Good Things Come to Those Who Wait (a Decade):

Clinical Practice Guidelines for the Management of Pain, Agitation and Delirium in Adult Patients in the ICU

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Disclosures

- I have no conflicts to disclose

Objectives

- Discuss the modified methodology employed in the updating of the 2002 Clinical Practice Guidelines for the Sustained Use of Sedatives and Analgesics in the Critically Ill Adult
- Review the key recommendations of the 2012 Pain, Agitation and Delirium Clinical Practice Guidelines for Adult ICU Patients
- Describe the pharmacotherapeutic options for the management of pain, agitation and delirium in adult patients in the ICU

The Path to the Present Guidelines

Clinical Practice Guidelines for the Sustained Use of Sedatives and Analgesics in the Critically Ill Adult

Clinical Practice Guidelines for the Sustained Use of Sedatives and Analgesics in the Critically Ill Adult

PAD Inspiration

1996	Ely, et al. NEJM	SBT ↓ MV 1.5 days
2000	Kress, et al. NEJM	SAT- DSI ↓ MV >2d, ICU LOS↓ 3.5d
2001	Ely, et al. JAMA	CAM-ICU validated, delirium incidence = 83%
	2002: Jacobi, et al. CCM SAG Revision	
2004	Ely, et al. JAMA	Delirium predicts ↑ 6mo mortality and ↑ Hosp LOS
2006	Chanques, et al. CCM	Protocolized analgesia + sedation titrated to BPS, RASS ↓ pain 21%, ↓ agitation 17%, ↓ MV 2.2d, ↓ infection 50%
2007	Bailey, et al. CCM	EM feasible, safe in MV ICU pts
2008	Morris, et al. CCM	ABC + EM ↓ ICU LOS 1.4d, Hosp LOS 3.3d
2008	Girard, et al. Lancet	SAT + SBT = ABC, ↓ MV 3d, ICU, Hosp LOS 4d, ↓ risk of death 32%
	2012: Barr, et al. CCM PAD Guidelines	

The Path to the Present Guidelines

Clinical Practice Guidelines for the Sustained Use of Sedatives and Analgesics in the Critically Ill Adult

Clinical Practice Guidelines for the Sustained Use of Sedatives and Analgesics in the Critically Ill Adult

Special Article

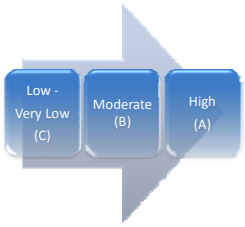
Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit

Then and Now

	2002 SAG	2012 PAD
Number of recommendations	28	54
Patient characteristics	Age >12 years Intubated only	Age >18 years Intubated and non-intubated Medical, surgical, trauma ICU
Duration of sedation addressed	Prolonged	Brief Prolonged
Content	• NMB	• Psychometric assessments comparing pain, sedation, delirium monitoring tools • Regional analgesia • Delirium
Methodology	• Recommendation consensus via open discussion • Cochrane method	• Anonymous voting • GRADE method

GRADE Method

Quality of evidence:



Strength of recommendations:

- Either in favor of an intervention (+) or against an intervention (-)
- Either:
  - Strong (1)
    - *"We recommend…"*
  - Weak (2)
    - *"We suggest…"*
  - None (0)
    - *"No recommendation…."*

Guyatt et al. BMJ 2008;336:924-6

New Overarching Themes

- Stronger quality of recommendations
  - Removal of expert opinion
  - Description of gaps within current literature
- Greater focus on patient individualization
  - Comprehensive assessment and management of pain, agitation and delirium
  - Utilization of non-pharmacologic interventions first
- Enhanced emphasis on adequate pain control
- Preference for lighter level of sedation, benzodiazepine avoidance

PAD Guideline Content

- Underlying medical conditions
- Trauma
- Invasive medical and nursing interventions
- Acute medical or surgical illness
- Hospital acquired illness
- Mechanical ventilation
- Prolonged immobility

PAD 2012: **Incidence**

- Adult medical, surgical, and trauma ICU patients routinely experience pain, both at rest and with routine ICU care (B).
- Procedural pain is common in adult ICU patients (B).
- Pain in adult cardiac surgery patients is common and poorly treated; women experience more pain than men after cardiac surgery (B).

