Implementing the ACS NSQIP Multispecialty Option

Mary H. McGrath, MD MPH FACS
Professor of Surgery
University of California San Francisco
Outcomes of Surgical Care

American College of Surgeons

NSQIP
National Surgical Quality Improvement Program

“Quality Improvement Through Quality Data”
Association of Surgical Care Improvement Project Infection-Related Process Measure Compliance with Risk-Adjusted Outcomes: Implications for Quality Measurement

Angela M Ingraham, MD, MS, Mark E Cohen, PhD, Karl Y Bilimoria, MD, MS, Justin B Dimick, MD, MPH, Karen E Richards, BS, Mehul V Raval, MD, Lee A Fleisher, MD, Bruce L Hall, MD, PhD, MBA, FACS, Clifford Y Ko, MD, MS, MSHS, FACS

BACKGROUND: Facility-level process measure adherence is being publicly reported. However, the association between measure adherence and surgical outcomes is not well-established. Our objective was to determine the degree to which Surgical Care Improvement Project (SCIP) process measures are associated with American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) risk-adjusted outcomes.

STUDY DESIGN: This cross-sectional study included hospitals participating in the ACS NSQIP and SCIP (n = 200). ACS NSQIP outcomes (30-day overall morbidity, serious morbidity, surgical site infections [SSI], and mortality) and adherence to SCIP SSI-related process measures (from the Hospital Compare database) were collected from January 1, 2008, through December 31, 2008. Hospital-level correlation coefficients between compliance with 4 process measures (ie, antibiotic administration within 1 hour before incision [SCIP-1]; appropriate antibiotic prophylaxis [SCIP-2]; antibiotic discontinuation within 24 hours after surgery [SCIP-3]; and appropriate hair removal [SCIP-6]) and 4 risk-adjusted outcomes were calculated. Regression analyses estimated the contribution of process measure adherence to risk-adjusted outcomes.

RESULTS: Of 211 ACS NSQIP hospitals, 95% had data reported by Hospital Compare. Depending on the measure, hospital-level compliance ranged from 60% to 100%. Of the 16 correlations, 15 demonstrated nonsignificant associations with risk-adjusted outcomes. The exception was the relationship between SCIP-2 and SSI (p = 0.004). SCIP-1 demonstrated an intriguing but nonsignificant relationship with SSI (p = 0.08) and overall morbidity (p = 0.08). Although adherence to SCIP-2 was a significant predictor of risk-adjusted SSI (p < 0.0001) and overall morbidity (p < 0.0001), inclusion of compliance for SCIP-1 and SCIP-2 caused only slight improvement in model quality.

CONCLUSIONS: Better adherence to infection-related process measures over the observed range was not significantly associated with better outcomes with one exception. Different measures of quality might be needed for surgical infection. (J Am Coll Surg 2010;211:705–714. © 2010 by the American College of Surgeons)
Data for national surgical outcomes research and reporting (proud to be part of this) and

Program satisfy internal needs for a QI tool at the medical center level:
(nationally validated, risk adjusted, outcome based)

Multispecialty option ±
If You Expect to Score Points by Whining,
Join a European Soccer Team
2008 - Decision to join with the multispecialty option:

- Large number of surgical cases other than General / Vascular Surgery
- Interest from specialties, esp. Urology & Neurosurgery
- Strong central patient safety and QI organization
- Belief that multispecialty model would grow within ACS NSQIP:
  - Increase the number of CPT codes sampled in each specialty
  - Increase number of medical centers nationally
  - Increase national data for benchmarking
Problems encountered:

- Skimpy data reporting for each specialty
- Inability to drill down on specific operations or surgical subunits due to tiny numbers
- Inability to find significant enterprise-wide “hotspots”
- Realization that NSQIP complications are not equally relevant to all specialties (eg: stroke in NS patients, CAUTI in Urology or GYN patients)
- Work load with parameters of data collection precludes Targeted modeling without adding more personnel
- Chagrin with medical centers available for benchmarking
- Chagrin with the CPT codes selected for some specialties
- Burdens:
  - reporting to 6 Departments (16 Divisions)
  - sustaining faith in value of the program & medical center support (eg: questions about joining CMS Hospital Compare pilot)
Semiannual Report Statistics: Overall (Multispecialty)*

