SEDATION AND DELIRIUM GUIDELINES FOR ADULTS IN CRITICAL CARE

AIM: Optimise the management of pain, delirium and sedation in critical care patients

Key Points

- **Delirium**

  Perform **8 hourly** CAM-ICU score and follow delirium protocol

- **Analgesia**
  - Treat Pain
  - Non-Pharmaceutical Methods
  - Consider Analgesia
- **Sedation**

  Prescribe sedation scores daily and note on ICU Chart

  Consider sedation breaks daily on all patients.

  Sedation breaks should involve decreasing and/or stopping the sedative drug(s) completely

Other Considerations

- Review every 24hrs whether Remifentanil should be continued or changed to Alfentanil
- It may be appropriate to continue with Remifentanil in the following circumstances:
  - Suspected neurological injury (post cardiac arrest, head trauma)
  - Liver failure
  - Acute and chronic kidney injury
  - At the discretion of the duty consultant

- Upper recommended limit for Propofol infusion is 15ml/hour (300mg/hr)
- If Propofol rates are greater than 15ml/ hour for longer than 12 hours
  - Check triglyceride levels
  - Remain vigilant for Propofol infusion syndrome-features include refractory bradycardia in the presence of one or more of the following: metabolic acidosis, rhabdomyolysis, hyperlipidaemia and an enlarged fatty liver
  - For extremes of body weight please discuss limits with Critical Care Consultant

Authors: Steven Lockwood and Sedation & Delirium Group (LG, DM, JW, IG) ✧Date:01/06/2023 ✧Revision Due: 01/06/2025

Confusion Assessment Method in ICU (CAM-ICU)

The patient needs to have a Richmond Agitation Sedation Scale (RASS) >-4.
If score is -4 or -5, reassess the patient at a later time.

1. Is there an acute onset of confusion or a fluctuating course?

- No → Stop assessment - NO DELIRIUM
- Yes ↓

2. Assess inattention

Please read the following 10 letters: **SAVEAHAART**

Ask the patient to squeeze your hand on the letter **A**

If the patient fails to do so or squeezes on any other letter, this counts as an error

