American College of Medical Quality

Implementing Surgical Quality Innovations

John M. Morton, MD, MPH, FACS
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Director of Surgical Quality
Stanford University Hospital
Surgery in America 2006

Figure 4. Number of all-listed inpatient procedures by sex: United States, 2006
Surgery and the Public’s Health

- 234 m surgeries annually: Exceeds Childbirth
- Surgical Complications = 11% of Disease Burden
- 50% of Surgical Complications Preventable
“To Err is Human”  STANFORD BOARD DIRECTIVE
Within health care hides massive, avoidable death toll

Experts estimate that a staggering 98,000 people die from preventable medical errors each year. More Americans die each month of preventable medical injuries than died in the terrorist attacks of Sept. 11, 2001.

Hospitals slow to adopt lifesaving practices
A look at AHRQ's budget
Timeline of events
Terminology
About the Medical Error Surveillance Tool
Introduction Video Slideshow

About Dead by Mistake
Dead by mistake, the comprehensive story you see on this web site, is the result of two things converging: a team of skilled and dedicated journalists from across Hearst newspapers and television stations, and a critical and neglected health care issue that dramatically affects hundreds of thousands of Americans every year.

more...

Send us your tips

Family suspects coverup behind altered files
By LANCE WILLIAMS HEARST NEWSPAPERS
July 30, 2009, 5:17PM

A hospital patient suffers excruciating pain from what turns out to be a routine complication from elective surgery.

For hours, a feeding tube fed patient's lung
A feeding tube inserted into his right lung resulted in death.

Family photo

Diane Stewart (with son of wedding) had knee replacement surgery at Stanford hospital. (Family photo)
Back to the Future

“...every hospital should follow every patient it treats, long enough to determine whether or not the treatment has been successful...and if not, why not...”

“...I am called eccentric for saying in public that hospitals, if they wish to be sure of improvement,
1. Must find out what their results are
2. Must compare their results with those of other hospitals...
3. Must analyze their results, to find their strong and weak points.
   -Codman 1917
Face of End Result Card

Name  Mr. Edward James Galleson
Age  78

Addr. of Pt.  50 Crescent St., New York City, N.Y.
Pt's Phys.  Dr. E.H. Black, 16 Grove St., Boston.
Perm. Addr. of Frnd  Mrs. George White, Elm St., Salem, Mass.

Pre-op. Diag. Duodenal ulcer, with grave doubt of cancer of pyloric end stomach.

Post-op. Diag. Ulcer lesser curvature of stomach about an inch from pylorus. Felt very hard and suggested cancer.

No hematemesis but some melena


Anes. Ether and local novocaine. Ether by E.E. Collie.

Gall bladder felt as if full of stones. Duodenum normal except for slight induration of pylorus. Closed without drainage.

Compl. of Convalesce. None. Except that during convalescence he vomited several times without apparent cause.


Date of Adm.  6/2/11
Date of Operation  7/7/11
Hosp. No.  201

Signed  A.B.G.
“The End Result Idea may not achieve fulfillment for several generations.”

— Ernest Amory Codman
The Quality of Health Care Delivered to Adults in the United States

Elizabeth A. McGlynn, Ph.D., Steven M. Asch, M.D., M.P.H., John Adams, Ph.D., Joan Keesey, B.A., Jennifer Hicks, M.P.H., Ph.D., Alison DeCristofaro, M.P.H., and Eve A. Kerr, M.D., M.P.H.

RESULTS
Participants received 54.9 percent (95 percent confidence interval, 54.3 to 55.5) of recommended care.
National PSI Rates
Morton 2009

High-Frequency Increasing PSIs

Year of Discharge

Risk-Adjusted Rate per 1000 Discharges

Decubitus Ulcer*
Postoperative Respiratory Failure**
Postoperative PE/DVT*

*Statistically Significant p<0.005
**Statistically Significant p<0.05
Clinical Outcomes Report: Product Line Mortality Comparison
October 2006 – September 2007

175 Surgical Deaths, Dept of Surgery 71, 2.1%
SF=110, Oakland=140

Cardiothoracic Surgery Case = 988 Deaths = 48 Rate =5%
Gynecology Case = 580 Deaths = 0 Rate =0%
Heart Transplant or Implant Case = 58 Deaths = 6 Rate =10%
Kidney/Pancreas Transplant Case = 78 Deaths = 0 Rate =0%
Liver Transplant Case = 58 Deaths = 1 Rate =2%
Lung Transplant Case = 35 Deaths = 1 Rate =3%
Neurosurgery Case = 903 Deaths = 35 Rate =4%
Orthopedics Case = 2330 Deaths = 8 Rate =0%
Otolaryngology Case = 411 Deaths = 4 Rate =1%
Plastic Surgery Case = 176 Deaths = 0 Rate =0%
Spinal Surgery Case = 1225 Deaths = 0 Rate =0%
Surgery General Case = 2292 Deaths = 54 Rate =2%
Surgery Oncology Case = 304 Deaths = 5 Rate =2%
Trauma Case = 182 Deaths = 5 Rate =3%
Urology Case = 719 Deaths = 2 Rate =0%
Vascular Surgery Case = 271 Deaths = 6 Rate =2%

UHC Median

SHC
Improving surgical care

Structure

Process

Outcomes

Structure – Volume

Process – SCIP

Outcomes - NSQIP
Department of Surgery Quality Plan Preview

• Imperative from SHC Board
• **Areas of Focus**
• Measurement
• Goals
• Communication
• Education
• Accountability
• Leadership
Persistent Pursuit of Excellence

• Dedicated Monthly Grand Rounds on Quality
• NSQIP based Morbidity and Mortality Conference
• Resident Award for Quality Improvement
• Novel Quality Improvement/Patient Safety Resident Curriculum
• Documentation Improvement Program
• Peer Review
• Surgery Quality Council
• Quality Initiatives
• Rounding Policy
• OR Checklist
• Leadership
# Clinicians in Quality Improvement
## A New Career Pathway in Academic Medicine

<table>
<thead>
<tr>
<th>Table. Types of Health Care Quality Activities and Their Potential Academic Merit</th>
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</thead>
<tbody>
<tr>
<td><strong>Traditional Research</strong> (Recognized as Having Academic Merit)</td>
</tr>
<tr>
<td>Measuring quality problems</td>
</tr>
<tr>
<td>Epidemiologic studies of prevalence, risk factors for various quality and safety problems</td>
</tr>
<tr>
<td>Interventions to improve quality</td>
</tr>
<tr>
<td>Rigorous evaluation of emerging QI intervention</td>
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<tr>
<td>Demonstrating the effectiveness of a well-known QI intervention across a broad range of settings (eg, checklist of processes for reducing infections associated with central lines)</td>
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</table>

766 JAMA, February 18, 2009—Vol 301, No. 7 (Reprinted)
Initiatives

- Data Use
- PPEC
- NSQIP
- Post-Op SSI
- Time Out
Engaging Your Surgeons

• Leadership Commitment
• Data Transparency
• Target Areas of Improvement
• Data Drives Discussion
  – Denial
  – Anger
  – Bargaining
  – Depression
  – Acceptance
Administrative Data

• Financial
• Clinical Input
• Goethe
  – “You search where there is light”
Administrative Data

- Consistent
- Benchmark
- Prioritize
**Stanford Hospital and Clinics**

**Jul - Sep 2007 (Q3)**

**Surgery General**

### Definition - Surgery General

Product lines are defined by UHC and displayed in the CDB. This product line includes inpatient discharges in DRGs 113-114, 120, 146-147, 149-153, 155-167, 170-171, 191-196, 200-201, 206-262, 267, 269-270, 285-286, 288-290, 292-293, 392-394, 424, 440, 461, 468, 477, 493-494, 567-570, 578-579. This list is based on the effective DRGs for the reported current quarter. Prior periods, product line assignments were based on the effective DRGs at that time.

