Impacting Clinical & Financial Outcomes: Evidence Based Strategies to Reduce HAP and VAP

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Disclosures

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

Some Slides Courtesy of Barb Quinn
Session Objectives

- Create the link of patient advocacy to the basic nursing care
- Define key fundamental evidence based nursing care practices that reduce harm
- Discuss strategies to overcome barriers

Notes on Hospitals: 1859

“It may seem a strange principle to enunciate as the very first requirement in a Hospital that it should do the sick no harm.”

Florence Nightingale

Advocacy = Safety
Advocacy Starts with Us

PROTECT THE PATIENT FROM BAD THINGS HAPPENING ON YOUR WATCH

Implement Interventional Patient Hygiene
Interventional Patient Hygiene

- Hygiene… the science and practice of the establishment and maintenance of health
- Interventional Patient Hygiene…. nursing action plan directly focused on fortifying the patients host defense through proactive use of evidence based hygiene care strategies

Incontinence Associated Dermatitis Prevention Program

INTERVENTIONAL PATIENT HYGIENE (IPH)

- VAP/HAP
- Oral Care/Mobility
- HAND
- Catheter Care
- Skin Care/Bathing/Mobility
- CA-UTI
- CA-BSI
- SSI
- HASI

Achieving the Use of the Evidence

Factors Impacting the ability to Achieve Quality Nursing Outcomes at the Point of Care

Attitude & Accountability

Skills & Knowledge

Resources & System

Achieving the Use of the Evidence


Why HAI's?
Protecting Patients From Harm

Estimates: 183 Hospitals in 10 States

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>HAI</td>
<td>722,000/year</td>
</tr>
<tr>
<td>HAI-related deaths</td>
<td>75,000/year</td>
</tr>
<tr>
<td>Hospitalized patients develop infection:</td>
<td>1 out of 25 (4%)</td>
</tr>
<tr>
<td>Death due to sepsis/septic shock:</td>
<td>700/day</td>
</tr>
<tr>
<td>Money spent:</td>
<td>$45 billion/year</td>
</tr>
<tr>
<td>Increase risk of readmission:</td>
<td>27 days vs. 59 days</td>
</tr>
</tbody>
</table>

### Health Care Associated Infection Data

<table>
<thead>
<tr>
<th>Measurement</th>
<th>NHSN 2012 3742 hospitals in US</th>
<th>Estimated # of Infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAP/per 1000 patient days</td>
<td>157,500 (21.8%)</td>
<td></td>
</tr>
<tr>
<td>VAP/per 1000 vent days</td>
<td>Range of pooled means 0.2 (Ped CVICU) - 4.4 (Burn ICU)</td>
<td>49,900</td>
</tr>
<tr>
<td>CLA-BSI/per 1000 cath days</td>
<td>Range of pooled means 0.8 (CVICU)- 3.4 (Burn ICU) Step-down-Ward 0.3 (Adult Rehab)- 2.4 (Burn)</td>
<td>15,600</td>
</tr>
<tr>
<td>CA-UTI/per 1000 cath days</td>
<td>Range of pooled means 0.7 (Peds Surgical)- 5.0 (Neuro ICU) 0.0 (Well Baby) – 4.1 (Peds rehab)</td>
<td>35,600</td>
</tr>
</tbody>
</table>


- 75% of HAI not related to devices (CAUTI, CLABSI, VAP)
- **Recommendation:**
  - As device-related infections decrease, expand surveillance and prevention activities to include other HAIs

## Improvement Seen Except CAUTI’s

- 44% ↓ in CLABSI’s between 2008-2012
- 20% ↓ in infections for 10 surgical procedures between 2008-2012
- 4% reduction in MRSA bacteremia's 2011-2012
- 2% reduction in C-Diff between 2011-2012
- 3% ↑ in CAUTI’s 2009-2012


## Definition: Hospital-Acquired Pneumonia

- Hospital-acquired pneumonia (HAP)
  - 48 hours
  - Meets algorithm of criteria (CDC, 2003)

- Types of HAP
  - VAP
  - NV-HAP
  - Post op pneumonia

ATS (2005)
CDC (2003)
Why NV-HAP?

