The Power of One: Impacting Patient Outcomes By Returning to the Basics of Prevention

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Disclosures

• Sage Products
  Speaker Bureau
  & Consultant
• Eloquest
  Healthcare
• Hill-Rom
It is Time to Change!!

- 44,000 to 98,000 preventable death in hospitals related to medical errors annually (IOM report, 1999)
- 92,888 deaths directly attributable to safety indicators between 2005-2007 (HealthGrades 2009)
  - post-op infections, failure to rescue & pressure ulcers
- National Patient Safety Goals include prevention of HAI’s
- Lack of reimbursement for preventable injury


It is Time to Change!!

- $50 billion in total costs for preventable injury
- 2011 mandatory federal reporting of CLA-BSI’s
- 2013-lowest percent improvement/total Medicare cut
- HHS goal to reduce HAI’s by 40% in 3 years (1 billion to assist in achieving goal)

http://content.healthaffairs.org/content/30/4/723.abstract
HAI Provisions of PPACA
Projected Medicare savings – $1.4B

Provisions
- Federal-level public reporting of HAs.
- Infection included in Value-Based Purchasing FY 2013 (CLBSI, MRSA, C-Diff, CAUTI, VAP, SSI).
- Hospitals in lowest performing quartile of HACs get a 1% reduction in Medicare inpatient payments in FY 2015.
- Medicaid provision similar to the existing Medicare policy that prevents a HAC from qualifying a case for higher payment.

Implications
- You can avoid these cuts
- Focus on evidenced-based care
- Benchmark against others
- Improve physician alignment
- Better identify & code POA
- Business case for technologies?

www.premierinc.com/advisorlive accessed 08/25/2010

Advocacy Starts with Us
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

Patient Advocacy/Safety Related to Clinical Practice

• Nurses knowledge of the evidence based care
• Ability to deliver the care to the right patient at the right time, every time it is needed
• The ability to communicate patient concerns in a concise, data driven manner and take appropriate action
• Understanding the chain of command when faced with resistance
Protect The Patient From Bad Things Happening on Your Watch

Implement
Interventional Patient Hygiene

Interventional Patient Hygiene

- Hand Hygiene
- Catheter Care
- Pressure Ulcer Prevention
- Bathing & Assessment
- Comprehensive Oral Care Plan

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)

Vollman KM. Australian Crit Care, 2009;22(4): 152-154

VAP/HAP

Oral Care / Mobility

HAND

Patient

HYGIENE

Catheter Care

Skin Care / Bathing / Mobility

CA-UTI

CA-BSI

SSI

HASI

Achieving the Use of the Evidence

Vollman KM. Australian Crit Care, 2009;22(4): 152-154
Why Prevention of HAI’s?

- 2.5 million HAI’s year/USA
- Everyday, 247 people die in the USA as a result of a HAI
- 99,000 deaths
- 5-10% of all patients admitted to US hospital annually contract HAI’s (1 of every 10-20 patients)
- Higher nurse staffing results in lower HAI’s*
- Cost estimated 28-34 billion a year
- HHS goal to reduce HAI’s by 40% in 3 years (1 billion to assist in achieving goal)

WHO 2005

REDUCING THE BACTERIAL LOAD ON THE PATIENT: IMPACT ON MRSA/MDRO
Traditional Bathing

Why are there so many bugs in here?

Spreading Microorganism

Environmental Contamination as a Source of Health Care Acquired Pathogens

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Survival</th>
<th>Data</th>
<th>Transmission Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>C. difficile</em></td>
<td>Months</td>
<td>3+</td>
<td>Healthcare facilities</td>
</tr>
<tr>
<td>MRSA</td>
<td>d-weeks</td>
<td>3+</td>
<td>Burn units</td>
</tr>
<tr>
<td>VRE</td>
<td>d-weeks</td>
<td>3+</td>
<td>Healthcare facilities</td>
</tr>
<tr>
<td>Acinetobacter</td>
<td>33 d</td>
<td>2/3+</td>
<td>ICUs</td>
</tr>
<tr>
<td><em>P. aeruginosa</em></td>
<td>7 h</td>
<td>1+</td>
<td>Wet environments</td>
</tr>
</tbody>
</table>

Hands equally become contaminated from commonly examined skin sites & environmental surfaces

Bath Water: A Source of Health-Care Associated Microbiological Contamination

- Compared normal bath water with chlorhexidine bath water on 3 wards
- Without Chlorhexidine: All samples + for bacterial growth \((14/23 > 10^5 \text{ cfu/ml})\)
- With Chlorhexidine: 5/32 grew bacteria with growth 240 to 1900 cfu/ml
- Gloved hands/bathing: objects touch grew significant numbers of bacteria


Bath Basins: Potential Source of Infection

- Multicenter sampling study (3 ICU’s) of 92 bath basins
- Identify & quantify bacteria in patients basins
- Sampling done on basins used > 2x in patients hospitalized > 48 hours & preformed 2 hours post bath
- Cultures sent to outside laboratory
- Qualitative vs. quantitative measures used to exclude growth that may have occurred in transport
- Bathing practices not controlled & no antiseptic soaps used to bathe

Bath Basins: Potential Source of Infection

Results
- 98% of all cultures grew some form of bacteria after plating or enrichment

• Enrichment Results
- 54% enterococci. 32% for gram -, 23% for S aureus and 13% VRE (statistically significant)
- <10% growth rates for: MRSA 8%, P aeruginosa 5%, C albicans 3% & E coli 2%