### Relative Performance

<table>
<thead>
<tr>
<th>Denom. (Cases)</th>
<th>Obs/Exp Ratio</th>
<th>UHC Median Rank</th>
<th>Hospitals w/ Same Rank</th>
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<tbody>
<tr>
<td>Current Quarter</td>
<td>583</td>
<td>0.54</td>
<td>0.85</td>
</tr>
<tr>
<td>Recent Year</td>
<td>2,292</td>
<td>1.00</td>
<td>0.89</td>
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### Observed vs. Expected

<table>
<thead>
<tr>
<th>Cases (denom.)</th>
<th>Current Quarter</th>
<th>Last Quarter</th>
<th>Recent Year</th>
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<tbody>
<tr>
<td>Observed Deaths</td>
<td>14.72</td>
<td>11.82</td>
<td>53.67</td>
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<tr>
<td>Expected Deaths</td>
<td>12.13</td>
<td>11.54</td>
<td>53.67</td>
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<tr>
<td>Observed Mortality (%)</td>
<td>1.37</td>
<td>2.94</td>
<td>2.36</td>
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<tr>
<td>Expected Mortality (%)</td>
<td>2.52</td>
<td>2.04</td>
<td>2.34</td>
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<tr>
<td>Observed/Expected Ratio</td>
<td>0.54</td>
<td>1.19</td>
<td>1.60</td>
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</table>

### Recent Year UHC Top-10 Mortality

<table>
<thead>
<tr>
<th>Mort Q/E Cases</th>
<th>LOS Q/E</th>
<th>Readmit Rate</th>
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<tbody>
<tr>
<td>UHCASE</td>
<td>0.45</td>
<td>2.22</td>
</tr>
<tr>
<td>STLUKEHOUSTON</td>
<td>0.46</td>
<td>3.01</td>
</tr>
<tr>
<td>WISCONSIN</td>
<td>0.48</td>
<td>2.52</td>
</tr>
<tr>
<td>HOPKINS</td>
<td>0.53</td>
<td>3.72</td>
</tr>
<tr>
<td>MCHTIX</td>
<td>0.53</td>
<td>3.39</td>
</tr>
<tr>
<td>NORTHWESTERN</td>
<td>0.55</td>
<td>2.49</td>
</tr>
<tr>
<td>MINNESOTA</td>
<td>0.50</td>
<td>2.53</td>
</tr>
<tr>
<td>CLARIAN-INDIANA</td>
<td>0.50</td>
<td>1.99</td>
</tr>
<tr>
<td>UCIRVINE</td>
<td>0.61</td>
<td>1.39</td>
</tr>
<tr>
<td>CLARIAN-METHODIST</td>
<td>0.62</td>
<td>1.46</td>
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</tbody>
</table>

**Substantially Worse than Target Range**

- O/E Ratio > 1.4
- Quality Alert Warning
  - Quality alert screening criteria triggered (only for current quarter)
  - Low volume, excluded from top-10

**Worse than Target Range**

- O/E Ratio > 1.0 and < 1.4

**Within Target Range**

- O/E Ratio = 0.6 and <= 1.0

**Substantially Better than Target Range**

- O/E Ratio < 0.6

**Quality Alert Screening Criteria**

- Most recent 8 quarters mortality higher than expected and one of the most recent 4 quarters has O/E Ratio >= 1.4
- Any 2 data points in the most recent 4 quarters have O/E Ratio >= 1.4
- 6 of the most recent 8 quarters trending upwards

*UHCRreport@uhc.edu*
PSIs: Quality Diagnostic Tool
2007 Quality Improvement and Patient Safety Scorecard

Patient Safety Indicators - Rate per 1,000

<table>
<thead>
<tr>
<th>PSI</th>
<th>Rate per 1,000</th>
<th>2005</th>
<th>2006</th>
<th>Oct 2006 - Sep 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall</td>
<td>UHC</td>
<td>Overall</td>
<td>UHC</td>
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<tr>
<td>Death in Low Mortality DRG</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Failure to Rescue</td>
<td>134.50</td>
<td>110.60</td>
<td>94/121</td>
<td>141.50</td>
</tr>
<tr>
<td>Decubitus Ulcer</td>
<td>10.90</td>
<td>28.10</td>
<td>12/122</td>
<td>10.90</td>
</tr>
<tr>
<td>Foreign Body</td>
<td>0.10</td>
<td>0.10</td>
<td>65/122</td>
<td>0.30</td>
</tr>
<tr>
<td>Iatrogenic pneumothorax</td>
<td>1.70</td>
<td>0.90</td>
<td>108/122</td>
<td>1.60</td>
</tr>
<tr>
<td>Selected Infection due to Medical Care</td>
<td>4.80</td>
<td>3.80</td>
<td>77/122</td>
<td>4.00</td>
</tr>
<tr>
<td>Post Op Hip Fracture</td>
<td>0.35</td>
<td>0.00</td>
<td>92/120</td>
<td>0.20</td>
</tr>
<tr>
<td>Post Op Hemorrhage/Hematoma</td>
<td>3.50</td>
<td>3.10</td>
<td>84/120</td>
<td>4.80</td>
</tr>
<tr>
<td>Post Op Phys/Metabolic</td>
<td>1.70</td>
<td>2.00</td>
<td>54/120</td>
<td>1.80</td>
</tr>
<tr>
<td>Post Op Respiratory Failure</td>
<td>11.20</td>
<td>12.70</td>
<td>47/120</td>
<td>10.10</td>
</tr>
<tr>
<td>Post Op PE or DVT *</td>
<td>18.90</td>
<td>15.60</td>
<td>84/120</td>
<td>17.20</td>
</tr>
<tr>
<td>Post Op Wound Dehiscence</td>
<td>0.60</td>
<td>2.20</td>
<td>26/118</td>
<td>3.80</td>
</tr>
<tr>
<td>Accidental Puncture or Laceration</td>
<td>7.20</td>
<td>5.00</td>
<td>82/122</td>
<td>8.20</td>
</tr>
<tr>
<td>Transfusion Reaction</td>
<td>0.00</td>
<td>0.00</td>
<td>1/122</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* Run charts attached

Comments:
The ARHQ indicators are surrogate measures for how well care is delivered based on complication rates. Overall our performance shows tremendous opportunity to improve our standings and requires focused efforts to drill down on the data and look for causal relationships.