Sessler et al. Chest 2008;133:552-65.
Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Pain: Assessment

- We **recommend** that pain be routinely monitored in all adult ICU patients (+1B).
- The **Behavioral Pain Scale (BPS)** and the **Critical-Care Pain Observation Tool (CPOT)** are the most valid and reliable behavioral pain scales for monitoring pain in medical, postoperative, or trauma (except for brain injury) adult ICU patients who are unable to self report, and in whom motor function is intact and behaviors are observable (B).

Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Patient Case

- AC is a 31 yo AAM presents to ER for wheezing, shortness of breath, diaphoresis
- PMH: Asthma, allergic rhinitis, depression
- SH: Smokes ½ ppd, (-) EtOH
- All: penicillin, ibuprofen, aspirin
- Home medications: Advair, PRN albuterol, citalopram, loratadine, fluticasone nasal spray
- ER management:
  - BP: 154/67 HR: 120 RR: 32 Temp: 37.5°C Wt: 115kg Ht: 67 in
  - Steroids, nebulized bronchodilators
  - ABG: 7.23/69/123 → Intubated
    - RSI: propofol, rocuronium
    - 50mcg fentanyl, 2mg midazolam prior to MICU transfer

Audience Poll

- How many institutions' standard practice is to place a patient like AC on continuous infusion opioid and benzodiazepine infusions upon admission to the ICU?

Patient Case :

Does this patient meet criteria for analgesic therapy?

- MICU: BP: 166/71 HR: 124 RR: 29 Temp: 37.5°C
- Upon exam:
  - Intermittent grimacing
  - Moving upper extremities but not reaching for his ETT
  - Fighting the ventilator

Pain: Assessment

- We **do not suggest** that vital signs (or observational pain scales that include vital signs) be used alone for pain assessment in adult ICU patients (-2C).
- We **suggest** that vital signs may be used as a cue to begin further assessment of pain in these patients, however (+2C).

Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Behavioral Pain Scale (BPS)

BPS Range = 3-12, BPS ≥ 6 requires treatment

Item	Description	Score
Facial expression	Relaxed	1
	Partially tightened (e.g., brow lowering)	2
	Fully tightened (e.g., eyelid closing)	3
	Grimacing	4
Upper limbs	No movement	1
	Partially bent	2
	Fully bent with finger flexion	3
	Permanently retracted	4
Compliance with ventilation	Tolerating movement	1
	Coughing but tolerating ventilation for most of the time	2
	Fighting ventilator	3
	Unable to control ventilation	4

Payen J et al. Crit Care Med 2001;29(12):2258-2263

Critical Care Pain Observation Tool (CPOT)

CPOT range = 0 – 8, CPOT ≥ 3 requires treatment

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

Gelinas et al. Am J Crit Care 2006;15:420-427

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BPS

Range = 3 - 12
AC's score = 9

BPS ≥ 6 requires treatment

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Total, range			0-8

CPOT

Range = 0 – 8

AC's score = 6

CPOT ≥ 3 requires treatment

Pain: Treatment

- We **suggest** that analgesia-first sedation be used in adult ICU patients who are mechanically ventilated (+2B).
- We **recommend** that pre-emptive analgesia and/or non-pharmacologic interventions (e.g., relaxation) be administered to alleviate pain in adult ICU patients prior to chest tube removal (+1C).
- We **suggest** that for other types of invasive and potentially painful procedures in adult ICU patients, pre-emptive analgesic therapy and/or non-pharmacologic interventions may also be administered to alleviate pain (+2C).

Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Pain: Treatment

- We **recommend** that IV opioids be considered as the first-line drug class of choice to treat non-neuropathic pain in critically ill patients (+1C).
- All available IV opioids, when titrated to similar pain intensity endpoints, are equally effective (C).

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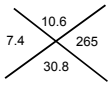
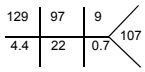
Audience Poll

- What would you use to treat AC's pain?
  - Fentanyl
  - Hydromorphone
  - Morphine
  - Other?





LFTs NML

- How would you recommend your selection be prescribed?
  - Continuous infusion?
  - Intermittent boluses?
    - Scheduled or PRN?
- Do you have experience utilizing continuous infusion ketamine for sedation and analgesia?

