Interventional Patient Hygiene: Impacting Patient Outcomes By Returning to the Basics

Kathleen M. Vollman MSN, RN, CCNS, FCCM
Clinical Nurse Specialist/Educator/Consultant
ADVANCING NURSING
kvollman@comcast.net
Northville, Michigan
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• E. L. Lilly Speaker Bureau

Driving Forces for Change
• Scientific Driver
  – Evidence-based practice movement
• Economic & Social Drivers
  – IOM/Medical error
  – Quality/Safety Organization
    • Australian Patient Safety Foundation (1989)/Safety & Quality Council (2000)/New Zealand part of Quality Network
    • Queensland I-Care, NSW: Safer Systems-Savings Lives, Victoria Nosocomial Infection Surveillance System
    • Patient Safety First Campaign/NPSA/NICE/UK
    • IHI/VHA: 100,000 lives campaign / 5 million lives campaign
  – Accreditation bodies
• Professional Driver: Back to the basics
Vollman KM. Crit Care Nurs Clin N Am, 2006; 18:453-467
http://www.apsf.net.au/
http://www.saferhealthcarenow.ca/
http://www.npsa.nhs.uk/

Is this the full measurement of the quality of nursing care we deliver?

Behavioral Rationale for Current Environment of Nursing Practice

Behavior that is recognized and reinforced continues

Behavior that is ignored or not reinforced does not continue

Driving Forces for Change
• Scientific Driver
  – Evidence-based practice movement
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HealthGrades Report 2008

- Patient Safety Incidents for Medicare
  - Analysis of 41 million Medicare patients between 2004-2006
  - 5000 hospitals studied
  - 238,337 potential preventable deaths
  - 8.8 billion in preventable costs
  - 249 hospitals top safety performers (5%)
  - Failure to rescue improved by 11%
  - Bed-sores & post op respiratory complications

Bed sores, failure to rescue and post op respiratory failure accounted for 63.4% of all incidents.

Components of Successful Long Lasting Change

Nurse Sensitive Hospital Acquired Injury

- Ventilator-associated pneumonia
- Prevention of Hospital-acquired skin injuries cause by pressure and moisture
- MDRO’s
- CA-UTI’s
- CA-BSI’s

Do No Harm

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

Fortifying Host Defense

Implement Interventional Patient Hygiene

Interventional Patient Hygiene

- Hygiene...the science and practice of the establishment and maintenance of health (Webster)
- Hygiene...refers to practices associated with ensuring good health and cleanliness (Wikipedia)
- Interventional Patient Hygiene...nursing action plan directly focused on fortifying the patients host defense through proactive use of evidence based hygiene care strategies

**Progressive Mobility**

**Hand Hygiene**

- Hygiene...establishment and maintenance of health
- Hygiene...refers to practices associated with ensuring good health and cleanliness

**Bathing & Assessment**

**Comprehensive Oral Care Plan**

**Incontinence Associated Dermatitis Prevention Program**

**IPH: Intervention, Measurable Outcome/Reference**

<table>
<thead>
<tr>
<th>Evidence-based Practice Intervention</th>
<th>Measureable Outcome</th>
<th>Recommendations Protocol References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Hygiene</td>
<td>Hand Hygiene compliance rates</td>
<td>WHO hand hygiene CDC hand hygiene McGuckin M., et al</td>
</tr>
<tr>
<td>Catheter Care</td>
<td>Blood/skin infections</td>
<td>CDC guidelines IHI bundle Bleasdale SC., et al</td>
</tr>
<tr>
<td>Skin Care/Mobility</td>
<td>Surgical site infections, hospital-acquired skin injury (pressure ulcer &amp; incontinence-associated dermatitis)</td>
<td>CDC guidelines AHRQ Maki et al Vernon et al Matlote AM., et al HII-SSI HII-pressure ulcers</td>
</tr>
</tbody>
</table>

**Identified Components of IPH**

<table>
<thead>
<tr>
<th>IPH Component</th>
<th>Percentage Considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Hygiene</td>
<td>98.7%</td>
</tr>
<tr>
<td>Oral Hygiene</td>
<td>94.7%</td>
</tr>
<tr>
<td>Early Pre-op Skin Prep</td>
<td>69.9%</td>
</tr>
<tr>
<td>Bathing/Skin Assessment</td>
<td>93.5%</td>
</tr>
<tr>
<td>Incontinence Care</td>
<td>92.4%</td>
</tr>
</tbody>
</table>

**Ranking of Factors Relating to IPH**

<table>
<thead>
<tr>
<th>Item</th>
<th>Very Important</th>
<th>Somewhat Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate/ Appropriate Supplies</td>
<td>94%</td>
<td>4%</td>
</tr>
<tr>
<td>Adequate Time</td>
<td>90%</td>
<td>7%</td>
</tr>
<tr>
<td>Standardization of Protocol</td>
<td>86%</td>
<td>11%</td>
</tr>
<tr>
<td>Documentation forms for monitoring</td>
<td>73%</td>
<td>25%</td>
</tr>
</tbody>
</table>

**Patient Safety**

"Medicine used to be simple, ineffective and relatively safe."

