

Author(s): Darrell A. Campbell, Jr. MD, FACS

License: Unless otherwise noted, this material is made available under the terms of the **Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License**:
<http://creativecommons.org/licenses/by-nc-sa/3.0/>

We have reviewed this material in accordance with U.S. Copyright Law **and have tried to maximize your ability to use, share, and adapt it.** The citation key on the following slide provides information about how you may share and adapt this material.

Copyright holders of content included in this material should contact **open.michigan@umich.edu** with any questions, corrections, or clarification regarding the use of content.

For more information about **how to cite** these materials visit <http://open.umich.edu/education/about/terms-of-use>.

Any **medical information** in this material is intended to inform and educate and is **not a tool for self-diagnosis** or a replacement for medical evaluation, advice, diagnosis or treatment by a healthcare professional. Please speak to your physician if you have questions about your medical condition.

Viewer discretion is advised: Some medical content is graphic and may not be suitable for all viewers.

Citation Key

for more information see: <http://open.umich.edu/wiki/CitationPolicy>

Use + Share + Adapt

{ Content the copyright holder, author, or law permits you to use, share and adapt. }



Public Domain – Government: Works that are produced by the U.S. Government. (17 USC § 105)



Public Domain – Expired: Works that are no longer protected due to an expired copyright term.



Public Domain – Self Dedicated: Works that a copyright holder has dedicated to the public domain.



Creative Commons – Zero Waiver



Creative Commons – Attribution License



Creative Commons – Attribution Share Alike License



Creative Commons – Attribution Noncommercial License



Creative Commons – Attribution Noncommercial Share Alike License



GNU – Free Documentation License

Make Your Own Assessment

{ Content Open.Michigan believes can be used, shared, and adapted because it is ineligible for copyright. }



Public Domain – Ineligible: Works that are ineligible for copyright protection in the U.S. (17 USC § 102(b)) *laws in your jurisdiction may differ

{ Content Open.Michigan has used under a Fair Use determination. }



Fair Use: Use of works that is determined to be Fair consistent with the U.S. Copyright Act. (17 USC § 107) *laws in your jurisdiction may differ

Our determination **DOES NOT** mean that all uses of this 3rd-party content are Fair Uses and we **DO NOT** guarantee that your use of the content is Fair.

To use this content you should **do your own independent analysis** to determine whether or not your use will be Fair.


The Power of Collaboration

In a real world setting

Health Informatics

Darrell A. Campbell, Jr. MD, FACS

Professor of Surgery, UM

- 
- ◆ “Managing Clinical Knowledge for Clinical Improvement” Balas and Boren
 - ◆ Yearbook of Medical Informatics 2000

The problem: Slow diffusion of knowledge

- ◆ New technology 4-6 yrs to reach 25 citations
- ◆ Thrombolytic drugs for AMI 13 years before experts recommended
- ◆ 6.3 yrs for evidence to reach reviews, papers and texts
- ◆ Increase rate of use for 9 landmark findings was 3.2% per year
- ◆ 15.6 years from 0% to 50% use

Diffusion of knowledge in surgery

Reputation based

Word of mouth referrals

Outcomes assumed to be good

"I am called eccentric for saying in public that hospitals, if they wish to be sure of improvement, must find out what their results are. Must analyze their results to find their strong and weak points. Must compare their results with those of other hospitals... Such opinions will not be eccentric a few years hence."



E. A. Codman, MD
(1869 - 1940)


The Present

Hospital based

Outcomes increasingly important

Diffusion of knowledge still a problem

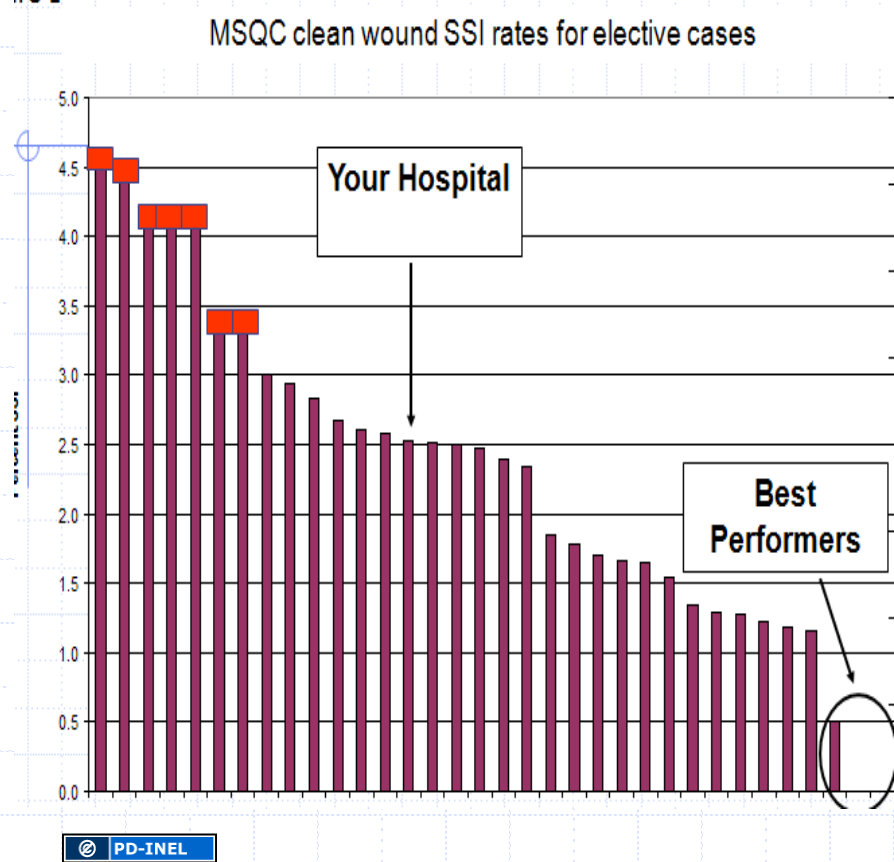
What is a better approach?

