The Newcastle upon Tyne Hospitals NHS Foundation Trust

Critical Care Guidelines for Pain, Agitation/Sedation and Delirium (PAD)

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1 Introduction

The majority of patients in critical care suffer pain. Frequent assessment and effective treatment is mandatory but frequently poorly delivered in observational studies. (Payen 2006).

Sedation is required in a significant proportion of patients in order to: enable delivery of care such as mechanical ventilation; reduce anxiety and distress and as part of specific treatment e.g. raised intracranial pressure. Excess sedation is associated with poor outcomes (Skrobik 2015)

Delirium is known to occur in up to 75% of patients in critical care. It is independently associated with mortality (Ely 2004) and poor long term cognitive function (Girard 2010). Regular screening for delirium is a national standard which allows recognition, treatment and follow up to occur (GPICS 2015).

Recent evidence demonstrates that combining the management of these problems in critical care can result in significant improvements in patient outcome. (Skrobik 2014)

2 Guideline scope

This guideline is intended for use by all healthcare professionals treating patients on Newcastle Hospitals Critical Care units. It should be acknowledged that there is likely to be slightly different approaches on the individual units. This document provides the framework to the general principles of best care rather than acting as a rulebook which all must follow.

3 Guideline

3.1 Pain

3.1.1 Pain in ICU is common and underestimated by all staff groups. Structured assessment may reduce time on mechanical ventilation and length of stay.

Pain is: “An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”.
All healthcare staff should try to:

- Anticipate the presence of pain.
- Ensure treatment is rapid, appropriate and effective by regular re-assessment and review of medication dosing and frequency.
- Treat severe pain with intravenous opiates rapidly.

3.1.2 Assessment

All patients should be regularly assessed for pain using a validated scale:
Pain severity mandates type of therapy required and frequency of assessment after initial treatment. In general, the more severe the initial pain, the more rapid the reassessment should be. A patient with severe pain should receive rapid treatment with intravenous opiates; failure to do this may result in long term harm.

Pain Scales (see Appendix 1): Critical care Pain observation tool (CCPOT) should be used as the assessment tool of choice if the patient is intubated. A numeric rating scale (score of 1-10) is preferred for those who can communicate normally.

If a patient is receiving analgesia via PCA, epidural or other nerve catheters (paravertebral, fascia iliaca, etc.) then assessment and management should follow existing Trust policies. Specific documentation e.g. PCA charts should be completed *in addition* to standard ICU documentation. Staff should be aware of the conversion chart in appendix 2 for patients on strong opioid medications.

Pre-emptive analgesia: consider giving rapidly acting agents for painful procedures as detailed below (e.g. morphine bolus at least 5 minutes before intervention or fentanyl 1 minute before)

Be alert for potential sources of pain, including but not limited to:

Repositioning on the bed and airway suctioning	Cannulation
Intubation	Catheterisation
Drain removal	Dressing changes
Bowel obstruction	Immobility
Joint pain	Myopathy and neuropathy
Limb Ischaemia	Lines/Drains

3.1.3 Analgesic drug information:

See table in Appendix 3

3.1.4 Treatment of pain

Consider enteral analgesia for all patients, if possible, including opioid-sparing agents (e.g. paracetamol, clonidine, nefopam or gabapentin) if strong opioids are required.

An example of a suitable treatment flowchart can be seen in Appendix 4.

The choice of opioid infusion varies according to the individual patient and unit preference but will most commonly be fentanyl or morphine.

3.1.5 Specific types of pain

See Appendix 5 for a guide on management of neuropathic and bowel pain.

The guide on gabapentin initiation is found in appendix 6.

3.2 Sedation/Agitation

- Sedation: An induced state of reduced consciousness in which verbal contact with the patient may be maintained.
- Agitation: A state of anxiety or nervous excitement.

3.2.1 Aims of Sedation

- Reduce patient agitation, anxiety and distress.
- Enable delivery of modes of treatment.

3.2.2 Delivery

- Ensure adequate analgesia at all times as above.
- Consider RASS targets (see 3.2.4) and assess regularly (at least 4 hourly but more often if drug titration occurring) if on continuous IV sedation (GPICS 2015). Not recording RASS regularly is analogous to using a vasoconstrictor infusion without checking blood pressure.
- Hold or reduce sedation when possible and safe to minimise accumulation.
- Monitor for interactions and lipid accumulation especially if using high doses of propofol.
- Avoid benzodiazepine infusions if possible.

3.2.3 Risks

Patients may look more “settled” when deeply sedated but we should remember that it may be bad for them!

Deep early sedation is an independent risk factor for increased 180 day mortality (Shehabi 2010). Deeper and longer periods of sedation increase risk of developing depression and post-traumatic stress disorder (PTSD). Deep sedation may also be associated with increased hypotension, ventilator associated pneumonias, pressure sores and impaired GI absorption.

3.2.4 Assessment

The Richmond agitation and sedation score (RASS) is a fully validated scale with good inter-rater reliability (Sessler 2002) that is endorsed by NICE clinical guideline 103 on delirium (NICE 2010). It is the scale of choice for all adult critical care units within NUTH (appendix 7).

3.2.5 Titration

The ideal target is a calm co-operative patient, i.e. a RASS of 0 to -1. However it is recognised that this is not always possible or in some cases desirable.

Importantly, light sedation is **not** associated with increased rates of self-extubation or psychological sequelae. Unnecessary deep sedation is potentially harmful and should be avoided.