- No → Stop assessment - NO DELIRIUM
- ≥3 errors ↓

3. Altered level of consciousness

If RASS 0, proceed to next step

- If RASS is other than 0 → Stop assessment - PATIENT HAS DELIRIUM
- RASS = 0 ↓

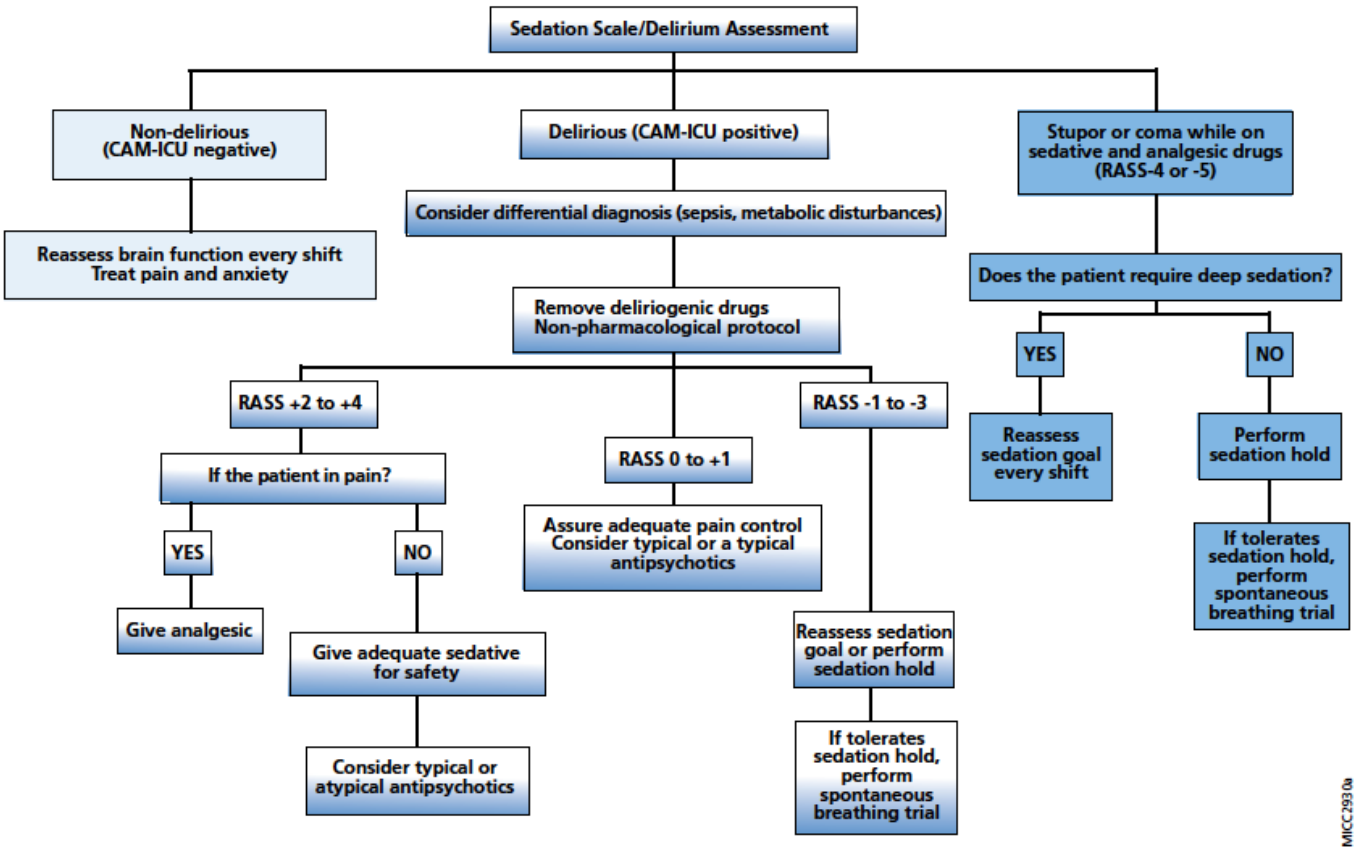
4. Disorganised thinking

Ask the following questions:
Will a stone float on water?
Are there fish in the sea?
Does one pound weigh more than two pounds?
Can you use a hammer to pound a nail?

Say to the patient: "Hold up this many fingers"
Examiner should hold up 3 fingers
Then ask the patient to do the same with the other hand
If the patient is unable to move both arms, ask him to add one more finger.

- <2 errors → Stop assessment - NO DELIRIUM
- ≥2 errors → PATIENT HAS DELIRIUM

Delirium Protocol



SEDATION AND DELIRIUM GUIDELINES FOR ADULTS IN CRITICAL CARE

Aims:

- Patient comfortable, pain free, calm and co-operative
- Patient able to sleep when undisturbed, but easily rousable
- Patient able to tolerate organ support, including mechanical ventilation
- Note that to reduce the risk of delirium this does not mean they must be asleep at all times
- RASS score of between 0 and -1 unless there is a clinical need for deeper sedation
- The RASS should be prescribed on the Doctors record, recorded on the nursing ward round sheet, as well as ICU Chart
- All patients should have a once daily sedation break at 8am unless contraindicated or specified by the consultant

Patients who require full sedation for procedures such as mechanical ventilation can benefit from non-pharmacological interventions.