Priority PI Initiatives include:
Sepsis
Post Op DVT
Iatrogenic Pneumothorax

The Clinical Documentation program will establish a consistent baseline for how complications are assigned. ***
# Top Priority PI Action Plans

<table>
<thead>
<tr>
<th>Goals</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DVT/PE:</strong> Reduce the rate of DVT &amp; PE by 25% by December 2008.</td>
<td>● Increase Monitoring</td>
</tr>
<tr>
<td></td>
<td>● Provide Feedback to Physicians</td>
</tr>
<tr>
<td></td>
<td>● Improve Compliance to order sets</td>
</tr>
<tr>
<td><strong>Sepsis:</strong> Reduce hospital mortality of severe sepsis &amp; septic shock from 50% to 40% by Jan 09</td>
<td>● Update Sepsis Guidelines</td>
</tr>
<tr>
<td></td>
<td>● Implement processes for early identification of sepsis and aggressive treatment</td>
</tr>
<tr>
<td></td>
<td>● Establish ICU/ED task force and spread learning</td>
</tr>
<tr>
<td><strong>IAP:</strong> Reduce the rate of iatrogenic pneumothorax (IAP) from central venous catheterization (CVC) by 50% by December 08</td>
<td>● Promote ultrasound-guided internal jugular (IJ) catheterization as the method of choice for CVC</td>
</tr>
<tr>
<td></td>
<td>● Require all medical &amp; surgical interns to complete CVC Website Curriculum &amp; Simulation Program during orientation</td>
</tr>
<tr>
<td></td>
<td>● Require that the first 5 CVCs by a house staff member be supervised by a more senior physician who has successfully inserted &amp; documented the placement of 5 CVCs</td>
</tr>
</tbody>
</table>
UHC DVT/PE Measure

AHRQ Patient Safety Indicators

Post Operative DVT or PE
Rate per 1000 Surgical Inpatient Discharges

- Observed
- Target
- UHC Median

- 2004 Q1 (N=2740)
- 2004 Q3 (N=2850)
- 2005 Q1 (N=2751)
- 2005 Q3 (N=2760)
- 2006 Q1 (N=2797)
- 2006 Q3 (N=2836)
- 2007 Q1 (N=2846)
- 2007 Q3 (N=2808)
# Action Plan for DVT/PE

Reduce the rate of DVT & PE by 25% by December 2008.

<table>
<thead>
<tr>
<th>Action</th>
<th>Agents</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor concurrent MD ordering practices of DVT prophylaxis &amp; educate/reinforce Epic order sets.</td>
<td>Quality Specialist to audit 10 charts/wk of General &amp; Ortho Surgery pts &amp; educate MDs.</td>
<td>Begin Feb 1</td>
</tr>
<tr>
<td>Review concurrent DVT/PE cases for adherence to DVT prophylaxis guidelines monthly.</td>
<td>Quality Specialist to perform audit based on monthly report of + radiology tests.</td>
<td>Feb 18</td>
</tr>
<tr>
<td>Examine &amp; present results from concurrent monitoring &amp; audit &amp; NSQIP data to providers.</td>
<td>P. Pilotin &amp; K. Bashaw to discuss results with Chairs of General &amp; Orthopedic Surgery.</td>
<td>Feb 25</td>
</tr>
<tr>
<td>Educate physicians to DVT guidelines and order sets.</td>
<td>P. Pilotin to develop/distribute materials of DVT guidelines &amp; screen shots of Epic DVT order set.</td>
<td>Feb 15</td>
</tr>
<tr>
<td>Establish rules &amp; rates for DVT/PE cases for individual MD profiles.</td>
<td>Quality Dept to establish rules &amp; rates in Midas.</td>
<td>March 31</td>
</tr>
<tr>
<td>Refine DVT prophylaxis guidelines for medical patients.</td>
<td>K. Posley to review/revise guidelines.</td>
<td>Feb 1</td>
</tr>
</tbody>
</table>

## REAL-TIME Assessment

DVT/PE Concurrent Review By Action Team
Concurrent Surgical Audit

- Concurrent audit started in Feb 08; conducted by Quality Specialist 24 hours after surgery on:
  - Orthopedic surgery
  - General surgery patients

- “Risk level” of patient is assessed by Quality Specialist & compliance determined based on current order

- Surgical DVT Prophylaxis must be ordered and 1st drug dose given within 24 hours after surgery

- If no order or inadequate order, a “fix-it” ticket is placed in medical record so MD can order or revise prophylaxis
Retrospective Surgical Audit (Radiology test)

Accordance of Ordered Drug Agent, Dose & Frequency to Patients Risk Level and SHC Guidelines (N=17) (Aug-Oct 08)

Drug Agent: 88%
Drug Dose: 88%
Drug Administration Frequency: 88%
Postoperative Drug Prophylaxis Ordered and 1st Drug Dose Administered within 24 Hours of Surgery (N=17) (Aug-Oct 08)

- MD Order w/in 24 hrs of Surgery: 71%
- Receipt of 1st dose w/in 24 hrs of Surgery: 53%
<table>
<thead>
<tr>
<th>Patient</th>
<th>MRN</th>
<th>ACC</th>
<th>Dept</th>
<th>Exam</th>
<th>ExamDesc</th>
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<th>CompletedDTTM</th>
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<td>01/14/2008 9:36 PM</td>
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<td>4192454</td>
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<td>USNVLOW</td>
<td>US Vein Lower Extremity Bilateral Rule Out</td>
<td>01/11/2008 6:41 PM</td>
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<td>1933385-3</td>
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<td>01/10/2008 9:49 AM</td>
<td>01/16/2008 5:17 PM</td>
<td>451.89</td>
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</tbody>
</table>
# DVT/PE Risk Assessment in Epic

## VTE Prophylaxis

**Low Risk DVT/PE Prophylaxis** (<5% risk of DVT: Patient <40 years old and minor surgery and no additional risk factors)
- **Routine, ONCE**
  - Placebo

**Moderate Risk DVT/PE Prophylaxis** (10-20% risk of DVT: Patient 40-60 years old with no additional risk factors or minor surgery in patients with additional risk factors)
- **Routine, ONCE**
  - enoxaparin (LOVENOX) 40 mg/mL syringe 40 mg, SUBCUTANEOUS, DAILY
  - heparin 10,000 units/mL injection (for subcut) 6000 Units, SUBCUTANEOUS, EVERY 12 HOURS
  - Sequential Compression Device (SCD) Routine, ONCE

**High Risk DVT/PE Prophylaxis** (21-40% risk of DVT: Surgery in patients >60 years old or age >40 years with additional risk factors)
- **Routine, ONCE**
  - enoxaparin (LOVENOX) 30 mg/mL syringe 30 mg, SUBCUTANEOUS, 2 TIMES DAILY
  - enoxaparin (LOVENOX) 40 mg/mL syringe 40 mg, SUBCUTANEOUS, DAILY
  - heparin 10,000 units/mL injection (for subcut) 5000 Units, SUBCUTANEOUS, EVERY 8 HOURS
  - Sequential Compression Device (SCD) Routine, ONCE

**Highest Risk DVT/PE Prophylaxis** (41-80% risk of DVT: Surgery in patients with multiple risk factors or hip or knee arthroplasty, hip fracture surgery, major trauma or spinal cord injury. Warfarin started day of surgery, target INR 2-3)
- **Routine, ONCE**
  - enoxaparin (LOVENOX) 30 mg/mL syringe 30 mg, SUBCUTANEOUS, 2 TIMES DAILY
  - fondaparinux (ARBIXTRA) 2.5 mg/0.5 mL syringe 2.5 mg, SUBCUTANEOUS, DAILY
  - warfarin (COUMADIN) tablet Oral, DAILY
  - Sequential Compression Device (SCD) Routine, ONCE

**VTE Adjunct Orders**
- Early Ambulation Routine, AS TOLERATED
DVT/PE Rates with SCIP VTE

*SCIP is based on a sampling of all surgical cases
Incidence of DVT/PE by DRG
Overall* DVT/PE

Observed Rate: 0.56%
Expected Rate: 1.08%
O/E Ratio: 0.52
Status: Exemplary

* Includes General and Vascular Surgery Cases
Program Overview

• ACS NSQIP is a data-driven, risk-adjusted, outcomes-based surgical quality improvement program.

• Benefits of participation include:
  • Identifying quality improvement targets
  • Improving patient care and outcomes
  • Decreasing institutional healthcare costs
Additional Program Benefits

Maintenance of Certification (MOC) for Surgeons

• The American Board of Surgery has stated that participation in ACS NSQIP satisfies the requirement for surgeons to be compliant with MOC, Part IV.