Current guidelines recommend **either** sedation holds (Kress 2002) or the use of a protocol to limit sedative accumulation (Mehta 2012 and Barr 2013).

The target RASS may be set by the clinical team and should be maintained by adjusting the analgesic (1^{st}) and sedative (2^{nd}) components of the prescribed regime. An example sedation protocol is shown in appendix 4.

Deeper sedation (RASS -3 to -5) is mandated in some situations e.g.

- Traumatic brain injury or hepatic failure with raised intracranial pressure.
- Use of muscle relaxants.
- Refractory hypoxia or difficult ventilation.
- Status epilepticus requiring burst suppression.
- Other situations as mandated by a Consultant Intensivist.

3.2.6 Sedation Holds

All patients should be considered for sedation holds daily unless they are in target RASS or clinical contraindications exist (see below).

This allows neurological assessment, identification of readiness to wean from ventilation and identification of patients who require minimal or no sedation.

Patients anticipated as having high analgesic requirements should have ongoing analgesic infusions continued and adequate analgesia planned if not on an infusion. If analgesic infusions are continued they should be reduced rapidly or stopped if there is evidence that patients remain deeply sedated 2 hours after sedative infusions are stopped.

Contraindications to sedation holds

- muscle relaxed patient (e.g. cisatracurium infusion)
- brain injury or hepatic failure sedated for raised ICP
- difficulty ventilating – coughing / asynchrony
- difficulty oxygenation FiO2≥70% or PEEP≥10
- therapeutic hypothermia below 36 degrees centigrade
- palliative care
- recent increase in sedation to manage agitation (reassess pain first)

Staff should be available during a 'sedation hold' should the patient wake up agitated and be difficult to manage. If this occurs look for and treat sources of pain. Re-sedate at half the original rate initially as titrate as required (Kress 2002).

3.2.7 Sedation protocols

Sedation protocols reduce time on mechanical ventilation and length of stay. (Blackwood 2014). Another recent review (Burry 2014) found no strong evidence to support sedation holds as compared to sedation titration with protocols, hence whilst sedation holds may be appropriate in some patients, an unsuccessful sedation hold should not preclude subsequent titration of sedation. An example protocol is included in appendix 4.

Fig 2. **Drugs for Sedation/analgesia: summary table of commonly used drugs.**

Drug	Type	Use (in Critical Care)	Typical (Bolus) dose	Other Information
Alfentanil	Opioid	▪ Continuous sedation	▪ 250mcg	▪ Short acting (half life 1 to 2 hours)[*1]
Clonidine	Alpha-2-agonist	▪ Rescue sedation (unlicensed use), ▪ Drug withdrawal. ▪ Anxiolysis	▪ 50-100qds	▪ May be of particular use in certain withdrawal syndromes ▪ Monitor BP and taper dose slowly.
Dexmedetomidine	Alpha 2 agonist	▪ Sedation, ▪ Drug withdrawal. ▪ Anxiolysis	▪ N/A	▪ Expensive ▪ Useful in young patients with high sedation requirements
Fentanyl	Opioid	▪ Analgesia ▪ Continuous or intermittent dosing	▪ 25-50mcg	▪ Context sensitive half life ▪ May accumulate in renal impairment
Propofol	Hypnotic	▪ Continuous sedation	10-20mg for emergency only (If intubated)	▪ Rapid onset and short acting (half life 3 to 12 hours) ▪ High fat content
Midazolam	Benzodiazepine	▪ Continuous sedation	▪ 1-2mg ▪ Avoid if at all possible	▪ Causes amnesia ▪ Accumulates in renal impairment and in critically ill patients
Morphine	Opioid	▪ Analgesia ▪ Not recommended for continuous infusion.	▪ 2-5mg	▪ At least 10 minutes to peak onset, often much longer.
Remifentanil	Opioid	▪ Continuous sedation ▪ Very short half life ▪ Not for bolus use	▪ N/A	▪ Very short acting (half life 10-20 minutes) ▪ Do not bolus
Thiopental	Barbiturate	▪ Continuous sedation ▪ Used in neuro only for ICP control or burst suppression.	▪ N/A	▪ half life 10-12 hours ▪ May accumulate in hepatic impairment ▪ Risk of hypokalaemia

Notes:
Propofol Infusion Syndrome (PRIS) is a rare syndrome, causing lipaemia, acidosis, arrhythmias and rhabdomyolysis with a high mortality of 33% (Vasile 2003). Risk factors for PRIS include doses of propofol greater than 5mg/kg/hour. It should not be used for critical care sedation in patients who are 16 years old or younger.

Lipid levels should ideally be checked on day 4 of use and then according to consultant assessment. Raised triglyceride levels >2.2mmol/L should prompt consideration of changing propofol to midazolam.

Dexmedetomidine
Dexmedetomidine is an alpha-2 agonist, causing sedation and anxiolysis, as well as decreased blood pressure and heart rate. It is expensive and evidence of definitive superiority over other drugs in the broader ICU population is currently lacking. Evidence for benefit exists in patients with agitated delirium (Reade 2016). It may also be used in young agitated patients with traumatic brain injury or those being treated for overdose of "legal highs" or MDMA) as per a separate guideline, on the approval of a Consultant intensivist.

