



# 42nd Critical Care Congress Review

Supported by education grants from Hospira, Inc. and Nestlé HealthCare Nutrition.

CE/CME Enduring Material  
Release Date: June 2013  
Expiration Date: June 2014

## Learning Objectives

At the conclusion of this activity participants should be able to:

- Discuss approaches to screen for delirium and consider both pharmacologic and nonpharmacologic approaches to prevention and management
- Minimize the development of malnutrition through goal-directed therapy combining the use of enteral and parenteral nutrition
- Recognize new therapies for sepsis in the intensive care unit and the limitations of current research for better translation of evidence to the bedside

## Type of Activity

This activity was designed as an evidenced based forum to review expert opinions of various topics in critical care. This activity will focus on increasing knowledge and its application to practice.

## Competencies

SCCM supports recommendations that will promote life-long learning through continuing education. SCCM promotes activities that encourage the highest quality in education that will enhance knowledge, competence or performance in critical care practice. This activity will meet the following:

- Patient- and Family-Centered Care
- Practice Applications
- Quality Improvement
- Multiprofessionalism

## Target Audience

This continuing medical education offering is intended to meet the needs of all physicians, nurses, pharmacists, respiratory therapists and other providers who care for critically ill patients.

## Physicians

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### Designation Statement

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SCCM is approved by the California Board of Registered Nursing, Provider No. 8181 and approves this panel for 1 contact hour.

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# Strategies for Preventing and Treating Pain, Agitation and Delirium in Clinical Practice

With the advent of new clinical practice guidelines, critical care medicine is on the threshold of greatly improving the lives of patients in the intensive care unit (ICU). To achieve optimal outcomes, intensivists are urged to adopt these well-supported recommendations for the treatment and prevention of pain, agitation and delirium (PAD) in critically ill patients

## An Integrated Approach to Implementing the PAD Clinical Practice Guidelines

The importance of managing PAD in an integrated, interdisciplinary fashion is emphasized in the 2013 Pain, Agitation and Delirium Clinical Practice Guidelines for Adults in the ICU (Barr J, et al. *Crit Care Med.* 2013;41:263-306), recently released by the Society of Critical Care Medicine's (SCCM) American College of Critical Care Medicine (ACCM). "Given the ubiquitous nature of pain, agitation and delirium in these patients, we believe these guidelines will be transformative in terms of their impact on ICU care," stated Juliana Barr, MD, FCCM, who chaired the guidelines task force.

The 2013 ICU PAD guidelines differ greatly from previous versions in terms of the methods used, content and scope. "We used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) method, which bases recommendations not only on the strength of evidence but also on the risks and benefits of each intervention," said Barr. "GRADE precludes use of expert opinion in the absence of evidence, thus enabling us to make more robust statements and recommendations." Other methodology changes included the use of a professional librarian for literature searches, maintenance of a database exceeding 19,000 references, and use of anonymous, electronic voting to achieve consensus for all statements and recommendations.

Compared with previous versions, the 2013 guidelines contain twice as many statements and recommendations. The guidelines are more patient-centered, placing less emphasis on recommending specific drugs in certain circumstances and more emphasis on delirium in critically ill patients.

Strong evidence now demonstrates that most ICU patients can be safely maintained at lighter sedation levels and actively mobilized, even while intubated. Keeping ICU patients deeply sedated is linked to poorer outcomes in mechanical ventilation duration, delirium incidence, ICU and hospital days, in-hospital mortality rates, and incidence of prolonged physical and cognitive dysfunction after ICU and hospital discharge.

"We also now know that linking pain, sedation and delirium management protocols together, with spontaneous awakening trials, breathing trials, and early mobility protocols, results in synergistic improvements in ICU outcomes," reported Barr. "A growing body of evidence shows that use of ventilator weaning protocols, light levels of sedation, sedation titration protocols or daily sedation holidays, and early mobility protocols can improve clinical outcomes in ICU patients."

Key evidence published since the last version of these guidelines in 2002, includes the 2008 report of the Awakening and Breathing Controlled (ABC) Trial, in which the combination of spontaneous awakening and breathing trials reduced mechanical ventilation duration by three days, ICU/hospital length of stay by four days, and mortality risk by 32% (Girard TD, et al. *Lancet.* 2008;371:126-134). Another 2008 report showed that the ABC protocol linked with an early mobility protocol reduced ICU and hospital lengths of stay by 1.4 and 3.3 days, respectively (Morris PE, et al. *Crit Care Med.* 2008;36:2238-2243). Data published in 2009 indicated that an early mobility protocol linked with a spontaneous awakening trial reduced the incidence of delirium and increased threefold the likelihood that patients would achieve an

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independent functional status at hospital discharge (Schweickert WD, et al. *Lancet.* 2009;33:1874-1882).