Opioid Analgesic Options

Agent	t ½	Onset	Metabolism	Active metabolites	ADRs
Morphine*	3-7 hr	5-10 min	Glucuronidation	Yes: 6-and 3-glucuronide Accumulates in renal failure	CNS depression, Constipation, Flushing, Hypotension, Nausea, Vomiting, Pruritus, Respiratory Depression, Sedation, Ileus
Fentanyl	1.5-6 hr	1-2 min	N-dealkylation CYP3A4/5 substrate	No	
Remifentanil	5-10 min	1-2 min	Hydrolysis by plasma esterases	No	
Hydromorphone	2-3 hr	5 min	Glucuronidation	No	
Methadone	8-59 hr	10-20 min	N-demethylation CYP3A4/5, 2D6, 2B6, 1A2 substrate	Yes: N-demethylated derivative	

*Associated with high degree of histamine release, rash

Ketamine ***also has sedative, amnestic properties**	1-2 hr	30 sec	N-demethylation	Norketamine	↑ HR, ↑ CO, CNS, rash

http://www.lexicomponline.com Accessed on 3/9/2013.
Jacobi J et al. Crit Care Med 2002;30:119-41.
Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Pain: Treatment

- We **suggest** that non-opioid analgesics be considered to decrease the amount of opioids administered (or to eliminate the need for intravenous opioids altogether), and to decrease opioid-related side effects (+2C).
- We **recommend** that either enterally administered gabapentin or carbamazepine, in addition to intravenous opioids, should be considered for treatment of neuropathic pain (+1A).

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Non-Opioid Analgesic Options

Agent	t ½	Onset	Metabolism	Adverse Effects
Acetaminophen (PO/PR)	2-4 hrs	IV: 5-10 min PO: 30-60 min PR: variable	Glucuronidation	Hypotension, N/V, Headache, Insomnia, Increased LFTs
Ketorolac (IV/IM)	2.5-8.5 hr	10 min	Hydroxylation, conjugation/renal excretion	GI bleed Renal effects (MAX 5 days)
Ibuprofen (IV/PO)	2 hr	IV: N/A PO: 30 min	Oxidation	CV thrombotic events, GI bleed/ulceration, increased LFTs, HTN, HF exacerbation risk
Gabapentin (PO)	5-7 hr (↑ w/ renal failure)	N/A	Excreted renally un-changed	Dizziness, somnolence, ataxia, fatigue, peripheral edema, rash
Carbamazepine (PO)	Variable (autoinduction)	4-5 hr	Oxidation	GI disturbances, CNS depression

http://www.lexicomponline.com Accessed on 3/9/2013.
Jacobi J et al. Crit Care Med 2002;30:119-41.
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Pain: Treatment - Epidurals

Surgery	We **recommend** that thoracic epidural anesthesia/analgesia be considered for postoperative analgesia in patients undergoing abdominal aortic aneurysm surgery (+1B). We provide **no recommendation** for : • using a lumbar epidural over IV opioids for postoperative analgesia in patients undergoing AAA surgery, due to a lack of benefit of lumbar epidural analgesia over IV opioids in this patient population (0,A). • use of thoracic epidural analgesia in patients undergoing either intrathoracic or non-vascular abdominal surgical procedures, due to insufficient and conflicting evidence for this mode of analgesic delivery in these patients (0,B).
Trauma	We **suggest** that thoracic epidural analgesia be considered for patients with traumatic rib fractures (+2B).
Medical	We provide **no recommendation** for neuraxial/ regional analgesia over systemic analgesia in medical ICU patients, due to lack of evidence in this patient population (0, No Evidence).

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PAD Guideline Content

PAD Guideline Content

- Underlying medical conditions
- Acute medical or surgical illness
- Invasive and non-invasive devices
- Hospital acquired illness
- ICU environment

Sedation Goals:

- Enhance safety for patients and nursing staff
- Reduce metabolic demands, especially oxygen consumption
- Facilitate mechanical ventilation, invasive monitoring and procedures
- Ensure patient comfort
- Appropriately utilize neuromuscular blockade
  - Sedation is a mandatory concomitant therapy

Sessler et al. Chest 2008;133;552-65.
Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Sedation: Depth

- Maintaining light levels of sedation in adult ICU patients is associated with improved clinical outcomes (e.g., shorter duration of mechanical ventilation and a shorter ICU length of stay) (B).
  - Maintaining light levels of sedation increases the physiologic stress response, but is not associated with an increased incidence of myocardial ischemia (B).
- The association between depth of sedation and psychological stress in these patients remains unclear (C).
- We **recommend** that sedative medications be titrated to maintain a light rather than a deep level of sedation in adult ICU patients, unless clinically contraindicated (+1B).
- We **recommend** routinely using either daily sedation interruption or targeting a light level of sedation in mechanically ventilated adult ICU patients (+1B).

