

High Impact Intervention

Delirium Prevention Care Bundle for Critically Ill Patients

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Context

The aim of the care bundle as set out in this high impact intervention (HII) is to ensure appropriate and high quality “harm free” patient care. Regular auditing of the care bundle elements will support cycles of review and continuous improvement in care settings.

Registered nurses must audit compliance against key policies and procedures for delirium prevention and management, in line with the relevant guidance documents available at the time of publication (ICS /FICM, 2015; NICE, 2010).

Aim and Objectives

The overall aim of this bundle is to ensure that evidence based practice is achieved and maintained to prevent long term cognitive impairment, and associated early morbidity for critically ill patients (ICS /FICM, 2015, Ely et al, 2004; Wei et al, 2008; NICE,2010).

The objectives are to;

- reduce the risk and incidence of delirium development in critically ill patients
- Ensure implementation of delirium prevention strategies across Lancashire and South Cumbria Critical Care Units, thus providing equity for patients.

Delirium in Critical Care

Delirium has been defined as an acute brain syndrome and as such should be recognised and treated as early as possible within the critical care environment (Page, 2008). Delirium is common in critically ill patients, and often goes unrecognised. It is a predictor of worse outcomes for patients, including death and long-term cognitive impairment. It is also distressing for patients and families.

Up to 85% of ICU patients may experience some degree of delirium, (Riker et.al.,2009) leading to increased morbidity and mortality, prolonged hospital stays, prolonged duration of mechanical ventilation, patient injury or self-extubation, and respiratory complications. It is important to understand the mechanics of delirium and how it affects patients, thus monitoring cognitive function of critically ill patients is essential (Page, 2008).

Pain, Analgesia and Sedation in Critical Care

The majority of patients who are treated in ICUs have pain, (Stein-Parbury and McKinley, 2000) which makes the assessment of pain and provision of adequate analgesia essential components of ICU care. Assessing whether a patient in the ICU is in pain may be difficult. but pain scales such as the Behavioural Pain Scale (Payen et.al. 2001) and the Critical Care Pain Observation Tool (Gelinas et.al. 2006) provide structured and repeatable assessments and are currently the best available methods for assessing pain. Pain should always be treated before a sedative agent is considered (Devlin et.al., 2018).

A minority of ICU patients have an indication for continuous deep sedation, for reasons such as the treatment of intracranial hypertension, severe respiratory failure, refractory status epilepticus, and prevention of awareness in patients treated with neuromuscular blocking agents. However, for the remaining overwhelming majority of patients undergoing mechanical ventilation the use of sedatives and analgesics should be minimized, with the goal that they be calm, lucid, pain-free, interactive, and cooperative with their care (Reade et.al. 2014). The consistent message from literature is that minimizing sedation among patients in the ICU provides clinical benefit i.e. reduced length of ventilation, reduced length of stay in critical care and reduced mortality (ICS, FICM, 2015).

Types of Delirium

- Hyperactive Delirium – patients often appears restless, agitated or confused. As delirium progresses the patient will pull at lines and tubes with frequent non-purposeful movements. They may become aggressive / combative and can pose a danger to themselves and others.

- Hypoactive Delirium – patients can present with lethargy and sedation. Hypoactive delirium is more subtle as patients may be quiet and cooperative but they will also display signs of inattention and disorganised thinking.
- Mixed Delirium – a combination of or fluctuation between hypo and hyperactive symptoms.

Risk Factors for delirium

These can be categorised into; host Factors, acute illness and /or iatrogenic / environmental factors as per the following table:

Table 1: Risk Factors for Delirium

Host Factors	Acute Illness	Iatrogenic/environmental
Elderly	Severe Sepsis	Sedatives / Analgesics
Co-morbidities	ARDS	Immobilisation
Pre-existing cognitive impairment	Multi Organ Failure	Total Parenteral Nutrition
Hearing / Vision impairment	Drug overdose/ illicit drug use /addiction	Sleep deprivation
Neurological disease	Nosocomial infection	Malnutrition
Alcohol / Smoker	Metabolic disturbance	Anaemia

There are also many medications which can predispose to the development of delirium. Some commonly used drugs which can have deliriogenic effects are listed as follows;

Table 2: Examples of commonly used deliriogenic medications:

Analgesics	Codeine, Fentanyl, Morphine, Pethidine
Antidepressants	Amitriptyline, Paroxetine
Anticonvulsants	Phenytoin
Antihistamines	Chlorphenamine, Promethazine
Antiemetics	Prochlorperazine
Sedatives e.g. benzodiazepines	Midazolam, Lorazepam,
Cardiovascular agents	Atenolol, Digoxin, Dopamine, Lignocaine
Corticosteroids	Hydrocortisone,
Diuretics	Furosemide
Gastric agents	Ranitidine

Predisposing Factors

All critically ill patients are at risk of delirium due to a number of factors, and reversible causes should be considered and corrected where possible. These include issues related to; infection, perfusion, altered gas exchange (oxygenation), nutrition, hydration, electrolyte disturbances, temperature, constipation, drug or alcohol withdrawal.

Reducing delirium requires:

- Identifying patients at risk
- Implementing prevention strategies for all patients who are identified as being at risk

Why use the care bundle?

This care bundle is based on evidence-based guidance, expert advice and national policy. It should be used to support the development and implementation of local policy. Its purpose is to act as a way of improving and measuring the implementation of key elements of care. The delirium prevention care bundle audit is shown in Appendix 1. This high impact intervention (HII) is not meant to replace existing guidelines, but to act as a simple method for improving the reliability of the clinical process. It is based on the NHS improvement care bundle approach, with further information about this method of improvement available at: <http://webarchive.nationalarchives.gov.uk/20120118165100/http://hcai.dh.gov.uk/whatdoido/high-impact-interventions/>

Staff competence and training

In line with policy, staff should be appropriately trained and competent in any stated procedure or care process. Assessment of competence is not a specific care action within the HII as it is a prerequisite for any care delivered. Registered care providers will have mechanisms for assuring training, assessment and recording of competence.

Underlying Principles

Lancashire and South Cumbria Critical Care Network DREAMS (*not nightmares*) Bundle

The 'DREAMS' Bundle for critical care aims to reduce the incidence of ICU delirium by concentrating on 5 key elements of best practice.

- Documentation and Information
- Rehabilitation
- Early Identification
- Aids to communication
- Medication
- Sleep bundle

DREAMS not *Nightmares*

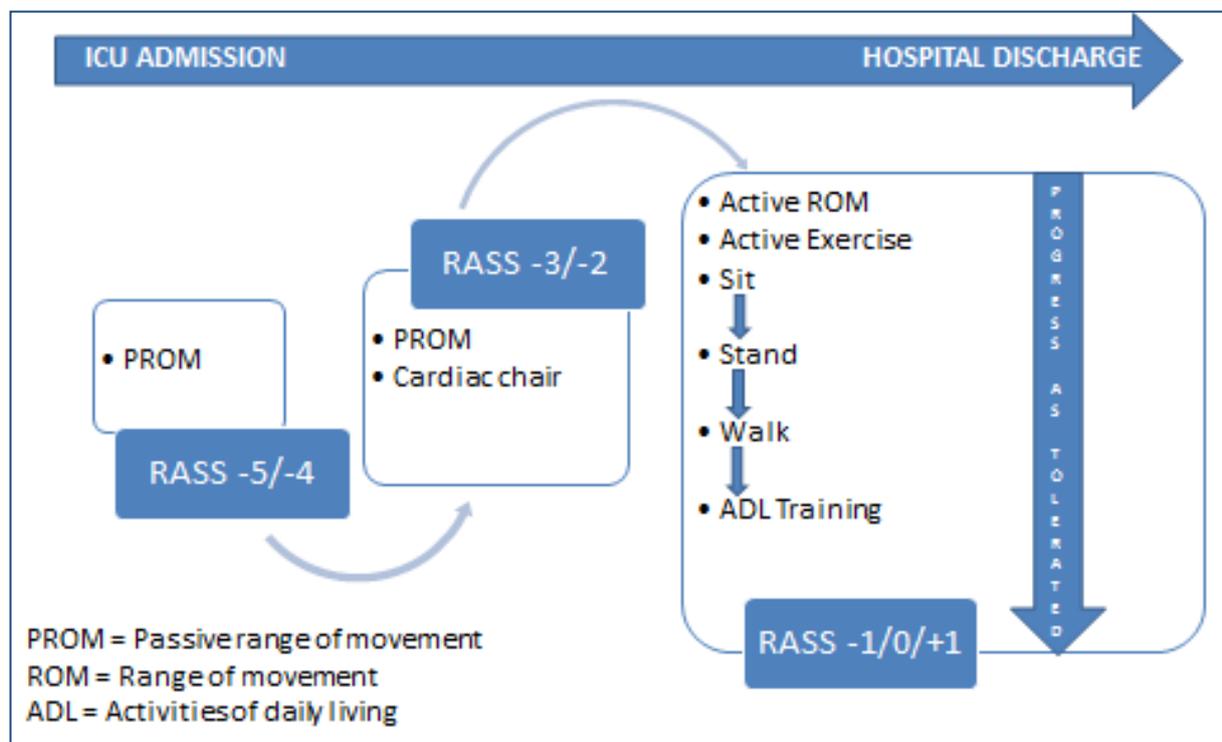
Documentation & Information	<ul style="list-style-type: none"> • Patient diary commenced for applicable patients (locally determined) • Daily update in nursing records relating to 'DREAMS' elements, including plan of care and evaluation • Provision of information relating to delirium for patients and relatives following admission
Rehabilitation	<ul style="list-style-type: none"> • To be commenced early e.g. as per unit protocol, early mobility flowchart and /or care pathway. Audit programme established to assess compliance • Seen by physiotherapist daily (Mon-Fri) • Daily activity /mobility recorded 7 days /week
Early Identification	<ul style="list-style-type: none"> • Assessment for delirium utilising CAM-ICU tool x 3 per day and on change of neurological status
Aids to communication	<ul style="list-style-type: none"> • Hearing aids, spectacles available as appropriate. Consider barriers to effective communication and implement strategies to overcome e.g. translation services access if language barriers
Medication	<ul style="list-style-type: none"> • Assess sedation (RASS) as a minimum 4 hourly, utilise sedation protocol incorporating pain assessment. • Daily review of sedation including setting of targets (RASS) and /or daily sedation hold • Daily (Mon-Fri) review of prescription charts by critical care pharmacist to ensure effective prescribing practices. Prescription review to take place on admission and discharge to critical care to promote effective medicines reconciliation.
Sleep Bundle	<ul style="list-style-type: none"> • Reduce light and noise between 23.00 hrs and 07.00hrs • Offer eye mask and ear plugs to patients (RASS \geq-1)