Large Multi-Center Basin Evaluation For Presence of MDRO’s

Methodology
• 88 hospitals from US & Canada
• From July 2007 to February 2011
• Randomly selected basins for damp swab culture
• External lab tested for MRSA & VRE & gram – bacilli
• All basins were clean & were not visibly soiled

Results:
• 1103 basins: 63.2% contaminated
• 385 basins (34.9%) from 80 hospitals were colonized with VRE
• 495 basins (44.9%) from 86 hospitals had gram-negative bacilli
• 36 basins (3.3%) from 28 hospitals had MRSA

Waterborne Infections Study

- Hospital tap water is the most overlooked source for Health-care associated pathogens
- 29 evidenced-based studies present solid evidence of waterborne Health-care associated infections
- Transmission occurs via drinking, bathing, items rinsed with tap water and contaminated environmental surfaces
- Immunocompromised patients are at the greatest risk
- Recommendation I: Minimize patient exposure to hospital tap water via bottled water and pre-packaged, disposable bathing sponges


Bacteria Biofilm

- Organized communities of viable & non-viable microorganisms protected within a matrix of extracellular polysaccharides, nutrients & entrained particles
- Adhere to inert material (plumbing)
- Bacteria contain within Biofilm may be transmitted to at risk patients by direct contact with water used for ingestion, ice, washing

ICU & Hospital Water Samples

• Systematic review published studies 1998-2005 (29 studies)
  – 9.7%-68.1% of random ICU water samples + for Pseudomonas aeruginosa
  – 14.2%-50% of patient infections were due to genotypes found in ICU water
• 9 hospital in New York city
  – Bacteria recovered in every hospital
  – 4-14 species identified
  – 1/3 organism known to be responsible for HAI’s


Impact on UTI with Basin Bathing

UTI Rate- Removal of Prepackaged Bath Product QTR 3 FY05

## The Effect of Bathing with Basin and Water and UTI Rate, LOS and Costs

### Unit Census: 14

<table>
<thead>
<tr>
<th>Phases</th>
<th>Product Cost/ No. of UTI</th>
<th>Median(^4) LOS 17 Days</th>
<th>Median(^4) Cost (4857.00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I- Pre-Packaged Bathing Washcloths</td>
<td>$10,530(^1) (3.00)</td>
<td>25</td>
<td>$117,175</td>
</tr>
<tr>
<td>(9 months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II- Basin/Water</td>
<td>$3,510(^2) (1.00)</td>
<td>48</td>
<td>$224,916</td>
</tr>
<tr>
<td>(9 months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III- Additional Product Cost, UTI,</td>
<td>$7,020(^3)</td>
<td>23(^3)</td>
<td>$107,741</td>
</tr>
<tr>
<td>LOS, COSTS</td>
<td></td>
<td>151</td>
<td></td>
</tr>
</tbody>
</table>

1. Based on 3 packages of 8 towels each
2. Based on product cost of towels, soap, and basin
3. Between phase I pre-package/phase II basin water
4. CA-UTI 7.5 per 1000 catheter days to 4.42 per 1000 catheter days, then to .46 per 1000 catheter days

---

### Reducing UTIs Through Basinless Bathing

![Reducing UTIs Through Basinless Bathing](image)

89% Reduction

CA-UTI 7.5 per 1000 catheter days to 4.42 per 1000 catheter days, then to .46 per 1000 catheter days
Pre-Op Prep

- Antisepsis must demonstrate a $3.0 \log_{10}$ from baseline in groin, $2.0 \log_{10}$ log reduction on the abdomen and maintain effectiveness for minimum of 6 hrs.
- CHG shower/bathing versus soap & water showed no difference in SSI (Cochrane EBR: 2007:CD004985)
- 2% prep cloth more effective in reducing bacterial load than 4% CHG solution that must be rinsed off/Inguinal sites sustained action at 10min, 30 min, 6 hrs > than 4% (Edmiston CE. Et al AJIC, 2007;35:89-96)
- CDC recommends must bathe or shower night before
  - Compliance issues, consistency in application, unable to bathe self

Innovative Strategy: Study
Re-examine Pre-op Prep

- Methodology
  - Observational study with a pre & post intervention period
  - Baseline: Actively part of National SCIP program
  - Pre-intervention pre-op prep was night before in home showering or washing with 4% CHG solution
  - Post intervention: Pre-op prep preformed with a pre-packaged 2% CHG prep product with instructions on its use
  - Pre-package prep preformed at hospital prior to surgery
- Measured:
  - Change in baseline SSI would occur with new prep process
  - Cost savings

Harris H et al Infection Control Today. March 2008: www.infectioncontroltoday.com
Innovative Strategy: Case Study
Re-examine Pre-op Prep

• Results:
  – 25 SSI’s during historical period out of 5174 procedures (rate of 2.1%)
  – 11 SSI’s during interventional period out of 4266 procedure (rate 0.7%)

Harris H et al Infection Control Today. March 2008: www.infectioncontroltoday.com

Bathing with CHG Basinless Cloths

• Prospective sequential group single arm clinical trial
• 1787 patients bathed
  – Period 1: soap & water
  – Period 2: CHG basinless cloth bath
  – Period 3: non-medicated basinless cloth bath

Veron MO et al. Archives Internal Med 2006;166:306-312
26 colonization's with VRE per 1000 patients days vs. 9 colonization's per 1000 patient days with CHG bath

Veron MO et al. Archives Internal Med 2006;166:306-312

Table 3. Percentage of Environmental Surface Culture Specimens That Were Positive for Vancomycin-Resistant Enterococci During the 3 Study Periods*  