A large scale randomised controlled trial is currently underway assessing its utility compared to propofol for early ICU sedation (SPICE 3)

Benzodiazepines
Due to its licensing status, midazolam is the most frequently used benzodiazepine given as a continuous infusion in the UK. It produces both sedation and anterograde amnesia. It has unpredictable pharmacokinetics (i.e. no consistent relationship between dose/plasma level and plasma level and effect) in critically ill patients (Mackenzie 2003) and it may worsen or precipitate delirium (Borthwick 2006).

Barbiturates
Thiopental is the only barbiturate anaesthetic given as a continuous infusion in critical care. It is only used as an infusion, in cases of refractory status epilepticus or refractory raised intracranial pressure (see separate guidelines). Extravasation may cause tissue necrosis as the solution is highly alkaline. It is only for use on specific instruction from a Consultant Intensivist.

3.3 Delirium

Delirium is "the acute onset of a fluctuating level of consciousness associated with confusion and inattention". DSM V (American Psychiatry Association 2013). It has the following features:

- Disturbance in attention, i.e. reduced ability to direct, focus, sustain, and shift attention and awareness.

- Change in cognition, e.g. memory deficit, disorientation, language disturbance, perceptual disturbance that is not better accounted for by a pre-existing, established, or evolving dementia.
- The disturbance develops over a short period (usually hours to days) and tends to fluctuate during the course of the day.
- There is evidence from the history, physical examination, or laboratory findings that the disturbance is caused by a direct physiologic consequence of a general medical condition, an intoxicating substance, medication use, or more than one cause.

Three subtypes exist:

Hyperactive subtype is where the patient is abnormally excitable or exuberant.

Hypoactive subtype: there is inhibition of behavioural and or locomotor activity; the patient is unusually unresponsive to changes in their environment. This subtype is as common as the hyperactive subtype but is much harder to detect.

In around 10% of patients a mixed type exists where the patient fluctuates between subtypes. Visual hallucinations are common in all subtypes and may be very distressing.

Delirium is detectable at some point in up to 75% of critically ill patients and is associated with higher mortality, longer length of stay and greater likelihood of neuropsychological disturbance following hospital discharge (Borthwick 2006).

Prolonged delirium in critically ill patients is associated with structural changes in the brain. Clinically this is associated with affected patients having long term cognitive decline equivalent to those with moderate levels of dementia.

Delirium is independently associated with an increased risk of dying before hospital discharge.

3.3.1 Aims

- Regularly assess delirium status using Confusion Assessment Method for ICU (CAM-ICU) at start of every nursing shift. (GPICS 2015 – see appendix 8)
- Ensure possible causes of delirium are addressed, including drugs.
- Ensure early mobilisation (see appendices 9-10).
- Provide appropriate non-pharmacological and pharmacological management of delirium including psychological stimulation and sleep management.
- Regular audit of all of the above with the aim of reducing delirium incidence and impact.

3.3.2 Risk factors for delirium include:

- age 65 years and over*
- pre-existing cognitive impairment*
- Current hip fractures*

- severe illness* (a clinical condition that is deteriorating or is at risk of deterioration)
- coexisting medical conditions
- malnutrition or dehydration
- a history of, or active, alcohol abuse
- multiple drugs prescribed (polypharmacy)
- visual or hearing impairment
- immobility
- previous delirium episode(s)
- multiple psychoactive drugs
- poor sleep
- male gender

* Risk factors listed in NICE clinical guidance 103 Delirium (NICE 2010).

3.3.3 Assessment

The assessment method in use across NUTH is the CAM-ICU test (appendix 6)

The patient should be assessed at the start of each nursing shift by preforming a CAM-ICU. CAM-ICU should also form part of the assessment of acute behaviour change, i.e. new agitation or confusion or become suddenly less responsive or engaged with their environment. RASS must be -2 or greater to proceed with screening. Units should ensure that all clinical staff are trained to do a CAM-ICU.

It is possible to have delirium despite a negative CAM-ICU and further medical assessment should occur if in any doubt.

3.3.4 Treatment

If a patient is assessed as being delirious, look for and treat underlying causes as above and assess potential causative drugs.

Common drugs contributing to delirium include:

- Central nervous system drugs: amitriptyline, benzodiazepines (diazepam, midazolam, lorazepam), chlordiazepoxide, thiopental, codeine, fentanyl, morphine, pethidine, chlorpromazine, phenytoin
- Gastrointestinal drugs: ranitidine and metoclopramide
- Cardiovascular drugs: atenolol, digoxin and furosemide
- Endocrine drugs: steroids
- Anticholinergic and anti-muscarinic drugs: atropine and hyoscine

Standard ICU patient assessment should occur if new delirium occurs. A septic screen including urine and blood cultures should be performed if appropriate. Full routine bloods should be reviewed. A CT brain may be required if any new localising neurology or depressed level of consciousness is present. Any significant cardiorespiratory compromise should be treated as part of standard ICU practice.

Specific delirium treatment is then divided into non-pharmacological and pharmacological

Non-pharmacological treatment:

- Calm approach to patient
- ABC chart may be helpful in identifying triggers for agitation
- Allow mobilisation if environment safe (see appendix 7)
- Ensure patient has spectacles
- Provide appropriate lighting and clear signage
- Ensure any hearing aid is working and any ear wax treated
- Monitor food and fluid intake using appropriate charts, and ensure adequate hydration.
- Re-orientate by explaining where they are, who they are and the role of the caregiver
- Clocks should be clearly visible to facilitate orientation
- Promote good sleep patterns and sleep hygiene (see below)
- Introduce cognitively stimulating activities such as reminiscence, radio and TV
- Consider an interpreter if English is not the patients first language
- Facilitate regular visits from family and friends.