"In 2010, Vasilevskis captured the essence of this integrated approach to PAD by coining the phrase ABCDE bundle, which stands for awakening and breathing, coordination, delirium prevention and monitoring, and early mobility and exercise," said Barr.

Other recent research shows that the incidence of delirium in ICU patients may be as high as 80%. Most of these patients manifest a hypoactive form of delirium, which can result in the underdiagnosis of delirium (Spronk P, et al. *Intensive Care Med.* 2009; 35:1276-1280; Schweickert W, et al. *Lancet.* 2009; 373:1874-1882; Vasilevskis E, et al. *Chest.* 2010; 138:1224-1233; Devlin J, et al. *Crit Care Med.* 2010; 38:419-427). Newer data also reveal that delirium is associated with increased risk of long-term cognitive dysfunction in ICU survivors and an increased risk of death in critically ill patients (Girard T, et al. *Crit Care Med.* 2010; 38:1513-1520; Ely EW, et al. *JAMA.* 2004;291:1753-1762).

Implementing the 2013 ICU PAD guidelines requires an integrated, interdisciplinary approach, with early adopter representation of all stakeholders including: physicians, nurses, respiratory therapists, pharmacists, physical/occupational therapists, hospital administrators, patients, and families. "Implementation success will depend on the presence of an ICU clinician champion – someone who can lead by example to inspire others to move towards an integrated approach to managing PAD in all ICU patients," said Barr. The expected benefits of implementing the 2013 guidelines are substantial (Table 1).

The new PAD guidelines include the ICU PAD care bundle, a step-by-step road map for implementing guideline recommendations. Step 1 focuses on assessment of pain, agitation/sedation and delirium using validated tools at the bedside. Step 2 entails incorporating PAD assessments into daily ICU rounds, with the ICU team addressing the patient's current pain score and current analgesia regimen; current and target sedation scores and current sedation regimen; and current delirium score and delirium risk factors.

In Step 3, this daily assessment is used to target treatments for pain, agitation and delirium using protocols specific to the ICU. "The guidelines do not propose a one-size-fits-all drug treatment strategy, but protocol treatment goals should nevertheless be the same," said Barr. "First, optimize pain management by assessing and treating pain first, then sedating patients only if needed. Treat all significant pain in a timely fashion, employ patient-specific pain management strategies, and treat ICU procedural pain preemptively. Second, optimize sedation

Supported by a medical education grant from Hospira, Inc.

Table 1.

### Expected Benefits of Implementing the 2013 ICU PAD Guidelines

- Shortened duration on mechanical ventilation
- Reduced ICU length of stay
- Reduced hospital length of stay
- Increased ICU patient throughput and bed availability
- Decreased costs per patient
- Improved long-term cognitive function and mobility
- Increased number of patients discharged to home
- Decreased mortality rate

management by sedating as needed while maintaining a light level of sedation (i.e., patient can perform three of five commands), using either targeted sedation strategies or daily sedation holidays. Choose sedatives that minimize side effects. Finally, optimize delirium management through pharmacologic and nonpharmacologic strategies, making sure patients with delirium receive adequate pain treatment. Reorient ICU patients frequently, giving them access to their eyeglasses and hearing aids, if needed. Avoid benzodiazepines in patients with delirium for reasons other than alcohol/benzodiazepine withdrawal, and use antipsychotics judiciously.”

Step 4 involves implementing strategies to prevent PAD by linking spontaneous awakening trials to spontaneous breathing trials and early mobility protocols. Environmental management protocols are also followed to protect ICU patients’ sleep/wake cycles.

“These guidelines give us the opportunity to bring the humanity of our patients back into our practice and to significantly improve their lives beyond their ICU stay,” summarized Barr. “The past ten years of critical care practice have focused on implementing the sepsis care bundle. Let this be the decade of the PAD care bundle.”

## New Strategies for Preventing and Treating PAD in ICU Patients



Presented by Aaron M. Joffe, DO, an Assistant Professor in the Department of Anesthesiology and Pain Medicine at the University of Washington, Harborview Medical Center in Seattle, Washington, USA. He was also an active member of the American College of Critical Care Medicine’s Pain, Agitation and Delirium Guidelines Task Force.

Pain – a common occurrence in the ICU setting – should always be considered a cause of agitation in ICU patients. “We know that after discharge, 50% or more of patients may recall having had moderate to severe untreated pain in the ICU,” said Aaron M. Joffe, DO. “That underscores a serious unmet need.”