<table>
<thead>
<tr>
<th>Site Where Culture Specimen Was Obtained</th>
<th>Soap and Water (n = 311)</th>
<th>Chlorhexidine (n = 307)†</th>
<th>Nonmedicated Cloth (n = 140)‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table</td>
<td>10 (3)</td>
<td>4 (1)</td>
<td>13 (9)</td>
</tr>
<tr>
<td>Bed rail</td>
<td>33 (11)</td>
<td>13 (4)</td>
<td>23 (16)</td>
</tr>
<tr>
<td>Pull sheet</td>
<td>63 (20)</td>
<td>17 (6)</td>
<td>43 (31)</td>
</tr>
</tbody>
</table>

Veron MO et al. Archives Internal Med 2006;166:306-312
CHG Bathing Reduces CLA-BSI’s (II)

- 52 week, 2 arm, cross-over design clinical trial
- 22 bed MICU with 11 beds in 2 geographically separate areas
- 836 MICU patients
  - 1st 28 weeks: 1 hospital randomize to bathe with (Sage 2%) CHG cloths & the other unit bathe with soap & water
  - 2 week wash out period
  - 2nd 24 weeks: methods were crossed over
- Measured: Primary outcomes: incidence of CA-BSI’s & clinical sepsis. Secondary: other infections


CHG Bathing Reduces CLA-BSI's (II)

Results:
- CHG arm were significantly less likely to acquire a CA-BSI 4.1 vs. 10.4 infections per 1000 patient days
- Benefit against primary CA-BSI’s by CHG cleansing after 5 days in MICU
- No difference in clinical sepsis or other infections

Daily CHG Bathing with 2% Cloths to Reduce CLA-BSI: Meta-Analysis

- Statistical significance in reducing CLA-BSI's
- Limitations
  - Non-randomized
  - Before/after designs
  - Other data potentially impacting findings was not reported


The Efficacy of Daily Bathing with Chlorhexidine for Reducing Healthcare-Associated Bloodstream Infections: A Meta-analysis

John C. O’Heo, MD; Germana L. M. Silva, MD; Silvia Munoz-Price, MD; Nisia Sodier, MD, PhD

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Events</th>
<th>Control Events</th>
<th>Weight</th>
<th>M H, Random, 95% CI</th>
<th>Odds Ratio</th>
<th>M H, Random, 95% CI</th>
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<tbody>
<tr>
<td>1.2 CHG Impregnated Cloths</td>
<td>9 2210</td>
<td>22 2198</td>
<td>8.2%</td>
<td>0.19 (0.08, 0.44)</td>
<td>0.19 (0.08, 0.44)</td>
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<tr>
<td>Dicz and Cava, 2000</td>
<td>8 1148</td>
<td>27 1146</td>
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<td>17 1798</td>
<td>15 1796</td>
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<td>0.20 (0.09, 0.42)</td>
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<tr>
<td>Froscot et al, 2009</td>
<td>1 1200</td>
<td>2 1199</td>
<td>3.3%</td>
<td>0.28 (0.05, 1.29)</td>
<td>0.28 (0.05, 1.29)</td>
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<tr>
<td>Pappou et al, 2009</td>
<td>3 5610</td>
<td>10 5678</td>
<td>3.4%</td>
<td>0.11 (0.03, 0.34)</td>
<td>0.11 (0.03, 0.34)</td>
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<tr>
<td>Subtotal: 1.2 CHG Impregnated Cloths</td>
<td>39 5021</td>
<td>32 4895</td>
<td>9.3%</td>
<td>0.31 (0.14, 0.67)</td>
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Heterogeneity: Tau^2 = 0.19; Chi^2 = 12.03; df = 6 (P = 0.05); I^2 = 53%
Test for overall effect: Z = 3.74 (P = 0.0002)

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<th>26 24.22</th>
<th>7 14.0</th>
<th>13.7%</th>
<th>0.13 (0.03, 0.56)</th>
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Infect Control Hosp Epidemiol 2012;33(3):257-267
K1
Add the metanalysis from Infection control & Hosp Epi
Kathle, 8/18/2012
Effect of CHG Cloth Bath of HAI’s in Trauma Patients

- Retrospective analysis 6 months before and after institution of CHG bathing
- 12 bed level 1 trauma center
  - 286 severely injured patients bathes 2% CHG cloth
  - 253 severely injured patients bathed without CHG cloth
- Results: CHG bathed patients less likely to acquire a CLA BSI (2.1-vs. 8.4), MRSA VAP 1.6 vs. 5.7 & rate of colonization was significantly lowers; 23.2 vs.69.4 per 1000 patient days


2% CHG Cloth vs. Soap & Water Bathing for Reduction of HAI’s in Med-Surg

- Quasi-experimental study of 14,701 patients in 4 med-surg units (94 beds) in a 719 bed academic center
- Pre-post design: 7102 (control group soap & water) 7699 (experimental group 2% CHG cloth)
- Monitor hand hygiene and isolation compliance
- MRSA screening performed in both groups
- Results
  - 64% reduced risk of developing HAI’s from MRSA & VRE (hazard ratio, .36 [95% CI, 0.2-0.8]; P=.01)
  - More + MRSA colonization in CHG group so > isolation & hand hygiene

Simple Cost Effective Strategies to Reduce HAIs

Implementation:

- Utilize daily 2% CHG cloths for cleansing at night in any patient with a central line or foley catheter
- Focused on areas most prone to bacterial colonization from the neck down

Was moved from the ICU to house-wide post initial project with similar results in Med-Surg

Strategies for Bathing to Reduce Source Control & Improve Skin Defense

Basin Bath

- ↑ transmission of organisms
- ↑ time & effort
- ↑ # of supplies
- Harmful soaps
- Rough washcloths
- Cold/tepid water
- Scrubbing technique
Reducing the Bacterial Load in the Mouth to Impact VAE’s and HAP
Hospital Acquired Pneumonia (HAP) and Ventilator-Associated Pneumonia (VAP)

- VAP crude mortality approximately 10-40%.
- HAP crude mortality 15-18%
- Pooled mean ranges 0.7 (Ped CVICU) to 7.4 (Burn ICU) per 1000 ventilator days
- HAP rates 5-15 per 1000 patient days
- Est cost $30,000-$40,000 per VAP
- Calculated loss for VAP against matched controls = $12,780
- Increase LOS up to 4-14 days
- Annual cost $2 billion dollars.


