Infection Control for Otolaryngologists

Gonzalo Bearman, MD, MPH
Associate Professor of Internal Medicine & Epidemiology
Associate Hospital Epidemiologist
Outline

- Background
- BSI risk reduction
- VAP risk reduction
- SSI risk reduction
- MRSA and surgical care
- BBF exposure risk reduction
- Bare below the elbows
Hospital Acquired Infections

- 5-10% of patients admitted to acute care hospitals acquire infections
  - 2 million patients/year
  - ¼ of nosocomial infections occur in ICUs
  - 100,000 deaths/year
  - Attributable annual cost: $4.5 – $5.7 billion
    - Cost is largely borne by the healthcare facility not 3rd party payors
- 70% are due to antibiotic-resistant organisms
- Invasive devices are more important than underlying diseases in determining susceptibility to nosocomial infection

Mandatory Reporting Legislation for Nosocomial Infections

Healthcare-Associated Reporting Laws and Regulations

Source: APIC, February 2008
2009: JCAHO NPSG GOAL 7

• Reduce the risk of health care-associated infections:
  – Meeting Hand Hygiene Guidelines
  – Sentinel Events Resulting from Infection
  – Preventing Multi-Drug Resistant Organism Infections
  – Preventing Central-Line Associated Blood Stream Infections
  – Preventing Surgical Site Infections

Shifting Vantage Points on Hospital Acquired Infections

Many infections are inevitable, although some can be prevented.

Each infection is potentially preventable unless proven otherwise.

The existence and dissemination of evidence based recommendations has been insufficient to ensure that evidence based infection prevention be practiced
How Active Resisters and Organizational Constipators Affect Health Care-Acquired Infection Prevention Efforts

• Qualitative study
• In-depth phone and in-person interviews conducted with 86 participants from 14 hospitals
  – Chief executive officers, chiefs of staff, hospital epidemiologists, infection control professionals, intensive care unit directors, nurse managers, and frontline physicians and nurses

How Active Resisters and Organizational Constipators Affect Health Care-Acquired Infection Prevention Efforts

• Study indentified pervasiveness of:
  – “Active resisters”—hospital personnel who vigorously and openly opposed various changes in IC practice
  – “Organizational constipators”- mid to high level executives who act as insidious barriers to change

• Active resisters and constipators were identified in all hospitals surveyed

Strategies for Reducing HAIs

• Enhanced transparency of reporting HAI rates and monitoring tools for compliance assessment and feedback
  – Feedback to management and frontline providers
• Implementation of multiple evidence based interventions- ‘bundles’ and IP best practices
• Evidence based policies
• Procedures with checklists
  – CVC insertion bundle
Prevention of Nosocomial BSIs
Hopkins Model (Central Line Bundle)

• Creation of a central line insertion cart
• Use of a insertion checklist to ensure:
  – Hand hygiene prior to the procedure
  – Sterile gloves, gown, mask, cap, full-size drape
  – Chlorhexidine skin prep of the insertion site
  – Use of subclavian vein as the preferred site
• Bedside nurse empowered to stop the procedure if a step is missed
• Ask every day during rounds whether catheters can be removed

Practice Standardization Leads to Major Reduction in ICU CLABSI

BSIs/1,000 catheter days

Surgical ICU at Johns Hopkins Hospital


ICUs at 103 Michigan hospitals

Chlorhexidine Impregnated Sponges

http://www.uwhealth.org/images/ewebeditpro/uploadimages/Piccbiopatchstat.jpg
Chlorhexidine Impregnated Sponges

- Randomized, blinded controlled trial conducted in 7 French ICUs
- Adults with arterial catheter, CVC or both for 48 hours or longer
- CHGIS vs standard dressings (controls) with scheduled change of unsoiled adherent dressings every 3 vs every 7 day
- Outcome CR-BSI and colonization rate between CHGIS vs controls at 3- vs 7-day dressing changes

