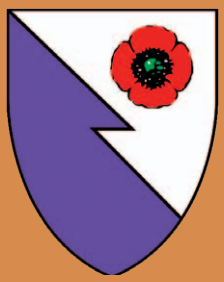
Safe Sedation of Adults in the Emergency Department



Report and Recommendations by
The Royal College of Anaesthetists and The College of Emergency Medicine
Working Party on Sedation, Anaesthesia and Airway
Management in the Emergency Department

November 2012

Contents

Summary

This document sets standards for Emergency Department sedation in adults, and has been approved by the Royal College of Anaesthetists and the College of Emergency Medicine.

Sedation is a continuum, and it is not always possible to maintain patients at a pre-determined sedation depth. This document recognises a clear distinction between lighter levels of sedation (minimal and moderate, or conscious, sedation) and deeper levels (including the dissociative state caused by ketamine). Deeper levels of sedation are indistinguishable from general anaesthesia, and should be treated as such. This is reflected in a series of recommendations for staff numbers and competencies, alongside the required environment and equipment, which are required for each target sedation depth. Because maintenance of the airway is essential, for deep and dissociative sedation in low risk patients the sedating practitioner should have successfully completed the initial assessment of competence of the Royal College of Anaesthetists and been accredited through a local training programme. Additional supervised practice and competence assessment are required to undertake unsupervised rapid sequence induction of anaesthesia and tracheal intubation in the Emergency Department, and these additional skills are not included within the scope of this document.

The use of continuous capnography is mandatory wherever deep sedation, dissociative sedation or general anaesthesia occurs, and is also recommended at lighter levels of sedation. A skilled assistant must be present for all levels of sedation beyond minimal. Prior patient consent should be obtained wherever possible, and standard documentation, within a robust system of clinical governance, put in place along with post-sedation and discharge advice.

Fasting is not needed for minimal sedation or moderate sedation where verbal contact is maintained. For deeper levels of sedation the fasting rules for general anaesthesia form an accepted baseline. For an emergency procedure in the absence of fasting any decision to proceed should be based on urgency and the target depth of sedation coupled with a careful assessment of aspiration risk. Approaches to reduce aspiration risk should be considered, and are described.

Part 1 Introduction

Aim

The aim of this document is to set standards for the safe practice of adult sedation in the Emergency Department (ED).

Scope

The joint Royal College of Anaesthetists (RCoA) and College of Emergency Medicine (CEM) Working Party was established to produce good practice documentation on sedation, anaesthesia and airway management in the Emergency Department. This guidance refers to adult sedation only.

This document applies only to sedation within the Emergency Department, and is not intended to be used in any other setting. It is intended to promote collaborative and safe working between specialties to achieve the best possible patient outcomes whilst acknowledging the complexities and risks of providing care to individuals with serious illness and injury. It relates to sedation undertaken by doctors; if other professionals are engaged in the delivery and management of sedation in the Emergency Department, additional local guidance should be provided.

Working Party Membership

The working party was constituted as follows:

Core Members

Dr David Greaves	Chairman (RCoA)
Professor Jonathan Benger	Co-Chairman (CEM)
Dr Les Gemmell	Association of Anaesthetists of Great Britain and Ireland (AAGBI)
Dr Alasdair Gray	CEM
Dr Gavin Lloyd	CEM
Dr Andy Norris	RCoA
Dr Rebecca Strachan	Lay Representative (CEM)
Dr Richard Telford	RCoA

Advisory Members

Dr Ian Crawford	Emergency Medicine Trainees Association (CEM)
Professor Robert Crouch	Royal College of Nursing (RCN)
Dr Hannah Gill	AAGBI Group of Anaesthetists in Training (GAT)
Mr Mark Gillespie	Emergency Care Association (RCN)
Dr Max Jonas	Intensive Care Society (ICS)

Part 1 Introduction

Dr Ramani Moonesinghe	Trainee Advisory Group (RCoA)
Professor Robert Sneyd	RCoA
Dr Bruce Taylor	Faculty of Intensive Care Medicine (FICM)

Attending

Miss Jane Griggs	Secretary (RCoA)

This document has been endorsed by the following organisations:

The Royal College of Anaesthetists
The College of Emergency Medicine

September 2012

Part 2 Recommendations for safe sedation in the Emergency Department

Depth of sedation and definitions

Sedation is a continuum which extends from normal alert consciousness to complete unresponsiveness. Sedation and recovery move patients along this scale, but it is difficult to accurately assess the precise degree of sedation at any one time, and even harder to maintain a patient at a pre-defined target level.

