Implementation of the ABCDEF Bundle: Reducing VAE, LOS, Delirium & Physical Dysfunction

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Disclosures

- Sage Products
  Speaker Bureau
  & Consultant
- Hill-Rom
- Eloquest
  Healthcare
Learning Objectives

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

• Overview of the body of evidence that demonstrate the need for full integration of the ABCDEF bundle for maximizing patient outcomes.
• Outline a few practical strategies for implementing a nurse driven mobility protocol and influencing a shift in unit practice.
• Describe one or two major challenges to implementation and pinpoint workable solutions.
The Why

Ventilator-Associated Events—Not a New Definition for VAP

The CDC defines ventilator-associated events (VAE) as deterioration in respiratory status after a period of stability, possible infection/inflammation, and laboratory evidence of respiratory infection.

NHSN has revised its policy to include surveillance of all VAE, including:
- Ventilator-associated conditions (VAC)
- Infection-related ventilator-associated complications (IVAC)
- PVAP (probable VAP)

Patient criteria for VAE surveillance:
- **Included patients:** Mechanically-ventilated patients ≥18 years who have an event on or after calendar day 3 of mechanical ventilation
- **Excluded patients:** Patients receiving rescue therapies HFV & ECMO, patient ventilated < 3 days

Qualitative analysis of 153 VAEs
Royal Brisbane & Women’s Hospital, Queensland, Australia

- Pneumonia: 38%
- Edema: 26%
- Atelectasis: 15%
- ARDS: 6%
- Abx + Furosemide: 6%
- Other: 8%


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Canadian Critical Care Trials Group ABATE Study
11 ICUs, 1330 patients, VAE vs VAP Surveillance

**VAE**
9.9 events per 1000 vent days

**VAP**
10.6 events per 1000 vent days

Mucedere et al. Chest 2013;144:1453
VAE Definition Algorithm Summary

- Patient on mechanical ventilation > 2 days
  - Baseline period of stability or improvement, followed by sustained period of worsening oxygenation
    - Ventilator-Associated Condition (VAC)
  - General evidence of infection/inflammation
    - Infection-Related Ventilator-Associated Complication (IVAC)
  - Positive results of microbiological testing
    - Possible VAP (PVAP)

VAC
Ventilator-Associated Condition

IVAC
Infection-related Ventilator-Associated Complication

PVAP
Possible Ventilator-Associated Pneumonia
Infection-related ventilator-associated complications (IVAC)

**VAC with concurrent abnormal temp or WBC count AND ≥4 days of new antibiotics**

<table>
<thead>
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<th>PEEP (min)</th>
<th>FiO2 (min)</th>
<th>T min</th>
<th>T max</th>
<th>WBC min</th>
<th>WBC max</th>
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<td>16.1</td>
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<td>Jan 8</td>
<td>5</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cefepime</td>
<td></td>
</tr>
<tr>
<td>Jan 9</td>
<td>5</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cefepime</td>
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</tr>
</tbody>
</table>
Ventilator-associated pneumonia

IVAC with concurrent purulent sputum (Gram stain neutrophils)
and/or positive pulmonary cultures

<table>
<thead>
<tr>
<th>Date</th>
<th>PEEP (min)</th>
<th>FiO2 (min)</th>
<th>Gram Stain Polys</th>
<th>Gram Stain Epis</th>
<th>Culture</th>
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<td></td>
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</tr>
<tr>
<td>Jan 4</td>
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<td>40</td>
<td>3+</td>
<td>0</td>
<td>Klebsiella pneumoniae</td>
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<td>60</td>
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<tr>
<td>Jan 9</td>
<td>5</td>
<td>40</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

POSSIBLE VAP

Attributable Mortality of VAC versus VAP

USA – 3 centers
PLoS ONE 2011;6:e18062

USA – 8 centers
Crit Care Med 2012;40:3154

Canada – 11 centers
Chest 2013;144:1453

Netherlands – 2 centers
Am J Resp Crit Care Med 2014;189:947

USA – 2 centers
Crit Care Med 2014;ePub

USA – 1 center
Infect Control Hosp Epidemio 2014;5:502
Post Intensive Care Syndrome

Definition

PICS is defined as new or worsening impairment in physical, cognitive, or mental health status arising and persisting after hospitalization for critical illness.
http://www.icudelirium.org/testimonials.html

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

ICU-Acquired Weakness (ICUAW)

Definition:
• Syndrome of generalized limb weakness that develops while the patient is critically ill and for which there is no alternative explanation other than the critical illness itself.\(^1\) Average Medical Research Council Scale (MRC) score <4 across all muscles tested.