CMS Surgical Care Improvement Program (SCIP)

• ACS NSQIP offers a SCIP module to streamline the data collection process.

Joint Commission Recognition on Quality Check Website

• The Joint Commission awards ACS NSQIP hospitals a Merit Badge on their Quality Check public website.
History of the ACS NSQIP

• Originated in the Veterans Health Administration and has been operational since 1991

• In 2001, ACS received funding to implement NSQIP pilot program in private sector hospitals.

• In 2004, ACS expanded the program to additional private sector hospitals.
Quality Improvement Process

1. Hospitals abstract data.
2. Data are analyzed by ACS NSQIP.
3. Data are reported back to hospitals.
4. Hospitals act on their data.
5. Hospitals monitor interventions with data.
ACS NSQIP Case Selection

Systematic Sampling Process
• 8 - day cycle assures cases have equal chance of being selected.
• The first 40 cases meeting inclusion/exclusion criteria are selected.

Inclusion/Exclusion Criteria
• Inclusion based on CPT codes
• Exclusion criteria
  - Under age 16
  - >3 inguinal herniorrhaphies, >3 lumpectomies, > 3 laparoscopic cholecystectomies, or 3 transurethral resection of the prostate and/or bladder (if the hospital collects multispecialty data) per cycle
  - Trauma and Transplant
  - ASA class 6
Program Overview

• Includes general and vascular surgery cases as well as, at multispecialty institutions, 8 subspecialties (gynecologic, neurologic, orthopedic, otolaryngologic, plastic, cardiac, thoracic, and urologic surgery)
• Outcomes assessed at 30 days after index surgery (inpatient or outpatient)
• Highly standardized and validated data definitions
• Intense Surgical Clinical Reviewer training, continuing education, and support
• 135 total variables collected
Data Collection

Preoperative data
• Demographics - 6 variables
• 44 clinical variables and 13 laboratory variables

Intraoperative data
• Surgical Profile - 11 variables
• 16 clinical variables and 3 complications

Postoperative data
• 30-day outcomes (inpatient and outpatient)
• 20 complications, 12 laboratory variables, and 10 discharge variables
Data Available to Hospitals

**Real-Time Benchmarking**
- Allows comparison to other ACS NSQIP hospitals using online reports
- Custom reports are available upon request.

**Semiannual Reports**
- Provides risk-adjusted comparisons of all ACS NSQIP hospitals regarding morbidity, mortality, and complications

**Participant Use File**
- Contains all cases reported from 2005 to date
ACS NSQIP Overview for Our Hospital

- Surgeon Champion: Dr. John Morton
- Dedicated Surgical Clinical Reviewer(s): Yanina Stanislavskaya
- Most Recent Inter-Rater Reliability (IRR)

Hospital Audit Data
  - IRR Date: (06/2007)
  - Audit Status: Pass
  - Disagreement Rate: 2.01%

- Percent with complete 30-day follow up: 95.58%
Models have traditionally had 25 risk adjustment variables…
CAN WE RISK ADJUST WITH LESS VARIABLES?

Risk adjusted Morbidity
5 variables

Correlation coefficient = 0.99

Risk adjusted Morbidity
20 variables

Can decrease data
collection by >50%
Clinical vs. Administrative Data: Clinical Data tends to tell us more...

<table>
<thead>
<tr>
<th></th>
<th>NSQIP</th>
<th>Admin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Complications</td>
<td>28%</td>
<td>11%</td>
</tr>
<tr>
<td>SSI</td>
<td>13%</td>
<td>1%</td>
</tr>
<tr>
<td>Wound Disruption</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>UTI</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>Mortality</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>
NSQIP Impact

Mortality

Morbidity

Khuri, Ann Surg, 2002
Overall* 30-Day Mortality

Observed Rate: 1.05%
Expected Rate: 1.81%
O/E Ratio: 0.58
Status: Exemplary

* Includes General and Vascular Surgery Cases
Overall* 30-Day Morbidity

Observed Rate: 12.77%
Expected Rate: 11.9%
O/E Ratio: 1.07
Status: As Expected

* Includes General and Vascular Surgery Cases
Overall*
Cardiac Complications

Observed Rate: 0.43%
Expected Rate: 0.71%
O/E Ratio: 0.61
Status: As Expected

* Includes General and Vascular Surgery Cases
Overall* Pneumonia

- Observed Rate: 0.93%
- Expected Rate: 1.61%
- O/E Ratio: 0.58
- Status: Exemplary

* Includes General and Vascular Surgery Cases
Overall*
Unplanned Intubation

Observed Rate: 1.05%
Expected Rate: 1.46%
O/E Ratio: 0.72
Status: As Expected

* Includes General and Vascular Surgery Cases
Overall*
Ventilator >48 hours

Observed Rate: 2.56%
Expected Rate: 1.88%
O/E Ratio: 1.36
Status: As Expected

* Includes General and Vascular Surgery Cases
Overall* DVT/PE

Observed Rate: 0.56%
Expected Rate: 1.08%
O/E Ratio: 0.52
Status: Exemplary

* Includes General and Vascular Surgery Cases
Overall* Renal Failure

Observed Rate: 0.74%
Expected Rate: 0.81%
O/E Ratio: 0.92
Status: As Expected

* Includes General and Vascular Surgery Cases
Overall*
Urinary Tract Infections

Observed Rate: 1.61%
Expected Rate: 1.83%
O/E Ratio: 0.88
Status: As Expected

* Includes General and Vascular Surgery Cases
Overall Surgical Site Infections

- Observed Rate: 6.96%
- Expected Rate: 5.14%
- O/E Ratio: 1.35
- Status: Needs Improvement

* Includes General and Vascular Surgery Cases
General Surgery
Surgical Site Infection

Observed Rate: 7.36%
Expected Rate: 5.71%
O/E Ratio: 1.29
Status: Needs Improvement
Colorectal Surgery
Surgical Site Infection

Observed Rate: 17.68%
Expected Rate: 12.17%
O/E Ratio: 1.45
Status: Needs Improvement
Vascular Surgery
Surgical Site Infection

Observed Rate: 4.62%
Expected Rate: 2.22%
O/E Ratio: 2.08
Status: Needs Improvement
Overall Wound Infection with UHC Comparison (CY 2006 Q4 to 2009 Q2)
Summary of Outcomes
Better Than Expected Outcomes, Exemplary:

• **Overall (Non-Multispecialty) Pneumonia**
  - Low outlier: 2 time period(s)
  - Last time period: Low Outlier

• **Overall (Non-Multispecialty) DVT/PE**
  - Low outlier: 1 time period(s)
  - Last time period: As Expected

• **Overall (Non-Multispecialty) Mortality**
  - Low outlier: 1 time period(s)
  - Last time period: As Expected

• **General Mortality**
  - Low outlier: 1 time period(s)
  - Last time period: As Expected

• **Colorectal Mortality**
  - Low outlier: 1 time period(s)
  - Last time period: As Expected
Summary of Outcomes for Our Hospital

Worse Than Expected Outcomes, Needs Improvement:

• **Overall (Non-Multispecialty) Surgical Site Infection**
  High outlier: 2 time period(s)
  Last time period: High Outlier

• **General Surgical Site Infection**
  High outlier: 2 time period(s)
  Last time period: High Outlier

• **Colorectal Surgical Site Infection**
  High outlier: 1 time period(s)
  Last time period: As Expected

• **Vascular Surgical Site Infection**
  High outlier: 1 time period(s)
  Last time period: As Expected
Utilizing Hospital Outcomes for Quality Improvement

- Utilize resources available from the ACS NSQIP secure website
- Best Practices Case Studies
- Best Practices Guidelines
- Prevention of Catheter-Associated Urinary Tract Infections
- Prevention and Treatment of Venous Thromboembolism
- Prevention and Assessment of Intravascular Catheter-Related Bloodstream Infections
- Prevention of Surgical Site Infections

Monitor the impact of quality improvement initiatives and disseminate those achievements.