The American Society of Anesthesiologists (ASA) uses the following useful definitions for sedation:[1]

- **Minimal Sedation (Anxiolysis)** is a drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilatory and cardiovascular functions are unaffected. In the Emergency Department this is most often achieved using inhaled Entonox (50% nitrous oxide and 50% oxygen).
- **Moderate Sedation/Analgesia ('Conscious Sedation')** is a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained. In the Emergency Department this is most often achieved using a combination of opioids and benzodiazepines.
- **Deep Sedation/Analgesia** is a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.
- **General Anaesthesia** is a drug-induced loss of consciousness during which patients are not rousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may also be impaired.

These definitions are also frequently referred to as levels 1 to 4: 1 being anxiolysis and 4 being general anaesthesia.

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- **Dissociative Sedation.** Ketamine is a unique drug in sedation practice because it causes a dissociative state that does not fit the standard definitions of sedation listed above. A separate sedation category, 'dissociative sedation', has therefore been introduced. Dissociative sedation is defined as 'a trance like cataleptic state characterized by profound analgesia and amnesia, with retention of protective airway reflexes, spontaneous respirations, and cardiopulmonary stability.'

We recognise that an important boundary exists between moderate or 'conscious' sedation, where the patient responds purposefully to verbal commands, and deeper levels of sedation where the patient responds only to painful stimuli, or not at all. Once verbal contact with the patient is lost it becomes difficult to determine the level of unconsciousness, and over-sedation with an associated risk of airway and cardio-respiratory complications is possible. Therefore, this document draws a clear distinction between the intention to achieve 'conscious' sedation and the intention to achieve deeper levels of sedation. Deeper levels of sedation are, to all intents and purposes, indistinguishable from general anaesthesia and should therefore be treated as such. Because sedation is a continuum, it is not always possible to predict how the individual patient will respond. Patients in whom conscious sedation is intended have the potential to become more deeply sedated. Practitioners intending to produce a given level of sedation must therefore be able to 'rescue' patients from a deeper level of sedation than intended. A clinician intending to achieve 'deep sedation' should therefore have the knowledge and skills to manage and rescue a patient from general anaesthesia.

We also draw a distinction between deep sedation/ general anaesthesia, and the technique of rapid sequence induction of anaesthesia (RSI) and tracheal intubation. RSI is sometimes indicated in the emergency patient in order to secure the airway and achieve adequate ventilation. RSI and tracheal intubation is an advanced airway skill. The practitioner must be familiar with alternative supportive oxygenation and ventilation techniques should tracheal intubation fail and bag mask ventilation prove difficult or impossible.

As there is a loss of verbal contact with patients during ketamine sedation and because significant complications, although rare, can occur unpredictably, ketamine sedation has been grouped with deep sedation/general anaesthesia.

Requirements for sedation

The minimal requirements for safe sedation practice in Emergency Department patients are shown in Table 1.

Part 2 Recommendations for safe sedation in the Emergency Department

Table 1 Requirements for Emergency Department Sedation (see also notes below)

Depth of sedation	Minimum staffing levels	Competencies of sedating practitioner	Location and Facilities	Monitoring
Minimal sedation with Entonox	One Physician *or* Emergency Nurse Practitioner (ENP)	Current Immediate Life Support (ILS) or Advanced Life Support (ALS) certification or equivalent agreed locally	Anywhere within the Emergency Department (ED)	Pulse oximetry
Moderate sedation/ analgesia ('conscious' sedation) using intravenous agents, typically benzodiazepines	One physician as sedationist *and* one Physician or ENP as operator *and* one Nurse	Current ILS or ALS certification Local sign off for Level 1 sedation training*	Resuscitation room facilities****	ECG, NIBP, pulse oximetry The use of capnography is recommended
Deep sedation/ analgesia	As above	Royal College of Anaesthetists initial assessment of competence Local sign off for Level 2 sedation training**	Resuscitation room facilities****	Standards conforming to AABGI guidelines for general anaesthesia[2] The use of capnography is mandatory
Dissociative sedation using ketamine	As above	As above	As above	As above
Rapid sequence induction of anaesthesia (RSI) and tracheal intubation	As above	As above, plus additional supervised practice and local sign off for ED RSI training including: ■ experience in failed intubation drills/ rescue oxygenation techniques ■ the use of cricoid pressure ■ the adjustment of anaesthetic dosage in critical illness and circulatory support***	As above	As above

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*** Level 1 sedation training ('conscious' sedation)**

- ASA grading
- Pre-procedural assessment including prediction of difficulty in airway management
- Pre-procedural fasting and risk benefit assessment
- Consent and documentation
- Drug selection and preparation: benzodiazepine/opioid combinations, intervals between increments and reversal drugs
- Monitoring, complications (e.g. hypoxia and hypotension) and rescue strategies
- Governance and audit