- HAP 1st most common HAI in U.S.
  - Increased morbidity $\rightarrow$ 50% are not discharged back home
  - Increased mortality $\rightarrow$ 18%-29%
  - Extended LOS $\rightarrow$ 4-9 days
  - Increased Cost $\rightarrow$ $28K$ to $109K$
  - 2x likely for readmission <30 day
- Understudied, under-addressed
- Focus has been on the other HAP $\rightarrow$ VAP
  - Surveillance not required....yet


Hospital-Acquired Pneumonia: Non-Ventilated versus Ventilated Patients in Pennsylvania

- Purpose:
  - Compare VAP and NV-HAP incidence, outcomes
- Methods:
  - Pennsylvania Database queried
  - All nosocomial pneumonia data sets (2009-2011)

Results:

- Mortality
- Incidence
- Total deaths
- Total cost
- Wide-spread

[Table 1: Pennsylvania Nosocomial Pneumonia and Related Deaths]

<table>
<thead>
<tr>
<th>Year</th>
<th>NO. of NV-HAP Cases</th>
<th>NO. of NV-HAP Deaths</th>
<th>% of NV-HAP Cases Contributing to Death</th>
<th>NO. of VAP Cases</th>
<th>NO. of VAP Deaths</th>
<th>% of VAP Cases Contributing to Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1,976</td>
<td>363</td>
<td>18.4 (95% CI: 16.5 to 20.3)</td>
<td>922</td>
<td>163</td>
<td>17.7 (95% CI: 15.0 to 20.5)</td>
</tr>
<tr>
<td>2010</td>
<td>1,848</td>
<td>366</td>
<td>19.0 (95% CI: 17.8 to 21.8)</td>
<td>737</td>
<td>144</td>
<td>19.5 (95% CI: 16.3 to 22.7)</td>
</tr>
<tr>
<td>2011</td>
<td>1,773</td>
<td>315</td>
<td>17.8 (95% CI: 15.8 to 19.7)</td>
<td>640</td>
<td>127</td>
<td>19.8 (95% CI: 16.4 to 23.3)</td>
</tr>
<tr>
<td>Total</td>
<td>5,597</td>
<td>1,044</td>
<td>19.7 (95% CI: 17.5 to 19.8)</td>
<td>2,299</td>
<td>434</td>
<td>18.6 (95% CI: 17.1 to 20.7)</td>
</tr>
</tbody>
</table>

Note: NV-HAP refers to nonventilator hospital-acquired pneumonia and VAP refers to ventilator-associated pneumonia.


Incidence, Prevalence of NV-HAP: A Local Study (2010)

- **Purpose:**
  - Determine incidence and clinical factors of NV-HAP

- **Method:**
  - Descriptive, quasi-experimental study using retrospective data
  - Inclusion criteria:
    - All adult discharges
    - ICD-9 codes of pneumonia not POA
    - AND met CDC definition of HAP

Hap ICD-9 Codes

| 480.8  | 481  | 482  | 482.1  | 482.2  | 482.39 | 482.41 | 482.42 | 482.82 | 482.83 | 482.89 | 483.8 | 484.1 | 484.6 | 484.7 | 485  | 486  |

Results

- 24,482 patients and 94,247 patient days
- 115 cases of NV-HAP
- Total estimated annual effect of NV-HAP:
  - $4.6 million
  - 23 deaths
  - 1035 days

NV-HAP Study #1: Conclusions

- HAP is occurring in nonventilated patients
- Costing lives and dollars
- Patients are at risk on ALL units
- Preventative nursing care is missed
Preventing NV-HAP Through Evidence Based Fundamental Nursing Care Strategies

Pathogenesis → Prevention

Germs in Mouth
- Dental plaque provides microhabitat
- Bacteria replicate 5X/24 hrs

Aspirated into Lungs
- Most common route
- 50% of healthy adults micro-aspirate in sleep

Weak Defenses
- Poor cough
- Immunosuppressed
- Multiple co-morbidities
Prevention

Germs in Mouth
• Comprehensive oral care

Aspirated
• Aspiration prevention strategies

Weak Host
• Strengthen host defenses

Risk Factors for Oral Bacteria in the Hospital

• Poor oral health in the U.S. (CDC, 2011)
• Increased bacteria counts
  • Plaque, gingivitis, tooth decay
  • Reduced salivary flow
• 24-48 hours for HAP pathogens in mouth
• If aspirated = 100,000,000 bacteria/ml saliva into lungs