Timsit JF et al. JAMA 2009 Mar 25;301(12):1231-41.
Chlorhexidine Impregnated Sponges

• Use of CHGIS dressings with intravascular catheters in the intensive care unit reduced CR-BSIs even when background infection rates were low
  – 0.6/1000 DD vs 1.4/1000 DD
    • (HR 0.39 95%CI 0.17 vs 0.93)
• Reducing the frequency of changing from every 3 days to every 7 days appeared safe

Timsit JF et al. JAMA 2009 Mar 25;301(12):1231-41.
Patient Skin Decolonization with Clorhexidine

- 4% chlorhexidine whole-body washing and *A. baumannii* skin colonization and infection among patients in a medical ICU
  - Daily whole-body disinfection with 4% CG significantly reduced *A. baumannii* colonization and infection
  - *A. baumannii*-BSIs decreased from:
    - 4.6 to 0.6 per 100 patients (P ≤ 0.001)

Head of Bed Elevation in VCU Medical ICU: Effect of Feedback

Head of Bed Elevation in VCU Medical ICU: Effect of Feedback

% Compliance with HOB elevation vs. Pneumonia cases/1,000 ventilator-days

Baseline; no feedback vs. Performance feedback quarterly

Slide: courtesy of MB Edmond MD, MPH, MPA
Much Cleaner Cuts

**Problem:** Infection related to surgery  
**Proposal:** Better use of antibiotics, don’t shave with razor prior to surgery, tighten control of blood sugar  
**Possible Lives Saved:** 8,000

A hospital is a risky place for people who have had surgery. No matter how much antibacterial solution is painted on before the first cut, opening the body invites lurking microbes. Infections at the surgery site complicate an estimated 780,000 operations a year, or more than 1 in every 40 procedures. For abdominal surgery, the likelihood is as high as 1 in 5. And the complications are tough to treat. Infected patients are two to three times more likely to die and are hospitalized an average of seven days longer than uninfected patients who had the same operation.

Even before the 100K campaign got underway, IHI had been working with a group of 56 hospitals on strategies to lower the rate of surgical-site infections. Results of the yearlong effort, published last month in the *American Journal of Surgery,* showed a re-

Hospital Outpatient Department
Quality Measures (HOP)

• CMS initiative to provide a uniform set of quality measures to be implemented in the outpatient setting
• Purpose is to promote high quality care for patients receiving surgical and medical services as outpatients
• Data is reviewed and extracted by trained personnel
SCIP
Surgical Care Improvement Project

• A national partnership of organizations to improve the safety of surgical care
• Goal: reduce surgical complications 25% by 2010
• Initiated in 2003 by CMS & CDC
  – Steering committee of 10 national organizations
  – >20 additional organizations provide technical expertise
• Strategy: Surgeons, anesthesiologists, periop nurses, pharmacists, infection control professionals, & hospital executives work together to improve surgical care
<table>
<thead>
<tr>
<th></th>
<th>SCIP Infection Prevention Measures</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perioperative antibiotic prophylaxis</td>
<td>Antibiotic given within 1 hour prior to incision</td>
</tr>
<tr>
<td>2</td>
<td>Appropriate antibiotic selected</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Antibiotic discontinued within 24 hrs of surgery end time (48 hrs for cardiac surgery)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Glycemic control</td>
<td>Cardiac surgery patients with 6 AM glucose ≤ 200 mg/dL on postop day 1 &amp; 2</td>
</tr>
<tr>
<td>5</td>
<td>Appropriate hair removal</td>
<td>No hair removal, or hair removal with clippers or depilatory</td>
</tr>
<tr>
<td>6</td>
<td>Normothermia</td>
<td>Colorectal surgery patients with T ≥ 96.8°F within the first hour after leaving the OR</td>
</tr>
<tr>
<td>7</td>
<td>Perioperative β-blockers</td>
<td>Patients on a β-blocker prior to admission who received a β-blocker 24 hrs prior to incision through discharge from PACU</td>
</tr>
<tr>
<td>8</td>
<td>DVT prophylaxis</td>
<td>Patients with recommended DVT prophylaxis ordered during the admission</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Patients who received appropriate DVT prophylaxis within 24 hours prior to <em>Surgical Incision Time</em> to 24 hours after <em>Surgery End Time</em></td>
</tr>
</tbody>
</table>
HOP