Documentation and Information;

Delirium is distressing for patients and families (GPICS, 2015) and as such the provision of verbal and written information about the condition and its effects should be provided for all patients (and their families) admitted to critical care areas. The use of patient diaries in critical care in the UK is increasing (Phillips, 2011) Nursing Standard, and the National Institute for Health and Clinical Excellence (NICE, 2009) has recommended that services should be developed to meet the psychological care needs of patients following critical illness. Patients are frequently sedated for long periods of time and this can cause memory loss and unusual perceptual experiences which can make it difficult for survivors to piece together the time they spent in critical care (Samuelson and Corrigan, 2009) and this can complicate recovery. Patient diaries can help to fill in memory gaps and encourage discussion and is a simple, low cost approach to helping support patients through their recovery. It is also important that the patient's GP is made aware of a diagnosis of delirium during their stay in critical care and as such, this should be included within the discharge letter from the unit /hospital. (NICE, 2014). Good record keeping throughout the patients critical care stay on delirium assessments and prevention strategies along with possible treatments.

Rehabilitation

Rehabilitation should be commenced as early as possible during a patient's critical care stay in order to reduce the risk of physical and non-physical morbidity (NICE, 2009). Patient pathways should be multiprofessional planned and delivered and the use of early mobility flowcharts can assist all practitioners in the delivery of a safe approach to promoting physical activity through a spectrum of activity according to locally agreed protocols. An example of progression is shown below;



Sedation where possible should be minimised, with the aim that patients are calm, lucid, interactive, and cooperative with their care, and analgesia should be administered to ensure patients are pain-free to facilitate engagement with rehabilitation activities. For most patients a target RASS of 0 would be the ideal goal.

An early mobility flowchart example is provided in Appendix 2.

Early Identification

Consideration should be given to those 'high risk' groups as discussed previously, and assessment should take place by trained and competent staff utilising a validated delirium assessment method. The Network recommends the use of the CAM-ICU tool to assess for delirium in adult critical care patients. Assessment is recommended 3 times per day and on change of neurological status. Critical care practitioners may consider utilising additional tools in order to assess patients for acute distress and the risk of future psychological morbidity such as the Intensive care Psychological Assessment Tool (IPAT). This tool is a simple, quick screening tool which has been found to have good reliability and validity (Wade, Hankins and Weinman, 2014). The IPAT can be found in Appendix 3.