Joffe discussed the importance of using validated tools to measure pain, assess depth of sedation and determine whether delirium is present in ICU patients. Demonstrating the beneficial impact of pain assessment on outcomes, a large multicenter controlled trial in France and Luxembourg found that a single pain assessment on day 2 in the ICU reduced sedative/hypnotic use as well as days on mechanical ventilation and in the ICU (Payen JF, et al. *Anesthesiology*. 2009;111:1308-1316). Other research shows that providing analgesia first, so called analgeso-sedation, with little or no sedation-specific medication, may result in fewer days on mechanical ventilation and reduced ICU and hospital lengths of stay (Strøm T, et al. *Lancet*. 2010;375:475-480).

In measuring pain, patient self-assessment is the target “gold standard” and should be the basis of treatment. A numeric rating scale is preferred, whether the patient can verbalize the degree of discomfort or indicate where on a visual analog tool they lie. “There is no reason not to be using this for patients who can communicate,” said Joffe.

For patients with intact motor function but unable to self-assess, clinicians can choose from two widely validated and accepted tools recommended by the 2013 ICU PAD guidelines: the Behavioral Pain Scale (BPS) and the Critical Care Pain Observation Tool (CPOT). The BPS uses a scoring system to assess the patient’s facial expression, movement of upper limbs and compliance with mechanical ventilation. The CPOT also applies scores to a compendium of behavioral and physiologic indicators involving facial expression, body movements, muscle tension, evaluated by passive flexion and extension of upper extremities, and either

compliance with a ventilator (for intubated patients) or vocalization (for extubated patients). “These scores correlate well with those of patients who are able to self-report,” noted Joffe.

“However, it should be noted that with both of these tools, your ability to assess can be widely affected by people who are deeply sedated,” stated Joffe. “Therefore, after assessing and treating pain, clinicians would move into assessing and treating sedation.”

Assessment tools for agitation and sedation are subjective and based on observable behavior. “They should have proven inter-rater reliability and validity, and should show appropriate changes over time,” said Joffe. These tools are not applicable when neuromuscular blocking drugs are being administered and have limited reliability when patients are deeply sedated. The oldest tool for assessing agitation and sedation is the Ramsay Scale, which was expanded upon to the Sedation-Agitation Scale (SAS) in 1999 to identify different degrees of anxiety and agitation (Riker RR, et al. *Crit Care Med*. 1999;27:1325-1329). The Richmond Agitation Sedation Scale (RASS) adds further additional grading scores to the SAS for patients who are lightly sedated or those who are anxious or agitated. Both the SAS and RASS are validated tools and highly recommended in the 2013 ICU PAD guidelines.

“Evidence shows that light sedation is associated with better patient outcomes than deep sedation,” Joffe said. Light sedation is reflected by an SAS score of 3 to 4, and an RASS score of 0 to -2.

Delirium is a serious and common problem in the ICU, necessitating appropriate assessment and treatment. “Delirium in ICU patients is associated with increased mortality, days on mechanical ventilation, accidental device removal, and cognitive impairment at hospital discharge,” reported Joffe. One tool for assessing delirium is the Confusion-Assessment Method of ICU (CAM-ICU), based on four features of delirium. Diagnosis requires two features (altered mental status and inattention), plus either disorganized thought or an altered level of consciousness. Another assessment tool is the Delirium Screening Checklist, which includes eight features to be checked off by the clinician if observed in the ICU patient over the past 24 hours. Each feature is scored as 1 if present. Delirium is diagnosed when four or more features (score >4) are present. An example of a patient with delirium is presented in Table 2. Both assessment tools are based on features denoted in the Diagnostic and Statistical Manual of Mental Disorders.

Assessment of pain, agitation and delirium is followed by the treatment recommendations set forth in the 2013 ICU PAD guidelines, which address the use of sedatives and atypical antipsychotics, the need to minimize delirium-associated medications such as benzodiazepine agents, and reorientation therapy.

Table 2.

### ICU Delirium Screening Checklist and Sample Score

Item	Score
Altered level of consciousness	1
Inattention	1
Disorientation	1
Hallucination, delusion, psychosis	0
Agitation or psychomotor retardation	1
Inappropriate speech or mood	0
Sleep/wake cycle disturbance	1
Symptom fluctuation	1
<b>TOTAL SCORE (0-8)</b>	<b>6/8</b>

Scoring: 0 = No delirium; 1-3 = Subsyndromal; ≥4 = Delirium

Reproduced with permission. © 2001 Springer. Bergeron N, Dubois MJ, Dumont M, Dial S, Skrobik Y. Intensive Care Delirium Screening Checklist: evaluation of a new screening tool. *Intensive Care Med*. 2001;27(5):859-864.