The following should be considered for all patients in the critical care unit:

- Clinical problems – consider MI, PE, abdominal pathology, worsening gas exchange
- Communication – reassure and explain
- Immobility – physiotherapy and pressure relieving mattress
- Nausea – anti-emetics and/or nasogastric tube
- Distended bladders – catheterise or check that catheter is working
- Thirst – fluids and mouth care
- Ventilation – change settings or mode (SIMV, BiPAP, pressure support) as appropriate
- ET tube – consider early tracheostomy or nasal ETT, based on clinical need
- Sleep – avoid noise and bright lights at night, consider ear plugs, utilise sound ear
- Relaxation – massage, music therapy, breathing exercises

TREAT PAIN FIRST

- Consider non-pharmacological Interventions - such as repositioning
- Analgesic ladder - start with simple analgesics and work up to intravenous opioids as necessary. Consider regular Paracetamol.
- Generally, avoid NSAIDS but especially in cardiovascular instability, GI bleed, age > 65 years, renal or hepatic impairment. If patient is to be considered, then the first choices are Ibuprofen or Naproxen. These should be prescribed at the lowest effective dose for the shortest period of time. Renal function should be monitored daily and the need for NSAID should be also reviewed daily.
- Opioids may be administered by continuous intravenous infusion, sub-cutaneous or orally. Consider PCA for co-operative patients
- Pain team – are available for advice if needed.
- Regional analgesia – epidural, peripheral nerve blocks. Caution in presence of coagulopathy or cardiovascular instability.

SEDATION & ANALGESIA FOR VENTILATED PATIENTS

A combination of a sedative and an opioid analgesic is appropriate for the ventilated patient. Some form of analgesia should usually be provided, as prolonged immobility and tracheal intubation are generally painful although this decreases with time.

Titrated to achieve the desired effect-see flow chart.

ALL PATIENTS SHOULD HAVE A ONCE DAILY SEDATION BREAK at 8AM UNLESS CONTRAINDICATED OR SPECIFIED BY THE CONSULTANT.

SEDATION 1st LINE

Opioids and Propofol

- Remifentanil for short term patients (see protocol)

Remifentanil is ultra-short acting. Due to the very rapid offset of action of remifentanil no residual opioid activity will be present within 5 to 10 minutes after discontinuation. For those patients undergoing surgical procedures where post-operative pain is anticipated, analgesics should be administered prior to discontinuation of remifentanil. Sufficient time must be allowed to reach the maximum effect of the longer acting analgesic.

- Alfentanil for patients who are expected to be intubated for longer than 72 hours

- Propofol DOSE / hour (2% solution)

Propofol must not be used if patient less than 16 years old.

Propofol may cause hypotension – review daily, consider fluids, noradrenaline or change to 2nd line management. If the benefits of rapid reversal outweigh the disadvantage of cardiovascular depression (e.g. in head injury), vasopressors may be used.

If Propofol is used in high dose (>4mg/kg/hour) or for more than 48 hours, monitor serum triglycerides and unexpected change in acid-base status. Monitor for symptoms of Propofol syndrome. These include cardiac failure, rhabdomyolysis, metabolic acidosis, kidney failure, high blood potassium, high blood triglycerides

Consider alternatives in 2nd or 3rd line management if larger than expected doses are used. Seek consultant advice.

SEDATION 2nd & 3rd LINE

- Morphine and Midazolam

This regimen may be used if 1st line drugs fail to provide adequate sedation without unacceptable cardiovascular depression or Midazolam alone can be added to the first line drugs to reduce Propofol infusion rates.

- Clonidine may be used, alone or in combination, if the first regimen fails to provide adequate analgesia, sedation and autonomic stability. Clonidine is not licensed as a sedative and should be prescribed after consultation with a Consultant.

MUSCLE RELAXANTS

Muscle relaxants should never be used without appropriate sedation and be avoided if possible.

However, if there is an indication for a relaxant, e.g., severe bronchospasm, Cisatracurium should be considered. Bi-spectral index (BIS) monitoring should be used if available.

Sedation depth should be monitored using BIS/Massimo

ALCOHOL WITHDRAWAL

See Trust protocol and follow local guidelines

NIGHT SEDATION

If patients do not require day time sedation but are having trouble sleeping at night and all the other considerations (see section 2) **(not labelled)** have been addressed, consider drugs that are licensed for night sedation or medications that have a sedative side-effect profile e.g. amitriptyline. However, drug choices should be considered alongside individual patient consideration and potential side-effects/ contraindications. Also consider patients CAM-ICU score as this may influence the choice of night sedation. Especially drugs that are within the benzodiazepines and the 'Z' class e.g. Zopiclone as these may exacerbate underlying delirium.

