Successful Implementation Strategy for the Prevention of Surgical Site Infections

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Armstrong Institute for Patient Safety and Quality

Hosted by Prof. Joseph Solomkin
University of Cincinnati College of Medicine

February 17, 2016

Roadmap

• Review an implementation model used in successful large-scale programs associated with reductions in healthcare-associated infections, mortality, and costs

• Review how this model was adapted to achieve reductions in colorectal surgical site infections and improved patient satisfaction.
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Preventable Harm in Surgery

- 50% of all hospital adverse events linked to surgery
- At least HALF of those adverse surgical events are avoidable
- 25% in-patient surgeries followed by complications each year

More than 250,000 avoidable deaths after surgery


Increasing rates of infection-related and post-procedural adverse events among patients who required surgery

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE


Yun Wang, Ph.D., Noel Eldridge, M.S., Mark I. Metersky, M.D., Nancy R. Verzic, M.S.N., Thomas P. Meehan, M.D., M.P.H., Michelle M. Pandolfi, M.S.W., M.B.A., JoAnne M. Foody, M.D., Shih-Yieh Ho, Ph.D., M.P.H., Deron Galusha, M.S., Rebecca E. Kliman, M.P.H., Nancy Sonnenfeld, Ph.D., Harlan M. Krumholz, M.D., and James Battles, Ph.D.

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Surgical Care Improvement Project (SCIP)

However, improvements in SCIP measures did not translate into improvements in patient outcomes.

Despite Years Of Technical Intervention, Rates Rose

“Checklists” do not translate into improved results.

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How Will We Get There?

TECHNICAL WORK
- Work that we know we should do, like appropriate antibiotic dosing and skin preparation
- Work that lends itself to standardization (e.g., checklists and protocols)
- Evidence-based interventions

ADAPTIVE WORK
- The intangible components of work, like ensuring team members speak up with concerns and hold each other accountable
- Work that shapes the attitudes, beliefs, and values of clinicians, so they consistently perform tasks the way they know they should
- Safety culture, including teamwork

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Why does Safety Culture Matter?

Safety culture is related to outcomes

• Patient outcomes
  – Patient care experience
  – Infection rates, sepsis
  – Post op hemorrhage
  – Respiratory failure or puncture / laceration
  – Treatment errors

• Clinician outcomes
  – Incident reporting
  – Burnout and turnover

Huang et al., 2010; Mardon et al., 2010; MacDavitt et al., 2007; Singer et al., 2009; Sorra et al., 2012; Weaver et al, 2011.

Why does Safety Culture Matter?

• Safety culture influences the effectiveness of other safety and quality interventions
  – Can enhance or inhibit effects of other interventions

• Safety culture can change through intervention
  – Best evidence so far for culture interventions that use multiple components (ie: CUSP)

Haynes et al., 2011; Morello et al., 2012; Van Nord et al., 2010; Weaver et al., 2011.
COMPREHENSIVE UNIT-BASED SAFETY PROGRAM (CUSP)

A practical approach to tap into the wisdom of frontline staff and improve teamwork and safety culture

CUSP Pre-work

• Start in one unit and then spread
• Imperative for frontline staff to be involved
• Build strong partnerships:
  – Infection prevention staff
  – Hospital quality and safety leaders
  – Nurse educators
  – Physician leaders
CUSP Objectives
Comprehensive Unit-based Safety Program

1. Educate staff on science of safety
2. Identify defects
3. Partner with a senior executive
4. Learn from defects
5. Improve teamwork and communication

Jt Comm J Qual Patient Saf 2010;36:252-60
Resources: http://www.ahrq.gov/cusptoolkit/

Generalizable

- Central line-associated blood stream infections (CLABSI)
- Ventilator Associated Pneumonia (VAP)
- Venous Thromboembolism (VTE)
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Michigan Keystone ICU
CLABSI Rate: 2004-2012

National Efforts
On the CUSP:Stop BSI Program

- 1,071 ICUs in 45 states
- 43% CLABSI reduction
- Number of ICUs that achieved CLABSI rate of ZERO, more than doubled

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How will the next patient develop a SSI?

