Operating Room Culture and Outcomes: Can We Move the Needle?

Elizabeth C. Wick, M.D.
Deborah B. Hobson, B.S.N, R.N.
Objectives

• To describe the burden of colon infections

• To outline the relationship between culture and clinical outcomes

• To describe the use of adaptive and technical changes to prevent colon infections
The Problem is Large

- In U.S. Healthcare system
  - 7% of patients suffer a medication error 2
  - On average, every patient admitted to ICU suffers adverse event 3,4
  - 44,000-98,000 people die in hospitals each year as the result of medical errors 5
  - Nearly 100,000 deaths from HAI's 6
  - Estimated 30,000 to 62,000 deaths from CLABSI's 7
  - Cost of HAI's is $28-33 billion 7
- 8 countries report similar findings to the U.S.

Background

- SSI is the most common nosocomial infection in the surgical patient
- SSI is the most common complication after colorectal abdominal surgery (3-30%)
- SSI is associated with increased mortality, length of stay and readmission
- An SSI costs between $6,200 - $15,000/per patient (superficial-organ space)

Smith et al, 2004
Wick et al, 2011
## Colorectal Surgery Readmissions
### Johns Hopkins Hospital

### Readmission rate 17.6% (2009-12)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Readmitted Patients N=129, No. (%)</th>
<th>Non-Readmitted Patients N=606, No. (%)</th>
<th>P</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intra-operative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presence of ostomy:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Yes ostomy</td>
<td>74 (57)</td>
<td>220 (36)</td>
<td>&lt;0.001</td>
<td>2.59</td>
</tr>
<tr>
<td>- No ostomy</td>
<td>55 (43)</td>
<td>386 (64)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of operation, mean hours (range)</td>
<td>4.9 (1.5-12.2)</td>
<td>4.2 (1-14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Post-operative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical-site infection (SSI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Superficial Incisional SSI</td>
<td>58 (45)</td>
<td>108 (18)</td>
<td>&lt;0.001</td>
<td>3.39</td>
</tr>
<tr>
<td>- Deep Incisional SSI</td>
<td>27 (21)</td>
<td>89 (14.7)</td>
<td>0.043</td>
<td>1.74</td>
</tr>
<tr>
<td>- Organ Space SSI</td>
<td>4 (3.1)</td>
<td>2 (0.3)</td>
<td>0.004</td>
<td>14.78</td>
</tr>
<tr>
<td>- Organ Space SSI</td>
<td>27 (21)</td>
<td>17 (2.8)</td>
<td>&lt;0.001</td>
<td>11.54</td>
</tr>
<tr>
<td>Length of stay, median days (range)</td>
<td>9 (3-65)</td>
<td>7 (1-153)</td>
<td>*</td>
<td>1</td>
</tr>
<tr>
<td>30-day mortality</td>
<td>1 (.8)</td>
<td>19 (3.1)</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Hechenbleikner et al., under review, 2012.
**SSI Definitions**

- **Superficial**
  - purulent drainage from wound
  - positive wound culture
  - pain, redness swelling
  - diagnosis by surgeon

- **Deep**
  - purulent drainage from deep aspect of wound
  - dehiscence
  - abscess on exam or CT scan

- **Organ Space**
  - infection in surgical cavity (abdomen)
Pathogenesis of SSI

- Bacteria
- Host
- Procedure
2013:
• CMS mandated public reporting of colon SSI via CDC-NHSN
• Maryland likely to follow in 2014

2013:
• CMS all-cause readmission measure with penalties for higher than expected readmission rates
Does SCIP gives us enough information?