"Now it is complex, effective, and potentially dangerous."

Sir Cyril Chantler

Courtesy: Philip M. Kobort, MD, MBA, CMO
Children’s Hospital of Minnesota
US Estimates of Incidence & Mortality from HAI’s

<table>
<thead>
<tr>
<th>Type of Infection</th>
<th>Number of Infections (2002)</th>
<th>Rate per 1000 Patient Days in ICU</th>
<th>Deaths from Infections (2002)</th>
<th>% Fatal Infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-BSI</td>
<td>248,678</td>
<td>2.71</td>
<td>30,665</td>
<td>12.3%</td>
</tr>
<tr>
<td>VAP</td>
<td>250,205</td>
<td>3.33</td>
<td>35,967</td>
<td>14.4%</td>
</tr>
<tr>
<td>CA-UTI</td>
<td>561,667</td>
<td>3.38</td>
<td>13,088</td>
<td>2.3%</td>
</tr>
<tr>
<td>SSI</td>
<td>290,485</td>
<td>.95</td>
<td>8,205</td>
<td>2.8%</td>
</tr>
<tr>
<td>Other</td>
<td>386,090</td>
<td>2.67</td>
<td>11,062</td>
<td>2.9%</td>
</tr>
<tr>
<td>Total</td>
<td>1,737,125</td>
<td>13.04</td>
<td>98,987</td>
<td>5.7%</td>
</tr>
</tbody>
</table>


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

Peter F. Drucker

Fortifying Host Defense: Maintaining Skin Barrier Function & Bacteria Load

Skin Barrier Function
- Maintain healthy skin
- Minimize Pressure

Skin Decontamination:
- MDRO/CA-BSI's/CA-UTI's
- Manage Moisture
- Incontinence Care

Types of Hospital Acquired Skin Injury
- Injury caused by the way we bath patients
- Injury caused by pressure
- Injury caused by moisture
- Injury caused by devices
- Injury caused during care activities

The Bath: The First Line Of Defense

- Early Detection of Skin Injury
- Nurse!!!

Optimal Hygiene
- ph balanced (4-6.8)
  - Stable pH discourages colonization of bacteria & risk of infection
  - Bar soaps may harbor pathogenic bacteria
  - Skin pH requires 45 minutes to return to normal following a ordinary washing
- Excessive washing/use of soap compromises the water holding capacity of the skin
- Non-drying, lotion applied
- Multiple steps can lead to large process variation

Veigel D. J WOCN. 2008;35(1):84-90
Comparison of Basinless Bath to a Basin Bath

Methodology:
- 60 patient in a progressive & surgical unit in an acute care institution compared basin bath vs. comfort bath
- Served as their own control with the right side of the body bathed with basinless bath/ left side with a basin bath
- Required a partial or complete bath conducted over 3 consecutive days
- Measured skin condition using SCDF, nurse satisfaction & patient satisfaction

Kron-Chalupa J et al. Iowa City Veterans Medical Center

<table>
<thead>
<tr>
<th>Questions</th>
<th>Basinless Bath</th>
<th>Basin Bath</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall preference</td>
<td>97%</td>
<td>3%</td>
</tr>
<tr>
<td>Nurse satisfaction</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Time</td>
<td>10 minutes</td>
<td>21 minutes</td>
</tr>
<tr>
<td>SCDF (skin condition)</td>
<td>Significantly improved</td>
<td>Improved</td>
</tr>
</tbody>
</table>

Traditional vs. Disposable Bath in Critically Ill Patients

Methodology:
- 40 patients in Surgical, Medical and CT ICU received both baths on different days
- Compare basin bath vs. disposable
- Measure: time, quality of bath, microbial counts on skin (periumbilicus & groin, nurse satisfaction & costs

Larson E. et al. AJCC. 2004; 13(3):235-41

Results:
- No difference in quality or microbial scores between the two bathing procedures
- Fewer products used*, lower costs, less time and higher nurse satisfaction with disposable bath*