- ENT / Head and neck procedures
  - Mandibular ORIF
  - Mandibular ORIF without interdental fixation
  - Mandibular ORIF with multiple surgical approaches
  - Removal of esophageal pouch/diverticulum
HOP: ENT Process of care Measures

• January- September 2009
  – Number of cases 15
    • Antibiotic timing 82%
    • Antibiotic choice 100%
Infection Rate

![Graph showing the relationship between infection rate and total bacterial count. The graph compares the effect of prophylaxis on infection rate.]


Downloaded from: Principles and Practice of Infectious Diseases
Meta-analyses: Antibiotic Prophylaxis vs Placebo

- OR 0.35; TAH; 17 trials
- OR 0.35; TAH; 25 trials
- OR 0.30; biliary surgery; 42 trials
- OR 0.20; CT surgery; 28 trials

Comparison of Different Regimens for Surgical Hand Preparation

• Prospective clinical trial comparing a traditional surgical scrub with chlorhexidine vs. a waterless hand rub

• Waterless hand rub:
  • Caused less skin damage (P=0.002)
  • Produced lower microbial counts postscrub at days 5 (P=0.002) & 19 (P=0.02)
  • Required less time (1.3 minutes vs. 2.4 minutes; P<0.0001)
  • Was preferred by surgical staff (P=0.001)
  • Was cheaper

Alcohol-based Hand Rub vs Traditional Scrub
Prevention of Surgical Site Infection

- Prospective, randomized equivalence trial comparing the effectiveness of waterless, alcohol-based hand rub vs traditional scrub
- 4,387 consecutive patients who underwent clean and clean contaminated surgery
- Findings:
  - Alcohol hand rub was as effective as traditional scrub in preventing SSIs in a 30 day follow-up
  - Alcohol hand rub was better tolerated by surgical teams
  - Alcohol hand rub can be safely used as an alternative to traditional surgical hand-scrubbing

S. aureus carriage in healthy populations

• Cross sectional surveys
  – Nasal carriage 20%-55%

• Longitudinal studies
  – 10%-35% of healthy adults are persistent nasal carriers
  – 20%-75% of healthy adults are intermittent carriers

Vandenberg et al. J Lab Clin Med 1999;133:525-34
MRSA as a Pathogen in Deep Neck Abscesses:

Table 1: Pediatric case series of neck abscesses with MRSA

<table>
<thead>
<tr>
<th></th>
<th>Case #1</th>
<th>Case #2</th>
<th>Case #3</th>
<th>Case #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at presentation (months)</td>
<td>23</td>
<td>15</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Sex/race</td>
<td>F/AA</td>
<td>F/AA</td>
<td>F/AA</td>
<td>M/AA</td>
</tr>
<tr>
<td>Signs and symptoms</td>
<td>L neck edema</td>
<td>R neck edema</td>
<td>R neck edema</td>
<td>L neck edema</td>
</tr>
<tr>
<td>Duration of symptoms (days)</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Antibiotics prior to admission</td>
<td>None</td>
<td>Amoxicillin/clavulanate</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Initial WBC (cells/mm³)</td>
<td>17300</td>
<td>17200</td>
<td>19200</td>
<td>5500</td>
</tr>
<tr>
<td>Imaging on admission</td>
<td>CT with abscess</td>
<td>CT with abscess</td>
<td>None</td>
<td>CT with cellulitis</td>
</tr>
<tr>
<td>Length of hospitalization (days)</td>
<td>1</td>
<td>5</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Antibiotics in hospital</td>
<td>Ceftriaxone</td>
<td>Nafcillin</td>
<td>Nafcillin, clindamycin, fluconazole</td>
<td>See case report</td>
</tr>
<tr>
<td>Surgical intervention</td>
<td>I&amp;D</td>
<td>I&amp;D</td>
<td>Aspiration</td>
<td>See case report</td>
</tr>
<tr>
<td>C&amp;S result</td>
<td>4 + MRSA</td>
<td>2 + MRSA</td>
<td>3 + MRSA</td>
<td>1 + MRSA</td>
</tr>
<tr>
<td>Antibiotics at home at d/c</td>
<td>Amoxicillin/clavulanate</td>
<td>Cephalexin</td>
<td>TMP/SMX, nitrofurantoin</td>
<td>None</td>
</tr>
<tr>
<td>Follow-up (months)</td>
<td>22</td>
<td>22</td>
<td>4</td>
<td>23</td>
</tr>
</tbody>
</table>


