Magpas AIR AMBULANCE

STANDARD OPERATING PROCEDURE

5.3 Procedural Sedation

Position responsible: Medical Director	Issue Date : April 2020
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Related Documents	SOP 5.1 Analgesia SOP 5.2 Regional Anaesthesia SOP 6.1 Pre-Hospital Emergency Anaesthesia Safe Sedation Practice for Healthcare Procedures: Standards and Guidance, Academy of Medical Royal Colleges, 2013 Safe Sedation in the Emergency Dept, RCEM and RCoA 2012
Further information	Fundamental Principles and Practice of Anaesthesia, Hutton

At a glance dosing for procedural sedation:

KETAMINE

0.5mg/kg initial bolus (IV/IO)
additional increments of 0.25mg/kg

Shocked/frail/compromised – 0.25mg/kg initial bolus

1.0 Background

1.1 This SOP concerns the administration of sedative agents. The term 'procedural sedation' is used to highlight the fact that sedation is generally only indicated in the pre-hospital environment when analgesia alone would be insufficient to facilitate a specific and clearly identifiable procedure. Procedures include rescue, extrication, movement, wound care, fracture/dislocation management or any other urgent clinical intervention.

1.2 Whichever procedure represents the indication for sedation, the commonest error is the administration of a sedative agent to a physiologically compromised, injured and trapped patient BEFORE a clear plan for extrication or management has been made and BEFORE all necessary personnel and equipment are organised and ready to proceed without interruption. The result can be a physiologically compromised, injured, trapped and now sedated patient. Anxiety and pain should be managed by non-pharmacological means combined with inhalational agents such as methoxyflurane (Penthrox) or nitrous oxide (where appropriate) and opioid analgesia (intranasal, intravenous or intraosseous).

1.3 Only in exceptional circumstances should sedation be administered before it is possible to commence treatment or extrication. The most common reason for this is to gain control of the combative, agitated patient who is likely to require pre-hospital emergency anaesthesia. In these circumstances, sedation may facilitate clinical assessment, adequate pre-oxygenation, intravenous access and application of monitoring prior to anaesthesia. Small

doses of an opiate often provide effective analgesia and anxiolysis in these cases – especially if the principle stimulus appears to be pain. Where there are no obvious major external injuries and cerebral agitation appears to be the predominant problem, small doses of midazolam or ketamine are usually effective.

1.4 This SOP represents the standard of practice for and defines the criteria for the Magpas Safe Sedation Practice Audit.

2.0 Procedure

2.1 Identify the procedure(s) for which sedation is indicated. Question whether the procedure(s) can be undertaken with analgesia alone or whether rapid intervention without sedation is necessary.

2.2 Explain and discuss the procedure and the need for sedation with all personnel involved with handling the patient. Give opportunity, as urgency allows, for questions and clarification.

2.3 Verbalise and plan the sequence of events: the commonest pitfall in procedural sedation is sedation without a procedure. Ensure that all personnel and equipment are prepared and in place (e.g. fire service personnel to undertake ramming or cutting operations and support the patient, ambulance personnel to control, co-ordinate and assist with extrication, prepositioned ambulance trolley etc).

2.4 Brief all patient carers regarding the expected clinical course in terms of the effects of sedation. In particular, discuss the risk of precipitating vomiting and/or laryngospasm with inappropriate use of airway adjuncts in the sedated patient. Also discuss the need to undertake the procedure in a progressive, timely and deliberate manner.

2.5 Undertake a pre-anaesthetic assessment in every patient and be prepared to proceed to prehospital emergency anaesthesia if necessary.

2.6 Administer continuous supplemental oxygen throughout the procedure using high-flow oxygen, 12-15L/min via a non-rebreathe mask. (NB this is a change to the 2018 version of the SOP)

2.7 Ensure immediate access to functioning suction throughout.

2.8 Secure intravenous or intraosseous access according to the clinical situation, ideally aiming for two secure points of access, if possible.

2.9 Ensure minimum monitoring of three lead ECG, continuous pulse oximetry, intermittent noninvasive blood pressure recording and continuous respiratory rate, monitored by end-tidal CO2. Although some monitoring may be removed to facilitate safe extrication, a continuous monitoring of pulse oximetry and respiratory rate by end-tidal CO2 must be maintained. All patients should be clinically monitored for airway obstruction and apnoea throughout the sedation period.

2.10 Prior to administering sedation, complete pre-sedation checklist (see appendix 1).

2.11 Give sedation. Ketamine is the preferred agent for procedural sedation. It should be administered intravenously wherever possible. The most common clinical practice is to **administer a bolus of 0.5 mg/kg** and repeatedly assess the effectiveness of sedation. Consider further incremental doses (**typically 0.25mg/kg boluses of ketamine**) until the patient is in the dissociated state. Typically, adequate sedation is likely to have been achieved when verbal dialogue is lost. Other features such as nystagmus may be present. It is important to appreciate that the aim is to achieve the dissociated state within a short time frame so that the procedure can be undertaken with minimal delay. Consider further supplemental doses (0.25mg/kg bolus of ketamine) during the procedure if required. An insufficiently sedated patient will misperceive external sensory stimuli and develop emergence phenomena.

