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IAEM Clinical Guideline

Procedural Sedation of Adults in the Emergency Department

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DISCLAIMER

IAEM recognises that patients, their situations, Emergency Departments and staff all vary. These guidelines cannot cover all clinical scenarios. The ultimate responsibility for the interpretation and application of these guidelines, the use of current information and a patient's overall care and wellbeing resides with the treating clinician.

Revision History

Date	Version	Section	Summary of changes	Author
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GLOSSARY OF TERMS

ED	Emergency Department
ASA score	American Society of Anesthesiologists physical status classification system
RCEM	Royal College of Emergency Medicine
RCOA	Royal College of Anaesthetists
ECG	Electrocardiograph
BMI	Body Mass Index
IV	Intra-venous

Procedural Sedation of Adults in the Emergency Department

PARAMETERS

Target audience: This guideline is directed at all healthcare professionals involved in the delivery of procedural sedation to adult patients in the ED.

Patient population: This guideline relates to adult patients, age of 16 and above, who require sedation in the ED to allow a procedure to be performed safely and effectively.

Exclusion criteria

- Patients under the age of 16.
- Patients requiring sedation in a setting other than the ED.

Contraindications:

- No appropriately trained staff available to perform either the sedation or the procedure
- The patient has an allergy or hypersensitivity to the relevant medications
- No available resuscitation facilities

Relative Contraindications:

- Patients with an ASA score greater than II
- Patients with a high risk of aspiration
- Situations in which a general anaesthetic would be more appropriate

AIM

To provide a guideline that will assist staff in providing safe procedural sedation in the ED setting and to standardise the provision of procedural sedation across the country.

This document complements a [procedural sedation proforma](#) which should be used for all patients requiring procedural sedation in the ED^{2,4}. There is a sample included with this guideline but a local proforma may be in use in individual institutions.

INTRODUCTION

In Emergency Medicine, there are several common procedures which cause anxiety and pain for patients. Procedural sedation and analgesia aims to minimise this anxiety and pain with the use of short-acting pharmacological agents¹. Effective procedural sedation provides anxiolysis, analgesia, sedation and amnesia². In most cases a combination of short acting analgesics and sedatives are used to achieve this. Ketamine is the only single drug which can provide all required aspects of procedural sedation².

Practice in procedural sedation varies across hospitals and across practitioners within the same hospital³. This guideline was developed to standardise the provision of procedural sedation in EDs nationwide.

DEPTH OF SEDATION

Sedation is a continuum which stretches from fully conscious to completely unresponsive or general anaesthesia³⁻⁶. During sedation and recovery, a patient generally moves through several levels of sedation. It is difficult to accurately assess the level of sedation at any one time and to maintain a patient at the target level of sedation for a significant period of time⁴.

The American Society of Anaesthesiologists (ASA) uses the definitions below for levels of

	Minimal Sedation	Moderate Sedation	Deep Sedation	General Anaesthesia	Dissociative Sedation
Response	Normal response to verbal commands Anxiolysis achieved	Reduced conscious level, but patients still respond purposefully to a verbal stimulus either alone or combined with light tactile stimulation	Lower level of consciousness in which the patient cannot be easily aroused but still responds purposefully to repeated or painful stimulation	Complete loss of consciousness whereby the patient does not respond to even painful or repeated stimuli	Defined as “a trance like cataleptic state characterized by profound analgesia and amnesia”
Airway	Maintained	Maintained	May require intervention	Intervention often required	Maintained
Spontaneous ventilation	Maintained	Adequate	May be inadequate	Often inadequate	Maintained
Cardiovascular function	Maintained	Usually maintained	Usually maintained	May be impaired	Maintained
Note	Often achieved with nitrous oxide or methoxyflurane	Also known as conscious sedation. This is the target level of sedation for ED procedural sedation			A separate type of sedation which can only be achieved with Ketamine. It does not truly fit into the standard classification

Even with the best of intentions, it is possible to produce a level of sedation which is deeper than intended⁴. Because of this, drugs should be titrated slowly and in small dose increments.

Level of sedation is also affected by noxious stimuli. Therefore, a patient who has reached the conscious sedation level to allow manipulation of a fracture, for example, may fall into a deeper level of sedation once the fracture is reduced and the noxious stimulus is lost. For this reason, RCEM and RCOA state that “practitioners intending to produce a given level of sedation must therefore be able to ‘rescue’ patients from a deeper level of sedation than intended”⁴.

REQUIREMENTS FOR PROCEDURAL SEDATION (MODERATE AND/OR DEEP SEDATION)

Environment

Procedural sedation should only be performed in the resuscitation room or dedicated procedure room, with the availability of full resuscitation equipment including difficult airway equipment⁴.

Mandatory minimum monitoring includes^{4,8}:
Pulse oximetry
3 lead ECG
Non-invasive blood pressure
Continuous waveform capnography ^{8,9}

All patients who have been sedated in ED should be monitored in the resuscitation room or procedure room, until their level of consciousness and vital signs have returned to the pre-sedation state⁴.

Staff

At least three staff members are required for procedural sedation⁴.

This includes:

- One nurse.
- One doctor responsible for sedation.
- One doctor or advanced nurse practitioner to perform the procedure.

Dissociative sedation with ketamine requires the same facilities, monitoring and staffing levels as procedural sedation⁴.

Consent

Informed verbal consent to both the procedure and the sedation should be documented prior to the administration of any drugs³. The risks and benefits should be explained by the doctor responsible for the patient.

