Post ICU Syndrome (PICS): What You Need to Know to Impact Outcomes Starts with Your ABC’s…

Kathleen M. Vollman MSN, RN, CCNS, FCCM, FAAN
Clinical Nurse Specialist / Educator / Consultant
ADVANCING NURSING
kvollman@comcast.net
Northville Michigan
www.Vollman.com
Disclosures for Kathleen Vollman

- Consultant-Michigan Hospital Association Keystone Center
- Consultant/Faculty for CUSP for MVP—AHRQ funded national study
- Subject matter expert for CAUTI and CLABSI for CMS/HEN 1.0 & 2.0
- Consultant and speaker bureau for Sage Products LLC
- Consultant and speaker bureau for Hill-Rom Inc
- Consultant and speaker bureau for Eloquest Healthcare
Learning Objectives

At the completion of this activity, the participant will be able to:

• Define Post ICU Syndrome in the patient and family
• Identify current practice through performance of a gap analysis and begin to build the will to reduce cognitive and physical dysfunction harm that occurs during a patients ICU stay.
• Discussion current evidence based practice that can help reduce PICS & PICS-F
Changing Culture-Critical to Success

• Culture does not change because we desire to change it. Culture changes when the organization is transformed; the culture reflects the realities of people working together every day."
— Frances Hesselbein
The Why
PICS: Concepts Driving Initiatives

Focus on safe transitions and handoffs

Critical care is the whole episode of care---not just the ICU

Family-centered care

Post Intensive Care Syndrome

Post Intensive Care Syndrome (PICS)

Family
(PICS-F)
- Mental Health
  - Anxiety/ASD
  - PTSD
  - Depression
  - Complicated Grief

Survivor
(PICS)
- Mental Health
  - Anxiety/ASD
  - PTSD
  - Depression
- Cognitive Impairments
  - Executive Function
  - Memory
  - Attention
  - Visuo-spatial
  - Mental Processing Speed
- Physical Impairments
  - Pulmonary
  - Neuromuscular
  - Physical Function

PICS is defined as new or worsening impairment in physical, cognitive, or mental health status arising and persisting after hospitalization for critical illness.
PICS-Physical Dysfunction

• Less than 10% of patients on mechanical ventilation for > 4 d are alive and fully independent 1 yr later
• Caregiver assistance ranging from assistance with activities of daily living to full care is required by patients 1 yr later
• Half of patients with adult respiratory distress syndrome have not returned to work 1 yr later
• ICU-acquired weakness that can persist for years can develop in 25–80% of those with sepsis or on mechanical ventilation for > 4 d

PICS: Cognition & Mental Illness

• Cognitive impairment that can persist for years develops in 30–80% of patients
• Symptoms of depression occur 1/3 of patient and persist for a year
• Symptoms of anxiety occur in 23–48% have symptoms of anxiety
• Symptoms of posttraumatic distress syndrome occur in 10–50% of patients and may persist for years

Epidemiology of ICU Delirium

- 20 - 80% of ICU patients have delirium during ICU
- Frequently unrecognized or misdiagnosed by clinicians

**Subtypes:**
- Hyperactive (agitated, increased motor activity) 1%
- Hypoactive (sleepy, inattentive, decreased motor activity) 44%
- Mixed 55%

- Onset: ICU Day 2 (+/- 2)
- Duration: 4 (+/- 2) days
- 50% & 10% of ARDS pts delirious at ICU & hospital d/c

Ely, EW, et al. *JAMA* 2001; 286, 2703-2710
Peterson, et al *JAGS* 2006; 54:479-484
McNicoll L, *JAGS* 2003;51:591-98;
Brain-ICU Study

- Multicenter RCT- medical-surgical ICU’s
- 821 patients with ARF or Shock
- Evaluated in-hospital delirium and cognitive impact 3-12 months post d/c

Results

- 74% of patients developed delirium during hospital stay
- 1/3 & 1/4 had cognitive scores at 1 year follow-up c/w moderate TBI & mild Alzheimers, respectively
- Affected both older and younger

Lived Experience of ICU in Patients with Delirium

“I can’t remember”

“fear & safety concerns”

“wanting to make a connection”

“trying to get it straight”

Delirium and Patient Outcomes

- Independently associated with increased risk of death
- Duration assoc. with short & long term cognitive impairment
- 1 out of 4 patients had cognitive impairment at 12 months
- Mech Vent duration
- ICU & Hospital Length of Stay
- Estimated national costs $4 to $16 Billion
- Post-d/c anxiety/ PTSD symptom from delirious memory
Patient Risk Factors

- Immobility
- Number of days on mechanical ventilation
- Length of stay in the ICU
- Heavy sedation
- Delirium
- Hypoglycemia
- Hypoxia
- Sepsis
- ARDS

PICS-F: Psychosocial Challenges

• Anxiety is present in 10–75% of family
• Symptoms of posttraumatic distress syndrome occur in 8–42% of family
• Medication for anxiety or depression are required by 33% of family
• The above can persist for years
• Family members may develop prolonged or complicated grief
• Family members may have exacerbation of chronic health conditions
• Family dynamics may be challenged
• Family financial security may be at risk
  – A total of 50% of patients require caregiver assistance 1 year later.

The Cost of Surviving ICU Care

• 50% ICU survivors require long term care
• 31% depleted savings
• 20% reported family had to leave gainful employment
• Caregiver support-17.4 hours per week
• Higher 5 year mortality (32.2% vs 22.7%)
• Greater hospital resource use defined as mean hospital readmission rate (4.8 vs. 3.3/person/five years)
• Comorbidities/pre-ICU hospitalizations stronger predictor of hospital resource use than acute illness
• 51% higher mean 5 year hospital cost ($23,608 vs 16,913/patient)
• After adjustment for co-founders-resource use persisted

Prevention is Key

Minimizing Risk Factors
Reduction of Risk Factors for PICS-F

- Family center care programs
- Frequent and understandable communication about the patient’s care and condition
- Shared decision-making
- Early psychologic intervention and support
- Family presence and participation in care programs
- Caseworker and social worker involvement in care and planning
- ICU diaries an education on how to use them
- Information on PICS and resources

Reduction of Risk Factors for PICS

• ABCDEFGH bundle
  – Follow up referrals
  – Functional reconciliation checklist
  – Good Handoff communication
  – Handout materials on PICS & PICS-F
• Early psychologic intervention
• ICU diaries
• Healing environments of care
• Post-discharge follow-up programs

“Four Cornerstones for Success”