<table>
<thead>
<tr>
<th></th>
<th>Johns Hopkins</th>
<th>Comparison Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery patients who were given an antibiotic at the right time (within one hour before surgery) to help prevent infection</td>
<td>98%</td>
<td>97%</td>
</tr>
<tr>
<td>Surgery patients who were given the right kind of antibiotic to help prevent infection</td>
<td>98%</td>
<td>98%</td>
</tr>
<tr>
<td>Surgery patients whose preventive antibiotics were stopped at the right time (within 24 hours after surgery)</td>
<td>97%</td>
<td>96%</td>
</tr>
<tr>
<td>Surgery patients needing hair removed from the surgical area before surgery, who had hair removed using a safer method (electric clippers or hair removal cream – not a razor)</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Patients having surgery who were actively warmed in the operating room or whose body temperature was near normal by the end of surgery.</td>
<td>98%</td>
<td>99%</td>
</tr>
</tbody>
</table>
NSQIP report 2009

30-Day Morbidity O/E Ratios for Colectomy
01/01/2009 – 12/31/2009 (depending on protocol)

(n=12)

5,888 Events among 22,997 Cases in 182 Hospitals
How do we move that needle?

CUSP
Comprehensive Unit Based Safety Program
The Vision of CUSP

- Improve patient safety awareness and systems thinking at the unit level
- Empower staff to identify and resolve patient safety issues
- Integrate Safety Practices into daily work of all staff members
- Create a patient safety partnership between executives and frontline caregivers
- Provide tools to help CUSP teams investigate and learn from defects and improve teamwork and safety culture
What is Culture*?

“The way we do things around here”

1 attitude = opinion...everyone’s attitude = culture

*aka Climate

© JHU and JHHS, 2011
Why Culture Matters…

Research has linked teamwork and safety climate to:

- Decubitus Ulcers
- Delays in OR and ICU
- Bloodstream Infections in the ICU
- Ventilator Associated Pneumonia
- Wrong Site Surgeries
- Post-Op Sepsis
- Post-Op Infections
- PE/DVT
- RN Turnover
- Absenteeism
- Incident Reporting Rates/Reporting Harm
- Burnout
- Spirituality
- Unit Size

Slide courtesy of J. Bryan Sexton
Successful Efforts to Reduce Preventable Harm

Johns Hopkins ICU program\textsuperscript{1}

Michigan Keystone ICU program\textsuperscript{2,3}

National On the CUSP: Stop BSI program

Reductions in central line-associated blood stream infections (CLABSI)

CUSP Steps

**Pre-CUSP**

1. Conduct the culture assessment
2. Establish interdisciplinary CUSP team
3. Partner with senior executive
4. Gather unit outcome and safety information

**CUSP**

1. Educate everyone in the Science of Safety
2. Identify defects (2 question survey)
3. Recruit executive as active CUSP team member
4. Learn from one defect per quarter
5. Implement teamwork tools
Safety Climate Across 100 Clinical Areas
WICU & SICU Climate Pre-Post CUSP

% of respondents within a clinical area reporting good safety climate
Teamwork Climate Across Michigan ICUs: Keystone ICU Project

No BSI (21%)
No BSI 31%
No BSI 44%

The strongest predictor of clinical excellence:
Caregivers feel comfortable speaking up if they perceive a problem with patient care.

No BSI = 5 months or more w/ zero
# CUSP Steps

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3. Learn from one defect per quarter
4. Implement teamwork tools
CUSP OR Team Members

Essential Team Members
• Surgeons
• Anesthesiologists
• CRNAs
• Circulating nurses
• Scrub nurses / OR techs
• Perioperative nurses
• Executive partner
• Nurse leaders

Enhancing Team Members
• Physician assistants
• Nurse educators
• Anesthesia assistants
• Infection preventionists
• OR directors
• Patient safety officers
• Chief quality officers
• Ancillary staff
# CUSP Steps

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NSQIP report 2009

30-Day Morbidity O/E Ratios for Colectomy
01/01/2009 – 12/31/2009 (depending on protocol)

(n=12)

(n=10)

Johns Hopkins
COLORECTAL SURGERY CUSP

Year 1
Our Approach

**Comprehensive Unit based Safety Program (CUSP)**
1. Educate staff on science of safety
2. Identify defects
3. Assign executive to adopt unit
4. Learn from one defect per quarter
5. Implement teamwork tools