Oral Cavity & VAP

- 89 critically ill patients
- Examined microbial colonization of the oropharynx throughout 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

http://helios.bto.ed.ac.uk/bto/microbes/biofilm.html
Loesche, W. 2012
Oral Intensity: Reducing NV-HAP in Neuro Impaired Patients

• Method
  – Quasi-experimental, comparative study
  – Adults, acute Neuroscience unit Western Canada
  – 51 retrospective patients – standard oral care
  – 34 prospective patients – enhanced oral care

• Results
  – Statistically significant decrease in NV-HAP (p<0.05)


Phase 2:
Could NV-HAP be decreased simply brushing the patient’s teeth?

Nine out of ten dentists recommend brushing your teeth.
SMCS HAP Prevention Plan

Phase 1: Oral Care

- Formation of new quality team: Hospital-Acquired Pneumonia Prevention Initiative (HAPPI)
- New oral care protocol to include non-ventilated patients
- New oral care products and equipment for all patients
- Staff education and in-services on products
- Ongoing monitoring and measurement
  - Monthly audits


Use of the Influencer Model

<table>
<thead>
<tr>
<th>Influencer Model</th>
<th>Motivation</th>
<th>Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.Vitalsmarts.com">www.Vitalsmarts.com</a></td>
<td>Patient stories</td>
<td>Education</td>
</tr>
<tr>
<td>Personal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Compare units</td>
<td>Mentor peers</td>
</tr>
<tr>
<td>Structural</td>
<td>Measure Recognize</td>
<td>Tools</td>
</tr>
</tbody>
</table>
## Gap Analysis

<table>
<thead>
<tr>
<th>Best Practice</th>
<th>Our Gaps</th>
<th>Action To Take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive oral care for all (CDC, SHEA)</td>
<td>ICU vent patients only</td>
<td>Develop inclusive oral care protocol</td>
</tr>
<tr>
<td>Oral CHG (0.12%) periop adult CV surgery and vent pts. (CDC, ATS, IHI).</td>
<td>Not using CHG on these patients.</td>
<td>Added to preprinted orders, and to protocol</td>
</tr>
<tr>
<td>Therapeutic oral care tools (ADA)</td>
<td>Poor quality oral care tools. Absence of denture care supplies.</td>
<td>New tools and supplies.</td>
</tr>
</tbody>
</table>

## 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>
SMCS NV-HAP Prevention

Patient and family education part of daily nursing care

Did You Know

The best way to prevent pneumonia is through good oral care. Sutter Medical Center, Sacramento is working to reduce the number of infections through effective use of new oral care tools:

- Toothpaste with baking soda that removes plaque
- Antiseptic mouth rinse that kills germs that cause pneumonia
- A soft toothbrush that won’t harm sensitive gums

Our nursing staff are working to educate patients and families about the proper methods to prevent pneumonia.

We are preventing pneumonia and saving lives, one meal at a time.

Provide Meaningful Data

- Ortho Unit had ZERO HAP cases in the last 4 months of 2013!!
- Great WORK!!
- Remember, the goal is to provide and document oral care after each meal and before bedtime.
Oral Care Knowledge & Attitude Survey:

- Method:
  - Staff survey
  - Pre – Post education
- Results:
  - Awareness of oral care protocol (77%)
  - Priority of care for NAs (96%)
  - RN perception that their patients received oral care (300%)

Frequency of Oral Care: Increased in the ICU

Frequency of Oral Care for Non-vented patients in the ICU ↑ 300%
Mean Frequency of Oral Care in Relationship to NV-HAP

Oral Care Frequency Per 24 Hours – All Units

X-bar chart mean oral care May, 2012 through December, 2013 (excludes months with < 10 cases)

Baseline

Mean Oral Care
NV-HAP Incidence
50 % Decrease from Baseline

Control chart for NV-HAP
January 2010 to December 2013

Open Heart Surgery Patients:
NV-HAP Reduced 75%

Oral care
Baseline
Oral care
Average

4N OHS

Oral chlorhexidine periop started

4N OHS
Linear (4N OHS)
Rate of NV-HAP 2010-2013

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
HAP Significant Trend Downward
Jan 2010-June 2014

Control chart for non-ventilator HAP
January 2010 to June 2014

WHEN WOULD NOW BE A GOOD TIME TO DO THIS?