- 
- ◆ BCBSM pays for every penny of this initiative
 - ◆ BCBSM sees only aggregate data
 - ◆ A pay for participation model

How to improve surgical quality

- ◆ Develop a surgical registry
- ◆ Use the registry to examine variation in quality
- ◆ Identify best performing hospitals
- ◆ Identify “best practices” in the best performing hospitals
- ◆ Distribute the information

The importance of the site visit



Culture is important

FRIENDLY

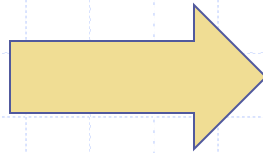
- ◆ Collegial
- ◆ Non-competitive
- ◆ Evidence-based

The MSQC “Blood Oath”

- ◆ We will not use the data for competitive advantage (no billboards)
- ◆ Information shared at working group meetings is confidential
- ◆ There are no secrets among our group

Success factors for the MSQC

STRUCTURE



CULTURE

- ◆ Financial support
 - ◆ Payer agnostic to results
 - ◆ “Pay for participation”
 - ◆ Reliable data, (doctors believe it), regular feedback
 - ◆ Regional rather than national organization
 - ◆ Multidisciplinary (doctors, nurses, administration)
- ◆ High quality workers
 - ◆ Non threatening
 - ◆ Non competitive
 - ◆ Engagement
 - ◆ Site visits welcomed
 - ◆ Interest in discovery and innovation

Evidence based medicine

Made easily available to the sites

Antibiotics within 60 min of incision (SCIP1)

82% overall compliant

57% for emergent

Appropriate antibiotics(SCIP2)

80% overall compliant

53% emergent

Antibiotic dose adjustment based on weight

- ◆ 55%
compliant

Redosing of antibiotic after 3 hours of surgery

7% compliant!!

Oral non absorbable antibiotics after mechanical bowel prep

39% compliant

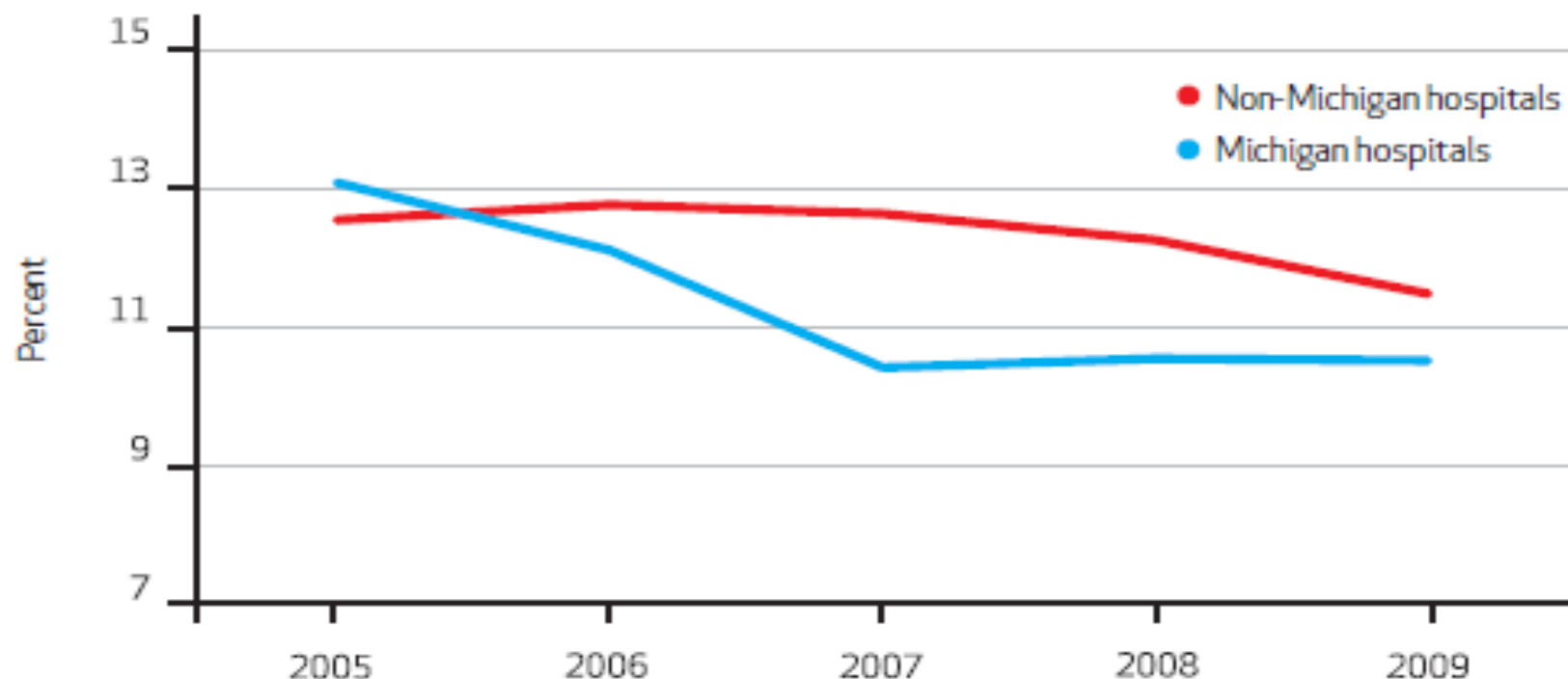


Does this approach work?