**** Level 2 sedation training (deep sedation/general anaesthesia)**

- As per level 1
- Drug selection with emphasis on potential alternative strategies and/or lighter sedation
- Safe use of propofol
- Safe use of ketamine
- Monitoring, complications (e.g. hypoxia and hypotension) and rescue strategies
- Governance and audit

***** Additional training for ED RSI**

- As per level 2
- Additional supervised practice and assessment in the operating theatre, intensive care unit and ED. Independent RSI is not included within the current emergency medicine core curriculum, and the additional competencies required to undertake this procedure, and maintain skills over time, have not yet been defined. Further work in this area would be welcomed

****** Resuscitation room facilities**

- Full resuscitation equipment for the administration of basic and advanced life support. Equipment and drugs should be checked daily, and after each use. That such checks have occurred should be routinely recorded
- Difficult airway equipment
- Continuous high flow oxygen with appropriate devices for administration
- High pressure suction with appropriate suction catheters
- A trolley capable of being tipped head down
- Monitoring: Pulse oximeter, ECG, NIBP and continuous quantitative capnography
- Appropriate range of intravenous cannulae
- An appropriate range of intravenous fluids and infusion devices
- Manual handling devices

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Immediate Life Support comprises the essential knowledge and skills to enable recognition of the acutely ill patient and treatment of a patient in cardiac arrest while awaiting the arrival of a resuscitation team. Competencies within the domain of ILS include: delivery of high-quality chest compressions, basic airway management, safe defibrillation using either manual or automated external defibrillators (AEDs), and being a cardiac arrest team member.

Oxygen

Oxygen should be given to sedated patients, who may experience a fall in oxygen saturation from the baseline level measured on room air. Oxygen should be given from the start of sedative administration until the patient is ready for discharge from the recovery area.

Capnography

The use of continuous capnography is mandatory wherever deep sedation, dissociative sedation, general anaesthesia or RSI occurs (i.e. whenever it is anticipated that verbal contact with the patient will be lost), except in rare cases where it would substantially interfere with surgical access. Capnography is also recommended at lighter levels of sedation; this is an emerging area of practice, and the use of capnography is expected to become routine.[3]

Documentation

Standard forms should be routinely used for patient pre-assessment, patient information, consent, monitoring, discharge information and clinical audit. Past medical history, medications, allergies and physical examination of vital signs, airway and cardiopulmonary status should all be recorded prior to the procedure. Good practice guidelines, issued by the Department of Health, include standard consent forms for patients undergoing procedures including sedation and general anaesthesia,[4] but national agreement has not been established in the other documentation areas, and the development of appropriate forms would be welcomed. Whilst the urgency of the clinical situation or patient status may sometimes necessitate treatment in the absence of consent, and in the patient's best interests, every effort should be made to obtain prior written consent for both the proposed procedure and sedation technique.

Post-procedure monitoring

All patients who have received sedation should continue to be managed in a clinical area that provides the same level of facilities and monitoring as those required during the procedure, until the level of consciousness and other vital signs have returned to pre-procedure baseline levels. This includes the presence of a clinician who has been trained in the core skills required of recovery nurses, as described in guidelines issued by the Association of Anaesthetists of Great Britain and Ireland.[5] These skills include the monitoring and measurement of vital signs and overall patient status, including respiratory rate, blood pressure, heart rate, Glasgow Coma Score and basic life support training.

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Discharge status

Patients should be formally assessed for discharge suitability from the clinical area where sedation has taken place. Discharge criteria are as follows:

- The patient has returned to their baseline level of consciousness.
- Vital signs are within normal limits for that patient.
- Respiratory status is not compromised.
- Pain and discomfort have been addressed.

If there is a requirement to discharge the patient prior to meeting these criteria they should be transferred to an appropriate clinical environment, usually level 2 care with continuation of peri-procedure monitoring standards.

Patients meeting discharge criteria following sedation who go on to be discharged home from the Emergency Department should be discharged into the care of a responsible third party. Verbal and written instructions should be given.

The role of the skilled assistant

The RCoA recommends that anaesthesia should not proceed without a skilled, dedicated assistant.[6]

The role of the skilled assistant can be undertaken by a number of professionals in the emergency care setting such as an emergency nurse, other emergency practitioner or an operating department practitioner. They must be formally trained in the role that they will be required to undertake, be that assistance with sedation or assistance with RSI. NHS Education Scotland has devised a portfolio of core competencies for anaesthetic assistants.[7] It would be expected that those assisting with sedation and RSI would have achieved competencies equivalent to those listed in sections 3.5 and 3.6 and sections 4.1 to 4.12 of this document. If the patient is thought to have a potential neck injury a second competent assistant is needed to perform manual in-line cervical stabilisation (MILS).