2.12 In shocked, frail, elderly or otherwise compromised patients the initial bolus dose should be halved (0.25mg/kg)

2.13 To avoid dysphoria or emergence phenomenon with ketamine (which may occur during administration or during recovery): a) provide an adequate initial dose within a short time frame b) consider maintaining sedation until the patient is in an appropriate recovery environment, c) consider administration of additional analgesia (e.g. opiate) if painful stimuli persist d) consider anxiolysis with midazolam.

2.14 If intramuscular ketamine is considered, it must be recognised that the dose required is higher (e.g. 4mg/kg), the onset is slower and the response is much less predictable. This must be delivered using the 50mg/ml ketamine solution and not the pre-filled syringes.

2.15 Midazolam may be used for procedural sedation but the dose/response is more variable. The average dose required to achieve sedation is typically 0.05 – 0.1 mg/kg. Common practice, in adults, is to administer an initial intravenous bolus dose of 2 mg followed by incremental doses of 0.5 to 1 mg every 2 minutes. If opioid analgesia has already been administered, lower doses are required. Repeatedly assess the effectiveness of sedation during the procedure and consider further incremental doses of 0.5 to 1 mg boluses of midazolam.

2.16 Consider using midazolam to gain clinical control of agitated patients that do not appear to have a significant pain component. Ketamine can also safely be used in such patients.

2.17 Adverse side effects from midazolam (e.g. excessive neurological and respiratory depression) can be reversed by the administration of flumazenil. The initial adult intravenous dose is 200 micrograms then a further 100 micrograms at 1 minute intervals up to a total of 1mg. The paediatric flumazenil dose is 0.1micrograms/kg over 15 seconds then a further 0.05/0.1micrograms/kg at 1 minute intervals up to a total of 1mg. It is preferable to titrate the dose of midazolam to avoid over sedation rather than have to reverse the effects with flumazenil. It is not recommended for children under 1 year.

2.18 Review post procedure level of sedation and consider need to proceed to pre-hospital emergency anaesthesia to facilitate safe transfer.

2.19 On completion of the procedure, review the balance of sedation and analgesia and consider maintenance of sedation until arrival at the emergency department. This should only be considered when there is no indication for pre-hospital emergency anaesthesia and it is considered undesirable (from a clinical and/or humanitarian perspective) to allow the patient

to fully recover during transfer. The balance of risks and benefits from this prolonged sedation should be carefully considered for each patient.

2.20 If consciousness is not fully regained prior to transport and pre-hospital emergency anaesthesia is not indicated, land ambulance transfer should be undertaken. Sedated patients should not be conveyed by helicopter.

2.21 The team should accompany all patients who have undergone procedural sedation to hospital unless, in exceptional circumstances, the on-scene time is so prolonged that the patient has totally recovered from the sedation and is fully alert.

2.22 Ensure full clinical records of pre, intra and post procedure vital signs are maintained.

2.23 Ensure that full records of procedural sedation are conveyed to the emergency department with the patient and any sedation related adverse events (eg hypoxia, apnoea or emergence) are recorded and highlighted on the patient's record and a Magpas SER completed.

3.0 Audit

3.1 All sedations will be audited and reviewed by the associate/clinical director as part of the ongoing governance process, and subject to in-depth review in governance forums.

3.2 Audit standards

STANDARD	EXCEPTIONS
Clearly documented associated procedure	
Airway assessment documented	
Initial ketamine dose = 0.5mg/kg	Documented reason for "off-SOP" dosing
Monitoring during procedural sedation must be documented to have included non-invasive blood pressure, pulse oximetry, ECG and continuous capnography.	
Oxygen should be given for the procedure	
Oxygen saturations >92% throughout procedure	Saturations <92% pre-procedure
Team accompanied patient to hospital	Documented reason for not accompanying

APPENDIX 1 – Procedural Sedation Checklist

Procedural Sedation Checklist			
Briefing			
Is there a plan for complications? Vomiting? Apnoea? Conversion to PHEA?		YES	NO
Have all personnel been briefed?		YES	NO
Airway & Breathing			
Is there a functioning suction unit to hand?		YES	NO
Is there emergency airway equipment to hand?		YES	NO
Is there a BVM to hand?		YES	NO
Is supplemental oxygen on and at an appropriate rate?		YES	NO
Is there sufficient oxygen?		YES	NO
Vascular access			
Is there at least one point of access flushing easily?		YES	NO
Monitoring			
Is SpO2 applied and SpO2 >95%		YES	NO
Is an ECG applied and recording sufficiently?		YES	NO
Is EtCO2 applied and recording sufficiently?		YES	NO
Is NIBP applied and set to cycle every 3 minutes?		YES	NO
Is the systolic BP >100 mmHg?	*Consider fluid bolus*	YES	NO
Drugs			
What is the sedation agent chosen?	*State drug*	YES	NO
Is the dose appropriate for weight and BP?	*State dose*	YES	NO
If YES to all questions proceed with sedation			
If NO to any question address issue, reconsider need and consider remote senior advice			