It is not enough to do your best; you must know what to do, and THEN do your best.

~ W. Edwards Deming
**Hospital Acquired Pneumonia (HAP) and Ventilator-Associated Pneumonia (VAP)**

- VAP crude mortality approximately 10-40%.
- HAP crude mortality 15-18%
- Pooled mean ranges 0.5 (Ped CVICU) to 4.4 (Burn ICU) per 1000 ventilator days
- HAP rates 5-15 per 1000 patient days
- Est cost $30,000-$40,000 per VAP
- Increase LOS up to 4-14 days
- Annual cost $2 billion dollars.

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**References**

- Rello J. Chest. 2002;12:2115-2121
- ATS Guidelines for Healthcare Acquired Pneumonia 2006
Definition is Changing 1/2013: Ventilator Associated Events

- **Foundation:**
  - Criteria: objective, clinical data that are expected to be readily available across the spectrum of mechanically-ventilated patients, intensive care units and facilities

- **New definition only for the following patients**
  - Patients $\geq 18$ years of age;
  - Patients who have been intubated and mechanically ventilated for at least 3 calendar days; and
  - Patients in acute and long-term acute care hospitals and inpatient rehabilitation facilities.

**NOTE:** Patients receiving rescue mechanical ventilation therapies (e.g., high-frequency ventilation, extracorporeal membrane oxygenation, or mechanical ventilation in the prone position) are excluded from surveillance using the new, proposed definition algorithm.

Healthcare Acquired Pneumonia

- **Risk Factor Categories**
  - Factors that increase bacterial burden or colonization
  - Factors that increase risk of aspiration
Body Position: Supine versus Semi-recumbent (30-45 degrees)

Methodology

- 19 mechanically ventilated patients
- 2 period crossover trial
- Study supine and semirecumbent positions over 2 days
- Labeled gastric contents (Tc 99m sulphur colloid)
- Measured q 30 min content of gastric secretions in endobronchial tree in each position
- Sampled ET secretions, gastric juice & pharyngeal contents for bacteria


Results

- Radioactive contents higher in endobronchial secretions in supine patients
- Time dependent:
  - Supine: 298cpm/30min vs. 2592cpm/300min
  - HOB: 103cpm/30min vs. 216cpm/300min
- Same microbes cultured in all 3 areas 32% with HOB vs. 68% supine.

HOB Research

Methodology:
- 86 patients
- Randomly assigned to supine position or HOB 45 degrees (39 semi recumbent, 47 supine)
- Monitored clinical suspected & microbiologically confirmed nosocomial pneumonias

Results:
- Microbiologically confirmed nosocomial pneumonia lower in the semi recumbent group 2/39 (5%) vs. 11/47 (23%)
- Supine position & enteral nutrition were independent risk factors for VAP & had the greatest number of VAP’s 14/28 (50%)

Drakulovic MB. et. al. Lancet. 1999;354:1851-1858

HOB Research

- Methodology
  - Prospective multicenter trial randomly assigned to targeted 45° vs. 10° HOB
  - 112 to targeted 45° vs. 109 patients to 10°
  - Continuous measurement of backrest elevation first wk of MV

Results
- Baseline characteristics similar
- Average elevations
  - 10° group day 1 & 7: 9.8 & 16.1
  - 45° group day 1 & 7: 28.1 & 22.6*
- Target 45° not achieved 85% of the time
- VAP: 10° = 6.5% vs. 45° = 10.7%

*p < .001

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

<table>
<thead>
<tr>
<th>Antiseptic</th>
<th>Effect</th>
<th>Odds Ratio</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorhexidine</td>
<td>9/22</td>
<td>0.5</td>
<td>0.004</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>3/26</td>
<td>0.15</td>
<td>0.04</td>
</tr>
</tbody>
</table>

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% H₂O₂ 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 performed, 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


ICU Liberation Website

HTTP://WWW.ICULIBERATION.ORG/PAGES/DEFAULT.ASPX
**Goal: To Address Delirium And ICU Acquired Weakness**