Incidence:
• 25% of patients with prolonged mechanical ventilation will develop ICUAW\(^1\)
• Est 75,000 pts in US, 1 million worldwide

Caused By:\(^1\)
– Critical illness polyneuropathy and myopathy
– Combination

Risk factors:
– Severe Sepsis\(^1\)
– Duration of mechanical ventilation\(^1,4\)
– ICU LOS\(^5\)
– Systemic inflammatory response syndrome\(^2\)
– Multiple organ failure\(^2,4\)
– Immobility\(^2\)
– Use of corticosteroids/neuromuscular blockers\(^2,3,5\)

Negative impact:\(^1,2\)
– Prolong mechanical ventilation
– Reoccurring respiratory failure & VAP
– Increased ICU and hospital length of stay
– Increase mortality

PICS: Cognition & Mental Illness

- Cognitive impairment that can persist for years develops in 30–80% of patients
- Symptoms of depression occur in 8–57% of patients and may improve over months
- 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


The Effects of Hospitalization on Neurological Function

- Delirium
  - Acute, fluctuating change in consciousness and cognition
  - Develops over a brief time period
  - Often an ICU and hospital complication
- Psychological effects
  - Depressed mood
  - Poor appetite or overeating
  - Insomnia or hypersomnia
  - Low energy or fatigue

Vasilevskis EE, et al. CHEST. 2010;138:1224-1233
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

Delirium and Patient Outcomes

- ?Independently associated with increased risk of death
- Duration assoc. with short & long term cognitive impairment
- Increased Mech Vent duration
- Increased ICU & Hospital Length of Stay
- Estimated national costs $4 to $16 Billion
- ?Post-d/c anxiety/PTSD symptom from delirious memory
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

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.


Prevention is Key

Minimizing Risk Factors
“Four Cornerstones for Success”

- Evidence Based Practice
- Inter-Professional Teams
- Reduction of Practice Variation
- System Collaboration

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
Awake and Breathing Coordination
- Duration of mechanical ventilation
- Duration of coma
- Mortality

Choose light sedation & avoid benzos
- Duration of mechanical ventilation
- Mortality
- Delirium

Delirium monitoring & management
- Delirium detection

Early Mobility & Environment
- Duration of delirium
- Disability
- ICU Length of Stay
- Rehospitalization/Mortality

Morandi et al, Curr Opin Crit Care 2011;17:43-9
Vasilevskis et al, Crit Care Med 2010;38:5685-91
Vasilevskis et al, Chest 2010;138:1224-1233
Zaal et al, Intensive Care Med 2011;37:1823-33

ASSESS, PREVENT & MANAGE PAIN
Recommendations/Guidelines

Society of Critical Care Medicine
January 2013
• Pain in ICUs is common, under treated
• Vital Signs and behaviors are flags to investigate.

The American Society of Pain Management Nursing
July 2011
• Inability to self report = lack of recognition
• Poor pain control
• Vital signs are not “sensitive”

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

Common Barriers to Implementation

• Inappropriate skill mix, lack of equipment
  – No equipment required, already available in EMR
  – RN will perform
• Peer group barriers
  • Surveyed nursing staff
  • Potential confusion using a 0-8 and 0-10 scale by members of health care team
• Knowledge, attitude & skill
  – VS not predictive of presence of pain—common current belief
  – CPOT not a severity of pain scale like the 0-10 self report scale
  – Pain contributes to agitation & delirium so treat first
• Communication/teamwork
  – Healthcare team application of CPOT into daily practice

Manage Pain

Clinical Guidelines, Protocols, Research ➔ Pain management

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

Puntollo K AJCC 2001;10:238-251
Puntollo K AJRCCM, 2014;89:39-47
LTACH Implications

- Potential opioid withdrawal syndrome
  - High dose use for longer than one week
  - May mimic agitation/delirium
  - Schedule opioid tapered dose over a week

- Consider altering report to include these components during transfer and per shift


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)