De-escalation techniques:

Where the person with delirium is distressed or considered a risk to themselves or others, non-pharmacological techniques should be attempted first. More information on de-escalation techniques can be found in NICE clinical guideline 25 (Violence) on the intranet.

Physical restraint: This may be required if a patient is a serious risk to themselves or others following a best interest's process. (see NUTH restraint guidelines).

Pharmacological treatment:

Trust delirium guidelines state that antipsychotics should not be used unless de-escalation techniques have been used. This applies to critical care areas equally but it is recognised that illness severity is different within critical care and device removal (e.g. CVP lines may be more catastrophic) patient safety is the priority at all times.

Data on efficacy is largely lacking for antipsychotic drugs in ICU and for that reason doses of drugs should be minimised and given for the shortest time possible. If they are not effective after a reasonable time has elapsed they should be stopped. Prophylactic treatment with Haloperidol has recently been shown to be ineffective (Page 2013).

If pharmacological treatment is required a baseline ECG should be performed when possible to assess the Q-T interval.

- haloperidol IV 1-5 mg is first line, 4-6 hourly plus prn

- 2nd line is Olanzapine 2.5-10mg enterally (nocte), can be increased to b.d
- 3rd line is Quetiapine 12.5-50mg b.d enterally (this drug is first line in patients with lewy body dementia)
- Risperidone (0.5-2mg nocte oral) may be useful in young agitated patients.

Failure of 1st or 2nd line agents after 24-48 hours should prompt *consideration* of a change to the next agent along. This advice may change in light of new studies and it is recognised that individual consultants may have different preferences.

Clonidine (25-100mcg 6 hourly PO/IV) or dexmedetomidine may also be used to reduce agitation in delirious patients alongside the above agents.

3.3.5 Sleep

The relationship between adequate sleep and delirium is complex and not yet fully described, however patients have a right to protection from unnecessary disturbance, particularly from loud conversation at night and this should be avoided if possible.

- Avoid nursing or medical procedures during sleeping hours
- Attempt to group interventions that are needed to minimise number of sleep interruptions
- Schedule medication rounds to avoid disturbing sleep
- Reduce noise to a minimum during sleep periods
- Offer eye masks and ear plugs.
- Assess whether 2 hourly turns are indicated.

3.3.6 Withdrawal Syndromes

Patients withdrawing from alcohol should be treated according to Trust Clinical Institute for Withdrawal from Alcohol (CIWA) guidance. This consists of chlordiazepoxide given in response to symptom assessment, whereas patients withdrawing from recreational drugs (usually psychoactive drugs) or nicotine may benefit from clonidine or dexmedetomidine. Nicotine patches may be required in previous heavy smokers.

Patients may also exhibit signs of withdrawal from sedative and analgesic medications given on intensive care. Staff should be alert for the clinical signs of this (sweating, dilated pupils, agitation, tachycardia) especially when long term sedative infusions have been rapidly

withdrawn. Clonidine may need to be commenced and increased for 24 hours before sedation is stopped again in this situation. Beta blockade may be appropriate in some situations on the advice of a critical care consultant.

4 Training, Implementation, Resource Implications

All ICU staff should be trained in the use of CCPOT, CAM-ICU and RASS scoring.

5 Monitoring

CAM-ICU testing CCPOT scoring and regularity of RASS assessment and actual pain scores should all be audited every 2-3 years as a minimum.

6 Evidence Review and Evaluation

New Evidence will be added to the guideline as it is published by one of the authors.

7 References

7.1 Pain

- Payen J-F, et al, Pain assessment is associated with decreased duration of mechanical ventilation in the Intensive Care Unit Anaesthesiology 2009, 111: 1308-1316
- Barr J, et al, Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit. Crit Care Med 2013, 41 (1): 263-306
- Gélinas C, Fillion L, Puntillo K. Item selection and content validity of the Critical-Care Pain Observation Tool for non-verbal adults. J Adv Nurs. 2008;65(1):203-216
- Gunning K, Management of pain in the intensive care patient JICS 2010; 11 (supp 1) 4-7
- Kress JP, Pohlman, AS & Hall, JB, Sedation and analgesia in the intensive care unit. Am J Respir Crit Care Med 2002, 166: 1024-1028

7.2 Sedation

- Mehta S, et al Daily sedation interruption in mechanically ventilated critically ill patients care for with a sedation protocol a randomised controlled trial JAMA 2012 308:1985-1992
- Shehabhi Y, et al Early intensive care sedation predicts long-term mortality in ventilated critically ill patients. Am J Respir Crit Care Med 2012 186:724-731
- Devlin, JW, Mallow-Corbett, S & Riker, RR, Adverse drug events associated with the use of analgesics, sedatives, and antipsychotics in the intensive care unit. Crit Care Med 2010, 38 (6): S231-243
- Girard, TD et al, Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care

(Awakening and Breathing Controlled trial): a randomised controlled trial. Lancet 2008, 371: 126-134
- Blackwood, B et al, The Cochrane Collaboration: Protocolized versus non-protocolized weaning for reducing the duration of mechanical ventilation in critically ill adult patients (Re-review) The Cochrane Library 20104.
- Ostermann ME, et al, Sedation in the intensive care unit: A systematic review JAMA, 2000, 283: 1451-1459
- Tan, JA & Ho, KM, Use of remifentanil as a sedative agent in critically ill adult patients: a meta-analysis. Anaesthesia 2009, 64: 1342-1352
- Sessler CN, et al. The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002;166:1338-1344