MRSA as a Pathogen in Deep Neck Abscesses:

• MRSA should be considered as a potential pathogen in deep neck space abscesses
• A high index of suspicion is needed as well as aggressive treatment including incision and drainage along with culture-directed medical therapy
• Surgical drainage may be the most important aspect of therapy

The Impact of MRSA on ENT Practice

- The reservoir of MRSA in the community is growing
- Head and neck cancer patients are at high risk of both carrying MRSA and developing serious post-operative infections as a result of MRSA.

The Impact of MRSA on ENT Practice


### Table I

**Infection Control Guidelines for UK ENT Departments**

<table>
<thead>
<tr>
<th>Hand hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emphasis on education in infection control</td>
</tr>
<tr>
<td>Alcohol gel available at every bedside</td>
</tr>
<tr>
<td>Alcohol gel available in every clinic and treatment room</td>
</tr>
<tr>
<td>Pocket carriage of alcohol gel to be encouraged</td>
</tr>
<tr>
<td>Ensure access to sinks is freely available</td>
</tr>
<tr>
<td>Consider separating elective low risk patients from high risk patients</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients for admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of at risk patients</td>
</tr>
<tr>
<td>Preadmission screening of at risk patients when possible</td>
</tr>
<tr>
<td>Isolation of proven MRSA +ve patients</td>
</tr>
<tr>
<td>Isolation of unscreened high risk patients until culture results available</td>
</tr>
<tr>
<td>Consider geographic separation of low and high risk patients</td>
</tr>
<tr>
<td>Consideration of staff screening in event of cluster of infections</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular feedback as part of ongoing clinical governance</td>
</tr>
<tr>
<td>Consider departmental antibiotic policy, especially regarding long term antibiotics</td>
</tr>
<tr>
<td>Close liaison with infection control services</td>
</tr>
</tbody>
</table>

| MRSA = methicillin-resistant *Staphylococcus aureus* |
| +ve = positive |
Highly Effective Regimen for Decolonization of Methicillin-Resistant *Staphylococcus aureus* Carriers

- Prospective cohort study with a mean follow-up period of 36 months
- 62 patients
  - Decolonization treatment was performed
  - At least 6 body sites were screened for MRSA (including by use of rectal swabs) before the start of treatment.

Highly Effective Regimen for Decolonization of Methicillin-Resistant *Staphylococcus aureus* Carriers

- Standardized decolonization treatment
  - Mupirocin nasal ointment
  - Chlorhexidine mouth rinse
  - Full-body wash with chlorhexidine soap for 5 days.
  - Intestinal and urinary-tract colonization treated with oral vancomycin and cotrimoxazole
  - Vaginal colonization treated with povidone-iodine or with chlorhexidine ovula

VCUMC Approach to MRSA Active Surveillance – select patient populations

• High risk surgeries
  – Cardiothoracic surgery
    • CABG
    • Valve replacements
  – Neurosurgeries
    • Craniotomies
    • Spinal fusion
  – Orthopedic surgery
    • Joint replacement

• Outbreak situations
  – For epidemiologic surveillance and source/cross transmission control
Rapid Detection of MRSA

• The BD GeneOhm™ MRSA Assay
  – Qualitative *in vitro* diagnostic test for the direct
detection of methicillin-resistant
*Staphylococcus aureus* (MRSA) from a nasal
specimen.