MENDS Trial: 
Dexmedetomidine versus Lorazepam Sedation

Study Design:
• Double-blind, randomized, controlled trial of mechanically ventilated medical and surgical ICU patients (N = 106)

Results:
• Dexmedetomidine sedation:
  – more days alive without delirium or coma than with lorazepam ($P = 0.01$)
  – lower prevalence of coma ($P < 0.001$) than with lorazepam ($P = 0.01$)
  – more time spent within sedation goals than with lorazepam ($P = 0.04$)
  – No differences in 28-day mortality and delirium-free days
  – Incidence of bradycardia and hypotension were similar


SEDCOM Trial: 
Dexmedetomidine vs Midazolam Sedation

Study Design:
– Double-blind, randomized, multicenter trial comparing long-term (> 24 hr) dexmedetomidine (n = 244) with midazolam (n = 122)

Results:
– No difference between groups in percentage of time patients were in targeted sedation range ($P = 0.18$)
– Lower delirium prevalence in the dexmedetomidine group ($P=0.001$)
– Shorter sedation duration in the dexmedetomidine group ($P=0.01$)
– Shorter time to extubation in the dexmedetomidine group ($P=0.01$)

MIDEX-PRODEX Trials:
Dexmedetomidine vs. Midazolam or Propofol

Two-phase, three-multicenter RCTs:
• MIDEX trial: Dexmedetomidine vs. midazolam sedation
  – Shorter time to extubation (4.2 vs. 6.1 days, \( P = 0.01 \)) with dexmedetomidine than with midazolam.
  – Shorter duration of mechanical ventilation (5.1 vs. 6.8 days, \( P = 0.03 \))
• PRODEX trial: Dexmedetomidine vs. propofol sedation
  – Shorter time to extubation with dexmedetomidine vs. propofol (2.9 vs. 3.9 days, \( P = 0.04 \))
  – No difference in duration of mechanical ventilation (\( P = 0.24 \))
• Dexmedetomidine equal to midazolam in maintaining light to moderate sedation
• More adverse effects associated with dexmedetomidine
• Patients receiving dexmedetomidine aroused easier, were cooperative, and better able to report pain.

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.
Agitation

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

www.iculiberation.org
TRUST THE PROCESS

WAKE UP AND BREATHE
**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

- 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

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**Spontaneous Awakening Trials (SATs) Protocol**

- SAT consists of two parts: safety screen and trial
- Safety screen checks for contraindications
- Patient passes the screen unless following factors are present
  - Receiving a sedative infusion for active seizures or alcohol withdrawal
  - Receiving escalating doses of sedative for agitation
  - Receiving neuromuscular blockers
  - Evidence of active myocardial ischemia in prior 24 hours
  - Evidence of increased intracranial pressure

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Spontaneous Awakening Trials (SATs) Protocol

• Passes the SAT if can do 3 out of 4 task on request
  – Open their eyes
  – Look at their caregiver
  – Squeeze the hand
  – Put out their tongue

• OR can go without sedation for 4 hours without new symptoms or complications


Spontaneous Awakening Trials (SATs) Protocol

Passes the SAT if without sedation for 4 hours without the following:

• Sustained anxiety
• Agitation
• Pain
• Respiratory rate of 35 breaths/minute for ≥ 5 minutes
• SpO₂ of less than 88% for ≥ 5 minutes
• Acute cardiac dysrhythmia
• Two or more signs of respiratory distress
  – Tachycardia
  – Bradycardia
  – Use of accessory muscles
  – Abdominal paradox
  – Diaphoresis
• Marked dyspnea

### 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>
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<tr>
<td>Ventilator-free days</td>
<td>12</td>
<td>15</td>
<td>0.02</td>
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<tr>
<td>Time-to-event, days</td>
<td></td>
<td></td>
<td></td>
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<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

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### ABC Trial: Mortality at 1 Year

![Graph showing survival rates for SAT plus SBT vs Usual care plus SBT with specific event counts provided.](image-url)
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

**SAT Safety Screen**
- SAT: Can patient go w/o sedation and complications for 4 hours?

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

Notify physician to consider extubation

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

Is the patient responsive to verbal stimuli?