- January 1, 2009 – December 31, 2009
- Based on 108,079 cases
  - 2,127 cases from our hospital
  - Subspecialty breakdown:
    - 462 General Surgery cases
    - 125 Vascular Surgery cases
    - 395 Orthopedic Surgery cases
    - 349 Neurosurgery cases
    - 84 Cardiac Surgery cases
    - 198 Gynecology Surgery cases
    - 126 Otolaryngology Surgery cases
    - 84 Plastic Surgery cases
    - 83 Thoracic Surgery cases
    - 221 Urology Surgery cases

* Includes Multispecialty Cases Only
Case Distribution

Department of Surgery Services Contributing to General Surgery ACS NSQIP:

- Bariatric
- Breast
- Colorectal
- Endocrine
- GI – Acute care surgery
- GI – hepatopancreatobiliary
- Oncologic Surgery
- Trauma

Department of Surgery Services with independent reports in ACS NSQIP:

- Vascular Surgery
- Cardiac Surgery
- Thoracic Surgery
- Plastic Surgery

Separate Departments: Orthopedic Surgery, Neurosurgery, Otolaryngology-HNS, Urology, Gynecology
General and Vascular Surgery
Risk Adjusted

462  General Surgery cases
125  Vascular Surgery cases
General & Vascular Surgery
Risk Adjusted
O/E Ratios

UCSF N= 587
NSQIP N= 272,634

*Area which UCSF Overall is higher than unadjusted compare groups.

Decile: 1 8 6 7 4 8 9 4

Confidential Protected Under California Evidence Codes # 1156, 1157
General & Vascular Surgery

Pneumonia O/E Ratio by Decile and Over time

Drilldown:
4 GS
7 Vascular

Findings:
- 100% were admitted from home
- 0% of patients were on vent prior to surgery
- 72% were admitted > 1 day prior to surgery
- 45% were on the vent > 48 hours

Notes:
- 27% had Unplanned intubation
- 40% of those on vent > 48 hours died

<table>
<thead>
<tr>
<th>Decile</th>
<th>Observed</th>
<th>%</th>
<th>O/E ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>11</td>
<td>1.87%</td>
<td>1.27*</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Confidential Protected Under California Evidence Codes # 1156, 1157
General & Vascular Surgery

DVT/PE O/E Ratio by Decile and Over time

<table>
<thead>
<tr>
<th>Decile</th>
<th>Observed</th>
<th>%</th>
<th>O/E ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>4</td>
<td>.68%</td>
<td>.7*</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Confidence Interval .19-1.8 (95%)

Drilldown: GS

Findings: 75% were DVT
25% PE
0% were on anticoagulation prior to surgery

Notes: 50% in access lines

UCSF N = 587
NSQIP N = 274059
Inability to drill down on specific operations or surgical subunits due to tiny numbers . . .
Colorectal Surgery
Risk Adjusted

Colorectal Surgery Risk Adjusted
O/E Ratio

Based on CPT codes:
44140-44160; 44204-44212; 44239; (Partial or Total Colectomy)
45110-45123 (Partial or Total Proctectomy)
45499 (unlisted lap procedure: rectum)
45550 (Proctoplasty for stenosis)

*Area which UCSF Overall is higher than unadjusted compare groups.
Vascular Surgery
NSQIP Sample by CPT Code Category

UCSF N= 125
Inability to find *significant* “hotspots” . . .
Summary of Outcomes

EXEMPLARY Low Outlier:
• Colorectal Morbidity

Top 40% of Hospitals:
• Overall (GS/VAS) Mortality
• Overall (GS/VAS) SSI 22 cases
• Overall (GS/VAS) DVT/PE 4 cases
• General Surgery Pneumonia 4 cases
• Colorectal Surgery SSI 1 case

Bottom 20% of Hospitals:
• Overall (GS/VAS) Pneumonia 11 cases
• Overall (GS/VAS) UTI 14 cases
• Overall (GS/VAS) Renal Failure 8 cases
• Vascular Surgery Morbidity
American College of Surgeons
National Surgical Quality Improvement Program
Neurosurgery