Evidence Based Practice → Inter-Professional Teams

Reduction of Practice Variation → System Collaboration
Blending Priorities

Clinical Implementation of PAD guidelines + Inter-professional Team Development

The ABCDEFGH Bundle for the ICU
ASSESS, PREVENT & MANAGE PAIN

BOTH SAT & SBT

CHOICE OF SEDATION

DELIRIUM

EARLY MOBILITY

FAMILY ENGAGEMENT & EMPOWERMENT/FOLLOW UP REFERRALS/ FUNCTIONAL CHECKLIST

GOOD HANDOFF COMMUNICATION

HANDOUT MATERIALS FOR PICS & PICS-F

www.iculiberation.org
ASSESS, PREVENT & MANAGE PAIN

Society of Critical Care Medicine PAD Guidelines 2013

CPOT and BPS most valid and reliable

The American Society of Pain Management Nursing July 2011

CPOT is acceptable for the critically ill/unconscious
### Critical Care Pain Observation Tool (CPOT)

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

Assess
- Assess pain ≥ 4x/shift & PRN
- Significant pain with NRS >3, BPS >5, or CPOT>2

Treat
- Treat pain within 30 minutes of detecting significant pain & REASSESS:
  - Non-pharmacological treatment (e.g. relaxation)
  - Pharmacological treatment

Prevent
- Administer pre-procedural analgesia and/or non-pharmacological interventions
- Treat pain first, then sedate
### Acute Pain Management Algorithm

**Choosing Appropriate Opioid: If multiple oral or IV opioids in the same class are ordered, select opioid in order shown.**

<table>
<thead>
<tr>
<th>Class</th>
<th>Morphine Equivalence</th>
<th>IV</th>
<th>Route</th>
<th>Analgesic Potency Medication Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>1 – 2 mg</td>
<td>PO</td>
<td>Morphine 1-2 mg (2 mg dose)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxycodeine 5 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Percocet® (oxycodeine-acetaminophen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Norco® (hydrocodone-acetaminophen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Norco®, Norco®, Norco®</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hydrocodeone 2 mg, 1 tablet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tylenol® #3 (codeine-acetaminophen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IV</td>
</tr>
<tr>
<td>C</td>
<td>2.5 – 4 mg</td>
<td>PO</td>
<td>Morphine 2.5 – 4 mg (4 mg dose)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxycodeine 10 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Percocet® (oxycodeine-acetaminophen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Norco® (hydrocodone-acetaminophen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Norco®, Norco®, Norco®</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hydrocodeone 2 mg, 1 tablet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tylenol® #3 (codeine-acetaminophen)</td>
</tr>
<tr>
<td>D</td>
<td>4.5 – 7 mg</td>
<td>PO</td>
<td>Morphine 5 – 7 mg (6 mg dose)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxycodeine 10 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Percocet® (oxycodeine-acetaminophen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Norco® (hydrocodone-acetaminophen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Norco®, Norco®, Norco®</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hydrocodeone 4 mg, 1 tablet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Morphine 1.5 mg</td>
</tr>
</tbody>
</table>

*Important Additional Information:*
- Page clinicians for more potent oral medication dose if repeated IV rescue dose needed. Not recommended to repeatedly alternate oral and IV doses or two short acting opioid medications.
- May only rescue once in a dosing interval. If additional rescue is needed, page clinician.
- Adding NSAIDs, Ultrans or acetaminophen around the clock reduces the opioid dose needed and side effects.
- For pain management algorithm, go to Med Use Policy 201: Dose and Other Range Orders on Internet.

04/24/2013

**Dose Diminishing Factors:**
- Systolic blood pressure less than 90 and opioid naïve
- Overall state of debility and older than 70 years
- Less than 45 kg (100 pounds) and older than 70 years
- Disease states: Pre-existing pulmonary or cardiac disease or dysfunction or major organ failure COPD, asthma, morbid obesity, and/or sleep apnea.
- Receiving other sedating drugs and older than 70 years
- Page clinicians before PRN opioid dose for:
  - Sedation level 4 or 5 using a 1-5 sedation scale (difficult to arouse-unresponsive)
  - Respiratory rate less than 10

**Dose Enhancing Factors:**
- Pain score greater than 7 and unacceptable to patient.
- Patient is receiving an opioid analgesic equivalent to at least a Class D prior to admission.
- Patient receiving PCA, greater than 20 mg/hr or epidural dose greater than 55 mcg/hr prior to selecting PRN opioid analgesic.
Procedures Hurt More Than We Think

• Most Painful
  – Turning
  – Wound drain removal
  – Wound care
  – Chest tube removal
  – Arterial line insertion

• Others
  – ET suctioning
  – Tracheal suctioning
  – Femoral sheath removal
  – Mobilization
  – Peripheral blood draw & IV
  – Positioning
  – Respiratory exercises
  – Central line removal

Puntillo K AJCC 2001;10:238-251
Puntillo K AJRCCM, 2014;89:39-47
## Treating Acute Pain in the ICU

<table>
<thead>
<tr>
<th>Situation</th>
<th>Preferred Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute pain</td>
<td>Fentanyl IVP until pain resolves</td>
</tr>
<tr>
<td>Acute pain that persists/recurs</td>
<td>Fentanyl infusion plus fentanyl IVP for breakthrough</td>
</tr>
<tr>
<td>Acute pain in chronic opioid user?</td>
<td>Account for previous opioid use when using IV opioid (may consider ketamine)</td>
</tr>
<tr>
<td>Planned transition out of ICU and patient</td>
<td>Start scheduled oral/enteral opioid therapy (e.g., oxycodone) plus intermittent IV opioid (e.g., IVP or PCA)</td>
</tr>
<tr>
<td>on IV opioid infusion</td>
<td></td>
</tr>
</tbody>
</table>

[www.ICU liberation.org](http://www.ICU liberation.org)
Agitation

• Avoid deep sedation/coma:
  – Sedative medications should be titrated to maintain lighter levels of sedation, unless clinically contraindicated. (+1B)
  – Use daily awakening or a titrated sedation strategy to maintain patient wakefulness. (1B)

• Choice of sedative:
  – Non-benzodiazepines may be preferred over benzodiazepines to improve clinical outcomes in mechanically ventilated ICU patients. (+2B)

• Reduction in sedation requirements:
  – Use of an analgesia-first (i.e., analog-sedation) strategy is recommended in mechanically ventilated patients. (+ 2B)
Daily Sedation Interruption Decreases Duration of Mechanical Ventilation

- Hold sedation infusion until patient awake, then restart at 50% of prior dose
- “Awake” defined as any 3 of the following:
  - Open eyes in response to voice
  - Use eyes to follow investigator on request
  - Squeeze hand on request
  - Stick out tongue on request

www.ICUliberation.org.