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

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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/Resp
  - Determine if meet SBT protocol criteria/Resp
  - Consider one time of day-coordinate between resp and nursing (white board-EMR-communication tool)
  - Discuss results in multidisciplinary rounds
  - Include in nurse to nurse handoff/other handoffs
  - Dedicated RRT in rounds speaking up
  - Ventilator LOS posted/Extubation rates posted
Barriers to Implementation

- Concern by staff
- Workload and productivity concerns
- Fear of patient discomfort and asynchrony
- Fear of inadvertent extubation
- Fear of self-extubation during decreased sedation
- Excuses: “Let’s just give it one more day.” “It’s late in the day, and we don’t have coverage tonight.”

www ICUliberation.org

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
Healthcare Acquired Pneumonia

- **Risk Factor Categories**
  - Factors that increase bacterial burden or colonization
  - Factors that increase risk of aspiration
Oral Cavity & VAP

- 89 critically ill patients
- Examined microbial colonization of the oropharynx through out ICU stay
- Used pulse field gel electrophoresis to compare chromosomal DNA
- Results:
  - Diagnosed 31 VAPs
  - 28 of 31 VAP’s the causative organism was identical via DNA analysis

- 49 elderly nursing home residents admitted to the hospital
- Examined baseline dental plaque scores & microorganism within dental plaque
- Used pulse field gel electrophoresis to compare chromosomal DNA
- Results
  - 14/49 adults developed pneumonia
  - 10 of 14 pneumonias, the causative organism was identical via DNA analysis

El-Solh AA. Chest. 2004;126:1575-1582
Role of Salivary Flow

- Provides mechanical removal of plaque and microorganisms
- Innate & specific immune components (IgA, cortisol, lactoferrin)
- Patients receiving mechanical ventilation have dry mouth which in turn contributes to accumulation of plaque & reduced distribution of salivary immune factors

Munro CL & Grap MJ. AJCC. 2004;13:25-34
**What Does the Evidence Tell Us?**

Brush
CHX rinse alone
CHX rinse in Combination
Swab/Clean/Moisturize
Suction
All of the above

**Prevention of VAP with Oral Antisepsis: A Systematic Review & Meta-analysis**

- 14 studies evaluated from 1996 to 2011
- 2481 patients
- All randomized trials
- 9/14 blinded
- 12 trials assessed the effectiveness of CHG (2341 patients, 941 were CABG)
- 2 trials evaluated Povidone-iodine (140pts)
- Variation of additional interventions:
  - toothbrushing,
  - oropharyngeal aspiration
  - mechanical cleaning of the mouth
  - Frequency of antiseptic

![Graph showing data](image)

P=0.004

Comprehensive Oral Care Program

Comprehensive Oral Care Protocol: The Good Shepherd Study

Methodology:

- Retrospective study 10 bed Med-Surg
- Protocol included: Covered Yankauer for non-traumatic oral suctioning, soft-suction toothbrush, Suction Oral Swab, use of a 1.5% $\text{H}_2\text{O}_2$ peroxide mouth rinse for cleansing, subglottic suction catheter used 4x daily, dedicated oral suction line for infection control and ease of use.
- Education provided and presence of clinical champion.

Literature Review: Oral Care Impact of VAP

Comprehensive Oral Care:
- Reduction in VAP from 5.6 to 2.2 (Schleder B. et al. J Advocate Health 2002;4(1):27-30)
- Reduction in VAP from 4.10 (2005) to (2.15) in 2006 with addition of CPC & comprehensive oral care. Vent bundle & rotational therapy already being performed
- Reduction in VAP from 12.0 to 8.0 (p=.060) with 80% compliance, vent bundle already being preformed, 1538 patients randomized to control or study group, Additional outcomes; ↓ vent days (p=.05), ↓ ICU LOS (p=.05) ↓ time to VAP (p= <.001) & reduction in mortality (p=.05) (Garcia R et al AJCC, 2009;18:523-534)

Comprehensive Oral Care & CHG:
- Reduction in VAP to zero for 2 years, vent bundle, mobility, oral care & CHG with comprehensive education preformed (Murray TM et al. AACN Advanced Critical Care. 2007;18(2):190-199)

Dickinson S et al. SCCM Critical Connections, 02/2008
Does Compliance Make A Difference?