• Results available in less than 2 hours,
directly from a nasal swab specimen

• No culture step required
Active Surveillance Cultures Are Not Required to Control MRSA Infections in the Critical Care Setting

Infections/1,000 patient-days

<table>
<thead>
<tr>
<th>Year</th>
<th>MICU</th>
<th>SICU</th>
<th>NSICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>16.5</td>
<td>27.9</td>
<td>18.2</td>
</tr>
<tr>
<td>2004</td>
<td>14.3</td>
<td>25</td>
<td>10.3</td>
</tr>
<tr>
<td>2005</td>
<td>12.5</td>
<td>18.0</td>
<td>11.3</td>
</tr>
<tr>
<td>2006</td>
<td>8.9</td>
<td>12.8</td>
<td>10.5</td>
</tr>
</tbody>
</table>

## Risk for Occupational Transmission of Bloodborne Pathogens

<table>
<thead>
<tr>
<th>Virus</th>
<th>Route of exposure</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>Percutaneous</td>
<td>0.3%</td>
</tr>
<tr>
<td></td>
<td>Mucous membrane</td>
<td>0.09%</td>
</tr>
<tr>
<td></td>
<td>Nonintact skin</td>
<td>&lt;0.09%</td>
</tr>
<tr>
<td>HBV eAg (-)</td>
<td>Percutaneous</td>
<td>3%</td>
</tr>
<tr>
<td>HBV eAg (+)</td>
<td></td>
<td>20-40%</td>
</tr>
<tr>
<td>HCV</td>
<td>Percutaneous</td>
<td>2%</td>
</tr>
</tbody>
</table>
Potential Conjunctival BBF Contamination in Tonsillectomy

- Prospective study of 100 consecutive tonsillectomies
- Operating masks with plastic visors worn by surgical staff were examined by microscopy to detect contamination
- 46% of visors were contaminated by blood
- No surgeon performing greater than 3 operations escaped contamination

Double Gloving

• American College of Surgeons
  – *The ACS recommends the universal adoption of the double glove (or underglove) technique to reduce body fluid exposure caused by glove tears and sharps*
  
  • *In certain delicate operations, and in situations where it may compromise the safe conduct of the operation or safety of the patient, the surgeon may decide to forgo this safety measure*

http://www.facs.org/fellows_info/statements/st-58.html
Double Gloving: Facts

• Glove barrier perforation rates
  – 61% for thoracic surgeons and 40% for scrub personnel
  – Double gloving reduces the risk BBF exposure as much as 87%

• Double gloving has disadvantages such as decreased tactile sensation

• Despite a large body of data documenting the benefits of double gloving, this technique has not received wide acceptance by surgeons

http://www.facs.org/fellows_info/statements/st-58.html
Incidence of Glove Perforations in GI Surgery and the Protective Effect of Double Gloves: A Prospective, Randomized Control Study

- 566 pairs of gloves tested

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Single glove</th>
<th>Double glove (inner glove)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of glove perforations</td>
<td>53/306 (17%)</td>
<td>6/260 (2%)</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>Rate of surgeon blood contamination of hands</td>
<td>15/115 (13%)</td>
<td>2/98 (2%)</td>
<td>&lt;0.005</td>
</tr>
</tbody>
</table>

### Glove Perforation in Orthopedic and Trauma Surgery

<table>
<thead>
<tr>
<th>1769 Gloves from 349 Operations</th>
<th>Perforations/Gloves</th>
<th>Perforations Detected During Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Gloves</td>
<td>13/186 (7%)*</td>
<td>3/13 (23%) †</td>
</tr>
<tr>
<td>Indicator Gloves</td>
<td>41/426 (9.6%)*</td>
<td>37/41 (90.2%) †</td>
</tr>
<tr>
<td>Combination Gloves</td>
<td>25/242 (10.3%)*</td>
<td>9/25 (36%) †</td>
</tr>
</tbody>
</table>

*Orthopedic surgeons randomized to either single gloves of their preference, double indicator gloves, or a combination of two regular surgical gloves

* P>0.05 , †P <0.001

How Often Does Glove Perforation Occur in Surgery?

