Basic Care is Essential Care: Implementing Oral Hygiene to Prevent Hospital-Acquired Pneumonia
Sutter Medical Center, Sacramento

Two Acute Care Campuses in Sacramento, California
Community Hospital Not For-Profit
650 Beds

33,000 Discharges
80,000 ED Visits
4100 Employees
950 Physicians
Disclosures

- Sage speaker bureau, member
- Sage grant recipient: 2 unrestricted grants, used for data collection and analysis.
Acknowledgements

- Hospital-Acquired Pneumonia Prevention Initiative (HAPPI Team)
- Sacramento District Dental Society
- Dian Baker, RN, PhD, CSUS Professor of Nursing
- Sutter Institute for Medical Research
- Nursing Staff at SMCS
Objectives:

- Significance of hospital-acquired pneumonia (HAP)
- Why oral care may be the most modifiable intervention for patients at risk for HAP.
- Practical ideas for adopting evidence-based practice and decreasing HAP at your facility.
Preventing Patient Harm: What is Hospital-Acquired Pneumonia?

- 2nd most common HAI in the U.S.
- Hospital-acquired pneumonia (HAP)
  - Onset of pneumonia 48 hours after admission and not brewing prior to admission.
  - Includes a combination of radiologic, clinical, and lab data (CDC, 2003)

- VAP = HAP associated with mechanical ventilation
- NV-HAP = HAP not associated with mechanical ventilation
- Post op pneumonia = pneumonia occurring post surgery, not present prior; can be VAP or NV-HAP
Nonventilator Hospital-Acquired Pneumonia (NV-HAP)

- Understudied & underreported
- Matter of time before this preventable HAI affects reimbursement
- **Emerging studies** highlight significance
  - Similar pathogens, mortality, risks, length of stay, mult. units
    - Pennsylvania Pt Safety Advisory, 2012
Method:

- Descriptive, quasi-experimental study using retrospective data to determine incidence and clinical factors of NV-HAP.
- Inclusion criteria: all adult discharges between Jan. 1, 2010 and Dec 31, 2010 with ICD-9 codes of pneumonia not present on admission AND met CDC definition of HAP.
- NV-HAP were then attributed to either medical/surgical or ICU, based on date of clinical onset.
Results

- 24,482 patients and 94,247 patient days analyzed
- 35 cases of NV-HAP in ICUs
- 80 cases of NV-HAP in non-ICU units
- Total estimated annual effect of NV-HAP:
  - $4.6 million excess costs
  - 23 unnecessary deaths
  - 1035 extra hospital days
Nursing Care: Missing Key Prevention

Elevated HOB

Mobility

Oral Care

IS/C&DB

[Bar chart showing percentage of missed and achieved care for each category]
SMCS Study Conclusions:

- HAP was occurring in nonventilated patients, resulting in loss of dollars and lives.
- Patients were at risk on ALL units.
- Preventative nursing care was being missed.
- We needed to ACT to prevent HAP.
### Pathogenesis

#### Germs in Mouth
- Dental plaque provides microhabitat
- Replicate 5X/24 hrs

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

#### Weak Host
- Poor cough
- Immunosuppressed
- Multiple co-morbidities

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### Prevention

#### Germs in Mouth
- Comprehensive oral care
- Oral care protocol that includes all patients

#### Aspirated
- Swallow screens
- Tube feeding protocols
- Head of bed elevated

#### Weak Host
- Lung expansion
- Early mobilization
- Serum glucose in target range

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**HAP**

**Prevent HAP**
“Identify modifiable risk factors and develop programs to reduce the risk of pneumonia by changing those risk factors.” (CDC, 2003)

Germs in Mouth
- Dental plaque
- Pneumonia-causing pathogens

Aspirated
- Dysphagia
- CNS depressants
- NGT / OGT

Weak Host
- Immunosuppressed
- Elderly
- Co-morbidities

Bundle?
Care Bundles

- BUNDLE = “a small set of evidence-based interventions for a defined patient population and care setting”

- If the intervention needs to be applied to a diverse group of patients in different locations, it no longer meets the definition of a bundle.

= Standard of Care
Based on literature and scientific recommendations, we chose improving oral care as the most modifiable risk factor.