Oral care compliance & use of the ventilator bundle resulted in a 89.7% reduction in VAP


NV-HAP SMCS Research Findings: 2010

24,482 patients and 94,247 patient days

Incidence:
- 115 adults
- 62% non-ICU
- 50% surgical
- Average age 66
- Common comorbidities:
  - CAD, COPD, DM, GERD
- Common Risk Factors:
  - Dependent for ADLs (80%)
  - CNS depressant meds (79%)

Cost:
- $4.6 million
- 23 deaths
- Mean Extended LOS 9 days
- 1035 extra days

### Protocol – Plain & Simple

<table>
<thead>
<tr>
<th>Patient Type</th>
<th>Tools</th>
<th>Procedure</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Care / Assist</td>
<td>Brush, paste, rinse, moisturizer</td>
<td>Provide tools Brush 1-2 minutes Rinse</td>
<td>4 X / day</td>
</tr>
<tr>
<td>Dependent / Aspiration Risk</td>
<td>Suction toothbrush kit (4)</td>
<td>Package instructions</td>
<td>4 X / day</td>
</tr>
<tr>
<td>Dependent / Vent</td>
<td>ICU Suction toothbrush kit (6)</td>
<td>Package instructions</td>
<td>6 X / day</td>
</tr>
<tr>
<td>Dentures</td>
<td>Tools + Cleanser Adhesive</td>
<td>Remove dentures &amp; soak Brush gums, mouth Rinse</td>
<td>4X / day</td>
</tr>
</tbody>
</table>

### Return on Investment

- 60 NV-HAP avoided Jan 1 – Dec. 31 2013
- $2,400,000 cost avoided
- -117,600 cost increase for supplies
- $2,282,400 return on investment

- 12 lives saved

**PRICELESS**
Making it Happen: Comprehensive Oral Care with and Antiseptic

- Create visual cues to show evidence of compliance
- Include respiratory therapy in performing oral care as a joint function
- Include oral care in order sets and on flow sheets
- Info family if appropriate

ASSESS, PREVENT & MANAGE PAIN

BOTH SAT & SBT

CHOICE OF SEDATION

DELIRIUM

EARLY MOBILITY

FAMILY ENGAGEMENT & EMPOWERMENT

COORDINATION & COMPREHENSIVE ORAL CARE
**Delirium Assessment & Management**

- **Delirium Assessment:**
  - ICU-CAM
  - ICU Delirium Screening Checklist

- **Frequency:**
  - Q shift & prn

---

**Confusion Assessment Method in the ICU**

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

1. Acute onset or fluctuating course:
   - No score change from normal mental status
   - Onset within the past 24 hours
   - Patient's mental status fluctuating during the past 24 hours
   - **Yes**
   - **No**

2. Inattention:
   - Instruct:
     - Please read the following six letters and ask the patient to squeeze when you say the letter "A." (Save a BAART)
     - Error: When patient fails to squeeze on the letter "A".
   - **Yes**
   - **No**

3. Altered level of consciousness (actual RASS):
   - If RASS is zero, or if still on sedation or sedation is still changing, proceed to next step
   - **Yes**
   - **No**

4. Disorganized thinking:
   - **Yes**
   - **No**

---

**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: Risk Factors

Baseline (Predisposing)
- Age
- Dementia
- Depression
- Co-Morbidities
- Severity of Illness
- Hearing Impairment
- Visual Impairment
- Smoking, ETOH, Drug Use
- Surgery

Modifiable (Precipitating)
- Medications
- Hypoxia
- Administration of Lorazepam
- Room changes
- Visual/hearing Aids
- Restraints
- Availability of Clock
- Pain
- Electrolytes
- Metabolic Disturbance
- Immobility

Non-Pharmacological Strategies

Sleep Promotion
- Appropriate Medications
- Bath during day
- Chair position
- Lighting
- Television
- Hearing/Vision Aids/Dentures
- Control Noise

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

Other
- Cognitive Stimulation/Music
- Familiar objects in room/pictures

Sedation Holidays
- Sleep Promotion
- Mobility

Pandharipande P et al. (Lorazepam) Anesthesiology 2006;104:21–26;
Omet ICM 2007; 33:1007-1013;
Pandharipande P et al. (Midazolam) J Trauma 2008
Dubois MJ et al., (Morphine) Intensive Care Med 2001; 27:1297–
E: Early Exercise & Mobility

The Why:

- Skeletal muscle strength reduces 4-5% every week of bed rest (1-1.5% per day)
- Without activity the muscle loses protein
- Healthy individuals on 5 days of strict bed rest develop insulin resistance and microvascular dysfunction
- 2 types of muscle atrophy
  - Primary: bed rest, space flight, limb casting
  - Secondary: pathology

Cardow DG, Chilibick PD J Gerontol, 2005:60A:148-155
Homburg NM, Arterioscler Thrombo Vasc Biol, 2007,27(12):2650-2656
Skeletal Muscle Deconditioning

- Muscle groups that lose strength most quickly related to immobilization are those that maintain posture, transferring positions & ambulation.
- > 1/3 of patients with ICU stays greater than two weeks had at least two functionally significant joint contractures.
- Muscle atrophy in mechanically ventilated patients contribute to fatigue of the diaphragm and challenges with weaning.
- Degradation within 6-8 days; continues as long as bedrest occurs
- One day of bed rest requires two weeks of reconditioning to restore baseline muscle strength

Outcomes of Early Progressive Mobility Program

- ↓ incidence of skin injury
- ↓ time on the ventilator
- ↓ incidence of VAP
- ↓ days of sedation
- ↓ delirium
- ↑ ambulatory distance
- Improved function
Early Mobility Protocol: Impacting Outcomes

- Morris, et al. conducted a prospective cohort study to determine the impact of early mobility therapy using a team on patients who were mechanically ventilated with respiratory failure
- The control group received standard passive ROM and turning (n=165)
- The study group received low-impact mobility by a team (n=165)
  - Therapy initiated within 48 hours of mechanical ventilation
  - Therapy 7 days/week until ICU discharge
  - Mobility team included 1 ICU nurse, 1 physical therapist, and 2 nursing assistants

Early ICU Mobility Therapy

Results

- Baseline characteristic similar in both groups
- Protocol group:
  - Received as least 1 PT session vs. usual care (80% vs. 47%, p < .001)
  - Out of bed earlier (5 vs. 11 days, p < .001)
  - Reduced ICU LOS (5.5 days vs. 6.9 days, p=.025)
  - Reduced Hospital LOS (11.2 days vs. 14.5 days, p =.006)
  - No adverse outcomes;
    • Most frequent reason for ending mobility session was patient fatigue
  - Cost
    • Average cost per patient was $41,142 in the protocol group
    • Average cost per patient was $44,302 in the control group
Early Physical and Occupational Therapy in Mechanically Ventilated Patients

- Prospective randomized controlled trial from 2005-2007
- 1161 screen, 104 patients mechanically ventilated < 72hrs, functionally independent at baseline met criteria
- Randomized to:
  - early exercise of mobilization during periods of daily interruption of sedation (49 pts)
  - daily interruption of sedation with therapy as ordered by the primary care team (55 pts)
- Primary endpoint: number of patients returning to independent functional status at hospital discharge able to perform activities of daily living and walk (independently)


<table>
<thead>
<tr>
<th></th>
<th>Intervention (n=49)</th>
<th>Control (n=55)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time from intubation to first PT/OT session (days)</td>
<td>15(0-21)</td>
<td>74(6-298)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Independent ICU trial at ICU discharge</td>
<td>3(0-5)</td>
<td>0(0-5)</td>
<td>0.15</td>
</tr>
<tr>
<td>Independent ICU trial at hospital discharge</td>
<td>6(3-14)</td>
<td>4(0-28)</td>
<td>0.06</td>
</tr>
<tr>
<td>MRC examination score at hospital discharge</td>
<td>51(25-80)</td>
<td>48(10-80)</td>
<td>0.38</td>
</tr>
<tr>
<td>Handgrip strength at hospital discharge (kg)</td>
<td>39(10-95)</td>
<td>35(5-98)</td>
<td>0.67</td>
</tr>
<tr>
<td>Greatest walking distance at hospital discharge (m)</td>
<td>33 (9-94)</td>
<td>0(0-26.4)</td>
<td>0.004</td>
</tr>
<tr>
<td>Time from intubation to milestones achieved (days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out of bed</td>
<td>37(10-39)</td>
<td>66(42-83)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sitting</td>
<td>3(2-35)</td>
<td>60(45-80)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Walking in place</td>
<td>3(10-58)</td>
<td>62(14-96)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Transferring to chair</td>
<td>3(10-58)</td>
<td>63(15-84)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Walking</td>
<td>3(8-95)</td>
<td>73(39-96)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Table 1: Functional milestones outcomes according to study group.