Yes

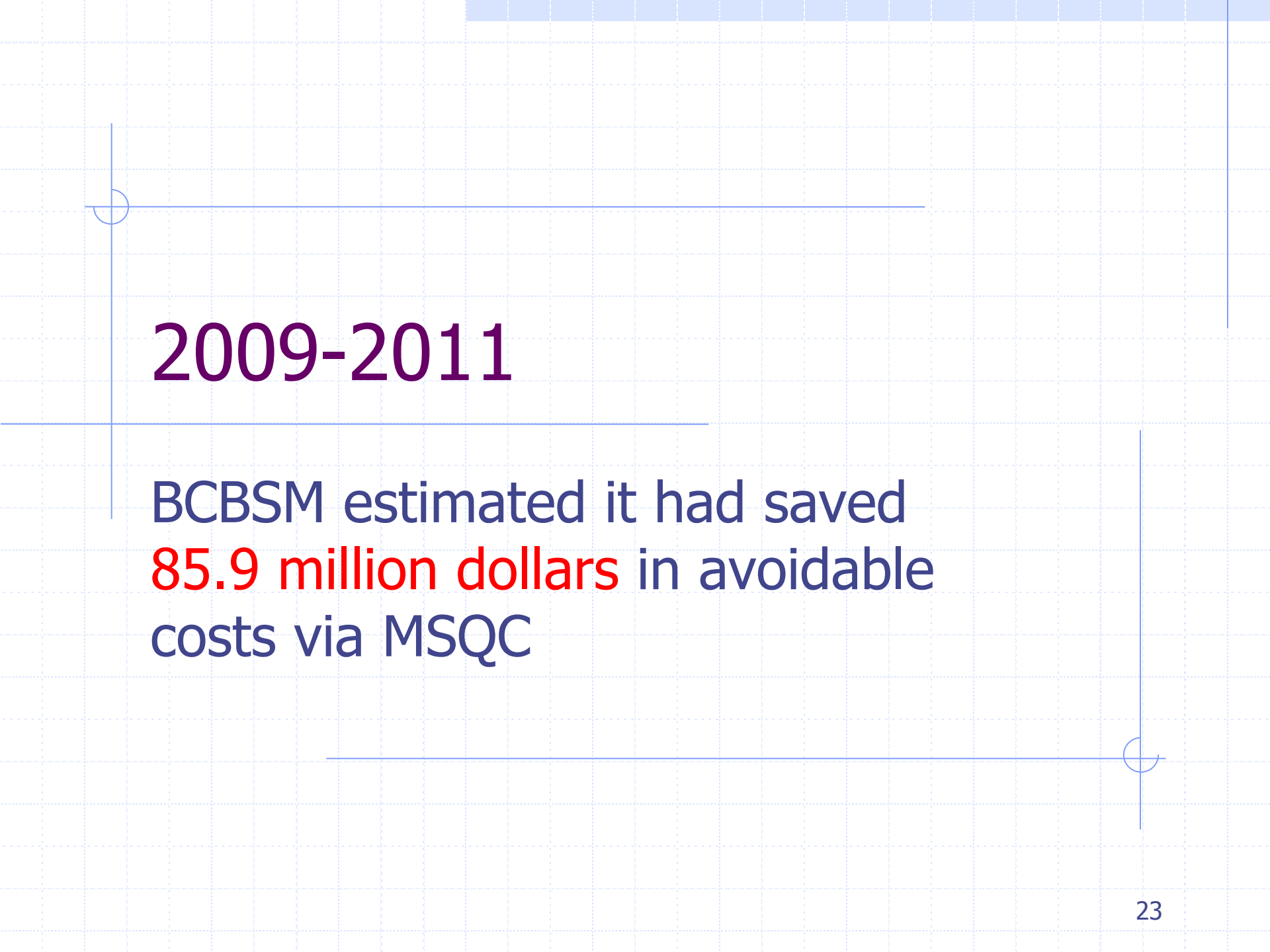
EXHIBIT 2

Risk-Adjusted Morbidity With General And Vascular Surgery: Hospitals In Michigan Versus Hospitals Outside Of Michigan, 2005-09



© PD-INEL

SOURCE Michigan Surgical Quality Collaborative and National Surgical Quality Improvement Program registries, 2005-09. **NOTES** Morbidity rates declined faster in Michigan hospitals ($p < 0.001$) and, by 2009, were lower than in other hospitals participating in the National Surgical Quality Improvement Program ($p < 0.001$).