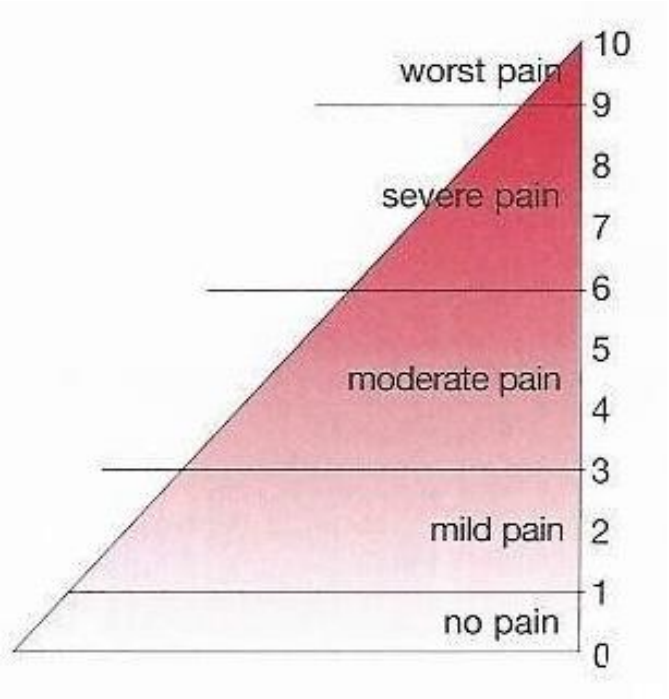
7.3 Delirium

- Borthwick, M et al, Detection, prevention and treatment of delirium in critically ill patients. UKCPA 2006
- Mental Capacity Act (2005) accessed 09 February 2012 at http://www.legislation.gov.uk/ukpga/2005/9/pdfs/ukpga_20050009_en.pdf
- National Institute for Health and Clinical Excellence: Clinical Guidance 103: Delirium, 2010
- Skrobik Y et al. Protocolized intensive care unit management of analgesia, sedation and delirium improves analgesia and subsyndromal delirium rates. Anaes Analg 2010 111:451-463
- Page V, et al Effect of intravenous haloperidol on the duration of delirium and coma in critically ill patients (Hope-ICU): a randomised, double-blind, placebo-controlled trial Lancet Resp Med 2013 1(7):515-523
- National Institute for Clinical Excellence: Clinical Guidance 83: Rehabilitation after critical illness, 2009

Appendix 1

Pain Scales

Numeric rating scale (NRS)



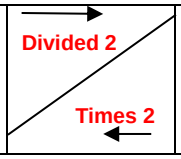
Critical care pain observation tool (CCPOT)

Critical-Care Pain Observation Tool

Indicator	Description	Score	
Facial expression	No muscular tension observed	Relaxed, neutral	0
	Presence of frowning, brow lowering, orbit tightening, and levator contraction	Tense	1
	All of the above facial movements plus eyelid tightly closed	Grimacing	2
Body movements	Does not move at all (does not necessarily mean absence of pain)	Absence of movements	0
	Slow, cautious movements, touching or rubbing the pain site, seeking attention through movements	Protection	1
	Pulling tube, attempting to sit up, moving limbs/ thrashing, not following commands, striking at staff, trying to climb out of bed	Restlessness	2
Muscle tension Evaluation by passive flexion and extension of upper extremities	No resistance to passive movements	Relaxed	0
	Resistance to passive movements	Tense, rigid	1
	Strong resistance to passive movements, inability to complete them	Very tense or rigid	2
Compliance with the ventilator (intubated patients)	Alarms not activated, easy ventilation	Tolerating ventilator or movement	0
	Alarms stop spontaneously	Coughing but tolerating	1
	Asynchrony: blocking ventilation, alarms frequently activated	Fighting ventilator	2
OR			
Vocalization (extubated patients)	Talking in normal tone or no sound	Talking in normal tone or no sound	0
	Sighing, moaning	Sighing, moaning	1
	Crying out, sobbing	Crying out, sobbing	2
Total, range			0-8

Appendix 2

Drug Conversions

Oral morphine dose in 24hrs		IV morphine dose in 24hrs

Opioid (oral unless otherwise stated)		Equivalent Dose of ORAL Morphine
10 mg	Morphine I.V.	20mg
10mg	Oxycodone (Oxycontin®)- *controlled release*	20mg (Zomorph®) *slow release*
10mg	Oxycodone (Oxynorm®) *instant release*	20mg (Oramorph®/Sevredol®) *instant release*
10mgs	Oxycodone I.V.	15mgs
30mg	Codeine phosphate	3mg
50mg	Tramadol	10mg
50mgs	Tramadol I.V.	10 mgs
10mg	Diamorphine I.V.	30mg
25micrograms/ 24 hours	Fentanyl patch	90mg /24 hours

Naloxone Administration:

If the patient suffers respiratory depression due to opioids (respiratory rate <8 breaths/minute), consider intravenous naloxone 400micrograms, given in 100microgram increments.

Analgesics

NSAIDs

- If NSAID regarded as essential for patients with high risk of GI side effects consider Ranitidine 150mg BD for the duration of NSAID use.