Early Physical and Occupational Therapy in Mechanically Ventilated Patients

- Safe
- Well tolerated
- ↓ duration of delirium
- ↑ VFD
- Functional independence at discharge
  59% protocol group vs. 35% in control arm

Progressive Mobility

Went home the following day

CRRT patient

# Determining Readiness

- Perform Initial mobility screen w/in 8 hours of ICU admission & daily
  - 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

**Patient Stable, Start at Level II & progress**

---

**Progressive Mobility Continuum**

<table>
<thead>
<tr>
<th>START HERE</th>
<th>LEVEL I</th>
<th>LEVEL II</th>
<th>LEVEL III</th>
<th>LEVEL IV</th>
<th>LEVEL V</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LEVEL I**

- RASS -5 to -3
- Goal: Clinical stability, passive ROM

**LEVEL II**

- RASS -3 & up
- Goal: Upright sitting, increased strength and moves arm against gravity

**LEVEL III**

- RASS -1 & up
- Goal: Increased trunk strength, moves leg against gravity and readiness to weight bear

**LEVEL IV**

- RASS 0 & up
- Goal: Stands w/ min to mod. assist, able to march in place, weight bear and transfer to chair

**LEVEL V**

- RASS 0 & up
- Goal: Increase distance in ambulation & ability to perform some ADLs

**ACTIVITY:**

- Q 2 hr turning
- Passive/Active ROM

**LEVEL I Activities:**

- Tolerates Level I Activities

**LEVEL II Activities:**

- Tolerates Level II Activities

**LEVEL III Activities:**

- Tolerates Level III Activities

**LEVEL IV Activities:**

- Tolerates Level IV Activities

**LEVEL V Activities:**

- Tolerates Level V Activities

**NO**

Start at Level II and progress*

**YES**

Start at Level II and progress*

---

*Mobility is the responsibility of the RN, with the assistance of the RT’s, Unlicensed Assistive Personnel and PT/OT. If the patient is intolerant of current mobility level activities, reassess and place in appropriate mobility level. For each position/activity change allow 5-10 minutes for equilibration before determining the patient is intolerant.

**Patient is unstable, start at Level I & progress**

---


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*Mobility is the responsibility of the RN, with the assistance of the RT’s, Unlicensed Assistive Personnel and PT/OT. If the patient is intolerant of current mobility level activities, reassess and place in appropriate mobility level. For each position/activity change allow 5-10 minutes for equilibration before determining the patient is intolerant.*

---

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

*Mobility is the responsibility of the RN, with the assistance of the RT’s, Unlicensed Assistive Personnel and PT/OT. If the patient is intolerant of current mobility level activities, reassess and place in appropriate mobility level. For each position/activity change allow 5-10 minutes for equilibration before determining the patient is intolerant.*
Progressive Mobility Programs

Journey to tolerating upright position, tilt, sitting, standing and walking can occur quicker through the use of technology.

Consensus on Safe Criteria for Active Mobilization

- Systematic review performed with 23 international experts to reach consensus

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>Low risk of an adverse event. Proceed as usual according to each ICU’s protocols and procedures.</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Potential risk and consequences of an adverse event are higher than green, but may be outweighed by the potential benefits of mobilization. The precautions or contraindications should be clarified prior to any mobilization episode. If mobilized, consideration should be given to doing so gradually and cautiously.</td>
</tr>
<tr>
<td>Neurological</td>
<td>Significant potential risk or consequences of an adverse event. Active mobilization should not occur unless specifically authorized by the treating intensive care specialist in consultation with the senior physical therapist and senior nursing staff.</td>
</tr>
</tbody>
</table>

Consensus reach on all criteria. If no other contraindications; vasoactives, endotracheal tube, FIO2 < 60% with SaO2 90% & RR < 30/min were Hodgson CL, et. al Critical Care, 2014;18:658
Early Mobility: Can We Do It? Is it Safe?