- All of health care benefits when best practices are identified and shared.
SCIP Measures (infection control) adapted from CMS Manual Specifications, 2009

- INF 1 – Prophylactic Antibiotic Received Within 1 Hour Prior to Surgical
- INF 2 – Prophylactic Antibiotic Selection
- INF 3 – Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery (48 for cardiac surgery)
- INF 4 – Cardiac Surgical Patients with Controlled 6 AM Postoperative Blood Sugar
- INF 6 – Surgery Patients with Appropriate Hair Removal
- INF 10 - Colorectal Patients With Immediate Postoperative Normothermia
  
  Beginning with October 1st, 2009 discharges - ALL patients will be required to have normothermia (36°C and above)

- Also coming in October 2009: Urinary Catheter Removed on Postoperative Day 1 (POD 1) or Postoperative Day 2 (POD 2)
Current SCIP Measures

Surgical Care Improvement Project

- Prophx Abx Within 1 Hr to Surgical Incision
- Prophylactic Antibiotic Selection For Surgical Patients
- Antibx DC Within 24 Hrs After Surgery End Time
- Cardiac Patients With Controlled 6 AM Postop Blood Glucose
- Colorectal Patients With Immediate Postop Normothermia
- Pts on Beta Blocker therapy prior to admission who rec'd Beta Blocker during

Mar-09 | Apr-09 | May-09 | Jun-09 | Aug-09
Prophylactic Antibiotic Use: Hardwiring of Physician Behavior, Not Education, Leads to Compliance

Glenn Whitman, MD, FACS, Vincent Cowell, MD, Kristen Parris, MD, Patricia McCullough, RN, Teresa Howard, RN, John Gaughan, PhD, Dean Karavite, MSI, Madolin Kennedy, RHIA, John McInerney, RN, Christina Rose, PhD

CONCLUSIONS: Despite hospital-wide education, improving compliance with evidence-based recommendations for ProAbx required processes that “forced” physician behavior, specifically: specialty-specific, preprinted physician orders limiting ProAbx choice; linking administration of preoperative ProAbx administration to the universal timeout; and standardization of the postoperative ProAbx order in the computerized physician order entry. (J Am Coll Surg 2008;207:88–94. © 2008 by the American College of Surgeons)
Surgical Site Infection
Case # 1

• Name of Surgical Procedure:
  Takedown of colostomy with colon resection and stapled side-to-side functional end-to-end anastomosis.
• Wound Class: 2 - Clean/Contaminated
• Length of Surgery: 38 min.
• SSI
• Length of Hospital Stay: 4 days
Case # 1
SCIP Measures

• INF 1 – Prophylactic Antibiotic Received Within 1 Hour Prior to Surgical Incision: YES

• INF 2 – Prophylactic Antibiotic Selection: CORRECT. Invanz.

• INF 3 – Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time (48 for cardiac surgery): YES (note: there was only 1 abx. dose administered)

• INF 10 - Colorectal Patients With Immediate Postoperative Normothermia (36°C and above) : NO (Temperature was 35.6°C within first 15 min. post-op)

• Urinary Catheter Removed on Postoperative Day 1 (POD 1) or Postoperative Day 2 (POD 2): NO. CATHETER REMOVED on POD 4
Conclusion

*what can we do differently?*

- Dose per weight
- Dosing - Redose in OR/Post op doses as appropriate
- Decrease Foley catheter time to 1-2 days post-op.
- Make sure patient does not leave OR with temperature below 36 C.
Impact of SSI: Clinical Effectiveness

• SSIs generate an average of $28,211 in extra costs per case and comprise 38% of all morbidities.

• SSI’s add an additional 7-9 excess hospital days

• Hospital Acquired Condition (HAC)
  – CT
  – Ortho
  – Bariatric
Hospitals Could Stop Infections by Tackling Bacteria Patients Bring In, Studies Find

By PAM BELLUCK

But Dr. Wenzel said the method used in the second study should be adopted across the board. That study, conducted at six United States hospitals, compared the skin disinfectant hospitals use 75 percent of the time before surgery with another one. The researchers found that patients receiving the standard disinfectant, povidone-iodine, were significantly more likely to develop infections. Those cleaned with the alternative, chlorhexidine-alcohol, got 40 percent fewer total infections, and half as many staphylococcus aureus infections.

Ms. Patrick said most hospitals still used the iodine solution largely because “we’ve always done it this way.”
Next Steps

Clinic Guidelines for Pre-operative Surgical Preparation

- CHG Chlorhexidine Cloths/EZ-Scrub
  - Clinics to provide patient with CHG EZ scrub sponges for *Baths/Showers* for pre-operative skin preparation the night before and morning of surgery

Pre-operative Order set

- Chlorhexidine pre-operative skin preparation (not OR prep) night before surgery
  - Nursing to provide pre-operative antimicrobial skin preparation using Chlorhexidine cloths the night before surgery: once

Standardized Preps

- Chloraprep
- Duraprep
- Betadine scrub/paint (allow to dry; do not wipe off with alcohol!)
- CHG soap (plastic surgery and allergy to other preps)
- Baby shampoo (if allergic to everything else)
NSQIP Notification

• NSQIP Adverse Event
• Each Surgeon Receives email
• Opportunity to further inform
• Must Conform to NSQIP Standards
Further NSQIP

• High Risk Module
  – 100% collection, only high risk procedures selected, e.g., pancreatectomy, hepatectomy, cholecystectomy, ventral hernia repair, gastric bypass, colectomy

• Multi-Specialty Module
  – Extend to other Surgical Specialties each with own surgical champion
Accountability
## Departmental Quality Structure

<table>
<thead>
<tr>
<th>M &amp; M s</th>
<th>PPEC</th>
<th>Quality Councils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Review for</td>
<td>• Peer Review</td>
<td>• Improve clinical outcomes</td>
</tr>
<tr>
<td>• Discussion</td>
<td>• Ongoing Professional Practice Evaluation (OPPE)</td>
<td>• Optimize systems of care</td>
</tr>
<tr>
<td>• Education</td>
<td></td>
<td>• Achieve clinical effectiveness</td>
</tr>
<tr>
<td>• Referrals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide multidisciplinary</td>
<td>Designed to oversee and facilitate physician participation in the</td>
<td>Inter &amp; Multidisciplinary councils designed to:</td>
</tr>
<tr>
<td>forum for case reviews</td>
<td>peer review process and to identify:</td>
<td>• Provide ongoing measurement &amp; monitoring of clinical outcomes</td>
</tr>
<tr>
<td>for teaching purposes</td>
<td>• Department/division performance over time</td>
<td>• Facilitate hand-off communication &amp; care coordination</td>
</tr>
<tr>
<td></td>
<td>• Practice pattern outliers</td>
<td>• Provide a venue for standardization &amp; high reliability of practice regarding</td>
</tr>
<tr>
<td></td>
<td>• Opportunities for performance improvement</td>
<td>institutional quality &amp; performance improvement</td>
</tr>
<tr>
<td></td>
<td>• Referral for Focused Professional Practice Evaluation (FPPE) to</td>
<td>• Identify &amp; resolve system issues within that service</td>
</tr>
<tr>
<td></td>
<td>CIC</td>
<td>• Select cases which highlight best practices, efficient care coordination,</td>
</tr>
<tr>
<td></td>
<td>• Identification of systems issues for referral to Quality Councils</td>
<td>patient-centered care</td>
</tr>
<tr>
<td></td>
<td>or Clinical Effectiveness Committee</td>
<td>• Promote efficient resource utilization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Review of evidence for clinical effectiveness</td>
</tr>
</tbody>
</table>
Specific Responsibilities

