Sacred Cows: 2015
Changing it Up

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Disclosures

• Sage Products Speaker Bureau & Consultant
• Eloquest Healthcare Speaker Bureau & Consultant
• Hill-Rom Speaker Bureau & Consultant
• Off label discussion of a CHG cloth
Objectives

- Identify current practices where tradition may overrule evidence
- Compare and contrast various practices using the evidence
- Design which practice you can modify within your own care environment

Bowel Sounds: Is it Worth Assessing

Fact or Fiction: Do Bowel Sounds Provide Us with An Indication of Successful Gastric Motility?

No Perfect Indicator: Challenges with all--Gastric tube drainage, toleration of enteral feeding, gastric residual volumes, defecation and bowel sounds
Review of the Literature

• Systematic review of the literature regarding bowel sounds for monitoring of gastrointestinal motility in critically ill patients-1966 to 2010

• 700 citations total of 35 used for review

• Bowel sound are subjective—but most universally used method\(^1\)
  – Colonic obstruction: 64% sensitivity/72% specificity
  – Ileus: 84.5% sensitivity/78.1% specificity
  – Intestinal obstruction: PPV 72.7%

• To increase accuracy, how long should we listen at each quadrant?

1. Li B, Et al Clinical Nurse Specialist.2012:29-34

Do Bowels Sounds Tell Us if A Patient is Ready to Be Feed?

• Bowels sounds may or may not be present with either bowel activity or inactivity

• Bowels sounds may even be present in patients with ileus

• Unreliable marker of normal bowel function\(^1\)

• Neither the presence or absence of bowel sounds and or evidence of passage of flatus in stool is required for the initiation of enteral feeding in intensive care patients\(^1\)

• Early feeding is critical & safe & improves outcomes in critically ill patients\(^1\)
  – EN supports the functional integrity of the gut
  – Reduced infection, organ failure, and hospital LOS (compared with the parenteral route)

Early Feeding Post Surgery Safe

Performed before the return of bowel function

<table>
<thead>
<tr>
<th>Lead author</th>
<th>Randomized</th>
<th>n</th>
<th>Type(s) of surgery</th>
<th>Definition of early feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binderow</td>
<td>Yes</td>
<td>64</td>
<td>Colonic or ileal resections</td>
<td>First postoperative morning</td>
</tr>
<tr>
<td>Bufo</td>
<td>No</td>
<td>36</td>
<td>Colorectal</td>
<td>Immediately postoperative</td>
</tr>
<tr>
<td>Choi</td>
<td>No</td>
<td>41</td>
<td>Colonic resections</td>
<td>Postoperative day (POD) two</td>
</tr>
<tr>
<td>Hartsell</td>
<td>Yes</td>
<td>58</td>
<td>Colorectal</td>
<td>POD one</td>
</tr>
<tr>
<td>Pearl</td>
<td>Yes</td>
<td>294</td>
<td>Gynecological oncologic</td>
<td>POD one if patient did not have nausea, vomiting, or distention</td>
</tr>
<tr>
<td>Reisman</td>
<td>Yes</td>
<td>161</td>
<td>Colon or small bowel</td>
<td>POD one</td>
</tr>
<tr>
<td>Schaller</td>
<td>Yes</td>
<td>96</td>
<td>Abdominal gynecological</td>
<td>POD one</td>
</tr>
<tr>
<td>Steed</td>
<td>Yes</td>
<td>96</td>
<td>Abdominal gynecological</td>
<td>POD one</td>
</tr>
</tbody>
</table>

POD = Postoperative day

Traditional Bathing

Why are there so many bugs in here?