DO NOT use Propofol for night sedation.

Night Sedation should be reviewed daily.

When adding night sedation take caution with interactions if patient is taking other psychotropic agents.

Night Sedation Choice	Advantages	Disadvantages
Zopiclone	Licensed for sleep disorders.	Potentially addictive. Could contribute to delirium
Melatonin	Relatively safe side effect profile. Licensed for sleep disorders (Circadian)	Little efficacy over 2mg and potential for hangover effect next morning with bigger doses.
Tricyclic antidepressants or related e.g. Amitriptyline, Trazadone	May be used for certain types of nerve pain if this is present also.	Can get hangover effect. Tolerance develops rapidly. Other side-effects include cardiac, urinary retention
Antipsychotics	If patient is aggressive	Many side-effects including cardiac and movement disorders

MONITORING

Vital signs - as a minimum BP, heart rate, conscious level, oxygen saturation and respiratory status must be recorded hourly. Signs of under sedation or pain include sweating, lachrymation, tachycardia, hypertension dilated pupils and facial expression. Over sedation may be indicated by hypotension, bradycardia or unreactive pupils.

Sedation Score – use RASS and record regularly (at least 3-4 hourly). Aim for RASS score of between 0 and -1 unless there is a clinical need for deeper sedation. Appropriate level of sedation will depend on the patient and diagnosis. This needs to be reviewed and documented on a daily basis.

Consider stopping all sedation each morning - provided there are no contra-indications **(see ventilator care instructions)** perform sedation break at the earliest opportunity. Re-institute sedation as necessary, starting at half the previous dose and titrating to effect. This should be discussed with the responsible consultant.

The Delirium Screening Tool or CAM-ICU tool is to be used **8 hourly** on all patients regardless of level of sedation.

WITHDRAWAL DELIRIUM

If opioids or benzodiazepines have been administered for more than 7 days, or at high dosage, infusion rate should be decreased gradually over 4-5 days **(see delirium protocol).**

If on oral this may need to be weaned gradually. Alternatively, Clonidine may be used. Side-effects may be troublesome, and the dose should be tapered over a period of days to prevent rebound hypertension.

MANAGEMENT GUIDANCE FOR PATIENTS WHO EXPERIENCE DELIRIUM IN CRITICAL CARE

Delirium is characterised by the acute onset of mental status changes or fluctuating mental status with inattention and either disorganised thinking or altered level of consciousness. It occurs in up to 60% of older hospitalised patients and may be present in up to 80% of critically ill patients. Those with ICU delirium have more than a three-fold increased risk of 6-month mortality compared with those who do not have delirium. Delirium is also an independent predictor of prolonged ICU and hospital length of stay. It may predispose survivors to longer-term neuropsychological problems.

IS YOUR PATIENT AT RISK OF DELIRIUM?

Risk factors for delirium may be divided into predisposing factors and precipitating factors. The former is difficult to alter while the latter represent areas of risk that are potentially modifiable by preventive or therapeutic intervention.

Predisposing factors for delirium	Precipitating factors for delirium
• Demographic factors • Age • Male gender	Intercurrent illnesses, such as Infection Hypoxia Shock Fever Myocardial infarction
• Cognitive status • Dementia • Depression • Previous delirium	Metabolic derangements, such as Dehydration Hypo/hyperglycaemia Electrolyte disturbance Poor nutritional status
Visual or hearing impairment	Surgery, such as Cardiac surgery especially with prolonged cardiopulmonary bypass Orthopaedic
• Immobility • Frailty • Pain • Chronic sleep deprivation • Malnutrition	Meningitis or encephalitis Cerebrovascular competencies Traumatic brain injury Subarachnoid haemorrhage Epilepsy
• Coexisting medical conditions • Chronic renal or hepatic disease • Previous stroke • Multiple comorbid conditions • Trauma	Drugs Toxicity or overdose Sedatives, opiates, anticholinergics Anticonvulsants Polypharmacy Withdrawal syndromes

Highlighted are things we can't affect - there Is a lot we can!