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Sedation: Brain Function Monitors

- We **do not recommend** that objective measures of brain function (e.g., Bispectral Index [BIS]) be used as the primary method to monitor depth of sedation in non-comatose, **non-paralyzed** critically ill adult patients, as these monitors are inadequate substitutes for subjective sedation scoring systems (-1B).
- We **suggest** that objective measures of brain function (e.g., Bispectral Index [BIS]) be used as an adjunct to subjective sedation assessments in adult ICU patients who are **receiving neuromuscular blocking agents**, as subjective sedation assessments may be unobtainable in these patients (+2B).
- We **recommend** that **EEG monitoring be used to monitor non-convulsive seizure activity** in adult ICU patients with either known or suspected seizures, or **to titrate electrosuppressive medication** to achieve burst suppression in adult ICU patients with elevated intracranial pressure (+1A).

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Sedation Monitoring: Scales

- The Richmond Agitation-Sedation Scale (**RASS**) and Sedation-Agitation Scale (**SAS**) are the most valid and reliable sedation assessment tools for measuring quality and depth of sedation in adult ICU patients (B).

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Audience Poll

- What institutions utilize:
  - RASS?
  - SAS?

Patient Case

- AC remains ventilated and is receiving fentanyl 75mcg/hr.
- BP: 129/54 HR: 87 RR: 25 Temp: 37.5°C
  - TG: 127 mg/dL
- He appears agitated and is biting his ETT. His nurse just repositioned him to attempt to make him more comfortable although it has not seemed to help.
- The RN tells you the patient has consistently been at a RASS of +3 (SAS of 6).

Richmond Agitation Sedation Scale (RASS)

Score	Term	Description	
+4	Combative	Overtly 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 vigorous	
0	Alert and calm		
-1	Drowsy	Not fully alert, but has sustained awakening (eye-opening/eye contact) to *voice* **(≥10 seconds)**	Verbal Stimulation
-2	Light sedation	Briefly awakens with eye contact to *voice* **(<10 seconds)**	Verbal Stimulation
-3	Moderate sedation	Movement or eye opening to *voice* **(but no eye contact)**	Verbal Stimulation
-4	Deep sedation	No response to voice, but movement or eye opening to *physical* stimulation	Physical Stimulation
-5	Unarousable	No response to *voice or physical* stimulation	Physical Stimulation

Sessler CN et al. Am J Respir Crit Care Med 2002;166:1338-1344.
Ely EW et al. JAMA 2003; 289:2983-2991.

Riker 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

Riker RR et al. Crit Care Med 1999;27(7):1325-1329

Audience Poll

- Who utilizes benzodiazepines first line for sedation?
  - Midazolam?
  - Lorazepam?
    - Continuous infusion?
- Are these agents generally initiated at the same time as analgesia?
- How many institutions do not have dexmedetomide on formulary secondary to cost?

Back to the Patient Case….

- AC remains ventilated and is receiving fentanyl 75mcg/hr.
- BP: 129/54 HR: 87 RR: 25 Temp: 37.5°C
  - TG: 127 mg/dL
- He appears agitated and is biting his ETT. His nurse just repositioned him to attempt to make him more comfortable although it has not seemed to help.
- The RN tells you the patient has consistently been at a RASS of +3 (SAS of 6).

What sedation strategy would you recommend?

- A: Lorazepam: intermittent bolus
- B: Midazolam: continuous infusion
- C: Propofol infusion (if not on shortage)
- D: Dexmedetomidine infusion
- E: Ketamine + low dose benzodiazepine

Sedation: Agent Selection

- We suggest that sedation strategies using ***nonbenzodiazepine*** sedatives (either propofol or dexmedetomidine) may be preferred over sedation with benzodiazepines (either midazolam or lorazepam) to improve clinical outcomes in mechanically ventilated adult ICU patients (+2B).

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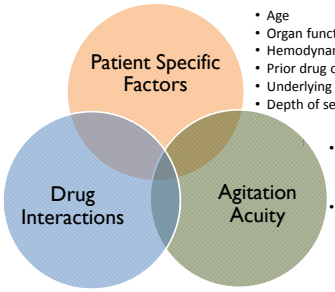
Recommending a Sedative Agent



- Age
- Organ function
- Hemodynamic status
- Prior drug or alcohol abuse
- Underlying disease process
- Depth of sedation required

- Acute
  - Drug onset
  - Access
- Continued
  - Duration of effect
  - Side effects
  - Availability
  - Cost

Jacobi et al. Crit Care Med 2002;30:119-41.