Semiannual Report, June 2010

Dates of Surgery: January 1, 2009-December 31, 2009
University of California, San Francisco

Confidential Protected Under California Evidence Codes # 1156, 1157
Semiannual Report Statistics: Overall (Multispecialty)*

- January 1, 2009 – December 31, 2009
- Based on 108,079 cases
  - 2,127 cases from our hospital
  - Subspecialty breakdown:
    - 462 General Surgery cases
    - 125 Vascular Surgery cases
    - 84 Cardiac Surgery cases
    - 349 Neurosurgery cases
    - 198 Gynecology Surgery cases
    - 395 Orthopedic Surgery cases
    - 126 Otolaryngology Surgery cases
    - 84 Plastic Surgery cases
    - 83 Thoracic Surgery cases
    - 221 Urology Surgery cases

* Includes Multispecialty Cases Only

Confidential Protected Under California Evidence Codes #1156, 1157
## Neurosurgery Morbidity

### Risk Adjusted

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
<th>O/E ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>43</td>
<td>12.32</td>
<td>1.08*</td>
</tr>
<tr>
<td>Expected</td>
<td>39.93</td>
<td>11.44</td>
<td></td>
</tr>
</tbody>
</table>

*Confidence Interval 0.78-1.45 (95%)

Confidential Protected Under California Evidence Codes # 1156, 1157
The Facts:
48 patients had an occurrence
87 total occurrences
25 had 1 occurrence

Drilldown:
Occurrence (denominator)
19 (129) involved spine
11 (59) vessel or aneurysms
9 (74) brain lesions
5 (10) bleeding/pressure relief
Neurosurgery Deep Infections
Unadjusted Drilldown

The Facts
0 during primary admission
5 during readmission (mean pod 18)
3 spine cases
2 brain (aneurysm/lesion)

Drilldown
Neuro 5 (1.7)

Confidential Protected Under California Evidence Codes # 1156, 1157
Neurosurgery Stroke
Unadjusted Drilldown

The Facts
4 during primary admission (mean pod 1)
1 post d/c (mean pod 16)
1 patient had on day of surgery and pod 4
2 patients had stroke on day of surgery

Drilldown
Neuro 6 (2)

UC NEURO N= 349
NSQIP N= 6873

Confidential Protected Under California Evidence Codes # 1156, 1157
Questions about the medical centers available for benchmarking . . .
Multispecialty Hospitals

Exempla Saint Joseph Hospital  Southeastern Regional Medical Center
Saint Johns Hospital  MetroHealth Medical Center
Doctors Hospital at Renaissance  The Reading Hospital and Medical Center
Eastern Maine Medical Center  Centra Health
Cleveland Clinic Foundation  Saint Vincent Hospital
William Beaumont Hospital  Huntington Hospital
Wake Forest University Baptist Medical Center  Baystate Medical Center
Creighton University Medical Center  Sinai-Grace Hospital
Mary Imogene Bassett Hospital  Marquette General Health System
Mayo Clinic Rochester Methodist Hospital  Beebe Medical Center
Northwest Community Hospital  Carle Foundation
South Miami Hospital  Harrison Medical Center
Parkview Medical Center  Legacy Emanuel Hospital & Health Center
Scott & White Hospital  Exempla Good Samaritan Medical Center
University of California San Diego  Pitt County Memorial Hospital
Hackensack University Medical Center  Meriter Health Services
David Grant Medical Center  Goshen General Hospital
Grinnell Regional Medical Center  West Jefferson Medical Center
Cuyuna Regional Medical Center  CentraState Medical Center
William Beaumont Army Medical Center  Mayo Clinic Arizona
New York Hospital Queens  Mayo Clinic Jacksonville
Washington University School of Medicine  Mayo Clinic Rochester
University of Michigan

Confidential Protected Under California Evidence Codes # 1156, 1157
The battle for their hearts and minds . . .
My NSQIP selling points internally:

1. CR collaboration with The Joint Commission
2. Developing new outcome models for CMS
3. Reconsidering NSQIP/SCIP modules
4. Developing of targeted CPT codes
5. Adding new variables: readmission, unplanned return to the OR, present prior to surgery, geriatric delerium
6. Pediatric ACS-NSQIP
7. Hospital Compare option
Contiguous Organ Resection Is Safe in Patients With Retroperitoneal Sarcoma: An ACS-NSQIP Analysis