Study #2: Could we decrease HAP by simply brushing our patient’s teeth?

Nine out of ten dentists recommend brushing your teeth.
To be successful we had to:

- Obtain administrative support
  - HAP Prevention Team
  - New supplies
  - Staff education

- Identify resources
  - Data
  - Research
  - Oral care experts

- Change staff behavior
  - Educate, support, mentor
We have a problem; sharing the study
  - Data, data, data
  - Supporting literature
  - Elevator speech

Expected ROI
  - Money saved minus cost of implementation

Existing quality structure
  - Tap into organizational goals and structure
Utilizing our Resources

- Scholarly Literature
  - Resource library
  - Don’t forget dental literature
  - Academic support from local school of nursing

- Local Dental Society
  - Sacramento District Dental Society

- Vendors
- Local Research Institute
- Grants
Changing Staff Behavior

“Human behavior flows from three main sources: desire, emotion, and knowledge.”

- Plato

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## Example of Gap Analysis:

<table>
<thead>
<tr>
<th>Best Practice</th>
<th>Our Gaps</th>
<th>Action To Take</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive oral care protocol for all patients (CDC, SHEA).</td>
<td>Only oral care protocol was for ICU ventilator patients.</td>
<td>Develop a new oral care protocol for all patients, including those not in ICU.</td>
<td>March 2012</td>
</tr>
<tr>
<td>Use oral CHG (0.12%) rinse during the perioperative period on adult CV surgery and vent pts. (CDC, ATS, IHI).</td>
<td>Not using CHG on these patients.</td>
<td>Added CHG oral care to all preprinted CV orders, and to oral care protocol for vented patients.</td>
<td>April 2012</td>
</tr>
<tr>
<td>Patient Type</td>
<td>Equipment</td>
<td>Procedure</td>
<td>Frequency</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Self-care. Able to do own mouth care, expectorate (spt). | 1 ultra soft toothbrush, 1 toothpaste, plaque removing, 1 bottle antiseptic oral rinse, alcohol-free, 1 mouth moisturizer, 1-2 swabs | 1. Set patient up at sink or in bed with all equipment.  
2. Instruct patient to brush teeth for 1-2 minutes.  
3. Instruct patient to swish and spit antiseptic oral rinse.  
4. May moisten interior of mouth and lips using a swab, PRN.  
5. Discard soiled Oral Tooshette Swab in appropriate receptacle. | After each meal and before bedtime.  
If patient is INPO, oral care should be done am, mid-day, evening, and bedtime. |
| Dependent for oral care. Able to expectorate (spt). | Gloves, 1 ultra soft toothbrush, 1 toothpaste, plaque removing, 1 bottle antiseptic oral rinse, alcohol-free, 1 mouth moisturizer, 2 swabs, 1 Emesis basin | 1. Set patient up in bed.  
2. Brush patient’s teeth for 1-2 minutes.  
3. Use swab to apply antiseptic oral rinse.  
4. Moisturize interior of mouth and lips with a clean swab.  
5. Discard soiled Oral Tooshette Swabs in appropriate receptacle. | Same frequency as above. |
| Dependent for oral care. Not able to expectorate (spt). | Q-Care Suction Swab & Toothbrush System (4): Gloves, 1 covered yankauer, 1 ultra soft suction toothbrush/swab, 1 antiseptic oral rinse, 1 mouth moisturizer | 1. Obtain the Suction Toothbrush/Swab package. Squeeze tube of antiseptic oral rinse to burst inside the package.  
3. Connect Suction Toothbrush/Swab to continuous suction. Ensure adequate suction source. Not to exceed 120mmHg.  
4. Brush/swab the teeth using the Suction Toothbrush/Swab for 1-2 minutes. Exert gentle pressure while moving in short horizontal or circular strokes.  
5. Suction debris from mouth by placing thumb over vertical port that engages suction action.  
7. Rinse yankauer after use. Pull up sleeve to cover.  
8. Discard yankauer after 24 hours.  
9. Apply moisturizer using a swab, to the interior of the oral cavity and the lips. | Total of 4 times/ 24 hours. Use suction toothbrush at AM and HS. |
| Dependent on oral care. Patient in a ventilator. | Q-Care Oral Cleansing & Suctioning System (6): Gloves, 1 covered yankauer, 2 oropharyngeal suction catheters, 1 ultra soft toothbrush and 1 swab OR 2 swabs, 1 Perox-a-mint solution, 1 Mouth moisturizer, 1 dose Chlorhexidine AM and HS | 1. Provide suction, PRN, to remove oropharyngeal secretions that can migrate down the tube and settle on top of the cuff.  
2. Obtain suction toothbrush/swab package. Squeeze tube of Perox-a-mint to burst inside the package.  
4. Connect Suction Toothbrush/swab to continuous suction. Ensure adequate suction source. Not to exceed 120mmHg.  
5. Remove the debris and cleanse the gums, tongue, and inside of cheeks with the solution-saturated swab.  
6. Suction debris from mouth by placing thumb over vertical port that engages suction action.  
7. Use second swab in package as needed to ensure adequate cleansing.  
8. Discard soiled Tooshette Suction Swab in appropriate receptacle.  
9. Apple moisturizer using a swab, to the interior of the oral cavity and the lips. | Every 4 hours and PRN oral debris.  
Use Chlorhexidine rinse as oral care solution AM and HS. |
| Denture Care                      | Gloves, 1 denture cup, labeled, 1 ultra soft toothbrush, Denture cleanser (for soaking only) | 1. After removing dentures, place in a labeled denture cup.  
2. Brush the palate, bucal surfaces, gums, and tongue with the toothbrush or swab.  
3. Patient can swish and spit antiseptic rinse, or use swab to apply.  
4. Line the sink with paper towel and add water to coax the dentures in case you drop them. Carefully brush dentures with warm water. DO NOT USE TOOTHPASTE as this may scratch the surface of the dentures.  
5. Clean and dry equipment and return to patient’s bedside table.  
6. Assist patient in inserting dentures into mouth.  
7. After HS mouth care, soak dentures in a commercial cleanser in the denture cup.  
8. If patient needs denture adhesive to hold firmly in place, follow manufacturer directions. | After each meal and at bedtime. |
2 HAP cases on M/S