2009-2011

BCBSM estimated it had saved
85.9 million dollars in avoidable
costs via MSQC



The Future Of Surgical Quality Improvement



The national approach to hospital based QI

Is fundamentally flawed

Hospital bears all of the cost for QI

Financial penalties sometimes apply
(never events, VBP)

Surgical complications are expensive

Reducing the incidence of expensive complications benefits the patients

Saves money-but whose money?

Who pays for poor surgical quality?
Building a business case for quality
improvement
JACS 2006 202:933

**Justin B. Dimick, MD, MPH; Raj J. Karia, MPH;
Smita Das, MPH; William B. Weeks, MD,
MBA, Darrell A. Campbell, Jr., M.D.**

Overall hospital costs and revenues for surgical patients with and without complications.

| | Costs: Resources used by the Hospital | Reimbursement : Amount Paid to the Hospital | Hospital Profit (Revenues less Costs) |
|---------------------------------|--|--|--|
| No complications | \$10,978 | \$14,266 | \$3,288 |
| With complications | \$21,156 | \$21,911 | \$755 |
| Change in Reimbursement: | | \$7,645 | |

| | Costs: Resources used by the Hospital | Reimbursement: Amount Paid to the Hospital | Hospital Profit (Revenues less Costs) |
|--|--|---|--|
| Colon resection for benign or malignant disease | | | |
| No complications (n=40) | \$15,464 | \$22,353 | \$6,889 |
| With complications (n=11) | \$35,950 | \$34,490 | (\$1,460) |
| Change in Reimbursement: | | \$12,137 | |

The stakeholder who bears the largest burden of additional costs from surgical complications would have a strong incentive to support quality improvement activities.

What are the options?

States have no money

CMS ? (never events, VBP)

Third party payers (BCBS)

BCBSM has a lot of skin in the game

Voluntary Employee Benefits Agreement

850,000 UAW member health benefits

BCBSM administers the VEBA

Responsible to UAW for improving quality

QI efforts should be facilitated

By modern information technology
Get the information to the
hospital, but also the individual
surgeon

Ann Arbor

Arbor Metrix

Hierarchical Modeling

Reliability Adjustment

Linkage to cost

MSQC (52)

Boston

QC Metrix

Website

Quarterly reports

Custom reports

Publications

Grants

New projects

Special projects

- Colectomy
- MI
- VTE
- POI

User Flow

Log-in as usual

MSQC

Michigan Surgical Quality
Collaborative

[About MSQC](#) | [Membership](#) | [Participants](#) | [News/Media](#) | [Contact](#) | [User Login](#)



Transforming Surgical Outcomes Together

Proven Results

Our evidence-based approach to best practices—and the proven savings that come with them—have already put MSQC on the road to a rare “triple win” for the region:

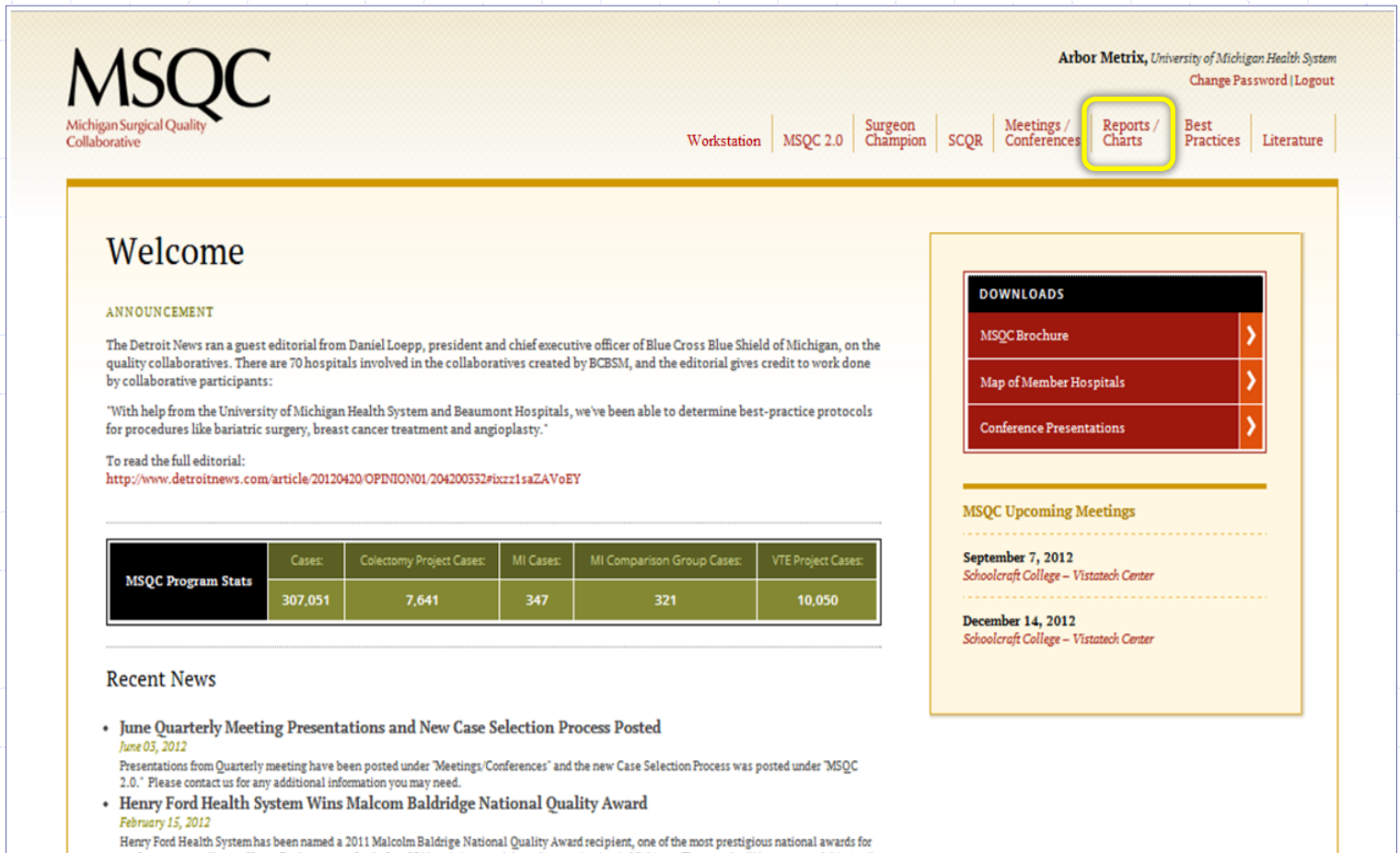


Patients: Better outcomes and well-being.



User Flow

Click on Reports/Charts



The screenshot shows the MSQC (Michigan Surgical Quality Collaborative) website. The 'Reports / Charts' link in the top navigation bar is highlighted with a yellow box. The page content includes a 'Welcome' section with an announcement about a Detroit News editorial, a table of MSQC Program Stats, and a 'Recent News' section. On the right, there are sections for 'DOWNLOADS' and 'MSQC Upcoming Meetings'.

MSQC
Michigan Surgical Quality Collaborative

Arbor Metrix, University of Michigan Health System
Change Password | Logout

Workstation | MSQC 2.0 | Surgeon Champion | SCQR | Meetings / Conferences | **Reports / Charts** | Best Practices | Literature

Welcome

ANNOUNCEMENT

The Detroit News ran a guest editorial from Daniel Loepp, president and chief executive officer of Blue Cross Blue Shield of Michigan, on the quality collaboratives. There are 70 hospitals involved in the collaboratives created by BCBSM, and the editorial gives credit to work done by collaborative participants:

"With help from the University of Michigan Health System and Beaumont Hospitals, we've been able to determine best-practice protocols for procedures like bariatric surgery, breast cancer treatment and angioplasty."

To read the full editorial:
<http://www.detroitnews.com/article/20120420/OPINION/01/204200332#ixzz1saZAVoEY>

| MSQC Program Stats | Cases: | Colectomy Project Cases: | MI Cases: | MI Comparison Group Cases: | VTE Project Cases: |
|--------------------|---------|--------------------------|-----------|----------------------------|--------------------|
| | 307,051 | 7,641 | 347 | 321 | 10,050 |

Recent News

- **June Quarterly Meeting Presentations and New Case Selection Process Posted**
June 03, 2012
Presentations from Quarterly meeting have been posted under 'Meetings/Conferences' and the new Case Selection Process was posted under 'MSQC 2.0.' Please contact us for any additional information you may need.
- **Henry Ford Health System Wins Malcom Baldrige National Quality Award**
February 15, 2012
Henry Ford Health System has been named a 2011 Malcom Baldrige National Quality Award recipient, one of the most prestigious national awards for...