**Translating Evidence into Practice (TRiP)**
1. Summarize the evidence in a checklist
2. Identify local barriers to implementation
3. Measure performance
4. Ensure all patients get the evidence
   - Engage
   - Educate
   - Execute
   - Evaluate

**Reducing Surgical Site Infections**
- Emerging Evidence
- Local Opportunities to Improve
- Collaborative learning

**Technical Work**

**Adaptive Work**

**Emerging Evidence**

**Local Opportunities to Improve**

**Collaborative learning**
CUSP Steps

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CUSP
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2. Identify defects (2 question survey)
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Two Question Survey

1. How will the next patient develop a wound infection?
   How can we prevent the next wound infection?

2. How will the next patient be harmed?
   How can we prevent that harm?
How will the next patient be harmed? (SSI Specific)

95 Responses from 36 Staff Members

- Infection Control: 60% response rate
- Coordination of Care: 15% response rate
- Communication and Teamwork: 15% response rate
- Equipment/Supplies: 5% response rate
- Policies/Protocols: 5% response rate
- Education/Training: 5% response rate

Percentage of Responses (%)

<table>
<thead>
<tr>
<th>CUSP Step 2: Safety Issue Identified</th>
<th>CUSP Steps 4 &amp; 5: Opportunities to improve</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infection Control</strong></td>
<td>• Skin preparation</td>
</tr>
<tr>
<td></td>
<td>• Hypothermia</td>
</tr>
<tr>
<td></td>
<td>• Contamination of bowel contents into the wound</td>
</tr>
<tr>
<td></td>
<td>• Antibiotic timing</td>
</tr>
<tr>
<td></td>
<td>• Selection and redosing</td>
</tr>
<tr>
<td></td>
<td>• Length of case</td>
</tr>
<tr>
<td><strong>Coordination of Care</strong></td>
<td>• Increase utilization of preoperative evaluation center,</td>
</tr>
<tr>
<td></td>
<td>• Improve surgical posting accuracy (case name and duration)</td>
</tr>
<tr>
<td></td>
<td>• Computer assistance for antibiotic selection and redosing</td>
</tr>
<tr>
<td><strong>Communication and Teamwork</strong></td>
<td>• Improve communication throughout perioperative period</td>
</tr>
<tr>
<td></td>
<td>• Empower team members to speak up</td>
</tr>
<tr>
<td></td>
<td>• Improve compliance with briefings/debriefings</td>
</tr>
<tr>
<td></td>
<td>• Implement teamwork tools</td>
</tr>
<tr>
<td><strong>Equipment/ Supplies</strong></td>
<td>• Accurate temperature probes</td>
</tr>
<tr>
<td></td>
<td>• Point of care glucose monitoring</td>
</tr>
<tr>
<td></td>
<td>• Under body warmers</td>
</tr>
<tr>
<td></td>
<td>• Sanitizing wipes near anesthesia machine</td>
</tr>
<tr>
<td><strong>Policies/Protocols</strong></td>
<td>• Standardize care/protocols/policies</td>
</tr>
<tr>
<td></td>
<td>• Monitor sterile technique policies</td>
</tr>
<tr>
<td><strong>Education/Training</strong></td>
<td>• Ongoing education (with supportive data)</td>
</tr>
<tr>
<td></td>
<td>• Development of a SSI prevention checklist</td>
</tr>
</tbody>
</table>

Gentamicin

Interventions:
• Increased amount of gentamicin available in the room
• Added dose calculator in anesthesia record
• Educated surgery, anesthesia and nursing

Despite >95% compliance on SCIP

Correct Dose of Gentamicin Received

% of Patients Compliant

Before 33%  After 92%

Despite >95% compliance on SCIP
Interventions:
- Confirmed that temperature probes were accurate (trial comparing foley and esophageal sensors)
- Initiated forced air warming in the pre-operative area
Skin Preparation