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 ≥ 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.  

Centers for Disease Control and Prevention  www.APIC.org
Proposed Algorithm

**Proposed Algorithm**

*NHSN Surveillance for Ventilator-Associated Events in Adults*

### Surveillance Definitions for Ventilator-Associated Events
- For use in acute and long-term acute care hospitals and inpatient rehabilitation facilities.
- For patients ≥18 years of age who are on mechanical ventilation for ≥2 calendar days.
- Note: patients on rescue mechanical ventilation (e.g., HIV, ECMO, mechanical ventilation in prone position) are excluded.

### Patient with a baseline period of stability or improvement on the ventilator, defined by ≥ 2 calendar days of stable or decreasing FiO2 or PEEP baseline FiO2 and PEEP are defined by the minimum daily FiO2 or PEEP measurement during the period of stability or improvement.

### After a period of stability or improvement on the ventilator, the patient has at least one of the following indicators of worsening oxygenation:
1. Minimum daily FiO2 values increase ≥ 0.20 (20%) over baseline and remain at or above that increased level for ≥ 2 calendar days.
2. Minimum daily PEEP values increase ≥ 3 cmH2O over baseline and remain at or above that increased level for ≥ 2 calendar days.

### Ventilator-Associated Condition (VAC) — Public Reporting Definition

### On or after calendar day 3 of mechanical ventilation and within 2 calendar days before or after the onset of worsening oxygenation, the patient meets both of the following criteria:
1. Temperature > 38°C or < 36°C, OR white blood cell count ≥ 12,000 cells/mm³ or ≤ 4,000 cells/mm³.
2. A new antimicrobial agent(s) is started, and is continued for ≥ 4 calendar days.

---

**Proposed Algorithm**

*Infection-related Ventilator-Associated Complications (VAC) — Public Reporting Definition*

### On or after calendar day 3 of mechanical ventilation and within 2 calendar days before or after the onset of worsening oxygenation, one of the following criteria is met:
1. Purulent respiratory secretion(s) from one or more specimen collection(s):
   - Defined as secretions from the lungs, bronchi, or trachea that contain ≥ 25 neutrophils and ≥ 1,000 squamous epithelial cells per low power field (≥ 100x).
   - If the laboratory reports semi-quantitative results, those results must be equivalent to the above quantitative thresholds.
   - Positive culture (qualitative, semi-quantitative or quantitative) of opsin, and/or tracheal aspirate, bronchoalveolar lavage, lung tissue, or protected specimen brushing.

### Possible Ventilator-Associated Pneumonia

### Internal Quality Improvement

### Probable Ventilator-Associated Pneumonia

### On or after calendar day 3 of mechanical ventilation and within 2 calendar days before or after the onset of worsening oxygenation, one of the following criteria is met:
1. Purulent respiratory secretion(s) from one or more specimen collection(s):
   - Positive culture of endotracheal aspirate, ≥ 10⁶ CFU/mL or equivalent semi-quantitative result
   - Positive culture of bronchoalveolar lavage, ≥ 10⁵ CFU/mL or equivalent semi-quantitative result
   - Positive culture of lung tissue, ≥ 10⁵ CFU/mL or equivalent semi-quantitative result
   - Positive culture of protected specimen brush, ≥ 10⁵ CFU/mL or equivalent semi-quantitative result

2. One of the following (without requirement for purulent respiratory secretion(s)):
   - Positive pleural fluid culture (where specimen was obtained during thoracentesis or initial placement of chest tube and NOT from an indwelling chest tube)
   - Positive lung histopathology
   - Positive diagnostic test for Legionella spp.
   - Positive diagnostic test on respiratory secretions for influenza viruses, respiratory syncytial viruses, adenovirus, parainfluenza viruses
Oropharyngeal Colonization

Methodology:
- 89 critically ill patients
- Examined microbial colonization of the oropharynx throughout the ICU stay
- Used pulse field gel electrophoresis to compare chromosomal DNA

Results:
- Diagnosed 31 VAPs
- 28 of 31 VAPs the causative organism was identical via DNA analysis


Dental Plaque

Methodology:
- 49 elderly nursing home residents admitted to the hospital
- Examined baseline dental plaque scores & microorganisms 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
BRUSH & SWAB

• 77% more clean approximal sites with brushing
• 44% more clean crevice sites with brushing
• Benefit of brushing is directly correlated with technique
• Foam swabs could not remove plaque from sheltered areas on or between teeth


Toothbrush; grade D, Swabs; unresolved, Use of flexible suction catheter post oral cleansing; Grade D (Berry AM et al. AJCC, 2007;16:552-563)

Oral Care Reduces Pneumonia In Nursing Homes

Methodology

➢ 11 nursing homes in Japan over 2 year period
➢ 417 enrolled / 366 residents analyzed (death from other causes)
➢ 184 received oral care program/182 did not
➢ Tooth brushing after each meal (teeth or dentures) & 1x weekly review by dentist/or

