
Guideline

Sedation of adult patients in the Emergency Department

Reason for development

- To standardise/improve patient care.

1 Scope

Adult patients requiring procedural sedation in the emergency department

2 Aim

This guideline is to help the clinicians (ED or other specialty) safely deal with adults who need procedures requiring sedation in the emergency department eg joint reduction, fracture manipulation.

Please read this guideline in conjunction with:

- Guideline for ketamine sedation in children in the ED
- ED sedation record (adults and children)

3 Introduction

Procedural sedation is a common practice in Emergency departments and is often performed in conjunction with clinicians from other specialties. The aims are to relieve anxiety, reduce pain, facilitate a procedure and provide amnesia. Sedation can produce a continuum of states, ranging from minimal sedation (anxiolysis) through to general anaesthesia. This guideline specifically applies to moderate sedation (ie "conscious sedation") and deep sedation. The drugs used can produce cardiovascular and respiratory complications.

Use of a standard protocol and knowledge of the drugs involved are vital to minimize the potential risks.

It is not acceptable for single operators to be sedating and performing a procedure in the ED. The minimum personnel required are two doctors and one nurse. The doctor supervising sedation should be familiar with this document and trained to recognize and have the skills to deal with potential complications, including advanced airway skills.

This document outlines the pre-sedation checklist, peri-sedation observations required and post-sedation management.

4 Pre-sedation checklist

4.1 History

A full history, including drugs, previous sedation or anaesthesia, allergies and fasting time should be documented.

Procedural sedation is contraindicated if any one of these applies

- Procedures involving stimulation of the posterior pharynx
- Procedures that are more appropriately performed under general anaesthesia or in sterile operating theatre conditions
- Patient is ASA grade >2
- History of airway instability, tracheal surgery, or tracheal stenosis or abnormal facial anatomy
- Active pulmonary infection or disease (including upper-respiratory infection, exception is for asthma)
- Head injury associated with loss of consciousness, altered mental status, or vomiting
- Central nervous system masses, abnormalities, or hydrocephalus
- Poorly controlled seizure disorder
- Glaucoma or acute globe injury
- Psychosis, porphyria, thyroid disorder, or thyroid medication
- A full meal within 3 hours. See below for latest (2007) consensus based guidelines on fasting for ED sedation

Oral intake in the prior 3 hours	Procedural Urgency ^b			
	<i>Emergent Procedure</i>	<i>Urgent Procedure</i>	<i>Semi-Urgent</i>	<i>Non-Urgent</i>
<i>Nothing</i>	All levels of sedation	All levels of sedation	All levels of sedation	All levels of sedation
<i>Clear liquids only</i>	All levels of sedation	Up to and including brief deep sedation	Up to and including extended moderate sedation	Minimal sedation only
<i>Light snack</i>	All levels of sedation	Up to and including dissociative sedation; non-extended moderate sedation	Minimal sedation only	Minimal sedation only
<i>Heavier snack or meal</i>	All levels of sedation	Up to and including dissociative sedation; non-extended moderate sedation	Minimal sedation only	Minimal sedation only

4.2 Examination and observations

- The patient's airway should be assessed to identify features associated with increased risk of difficult intubation and/or ventilation:
 - Obesity
 - Short neck, limited neck movements, dysmorphic face, reduced hyoid-mental distance (<3cm)
 - Small mouth opening, protruding incisors, large tongue
 - Small jaw

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- A focused physical examination including auscultation of the heart and lungs
 - Vital signs: 3 lead ECG, BP, HR and SpO₂
 - Procedural sedation is contraindicated in patients with a high risk of being difficult to ventilate or with significantly abnormal physiological parameters

4.3 Environment and staff

- Procedural sedation should take place in the Resuscitation room.
- There should be a tilting trolley, suction, oxygen, and equipment for advanced airway management.
- SpR or consultant present who has advanced airway management skills
- One clinician is nominated as performing the sedation while another performs the procedure.
- Intravenous access and supplemental oxygen available
- Availability of appropriate nursing staff and recovery area

4.4 Consent

- Written consent to be completed by a senior staff member

5 Administration of sedation

Intravenous sedative/analgesic drugs should be given in small, incremental doses that are titrated to the desired end-point of analgesia and sedation. In general single agents are safer than polypharmacy though no one agent or regime is conclusively more effective than another. Familiarity with drugs effects and potential side effects is most important.

Midazolam:

- A short acting water soluble benzodiazepine which at higher doses causes intense sedation (anaesthesia) and retrograde amnesia.
- Stocked in 5ml ampoules of 2mg/ml or 2ml ampoules of 5mg/ml.
- Should be drawn up into a 10ml syringe with 5mls of normal saline (10mg in total) and labelled accordingly.
- Dosage intravenously is initially 0.1 mg/kg (usually 5mg initially): small and elderly patients may require smaller first dose eg 1-2mg.
- Onset of action 30-60 seconds with peak action at 12min.
- Half life of Midazolam is approx 2hrs.
- May cause hypotension.
- Respiratory depression may be reversed with Flumazenil. The respiratory depression may be particularly pronounced if combined with an opioid eg fentanyl

Propofol:

- Propofol is an alkylphenol derivative, very lipid soluble anaesthetic agent
- 1% solution should be drawn up into a 10ml syringe, so 100mgs in 10mls. NB maximum 10mls syringe