DOWNLOADS

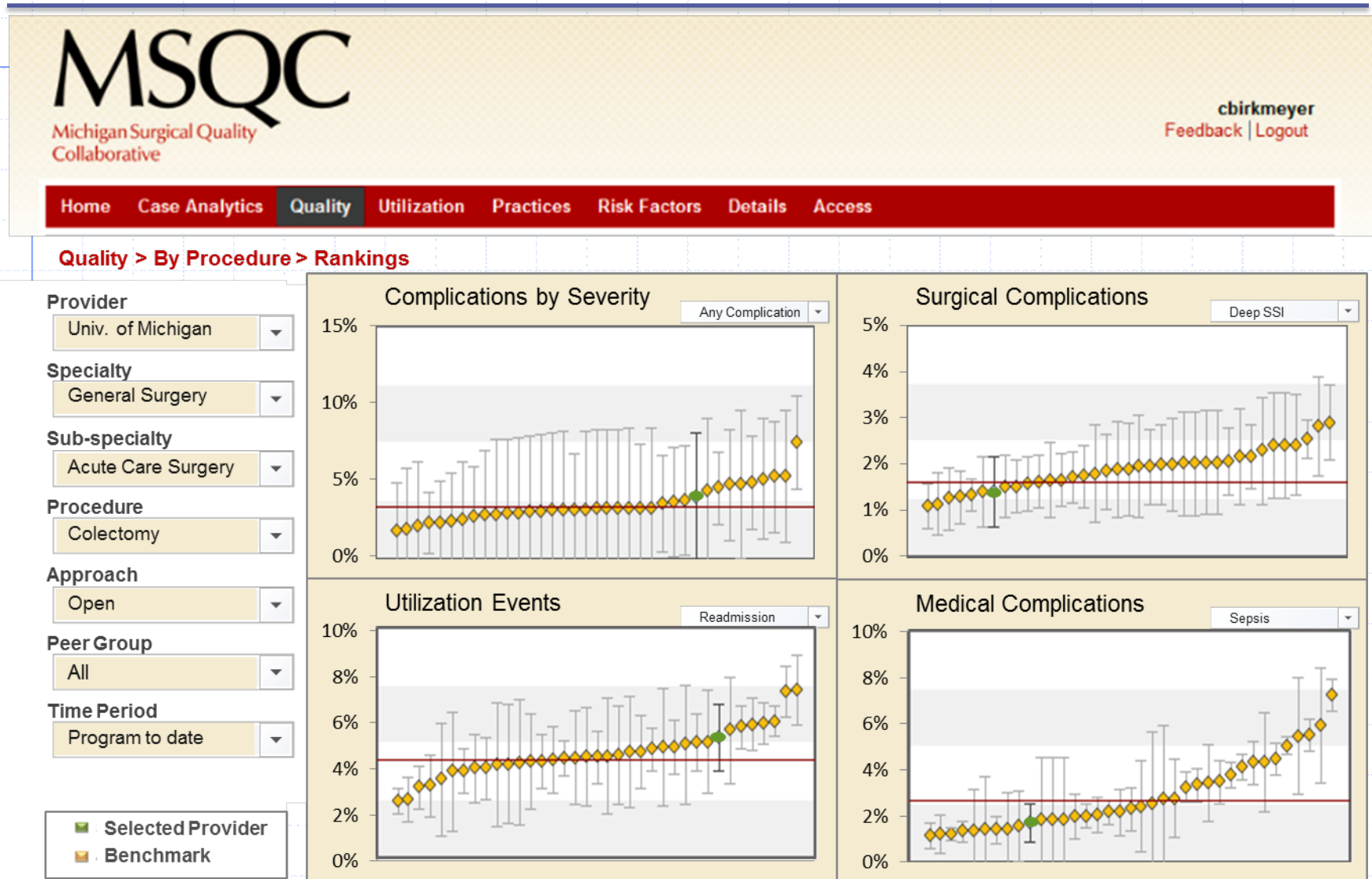
- MSQC Brochure >
- Map of Member Hospitals >
- Conference Presentations >

MSQC Upcoming Meetings

September 7, 2012
Schoolcraft College – Vistatech Center

December 14, 2012
Schoolcraft College – Vistatech Center

Reporting: Quality



Reporting: Quality

MSQC

Michigan Surgical Quality
Collaborative

cbirkmeyer
Feedback | Logout

[Home](#) [Case Analytics](#) **Quality** [Utilization](#) [Practices](#) [Risk Factors](#) [Details](#) [Access](#)