Results

<table>
<thead>
<tr>
<th></th>
<th>No Oral</th>
<th>Oral Care</th>
<th>p value</th>
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<tbody>
<tr>
<td>Febrile</td>
<td>29%</td>
<td>15%</td>
<td>p&lt;.01</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>19%</td>
<td>11%</td>
<td>p&lt;.05</td>
</tr>
<tr>
<td>Death</td>
<td>16%</td>
<td>7%</td>
<td>p&lt;.01</td>
</tr>
<tr>
<td>MMSE</td>
<td>Increase</td>
<td>p&lt;.05</td>
<td></td>
</tr>
</tbody>
</table>

Yoneyama et al. JAGS. 2002;50:430-433
Solutions

- Cetylpyridinium Chloride (CPC)

EBR: CHG; grade B evidence, Sodium Bicarb; unresolved, H2O2; unresolved, Salt solutions; unresolved; Tap water; not recommended, Sterile water; unresolved. (Berry AM et al. AJCC, 2007;16:552-563)

Review of Dental Literature Not Included

H₂O₂, Cetylpyridium Chloride (CPC) & Biotene

H₂O₂
- >3% may cause harm, <1% no benefit in plaque removal.
- Must be diluted properly, not with normal saline.
- 3x a day mouth rinse with 1.5% H₂O₂ revealed no mucosal damage, improved plaque scores and overall gingival health.
- Cetylpyridium chloride had significant antigingivitis effects in several individual studies
- Used in some over the counter plaque reduction rinses (Crest rinse)

Biotene
- Contains salivary enzymes
- Moisturize, Some oral care kits

**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)

<table>
<thead>
<tr>
<th>Antiseptic</th>
<th>Series</th>
<th>Control</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placebo</td>
<td>4</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>CHG</td>
<td>6</td>
<td>11</td>
<td>0.59</td>
</tr>
<tr>
<td>Seguric acid (PDA)</td>
<td>3</td>
<td>26</td>
<td>0.7</td>
</tr>
<tr>
<td>Sublingual (SMCO)</td>
<td>5</td>
<td>14</td>
<td>0.52</td>
</tr>
<tr>
<td>Trimepsan</td>
<td>9</td>
<td>22</td>
<td>0.37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Odds Ratio (95% CI)</th>
<th>P-value</th>
<th>Risk Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.72 (1.44 - 4.99)</td>
<td>&lt;0.004</td>
<td></td>
</tr>
</tbody>
</table>

- 2 trials evaluated Povidone-iodine (140pts)
- Variation of additional interventions:
  - toothbrushing
  - oropharyngeal aspiration
  - mechanical cleaning of the mouth
  - Frequency of antiseptic

**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 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)
Literature Review: Oral Care Impact of VAP

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, Feb 2008

Dental Brushing for Preventing VAP

- Prospective, simple blind, randomized trial of adult patients incubated for > 48 hours
- Randomized to oral care every eight hours with .12% CHG applied by gauze after suctioning oral secretions and √ cuff pressures (standard) or standard oral care plus electric toothbrushing

Results

- Terminated after randomizing hundred 47 patients
- No difference in VAP, mortality antibiotics three days duration mechanical ventilation or hospital ICU length of stay in the two groups

Oral Suctioning with Position Change

- Prospective time sequenced non-randomized study
  - 237 control (observation phase 9 months)
  - 227 Interventional (7 months interventional)
  - Difference in nursing protocol was oral suctioning prior to position change (11 additional suctions)
  - All other nursing care the same

- Results:
  - VAP: 6.51 to 2.04 per 1000 ventilator days ($p<0.002$)
  - Vent days: $28.8 \pm 17.2$ vs. $20.2 \pm 4.0$ ($p <0.009$)
  - ICU LOS: $27.6 \pm 17$ vs. $20.3 \pm 4.0$ ($p < 0.012$)
  - Suctioning before positional change only independent factor responsible for VAP decrease ($p=0.003$)


Does Compliance Make A Difference?

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

Hutchins K, et al.
Presented at APIC Annual Conference June 2008
CA-UTI Prevention

CA-UTIs: Reducing Load

- Use of catheter increases risk
- Daily risk of acquisition of UTI: 3% to 7%
- Second most common HAI & 80% attributable to indwelling catheterization
- CAUTI: associated with ↑ morbidity, mortality (2.3%), hospital cost ($589.00) & LOS
- 30% of HAI’s reported in acute care

Joanna Briggs Institute EBR: 2007
Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009
CA-UTIs: Reducing Load

- 15%-25% of hospital patients may have a urinary catheter during admission
- Pooled mean CAUTI with new definitions rates .8 -4.4 infections per 1000 catheter days (PICU lowest, Burn & Neurosurg ICU highest)
- Inpatient pooled mean for CA-UTI rates .3 to 3.8 infections per 1000 cath days (L & D lowest, Acute rehab highest)
- Add 1 day LOS per patient

Joanna Briggs Institute EBR: 2007
Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009