- Spontaneous **A**wakening Trials
- Spontaneous **B**reathing Trials
- **C**oordination of Awakening and Breathing Trials/ **C**hoice of Sedative
- **D**aily **D**elirium screening
- **E**xercise/ **E**arly Mobility

**Neurological Dysfunct**

- 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
- 3 months: 40% had global cognition scores 1.5 SD below population mean, 26% had scores 2 SD below pop mean
- 12 months: 34%, 24% global cognition scores below the mean

Facts About Neurocognitive Impairments

- Up to 78% of ICU survivors experience neurocognitive impairments.
- 46% neurocognitive impairment prevalence at 1 year.
- 25% neurocognitive impairment prevalence at 6 years.

Hopkins RO, et al. CHEST. 2006;130:869-878.

WAKE UP AND BREATHE
Using the Evidence

• Administer sedation using a goal and a reliable and valid tool—RASS & SAS
• Assess daily if the target is appropriate
• Implement the ABCDE bundle
  – Improve collaboration amongst team members
  – Standardize care processes
  – Break the cycle of over sedation and prolonged ventilation—causes of increase delirium & weakness
  – Discuss timing of the protocol

Vasilevskiss EE et al. Chest; 2010;138:1224-1233
AACN Pearl: ABCDE Bundle

C: Choice of Sedation/Coordination
D: Delirium Assessment & Management

• PAD Guidelines (Evidence Based Guidelines)
  • Pain (Non-pharm & Pharmacological-Remifentanil or Fentanyl)
  • Agitation (non-benzodiazepine, Dexmedetomidine or Propofol) light sedation & interruption
  • RASS
  • SAS
  • Delirium (use atypical antipsychotics-Olanzapine/Quetiapine)
  • ICU-CAM
  • ICU Delirium Screening Checklist

Symptom targeted pharmacological & non-pharmacological management

PAD Bundle
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

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 A Progressive Mobility Program

• ↓ incidence of skin injury
• ↓ time on the ventilator
• ↓ incidence of VAP
• ↓ days of sedation
• ↓ delirium
• ↑ ambulatory distance
• Improved function

Thomson GE, et al. CCM 2008;36;1119-1124
Winkelmann C et al, CCN,2010;30:36-60

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


Patient is unstable, start at Level I & progress
Journey to tolerating upright position, tilt, sitting, standing and walking can occur quicker through the use of technology.
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

Balas M et al Crit Care Med, 2014; online
## 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>1.623</td>
</tr>
<tr>
<td>Length of delirium</td>
<td>2 days</td>
<td>1 day</td>
<td>0.0437</td>
</tr>
<tr>
<td>Died in the ICU</td>
<td>25.8%</td>
<td>14.9%</td>
<td>0.0913</td>
</tr>
<tr>
<td>Self extubated</td>
<td>6.5%</td>
<td>5.3%</td>
<td>0.7421</td>
</tr>
</tbody>
</table>

Balas M. Presented Jan 20, 2013 SCCM
Back to The Basics!!!!

How to Get Started

Interventions To Ensure Patients Receive Evidence-Based Care

- Evidence based education
- Recognition of value and reinforcement
- Products/Processes that make it easy for the frontline caregiver to provide the care (make it part of the bundle)
  - Bathing kits
  - Oral care kits
  - Placement on the med record
  - Automated charting with flag reminders
- Frequent rounding/reinforcement of standard
- Multidisciplinary rounds/Checklists

Westwall S. Nursing in Critical Care, 2008;13(4):205-207
Abbott CA, et al. Worldviews on Evidence Based Practice, 2006;139-152
Interventions To Ensure Patients Receive Evidence-Based Care

- Setting targets/Celebrating successes
- Placement of new practice/education in orientation
- Attractive signs to outline protocol in the patient rooms near the products
- Compliance program with feedback to all caregivers
- Outcome measurement/Feedback*

Westwall S. Nursing in Critical Care, 2008;13(4):203-207
Abbott CA, et al. Worldviews on Evidence Based Practice, 2006:139-152

Forbid yourself to be deterred by poor odds just because your mind has calculated that the opposition is too great. If it were easy, everyone would do it.