Interventions:

• Chlorehexidine wash cloths given to patients pre-operatively

• Surgical skin preparation standardized to chloraprep (even in patients with ostomies)

• Prep responsibility shifted to circulating nurse from resident

• All nurses trained on chloraprep application
Separation of “Dirty” and “Clean” Instruments

Intervention:
• Built separate tray of instruments used for bowel anastomosis
• Extra suction and bovie tip and gloves opened and changed after anastomosis
• Educational sessions with scrub techs and nurses about instrument separation
• Audits and education on the spot
SSI Prevention Interventions

- Use of pre-operative chlorhexidine washcloths
- Pre-warming in the pre-op area
- Standardized skin preparation with chloraprep
- Separation of dirty and clean instruments
Colorectal SSI Rate by Quarter (NSQIP)

Baseline SSI Rate: 27%                           Year 1 SSI Rate: 17%

Goal: 15%

Quarter 3
Skin preparation protocol
Pre-op wash clothes

Quarter 4
CUSP kickoff
Antibiotic deficiencies addressed

Quarter 1
Pre-op warming
Enhanced sterile technique
Intervention checklist

Baseline SSI Rate: 27%                           Year 1 SSI Rate: 17%
COLORECTAL SURGERY CUSP
Teamwork and Communication: Briefings and Debriefings

Year 2
Safety culture moderates the effectiveness of safety and quality improvement efforts

- Safety climate scores correlated with the degree of reduction in mortality and morbidity achieved in the implementation of a surgical checklist \( (r = .71, p < .05) \) Haynes et al., 2011
Root Causes of Hospital Sentinel Events

- Communication
- Orientation/training
- Patient assessment
- Availability of info
- Staffing levels
- Physical environment
- Continuum of care
- Competency/credentialing
- Procedural compliance
- Alarm systems
- Organization culture

Percent of events
Operating Room Teamwork among Physicians and Nurses: Teamwork in the Eye of the Beholder

<table>
<thead>
<tr>
<th>Caregiver Position Being Rated</th>
<th>Surgeon</th>
<th>Anesthesiologist</th>
<th>Nurse</th>
<th>CRNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon</td>
<td>85</td>
<td>84</td>
<td>88</td>
<td>87</td>
</tr>
<tr>
<td>Anesthesiologist</td>
<td>70</td>
<td><strong>96</strong></td>
<td>89</td>
<td>92</td>
</tr>
<tr>
<td>Nurse</td>
<td><strong>48</strong></td>
<td>63</td>
<td><strong>81</strong></td>
<td>68</td>
</tr>
<tr>
<td>CRNA</td>
<td>58</td>
<td>75</td>
<td>76</td>
<td><strong>93</strong></td>
</tr>
</tbody>
</table>
Teamwork

Surgeon: If the nurse follows my orders

Nurse: If the surgeon listens to my concerns
“I know the names of the personnel I worked with during my last shift.”
Time-Out:
The Universal Protocol

• Right patient
• Right procedure
• Right site
The Pre-Op Checklist

“Briefing”

- What are the names and roles of the members of the team?
- Has the patient & procedure been confirmed?
- Have antibiotics been administered?
- What is the plan for DVT Prophylaxis?
- Are there any instruments and equipt. issues?

It was difficult to speak up if I perceived a problem with patient care.”

### Briefing/Debriefing Form

**The Johns Hopkins Hospital**  
**Operating Room Briefing/Debriefing Tool**

**Addressograph here**

**Attending Surgeon** to utilize this tool is to prompt open interdisciplinary communication before and after surgery to promote a clear understanding of specifics for each case.