- Length of MV 4.9 vs. 7.3 days (P=0.004)
- ICU LOS 6.4 vs. 9.9 days (P=0.02)
- Fewer diagnostic tests to assess changes in mental status
- No increase in rate of agitated-related complications or episodes of patient-initiated device removal
- No increase in PTSD or cardiac ischemia
## Propofol vs. Benzodiazepines

<table>
<thead>
<tr>
<th>Randomized Trial</th>
<th>ICU</th>
<th>Comparator</th>
<th>Superior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ronan et al. 1995</td>
<td>Surgical</td>
<td>Midazolam</td>
<td>Propofol</td>
</tr>
<tr>
<td>Chamorro et al. 1996</td>
<td>General</td>
<td>Midazolam</td>
<td>Propofol</td>
</tr>
<tr>
<td>Hsiao et al. 1996</td>
<td>Surgical</td>
<td>Midazolam</td>
<td>Equivalent</td>
</tr>
<tr>
<td>Kress et al. 1996</td>
<td>Medical</td>
<td>Midazolam</td>
<td>Propofol</td>
</tr>
<tr>
<td>Barrientos-Vega et al. 1997</td>
<td>General</td>
<td>Midazolam</td>
<td>Propofol</td>
</tr>
<tr>
<td>Searle et al. 1997</td>
<td>Cardiac</td>
<td>Midazolam</td>
<td>Equivalent</td>
</tr>
<tr>
<td>Weinbroum et al. 1997</td>
<td>General</td>
<td>Midazolam</td>
<td>Both</td>
</tr>
<tr>
<td>Sanchez-Izquierdo-Riera JA, et al. 1998</td>
<td>Trauma</td>
<td>Midazolam</td>
<td>Propofol</td>
</tr>
<tr>
<td>Hall et al. 2001</td>
<td>Mixed</td>
<td>Midazolam</td>
<td>Propofol</td>
</tr>
<tr>
<td>Carson et al. 2006</td>
<td>Medical</td>
<td>Lorazepam</td>
<td>Propofol</td>
</tr>
</tbody>
</table>

Outcomes improved by **propofol**: sedation quality, ventilator synchrony, time to awakening, variability of awakening, time to extubation from discontinuation of sedation, overall time to extubation, ventilator days, ICU LOS among survivors, costs of sedation.

Slide courtesy of Brenda Pun
Dexmedetomidine vs Benzodiazepines

<table>
<thead>
<tr>
<th>Trials with better outcomes with Dex</th>
<th>Population</th>
<th>Outcome Improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pandharipande et al/2007</td>
<td>Mixed ICU</td>
<td>More accurate sedation, more delirium/coma-free days</td>
</tr>
<tr>
<td>Riker et al/2009</td>
<td>Mixed ICU</td>
<td>Lower prevalence of delirium, earlier extubation</td>
</tr>
<tr>
<td>Ruokonen et al/2009</td>
<td>Mixed ICU</td>
<td>Shorter duration of mechanical ventilation</td>
</tr>
<tr>
<td>Maldonado et al/2009</td>
<td>Cardiac surgery</td>
<td>Lower incidence and duration of delirium</td>
</tr>
<tr>
<td>Esmaoglu et al/2009</td>
<td>Eclampsia</td>
<td>Shorter ICU length of stay</td>
</tr>
<tr>
<td>Dasta et al/2010</td>
<td>Mixed ICU</td>
<td>Lower ICU costs</td>
</tr>
<tr>
<td>Jakob et al/2012</td>
<td>General ICU</td>
<td>Lighter sedation, fewer ventilation days</td>
</tr>
</tbody>
</table>

 Trials with better outcomes with Benzo’s = None

Slide courtesy of Brenda Pun

Non-Benzodiazepine Sedative Medications are Associated with Better ICU Outcomes

- Systematic review and meta-analysis of 6 RCTs comparing benzodiazepine vs. non-benzodiazepine ICU sedation regimens:
  - ↓ICU LOS (6 studies)
    - Difference of 1.6 days, \( P= 0.0007 \)
  - ↓ Duration of mechanical ventilation (4 studies)
    - Difference of 1.9 days, \( P< 0.00001 \)
  - Similar delirium prevalence and short-term mortality.

Fraser G. Crit Care Med. 2013; 41:S30-8
Association Between Different Sedatives & Vent Related Outcomes

• Single academic center, retrospective analysis of patients mechanically ventilated for greater ≥ three days
• 9603 consecutive episodes of mechanical ventilation were evaluated over seven years

• Results
  – Benzodiazepines and propofol were associated with ↑ VAE risk, dexmedetomidine was not
  – Propofol associated with less time to extubation compared with benzodiazepines.
  – Dexmedetomidine was associated with less time to extubation compared with benzodiazepines and propofol. (small number)
  – No difference in hospital discharge or mortality

Agitation

- Assess q 4hrs or prn with change in dose or patient's condition
- Use validated tool (RASS or SAS)
- RASS target -1 to +1
- SAS target 3 to 4

<table>
<thead>
<tr>
<th>Score</th>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Combative</td>
<td>Overly combative or violent; immediate danger to staff</td>
</tr>
<tr>
<td>+3</td>
<td>Very agitation</td>
<td>Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated</td>
<td>Frequent nonpurposeful movement or patient-ventilator dyssynchrony</td>
</tr>
<tr>
<td>+1</td>
<td>Restless</td>
<td>Anxious or apprehensive but movements not aggressive or vigorous</td>
</tr>
<tr>
<td>0</td>
<td>Alert and calm</td>
<td>Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact, to voice</td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy</td>
<td>Briefly (less than 10 seconds) awakens with eye contact to voice</td>
</tr>
<tr>
<td>-2</td>
<td>Light sedation</td>
<td>Any movement (but no eye contact) to voice</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate sedation</td>
<td>No response to voice, but any movement to physical stimulation</td>
</tr>
<tr>
<td>-4</td>
<td>Deep sedation</td>
<td>No response to voice or physical stimulation</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable</td>
<td></td>
</tr>
</tbody>
</table>

Procedure
1. Observe patient. Is patient alert and calm (score 0)? Does patient have behavior that is consistent with restlessness or agitation (score +1 to +4 using the criteria listed above, under DESCRIPTION)?
2. If patient is not alert, in a loud speaking voice state patient's name and direct patient to open eyes and look at speaker. Repeat once if necessary. Can prompt patient to continue looking at speaker.
   Patient has eye opening and eye contact, which is sustained for more than 10 seconds (score -1).
   Patient has eye opening and eye contact, but this is not sustained for 10 seconds (score -2).
   Patient has any movement in response to voice, excluding eye contact (score -3).
3. If patient does not respond to voice, physically stimulate patient by shaking shoulder and then rubbing sternum if there is no response to shaking shoulder.
   Patient has any movement to physical stimulation (score -4).
   Patient has no response to voice or physical stimulation (score -5).
ASSESS, PREVENT & MANAGE PAIN

