the skin where a procedure will be performed. This can only be applied over intact skin.

5.1 Light Sedation Without Analgesia

For painless procedures only. Eg; CT scan without contrast

Minimum staffing - 1 RN (registered nurse)

Fasting time - 2 hours water, 4 hrs breast milk, clear fluids, 6 hrs bottle milk, solids
- Midazolam sub-lingual 0.5mg/kg (max. single dose 20mg).
- Midazolam IV 0.05mg/kg (max. dose 2.5mg). Repeat IV dose if necessary (max. 4 doses).

5.2 Light Sedation With Analgesia

For minor surgical or painful procedures. Eg; repair or small laceration.

Minimum staffing - 1 RN and 1 Doctor. 2nd RN to assist.

Fasting: Nitrous Oxide alone - 2 hours;
- Nitrous Oxide + Midazolam – 2 hrs water, 4 hrs clear fluids, breast milk, 6 hrs solids & bottle milk.
- Nitrous Oxide +/- Midazolam sub-lingual 0.5mg/kg (max. 20mg) or Midazolam IV 0.05mg/kg (max. 2.5mg) x 4 if required.

Local or regional anaesthetic can be used with this regime. (ring blocks, local anaesthetic and regional blocks, eg; femoral).

Reductions of fractures are NOT to be undertaken with this regime.
5.3 Deep Sedation

NOTE: Verbal communication must be maintained throughout the procedure. Loss of verbal communication indicates that the child is anaesthetised and that the child should be roused.

For more extensive surgical procedures.

Minimum staffing - 2 RN’s and 2 Doctors

Fasting - 2 hrs water; 4 hrs breast milk, clear fluids; 6 hrs solids, bottle milk

Training: At least one of the doctors must have completed the training program for deep conscious sedation (see below section 7).

- Nitrous oxide administration, then
- IV line insertion
- Midazolam 0.05mg/kg (max. 2.5mg)
- Fentanyl 1 microg/kg (max. 50microg) NB: Micrograms

These drugs should be:

- Given as a slow IV push over 1-2 minutes
- Given at intervals of 3-5 minutes to allow time for the drug to take effect.

It is not always necessary to use all of the drugs. Different combinations can be given. For example, Midazolam and Fentanyl alone; Midazolam and Nitrous Oxide; Fentanyl and Nitrous Oxide. In some cases, Morphine can be given with or without the use of Nitrous Oxide. In any sedation where Midazolam, Fentanyl and/or Nitrous Oxide is used, the child must be monitored by oxymetry until awake.

The common serious side effects of Midazolam are:

- respiratory depression/apnoea
- variations in blood pressure and heart rate

Additional effects are hiccups, nausea, vomiting, coughing, oversedation, drowsiness and injection site reactions, especially if extravasated.

Side effects of Fentanyl include:

- respiratory depression/apnoea
- muscle rigidity
- bradycardia
- nausea and vomiting
- euphoria
Side effects of Nitrous Oxide include:

- nausea
- vomiting

These can be reversed by reducing the concentration of nitrous oxide or ceasing administration.

5.4 Contraindications to Sedation

- Allergic reaction
- Decreased level of consciousness
- Increased intracranial pressure
- Insufficient staff numbers or skills

5.2 Complications of Sedation/Analgesia

**Respiratory depression:**

- Cease further drug administration
- Open airway and maintain patency
- Assess effectiveness of breathing
- Give oxygen as required
- Support breathing with bag, valve, mask ventilation if breathing ineffective
- Administer Flumazenil 5microg/kg (max. 250microg) for Benzodiazepine reversal,
  Naloxone 5 microg/kg (max. 400 microg) for narcotic reversal.

6. GENERAL ANAESTHESIA

General anaesthesia in theatres by anaesthetic staff should always remain an option, dependent upon the nature of the procedure and response of the child to lighter sedation.

7. STAFF TRAINING FOR IMPLEMENTING THE SEDATION PROTOCOL

The Staff Specialists and Fellows in Emergency may supervise children undergoing deep sedation with intravenous medication. Other staff may supervise following specific approval of the Emergency Staff Specialist or Fellow.
ASSESSMENT OF SEVERITY OF PAIN

MILD

Paracetamol
15 mg/kg po/pr
+/- Codeine
0.5 – 1mg/kg

If inadequate go to MODERATE/SEVERE

MODERATE TO SEVERE

Repeat once if needed.
Morphine i.v. 0.1 mg/kg
+/- N₂O for procedures
(fasting 2 hours for N₂O)

If ongoing need for analgesia Morphine
infusion 0.5mg/kg in 50ml
5% Dextrose infusing at 1-5 mls/hour
(10-50 microg/kg/hr)

If rash or allergy to Morphine
Pethidine 1mg/kg
Repeat if necessary
Infusion: 5mg/kg in 5%
Dextrose at 1-3mls/hour

NOTE: Contraindications –
- Allergic Reaction
- Decreased Level of Consciousness
- Raised Intracranial Pressure
16.S.1 APPENDIX 1 SEDATION AND ANALGESIA

FLOW CHART FOR SEDATION

Assess Degree of Sedation Required

LIGHT

Fasting: 2 hour
STAFF: 1 R.N. + 1 Doctor

N\textsubscript{2}O

Midazolam 1mg/kg (max. 15mg) orally
If anxious, not co-operative.

If Sedation not effective, proceed along
DEEP SEDATION OR GENERAL ANAESTHETIC

DEEP

Fasting: 4 hour
STAFF: 1 R.N. + 2 Doctors

N\textsubscript{2}O

IV Line Insertion

1. **Midazolam** – 0.05mg/kg (max 2.5mg) IV
2. **Fentanyl** – 1 microg/kg (max. 50 microg) IV
3. **Repeat Fentanyl** – 1 microg/kg (max. 50 microg) IV
4. **Repeat Midazolam** – 0.05mg/kg (max. 2.5mg) IV

AIRWAY MANAGEMENT AND OXYMETRY IS ESSENTIAL

GENERAL ANAESTHETIC

NOTE: Contraindications -
- Allergic Reaction
- Decreased Level of Consciousness
- Raised Intracranial Pressure
- Insufficient staff numbers or skills