<table>
<thead>
<tr>
<th>ORMS Case #</th>
<th>Date</th>
</tr>
</thead>
</table>

**Briefing – Before Every Procedure**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do the following match:</td>
<td></td>
</tr>
<tr>
<td>Patient ID band, Informed Consent (read out loud), Site Marking, OR Porting, patient’s verbalization of procedure (if patient awake), other clinically relevant documentation (H&amp;P, clinic note)</td>
<td></td>
</tr>
<tr>
<td>Do we have any safety, equipment, instrument, implant or other questions or concerns?</td>
<td></td>
</tr>
<tr>
<td>Have antibiotics been given, if indicated?</td>
<td></td>
</tr>
<tr>
<td>What are the anticipated times of antibiotic redosing?</td>
<td></td>
</tr>
<tr>
<td>Is glycemic control/ beta blockers indicated?</td>
<td></td>
</tr>
<tr>
<td>Is the patient positioned to minimize injury?</td>
<td></td>
</tr>
<tr>
<td>Has the Prep been applied properly, without pooling and allowed to dry?</td>
<td></td>
</tr>
<tr>
<td>Have the goals and critical steps of the procedure been discussed?</td>
<td></td>
</tr>
<tr>
<td>Is the appropriate amount of blood available?</td>
<td></td>
</tr>
<tr>
<td>Is DVT prophylaxis indicated? If so, what?</td>
<td></td>
</tr>
<tr>
<td>Has the patient received anticoagulants?</td>
<td></td>
</tr>
<tr>
<td>Any Special Precautions? If yes, describe.</td>
<td></td>
</tr>
<tr>
<td>Are warmers on the patient?</td>
<td></td>
</tr>
<tr>
<td>Is the time allotted for this procedure an accurate estimate?</td>
<td></td>
</tr>
<tr>
<td>Has Attending reviewed latest/ final test results for Lab/ Radiology? Are Intraoperative X-rays indicated?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circulating Nurse</th>
<th>Anesthesia Provider</th>
<th>Attending Surgeon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Debriefing – After Every Procedure**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Could anything have been done to make this case safer or more efficient?</td>
<td></td>
</tr>
<tr>
<td>Has the SSI data collection form been completed?</td>
<td></td>
</tr>
<tr>
<td>Are the patient name/ history number and the surgical specimen name and laterality on the paperwork? (Paperwork labeling to be independently verified by Surgeon)</td>
<td></td>
</tr>
<tr>
<td>Did we have problems with instruments?</td>
<td></td>
</tr>
<tr>
<td>Plan for transition of care to post-op unit discussed? To include:</td>
<td></td>
</tr>
<tr>
<td>Fluid Management/ blood (all slips in chart)</td>
<td></td>
</tr>
<tr>
<td>Antibiotics - continue post-op (dose/interval)</td>
<td></td>
</tr>
<tr>
<td>PACU tests/ X-rays</td>
<td></td>
</tr>
<tr>
<td>Pain/PCA plan</td>
<td></td>
</tr>
<tr>
<td>New meds needed (immediate periop)</td>
<td></td>
</tr>
<tr>
<td>Beta blockers (as required)</td>
<td></td>
</tr>
<tr>
<td>Glycemic control (as required)</td>
<td></td>
</tr>
<tr>
<td>DVT prophylaxis</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- No follow-up on comments
- Too long
- Same form used in all OR’s (neurosurgery, ortho, general surgery)
Building Capacity:
Armstrong Institute Patient Safety Fellowship
Jan – June 2012

Tracie Cometa, RN                Kevin Driscoll, CRNA

• Attended weekly classroom training on patient safety
• 8 hours/ week of protected time (Nursing)
Briefing and Debriefing
“real-time” identification of defects

- Team developed new form based on specific needs
- Candid discussion with surgeons about effective strategies for briefing/debriefing
- RN given protected time to address defects and communicate fixes
- Logbook of defects
# Debriefing Defect Logbook