Quality > General Surgery > Snapshot

Provider

Univ. of Michigan

Peer Group

All

Time Period

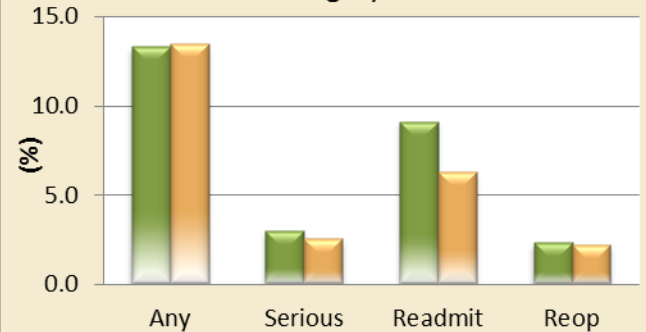
Program to date

■ Selected Provider
■ Benchmark

General Abdominal Surgery



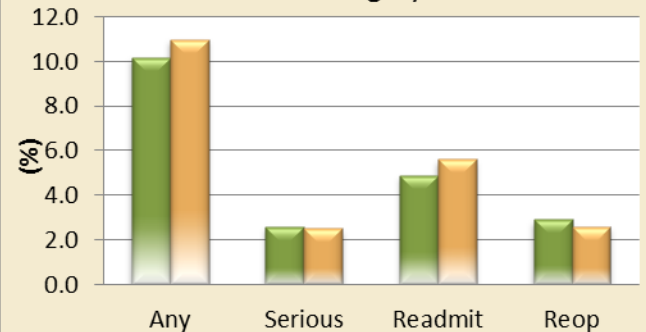
Cancer Surgery



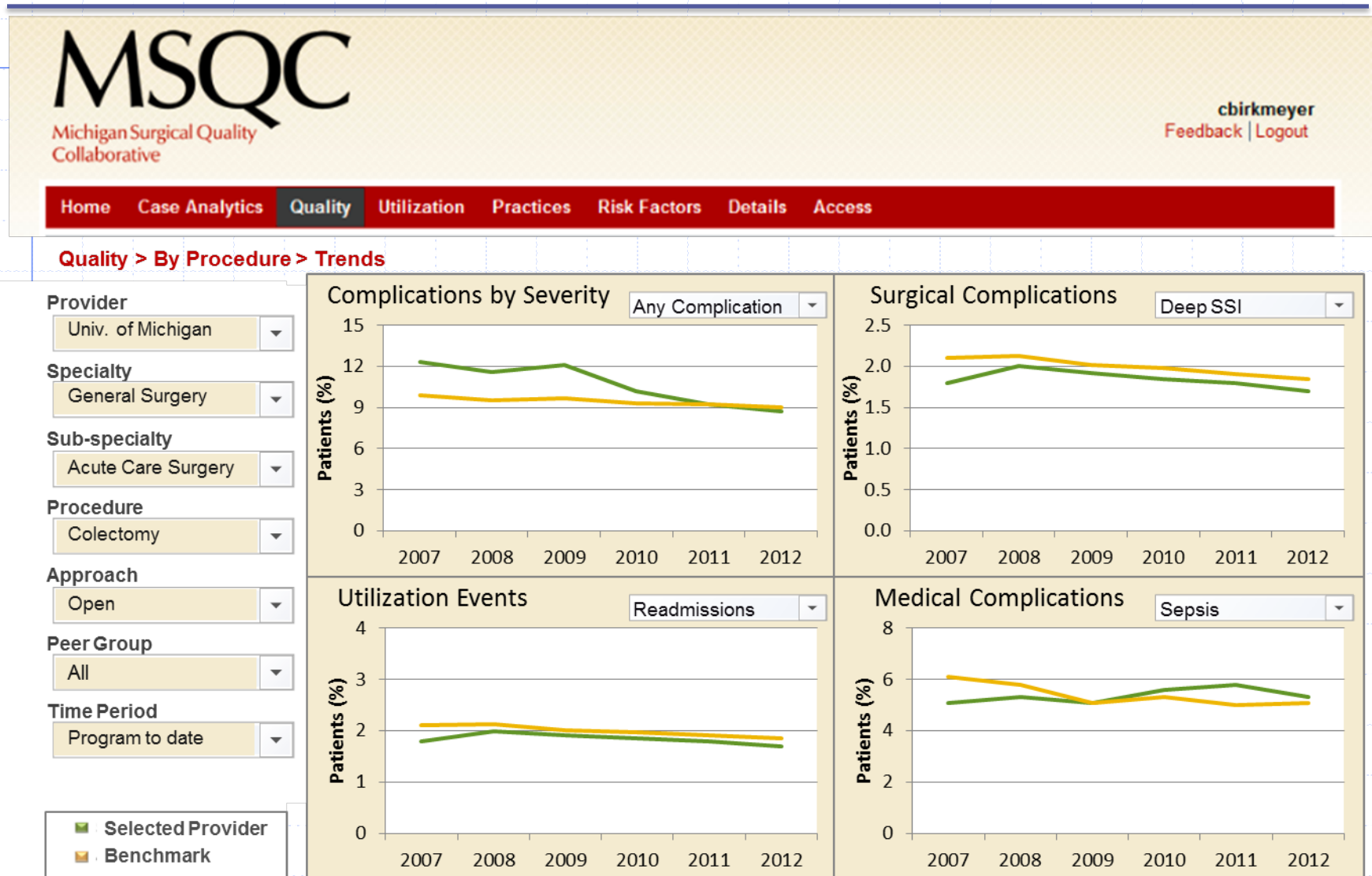
Acute Care Surgery



Colorectal Surgery



Reporting: Quality



Reporting: Quality

MSQC

Michigan Surgical Quality
Collaborative

cbirkmeyer
Feedback | Logout

Home Case Analytics **Quality** Utilization Practices Risk Factors Details Access

Quality > By Procedure > Complications Drill-down

Provider

Univ. of Michigan ▼

Specialty

General Surgery ▼

Sub-specialty

Acute Care Surgery ▼

Procedure

Colectomy ▼

Approach

Open ▼

Peer Group

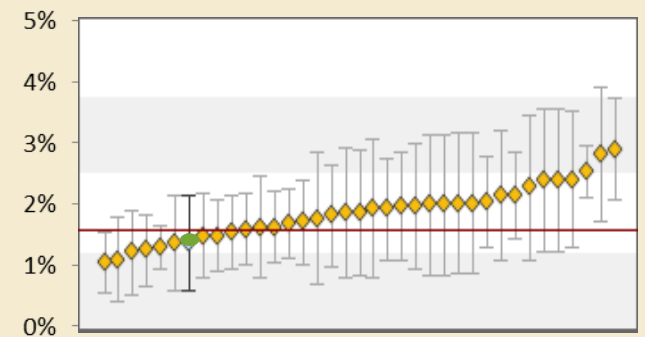
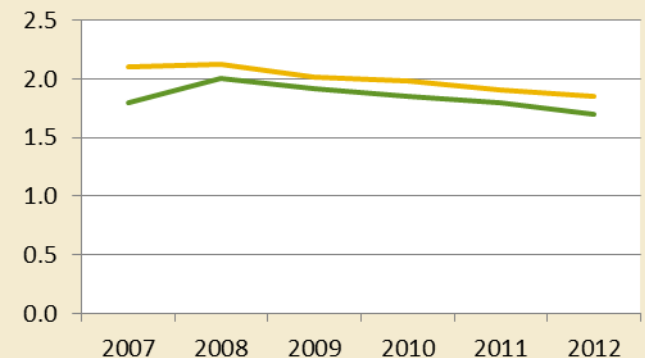
All ▼

