

Best Practice Guidance – Sedation

These recommendations are bound by the current evidence and best practice at the time of writing and so will be subject to change as further developments are made in this field.

Aim

To provide guidance on sedation management in adult critical care

Scope: All adult critical care patients

Introduction

The management of sedation is an important component of critical care medicine. Sedative drugs are often necessary to reduce stress and agitation, and to facilitate therapies such as mechanical ventilation. Excess use of sedative drugs has been shown to worsen outcome including length of stay, length of mechanical ventilation and rates of nosocomial infections^{1 2}. A balance must be struck between the need for sedation in certain circumstances and the risks of over-sedation.

The aim of this guideline is to ensure patients are comfortable and calm in ICU, improving their experience and clinical outcomes. There are a number of actions that can be taken to ensure patients receive the optimal level of sedation:

- Assessment of sedation
- Use the minimum sedation necessary
- Target sedation level set and regularly reviewed
- Optimisation of non-pharmacological measures
- Use daily sedation breaks unless contraindicated

Assessment Tools

A sedation scoring system enables critical care staff to optimise and minimise the sedation and analgesia requirements of patient's whilst providing maximum benefit and comfort for the patient. The Richmond Agitation Scoring System (RASS) (Appendix 1) is considered to be the best-validated tool for clinical assessment of sedation and agitation in ICU³ and is cited in the NICE Delirium guidance⁴ although other validated tools such as the Sedation Agitation Score (SAS)⁵ (Appendix 2)

¹ Kollef MH, Levy NT, Ahrens TS, et al: The use of continuous IV sedation is associated with prolongation of mechanical ventilation. *Chest* 1998; 114:541–548

² Brattebø G, Hofoss D, Flaatten H, et al: Effect of a scoring system and protocol for sedation on duration of patients' need for ventilator support in a surgical intensive care unit. *BMJ* 2002; 324: 1386–1389

³ Barr J, Fraser GL, Puntillo K, et. al. Clinical Practice Guidelines for the Management of Pain, Agitation and Delirium in Adult Patients in the Intensive Care Unit *Crit Care Medicine* 2013; 41:263-307

⁴ NICE Clinical Guideline 103 Delirium: prevention, diagnosis and management 2010

⁵ Assessing sedation in ventilated ICU patients with the bispectral index and the sedation-agitation scale. *Crit Care Med* 1999; 27:1499-1504.

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are available and used. Regular assessment of sedation is necessary to ensure sedative drugs are used in a balanced and appropriate way in ICU.^{6,7}

Action: Sedation should be assessed 2 - 4 hourly

Optimal Sedation

Excessive sedation reduces patients' ability to communicate and cooperate with care, and can increase the duration of mechanical ventilation, rates of nosocomial infections and ICU length of stay. Use of the minimum dose of a drug necessary to achieve a clinical goal is a widely-accepted principle in clinical practice.

Action: Use the minimum sedation necessary

Contraindications to management of patients using minimum sedation

There are patient who will however require deeper levels of sedation due to their clinical conditions. Listed below are clinical circumstances where sedation hold is contraindicated. Patients with:

- **Raised intracranial pressure**
- **Hypoxic brain damage within the first 48 hours post insult**
- **Nursed in prone position**
- **FiO₂>60%**
- **PEEP >10**
- **Neuromuscular blocking agents**
- **Expected surgery/transfer**
- **Awaiting bronchoscopy/tracheostomy/ scan procedures**

Levels of Sedation

A target level of sedation should be decided and regularly reviewed to reflect changes in the patient's condition⁸. Sedation should be regularly titrated to maintain the prescribed sedation score⁹.

Action: Set target sedation level and consultant review at least daily

Action: Sedation should be titrated to prescribed sedation score

⁶ KressJP, Pohlman AS, O'Connor MF, Hall JB. 'Daily interruptions of sedative infusions in critically ill patients undergoing mechanical ventilation'. NEJM 2000; 342: 1471 – 1477

⁷ Mehta S, Burry L, Cook D, et al. 'SLEAP Investigators; Canadian Critical Care Trials Group. Daily sedation interruption in mechanically ventilated critically ill patients cared for with a sedation protocol: a randomized controlled trial'. JAMA. 2012; 308(19):1985-92.

⁸ Guidelines for the provision of Intensive Care Services. Joint Professional standards Committee 2015

⁹ Cohen D, Horiuchi K, Kemper M et al. 'Modulating effects of propofol on metabolic and cardiopulmonary responses to to stressful intensive care unit procedures'. Crit Care Med 1996; 24: 612 – 617

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Optimal Sedation Aim for a RASS score of 0 to -1	Used to ensure distress is avoided in patients with ETT
	Sedation should be at a level to ensure the patient is comfortable enough to sleep if they wish, but not at a level where sleep is induced
	Sedation should not be used instead of analgesia
	The aim should be to decrease and stop sedation as clinical condition allows
Light/Moderate Sedation Aim for RASS -2/-3	??Stable and decreasing respiratory and CVS support. Anticipated full sedation hold in next 24 hours.
Deep Sedation Aim for RASS score of -4/-5	Required when patients are on muscle relaxants
	Patients where ventilatory strategies include inverse ratio ventilation; high levels of PEEP >15 ; high FiO2 >80% and where spontaneous coughing is undesirable
	During induced hypothermia
	Patients with acute cerebral pathology in whom coma is induced as a protective measure
	Patients on High /Frequency Oscillation
	Patients nursed in prone position
	Anticipated procedure in next 6 hours

Optimisation of non-pharmacological measures

Many factors contribute to discomfort in ICU. Simple measures such as re positioning the patient to aid comfort, orientation to time and place and minimising and or grouping care interventions helps to reduce the need for sedative drugs. As part of keeping patients orientated noise levels should be kept to a minimum and during night time hour's lights should be dimmed.