Aids to communication

It is essential that methods of effective communication are maintained throughout a patient's stay in critical care. It is expected that staff are aware of patient's usual aids to communication and ensure that these are available for use whilst the patient is in critical care. In situations where English is not the patient's first language, staff should ensure access to interpretation services and provide literature within the patient's native language. The use of technology to support effective communication can also be useful in certain situations and should be explored where appropriate.

Communication should be clear and concise; with repeated verbal reminders of the day, time, location, and identification of key individuals, such as members of the multidisciplinary team and relatives (ICS,2006). Consideration should also be given to environmental signposts which may be helpful for patients e.g. clocks, calendars, photographs. It is important to involve family and caregivers to encourage feelings of security and orientation. In summary individual communication and orientation strategies should be employed according to patient requirements.

Medication

Maintenance of lighter levels of sedation is associated with improved outcomes for patients such as shorter duration of mechanical ventilation and reduced length of stay in critical care (Kolleff, 1998), and sedative drugs can be associated with increased rates of delirium (Ouimet, 2007) as such, care should be taken to prevent over sedation. Use of a sedation score e.g. The Richmond Agitation Sedation Score (RASS) can help to assess levels of sedation and use of a sedation protocol can help to guide optimum sedation levels. Sedation protocols should also incorporate guidance on effective pain assessment and management in order to promote optimum levels of calm consciousness. (GPICS, 2015). An example protocol is included in Appendix 4.

ICU pharmacists should review patients' prescription charts and advise clinicians regarding the use of delirogenic drugs, including those with known anticholinergic properties. Antipsychotics should be reserved for the management of acute agitation (Page, 2013).

Sleep bundle

Patients frequently report disturbed sleep as one of the negative experiences of being in hospital. This is especially the case in the highly technical critical care environment which typically has high levels of noise and light overnight due to the intensive monitoring and treatment required by severely ill patients and sleep/wake disturbances are common in delirium, with sleep deprivation being an aggravating factor in the risk of delirium developing. Thus it is important that 'protected sleep time' is promoted as a concept, with efforts focussing reducing the disturbances for patients from sound, light, and frequent interventions. Implementing this 'bundle' of environmental measures as a means to improve the quality of patients sleep can reduce the risks of delirium developing (Patel et al, 2014). The network has created an infographic to help promote 'Protected Sleep Time' and this is available at: <http://www.lscn.org.uk/quality-workstreams/delirium>

Elements of the care process:

Delirium Prevention Bundle:

- The following care elements should be completed on every patient admitted to a critical care unit:

Documentation & Information:

- Patient diary commenced for applicable patients (locally determined)
- Daily update in nursing records relating to 'DREAMS' elements, including plan of care and evaluation
- Provision of information relating to delirium for patients and relatives following admission

Rehabilitation:

- To be commenced early e.g. as per unit protocol, early mobility flowchart and /or care pathway. Audit programme established to assess compliance.
- Seen by physiotherapist daily (Mon-Fri)
- Daily activity /mobility recorded 7 days /week

Early Identification:

- Assessment for delirium utilising CAM-ICU tool x 3 per day and on change of neurological status

Aids to communication:

- Hearing aids, spectacles available as appropriate. Consider barriers to effective communication and implement strategies to overcome e.g. translation services access if language barriers
-

Medication:

- Assess sedation (RASS) as a minimum 4 hourly, utilise sedation protocol incorporating pain assessment.
- Daily review of sedation including setting of targets (RASS) and /or daily sedation hold
- Daily (Mon-Fri) review of prescription charts by critical care pharmacist to ensure effective prescribing practices. Prescription review to take place on admission and discharge to critical care to promote effective medicines reconciliation.

Sleep Bundle:

- Reduce light and noise between 23.00 hrs and 07.00hrs
- Offer eye mask and ear plugs to patients (RASS \geq -1)

Using the care bundle and the electronic tool

The use of this care bundle will support cycles of review and continuous improvement, which will deliver appropriate and high quality patient care.

Audits of compliance with the care bundle should be carried out regularly and the results recorded at the point of care. They should be carried out by peers and the results can be collected manually or electronically depending on what is appropriate. The use of an electronic, graphical package such as the HII electronic tool provided is recommended, as this will increase the understanding and usefulness of the overall results.