Sedative Treatment Options

Agent	Onset IVP (min)	t ½	Metabolism	Active metabolite	Adverse Effects/ Unique Feature
Lorazepam	10-15	8-15h	Liver	No	• Solvent related acidosis/Renal failure
Midazolam	2-5	3-11h	Liver, accumulation in renal failure	Yes: especially in renal failure	• Unpredictable and/or prolonged sedation, especially in renal failure
Diazepam	2-5	20-120h	Liver	Yes	• Phlebitis when IV diazepam given via peripheral vein
Propofol	1-2	Short term use: 3-12h Long term use: 50h	Liver	No	• ↑triglycerides → pancreatitis if > 500 (order TG after 3-5d) • PRIS • Avoid in egg or soybean allergies • 1kcal/mL from lipid vehicle
Dexmedetomidine	1-2	6min	Liver	No	• Hypotension w/ IV push •* No respiratory depression

http://www.lexicomponline.com Accessed on 3/9/2013.
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PAD Guideline Content

PAD Guideline Content

- Underlying medical conditions
- Acute medical or surgical illness
- Medications
- Hospital acquired illness
- ICU environment

Why it's pertinent:

- Delirium is associated with increased mortality in adult ICU patients (A).
- Delirium is associated with prolonged ICU and hospital lengths of stay in adult ICU patients (A).
- Delirium is associated with the development of post-ICU cognitive impairment in adult ICU patients (B).

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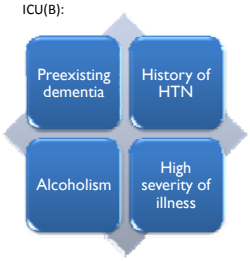
Delirium: Risk factors

- 4 baseline risk factors are positively and significantly associated with the development of delirium in the ICU(B):



- *Coma is an independent risk factor for the development of delirium in ICU patients.*
- Establishing a definitive relationship between various subtypes of coma (i.e., medication-related, structural, neurological, medical) and delirium in ICU patients will require further study (B).

Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Delirium: Drug Class Specific Risk

- **Conflicting data** surround the relationship between **opioid** use and the development of delirium in adult ICU patients (B).
- **Benzodiazepines may be a risk factor** for the development of delirium in adult ICU patients (B).
- There are **insufficient data to** determine the relationship between **propofol** use and the development of delirium in adult ICU patients (C).
- In mechanically ventilated adult ICU patients at risk for developing delirium, **dexmedetomidine** infusions administered for sedation **may be associated with a lower prevalence of delirium compared to benzodiazepine infusions** (B).

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Delirium: Prevention

- We **recommend** performing early mobilization of adult ICU patients whenever feasible to reduce the incidence and duration of delirium (+1B).
- We **recommend** promoting sleep in adult ICU patients by optimizing patients' environments, using strategies to control light and noise, clustering patient care activities, and decreasing stimuli at night to protect patients' sleep cycles (+1C).
- We provide **no recommendation** for using a pharmacological only or combined non-pharmacological and pharmacological delirium prevention protocol or a in adult ICU patients, as no compelling data demonstrate that this reduces the incidence or duration of delirium in these patients (0,C).

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Delirium: Monitoring

- We **recommend** routine monitoring for delirium in adult ICU patients (+1B). Routine monitoring of delirium in adult ICU patients is feasible in clinical practice (B).
- The Confusion Assessment Method for the ICU (**CAMICU**) and the Intensive Care Delirium Screening Checklist (**ICDSC**) are the most valid and reliable delirium monitoring tools in adult ICU patients (A).

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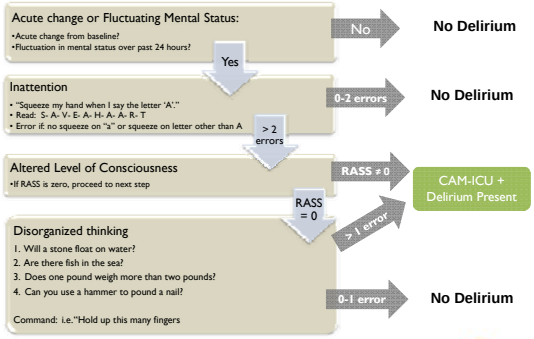
Confusion Assessment Method- ICU

(CAM-ICU)



Ely EW et al. Crit Care Med 2001, 29:1370-1379

Intensive Care Delirium Screening Checklist (ICDSC)