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- Starting dose: 0.5mg/kg (usually 3mls of 1%), up to 10mls if titrated carefully to sedation level and blood pressure. Less propofol is often required if given slowly. Loss of verbal contact is a key sign of the level of sedation/anaesthesia.
 - Anaesthetic induction may be at only 0.5mg/kg, especially in elderly ie could be only 3mls for 60kg patient
 - Beware using propofol with opioids (respiratory depression)
 - Only to be used by Consultants or senior SpRs

Ketamine:

- Agent of choice in children; see specific Ketamine protocol.
- Contraindicated in patients with cardiovascular disease, thyroid disease or if agitated and sympathetically stimulated.
- Only for use in adults under Consultant supervision
- Beware different concentrations available
- Intravenous: 0.5 to 1.0 mg/kg give slowly; add 0.5mg/kg as needed for prolonged procedures
- Atropine 0.01mg/kg (min 0.1mg, max 0.5mg) should be made ready in case of bradycardia
- Smaller doses (eg 20mg, sometimes repeated) can be used to facilitate short procedures eg radial fracture manipulation, where a haematoma block has already been given
- Beware emergence phenomena.

Etomidate:

- Etomidate is NOT recommended for use as a sedative in Addenbrookes ED
- Often (20-45% cases) associated with myoclonus; can be severe
- Causes more vomiting than propofol
- Can be associated with emergence delirium
- Etomidate *MAY* be appropriate in situations where cardiovascular stability is paramount, eg cardioversion
- Sedation dose 0.1mg/kg (ie about 6mls of 2mg/ml solution), supplemented with half doses

Associated Analgesia

Where possible, sedation should be augmented by local anaesthesia or pre-procedure analgesia. For painful conditions (eg fracture/dislocation ankle) morphine should be given at least 10minutes before sedation. If this is not possible fentanyl can be used; see below

Fentanyl:

- A potent synthetic opiate with a rapid onset of action and short half life.
- Stocked in 2ml ampoules of 50µg/ml.
- Should be drawn up into a 2ml syringe (100µg in total) and labelled accordingly.
- Dosage intravenously of 1.5µg/kg over 30 – 60 seconds.
- Beware apnoea if given with Propofol
- May cause significant respiratory depression and hypotension.
- Give at least 3 minutes before sedation

5.1 Patient monitoring

- Close observation of airway and respirations by an experienced health care professional until recovery well-established
- Drapes positioned such that airway and chest motion can be visualized at all times
- Availability of oxygen supplementation with pulse oximetry and ECG.
- The routine use of supplemental oxygenation may allow SpO₂ to remain satisfactory but hide the fact that there is significant hypoventilation and the patient may be on the cusp of losing their airway. In the absence of end tidal CO₂ monitoring, supplemental O₂ unless signs of hypoventilation or hypoxia (sats <94%)
- End tidal CO₂ monitoring is likely to become standard in the next few years; be aware of updates in local protocol
- Blood pressure measured every 5 minutes
- Level of consciousness, using the ASA guidelines (see table 1) will need regular communication with the patient to assess.

Table 1. Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia

	Minimal Sedation (Anxiolysis)	Moderate Sedation/Analgesia (Conscious Sedation)	Deep Sedation/Analgesia	General Anesthesia
Responsiveness	Normal response to verbal stimulation	Purposeful* response to verbal or tactile stimulation	Purposeful* response after repeated or painful stimulation	Unarousable, even with painful stimulus
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained	May be impaired

5.2 Possible complications

- laryngospasm/stridor (0.3%) – treat with adrenaline nebs (5ml of 1:1000); maintain airway with tight fitting mask, consider use of Mapleson C anaesthetic circuit
- hypoxia from respiratory depression (SpO₂ <92%)
- hypotension (BP <90mmHg)
- bradycardia (HR < 50bpm)
- increased level sedation (general anaesthesia)
- specific drug side effects (especially Ketamine)

5.3 Choice of sedation agent

The choice of sedation agent depends on the type of procedure undertaken, familiarity of the user and patient characteristics. As a guide the following are appropriate procedural sedatives:

- Joint reduction: Propofol
- Fracture manipulation Propofol preceded by opioid or Ketamine
- Colles fracture Haematoma block with small dose Ketamine
- Cardioversion Etomidate or Ketamine or Midazolam
- Laceration suturing Propofol (Ketamine in children)

6 Post-sedation management

6.1 Recover area

- Minimal physical contact or other psychic disturbance. Quiet area with dim lighting if possible
- Advise parents or caretakers not to stimulate patient prematurely
- Continue oxygen saturation monitoring
- Will need continuous nursing observation until fully alert and responsive – beware if the patient has required Flumazenil as may become re-sedated.

6.2 Discharge criteria

- Recovery depends on drug(s) used
- Return to pre-treatment level of verbalisation, awareness and mobility
- Normal vital signs and ability to take oral fluids.
- Give discharge instructions (see advice sheet): Nothing by mouth for 2 hours
- Responsible adult to accompany patient if discharged

7 Audit and governance

- The Emergency department will regularly audit the use of sedation against national standards. Any serious complications or near misses will be reported through the hospital incident reporting system and discussed at the quarterly ED clinical governance meetings.

Equality and Diversity Statement

This document complies with the Cambridge University Hospitals NHS Foundation Trust service Equality and Diversity statement.

Disclaimer

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References

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3. **Goodwin SA et al.** Clinical policy: procedural sedation and analgesia in the ED. *Ann Emerg Med* 2005; 45(2): 177-96
4. **Green SM et al.** Fasting and Emergency department procedural sedation and analgesia: a consensus-based clinical practice advisory. *Ann Emerg Med* 2007;49: 454-461
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