The electronic tool will:

- Collect, collate and produce different views of the information
- Clearly identify when actions within the care bundle have or have not been performed
- Provide information to support the development of plans to resolve any issues and improve the quality of care
- Support a culture of continuous improvement.

Audit results and action plans should be benchmarked on a critical care network wide level at least annually.

Recording and making sense of the results

- Print an audit sheet from the HII electronic tool or alternatively use the one in Appendix 1
- When a care bundle action is performed, insert a Y in the relevant column. If the action is not performed, insert an X in the relevant column
- When the care action is not performed, as it is not applicable (for example local policy has determined it as not applicable in all or certain situations) insert an N/A to demonstrate that local policy is being adhered to. ***(This is then recorded as a Y when total compliance is being calculated)***
- Calculate the totals and compliance levels manually or enter the results into the HII electronic tool to calculate these for you

NB. The electronic tool is set up to receive either '1' or '0' responses. '1' = Y or N/A and '0' = N

The goal is to perform every appropriate action of care every time it is needed and achieve 100% compliance with the care bundle. The "All actions performed" column should be filled with a Y when all the appropriate actions have been completed on every required occasion.

See the example below

Where actions have not been performed, overall compliance will be less than 100%. This provides immediate feedback for users of the tool on those care bundle actions not completed, and action can then be taken to improve compliance levels.

Example audit sheet

Observation	Care Actions				All actions
	Care action 1	Care action 2	Care action 3	Care action 4	
1	Y	N	Y	Y	N
2	Y	Y	N	Y	N
3	Y	Y	N/A	Y	Y
4	Y	Y	Y	N	N
5	Y	Y	Y	Y	Y
Total number of times an individual action was compliant	5	4	4	4	2
% when action of care was given	100%	80%	80%	80%	40%

This example tool shows that while most care actions were performed, on only two occasions were ALL actions performed correctly. As all actions were only 40% the risk of infection is significantly increased. (Please note for observation no 3. the N/A was calculated as a Y and overall compliance was achieved)

When the information has been entered into the HII electronic tool a compliance graph for each action of care and for overall compliance with the care bundle can be produced. This will show where to focus the improvement efforts to achieve full compliance and achieve high quality patient care.

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Appendix 1: Delirium Prevention Audit Tool

NB. Enter 'Y', N/A or 'N' depending if the elements of care have been applied

Delirium Prevention Bundle : Review Tool

Observation	Elements						All elements? (fills in automatically)
	Documentation & Information	Rehabilitation	Early Identification	Aids to communication	Medication	Sleep Bundle	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Total number of times an individual element was performed							
% When all elements of care were given							

Appendix 2: Early mobility flowchart example

Mobilisation in Critical Care

Aim To provide guidance on early physiotherapy mobilisation of patients in Critical Care
Scope All adult patients in Critical Care

Assess suitability for mobilisation daily

Consider pre-admission mobility and use of aids.
 Consider impact of recent injury or surgery. Assess patients neurological status.

Are there any contraindications to mobilisation?

- Active bleeding
- Acute cardiac ischaemia
- Neuromuscular blocking drugs
- Unstable spine or other fracture with mobilisation contraindicated
- RR < 5 or > 40 bpm or SaO₂ < 88%
- MABP < 55mmHg/>110mmHg
- HR < 40bpm or new onset arrhythmia
- Intra-aortic balloon pump
- RRT that cannot be paused (esp. if femoral line)
- Significant or rising dose of vasopressor (eg >0.2mcg/kg/min noradrenaline)
- Mechanically ventilated with FiO₂>0.6 and/or PEEP >10 cmH₂O or acutely worsening respiratory failure.
- Agitation – RASS > +3
- Precautions with large open wound (chest/abdomen)

Yes

Seek medical advice before mobilisation

No

Follow mobility guidance (see overleaf)

Mobility Guidance

Stage 1 - Patient unable to follow instructions RASS -5 to -3

Positioning
 Passive exercises

Stage 2 - Patient unable to follow instructions RASS -2

Cardiac chair position
 Positioning
 Passive exercises

Stage 3 - Patient alert and able to follow instructions RASS -1 and up

Cardiac chair position
 Sitting balance (passive/active)
 Active assisted/ Active exercises
 Sitting out in chair (hoist transfer)