## Patient Safety Log

<table>
<thead>
<tr>
<th>RN</th>
<th>Anesth</th>
<th>Equipment</th>
<th>Comment</th>
<th>Action Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td></td>
<td>Everything Great</td>
<td>Wrong tray, got a medium, needed major 1 &amp; 2</td>
<td>check type of case, possible preference card change</td>
</tr>
<tr>
<td>Jan</td>
<td></td>
<td>Instruments</td>
<td>No Olyvid, or colonoscope posted. No preop warming blanket, no at home washing.</td>
<td>Dr. Marchin’s office coordinator was educated on when to give home washcloths. Also spoke about postings being off compared to what Dr. Marohn wants, in order for him to get correct equipment. Residents needing to write an order for a blanket. Dr. Wick got access for CRNA's to put orders through.</td>
</tr>
<tr>
<td>E. Devoy</td>
<td></td>
<td>Equipment</td>
<td>Power cord to secondary monitor is too short, tripping hazard. Need extra CO2 tank for OR 12 (find home for 2nd tank). Inservicer circulating to change CO2 tanks.</td>
<td>Inservice being held Feb. 23, 2012 on how to change CO2 tanks. Lori Dixon equipment manager at holding for additional CO2 tank.</td>
</tr>
<tr>
<td>Lagmay</td>
<td></td>
<td>Equipment</td>
<td>Ultrasound was needed in another room, that room kept calling and asking for us during a critical part of Dr. Chos's case. Frustrated Dr. Chos stopped what he was doing and let the other OR use it and then we brought the US back down to Chos's room and continued on with the case (about a 15 minute lapse)</td>
<td>Contacted US manager Bob Dejong about possibly getting another US. New clinical building is Dejong is planning on teaching his sonographers on how to use the ALOHA that way we can use it</td>
</tr>
<tr>
<td>Tracie</td>
<td></td>
<td>Equipment</td>
<td>Overhead intercom disruptive to operating, left off hook before people realize that it happened.</td>
<td>Will place a note on phones next to avoid pressing over head intercom button. Mention at board</td>
</tr>
<tr>
<td>O. Nelson</td>
<td></td>
<td>Other</td>
<td>Posted for stirrups, patient was actually supine.</td>
<td>Case was posted as a reversal of ileostomy. Do not need stirrups for this case. Working on DPC preference card.</td>
</tr>
<tr>
<td>Germaine</td>
<td></td>
<td>DPC</td>
<td>No position posted for patient</td>
<td>Went back to preference card, no position aids entered, nor anything under comment section of DPC, as a part of ongoing DPC streamlining.</td>
</tr>
<tr>
<td>Germaine</td>
<td>Laurie Meginnis</td>
<td>Instruments</td>
<td>Incorrect balfour blade in colorectal set.</td>
<td>Steph Mullens is getting Instrument # and sending this to Decontam team so that they put new blade in set.</td>
</tr>
<tr>
<td>Ashleigh Pray</td>
<td></td>
<td>DPC</td>
<td>Incorrect posting</td>
<td>Case was misposted. Posted as a incisional hernia repair. Consent was for laparoscopic possible open segmental bowel resection with fistula and incisional hernia repair. Was not aware until consent was obtained.</td>
</tr>
<tr>
<td>Sneckenberger</td>
<td></td>
<td>Incorrect posting</td>
<td>Stirrups not posted but required.</td>
<td>Will speak with Dr. Marohn's scheduler to see why case incorrectly posted.</td>
</tr>
<tr>
<td>Sowinski</td>
<td></td>
<td>Posting</td>
<td>Communication of changes in practice, ex. Sheet over gel pad being used now. Need to increase # of colorectal trays, but still only 2 LA's in circulation. Need more or disposables available.</td>
<td>Will speak with Dr. Marohn's scheduler to see why case incorrectly posted.</td>
</tr>
<tr>
<td>M. Hillery</td>
<td></td>
<td>Other</td>
<td>Same issue as above</td>
<td>Communicate with surgeons when changes in practice occur. Looking into getting disposable balfour blades, Champness on progress.</td>
</tr>
<tr>
<td>E. Devoy</td>
<td>Laurie Meginnis</td>
<td>Instruments</td>
<td>The &quot;new&quot; balfour blade in colorectal set sticks and gets stuck in one position.</td>
<td>Will talk to central sterile about blade issue.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>Not posted for laparoscopic so no tower available. Tower brought without CO2. No instruments for Dr. Sacks part of case.</td>
<td>Will speak with scheduler for colorectal about posting incorrectly and also see if Dr. Sacks was posted equipment about CO2 not being on cart.</td>
</tr>
<tr>
<td>Deb Hansen, CRNA</td>
<td></td>
<td>Posting</td>
<td>Case posted incorrectly, was posted laparoscopic but was really an open case.</td>
<td>Follow up with Dr. Wick's scheduler on posting error.</td>
</tr>
</tbody>
</table>
Example of Defects Addressed: Instruments