The RSI assistant may also be involved in post intubation care, and should be familiar and practised in post intubation procedures. Local protocols, training packages and competency assessments should be developed to ensure that staff are able to perform the role of skilled assistant and regularly practise these skills (either through actual experience or high fidelity simulation).

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Fasting prior to Emergency Department sedation

Fasting is not needed for minimal sedation, sedation with nitrous oxide (in oxygen) alone, or moderate sedation where verbal contact is maintained.

For elective procedures using all other sedation techniques (deep sedation, dissociative sedation and moderate sedation where the patient might not maintain verbal contact with the healthcare professional), apply the fasting rule used for general anaesthesia: two hours for clear fluids and six hours for solids.[8]

For an emergency procedure in someone who is not fasted, base the decision to proceed with sedation on the urgency of the procedure and the target depth of sedation.

Careful judgement is required when assessing the risk of aspiration in relation to the urgency of a proposed procedure. The key factors to consider are:

1. The urgency of the proposed procedure. In many life or limb threatening situations (e.g. cardioversion of a cardiac arrhythmia causing significant cardiovascular compromise, or an orthopaedic procedure to correct distal limb ischaemia) the patient is unable to wait and the main question becomes the choice of sedation/ anaesthetic technique rather than the possibility of deferment.
2. The proposed depth and duration of sedation. Longer periods of sedation, greater sedation depth and airway interventions may stimulate airway reflexes (coughing, hiccoughs or laryngospasm) and gastro-intestinal motor responses (gagging or recurrent swallowing) leading to gastric distension, regurgitation or vomiting.
3. Patient factors. Conditions such as raised intracranial pressure, hiatus hernia and gastrointestinal obstruction are known to delay gastric emptying, and these patients may be at greater risk. Gastric emptying may also be delayed in patients who have previously undergone upper gastrointestinal surgery, in those recently injured or receiving opioids, and in pregnancy. Morbidly obese patients may be at risk, because the intra-abdominal pressure is higher and the incidence of hiatus hernia is greater than in non-obese patients. The timing of food intake in relation to the injury is also important.

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Therefore, each patient requires a thoughtful assessment of the urgency and benefit of the procedure compared to the risks of sedation. This assessment and the resulting decision should be recorded in the clinical notes, and discussed with the patient whenever possible. To assist with the decision-making process a North American committee of emergency physician sedation researchers have developed a 'tool to permit emergency physicians to identify prudent limits of sedation depth and timing in light of fasting status and individual patient risk factors', but goes on to state that 'the advisory is not intended to assert a legal standard of practice or absolute requirement'.[9] Overall, this clinical practice advisory is an attempt to more clearly articulate the required risk-benefit calculation, but includes an explicit expectation that further judgement will be required on a case-by-case basis.

Acting on increased aspiration risk

Where the risk of aspiration is significantly increased steps should be taken to mitigate this risk. Suggested approaches include:

- Delaying the procedure, if clinically appropriate.
- Adopting an alternative technique. Rapid sequence induction of anaesthesia and tracheal intubation is considered the 'gold standard' where there is an increased aspiration risk, but pulmonary aspiration may still occur.[10] In addition, RSI introduces other risks, such as inability to intubate or ventilate the patient and the risk of adverse reaction to induction and neuromuscular blocking drugs.
- Regional anaesthetic techniques may allow the required procedure to be performed with no or minimal sedation.
- Reducing the depth and duration of sedation. This increases the risk of procedural failure, but may be appropriate in some instances.
- Consider whether the administration of ranitidine or proton pump inhibitors, metoclopramide and sodium citrate is appropriate to neutralise gastric acid and promote gastric emptying.

In all cases of increased aspiration risk the advice of an expert sedationist should be sought. However there is no consensus on this subject, even among experts.[11]

Audit

All sedation practice should be audited; individual Emergency Departments should develop audit standards and markers.

References

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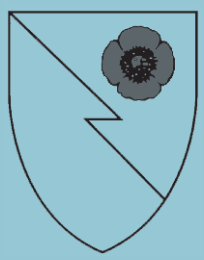

The Royal College of Anaesthetists

Churchill House
35 Red Lion Squaare
London WC1R 4SG

020 7092 1500
info@rcoa.ac.uk
www.rcoa.ac.uk

The College of Emergency Medicine

7–9 Bream's Buildings
London
EC4A 1DT

020 7404 1999
info@collemergencymed.ac.uk
www.collemergencymed.ac.uk