Stage 4 - Patient alert and able to follow instructions RASS -1 and up

Sit to stand practice
 Weight transfer in standing
 Stepping on spot
 Step transfer to chair
 Walking

Criteria for cessation of mobilisation:

- RR < 5 or > 40 or SaO₂ < 88%
- MABP < 55mmHg / >110mmHg
- HR < 40bpm or new onset arrhythmia
- Dizziness
- Vertigo
- SOB
- Fatigue
- Nausea
- Pain
- Decreased level of awareness/consciousness
- Distress

❖ For each position/activity change allow 5-10 minutes for equilibration before determining the patients tolerance

❖ If patient intolerant of current mobility level activities – reassess and place in appropriate mobility stage

This guideline has been adapted from an original document by the Critical Care Unit, Blackpool Teaching Hospitals NHS Trust.

Appendix 3: Intensive Care Psychological Assessment Tool

Date and time: _____

Patient's hospital number: _____

Patient's name: _____

Intensive Care Psychological Assessment Tool (IPAT)

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I would like to ask you some questions about your stay in Intensive care, and how you've been feeling in yourself. These feelings can be an important part of your recovery. To answer, please circle the answer that is closest to how you feel, or answer in any way you are able to (e.g. by speaking or pointing.)

	Since you've been in intensive care:	A	B	C
1	Has it been hard to communicate?	No	Yes, a bit	Yes, a lot
2	Has it been difficult to sleep?	No	Yes, a bit	Yes, a lot
3	Have you been feeling tense?	No	Yes, a bit	Yes, a lot
4	Have you been feeling sad?	No	Yes, a bit	Yes, a lot
5	Have you been feeling panicky?	No	Yes, a bit	Yes, a lot
6	Have you been feeling hopeless?	No	Yes, a bit	Yes, a lot
7	Have you felt disorientated (not quite sure where you are)?	No	Yes, a bit	Yes, a lot
8	Have you had hallucinations (seen or heard things you suspect were not really there)?	No	Yes, a bit	Yes, a lot
9	Have you felt that people were <i>deliberately</i> trying to harm or hurt you?	No	Yes, a bit	Yes, a lot
10	Do upsetting memories of intensive care keep coming into your mind?	No	Yes, a bit	Yes, a lot

Do you have any comments to add in relation to any of the answers?

SCORING

Any answer in column A = 0 points

Any answer in column B = 1 point

Any answer in column C = 2 points

Sum up the scores of each item for a total I-PAT score out of 20

Cut-off point ≥ 7 - indicates patient at risk

Sedation Assessment & Principles



Assess and treat pain first

Assess Richmond Agitation and Sedation Score (RASS) 4 hourly (minimum) in all patients

Score	Term	Description
+4	Combative	Overly combative, violent, immediate danger to staff
+3	Very agitated	Pulls or removes tube(s) or catheter(s); aggressive
+2	Agitated	Frequent non-purposeful movement, fights ventilator
+1	Restless	Anxious but movements not aggressive or vigorous
0	Alert & calm	
-1	Drowsy	Not fully alert, but sustained awakening (eye opening/ eye contact to voice > 10 secs)
-2	Light sedation	Briefly awakens with eye contact to voice (<10 seconds)
-3	Moderate sedation	Movement or eye opening to voice (but no eye contact)
-4	Deep sedation	No response to voice, but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

If using IV sedation, titrate based on RASS

Score	Adjustment
+4	Bolus & increase infusion by 30%
+3	Bolus & increase infusion by 30%
+2	Bolus & increase infusion by 20%
+1	Bolus & increase infusion by 10%
0	No change
-1	No change
-2	Reduce infusion by 20%
-3	Reduce infusion by 30%
-4	Reduce infusion by 75%
-5	Hold infusion

Principles of effective sedation practices:

- Assess pain regularly and control pain first
- Optimise non-drug measures
- Use the minimum sedation necessary
- Review sedation daily e.g. on ward round
- Daily setting of sedation target (e.g. aim for RASS = 0) and/or sedation break (consider contraindications such as;
 - Neuromuscular blockade (paralysis)
 - Severe CVS / respiratory instability
 - Sedation for neuro-protection/ cooling

This guideline has been adapted from an original document by the Academic Department of Critical Care, Queen Alexandra Hospital, Portsmouth, UK www.portsmouthicu.com

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