Traditional Bathing

Spreading Microorganism

Waterborne Infections Study

- Hospital tap water is the most overlooked source for Health Care Acquired pathogens
- 29 evidenced-based studies present solid evidence of waterborne Health Care Acquired infections
- Transmission occurs via drinking, bathing, items rinsed with tap water and contaminated environmental surfaces


Waterborne Infections Study

- Conservative estimates suggest significant morbidity and mortality from waterborne pathogens
- 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


Bacterial Biofilm

P. aeruginosa Outbreak: Tap Water the Culprit

- Single genotype
- 59 burn patients (hydrotherapy tank)
- 19 adult ICU patients (wash basins & water taps)
- 13/31 ICU patients (tap water)
- 5/14 surgical unit patients (tap water)


Bathing with CHG Basinless Cloths

- Prospective sequential group single arm clinical trial
- 1787 patients bathed
  - Period 1: soap & water
  - Period 2: CHG cloth cleansing
  - Period 3: non-medicated basinless cloth 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>Study Period</th>
<th>Site Where Culture Specimen and Water Was Obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Soap and Water</td>
</tr>
<tr>
<td></td>
<td>(n = 311)</td>
</tr>
<tr>
<td>Table</td>
<td>10 (3)</td>
</tr>
<tr>
<td>Bed rail</td>
<td>33 (11)</td>
</tr>
<tr>
<td>Pull sheet</td>
<td>63 (20)</td>
</tr>
</tbody>
</table>

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
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>C. difficile</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>P. aeruginosa</td>
<td>7 h</td>
<td>1+</td>
<td>Wet environments</td>
</tr>
</tbody>
</table>


Multicenter Trail: Daily Bathing with CHG cloths

- Evaluated before and after implementation of daily bathing with CHG cloth
  - 32% decrease in new acquisition MRSA colonization (p < 0.05)
  - 30% decrease in new acquisition VRE (p <0.01)
  - CA-BSI’s decreased by 21% (p < 0.05)

Clinic MK, et al. SHEA 2007, Abs 287
Mitroze AI et al. Clinical Infectious Disease, 2008;46:274-281

CHG Bathing Reduces CLA-BSI

- 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

Results:
- CHG arm were significantly less likely to acquire a CLA-BSI 6.4 vs. 16.8 infections per 1000 catheter days
- Benefit against primary CLA-BSI’s by CHG cleansing after 5 days in MICU
- No difference in clinical sepsis or other infections


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

All ICU patients receive the CHG basinless bath

All Patients in the ICU with a + swab for VRE, MRSA receive CHG basinless bath

All ICU patients admitted from a high risk location* receive CHG basinless bath

All other patients receive the non-medicated basinless bath unless admitted from a high risk location

All other patients receive the non-medicated basinless bath unless admitted from a high risk location

All other patients receive the non-medicated basinless bath

High Risk Location: LTC, Chronic dialysis, past hospitalization within 30 days
Fortifying Host Defense: Maintaining Skin Barrier Function & Bacteria Load

Skin Barrier Function
- Maintain healthy skin

Minimize Pressure
- Manage Moisture: Incontinence Care

Pressure Ulcer Prevalence & Incidence Rates in Acute Care

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>Victoria</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence Rate</td>
<td>15%</td>
<td>26.5%</td>
<td>*5.4-27%</td>
</tr>
<tr>
<td>Incidence Rate</td>
<td>7%</td>
<td>18.2%</td>
<td>~ 5-6%</td>
</tr>
</tbody>
</table>

Pressure ulcers develop within the first 2 weeks of hospitalization & within 72 hours of ICU admission.

Facts about Pressure Ulcers
- 2.5 million patients treated for pressure ulcers per year
- Associated with extended LOS
- 60,000 patients are estimated to die each year from complications r/t a hospital-acquired pressure ulcer
- Cost per case where pressure ulcer listed as secondary diagnosis $43,180.00
- Cost per stage IV pressure ulcer A61,230
- Incidence in acute care 7%

Reddy M et al. JAMA 2006;296:974-984
Australian Wound Care Association 2001

Pressure Ulcers – Risk Factors
1. Immobility 87.0%
2. Fecal Incontinence 56.7%
3. Malnutrition 54.4%
4. Decreased Mental Status 50.7%
5. Peripheral Vascular Disease 28.1%
6. Urinary Incontinence 27.0%
7. Diabetes 23.7%