Soap and water basin bath was an independent predictor for the development of a CLABSI
Optimal Hygiene

- pH balanced (4-6.8)
  - Stable pH discourages colonization of bacteria & ↓ risk of infection
  - Bar soaps may harbor pathogenic bacteria
- 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

Voegel D. J WOCN, 2008;35(1):84-90

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

The Evidence: Bath Basins
Potential Source of Infection

Multicenter Sample Study to Identify and Quantify Bacteria in Basins

- Enterococci 54%
- Gram negative 32%
- S. aureus 23%
- VRE 13%
- Less than 10% growth rates
  - MRSA 8%
  - P. aeruginosa 5%
  - Candida albicans 3%
  - E. coli 2%

98% grew bacteria


Bath Basins
Potential Source of Infection

Large multi-center study evaluates presence of multi-drug resistant organisms

- Contaminated: 62%
  - 686 basins/88 hospitals
- Colonized with VRE: 35%
  - 385 basins/80 hospitals
- Gram negative bacilli: 45%
  - 495 basins/86 hospitals
- MRSA: 3%
  - 36 basins/28 hospitals

Mechanisms of Contamination

- Skin flora
- Multiple-use basins
  - Incontinence cleansing
  - Emesis
- Product storage
- Bacterial biofilm from tap water


Waterborne Infection

Hospital Tap Water
- Most overlooked source for pathogens
- 29 studies demonstrate an association with HAIs and outbreaks
- Transmission:
  - Drinking
  - Bathing
  - Rinsing items
  - Contaminated environmental surfaces
- Immunocompromised patients at greatest risk

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

<table>
<thead>
<tr>
<th>Unit Census: 14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phases</strong></td>
</tr>
<tr>
<td>I- Pre-Packaged Bathing Washcloths (9 months)</td>
</tr>
<tr>
<td>II- Basin/Water (9 months)</td>
</tr>
<tr>
<td>III- Additional Product Cost, UTI, LOS, COSTS</td>
</tr>
</tbody>
</table>

1 Based on 3 packages of 8 towels each 2 Based on product cost of towels, soap, and basin 3 Difference between phase I pre-package/phase II basin water 4
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

*2% CHG cloth for bathing is considered an off-label use of the product.

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

26 colonization's with VRE per 1000 patient 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>

Study Period

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

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

John C. O’Horo, MD†, Gerardo L. M. Silva, MD†, Ljiljana Mihailovic-Price, MD‡, Nilsa Ford, MD, PhD†

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Events</th>
<th>Control Events</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,2 CHG slabtime</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bone et al., 2007</td>
<td>2</td>
<td>300</td>
<td>1523</td>
<td>1.38 (0.90, 2.10)</td>
</tr>
<tr>
<td>Chen et al., 2007</td>
<td>6</td>
<td>1991</td>
<td>1594</td>
<td>1.11 (0.72, 1.72)</td>
</tr>
<tr>
<td>Cimi et al., 2009</td>
<td>14</td>
<td>11172</td>
<td>1525</td>
<td>1.11 (0.76, 1.62)</td>
</tr>
<tr>
<td>Guld et al., 2007</td>
<td>17</td>
<td>8664</td>
<td>1409</td>
<td>1.11 (0.74, 1.66)</td>
</tr>
<tr>
<td>Watanabe et al., 3000</td>
<td>79</td>
<td>7632</td>
<td>820</td>
<td>1.09 (0.73, 1.64)</td>
</tr>
<tr>
<td>Standards (WHO)</td>
<td>53158</td>
<td>32296</td>
<td>48.5%</td>
<td>0.47 (0.39, 0.56)</td>
</tr>
<tr>
<td>Total events</td>
<td>272</td>
<td>386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritability (Cochran Q)</td>
<td>0.12, 2df = 6, P = 0.0024, I² = 64%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall</td>
<td>Z = 3.13 (P = 0.0014)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1,2,2 CHG Impregnated Cloths

Beechey et al., 2007 | 0 | 2410 | 2319 | 0.91 (0.78, 1.06) |
| Bikare et al., 2003 | 8 | 1148 | 3336 | 0.86 (0.51, 1.44) |
| Events et al., 2009 | 4 | 2136 | 1454 | 1.24 (0.70, 2.20) |
| Herder et al., 2009 | 12 | 2066 | 3333 | 1.13 (0.58, 2.21) |
| Mestral et al., 2010 | 17 | 1364 | 3203 | 1.28 (0.92, 1.78) |
| Poplawski et al., 2007 | 2 | 5950 | 8678 | 1.44 (0.51, 4.34) |
| Rapoport et al., 2000 | 17 | 1799 | 3736 | 1.14 (0.53, 2.46) |
| Standards (WHO)  | 54516               | 37959          | 50.7%                         | 0.41 (0.26, 0.63)             |
| Total events      | 149                 | 173            |                               |                               |
| Heritability (Cochran Q) | 0.10, 2df = 8, P = 0.0020, I² = 53% |
| Test for overall | Z = 3.49 (P = 0.0005) |