Daily Sedation Breaks

Daily sedation holds should be undertaken to ensure no accumulation of sedative/analgesic drugs. This is a complete cessation of sedation until the desired sedation score is reached. The length of a sedation hold can vary in individual patients depending on the level of sedation.

Daily breaks from continuous IV sedation reduce the duration of mechanical ventilation, ICU length of stay and requirement for neurological imaging with no increase in adverse events¹⁰.

Action: Daily sedation break unless contraindications are present

¹⁰ Kollef MH, Levy NT, Ahrens TS, et al: The use of continuous IV sedation is associated with prolongation of mechanical ventilation. Chest 1998; 114:541–548

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Common Sedative Drugs used in Critical Care

Drug	Properties	Contraindications/ adverse effects
Propofol	Propofol has a short duration of action and permits relatively rapid emergence but can accumulate when given as a continuous infusion.	Do not use in patients who are hypersensitive to peanuts and soya. Bradycardia, hypotension, tachycardia, flushing, hyperventilation, apnoea, convulsions, cough, hiccup, thrombosis, phlebitis, anaphylaxis
Clonidine	An alpha2-agonist which provides sedation with minimal respiratory depression. It is effective in controlling delirium and withdrawal symptoms from opioids, benzodiazepines, alcohol and nicotine.	Bradycardia, hypotension, fluid retention
Midazolam	A short acting benzodiazepine which can have unpredictable awakening times and prolonged extubation times	Respiratory depression and respiratory arrest
Alfentanil	Opioid with short half life	Hypotension, respiratory depression, bradycardia, hypoventilation, apnoea, muscle rigidity during induction, allergic reaction.
Remifentanyl	Opioid with shorter half-life than alfentanil	Muscle rigidity. Allergic reaction, respiratory depression, hypotension, bradycardia. Do not bolus
Dexmedetomidine	A newer alpha2- agonist with analgesic, sedative, sympatholytic and anxiolytic properties. Has a short half-life.	Changes in blood pressure, heart rate and blood glucose. Respiratory depression, nausea, vomiting and dry mouth. Do not bolus
Ketamine	Not commonly used as a sedative infusion due to its adverse effects however it is a bronchodilator and has a role to play in the management of status asthmaticus	Anaphylaxis, laryngospasm, respiratory depression, apnoea, raised BP & HR, hypotension, bradycardia, arrhythmias, hallucinations, confusion, delirium, nausea, vomiting
Thiopentone	Barbiturate used for burst suppression in management of status epilepticus.	Laryngeal spasm, respiratory depression, bronchospasm, depression of cardiac output, thrombophlebitis

Medusa Injectable Medicines guide NHS. ICS Guidelines for Sedation for patients in ICU
 Naloxone and Flumazaniol are opioid and benzodiazepine antagonists and should be available.

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Appendix 1

Richmond Agitation Scoring system (RASS)		
Score	Term	Descriptor
+4	Combative	Combative, violent, immediate danger to staff
+3	Very Agitated	Pulls to remove tubes or catheters; aggressive
+2	Agitated	Frequent non-purposeful movement, fights ventilator
+1	Restless	Anxious, apprehensive, movements not aggressive
0	Alert & Calm	Spontaneously pays attention to caregiver
-1	Drowsy	Not fully alert, but has sustained awakening to voice (eye opening & contact >10 sec)
-2	Light Sedation	Briefly awakens to voice (eyes open & contact
-3	Moderate Sedation	Movement or eye opening to voice (no eye contact)
If RASS is \geq -3 proceed to CAM-ICU (Is patient CAM-ICU positive or negative?)		
-4	Deep Sedation	No response to voice, but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Voice

Touch

Appendix 2

Sedation-Agitation Scale (SAS)		
Score	Term	Descriptor
7	Dangerous Agitation	Pulling at ET tube, trying to remove catheters, climbing over bedrail, striking at staff, thrashing side-to-side
6	Very Agitated	Requiring restraint and frequent verbal reminding of limits, biting ETT
5	Agitated	Anxious or physically agitated, calms to verbal instructions
4	Calm and Cooperative	Calm, easily arousable, follows commands
3	Sedated	Difficult to arouse but awakens to verbal stimuli or gentle shaking, follows simple commands but drifts off again
2	Very Sedated	Arouses to physical stimuli but does not communicate or follow commands, may move spontaneously
1	Unarousable	Minimal or no response to noxious stimuli, does not communicate or follow commands