The PPEC is designated to:

- Identify and address opportunities for system improvements
- Monitor practice and performance by conducting ongoing professional practice evaluation (OPPE) to identify improvement opportunities for both individuals and systems of care
- Monitor for significant trends in performance by analyzing aggregate data and case findings
- Ensure the process for professional practice evaluation is clearly defined, objective, equitable, defensible, timely, and helpful
### PPEC: Accountable Outcomes

<table>
<thead>
<tr>
<th>Target Indicator</th>
<th>Rule/Rate</th>
<th>Trigger</th>
<th>Required Action(s)</th>
<th>Monitor or used in Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality O/E</td>
<td>1.0</td>
<td>O/E &gt; 1.1 (rolling four quarters)</td>
<td>Peer review deaths for improvement opportunities</td>
<td>Profile</td>
</tr>
<tr>
<td>Length of Stay O/E</td>
<td>1.25</td>
<td>LOS O/E &gt; 1.26</td>
<td>Peer review outliers for improvement opportunities</td>
<td>Profile</td>
</tr>
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</table>
## PPEC: Accountable Outcomes

### SCIP

<table>
<thead>
<tr>
<th>Prophx Abx Selection for Surgical Patients</th>
<th>100%</th>
<th>&lt;90%</th>
<th>Review fall out cases for improvement opportunities; Letter to physician</th>
<th>Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prophx Abx discontinued within 24 hours after surgery end time</td>
<td>100%</td>
<td>&lt;90%</td>
<td>Review fall out cases for improvement opportunities; Letter to physician</td>
<td>Profile</td>
</tr>
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</table>
## PPEC: Accountable Outcomes

### PSIs

<table>
<thead>
<tr>
<th>PSI Description</th>
<th>Rate</th>
<th>Description</th>
<th>Action</th>
<th>Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHRQ-Death Among Surgical IP w/Serious Treatable Complications</td>
<td>81.08</td>
<td>Individual physician rate double the division AHRQ (162.16)</td>
<td>Perform review of cases</td>
<td>Profile</td>
</tr>
<tr>
<td>AHRQ- Foreign body left during procedure</td>
<td>1.0</td>
<td>Individual physician rate double the division AHRQ (1.1)</td>
<td>Perform review of cases</td>
<td>Profile</td>
</tr>
<tr>
<td>AHRQ- Postoperative Hemorrhage or hematoma</td>
<td>4.33</td>
<td>Individual physician rate double the division AHRQ (8.66)</td>
<td>Perform review of cases</td>
<td>Profile</td>
</tr>
<tr>
<td>AHRQ- Postoperative pulmonary embolism or DVT</td>
<td>11.96</td>
<td>Individual physician rate double the division AHRQ (23.92)</td>
<td>Perform review of cases</td>
<td>Profile</td>
</tr>
</tbody>
</table>
Event Data:

Date of Event(s)  Reason(s) for Referral
3/20/2  Review Results

Significance
Date of Review:  8/5/2009

NO ISSUE IDENTIFIED

[4/28/09]

Review Comments

with a small retractable QA Chair reviewed case. Trend case.
left. Planned aortic tying out bleeding better exposure. We took a small piece of the rectus muscle and used it as a "muscle weld" over the presacral fascia with good effect. The bleeding stopped. We placed some additional Flow-Seal and a piece of Surgicel for extra hemostasis." Patient was stable postoperatively.
Use of PSI in PPEC: Accidental Puncture or Laceration

Event Data: Review Results

Date of Review: 8/12/2009

3/1 IMPROVEMENT OPPORTUNITY

Review Comments

Potential systems issue related to the number of residents. Potential to utilize surgical PA's. Pull data for laparoscopic cholecystectomy with bile duct repair cases. The data was obtained and reviewed. Review of the case identified a technical error contributed most to the event.

4/2 She bile liver transplant surgery service. Intraoperative cholangiogram was also performed. The patient tolerated the procedure well without any further complication.
Universal Protocol
(Boarding Pass)

• Conduct a pre-procedure verification process
• Mark the procedure site
• A time-out is performed immediately prior to starting procedures.
THE DOCTOR'S MANIFESTO + HOW TO GET THINGS RIGHT

ATUL GAWANDE
BESTSELLING AUTHOR OF
BETTER AND Complications
BACKGROUND

Surgery has become an integral part of global health care, with an estimated 234 million operations performed yearly. Surgical complications are common and often preventable. We hypothesized that a program to implement a 19-item surgical safety checklist designed to improve team communication and consistency of care would reduce complications and deaths associated with surgery.
A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

### Table 2. Characteristics of Participating Hospitals.

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>No. of Beds</th>
<th>No. of Operating Rooms</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prince Hamzah Hospital</td>
<td>Amman, Jordan</td>
<td>500</td>
<td>13</td>
<td>Public, urban</td>
</tr>
<tr>
<td>St. Stephen’s Hospital</td>
<td>New Delhi, India</td>
<td>733</td>
<td>15</td>
<td>Charity, urban</td>
</tr>
<tr>
<td>University of Washington Medical Center</td>
<td>Seattle, Washington</td>
<td>410</td>
<td>24</td>
<td>Public, urban</td>
</tr>
<tr>
<td>St. Francis Designated District Hospital</td>
<td>Ifakara, Tanzania</td>
<td>371</td>
<td>3</td>
<td>District, rural</td>
</tr>
<tr>
<td>Philippine General Hospital</td>
<td>Manila, Philippines</td>
<td>1800</td>
<td>39</td>
<td>Public, urban</td>
</tr>
<tr>
<td>Toronto General Hospital</td>
<td>Toronto, Canada</td>
<td>744</td>
<td>19</td>
<td>Public, urban</td>
</tr>
<tr>
<td>St. Mary’s Hospital*</td>
<td>London, England</td>
<td>541</td>
<td>16</td>
<td>Public, urban</td>
</tr>
<tr>
<td>Auckland City Hospital</td>
<td>Auckland, New Zealand</td>
<td>710</td>
<td>31</td>
<td>Public, urban</td>
</tr>
</tbody>
</table>
RESULTS

The rate of death was 1.5% before the checklist was introduced and declined to 0.8% afterward \((P=0.003)\). Inpatient complications occurred in 11.0% of patients at baseline and in 7.0% after introduction of the checklist \((P<0.001)\).
Pre-Study Safety Practices

Table 3. Surgical Safety Policies in Place at Participating Hospitals before the Study.