WARREN H. TSENG, MD, STEVE R. MARTINEZ, MD, MAS, ROBERT M. TAMURIAN, MD, STEVEN L. CHEN, MD, MBA, RICHARD J. BOLD, MD, AND ROBERT J. CANTER, MD

J. Surg. Oncol. 2010 Dec 28

Risk Stratification for Distal Pancreatectomy Utilizing ACS-NSQIP: Preoperative Factors Predict Morbidity and Mortality

Kaitlyn Jane Kelly, David Yu Greenblatt, Yin Wan, Robert J. Rettammel, Emily Winslow, Clifford S. Cho, Sharon M. Weber


A Population-Based Study of Risk Factors for Stroke After Carotid Endarterectomy Using the ACS NSQIP Database


J Surg Res. 2010 Nov 11

Pediatric American College of Surgeons National Surgical Quality Improvement Program: feasibility of a novel, prospective assessment of surgical outcomes.

Raval MV, Dillon PW, Bruny JL, Ko CY, Hall BL, Moss RL, Oldham KT, Richards KE, Vinocur CD, Ziegler MM; on behalf of the ACS NSQIP Pediatric Steering Commit

J Pediatr Surg. 2011 Jan
Some victories . . .
Wound Classification

Class 1 CLEAN: An uninfected operative wound in which no inflammation is encountered.

Class 2 CLEAN/CONTAMINATED: An operative wound in which the respiratory, alimentary, genital or urinary tracts are entered under controlled conditions and without unusual contamination

Class 3 CONTAMINATED: Open, fresh, accidental or necrotic wound or major breaks in sterile technique or spillage from GI

Class 4: DIRTY/INFECTED: Old traumatic wound with retained devitalized tissue, or wounds with clinical infection, perforated viscera, pus or abscesses
Demands from my stakeholders:

- **Surgeons** want targeted CPT codes
  - Colorectal
  - Oncology
- **Surgeons** want new subsets
  - Geriatrics
  - Acute care surgery
  - (Pediatric)
- **Specialty surgeons** want relevance of CPT codes and outcomes measures (**Oto-HNS** wants H&N cancer - not thyroid; airway or swallowing outcomes)
- **Administration** wants narrower identification of QI targets by operation, by surgeons, by unit
- **Administration** wants enterprise-wide targets for QI
Realization that complications flow from the pathology (eg: NS patients on ventilator more than 48 hours, CAUTI in Urology and Gynecology patients with indwelling Foleys) so not all NSQIP complications are equally relevant to all specialties.

**Therefore:**
- Institution-wide outcomes are skewed by this (eg: more strokes when 23% of our cases are Neurosurgery)

**Translates to:**
- Problem joining CMS Hospital Compare pilot (eg; elderly surgery outcomes across 8 different departments doing different kinds of surgery ≠ outcomes of elderly on general/vascular only)
Problems encountered:

- Skimpy data reporting for each specialty
- Inability to drill down on specific operations or surgical subunits due to tiny numbers
- Inability to find *significant* enterprise-wide “hotspots”
- Realization that NSQIP complications are not equally relevant to all specialties (e.g., stroke in NS patients, CAUTI in Urology or GYN patients)
- Work load with parameters of data collection precludes Targeted modeling without adding more personnel
- Chagrin with medical centers available for benchmarking
- Chagrin with the CPT codes selected for some specialties
- Burdens:
  - reporting to 6 Departments (16 Divisions)
  - sustaining faith in value of the program & medical center support (e.g., entering CMS Hospital Compare pilot)
What would help the Multispecialty programs?

- Multispecialty voice for feedback to ACS NSQIP
- ACS NSQIP – led forum for Multispecialty programs
  - Frank appraisal of the value being a Multispecialty program
  - Frank appraisal of benchmarking data
- ACS NSQIP reevaluation of CPT codes for specialties
- General Session- sharing how we manage the program
- Develop “best practices” for multispecialty programs
  - How to get enough numbers to enable improvement projects?
  - How to incorporate targeted CPT codes
  - What should / can we omit to be able to do this?