3Q:

M/S Case study:

- 56 y.o healthy female admitted for elective colostomy takedown. POD5 c/o cough. Also positive for tan sputum, fever, and infiltrates on CXR. Treated with abx and DC’d home on POD 8.
Great Job!
Oral Care Knowledge & Attitude Survey: one year later

- **Method:**
  - Survey sent out via email May 2012 and repeated May 2013 to NAs and RNs at SMCS.

- **Results:**
  - Improved awareness of oral care protocol (77%)
  - Increased as priority of care for NAs (96%)
  - Increased RN perception that their patients received oral care (300%)
Oral Care Frequency on ICU Nonventilated patients/24 Hrs

![Chart showing oral care frequency comparison between baseline and Mar-13. The chart displays a significant increase in oral care frequency from baseline to Mar-13.](chart-url)
Oral Care Frequency Hospital-Wide

X-bar chart mean oral care  May, 2012 through September, 2013
NV-HAP Significant Trend Downward: 50% Decrease from Baseline

Control chart for non-ventilator HAP
January 2010 to September 2013

Oral care
Oral Care Campaign Starts on 3 Pilot Units
Focus in ICU
Outcome: Rate of NV-HAP in SMCS Adults

Year 2010

Year 2012

1Q 2013

Rate / 1000 pt days

Rate / 100 pts.
Return on Investment

- 45 NV-HAP avoided Jan 1 – Sept 31 2013
- $1,800,000 cost avoided
- $88,200 cost increase for supplies
- $1,711,800 return on investment

• 9 lives saved

Priceless!
Summary

- NV-HAP is a **commonly** occurring hospital-acquired infection.
- The **cost** of NV-HAP is high.
- Oral care is one **modifiable risk factor** that can **prevent** NV-HAP.
- Change management models and performance improvement methods can achieve **improved outcomes**.
“A year from now you will wish you had started today.”

-Karen Lamb

“We are preventing pneumonia and saving lives, one clean mouth at a time.”

(HAPPI Vision Statement, SMCS, 2012)
References