Safety

- > 1% adverse events during 1449 sitting, standing and walking sessions with patients on ventilators.
- Underwent daily sedation interruption followed by PT & OT daily until achieving physical function independence
  - Safety events occurred in 16% of all sessions
    - Loss of 1 arterial line, 1 nasogastric tube, 1 rectal tube
    - Therapy was stopped on 4% of all sessions for vent asynchrony, agitation, or both
    - Delirium present 53% of the time during therapy sessions

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
**ABCDE Bundle Reduces Ventilation, Delirium & ↑OOB**

- 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

---

**ABCDE Bundle Reduces Ventilation & Delirium**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Without ABCDE N=93</th>
<th>With ABCDE N=94</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received a spontaneous awakening trial</td>
<td>53%</td>
<td>71%</td>
<td>.0372</td>
</tr>
<tr>
<td>Received a spontaneous breathing trial</td>
<td>71%</td>
<td>84%</td>
<td>.0290</td>
</tr>
<tr>
<td>Got out of bed at least once</td>
<td>47%</td>
<td>61%</td>
<td>.0675</td>
</tr>
<tr>
<td>Days spent breathing without ventilator</td>
<td>21 days</td>
<td>24 days</td>
<td>.0371</td>
</tr>
<tr>
<td>Experienced delirium</td>
<td>75%</td>
<td>66%</td>
<td>.1623</td>
</tr>
<tr>
<td>Length of delirium</td>
<td>2 days</td>
<td>1 day</td>
<td>.00437</td>
</tr>
<tr>
<td>Died in the ICU</td>
<td>25.8%</td>
<td>14.9%</td>
<td>.0913</td>
</tr>
<tr>
<td>Self extubated</td>
<td>6.5%</td>
<td>5.3%</td>
<td>.7421</td>
</tr>
</tbody>
</table>

Balas M et al Crit Care Med, 2014; online

Balas M. Presented Jan 20, 2013 SCCM
### Keystones ABCDE Bundle Implementation

- 51 hospitals in Michigan’s Keystone ICU initiative
- Those implementing SATs and delirium screening were **3.5 times more likely** to exercise ventilated patients
- Incomplete or nonsequential bundle implementation yielded lower success rates
- Authors wrote, “Another layer of evidence that for the ABCDEs, the whole is greater than sum of the parts.”

---

**Keystones ABCDE Bundle Component Outcome**

<table>
<thead>
<tr>
<th>Outcome Description</th>
<th>Pre ABCDE Bundle (n = 146)</th>
<th>Post ABCDE Bundle (n = 151)</th>
<th>Unadjusted p</th>
<th>Adjusted Odds Ratio</th>
<th>Adjusted p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awakening and breathing coordination - 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>Delirium monitoring/management</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>0.55p (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>1.00p</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>Early exercise/mobility</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 (68.0)</td>
<td>0.002</td>
<td>2.11p (1.30–3.45)</td>
<td>0.003</td>
</tr>
<tr>
<td>28-day mortality</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>0.55p (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>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to discharge (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>0.21</td>
<td>1.16p (0.89–1.50)</td>
<td>0.27</td>
</tr>
<tr>
<td>From hospital, median (IQR)</td>
<td>13 (9, 15)</td>
<td>11 (9, 13)</td>
<td>0.99</td>
<td>1.01p (0.77–1.31)</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Conclusions of ABCDE Bundle

• Strategy for whole-body rehab (“Animation”) with a highly coordinated, multidisciplinary team, implementing…
  – Sedative protocols and interruption with SATs
  – Protocol-driven SBTs
  – Physical and occupational therapy
  – Progressive mobility

• Results in superior functional and cognitive outcomes

Integrating ABCDE into ICU culture

• Talk about all the ABCDE bundle as ONE.
• Utilize Change Champions in all aspects of integration
  – Demonstrate/Mentor staff
  – Ground Up
• Daily Rounds with Multidisciplinary Team
  • Expectation is for RN to speak the language
• Don’t start each intervention separate from the others
  – Group interventions together, demonstrate how they connect and evaluate together
Summary

- Critical illness is catabolic and depleting, rapidly and potentially lasting for years
- A prolonged ICU stay can cause delirium and cognitive changes for most patients
- Mobility combined with minimal or no sedation started at the beginning of an ICU stay is protective and preventative
- Approach the task with structured QI project, collaboration, barrier identification—MAKE IT THE NEW NORM

Implement the ABCDEF Bundle in your ICU today

“QUALITY IS NEVER AN ACCIDENT. IT REPRESENTS THE WISE CHOICE OF MANY ALTERNATIVES.”

Willa Foster