BOTH SAT & SBT

CHOICE OF SEDATION

DELIRIUM

EARLY MOBILITY

FAMILY ENGAGEMENT & EMPOWERMENT/FOLLOW UP REFERRALS/ FUNCTIONAL CHECKLIST

GOOD HANDOFF COMMUNICATION

HANDOUT MATERIALS FOR PICS & PICS-F

www.iculiberation.org
TRUST THE PROCESS
**ABC Trial (RCT Paired Sedation & Vent Weaning Protocols)**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>SBT</th>
<th>SAT+SBT</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilator-free days</td>
<td>12</td>
<td>15</td>
<td>0.02</td>
</tr>
<tr>
<td>Time-to-event, days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successful extubation, days</td>
<td>7.0</td>
<td>5</td>
<td>0.05</td>
</tr>
<tr>
<td>ICU discharge, days</td>
<td>13</td>
<td>9</td>
<td>0.02</td>
</tr>
<tr>
<td>Hospital discharge, days</td>
<td>19</td>
<td>15</td>
<td>0.04</td>
</tr>
<tr>
<td>Death at 1 year, n (%)</td>
<td>97 (58%)</td>
<td>74 (44%)</td>
<td>0.01</td>
</tr>
<tr>
<td>Days of brain dysfunction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coma</td>
<td>3.0</td>
<td>2.0</td>
<td>0.002</td>
</tr>
<tr>
<td>Delirium</td>
<td>2.0</td>
<td>2.0</td>
<td>0.50</td>
</tr>
</tbody>
</table>

*Median, except as noted

ABC Trail: Mortality at 1 Year

Spontaneous Breathing Trials (SBTs) Protocol

If passes the SAT, assessed for the SBT safety screen
Passes the SBT screening if achieve:

• Adequate oxygenation (SpO₂ ≥ 88% or an FiO₂ of ≤ 50% and a PEEP ≤ 8 cm H₂O)
• Any spontaneous inspiratory effort in a 5-minute period
• No agitation
• No significant use of vasopressors or inotropes
• No evidence of increased intracranial pressure

CDC Prevention Epicenters
Wake Up and Breathe Collaborative

- Prospective quality improvement collaborative
- Goal: prevent VAEs through less sedation and earlier liberation from mechanical ventilation
- Mechanism: increase performance of paired daily spontaneous awakening trials and breathing trials (SATs and SBTs)
- 12 ICUs affiliated with 7 hospitals
CDC Prevention Epicenters’
Wake Up and Breathe Collaborative

**SATs / SBTs**
- 63% in SATs
- 16% in SBTs
- 81% in SBTs done with sedatives off

**VAEs**
- 37% in VACs
- 65% in IVACs

SAT & SBT Protocol

Is the patient responsive to verbal stimuli?

SAT Safety Screen

SAT: Can patient go w/o sedation and complications for 4 hours?

Restart sedation at half dosage, then titrate for pain/sedation

SBT Safety Screen

SBT: Does patient breathe w/o complications for 2 hours?

Notify physician to consider extubation

Rescreen tomorrow
Outcome of SAT/SBT

- Decreased days of mechanical ventilation
- Reduced weaning time
- Reduced reintubation rates
- Fewer days with delirium
- Decreased length of ICU stay
- Decreased length of hospital stay

Esteban A. Am J Respir Crit Care Med. 1999;159:512-8
www.ICUliberation.org
Making it Happen: Wake Up & Breathe

• Process Measure: Daily audit of SAT/SBT compliance or documentation of contraindication
  – Determine if they meet SAT criteria
  – Decrease or stop sedation per protocol
  – Determine if patient meets Readiness to Wean
  – Determine if meet SBT protocol criteria
  – Consider same time daily (sometimes x2)
  – Discuss results in multidisciplinary rounds
  – Include in nurse to nurse handoff/other handoffs
  – Ventilator LOS posted/Extubation rates posted
Additional Strategies for Success

- Implement non-physician staff driven protocols for daily SBT/SAT
- Protocols on order sets
- Include in both nursing & respiratory flow sheets
- Self extubation is slightly higher but re-intubation is not.

Ely W et al. Chest, 2001;120(6):454s-463s
Westwall S. Nursing in Critical Care, 2008;13(4):203-207
Abbott CA, et al. Worldviews on Evidence Based Practice, 2006:139-152
Building Resiliency Into Interventions

- Forcing Functions and Constraints
- Automation and Computerization
- Standardization and Protocols
- Checklist and Independent Check Systems
- Rules and Policies
- Education and Information
- Vague Warning – “Be More Careful!”

Strongest

STRENGTH OF INTERVENTION

Weakest
ASSESS, PREVENT & MANAGE PAIN
BOTH SAT & SBT
CHOICE OF SEDATION
DELIRIUM
EARLY MOBILITY
FAMILY/PATIENT ENGAGEMENT

COORDINATION & COMPREHENSIVE ORAL CARE
FEEDING
Delirium: First Focus on Prevention

- Pain and sedation scores
- Analgesia and Sedative Algorithm
  - Control pain first, then anxiety
  - Use intermittent meds first before continuous
- Target RASS + 1 to -1
- Daily SAT (spontaneous awakening trial)
- Daily SBT (spontaneous breathing trial)
- Implement non-pharmacological strategies
• Delirium Assessment:
  • ICU-CAM
  • ICU Delirium Screening Checklist

• Frequency:
  • Q shift & prn

Delirium Assessment & Management

Confusion Assessment Method in the ICU

Delirium Assessment (CAM-ICU): 1 AND 2 AND (Either 3 or 4)

1. Acute Onset or Fluctuating Course
   - An acute change from mental status baseline?
   - Or Patient’s mental status fluctuating during the past 24 hours
   - If Yes, proceed to next step.
   - If No, stop. No delirium.

2. Inattention
   - Please read the following ten letters and ask the patient to squeeze when you say the letter: S A V E A H A R T
   - Scoring:
     - Error: when patient fails to squeeze on the letter “A”.
     - Error: when the patient squeezes on any letter other than “A”.
   - If Less than 3 Errors, stop. No delirium.
   - If Greater than or equal to 3 Errors, proceed to next step.