### Double gloving to reduce surgical cross-infection

<table>
<thead>
<tr>
<th>14 trials of double gloving</th>
<th>• More perforations to the single glove than the innermost of the double gloves (OR 4.10, 95% CI 3.30 to 5.09)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 trials of indicator gloves</td>
<td>• Fewer perforations detected with single gloves compared with indicator gloves (OR 0.10, 95% CI 0.06 to 0.16)</td>
</tr>
<tr>
<td></td>
<td>• Fewer perforations detected with standard double glove compared with indicator gloves (OR 0.08, 95% CI 0.04 to 0.17)</td>
</tr>
</tbody>
</table>

J Tanner, H Parkinson
*Cochrane Database of Systematic Reviews* 2008 Issue 2
Double gloving to reduce surgical cross-infection

• There is no direct evidence that additional glove protection worn by the surgical team reduces surgical site infections in patients

• The addition of a second pair of surgical gloves significantly reduces perforations to innermost gloves

• Perforation indicator systems results in significantly more innermost glove perforations being detected during surgery

J Tanner, H Parkinson, Cochrane Database of Systematic Reviews 2008 Issue 2
Surgical Glove Perforation and SSI

Overall SSI Rate 4.5%

<table>
<thead>
<tr>
<th>SSI Risk- Glove perforation W/O antimicrobial prophylaxis</th>
<th>SSI Risk- Glove Perforation with antimicrobial prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR 4.2</td>
<td>OR 1.2</td>
</tr>
<tr>
<td>95% CI 1.7-10.8</td>
<td>95% CI 0.9-1.9</td>
</tr>
<tr>
<td>P=0.003</td>
<td>P=0.26</td>
</tr>
</tbody>
</table>

Prospective, observational cohort of 4147 visceral, vascular or trauma surgeries
Multivariate logistic regression analysis employed

Misteli et al, Archives of Surgery. 2009; 144 (6): 553-558
The ACS recommends the use of HFT as an adjunctive safety measure to reduce sharps injuries during surgery except in situations where it may compromise the safe conduct of the operation, in which case a partial HFT can be used.

http://www.facs.org/fellows_info/statements/st-58.html
The Neutral Zone

• HFT and Sharps Neutral Zone
  – No direct handing of instruments from scrub person to surgeon and back

• Partial HFT
  – Sharps are directly handed by the scrub person to the surgeon, but then returned to the scrub person via a neutral zone

http://www.facs.org/fellows_info/statements/st-58.html
Effectiveness of the Hands Free Technique in Reducing Operating Theatre Injuries

<table>
<thead>
<tr>
<th>Hands free Technique</th>
<th>Event rate</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used</td>
<td>2.1% (33/1545)</td>
<td>0.41 (0.49-1.98)</td>
</tr>
<tr>
<td>Not used</td>
<td>5.1% (110/2153)</td>
<td>1.0 reference</td>
</tr>
</tbody>
</table>

- Prospective evaluation of the hands-free technique in reducing the incidence of percutaneous injuries, contaminations, and glove tears
- Circulating nurses recorded the proportion of use of the hands-free technique during each operation