95 Responses from 36 Staff Members

- Infection Control
- Coordination of Care
- Communication and Teamwork
- Equipment/ Supplies
- Policies/Protocols
- Education/Training

Percentage of Responses (%)


Improvement Model Works In The OR
Colorectal NSQIP SSI Rate at Hopkins


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Care of colorectal surgery patients is highly variable…

- Pre-operative education
- Anesthetic plan
- Pain management
- Fluid resuscitation
- Resumption of oral intake
- Mobility efforts

Enhanced Recovery After Surgery (ERAS)
Colorectal Surgery at Johns Hopkins

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**ERAS Society**
http://www.erassociety.org

- Mid-thoracic epidural anesthesia/analgesia
- No nasogastric tubes
- Prevention of nausea and vomiting
- Avoidance of salt and water overload
- Early removal of catheter
- Early oral nutrition
- Non-opioid oral analgesia/NSAIDs
- Early mobilization
- Stimulation of gut motility
- Audit of compliance and outcomes

**ERAS**

Intraoperative
- Short-acting anesthetic agents
- Mid-thoracic epidural anesthesia/analgesia
- No drains
- Avoidance of salt and water overload
- Maintenance of normothermia (body warmer/warm intravenous fluids)

Preoperative
- Preadmission counseling
- Fluid and carbohydrate loading
- No prolonged fasting
- No/selective bowel preparation
- Antibiotic prophylaxis
- Thromboprophylaxis
- No premedication

Postoperative

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**Colorectal NSQIP SSI Rate**

Baseline 27%

Post-ERAS 6%

Hospital Target 15%

Colorectal CUSP 22%

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Reduction in LOS and Cost Savings
Colorectal Surgery at Johns Hopkins

<table>
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<tr>
<th></th>
<th>Baseline</th>
<th>ERAS</th>
<th>Difference</th>
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<tbody>
<tr>
<td>No. Patients</td>
<td>310</td>
<td>330</td>
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<tr>
<td>Mean Length of Stay</td>
<td>7.2 days</td>
<td>5.3 days</td>
<td>1.9 days (26.4%)*</td>
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<tr>
<td>Variable Direct Cost</td>
<td>$10,933</td>
<td>$9,036</td>
<td>$1,897 (17.3%)*</td>
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*P <0.05

J Am Coll Surg 2015;221:669-77

Reduction in complications and improvements in patient satisfaction

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<th>Baseline</th>
<th>ERAS</th>
<th>Difference</th>
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<tr>
<td>UTI Rate</td>
<td>4.1%</td>
<td>1.6%</td>
<td>- 2.5%</td>
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<tr>
<td>VTE Rate</td>
<td>3.5%</td>
<td>1.6%</td>
<td>- 1.9%</td>
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<tr>
<td>Patient Satisfaction (HCAPS)</td>
<td>39%</td>
<td>97%</td>
<td>+ 58%*</td>
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*P <0.05

J Am Coll Surg 2015;221:669-77

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CUSP FOR SAFE SURGERY: SURGICAL UNIT-BASED SAFETY PROGRAM (SUSP)

An AHRQ funded national project to achieve significant reductions in surgical site infections and improvements in safety culture.

SUSP Project Overview

• AHRQ funding project
  – 5 year project, ended August 2015
  – Individual hospitals participated for 2 years

• Leveraging leaders in field
  – Armstrong Institute for Patient Safety and Quality, ACS NSQIP, AHRQ, University of Pennsylvania, WHO

• Adapts successful CUSP/TRIP model for surgery
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Enrollment

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<td>Armstrong Institute</td>
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<td>California Hospital Association</td>
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<td>Hawaii Safer Care SUSP Collaborative</td>
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<td>Tennessee Hospital Association</td>
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<td>VHA</td>
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SUSP Is Tailored
To Your Local Environment

• No single SSI prevention bundle
  – Frontline staff identifies local defects
  – Develop a SSI prevention bundle to address local defects

• Measure local safety culture using Hospital Survey of Patient Safety (HSOPS)
  – Implement CUSP to tap into wisdom of frontline staff and improve culture

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Back to Basics

Lessons Learned

• Informed by science
  – Technical and adaptive teamwork
  – Focus on systems; Not individuals

• Led by clinicians and supported by management
  – Tap into the wisdom of frontline staff
  – Interdisciplinary Clinical Community

• Culture trumps strategy; can be improved
  – CUSP is a practical and effective strategy
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The next WHO teleclass ....
March 16, 2016

THE GLOBAL MYCOBACTERIUM CHIMAERA OUTBREAK IN CARDIAC SURGERY

Dr. Hugo Sax
University of Zurich Hospitals

Objectives:
- How this patient safety threat was discovered in Zurich, Switzerland, and what is known so far
- The story of the global outbreak response
- How infected patients are diagnosed and treated
- How the risk can be contained in the OR

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TELECLASS EDUCATION

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