<table>
<thead>
<tr>
<th>Site No.*</th>
<th>Routine Intraoperative Monitoring with Pulse Oximetry</th>
<th>Oral Confirmation of Patient's Identity and Surgical Site in Operating Room</th>
<th>Routine Administration of Prophylactic Antibiotics in Operating Room</th>
<th>Standard Plan for Intravenous Access for Cases of High Blood Loss</th>
<th>Formal Team Briefing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

* Sites 1 through 4 are located in high-income countries; sites 5 through 8 are located in low- or middle-income countries.

\[16\]
### Table 4. Characteristics of the Patients and Procedures before and after Checklist Implementation, According to Site.*

<table>
<thead>
<tr>
<th>Site No.</th>
<th>No. of Patients Enrolled</th>
<th>Age Before</th>
<th>Age After</th>
<th>Female Sex Before</th>
<th>Female Sex After</th>
<th>Urgent Case Before</th>
<th>Urgent Case After</th>
<th>Outpatient Procedure Before</th>
<th>Outpatient Procedure After</th>
<th>General Anesthetic Before</th>
<th>General Anesthetic After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>524</td>
<td>51.9±15.3</td>
<td>51.4±14.7</td>
<td>58.2</td>
<td>62.7</td>
<td>7.4</td>
<td>8.0</td>
<td>31.7</td>
<td>31.8</td>
<td>95.0</td>
<td>95.2</td>
</tr>
<tr>
<td>2</td>
<td>357</td>
<td>53.5±18.4</td>
<td>54.0±18.3</td>
<td>54.1</td>
<td>56.7</td>
<td>18.8</td>
<td>14.5</td>
<td>23.5</td>
<td>20.5</td>
<td>92.7</td>
<td>93.5</td>
</tr>
<tr>
<td>3</td>
<td>497</td>
<td>51.9±21.5</td>
<td>53.0±20.3</td>
<td>44.3</td>
<td>49.8</td>
<td>17.9</td>
<td>22.4</td>
<td>6.4</td>
<td>9.3</td>
<td>91.2</td>
<td>94.0</td>
</tr>
<tr>
<td>4</td>
<td>520</td>
<td>57.0±14.9</td>
<td>56.1±15.0</td>
<td>48.1</td>
<td>49.6</td>
<td>6.9</td>
<td>1.8</td>
<td>14.4</td>
<td>11.0</td>
<td>96.9</td>
<td>97.8</td>
</tr>
<tr>
<td>5</td>
<td>370</td>
<td>34.3±15.0</td>
<td>31.5±14.2</td>
<td>78.3</td>
<td>78.4</td>
<td>46.1</td>
<td>65.4</td>
<td>0.0</td>
<td>0.0</td>
<td>17.0</td>
<td>10.0</td>
</tr>
<tr>
<td>6</td>
<td>496</td>
<td>44.6±15.9</td>
<td>46.0±15.5</td>
<td>45.0</td>
<td>46.6</td>
<td>28.4</td>
<td>22.5</td>
<td>1.4</td>
<td>1.1</td>
<td>61.7</td>
<td>59.9</td>
</tr>
<tr>
<td>7</td>
<td>525</td>
<td>37.4±14.0</td>
<td>39.6±14.9</td>
<td>69.1</td>
<td>68.6</td>
<td>45.7</td>
<td>41.0</td>
<td>0.0</td>
<td>0.0</td>
<td>49.1</td>
<td>55.9</td>
</tr>
<tr>
<td>8</td>
<td>444</td>
<td>41.9±15.8</td>
<td>39.7±16.2</td>
<td>57.0</td>
<td>52.7</td>
<td>13.5</td>
<td>21.9</td>
<td>0.9</td>
<td>0.2</td>
<td>97.5</td>
<td>94.7</td>
</tr>
<tr>
<td>Total</td>
<td>3733</td>
<td>46.8±18.1</td>
<td>46.7±17.9</td>
<td>56.2</td>
<td>57.6</td>
<td>22.3</td>
<td>23.3</td>
<td>9.9</td>
<td>9.4</td>
<td>77.0</td>
<td>77.3</td>
</tr>
</tbody>
</table>

P value: 0.63, 0.21, 0.26, 0.40, 0.68
# Outcomes

**Table 5. Outcomes before and after Checklist Implementation, According to Site.***

<table>
<thead>
<tr>
<th>Site No.</th>
<th>No. of Patients Enrolled</th>
<th>Surgical-Site Infection</th>
<th>Unplanned Return to the Operating Room</th>
<th>Pneumonia</th>
<th>Death</th>
<th>Any Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td>Before</td>
<td>After</td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>1</td>
<td>524</td>
<td>598</td>
<td>4.0</td>
<td>2.0</td>
<td>4.6</td>
<td>1.8</td>
</tr>
<tr>
<td>2</td>
<td>357</td>
<td>351</td>
<td>2.0</td>
<td>1.7</td>
<td>0.6</td>
<td>1.1</td>
</tr>
<tr>
<td>3</td>
<td>497</td>
<td>486</td>
<td>5.8</td>
<td>4.3</td>
<td>4.6</td>
<td>2.7</td>
</tr>
<tr>
<td>4</td>
<td>520</td>
<td>545</td>
<td>3.1</td>
<td>2.6</td>
<td>2.5</td>
<td>2.2</td>
</tr>
<tr>
<td>5</td>
<td>370</td>
<td>330</td>
<td>20.5</td>
<td>3.6</td>
<td>1.4</td>
<td>1.8</td>
</tr>
<tr>
<td>6</td>
<td>496</td>
<td>476</td>
<td>4.0</td>
<td>4.0</td>
<td>3.0</td>
<td>3.2</td>
</tr>
<tr>
<td>7</td>
<td>525</td>
<td>585</td>
<td>9.5</td>
<td>5.8</td>
<td>1.3</td>
<td>0.2</td>
</tr>
<tr>
<td>8</td>
<td>444</td>
<td>584</td>
<td>4.1</td>
<td>2.4</td>
<td>0.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>3733</td>
<td>3955</td>
<td>6.2</td>
<td>3.4</td>
<td>2.4</td>
<td>1.8</td>
</tr>
<tr>
<td>P value</td>
<td>&lt;0.001</td>
<td>0.047</td>
<td></td>
<td></td>
<td>0.46</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *P values were calculated using chi-squared tests.
WORLD ALLIANCE for PATIENT SAFETY

Safe Surgery Saves Lives

World Health Organization
Surgical Safety
A serious public health issue

• Globally, 234 million operations/yr
• With a mortality rate of 0.4-0.8% and 3-16% complications rate:
  – 1 million deaths
  – 7 million disabling complications
## Surgical Safety Checklist

### O.R. Boarding Checklist

**OR Circulating Nurse Documents Verification of the Following:**

- Patient bypass preop?
- Confirmation of the following with the patient:
  - Patient ID
  - Site Marking by Surgeon
  - Consent
  - Current H&P (within 30 days / within 24 hrs prior to scheduled procedure)
  - Allergy band on
  - Latex allergy
  - ABO blood group verified
  - UNOS ID# (if applicable)
  - Equipment/instrument issues or any concerns

### Time Out

**Operative Team Member Introduction by Name & Role**

*VERBALIZED OUT LOUD*

**For All Team Members to Verify**

**STOP!**

**Surgical Team Confirms:**

- Correct patient and procedure
- Correct position
- Correct operative site/side
- Consent is complete, accurate, and signed
- Surgical site marked by surgeon
- Mark visible after prep / after drape
- Images/implants available (if needed)
- Prophylactic antibiotic given / time
- DVT Prophylaxis

**New Anesthesiologist & Circulator Verify:** (confirmed by the Anesthesiologist)

- Anesthesia Safety Check completed
- Pulse Oximeter on Patient and Functioning
- Difficult Airway/Aspirational risk?
- Risk of >500ML Blood Loss (7ML/KG in children)

**New Nursing Verifies:**

- Implementation of aseptic technique

**Surgeon Verifies:**

- Any critical or unexpected steps
- Procedure duration
- Anticipated blood loss
- Any patient-specific concerns

### Patient Leaves Room

(Post Evaluation/Team Debrief)

**Verbalized Out Loud**

For all team members to verify

**Circulator/scrub verifies:**

- Discharge to
- Notification to
- Post-op airway status
- Level of consciousness
- Allergy band on
- ID band on
- Implant sheet complete
- Video/photo to:

**All Team Members Discuss:**

- Name of procedure and wound class recorded
- Counts are correct (or NA)
- Read back specimen labeling & Path form filled out per protocol
- Equipment/instrument problems to address
- Key concerns for recovery and management of patient

Based on the WHO Surgical Safety Checklist
### WHO Time Out Results: SCIP

<table>
<thead>
<tr>
<th>Measure</th>
<th>2009-Q1</th>
<th>2009-Q2</th>
<th>2009-Q1 Numerator</th>
<th>2009-Q2 Numerator</th>
<th>2009-Q1 Denominator</th>
<th>2009-Q2 Denominator</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCIP_1a</td>
<td>100%</td>
<td>100%</td>
<td>137</td>
<td>128</td>
<td>137</td>
<td>128</td>
</tr>
<tr>
<td>SCIP_2a</td>
<td>99%</td>
<td>100%</td>
<td>138</td>
<td>129</td>
<td>139</td>
<td>129</td>
</tr>
<tr>
<td>SCIP_3a</td>
<td>94%</td>
<td>94%</td>
<td>120</td>
<td>116</td>
<td>128</td>
<td>123</td>
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<tr>
<td>SCIP_VTE_1</td>
<td>100%</td>
<td>100%</td>
<td>55</td>
<td>60</td>
<td>55</td>
<td>60</td>
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<tr>
<td>SCIP_VTE_2</td>
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<td>100%</td>
<td>55</td>
<td>60</td>
<td>55</td>
<td>60</td>
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</table>
## WHO Time Out Results: UHC

<table>
<thead>
<tr>
<th>UHC Measures</th>
<th>2009-Q1 Surgical MS-DRG Index</th>
<th>2009-Q2 Surgical MS-DRG Index</th>
<th>2009-Q1 SHC Index</th>
<th>2009-Q2 SHC Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>UHC Mortality O/E</td>
<td>0.88</td>
<td>0.80</td>
<td>0.93</td>
<td>0.88</td>
</tr>
<tr>
<td>UHC LOS O/E</td>
<td>1.08</td>
<td>1.09</td>
<td>1.01</td>
<td>1.00</td>
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<tr>
<td>UHC CMI</td>
<td>1.99</td>
<td>2.01</td>
<td>2.78</td>
<td>2.80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UHC Complications - % of Cases with 1 or more</th>
<th>2009-Q1 Surgical MS-DRG</th>
<th>2009-Q2 Surgical MS-DRG</th>
<th>2009-Q1 SHC</th>
<th>2009-Q2 SHC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20%</td>
<td>19%</td>
<td>19%</td>
<td>18%</td>
</tr>
</tbody>
</table>
## WHO Time Out Results: PSN

<table>
<thead>
<tr>
<th>Measure</th>
<th>2009-Q1 % of PSN</th>
<th>2009-Q2 % of PSN</th>
<th>2009-Q1 PSN Volume</th>
<th>2009-Q2 PSN Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSN SHC Volume</td>
<td></td>
<td></td>
<td>2541</td>
<td>2387</td>
</tr>
<tr>
<td>PSN OR All Inclusive</td>
<td>22%</td>
<td>27%</td>
<td>559</td>
<td>637</td>
</tr>
<tr>
<td>PSN % by relevant EventType SHC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Equipment/Supplies</td>
<td></td>
<td></td>
<td>91</td>
<td>93</td>
</tr>
<tr>
<td>E. Error related to Procedure/Treatment/Test</td>
<td></td>
<td></td>
<td>586</td>
<td>494</td>
</tr>
<tr>
<td>F. Complication of Procedure/Treatment/Test</td>
<td></td>
<td></td>
<td>243</td>
<td>263</td>
</tr>
<tr>
<td>G. Transfusion</td>
<td></td>
<td></td>
<td>211</td>
<td>247</td>
</tr>
<tr>
<td>PSN % by relevant EventType OR All Inclusive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Equipment/Supplies</td>
<td>44%</td>
<td>65%</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>E. Error related to Procedure/Treatment/Test</td>
<td>34%</td>
<td>33%</td>
<td>200</td>
<td>164</td>
</tr>
<tr>
<td>F. Complication of Procedure/Treatment/Test</td>
<td>21%</td>
<td>22%</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>G. Transfusion</td>
<td>43%</td>
<td>36%</td>
<td>90</td>
<td>88</td>
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</table>
## WHO TO Results: OR Time

<table>
<thead>
<tr>
<th>Measure</th>
<th>Average Time in Minutes 2009-Q1</th>
<th>Average Time in Minutes 2009-Q2</th>
<th>2009-Q1 OR Volume</th>
<th>2009-Q2 OR Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR Room Start Time to Incision Time</td>
<td>59.4</td>
<td>56.7</td>
<td>5849</td>
<td>6398</td>
</tr>
<tr>
<td>OR Average Elapsed Times Patient In and Out</td>
<td>158.59</td>
<td>150.94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Persistent Pursuit of Excellence

- Dedicated Monthly Grand Rounds on Quality
- NSQIP based Morbidity and Mortality Conference
- Resident Award for Quality Improvement
- Novel Quality Improvement/Patient Safety Resident Curriculum
- Documentation Improvement Program
- Peer Review
- Surgery Quality Council
- Quality Initiatives
- Rounding Policy
- OR Checklist
- Leadership
**UHC General Surgery Product Line**

- **mortality O/E rank:**
  - CY2008: 5/101
  - CY2008 Q4: 55/99

- Compared to other CA academic medical centers, SHC has better performance.

**IMPROVEMENT NOT DUE DUE TO DOCUMENTATION!**

- Mortality O/E trending down
- CMI remains constant
Clinical Outcomes Report: Product Line Mortality Comparison
October 2006 – September 2007

175 Surgical Deaths, Dept of Surgery 71, 2.1%
SF=110, Oakland=140

Cardiothoracic Surgery Case = 988 Deaths = 48 Rate =5%
Gynecology Case = 580 Deaths = 0 Rate =0%
Heart Transplant or Implant Case = 58 Deaths = 6 Rate =10%
Kidney/Pancreas Transplant Case = 78 Deaths = 0 Rate =0%
Liver Transplant Case = 58 Deaths = 1 Rate =2%
Lung Transplant Case = 35 Deaths = 1 Rate =3%
Neurosurgery Case = 903 Deaths = 35 Rate =4%
Orthopedics Case = 2330 Deaths = 8 Rate =0%
Otolaryngology Case = 411 Deaths = 4 Rate =1%
Plastic Surgery Case = 176 Deaths = 0 Rate =0%
Spinal Surgery Case = 1225 Deaths = 0 Rate =0%
Surgery General Case = 2292 Deaths = 54 Rate =2%
Surgery Oncology Case = 304 Deaths = 5 Rate =2%
Trauma Case = 182 Deaths = 5 Rate =3%
Urology Case = 719 Deaths = 2 Rate =0%
Vascular Surgery Case = 271 Deaths = 6 Rate =2%

UHC Median

SF=110, Oakland=140
General Surgery

UHC Mortality Index (Observed/Expected)

<table>
<thead>
<tr>
<th>Year</th>
<th>O/E Index</th>
<th>Stanford</th>
<th>General Surgery Product Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>0.97</td>
<td>0.83</td>
<td>0.79</td>
</tr>
<tr>
<td>July 2007 to June 2008</td>
<td>0.82</td>
<td>0.56</td>
<td></td>
</tr>
</tbody>
</table>


Overall* 30-Day Mortality

Observed Rate: 1.05%
Expected Rate: 1.81%
O/E Ratio: 0.58
Status: Exemplary

* Includes General and Vascular Surgery Cases