Contraindications

- true allergy to aspirin or NSAIDs
- severe heart failure
- active peptic ulcer disease
- hepatic or renal impairment

Cautions

- elderly (short course only)
- asthma (only give if previously tolerated NSAID or asprin)
- bleeding disorders
- cardiovascular disease (e.g. IHD, Hypertention, CCF)
- anticoagulants (e.g. warfarin)
- antiplatelets (e.g. clopidogrel)
- SSRI antidepressants
- avoid in pregnancy and lactation
- long-term oral corticosteroids
- Nil by mouth (Patients not taking food orally for 48 hours or greater)

Opioids

- consider prescribing laxatives (Senna 15mg OD - BD, +/- Docusate 100-200mg BD)
- consider anti-emetics (see PONV guideline)
- consider limiting dose rather than time interval for prn opiates

Contraindications

- acute respiratory depression
- acute alcoholism
- risk of paralytic ileus
- on MAO inhibitor in last 2 weeks

Cautions

- when respiratory depression is to be avoided
- reduce dose or avoid in hepatic or renal impairment
- elderly - reduce dose
- convulsive disorders
- avoid in pregnancy and lactation
- when constipation to be avoided

Tramadol

- opioid effect and serotonergic and adrenergic properties
- psychiatric reactions have been reported

Contraindications

- acute respiratory depression
- acute alcoholism
- risk of paralytic ileus
- on MAO inhibitor in last 2 weeks

Cautions

- history of epilepsy
- patient on antidepressants or neuroleptics (or any other drugs that decreases seizure threshold)
- hepatic or renal impairment
- elderly - consider lower dose
- avoid in pregnancy and lactation

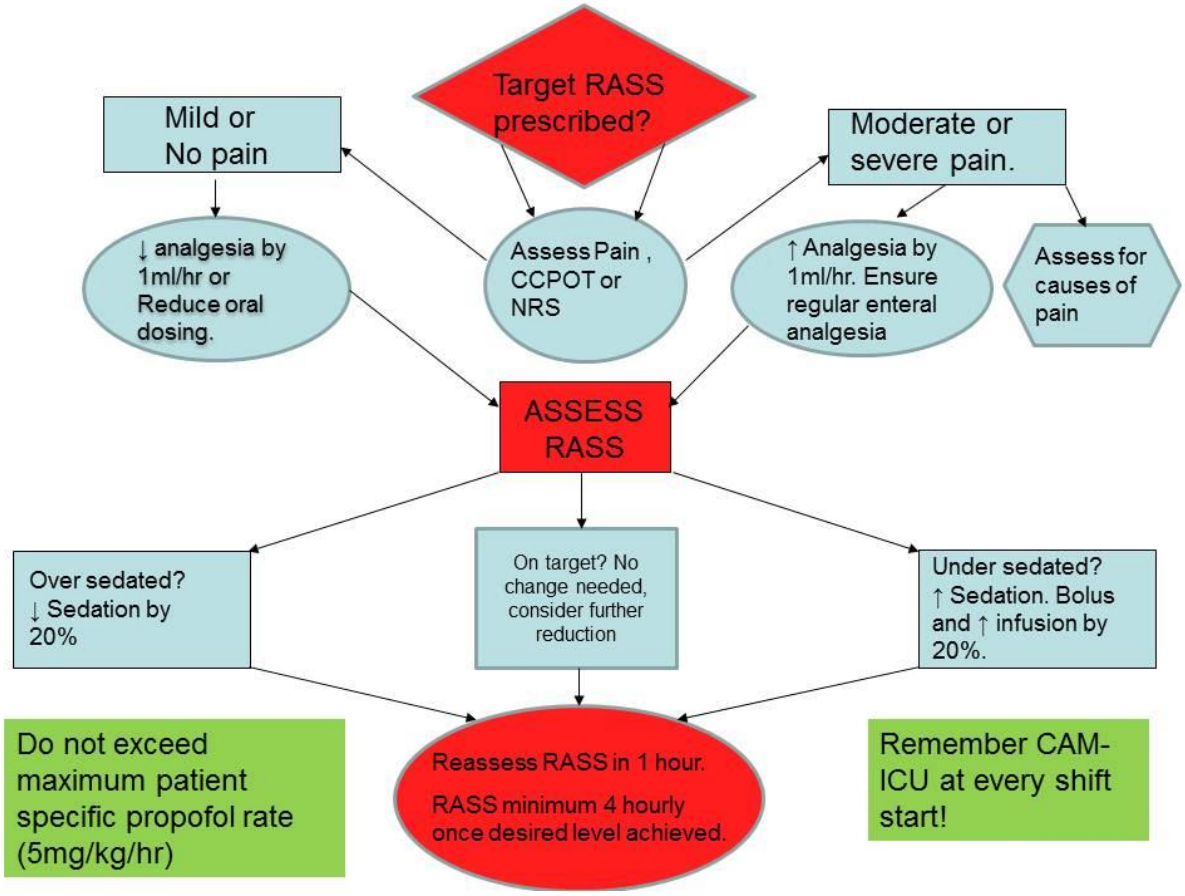
Nefopam

- non-opiate analgesic
- sympathomimetic and anticholinergic side effects
- lowers seizure threshold
- not for MI, risk seizure, MAOI use within 30/7