Patient Evaluation	Day 1	Day 2	Day 3
Altered level of consciousness*			
If A or B do not complete patient evaluation			
Inattention			
Disorientation			
Hallucination-delusion-psychosis			
Psychomotor agitation or retardation			
Inappropriate speech or mood			
Sleep/wake cycle disturbance			
Symptom fluctuation			
Total score (0-8)			

Score *(1 point for each present during shift)*	
1-3	Subsyndromal Delirium
≥ 4	Delirium

*Level of consciousness:
A: No response, score: 0
B: Response to intense and repeated stimulation (loud voice and pain), score: 0
C: Response to mild or moderate stimulation, score: 1
D: Normal wakefulness, score: 0
E: Exaggerated response to normal stimulation, score: 1

Bergeron N et al. Intensive Care Med 2001, 27:859-864.

Delirium: Treatment

- There is no published evidence that treatment with haloperidol reduces the duration of delirium in adult ICU patients (No Evidence).
- Atypical antipsychotics may reduce the duration of delirium in adult ICU patients (C).
- We **suggest** that in adult ICU patients with delirium unrelated to alcohol or benzodiazepine withdrawal, that continuous IV infusions of dexmedetomidine rather than benzodiazepine infusions be administered for sedation to reduce the duration of delirium in these patients (+2B).

Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Apply ICU Specific Pain, Agitation, and Delirium Management Protocols

Pain
- Assess, treat pain first, then sedate (analgo-sedation)
- Treat significant pain: BPS ≥ 6 or CPOT ≥ 3
- Use patient specific pain management strategies
- Administer pre-procedural analgesia

Agitation - Sedation
- Minimize benzodiazepine use, avoid over-sedation
- Sedation goals: RASS = 0 to -2 or SAS = 3 to 4
- Individualize sedative regimen to minimize side effects

Delirium
- Reorient patient, optimize environment
- Minimize use of deliriogenic drugs
- Treat with anti-psychotics (patient-specific)

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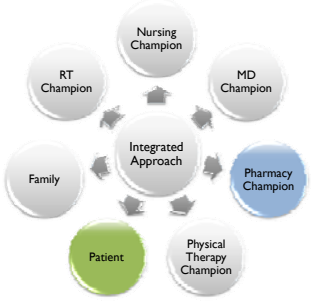
Expected Benefits of Implementing the PAD Guidelines

- Shortened duration of mechanical ventilation
- Reduced ICU & hospital LOS
- Increased ICU patient throughput & bed availability
- Decreased costs per patient
- Improved long-term cognitive function & mobility
- Increased number of patients discharged home
- Improved mortality

Expected Obstacles to PAD Implementation

- Training ICU staff to perform and interpret PAD assessments
- Making PAD management less dependent on medications and individual physician orders
- Changing ICU culture to accept light sedation to degree of patient interaction as a means to improve outcomes
- Overcoming logistical barriers –coordination of SBT/SAT/PT/OT interventions
- Early mobilization acceptance

PAD Implementation should be Interdisciplinary



Barr J, Fraser G and Puntillo K, et al. Crit Care Med 2013; 41:263-306.

Testing Your Knowledge

1. Which of the following statements is **false** regarding the methodology utilized in the development of the 2012 PAD Guidelines?
   A. Expert opinion recommendations have been removed
   B. GRADE approach was applied to strengthen the quality of recommendations
   C. Consensus was reached via open discussion
2. Which of the following statements is **true** regarding the key content recommendations of the 2012 PAD Guidelines?
   A. Greater emphasis is placed on neuromuscular blockade therapy
   B. Sedation therapy should be individualized and benzodiazepine usage avoided if possible
   C. No recommendations were provided regarding epidural therapy

Testing Your Knowledge

3. Which of the following statements is **true** regarding the management of **pain**?
   A. The RASS is the most appropriate tool for pain assessment
   B. Morphine should be used first line in patients with renal dysfunction
   C. Either enterally administered gabapentin or carbamazepine should be considered for treatment of neuropathic pain

Testing Your Knowledge

4. Which sedative is NOT associated with respiratory depression?
   A. Midazolam
   B. Propofol
   C. Dexmedetomidine
5. True or False: A BPS score of ≥ 6 requires treatment.
   A. True
   B. False

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Good Things Come to Those Who Wait (a Decade):

Clinical Practice Guidelines for the Management of Pain, Agitation and Delirium in Adult Patients in the ICU

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