Type of Facility Reporting

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Bed size category</th>
<th>&lt;=200 (N)</th>
<th>201-500 (N)</th>
<th>501-1000 (N)</th>
<th>&gt;1000 (N)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major teaching</td>
<td>81 (4.5)</td>
<td>117 (6.7)</td>
<td>83 (4.7)</td>
<td>3 (0.1)</td>
<td>284 (16.0)</td>
<td></td>
</tr>
<tr>
<td>Graduate teaching</td>
<td>85 (4.9)</td>
<td>69 (3.9)</td>
<td>22 (1.3)</td>
<td>1 (0.1)</td>
<td>177 (10.2)</td>
<td></td>
</tr>
<tr>
<td>Limited teaching</td>
<td>113 (6.5)</td>
<td>74 (4.2)</td>
<td>10 (0.6)</td>
<td>0 (0.0)</td>
<td>197 (11.3)</td>
<td></td>
</tr>
<tr>
<td>Nonteaching</td>
<td>834 (47.7)</td>
<td>237 (13.6)</td>
<td>19 (1.1)</td>
<td>1 (0.1)</td>
<td>1091 (62.5)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1113 (63.6)</td>
<td>497 (28.4)</td>
<td>134 (7.7)</td>
<td>5 (0.3)</td>
<td>1740 (100)</td>
<td></td>
</tr>
</tbody>
</table>
2009 NHSN Definition

• UTI's are defined using symptomatic urinary tract infection (SUTI) criteria or Asymptomatic Bacteremic UTI (ABUTI) criteria.

• Report UTIs that are catheter-associated (i.e. patient had an indwelling urinary catheter at the time of or within 48 hours before onset of the event).
Figure 2: Identification and Categorization of SUTI Indwelling Catheter Discontinued in Prior 48 Hours

Patient had an indwelling urinary catheter discontinued within 48 hours prior to specimen collection.

**Signs and Symptoms**
- At least 1 of the following with no other recognized cause:
  - Fever (≥38°C)
  - Dysuria
  - Urinary urgency
  - Suprapubic tenderness
  - Frequency
  - Costovertebral angle pain or tenderness

**Urinalysis**
- A positive urinalysis demonstrated by at least 1 of the following findings:
  - Positive dipstick for leukocyte esterase and/or nitrite
  - Pyuria (urine specimen with ≥10 WBC/mm³ of unspun urine or ≥3 WBC/high power field of spun urine)
  - Microorganisms seen on Gram stain of unspun urine

**Culture Evidence**
- A positive urine culture of ≥10⁵ CFU/ml with no more than 2 species of microorganisms
- A positive urine culture of ≥10⁸ and <10⁹ CFU/ml with no more than 2 species of microorganisms

**SUTI — Criterion 1a**
CAUTI

**SUTI — Criterion 2a**
CAUTI

Figure 5: Identification of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

Patient with or without an indwelling urinary catheter

**Signs and Symptoms**
- Patient of any age
  - None of the following:
    - Fever (≥38°C)
    - Urgency
    - Frequency
    - Dysuria
    - Suprapubic pain
    - Costovertebral angle pain or tenderness

**Patient 51 year of age**
- None of the following:
  - Fever (≥38°C)
  - Hypothermia (≤26°C core)
  - Agitation
  - Bradycardia
  - Lethargy
  - Vomiting

**Culture Evidence**
- A positive urine culture of ≥10⁵ CFU/ml with no more than 2 species of microorganisms
- A positive blood culture with at least 1 matching uropathogen microorganisms to the urine culture

**Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)**

*Unpathogen microorganisms are: Gram-negative bacilli, Staphylococcus spp., yeasts, beta-hemolytic Streptococcus spp., Enterococcus spp., G. vaginalis, Aerococcus urinae, Corynebacterium urease positive*.  
*Report Corynebacterium (urease positive) as either Corynebacterium species unspecified (COD) or, e.g., Corynebacterium (COD/L) if so specified.*
CA-UTI Bundle
“Bladder Bundle”

• CA-UTI Bundle ( “Bladder Bundle”)  
  – Avoid unnecessary urinary catheters  
  – Insert urinary catheters using aseptic technique  
  – Maintain urinary catheters based on recommended guidelines.  
  – Review urinary catheter necessity daily and remove promptly

http://www.bestcare.org.za/docs/Prevent%20Catheter%20CA-UTI.pdf

HICPAC CA-UTI Guideline

• Appropriate Urinary Catheter Use
  – Insert catheters only for appropriate indications and leave in place only as long as needed (1B)  
  – Avoid use of urinary catheters in patients and nursing home residents for management of incontinence. (1B)  
  – Use urinary catheters in operative patients only as necessary, rather than routinely. (1B)  
  – Consider using alternatives to indwelling urethral catheterization in selected patients when appropriate. (II)  
  – Further research is needed on the risks and benefits of suprapubic catheters as an alternative to indwelling urethral catheters in selected patients requiring short- or long-term catheterization. (No recommendation/unresolved issue)

Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. Final 2009
Expert Opinion

Table 2. Appropriate Indications for Indwelling Urethral Catheter Use

<table>
<thead>
<tr>
<th>Patient has acute urinary retention or obstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for accurate measurements of urinary output in critically ill patients</td>
</tr>
<tr>
<td>Perioperative use for selected surgical procedures:</td>
</tr>
<tr>
<td>• Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract</td>
</tr>
<tr>
<td>• Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)</td>
</tr>
<tr>
<td>• Patients anticipated to receive large-volume infusions or diuretics during surgery</td>
</tr>
<tr>
<td>• Operative patients with urinary incontinence</td>
</tr>
<tr>
<td>• Need for intraoperative monitoring of urinary output</td>
</tr>
<tr>
<td>To assist in healing of open sacral or perineal wounds in incontinent patients</td>
</tr>
<tr>
<td>Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine)</td>
</tr>
<tr>
<td>To improve comfort for end of life care if needed</td>
</tr>
</tbody>
</table>

Indwelling catheters should not be used:

- As a substitute for nursing care of the patient or resident with incontinence
- As a means of obtaining urine for culture or other diagnostic tests when the patient can voluntarily void
- For prolonged postoperative duration without appropriate indications
- Routinely for patients receiving epidural anaesthesia/analgesia