Problem: Conflict with colorectal set

- Increased fleet from 2 to 4
- Reorganized contents of set so it is only pulled for cases when it is really needed

Impact: Instruments available when needed
Example of Defects Addressed: Instruments

Revision of Laparoscopic GI Surgery Trays

Problem: Many open instruments set up for lap cases which were never used

Impact: Fewer instruments to count and turnover
Save money and time

137 instruments

54 instruments
Examples of Defects Addressed: Postings

Problem: Circulating RN and scrub could not tell from posting if an abdominal and perineal set-up was needed for a case

- Worked with posting office to add “second setup needed” to posting sheet and surgeon notes section in ORIMIS

Impact: RN and scrub can set up before discussing case with surgeon, fewer delays
Examples of Defects Addressed: Updating DPCs

Problem: Equipment, supplies and/or instruments not available for cases

- Decreased number of DPCs
- Removed argon from colorectal DPCs
- Decreased surgeon to surgeon variability (standardization)
- Increased accuracy

Impact: Fewer errors, less counting required, less instruments to return at end of case, increased efficiency
Hidden Cost-Savings Antibiotic Irrigation

• Frontline providers questioned the inconsistency in use of antibiotic irrigation between surgeons

• Solution: if effective, advocate for consistent use and if not proven stop using

• NO EVIDENCE TO SUPPORT USE

• $537,000/ year on antibiotic irrigation

• Obtained surgeon and leadership buy-in for removing it from hospital formulary
Audits done by:
Jennifer Bennett BA (medical student)
Anna Chay BA (nursing student)
Deborah Hobson RN (patient safety officer)
Mike Rosen Ph.D.
Sallie Weaver Ph.D.
Colorectal SSI Rate by Quarter (NSQIP)

Baseline SSI Rate: 27%    Year 1 SSI: 17%    Year 2 SSI Rate: 20%

Quarter 3
Skin preparation protocol
Pre-op wash clothes

Quarter 4
CUSP kickoff
Antibiotic deficiencies addressed

Quarter 1
Pre-op warming
Enhanced sterile technique
Intervention checklist

Quarter 4
Briefing/Debriefing
Mechanical bowel prep with oral antibiotics

Goal: 15%
COLORECTAL SURGERY CUSP
Surfacing Defects in SSI Prevention

Year 3
SSI Investigation Process

- Every month
- Patients with infections identified by NSQIP
- Data abstracted by hand from ORIMIS, Metavision, POE, EPR
## Surfacing Defects on Patients with Infections

### SCIP Measures:

<table>
<thead>
<tr>
<th></th>
<th>Q1 2012</th>
<th>Q2 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with Infections</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>CUSP group surgeons</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Antibiotic Selection</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Antibiotic Timing</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Warmer Use in OR</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
## Surfacing Defects on Patients with Infections