SCREENING OF PATIENTS

SCREENING	ALL PATIENTS ADMITTED TO A CRITICAL CARE UNIT ARE VULNERABLE TO DELIRIUM 1. Within 8 hours of admission screen and assess for delirium using the CAM-ICU tool 2. Repeat the screen and assess every 8 hours or more if mental state changes
DIAGNOSIS	USE THE CAM-ICU TOOL TO DIAGNOSE DELIRIUM The CAM ICU tool identifies delirium by acknowledging the presence of:- For delirium to be diagnosed the patient must have 1. Altered mental state *plus* 2. Inattention *plus* 3. *Either* altered level of consciousness *or* disorganised thinking

TREATMENT OF DELIRIUM

Treatment of delirium should always begin with the basics.

MANAGEMENT	Identity and treat any reversible cause **D**rug side effects or drug withdrawal **E**lectrolyte imbalance **L**iver, cardiac or respiratory failure **I**nfection / infarction **R**etention of urine / faeces **I**ntracranial event **U**raemia due to dehydration **M**etabolic

PRINCIPLES OF NON-PHARMACOLOGICAL MANAGEMENT OF DELIRIUM

1. Identify and treat organic causes of delirium such as hypoxia, pain, infection, acidosis, haemodynamic instability, withdrawal from drugs or alcohol
2. Repetitive orientation of patient by nursing and medical staff. Communicate clearly and concisely.
3. Use of spectacles and hearing aids if appropriate.
4. Encourage communication with family members.
5. Have familiar objects from the patient's home in the bed area.
6. Use of a radio or television may be helpful in reorientation.
7. Attempt consistency in nursing staff.
8. Ensure early mobilisation.
9. Attempt to restore the day /night cycle use 24hr clocks and calendars.
10. Improve the quality of sleep by reducing noise, dimming lights or encouraging use of ear plugs.
11. Pharmacological agents should be used as a last resort especially benzodiazepines and related agents.
12. Maintain adequate hydration – particularly important in hypoactive delirium
13. Enhance orientation e.g. lighting, signage, clocks etc.
14. Avoiding unnecessary catheterisation
15. De catheterisation as soon as clinically appropriate.
16. Find out what normal sleep routine Is and try to replicate: - face wash, clothes change, warm drink

PRINCIPLES OF PHARMACOLOGICAL MANAGEMENT OF DELIRIUM

1. Treat pain as this may be the course of delirium / agitation.

2. Treat other underlying causes as described in previous table

3. Discontinue, if possible, or reduce drugs which may precipitate delirium such as antimuscarinics (hyoscine, atropine), opiates (codeine, pethidine, morphine), antihistamines (chlorphenamine, promethazine).

4. Consider nicotine replacement therapy for those with a strong history of cigarette smoking. A 21mg patch should be applied for anyone who smokes more than the equivalent of 20 cigarettes per day

5. Opiate withdrawal should be treated by progressively tapering the opiate dose over days to weeks. Long acting opioids such as methadone or the addition of clonidine may be beneficial.

6. Initial drug treatment is with haloperidol. The dose depends on the patient's level of agitation, size, age and cardiovascular status and usually varies between 0.5-10mg. Initially, 1-2mg haloperidol should be given intravenously. If the patient remains unmanageable after 20 minutes, the dose should be doubled. Side –effects include QT prolongation on ECG and extra-pyramidal features similar to Parkinson's disease. Avoid Olanzapine and Haloperidol in Lewy body disease, Parkinson's and alcohol withdrawal.

7. Once the acute situation is controlled introduction of atypical anti-psychotics such as risperidone or olanzapine should be considered. Risperidone should be given orally in a dose of 0.5-1mg up to twice daily. The dose should be halved in renal or hepatic impairment. It is available in tablet (on stock) and liquid preparations (if requested). Olanzapine can be given orally in a dose of 5mg once daily. An initial dose of 5mg is recommended in renal or hepatic impairment. It is important to monitor white cell count as it can cause bone marrow depression. More prescribing details are described in the table below.