Appendix 4

Example sedation protocol

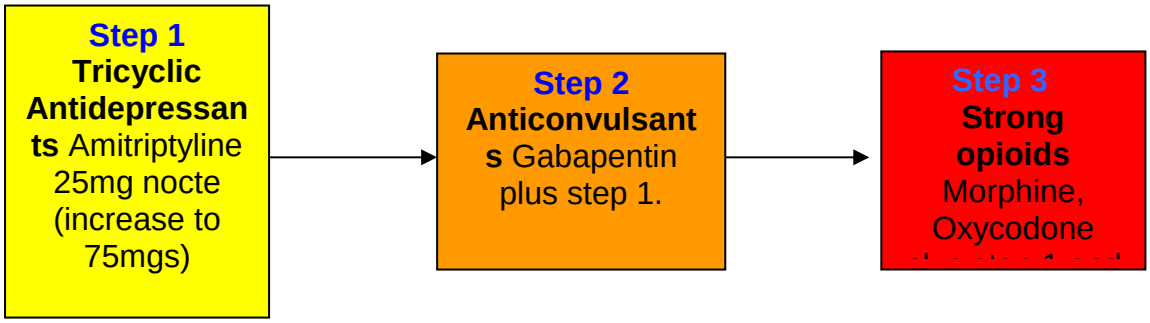
NB patients in severe pain should be treated with rapid IV opiates.



Appendix 5

Neuropathic Pain

Descriptions include; “tingling, pins and needles, shooting, electricity, burning, hot poker, tightness, crushing, and vice-like grip”. Associated with hypersensitivity (pain occurs when skin is lightly touched).
Neuropathic pain may not respond to opioids.



Side Effects/ Considerations
Gabapentin: major caution in renal failure, give small dose less often (e.g. 100mg o.d). Side effects are diarrhoea, dry mouth, nausea & vomiting, peripheral oedema, dizziness, drowsiness, anxiety.
Amitriptyline: caution with history of cardiac disease. Side effects- dry mouth, ‘hang-over effect’, drowsiness.

Bowel Pain

Described as; crampy, colicky, ‘like a contraction’, ‘comes in waves’ with minimal response to opioids and best response to natural remedies such as:

- Peppermint water
- Mobilisation
- Lie onto left side
- Heat pads
- Reassure the patient that it is normal and a good sign

If not responding to natural remedies consider hyoscine butylbromide 10-20mg qds po/iv if no surgical contraindication.

Bowel Pain Assessment
- Ask for description
- Full Abdominal Examination
- Consider PR exam if bowels not opened for >48hrs and no recent lower bowel surgery.

Appendix 6

Gabapentin Protocol

Gabapentin should be introduced slowly, gradually increasing the dose over two weeks. Below is a suggested table for drug increases. If drowsy, consider reducing dose to 200mg. Dose can be slowly increased to 3.6g per day.

DAY	MORNING	AFTERNOON	NIGHT
1	X	X	1 X 300mg capsule
2	1 x 300mg capsule	x	1 x 300mg capsule
3-7	1 x 300mg capsule	1 x 300mg capsule	1 x 300mg capsule
10	1 x 300mg capsule	1 x 300mg capsule	2 x 300mg capsules
12	2 x 300mg capsule	1 x 300mg capsule	2 x 300mg capsules
14	2 x 300mg capsules	2 x 300mg capsules	2 x 300mgs capsules

Appendix 7

Richmond Agitation/Sedation Scale

SCORE	BEHAVIOUR	DESCRIPTIVE	
+4	Combative	Violent, immediate danger to staff.	
+3	Very agitated	Aggressive. Pulls or removes tube(s) or catheter(s).	
+2	Agitated	Frequent non purposeful movements. May fight ventilator/ ventilation.	
+1	Restless	Anxious, apprehensive but movements are not aggressive or vigorous.	
0	Alert & Calm		
A	Asleep	REM/Natural sleep can only be scored if the patient's previous hourly RASS was –1 to +1 before natural sleep has commenced.	
-1	Drowsy	Not fully alert, but has sustained awakening to voice (eye opening & eye contact (>10 sec).	VOICE
-2	Light Sedation	Briefly awakens to voice (eye opening & eye contact (<10 sec).	VOICE
-3	Moderate Sedation	Movement or eye opening to voice (no eye contact).	VOICE
-4	Deep Sedation	No response to voice, but movement or eye opening to physical stimulation.	PHYSICAL STIMULATION
-5	Unrousable	No response to voice or physical stimulation.	PHYSICAL STIMULATION

Appendix 8

Sedation & Delirium Assessment
Step Two: The Confusion Assessment Method in ICU (CAM-ICU)

Inattention plus altered conscious level = DELIRIUM.
Inattention plus disorganized thinking = DELIRIUM.
Inattention plus altered conscious level plus disorganized thinking = DELIRIUM.

*** RASS must be –3 and above to conduct CAM-ICU ***
If RASS is < -3, STOP and reassess patient when RASS –3 or above

Feature 1 (F1) - Acute Onset or Fluctuating mental course

A: Is the patient different than his/her baseline (pre-admission) mental status?

OR

B: Has the patient had any fluctuation in mental status in the past 24 hours as evidenced by fluctuation in RASS, GCS, or previous delirium assessment?

NO → F1: -ve → STOP! No Delirium CAM-ICU –ve

YES → F1: +ve → Proceed to assess F2

Feature 2 (F2) - Inattention

Ask patient to squeeze your hand.
If the patient cannot squeeze your hand ask them to perform another command i.e. *Stick your tongue out,* OR *raise your hand,* OR *blink your eyes.*

Say to patient, *"Squeeze my hand* when I say the letter A."*
*or other chosen command

Read the following sequence of letters in a normal tone:
S A V E A H A A R T

Scoring
ERROR: When patient fails to squeeze on the letter "A", OR
If patient squeezes hand on any letter other than "A"

≤ 2 errors → F2: -ve → STOP! No Delirium CAM-ICU –ve

> 2 errors → F2: +ve → Proceed to assess F3

Feature 3 (F3) - Altered Level of Consciousness

Is patient's RASS **'0'** at time of CAM-ICU assessment?