3. Altered Level of Consciousness (“actual” RASS)
   - If RASS is 0, stop. Patient is Delirious.
   - If RASS is other than zero, proceed to next step.

4. Disorganized Thinking
   - Will a stone float on water? (Or: Will a leaf float on water?)
   - Are there fish in the sea? (Or: Are there elephants in the sea?)
   - Does one pound weigh more than two pounds? (Or: Do two pounds weigh more than one?)
   - Can you use a hammer to pound a nail? (Or: Can you use a hammer to cut wood?)
   - OR Command: Say to patient: “Hold up this many fingers” (Examiner holds two fingers in front of patient) “Now do the same thing with the other hand” (Not repeating the number of fingers). If patient is unable to move both arms for the second part, ask patient “add one more finger”
In Rounds When ICU-CAM is +

• When reporting the CAM ICU in rounds, if it is positive the following evaluation should occur.
• Dr. Dre
  – Dr: diseases; diseases that contributes to delirium (sepsis, hypoxia, COPD)
  – Dr: drug removal; benzodiazepines or any drug interactions that may contribute to delirium
  – E: environment; nonpharmacological interventions to reduce delirium. This may include reorientation sleep protocol, unrestrained, eyeglasses, hearing aids etc.
### Non-Pharmacological Strategies

#### Sleep Promotion
- Appropriate Medications
- Bath during day
- Chair position
- Lighting
- Television
- Hearing/Vision Aids/Dentures
- Control Noise
- Ear plugs/eye mask
- Minimizing care related disruptions

#### Mobility Promotion
- Evaluate for Physical Therapy
- Range of Motion
- Sleep
- Work with PT
- Spontaneous Awakening Trial

#### Sedation Holidays
- Sleep Promotion
- Mobility

---

Pandharipande P et al. (Lorazepam) *Anesthesiology* 2006;104:21–26;
Oimet ICM 2007; 33:1007-1013;
Pandharipande P et al. (Midazolam) *J Trauma* 2008
Abraha I, et al. Plos One. 2015;DOI:10.1371/journal.pone.0123090
PAD Treatment of Delirium Recommendations

• 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 do not** recommend administering **rivastigmine** to reduce the duration of delirium in ICU patients (–1B).
Perceptions and Practices Regarding Sleep in the ICU*1

- 1223 surveys of providers
  - 59% nurses
  - 39% physicians
- 24 countries
- 75% indicate ICU patients sleep poor or very poor
- 83% to 97% felt poor sleep was associated with negative ICU outcomes
- 32% had sleep promoting protocols

ICU noise at 45dBA & ½ the time at 54 dBA²

2. The Sleep in the ICU Task Force
## Table 4. Perceptions and practices surrounding sleep promotion in the ICU

<table>
<thead>
<tr>
<th>Question</th>
<th>All Respondents*</th>
<th>Sleep Protocol in ICU $^b$</th>
<th>P value$^c$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>Yes (n = 386)</td>
<td>No or Unknown (n = 810)</td>
</tr>
<tr>
<td>What is the one thing that you believe may improve your patients sleep in the ICU?</td>
<td>590 (49%)</td>
<td>182 (47%)</td>
<td>404 (50%)</td>
</tr>
<tr>
<td>Allowing patients blocks of uninterrupted sleep time</td>
<td>225 (19%)</td>
<td>67 (17%)</td>
<td>157 (19%)</td>
</tr>
<tr>
<td>Noise control</td>
<td>128 (11%)</td>
<td>45 (12%)</td>
<td>82 (10%)</td>
</tr>
<tr>
<td>Keeping patients physically active during the day so they are more tired for sleep at night</td>
<td>113 (9%)</td>
<td>36 (9%)</td>
<td>75 (9%)</td>
</tr>
<tr>
<td>Keeping the ICU dark at night and bright during the day</td>
<td>66 (5%)</td>
<td>27 (7%)</td>
<td>39 (5%)</td>
</tr>
<tr>
<td>Keeping patients awake during the day so they are more tired for sleep at night</td>
<td>38 (3%)</td>
<td>14 (4%)</td>
<td>23 (3%)</td>
</tr>
<tr>
<td>Medication prescribed for sleep</td>
<td>45 (4%)</td>
<td>15 (4%)</td>
<td>30 (4%)</td>
</tr>
<tr>
<td>Other / Do not know</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What percent of your patients receive medications for sleep?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-25%</td>
<td>574 (48%)</td>
<td>182 (48%)</td>
<td>387 (48%)</td>
</tr>
<tr>
<td>26-50%</td>
<td>377 (32%)</td>
<td>124 (33%)</td>
<td>250 (31%)</td>
</tr>
<tr>
<td>51-75%</td>
<td>137 (11%)</td>
<td>41 (11%)</td>
<td>95 (12%)</td>
</tr>
<tr>
<td>76-100%</td>
<td>87 (7%)</td>
<td>28 (7%)</td>
<td>59 (7%)</td>
</tr>
<tr>
<td>Do not know</td>
<td>19 (2%)</td>
<td>6 (2%)</td>
<td>13 (2%)</td>
</tr>
<tr>
<td>Rate whether you can do the following, 1 = Never, 10 = Always, mean (SD)</td>
<td>6.1 (2.4)</td>
<td>6.5 (2.4)</td>
<td>5.9 (2.4)</td>
</tr>
<tr>
<td>Assess whether patients are sleeping enough</td>
<td>6.7 (2.6)</td>
<td>7.1 (2.2)</td>
<td>6.5 (2.4)</td>
</tr>
<tr>
<td>Control lighting conditions to allow patients to sleep</td>
<td>5.7 (2.5)</td>
<td>6.0 (2.2)</td>
<td>5.5 (2.3)</td>
</tr>
<tr>
<td>Control environmental noise levels to allow patients to sleep</td>
<td>6 (2.6)</td>
<td>5.9 (2.5)</td>
<td>6.0 (2.4)</td>
</tr>
<tr>
<td>Adjust the ventilator or bilevel PAP to allow patients to sleep</td>
<td>6.5 (2.5)</td>
<td>6.8 (2.2)</td>
<td>6.3 (2.3)</td>
</tr>
<tr>
<td>Delay non-emergency disturbances to allow patients to sleep</td>
<td>6.6 (2.5)</td>
<td>7.2 (1.9)</td>
<td>6.4 (2.3)</td>
</tr>
<tr>
<td>Adhere to a clustered sleep protocol designed for the ICU</td>
<td>6.2 (2.9)</td>
<td>6.4 (2.7)</td>
<td>6.2 (2.7)</td>
</tr>
<tr>
<td>Temporarily suspend visitation to allow for sleep</td>
<td>6.7 (2.4)</td>
<td>7.1 (2.0)</td>
<td>6.5 (2.2)</td>
</tr>
</tbody>
</table>

*Total responses do not total 1223 since all respondents did not answer the question. Percentages represent proportion of responses among completed.