Total (95% CI) 67775 69637 100.0% 0.44 (0.33, 0.55) |

Infect Control Hosp Epidemiol 2012;33(3):257-267

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*Favors experimental
**Favors control
2% CHG Cloth Bathing: SCRUB Trial Critically Ill Children

- Cluster-randomized 2-period cross over trial
- >2 months of age
- 6 month
- 4947 admissions
  - SOC: basin less bathing or soap & H₂O
  - CHG: 2% CHG cloth
- Demographics similar
- Outcomes:
  - Primary bacteremia-36% reduction
  - 12 pts withdrew because of skin irritations (1%)
  - CHG-associated skin reactions-1-2 per 1000 pt days

![Daily Bathing Graph]


The Evidence: Impact of 2% CHG Cloth Baths
Evaluate effect of daily bathing with CHG on acquisition of MDRO’s and incidence of CLABSI

9 ICU’s & Bone Marrow Transplant unit

Randomly assigned 7727 patient:
- a. No-rinse, 2% CHG impregnated washcloths
- b. Non-antimicrobial, no-rinse bath cloths

Results of 2% CHG bathing

![Results Graph]

Impact of 2% CHG Cloth Baths
Study to determine the best method for reducing spread of MRSA & MDROs

3 protocols tested:

a) Swab for MRSA on admission to ICU
   - Isolate if positive
b) Swab for MRSA on admission to ICU
   - Isolate if positive
   - Nasal mucopiricin x 5 days
   - 2% CHG cloth bathing for entire ICU stay
c) No swab
   - Nasal mucopiricin x 5 days
   - 2% CHG bath for entire ICU stay

Results: No Swab Group
Universal Decolonization Demonstrated

37% reduction
44% reduction


Single Center CHG Bathing Study

- A pragmatic cluster randomized, crossover study of 9340 patients admitted to 5 adult intensive care units of a tertiary medical center in Nashville, Tennessee, from July 2012 through July 2013.
- Units performed once-daily bathing of all patients with disposable cloths impregnated with 2% chlorhexidine or non-antimicrobial cloths as a control
- Bathing treatments were performed for a 10-week period followed by a 2-week washout period during which patients were bathed with nonantimicrobial disposable cloths, before crossover to the alternate bathing treatment for 10 weeks….3x
- Results
  - No difference in CLABSI’s, CAUTI’s, VAP & c-diff infections were seen

Noto MJ, et al. JAMA, published online 01/20/2015
Limitations:
- Adherence to care practice was not monitored
- Intracluster correlation nor sequence of randomization was considered in the analysis
- Used outcomes measures beyond previous studies
- Active surveillance was not performed to detect cross over transmission of MDRO's
- Wasn't registered on the clinical trials site

Pittet D, et al. JAMA, published online 01/20/2015

Recommendations and Implementation Strategies

1. Bath patients daily in ICU with CHG (determine if exclusion criteria)

2. Patient-centered bath times
   - Evaluate clinical stability and patient preference.
   - Avoid bathing between 2400 - 0600.
   - Evaluate workloads on all shifts.
   - Adjust distribution of care practices.

3. Avoid reusable bath basins and use of washcloths
   - Remove soaps and creams from the unit stock.
   - Replace basin with better strategies for containing emesis and keeping supplies.
   - Reduce par levels of washcloths.