Minimize Pressure
- Turn & reposition every 2 hours (avoid positioning patients on a pressure ulcer)
  - Pillows and cushioning devices to maintain alignment & prevent pressure on boney prominences
  - Use lifting device or draw shifts to move patients to prevent shear (loose covers & increased immersion in the support medium increase contact area)
  - Use pressure-relieving surfaces (in all areas)
- Changes to sustain the gain
  - Tools inside the patients room (turn clock)
  - Unit or hospital wide musical cues
  - Use products that makes it easier to prevent pressure

Do We Achieve Q2 Hours?

www.ihi.org
Reger SI et al. OWM, 2007;53(10):50-58
Body Position: Clinical Practice vs. Standard

**Methodology**
- 74 patients/566 total hours of observation
- 3 tertiary hospitals
- Change in body position recorded every 15 minutes
- Average observation time 7.7 hours
- Online MD survey

**Results**
- 49.3% of observed time no body position change
- 2.7% had a q 2 hour body position change
- 80-90% believed q 2 hour position change should occur but only 57% believed it happened in their ICU

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Positioning Prevalence

**Methodology**
- prospectively recorded, 2 days, 40 ICU’s in the UK
- analysis on 393 sets of observations
- Turn defined as supine position to a right or left side lying

**Results**
- 5 patients prone at any time, 3.8% (day 1) & 5% (day 2) rotating beds
- Patients on back 46% of observation
- Left 28.4%
- Right 25%
- Head up 97.4%
- Average time between turns 4.85 hrs (3.3 SD)
- No significant association between time and age, wt, ht, resp dx, intubation, sedation score, day of wk, nurse/patient ratio, hospital

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Making Early Ambulation a Priority: Impacting Outcomes

**Pre-post cohort study of 104 respiratory failure patients at LDS**
- Respiratory failure requiring > 4 days of mechanical ventilation who were transferred from other LDS units
- Protocol: 3 criteria for activity initiation, neurologic (followed commands & cooperative), respiratory (FiO2 < 60% & PEEP < 10cm & circulatory (no drips or symptomatic orthostasis)

**Results**
- Transferring patients to the unit with an early mobility protocol significantly increased the probability of ambulation (p < .0001)
- After 2 days in the RICU, 3 fold increase in the number of patients ambulating compared to pre-transfer rates
- Female gender, absence of sedatives and a lower APACHE predicitive of probability to ambulate (p = .017)
Organizing Strategy to Reduce HAI: SMART

• **S**: Specific—precisely defined & quantification of desired outcome
• **M**: Measurable—monitor staff adherence/provide feedback
• **A**: Achievable—engage stakeholders in identifying tactics for implementation
• **R**: Relevant—to the institution so administrators provide adequate staffing, equipment & champion
• **T**: Time bound outcomes—set dates for baseline & periodic data collection and completion date


“Save Our Skin: Initiative Cuts Pressure Ulcer Incidence In Half”

• OSF St Francis – 710 beds, Level 1 Trauma, Magnet, 25,000 admits.
• **SOS Program**: OR Skin Assessment; new skin prevention protocol including a 1-step cleanser barrier cloths (Shield Barrier Cloth)

Courtney BA, Ruppman JB, Cooper HM, Save our skin: Initiative cuts pressure ulcer incidence in half. Nursing Management Apr 2006,17(4):36-46

Save Our Skin: Six Sigma Project

Save Our Skin: Six Sigma Project

SKIN: Ascension Hospitals

• **S** = Surface selection
• **K** = Keep Turning
• **I** = Incontinence management
• **N** = Nutrition

Post SKIN Bundle Implementation

1.4 per 1000 patient days system wide. 6 of the facilities had no acquired pressure ulcers for over 1 year. No new Stage III & IV acquired btwn 08/04 & 02/06

Ayello EA, Lyder CH, Nursing 2007: October

What Can We Do?

• Identify the challenges in your work environment
• Work with your colleagues to identify solutions (don’t wait for others to do it; if they were going to do it, it would already be done!)
• Look for tools to help you
• Find evidence such as best practice guidelines to support your plan and make your arguments more compelling
• Approach supervisor or the chief nurse in your facility for support
• Consult/network with experts in the field
• Think beyond your unit—think globally while acting locally
• Share your results so that best practices don’t just occur in isolated pockets

CREATE A SAFE PATIENT ENVIRONMENT

Everyday hospital care activities increase the patients risk of INJURY & BACTERIAL INVASION ……

Help reduce that risk by changing routine ways you provide care & replace it with evidence…Implement Interventional Patient Hygiene