The Sleep in the ICU Task Force
Healing Environments

- Lighting
- Color
- Art
- Noise reduction
- Room temperature
- Use of sensory aids
  - Glasses & hearing aids
- Promote family presence
- Sleep Protocols

↓ Delirium & anxiety which contribute to a ↓ in risk of cognitive impairment & PTSD post discharge

ASSESS, PREVENT & MANAGE PAIN

BOTH SAT & SBT

CHOICE OF SEDATION

DELIRIUM

EARLY MOBILITY

FAMILY ENGAGEMENT & EMPOWERMENT/FOLLOW UP REFERRALS/ FUNCTIONAL CHECKLIST

GOOD HANDOFF COMMUNICATION

HANDOUT MATERIALS FOR PICS & PICS-F

www.iculiberation.org
Outcomes of Early Mobility Programs

- ↓ incidence of VAP
- ↓ time on the ventilator
- ↓ days of sedation
- ↓ incidence of skin injury
- ↓ delirium
- ↑ ambulatory distance
- Improved function
- ↓ in hospital readmission
- ↓ ICU & Hospital LOS

Thomsen GE, et al. CCM 2008;36;1119-1124
Winkelman C et al, CCN,2010;30:36-60
Corcoran JR, et al. PMR J, 2016 in press
Progressive Mobility Continuum

START HERE

Perform Initial mobility screen w/in 8 hours of ICU admission
Reassess mobility level at least every 24 hours (Recommended at shift Δ)

Refer to the following criteria to assist in determining mobility level

- PaO2/FiO2 ≥ 250
- Peep <10
- O2 Sat > 90%
- RR 10-30
- No new onset cardiac arrhythmias or ischemia
- HR >60 <120
- MAP >55 <140
- SBP ≥90 <180
- No new or increasing vasopressor infusion
- RASS ≥ 3

**NO**

Start at level I*  
Start at level II and progress*

**YES**

Tolerates Level I Activities

LEVEL I

RASS -5 to - 3

Goal: clinical stability; passive ROM

ACTIVITY:
- HOB > 30°
- Passive ROM 2X/d performed by RN, or UAP

CLRT/Pronation initiated if patient meets criteria based on institutional practice
OR
Q 2 hr turning

LEVEL II

RASS -3 & up

Goal: upright sitting; increased strength and moves arm against gravity

ACTIVITY:
- Q 2 hr turning
- Passive /Active ROM 3x/d
  1. HOB 45° X 15 min.
  2. HOB 45°, Legs in dependant position X 15 min.
  3. HOB 65°, Legs in dependant position X 15 min.
  4. Step (3) & full chair mode
  X20 min. 3X/d
  Full assist into cardiac chair 2X/day

LEVEL III

RASS -1 & up

Goal: Increased trunk strength, moves leg against gravity and readiness to weight bear

ACTIVITY:
- Self or assisted Q 2 hr turning
  1. Sitting on edge of bed w/RN, PT, RT assist X 15 min.
  2. Progressive bed sitting Position
  Min.20 min. 3X/d
  Or
  Pivot to chair position 2X/d

LEVEL IV

RASS 0 & up

Goal: stands w/min. to mod. assist, able to march in place, weight bear and transfer to chair

ACTIVITY:
- Self or assisted Q 2 hr turning
  1. Bed sitting Position
  Min.20 min. 3X/d
  2. Sitting on edge of bed; stand w/RN, PT, RT assist
  3. Active Transfer to Chair (OBB) w/RN/PT/RT assist
  Min. 3X/d

LEVEL V

RASS 0 & up

Goal: Increase distance in ambulation & ability to perform some ADLs

ACTIVITY:
- Q 2 hr turning
  1. Chair (OBB) w/RN/PT/RT assist
  2. Meals consumed while dangling on edge of bed or in chair

AMBULATE progressively longer distances with less assistance x2 or x3/day with RN/PT/RT/UAP

For each position/activity change allow 5-10 minutes for equilibration before determining the patient is intolerant

***If the patient is intolerant of current mobility level activities, reassess and place in appropriate mobility level***

*Mobility is the responsibility of the RN, with the assistance from the RT’s Unlicensed Assistive Personnel and PT/OT. PT and OT may assist the team with placement to the appropriate mobility level of activity, always prioritizing patient and provider safety. Placement is based on clinical judgment.*
In-Bed Progressive Mobility

Journey to tolerating upright position, turning, tilt, sitting, standing and walking and out of bed chair sitting can occur quicker through the use of technology
It Takes a Village For Sustainability

1. Necessary Components for Early Rehab
   - Buy-in
   - Multiple disciplines
   - Team communication
   - Opinion leader
   - Individual discipline champion
   - Dedicated rehab personnel
   - Equipment
   - Sedation practice
   - Administrative funding

2. Implementation Strategies
   - Team center approach
   - Staff education
   - Strength & quality of evidence

3. Perceived Barriers
   - Increase workload
   - Safety concerns

4. Positive Outcomes
   - Improved patient outcomes
   - Staff satisfaction
   - Changed culture
   - Financial savings

“Even if you are on the right track, you will get run over if you just sit there.”

Will Rogers
ASSESS, PREVENT & MANAGE PAIN

BOTH SAT & SBT

CHOICE OF SEDATION

DELIRIUM

EARLY MOBILITY

FAMILY ENGAGEMENT & EMPOWERMENT/FOLLOW UP REFERRALS/ FUNCTIONAL CHECKLIST

GOOD HANDOFF COMMUNICATION

HANDOUT MATERIALS FOR PICS & PICS-F

www.iculiberation.org
Family Engagement and Empowerment

Good communication with the family is critical at every step of a patient’s clinical course, and empowering the family to be part of the team to ensure best care is adhered to diligently will improve many aspects of the patient’s experience. The F was recently added to help to keep patients and families as the center and focus of care.