NO → F3: +ve → STOP! Delirium! CAM-ICU +ve

YES → F3: -ve → Proceed to assess F4

Feature 4 (F4) - Disorganised Thinking

Ask patient questions from Set A or Set B and then ask them to complete command. Each incorrect answer = 1 error, and an inability to complete the command = 1 error.

Set A	Set B
1. *Will a stone float on water?*	1. *Will a leaf float on water?*
2. *Are there fish in the sea?*	2. *Are there elephants in the sea?*
3. *Is one pound worth more than two pounds?*	3. *Are two pounds worth more than one?*
4. *Can you use a hammer to hit a nail?*	4. *Can you use a hammer to cut wood?*

COMMAND:
Say to patient: "*Hold up this many fingers*" (hold up two fingers)
"*Now do the same with your other hand*" (do not demonstrate).

≥ 2 errors → F4: +ve → STOP! Delirium! CAM-ICU +ve

< 2 errors → F4: -ve → STOP! No Delirium CAM-ICU –ve

Adaption of E. Wesley Ely, MD, MPH and Vanderbilt University's CAM-ICU flow sheet (with permission)
Sedation and Delirium Assessment v1.2 12/2013 Acknowledgements to the Cambridge Delirium Group, CUHNHSFT

Appendix 9

Physiotherapy considerations relating to pain and sedation

PRIOR TO MOBILISATION THE FOLLOWING SHOULD BE CONSIDERED:

PAIN

AIM FOR TARGET PAIN LEVELS

NRS = 3-4 CPOT= 0-4

PROCEED WITH PHYSIOTHERAPY IF

NRS = 5-7 CPOT = 5-6

LIAISE WITH NURSING STAFF
CONSIDER OPIATE BOLUS PRIOR TO PHYSIOTHERAPY IF

NRS = 8-10 CPOT = 7-8

OPIATE BOLUS AND INCREASE ANALGESIA. RETURN WHEN PAIN ADEQUATELY CONTROLLED

SEDATION

RASS SCORE

-1 TO +2

PROCEED WITH PHYSIOTHERAPY IF

+3 OR ABOVE

LIAISE WITH NURSING STAFF
RETURN WHEN AGITATION REDUCED IF

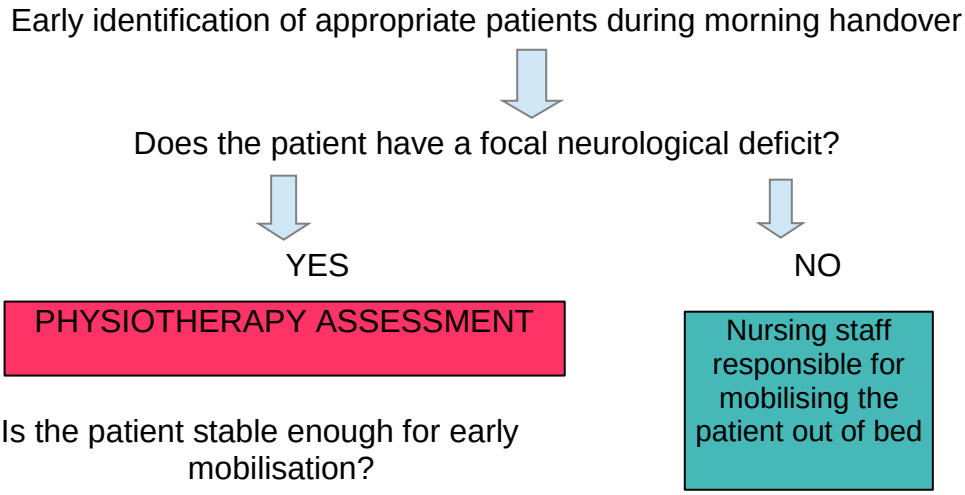
-2 OR BELOW

CONSIDER ARE THEY WITHDRAWN IN WHICH MOBILISATION MAY HELP
OR
ARE THEY STILL SEDATED IN WHICH CASE MOBILISATION IS NOT APPROPRIATE

PAIN SCORES SHOULD BE DOCUMENTED BY THE PHYSIOTHERAPIST PRE AND POST INTERVENTION. RASS SCORE SHOULD BE DOCUMENTED BY NURSES ON THE ITU/HDU CHART.

Appendix 10

Guide for mobilisation of patients on critical care



Contraindications to early mobilisation

- Raised ICP
- Vasospasm
- Agitation requiring increased sedation
- Unstable fractures
- Severe blood loss
- High doses of Noradrenaline
- Haemodialysis
- Unsecure airway
- New arrythmias
- Myocardial ischaemia

If unsure about stability liaise with the medical team

Treatment options if moblilisation is contraindicated

Chest Physiotherapy
Passive ROM
Exercises

Aim for daily mobilisation. If unable, the reason for not mobilising should be documented. Mobilisation may include the following activities:

- Active exercises
- Lying to sitting
- Sitting balance activities
- Hoist to chair
- Standing/transferring
- Tilt Table
- Walking