## Performance Metrics: PAD Guideline Implementation Strategies

“There are performance improvement strategies we can use in the workplace to transform the new ICU PAD guidelines into practice for the best possible outcomes, including prevention of post-intensive care syndrome,” stated Judy E. Davidson, RN, CNS, DNP, FCCM. This syndrome, known as PICS, describes new or worsening physical, cognitive or mental health impairments arising after critical illness and persisting beyond acute care hospitalization. “To protect our patients against these long-term complications – which can affect ICU survivors as well as family members – I urge critical care practitioners to embrace the new guidelines,” Davidson said.

The use of performance improvement strategies begins with analyzing the gap between what the guidelines recommend and an ICU’s current practice. “First, you should read the ICU PAD guidelines thoroughly,” said Davidson. “Then, ‘go to the gembu’ – a Six Sigma term that means ‘go to the place where the truth can be found.’ To do that you will need to talk to the frontline staff about what they’re doing, and look at the patients, not just their charts. Go to the front line and watch current practice.”

Speaking with staff will reveal the obstacles that exist in providing optimal care. “Staff will pinpoint the real issues that prevent them from changing care, and help uncover where future resistance may lie,” said Davidson. “Also, find out who wrote the policies, procedures, order sets, and orientation materials in the past – and enlist them as supporters in making changes.”

Another gap analysis tool is to “round with a purpose to evaluate current practice.” This involves making a checklist of procedures that need to be evaluated, then going on rounds at least once a week to check these at the bedside. This analysis will help you to identify where to focus change efforts. Surveying key stakeholders about current practice is also effective in analyzing and identifying gaps. “Once you’ve identified the gaps, you should create a team of interested parties to propose, approve, and implement change,” said Davidson. It is important to assemble an interdisciplinary team.

To monitor improvements in process and outcomes, metrics must be identified from selected points of change. Examples of process measures include hours at target sedation level, use of benzodiazepines, and early mobility. Outcomes measures might include quality of life, functional status, length of stay, mortality, mechanical ventilation-free

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days, delirium-free days, and discharge destination. “It takes a long time to see changes in outcome measures; they won’t show the short-term gains you see with process measure,” said Davidson.

Davidson also noted that implementing guidelines and monitoring change are not the same as conducting research. “To make change at the bedside and monitor that improvement based on evidence-based practice, you must do frequent interim data analysis, and change the plan whenever it’s not working. You’ll need to do frequent coaching to get the numbers right and have a constant presence to make the change stick,” she said. This requires intense, sustained interdisciplinary education and teamwork regarding early mobility, injury prevention, coordination of breathing trials, and maintenance of target sedation goals.

The mnemonic **ABCDE** has been previously described to guide an approach to pain, agitation and delirium care in the ICU. **A**irway and **B**reathing: **C**oordinated ventilator management, **D**elirium assessment and **E**arly mobility. However, also germane to performance improvement and guideline implementation is the **FGH** strategy: **F**amily involvement and follow-up referrals; **G**ood hand-off communication across transitions of care (“If we don’t explain the differences in the way we’ve treated and assessed the patient in the ICU to our floor staff, we may lose ground as the patient moves to the next level of care,” said Davidson); and **H**anding family written information about the consequences of critical illness and potential referrals. It is important to align principles of family-centered care into the guideline implementation: shared decision-making, early and frequent family communication, and family involvement in care. Davidson concluded, “The recommendations in the new guidelines call for maintaining patients in an awake state so that they can actively engage in activities. This is hard work, and it is important now more than ever to enlist the support of family in this process. Family can support the team with mobility goal setting and coaching, reporting pain and agitation, and performing cognitive activities with the patient.”

### Continuing Education Self-Assessment

#### Strategies for Preventing and Treating Pain, Agitation and Delirium in Clinical Practice

7. What percentage of patients recall having had moderate to severe pain that was untreated in the ICU?
  - a. 20%
  - b. 30%
  - c. 40%
  - d. 50%
  
8. How do the 2013 ICU PAD guidelines differ from the 2002 guidelines?
  - a. They provide fewer and more specific recommendations.
  - b. They place greater emphasis on delirium prevention and treatment.
  - c. They are more specific in recommending drugs for various clinical situations.
  - d. They base some recommendations on expert opinion when evidence is lacking.