www.icudelirium.org
Patient Family Centered Care Core Concepts

- Dignity and respect
- Information sharing
- Participation in care decisions
- Collaboration
<table>
<thead>
<tr>
<th>Treatment as a human being</th>
<th>Treatment as a unique individual</th>
<th>Treatment as someone entitled to professional patient care</th>
<th>Treatment with sensitivity to the patient’s vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offering introductions and greetings</td>
<td>Treating patient as an important and valuable person</td>
<td>Responsiveness and rapport</td>
<td>Orienting patients and families to the environment (machines, alarms)</td>
</tr>
<tr>
<td>Attending to basic bodily concerns (modesty, toileting, pain and comfort)</td>
<td>Facilitating ability to control aspects of care and make choices</td>
<td>Caring/positive attitude, demeanor, body language</td>
<td>Updating patients on their status and care plan</td>
</tr>
<tr>
<td>Treating patient as an equal</td>
<td>Recognizing individual preferences</td>
<td>Information Exchange a. Orientation/telling b. Explaining / Educating d. Listening e. Inviting questions and feedback</td>
<td>Interacting properly with professionals and patients and families during rounds</td>
</tr>
</tbody>
</table>

- Refraining from judgmental remarks and interacting considerately with
Meaningful Engagement to Positive Impact
Patient & Family Experience

• Empower patient/family representatives, facilitate their role, support them, help them communicate about and lead efforts
• They will provide you with the ‘ground truth’ and ask important questions that you would not think of.
• Create structures for ongoing engagement (e.g. PFACs at multiple levels); however, do not limit input to formal structures.
• Maintain engagement overtime (not a one time event)
• Families benefit when they can support themselves and the patient (flexible visitation, involvement in nursing care, participation in a diary)

Families are the heart of patient-centered care.

Welcome to the WICU

We believe that you know the person that we are caring for far better than we do.

We would like to invite you to participate in your loved one’s care.

Listed are options that you may choose.

If there is a particular care that you would like to assist with and it is not listed please speak with your nurse.

We will provide instruction as needed for each of the following according to your comfort level.

☐ Oral Care
☐ Incentive Spirometer
☐ Range of Motion
☐ Back Care
☐ Leg Care
☐ Assist with Ambulation
☐ Assist with Feeding
☐ Hand Care
☐ Shampoo
☐ Shave
☐ Pillow Repositioning
☐ Distraction- Music, TV, Reading
☐ Oscar Boot Repositioning

Thank you for your help, we are in this together!

Rhonda Malone Wyskiel, RN, BSN
Development of Menu

• Developed the Family Involvement Menu using results from nurse exercise and family survey.

• Educated nursing staff on the availability and intended uses of the Menu

• Displayed the Family Involvement Menu on a reusable white board in each patient room and encouraged its use.
“I have learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.”

Maya Angelou
Functional Reconciliation/
Follow Up Referrals

• Used to describe and keep track of progress in the patient’s physical, cognitive and mental status
• Helps to facilitate communication across the continuum of care
• Begins with an assessment of patient’s status prior to admission and follows them through the recovery
• Believed to be useful but has not been studied yet

ICU Diaries

- Used routinely in Europe
- Diaries are kept by families and staff to describe the patient's experience during the ICU stay
- Pictures are sometimes included
- When read post discharge, diaries can fill in memory gaps, replace false memories and delusions

Outcomes of ICU Diaries:
- Decrease anxiety, depression and PTSD symptoms
- Decrease PTSD symptoms in families

Early Psychologic Intervention

- Psychologists as members of the critical care team
- Early patient & family support, counseling and education on stress management and coping skills
- Psychologist involvement has shown to cut the prevalence of anxiety, depression and PTSD in half

ASSESS, PREVENT & MANAGE PAIN

BOTH SAT & SBT

CHOICE OF SEDATION

DELIRIUM

EARLY MOBILITY

FAMILY ENGAGEMENT & EMPOWERMENT/FOLLOW UP REFERRALS/ FUNCTIONAL CHECKLIST

GOOD HANDOFF COMMUNICATION

HANDOUT MATERIALS FOR PICS & PICS-F

www.iculiberation.org
Major Theme: Survivors do not experience continuity of medical care during recovery after critical illness
  - Informational needs change across the care continuum
  - Fear and worry persist when families don’t know what to expect
  - Survivors transition from dependence to independence

Each Phase Requires Different Levels of Support & Effective Handoff Communication

Handout materials on PICS and PICS-F

- Bring in a clock, calendar, and pictures from home; write the date on the whiteboard
- Avoid trying to correct false beliefs, perceptions, and unusual behaviors

Support healthy rest, sleep, and physical activity
- Decrease noise and distractions
- Let in sunlight during the day, and keep the room dark at night
- Keep lights low or off when resting
- Help the patient sit in a chair, walk, and move around if it is safe. Please ask the health care team first.

Support healthy eating and drinking
- If swallowing is not a problem and your loved one is hungry or thirsty, help the patient eat and drink. Please ask the health care team first.

Support good hearing and seeing
- Make sure hearing aids are working and are in place
- Talk slowly and in a deeper tone of voice in the better ear
- If the patient uses glasses, remind him or her to wear them
- Use good lighting

Delirium: A Guide for Families

What is delirium?
Delirium is confusion that comes on quickly over a matter of hours. It may affect one’s thinking, attention, and behavior. Delirium is a serious problem that will often get better. Sometimes delirium does not get better. People with delirium are not crazy; and delirium is not the same as dementia.

What signs and symptoms may be present?
- Trouble paying attention or concentrating
- Not knowing who or where one is
- A change in behavior:
  - Agitation (hitting or pushing; resisting care; or not cooperating)
  - Restlessness (feeling a need to move around or feeling tense and “stirred up”)
  - Lethargy (lack of energy); slowed speech and/or movements
  - Change in sleep (for example, may be more awake at night and asleep during the day)
  - Any other change in behavior or personality that is not normal for your loved one
- A change in perception:
  - Seeing or hearing things that others do not
  - Paranoid beliefs (thinking people are trying to hurt them) and not feeling safe

Self help rehabilitation manual showed ↓ In PTSD symptoms

Barriers to Post Hospital D/C Rehabilitation Programs

The early outcome research on these programs has not demonstrated significant benefit.