*Occup Environ Med 2002; 59: 703-707*
Blunt Tip Suture Needles

- Suture needle injuries pose the greatest risk of sharps injury to the surgeon and scrub personnel
- The ACS recommends the universal adoption of blunt tip suture needles for the closure of fascia and muscle in order to reduce needle-stick injuries

http://www.facs.org/fellows_info/statements/st-58.html
Blunt Tip Suture Needles

- The ACS recommends the universal adoption of blunt tip suture needles for the closure of fascia and muscle in order to reduce needle-stick injuries in surgeons and OR personnel
  - A new generation of blunt suture needles is available and provides for easier suturing

http://www.facs.org/fellows_info/statements/st-58.html
Glove Perforation During Hip Arthroplasty

- Prospective randomized trial comparing the incidence of surgical glove perforation by standard surgical needle vs. taperpoint needle

Glove Perforation During Hip Arthroplasty

Bare Below the Elbows for Inpatient Care

- Mandate across UK hospitals
- Recommended practice at VCUMC
- Ensure good hand and wrist washing

short sleeves, no wrist watch, no jewelry avoidance of ties when carrying out clinical activity
An In vitro Model of Lab Coats in the Transmission of Nosocomial Pathogens

- MRSA, VRE and pan-resistant Acinetobacter (PRA) serially diluted and inoculated onto swatches of a clean laboratory coat
- Sanitized pigskin samples were then rubbed across the inoculated swatches
- The pigskin was inoculated on selective media

An In vitro Model of Lab Coats in the Transmission of Nosocomial Pathogens

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1:100</th>
<th>1:1,000</th>
<th>1:10,000</th>
<th>1:100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MRSA</strong></td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>VRE</strong></td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>PRA</strong></td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

An In vitro Model of Lab Coats in the Transmission of Nosocomial Pathogens

• Pathogens can be transferred from lab coat to skin in vitro
• Lab coats represent a potential transmission risk
• Our study supports the British ban on lab coats in the healthcare setting
• VCU now recommends that HCWs not wear lab coats or neckties and adhere to “bare below the elbows” in the inpatient setting
• Further research is needed to determine the impact of “bare below the elbows.”

Three easy steps to prevent infection:

1. Bare below the elbows
   - No lab coats
   - No neck ties
   - No long sleeves
   - No wristwatch or bracelets

2. Wash up
   - Wash hands with soap & water or use alcohol foam before & after patient contact

3. Wipe down
   - Wipe down your stethoscope with an antiseptic wipe or alcohol pad after each use
### Major Interventions to Reduce Healthcare Associated Infections at VCU Medical Center

<table>
<thead>
<tr>
<th>Start date</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>Concurrent surveillance for HAIs in ICUs with feedback to unit leadership</td>
</tr>
<tr>
<td>2004</td>
<td>Hand hygiene campaign</td>
</tr>
<tr>
<td>2004</td>
<td>Feedback on HAIs and practices to all ICU via quarterly posters</td>
</tr>
<tr>
<td>2006</td>
<td>Central line insertion bundle</td>
</tr>
<tr>
<td>2006</td>
<td>Mandatory housestaff education on central line insertion</td>
</tr>
<tr>
<td>2007</td>
<td>Roving hand hygiene observers</td>
</tr>
<tr>
<td>2008</td>
<td>Chlorhexidine bathing of ICU patients</td>
</tr>
<tr>
<td>2009</td>
<td>&quot;Wash up, wipe down&quot; and &quot;bare below the elbows&quot; campaigns</td>
</tr>
<tr>
<td>2009</td>
<td>Integration of antimicrobial utilization with infection prevention efforts</td>
</tr>
<tr>
<td>2009</td>
<td>Complete roll out of concurrent surveillance for device-related infections to all inpatient areas</td>
</tr>
</tbody>
</table>
Conclusion

- Significant paradigm shift in HAI prevention
- Many infections are indeed preventable
- Evidence based risk reduction interventions exist for the reduction of HAIs and BBF exposures
- SSIs can likely be reduced by proper use of intranasal mupirocin, chlorhexidine showers and the correct preoperative antibiotic
- Measures such as double gloving, blunt suture needles and HFT will likely reduce exposure to BBF
- ‘Bare Below the Elbows’ for inpatient care is recommended by the IC Committee