<table>
<thead>
<tr>
<th>Normothermia</th>
<th>Q1 2012</th>
<th>Q2 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with Infections</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>CUSP group surgeons</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Antibiotic Dose (Gentamicin)</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>Redosing</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>Pre-op Warming*</td>
<td>55%</td>
<td>27%</td>
</tr>
<tr>
<td>Incision Temp</td>
<td>44%</td>
<td>27%</td>
</tr>
<tr>
<td>End Temp</td>
<td>44%</td>
<td>82%</td>
</tr>
<tr>
<td>Recovery Room Temp</td>
<td>100%</td>
<td>91%</td>
</tr>
<tr>
<td>Washcloths Use Pre-op*</td>
<td>55%</td>
<td>9%</td>
</tr>
<tr>
<td>Standardized Skin Prep*</td>
<td>77%</td>
<td>64%</td>
</tr>
<tr>
<td>Bowel Prep with Oral Antibiotics*</td>
<td>55%</td>
<td>36%</td>
</tr>
<tr>
<td>Reduced Steroid Dosage</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*CUSP
Addressing Defects: Tablet-based Pre-op Education

**Problem:** Patients did not know why we do the preparations we do

- Enhanced pre-op education to improve patient compliance with preparation for surgery
- Interactive
- Teachback
Problem:
Patients frequently scheduled months before surgery and materials not available in all pharmacies

- Patients will be given bowel prep materials when scheduled for surgery
- Reminder phone calls 2 days before procedure

Dec 2012-Jan 2013
35 pts contacted
31/35 (89%) compliant with washcloths
Addressing Defects: Standardization of Pre-op Warming

Problem:
Patients some abdominal GI patients not warmed

• All GI surgery abdominal patients will be warmed
Addressing Defects: Chlorhexidine Washclothes Day of Surgery

Problem:
Patients not using pre-op chlorhexidine washclothes

- Patients will be reminded with phone calls
- Prep will provide washclothes on the day of surgery for patients who did not use
Engaging Other Providers: Peer Outcome Reports

- Provider specific data compared to peers
- All surgeons performing > 10 colorectal procedures per year
- Sets the stage that problem is preventable and a social problem
Colorectal SSI Rate by Quarter (NSQIP)

<table>
<thead>
<tr>
<th>Quarter 3</th>
<th>Quarter 4</th>
<th>Quarter 4</th>
</tr>
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<tr>
<td>Skin preparation protocol</td>
<td>CUSP kickoff</td>
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</table>

Baseline
SSI Rate: 27%

Year 1
SSI: 17%

Year 2
SSI Rate: 20%

Year 3
SSI Rate: 11%??

Goal: 15%
Lessons Learned

- Colon SSIs can be prevented
- Change can not be “top down”
- CUSP sends a clear message, all provider opinions and ideas are important and essential for improvement
- Better teamwork → better outcomes → better culture and teamwork
- It takes time, commitment and leadership support
Our experience: Hospital level interventions (SCIP) pale in comparison to interventions at the work unit level (CUSP)

We embrace local wisdom in the Colorectal OR’s
NSQIP report 2013 or 2014

Johns Hopkins

Or even…
Surgical Unit Safety Program (SUSP): CUSP for Safe Surgery

National collaborative (JHU, ACS)
Goal: Reduce colon SSI and other harm
Sponsor: AHRQ

• Interventions
  – CUSP
  – Emerging evidence for SSI reduction

• Benefits
  – Engage frontline providers in improvement
  – Learn together
  – Community to share
Social Networking

SUSP: SUSP Teams

About Us
This is an external social networking group for the various SUSP teams.

Send Message
https://armstrongresearch.hopkinsmedicine.org
750 East Pratt Street, 15th Floor, Baltimore, MD 21202

SUSP Teams's Wire

Kathryn Taylor
From evidence to action: A surgeon's perspective
https://connect.johnshopkins.edu/r33npeupiig/
Webinar
When: December 18, 2012 4:00 pm
Listen to Dr Patch Dellinger from the University of Washington present his perspective on SSI prevention guidelines. Be sure to post your thoughts on the social network afterward!
10 days ago - Like | Comment

Dianne Rees, PhD
Looking forward to sharing and collaborating with everyone interested in SUSP.
10 days ago - Like | Comment

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