Catheter-Associated UTIs. Draft June 2009

HICPAC CA-UTI Guideline

- **Proper Technique for Urinary Catheter Insertion**
  - Perform hand hygiene immediately before and after insertion or any manipulation of the catheter device or site. (IB)
  - Ensure that only properly trained persons who know the correct technique of aseptic catheter insertion & maintenance are given this responsibility. (IB)
  - Insert catheters using aseptic technique and sterile equipment (except chronic intermittent catheterization). (IC)
    - Use sterile gloves, drape, sponges, an appropriate antiseptic or sterile solution for periurethral cleaning, and a single-use packet of lubricant jelly for insertion. (IC)
    - Antiseptic lubricants need not be used routinely to prevent CAUTI. (II)
  - Further research is needed on the use of antiseptic solutions vs. sterile water or saline for periurethral cleaning prior to catheter insertion. (No recommendation/unresolved issue)

Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009, final
HICPAC CA-UTI Guideline

• **Proper Technique for Urinary Catheter Insertion**
  - Properly secure indwelling catheters after insertion to prevent movement and urethral traction. (IB)
  - Consider using the smallest bore catheter possible, consistent with good drainage, to minimize urethral trauma. (II)

• **Proper Techniques for Urinary Catheter Maintenance**
  - Maintain a sterile, continuously closed drainage system (IB)
  - If breaks in aseptic technique, disconnection, or leakage occur, replace the catheter and collecting system using aseptic technique and sterile equipment. (IB)
  - Key the collecting bag below the level of the bladder at all times (IB)
  - Urinary catheter systems with preconnected, sealed catheter-tubing junctions may reduce the risk of CAUTI compared to unsealed catheter systems. (II)

Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009

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HICPAC CA-UTI Guideline

• **Proper Techniques for Urinary Catheter Maintenance**
  - Maintain unobstructed urine flow. (IB)
    - Keep the catheter and collecting tube free from kinking. (IC)
    - Empty the collecting bag regularly using a separate collecting container for each patient, and avoid contact of the drainage spigot with the nonsterile collecting container. (IC)
  - Use Standard Precautions, including the use of gloves and gown as appropriate, during any manipulation of the catheter or collecting system. (IC)
  - Complex urinary drainage systems (utilizing mechanisms for reducing bacterial entry such as antiseptic-release cartridges in the drain port) need not be used routinely to prevent CAUTI. (II)
  - Do not change indwelling catheters or drainage bags at arbitrary fixed intervals. (IB)

Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009
HICPAC CA-UTI Guideline

• **Proper Techniques for Urinary Catheter Maintenance**
  
  | Do not clean the periurethral area with antiseptics to prevent CAUTI while the catheter is in place. Routine hygiene (e.g., cleansing of the meatal surface during daily bathing) is appropriate. (1B)
  | Avoid bladder irrigation unless obstruction is anticipated (II)
  |   • If obstruction is anticipated, closed continuous irrigation may be used to prevent obstruction. (II)
  | The bladder or collection bag need not be irrigated with antimicrobials routinely to prevent CAUTI. (II)
  | Clamping indwelling catheters prior to removal is unnecessary. (II)

Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009

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HICPAC CA-UTI Guideline

• **Catheter Materials**
  
  | If the CAUTI rate is not decreasing with a comprehensive strategy, consider using antimicrobial/antiseptic impregnated catheters. (1B)
  |   • Further research is needed on the effect of using antimicrobial/antiseptic catheters in reducing the risk of symptomatic UTI. (No recommendation/unresolved issue)
  | Hydrophilic catheters may be preferable to standard catheters for patients requiring intermittent catheterization. (II)
  | Silicone may be preferable to other catheter materials to reduce the risk of encrustation in long-term catheterized patients who have frequent obstruction. (II)

Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009
**HICPAC CA-UTI Guideline**

- **Specimen Collection**
  - Obtain urine samples aseptically. (1B)
  - If a small volume of fresh urine is needed for examination (i.e., urinalysis or culture), aspirate the urine from the needleless sampling port with a sterile syringe/cannula adapter after cleansing the port with a disinfectant. (1B)
  - Obtain large volumes of urine for special analyses (not culture) aseptically from the drainage bag. (1B)

- **Spatial Separation of Catheterized Patients**
  - Further research is needed on the benefit of spatial separation of patients with urinary catheters to prevent transmission of pathogens colonizing urinary drainage systems. (No recommendation/unresolved issue)

Gould, CV et al. HICPAC Guideline for Preventing Catheter-Associated UTIs. 2009

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**2012 National Patient Safety Goal: NPSG.07.06.01**

- Full implementation of the goal by 01/01/2013
- Insert indwelling urinary catheters according to established evidence based guidelines that address;
  - Limiting use
  - Using aseptic technique for site prep, equip & supplies
- Manage indwelling urinary catheters according to established evidence-based guidelines that address;
  - Securing the catheter for unobstructed flow
  - Maintaining the sterility of the urine collection system
  - Replacing the urine collection system when required
  - Collecting urine samples
2012 National Patient Safety Goal: NPSG.07.06.01

- Full implementation of the goal by 01/01/2013
- Measure and monitor CA-UTI prevention processes and outcomes in high volume areas;
  - Selecting measures using EBP or best practices
  - Monitoring compliance
  - Evaluating effectiveness of prevention strategies

Surveillance may be targeted to areas with high volume of patients with in-dwelling catheters. High volume areas are identified through the hospital's risk assessment process.
Cost-Benefit Ratio

CA-UTI vs. IAD & Pressure Ulcer
Moisture Injury: Incontinence Associated Dermatitis