4. Avoid tap water for any component of bathing ICU patients

5. Use a no-rinse pH-balanced cleanser for facial cleansing
For Successful Banning of Basins for Patient Care

- We need to provide alternatives for the other functions:

<table>
<thead>
<tr>
<th>Current</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emesis</td>
<td>Emebags being installed in every adult and ped pt. room, ACU, PACU</td>
</tr>
<tr>
<td>Storage of patient items</td>
<td>Clear plastic “baggies” Trial of “Concierge List’ to decrease waste of unused/unneeded products</td>
</tr>
<tr>
<td>Foot soaks</td>
<td>Shampoo caps, prepackaged</td>
</tr>
<tr>
<td>Shampoo patient’s hair</td>
<td>Shampoo caps par’d on all units</td>
</tr>
<tr>
<td>24 hour urine, ice</td>
<td>Store some basins in lab to be dispensed with each 24 hour jug.</td>
</tr>
<tr>
<td>Bath cloths with no insulation, cold halfway through bath.</td>
<td>Bath cloths with insulation to stay warm longer</td>
</tr>
</tbody>
</table>

Recommendations and Implementation Strategies

Procedure:
- After routine washing of face and hair, remove one batch of CHG cloths (three bundled packages of two cloths each = six cloths).
- Warming is for patient comfort, it is not required.
- Cloths should be used to bathe the skin with firm massage.
- Do not use CHG above the jawline
- CHG should be used for incontinence care, or for any other reasons for additional cleaning
  - If incontinence occurs, rinse the affected area with chux. Then clean skin with CHG cloths.
- Use CHG-compatible barrier products if needed
- Do not rinse with water or wipe off

Routine Indwelling Catheter Care

- No evidence to support once a shift indwelling catheter care
- No evidence to support cleaning the entire length of the catheter as part of the care maintenance process
  - Greater manipulation potential for irritation and migration of microorganisms
  - Recommend with category B level science to anchor the catheter
  - Holding catheter during cleansing to the base creates tension. When release catheter migrates inward

Provide indwelling catheter care as part of routine hygiene during a bath and with incontinence episodes

CVP-Should We Use It?
CVP-Does it Tell Us Anything in Fluid Management

- Recognized limitations to static ventricular filling pressure estimates exist as surrogates for fluid resuscitation.....measuring pressure versus volume
- Elevated CVP may also be seen with preexisting clinically significant pulmonary artery hypertension, making use of this variable untenable for judging intravascular volume status.
- No studies of CVP and PAOP have shown that these pressures correlate well with volume status or provide information about stroke volume.

Ahrens T. CCN 2010;30(2):71-73

CVP-Does it Tell Us Anything in Fluid Management

- Although there are limitations to CVP as a marker of intravascular volume status and response to fluids, a low CVP generally can be relied upon as supporting positive response to fluid loading.
- 60% of patients in all arms in both the ARISE and ProCESS trial had CVP measurements by 6 hours.
- Measurement of CVP is currently the most readily obtainable target for fluid resuscitation

Evidence supports: Dynamic measures of SV are the key to effective fluid resuscitation
Optimize Cardiac Performance-Dynamic Measures

Fluid Bolus to define place on curve:
- Record CI and SV
- Give 250-500 NS bolus over 15 minutes
- Record CI and SV
- If see greater than a 10% increase in SV or CI—pt is on steep portion of curve and will still respond to fluid

Risk Assessment on Admission, Daily, Change in Patient Condition (B)
- Use standard EBP risk assessment tool
- Research has shown Risk Assessment Tools are more accurate than RN assessment alone
- Braden Scale for Predicting Pressure Sore Risk
  - Mobility
  - Sensory perception, activity
  - Tissue tolerance for pressure
  - Nutrition, moisture, shear/friction
  - Score 6-23

Clinical judgment of nurses alone achieve inadequate capacity to assess PU risk

Its About the Sub-Scale’s

- Retrospective cohort analysis of 12,566 adults patients in progressive & ICU settings for yr. 2007
- Identifying patients with HAPU Stage 2-4
- Data extracted: Demographic, Braden score, Braden subscales on admission, LOS, ICU LOS, presence of Acute respiratory and renal failure
- Calculated time to event, # of HAPU’s

Results:
- 3.3% developed a HAPU
- Total Braden score predictive (C=.71)
- Subscales predictive (C=.83)


Bradens Score Braden Sub-Scales

Multivariate model included 5 Braden subscales, surgery and acute respiratory failure C=0.91 (Mobility, Activity and sensory perception more predictive when combined with moisture or shear and friction)
References

- Gu Y1, Lim HJ, Moser MA. How useful are bowel sounds in assessing the abdomen? *Dig Surg* 2010;27(5):422-6.
References