PRIOR TO SEDATION

1. Assessment of indications and contraindications

- Typically procedural sedation is indicated for short, painful procedures which need to be performed relatively urgently for example reduction of fractures or dislocations, cardioversion etc.¹¹
- There are a number of contraindications to procedural sedation in the ED as described on page 3.
- ASA Classification system⁷:

ASA I	Normal, non-smoker, healthy patient
ASA II	Mild systemic disease e.g., smoker, BMI 30-40, well controlled diabetes, or hypertension
ASA III	Patient with severe systemic disease
ASA IV	Patient with severe systemic disease that is a constant threat to life
ASA V	Moribund patient not expected to live without the procedure
ASA VI	Brain dead patient

2. Airway assessment

- A useful mnemonic for airway assessment is 'LEMON'.
 - L – Look externally for features suggestive of a difficult airway including body habitus, head and neck anatomy, narrow mouth opening, loose teeth, facial hair, receding chin, beard.
 - E – Evaluate 3-3-2.
 - Can the patient fit their 3 fingers between their incisors?
 - Is the mandible length 3 fingers from the mentum to the hyoid?
 - Is the distance from the hyoid to the thyroid 2 fingers?
 - M – Mallampati score
 - O – Obstruction and obesity
 - Pathology including head and neck cancers, deep space infection, burns etc.
 - N – Neck mobility

3. Fasting status

- If it is not an emergency procedure, a minimum 2 hour fast from clear fluids or up to 6 hours from solids is required.
- For an emergency procedure, sedation may be required despite the patient being un-fasted, this should be assessed on a case by case basis.

DURING SEDATION

During sedation patients should be continuously monitored.

DRUGS USED IN PROCEDURAL SEDATION

There are several drugs routinely used for procedural sedation in the ED. It is important to be aware of how these drugs work, how they interact with each other and with other drugs, as well as how they may be affected by patient factors². A typical combination used for procedural sedation includes a sedative such as propofol with an opioid analgesic. Sedative agents should not be used alone for painful procedures as they have no analgesic properties.

Drug choice is determined by a number of factors including the nature of the procedure, the planned level of sedation, patient factors (age, fasting status, allergies, co-morbidities), local environment (staffing, availability of resuscitation facilities) and practitioner familiarity and training².

Preferred agents

Sedative agent

- Propofol¹³
 - An anaesthetic agent which should only be used by doctors with formal training and experience in airway management.
 - Can cause respiratory depression, profound hypotension and a deeper level of sedation than required or intended.
 - It has no analgesic properties.
 - Rapid onset of action, which is dose dependent, typically within 30-60 seconds.
 - An appropriate initial dose is 0.5-1mg/kg IV for young, healthy adults with further aliquots of 0.25-0.5mg/kg every 3-5 minutes titrating to effect².
 - In older or unwell patients give slow 10-20mg boluses titrating to effect².
 - Propofol is preferred for shorter procedures and when muscle relaxation is of benefit. It should be avoided if hypotension is a concern.

Analgesic agent

- Fentanyl
 - Opioid analgesic
 - Onset of action within 1-2mins with peak action at 3-5 minutes. Average duration of action is 30-60 minutes after a single IV dose.
 - Initially give 50-100mcg and then titrate in 50mcg to effect (max 200mcg)².
 - Rare side effects include insomnia, laryngospasm and asystole.

Ketamine sedation

- Dissociative anaesthetic and analgesic.
- Patients appear to be awake, but the awareness of external stimulation is blocked.
- Respiration and airway reflexes are usually preserved but it causes tachycardia and hypertension. Can rarely cause laryngospasm.
- Emergence phenomena may occur and administration of a benzodiazepine to treat or prevent emergence phenomena will likely prolong the recovery phase.
- Dose of 1mg/kg IV delivered over at least one minute rapidly produces a dissociative state lasting up to 30 minutes. Repeat doses of 0.25-0.5mg/kg may be required after 5-10 minutes to maintain sedation².
- In older patients a dose of 10-30mg is appropriate².

Other agents may be considered.

ADVERSE EVENTS

As with all medical procedures, procedural sedation carries the risk of adverse events. The risk of these events increases with increasing age. While adverse events are rare, particularly when drugs are titrated slowly and carefully, practitioners must be able to safely manage these events should they occur. Adverse events should be recorded in the patients notes.

- Respiratory depression, apnoea and hypoxia
 - Usually secondary to unintended over-sedation.
 - All patients should receive supplemental oxygen therapy. Basic airway management including simple manoeuvres, adjuncts and bag valve mask ventilation may be required.
- Hypotension
 - The drugs used for procedural sedation can cause hypotension, particularly in older patients and those with co-morbidities. To minimise this risk, patients should receive slow IV fluids from the start of sedation.
 - Due to the fast acting nature of the drugs used for procedural sedation, it is rare that patients require medication such as phenylephrine to treat hypotension during procedural sedation. If vasopressor medication is required, consideration should be given to alternative causes of hypotension.
- Vomiting/aspiration
 - Rarely, patients vomit during or after procedural sedation¹. Vomiting while sedated puts patients at high risk for aspiration, particularly if they have not fasted, are intoxicated with alcohol, or have comorbidities which cause delayed gastric emptying.
 - Nausea and vomiting may be treated with anti-emetics.
 - If there is a strong suspicion that the patient has aspirated, consider admission for observation +/- antibiotics.

DISCHARGE CRITERIA

Patients should be monitored in the ED until they meet all of the criteria as outlined in the [proforma](#).

A [patient advice leaflet](#) has also been provided.

COMPANION DOCUMENTS

- [Patient Advice Leaflet](#)
- [Proforma](#)

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