- Inflammatory response to the injury of the water-protein-lipid matrix of the skin
  - Caused from prolonged exposure to urinary and fecal incontinence

- Physical signs on the perineum & buttocks
  - Erythema, swelling, oozing, vesiculation, crusting and scaling

Brown DS & Sears M, OWM 1993;39:2-26

IAD Assessment Tool

The things included in the measurement becomes relevant, the things omitted are out of sight out of mind

Peter F. Drucker

Reminder Systems May Reduce Inpatient Catheter Use and Associated UTIs

<table>
<thead>
<tr>
<th>Study</th>
<th>RR(95% CI)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reminder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apisarnthanarak (2007)</td>
<td>0.24 (0.15, 0.37)</td>
<td>19.34</td>
</tr>
<tr>
<td>Crouzet (2007)</td>
<td>0.15 (0.01, 0.82)</td>
<td>11.09</td>
</tr>
<tr>
<td>Huang (2004)</td>
<td>0.72 (0.34, 0.96)</td>
<td>16.72</td>
</tr>
<tr>
<td>Jain (2006)</td>
<td>0.64 (0.33, 1.20)</td>
<td>10.35</td>
</tr>
<tr>
<td>Subtotal (P = 0.73; P &lt; 0.001)</td>
<td>0.44 (0.13, 0.74)</td>
<td>57.49</td>
</tr>
<tr>
<td>Stop Order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topal (2005)</td>
<td>0.53 (0.25, 1.06)</td>
<td>11.09</td>
</tr>
<tr>
<td>Stephen (2006)</td>
<td>0.41 (0.19, 0.82)</td>
<td>13.55</td>
</tr>
<tr>
<td>Darmopil (1998)</td>
<td>0.65 (0.30, 0.94)</td>
<td>17.87</td>
</tr>
<tr>
<td>Subtotal (P = 0.00; P &lt; 0.001)</td>
<td>0.59 (0.45, 0.73)</td>
<td>42.51</td>
</tr>
<tr>
<td>Overall (P = 0.78; P &lt; 0.001)</td>
<td>0.48 (0.28, 0.68)</td>
<td>100.00</td>
</tr>
</tbody>
</table>

NOTE: Weights are from random effects analysis

Reducing Use…Does it Reduce CA-UTIs

- Pre and post intervention study
- Unit clinicians developed indications for continued use of catheter (evidence-based)
- 6 month intervention period evaluated appropriateness of catheter daily
- 337 patients/1432 catheterization days were evaluated
  - Duration of use significantly reduced (236.6 d/mo vs. 311.7 d/mo)
  - CA-UTIs went from 4.7 per 1000 days to 0 per 1000 catheter days for the intervention period
  - Only 11% inappropriate days

<table>
<thead>
<tr>
<th>Appropriate indications</th>
<th>Inappropriate indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract obstruction</td>
<td>Incontinent without any of the appropriate indications</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>Frequent, but nonessential, determination of urinary output</td>
</tr>
<tr>
<td>Fever, chills</td>
<td>Frequent, but nonessential, determination of urinary output</td>
</tr>
<tr>
<td>Patient already on catheter</td>
<td>Frequent, but nonessential, determination of urinary output</td>
</tr>
<tr>
<td>Other medical condition</td>
<td>Frequent, but nonessential, determination of urinary output</td>
</tr>
<tr>
<td>Medications</td>
<td>Frequent, but nonessential, determination of urinary output</td>
</tr>
<tr>
<td>Family preference</td>
<td>Frequent, but nonessential, determination of urinary output</td>
</tr>
<tr>
<td>Urgent care</td>
<td>Frequent, but nonessential, determination of urinary output</td>
</tr>
</tbody>
</table>


Key Element of a CA-UTI Reduction Program

- Reformulation or clarification of policies and procedures related to indwelling catheters
- Active involvement of a multidisciplinary team
- Standardized mechanism to review appropriateness of insertion
- Mechanism for reviewing the potential to remove beginning as soon as day 1 and no later than day 3
- Mechanism for regular and constructive staff feedback about the results of the program

Gray M. AACN Advance Practice. 2010;21(3):247-257
Getting to Zero!!!!

How to Get Started

Four E’s

• Engage: help staff understand the preventable harm
  – Share stories about patients affected
  – Estimate number of patients harmed
  – Develop a business case
• Educate: ensure staff and senior leaders understand what they need to do to prevent injury and improve teamwork and communication
  – Conference calls, webcasts, meetings
• Execute: how given the resources and culture they would ensure that all patients received the evidence
  – Share with working, what’s not
  – Coaching calls
• Evaluate: project leader monitors that team are using standardized definitions, report their data and make it transparent at the unit level

In God We Trust!
Everyone else please bring data

Four E’s

• Engage: help staff understand the preventable harm
  – Share stories about patients affected
  – Estimate number of patients harmed
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• Evaluate: project leader monitors that teams are using standardized definitions, report their data and make it transparent at the unit level

Potential Barriers

- Perception of lack of time or the importance
- Lack of evidence based education...just do it!!!!
- Absence of a define protocol/procedure
- Staff turnover/Replacement staff
- Inaccessibility of needed supplies
- No real clinical lead on the unit
- Lack of feedback on progress
- Lack of accountability/responsibility


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
  - 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):203-207
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*
- Include RNs in Morbidity & Mortality peer review for VAP increased compliance/accountability & ↓VAP rates

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

Be Courageous

We all are responsible for the safety of our patients……Own the Issues

- “If not this, then what??”
- “If not now, then when?”
- “If not me, then who??”