ALL MEDICATIONS DESCRIBED IN POINTS 6 AND 7 SHOULD BE USED AT THE LOWEST DOSE FOR THE SHORTEST TIME AND SHOULD BE REVIEWED DAILY

IF PATIENTS ARE TO BE CONTINUED ON THESE MEDICATIONS POST CRITICAL CARE
A PLAN TO REDUCE AND ULTIMATELY STOP THEM BEFORE DISCHARGE MUST BE IMPLEMENTED.

PATIENTS SHOULD NEVER GO HOME ON THESE TYPES OF MEDICATION

8. Benzodiazepines, such as midazolam or diazepam, should be avoided unless the cause of delirium is alcohol or benzodiazepine withdrawal.

PHARMACOLOGICAL MANAGEMENT OF DELIRIUM

EMERGENCY TREATMENT

ATTEMPT TO DEESCALATE THE SITUATION

TRY TO AVOID PSYCHOTROPIC DRUGS

- Ensure the safety of patient, other patients and staff, and the environment
- Get patients attention before speaking / say one thing at a time / do not argue
- Acknowledge their distress & be aware of your body language
- Give rational explanations for the situation they are presently in
- Avoid Olanzapine/ Haloperidol and similar agents in Lewy body disease, Parkinson's and alcohol withdrawal

PSYCHOTROPIC MEDICATION guide for acute problem

- HALOPERIDOL
  - 0.5 – 5 mg IV STAT
  - if no effect in 10 mins repeat if needed
  - repeat as necessary under consultant advice

    Note: there is no maximum dose but use clinical discretion-if using large doses. Careful consideration must be given to potential side-effects, e.g., cardiovascular effects
- CLONIDINE
  - 50-150microg IV or nasogastric STAT
  - Consider re-sedating and commencing Clonidine infusions prior to next sedation break

DANGEROUS MOTOR ACTIVITY

- MIDAZOLAM
  - 1 - 5mg IV every 2 to 3 minutes until patient is calm

TREATMENT

ONGOING CHALLENGING BEHAVIOUR

Select from following options but consider any other factors first e.g. withdrawal

OLANZAPINE
- Start at 5mg once daily. Can be increased up to 20mg daily but only on consultant advice

HALOPERIDOL
- 0.5 – 5 mg once daily orally/ng and increase as necessary

RISPERIDONE
- dose range from 0.25mg od to 1mg BD. Higher doses by consultant request only

QUETIAPINE
- doses usual start at 25mg once to twice daily. Increase as necessary.

CLONIDINE
- 50-150microg IV or ORAL/NG STAT
- Consider IV infusion

ALL THESE MEDICATIONS SHOULD BE USED AT THE LOWEST DOSE FOR THE SHORTEST TIME AND SHOULD BE REVIEWED DAILY

IF PATIENTS ARE TO BE CONTINUED ON THESE MEDICATIONS POST CRITICAL CARE A PLAN TO REDUCE AND ULTIMATELY STOP THEM BEFORE DISCHARGE MUST BE IMPLEMENTED

PATIENTS SHOULD NEVER GO HOME ON THESE TYPES OF MEDICATION

SPECIAL CIRCUMSTANCES	NIGHT SEDATION – see main guidelines

	WITHDRAWAL
	• NICOTINE: consider the use of nicotine patches
	• ALCOHOL: follow local guidelines
	• OPIATE and / or BENZODIAZIPINE:
	  ○ Consult with substance misuse team (HILT-via switchboard)
	  ○ Avoid abrupt withdrawal if either has been administered for more than 7 days, or at high dosage.
	  ○ Consider tapering dose over 24-48 hours.
	  ○ If signs or symptoms of withdrawal occur, restart the opioid or benzodiazepine at a dose sufficient to suppress withdrawal and taper the dose over a longer period:
	  – Consider conversion to the enteral route
	  – Consider long acting agents such as Diazepam or Methadone
	  – Consider Clonidine.