<table>
<thead>
<tr>
<th>Barrier</th>
<th>Frequency reported overall, n (%)</th>
<th>Frequency reported as main barrier, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of funding</td>
<td>149 (90.9)</td>
<td>99 (63.5)</td>
</tr>
<tr>
<td>Lack of sufficient staff</td>
<td>128 (78.0)</td>
<td>17 (10.9)</td>
</tr>
<tr>
<td>Resources prioritised to other patient groups/clinical areas</td>
<td>71 (43.3)</td>
<td>4 (2.7)</td>
</tr>
<tr>
<td>Not considered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficient evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of trained staff</td>
<td>13 (7.9)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>No evidence</td>
<td>4 (2.4)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Not sure what to include in a programme</td>
<td>2 (1.2)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Other (time constraints)</td>
<td>1 (0.6)</td>
<td>1 (0.6)</td>
</tr>
</tbody>
</table>

First US Post ICU Clinics - Indiana University & Vanderbilt

• Critical Care Recovery Center at Indiana University (2011)
• ICU recovery Center at Vanderbilt (2012)
  – Team consists of medical ICU nurse practitioner, a pharmacist, pulmonary intensivists, a case manager and neurocognitive psychologist
  – Any member of the ICU teams can make a referral for patients to the clinic
  – Screening for inclusion and exclusion criteria are performed
  – Exclusion criteria
    • Pre-existing dementia or cognitive defect, life limiting illness, manage primarily by different subspecialty service/eg. liver/renal transplant, already have specialty resources (eg. Stroke or cardiac rehab, long-term resident of a skilled nursing facility
  – Initial visit: completes spirometry & a 6 minute walk test
  – Nurse practitioner completes a detailed history and physical exam
  – Neuropsychologist meets with the patient to evaluate and screen for cognitive impairment and PTSD, anxiety and depression
  – Only anecdotal data to date

Huggins EL, AACN Advances in Critical Care. 2016;27(2):204-211
SCCM Program

Every year, millions of Americans survive critical illness; but despite the efforts of their ICU, many are left with ongoing problems. The current health care system often does not meet the needs of these survivors, or their families, during their weeks to years of recovery. SCCM seeks to improve patient and family support after critical illness through the THRIVE Initiative.
THE OUTCOME
Eighteen-month, prospective, cohort, before-after study
5 adult ICU’s, 1 step down, 1 oncology unit
Compared 296 patients (146 pre-bundle) & 150 post bundle
Intervention: ABCDE
Measured:
- For mechanical ventilation patients (187) examined ventilator free days
- All patients examined incidence of delirium, mortality, time to discharge and compliance with the bundle

<table>
<thead>
<tr>
<th>ABCDE Bundle Component Outcome</th>
<th>Pre-ABCDE Bundle (n = 146)</th>
<th>Post-ABCDE Bundle (n = 150)</th>
<th>Unadjusted ( p )</th>
<th>Adjusted Odds Ratio</th>
<th>Adjusted ( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Awakening and breathing coordination</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventilator-free days&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (sd)</td>
<td>15 (11.4)</td>
<td>18 (10.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>21 (0–25)</td>
<td>24 (7–25)</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Delirium monitoring/management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delirium anytime, n (%)</td>
<td>91 (62.3)</td>
<td>73 (48.7)</td>
<td>0.02</td>
<td>0.55&lt;sup&gt;b&lt;/sup&gt; (0.33–0.93)</td>
<td>0.03</td>
</tr>
<tr>
<td>Duration of delirium, days, median (IQR)</td>
<td>3 (1–6)</td>
<td>2 (1–4)</td>
<td>0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent ICU days spent delirious, median (IQR)</td>
<td>50 (30–64.3)</td>
<td>33.3 (18.8–50)</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coma anytime, n (%)</td>
<td>41 (28.1)</td>
<td>43 (28.7)</td>
<td>0.91</td>
<td>1.00&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.99</td>
</tr>
<tr>
<td>Coma days, median (IQR)</td>
<td>2 (1–4)</td>
<td>2 (1–5)</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent ICU days spent in coma, median (IQR)</td>
<td>25 (18.2–44.4)</td>
<td>25 (12.5–42.9)</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Richmond Agitation-Sedation Scale Score, mean (sd)</td>
<td>0.02 (1.4)</td>
<td>-1.03 (1.2)</td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Early exercise/mobility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobilized out of bed anytime in ICU, n (%)</td>
<td>70 (48)</td>
<td>99 (66.0)</td>
<td>0.002</td>
<td>2.11&lt;sup&gt;b&lt;/sup&gt; (1.30–3.45)</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>28-day mortality</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital mortality (ICU and post-ICU), n (%)</td>
<td>29 (19.9)</td>
<td>17 (11.3)</td>
<td>0.04</td>
<td>0.56&lt;sup&gt;b&lt;/sup&gt; (0.28–1.10)</td>
<td>0.09</td>
</tr>
<tr>
<td>ICU mortality, n (%)</td>
<td>24 (16.4)</td>
<td>14 (9.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to discharge&lt;sup&gt;d&lt;/sup&gt; (d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From ICU, median (IQR)</td>
<td>5 (3, 8)</td>
<td>4 (3, 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From hospital, median (IQR)</td>
<td>13 (9, 15)</td>
<td>11 (9, 13)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Delirium risk ↓from 62.3% to 48.7% & 17% less time spent delirious
ABCDE QI Contextual Study

Quality Improvement Project
• 4 ICUs
• Implemented nearly all elements of the ABCDE bundle w/in the 12-month time frame.

Results:
• SATs compliance increased (25% → 81%)
• SBTs compliance increased (30% → 67%)
• Delirium Assessment increased (0% → 65%)
• ¾ ICUs have implemented an early mobility program
• 82% received some form of mobility
• 49% getting out of bed at least once per day

Carrothers, K. Crit Care Med 2013; 41:S128–S135
ABCDEF Bundle: Improving Survival & Reducing Brain Dysfunction

- Ventilated and non-ventilated medical and surgical ICU patients enrolled between January 1, 2014, and December 31, 2014
- Determine association between ABCDEF bundle compliance/total & partial & outcomes of hospital survival and delirium-free and coma-free days/adjusting for age, severity of illness, and presence of mechanical ventilation
- Patients experienced more days alive and free of delirium and coma with both total bundle compliance (incident rate ratio, 1.02; 95% CI, 1.01–1.04; \( p = 0.004 \)) and partial bundle compliance (incident rate ratio, 1.15; 95% CI, 1.09–1.22; \( p < 0.001 \)).

10% ↑ in total bundle compliance, patients had a 7% higher odds of hospital survival.
“QUALITY IS NEVER AN ACCIDENT. IT REPRESENTS THE WISE CHOICE OF MANY ALTERNATIVES.”

Willa Foster
Unfinished Revolutions In Critical Care

• 1970s: The birth of SCCM and a AACN and the rise of resuscitation
  – A well organized approach can save the very sick

• 1990’s: Owning End-of-Life Care
  – A well organized approach can give a good death to those we cannot save

• 2000’s: Bundling Care to Reduce Harm
  – A well organized approach to medical and nursing care to address preventable harm

• 2010’s: Beyond Life-and-Death: Surviving and Thriving
  – A well organized approach can help those who survive critical illness live full new lives

Adapted from TJ Iwashya presented at SCCM Congress 2016 Orlando Fl