Time Period

Program to date ▼

■ Selected Provider
■ Benchmark

| Complications (%) | Selected | Benchmark | P-Value |
|----------------------------|----------|-----------|---------|
| Any complication | 7.2% | 8.9% | 0.03 |
| Grade I | 4.6% | 6.0% | 0.02 |
| Grade II | 1.9% | 2.0% | 0.58 |
| Grade III | 0.7% | 0.9% | 0.19 |
| Acute Renal Problems | 1.2% | 1.4% | 0.14 |
| Cardiac Arrest /CPR | 0.3% | 0.3% | 0.51 |
| Cardiac Arrhythmias | 1.7% | 1.6% | 0.74 |
| Deep Incisional SSI | 1.1% | 1.3% | 0.23 |
| DVT req. Therapy | 3.4% | 3.5% | 0.89 |
| Myocardial Infarction | 0.1% | 0.1% | 0.74 |
| Pneumonia | 4.1% | 4.0% | 0.52 |
| Pulmonary Embolism | 0.7% | 0.6% | 0.51 |
| Sepsis | 5.1% | 4.9% | 0.42 |
| Stroke/CVA | 0.4% | 0.5% | 0.09 |
| Superficial Incisional SSI | 3.2% | 3.1% | 0.77 |
| Transfusions w/i 72 | 2.6% | 3.1% | 0.02 |





Home

Reports

> All General Surgery

Dashboard

Cost Trend

Cost by Hospital

Cost Detail

Quality Trend

Quality by Hospital

Quality Detail

> Acute Care Surgery

> Bariatric Surgery

> Cancer Surgery

> Perioperative Care

> Trauma

Custom Reports

Definitions

Help



Start Date 01/01/2008



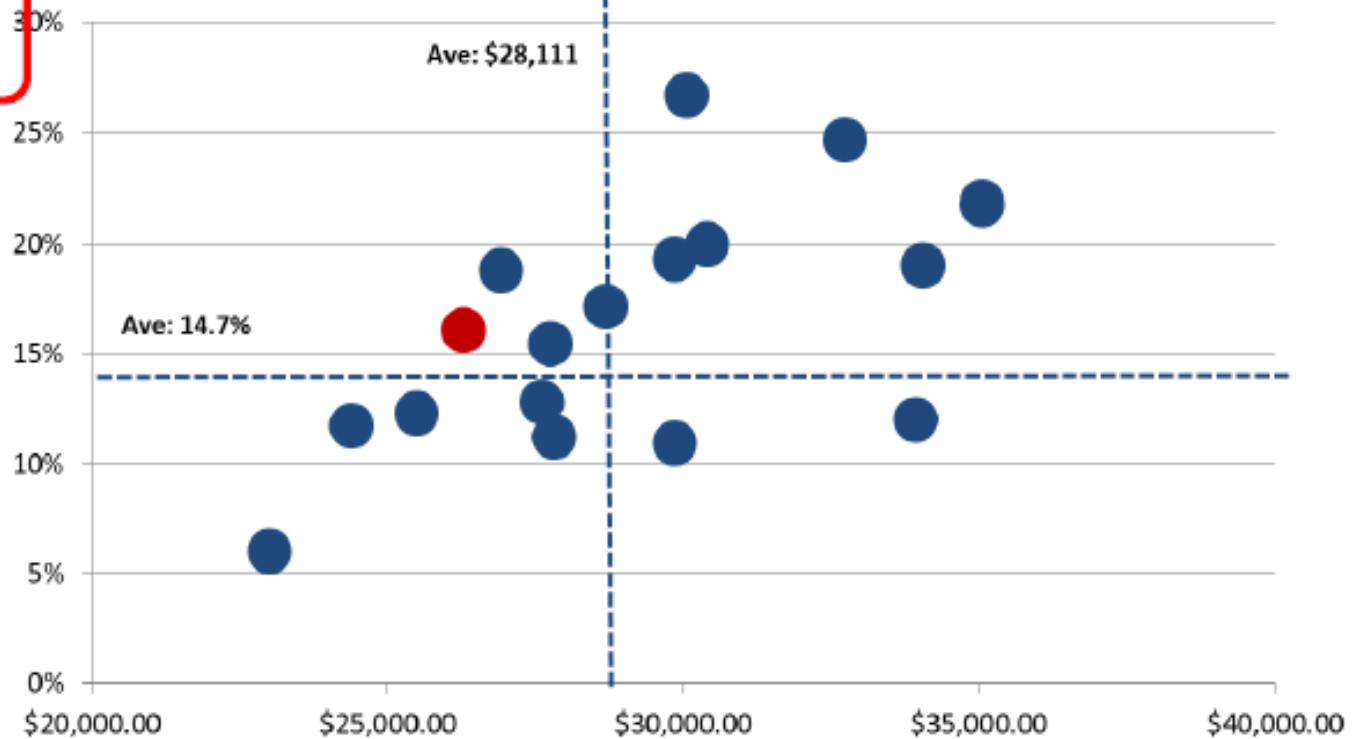
End Date 12/31/2011



Diagnosis [All]



Risk Adjusted Morbidity



Hospital 123

Average Episode Cost



A More Expansive Approach

To surgical quality improvement



MSQC

Optimal
Preparation for
Surgery

Prevention
of
Complications

Rescue
after
Complications



“Pre-hab” checklist-30 days prior to OR

- ◆ Stop smoking
- ◆ Incentive spirometer
- ◆ Walk 2-3 miles/day
- ◆ HgbA1c for diabetics, glycemic control
- ◆ Correct anemia (hct <30%)
- ◆ Nasal culture for Staph
- ◆ Antibacterial soap X 3 days pre op
- ◆ Consider starting a Beta blocker
- ◆ Consider starting a statin

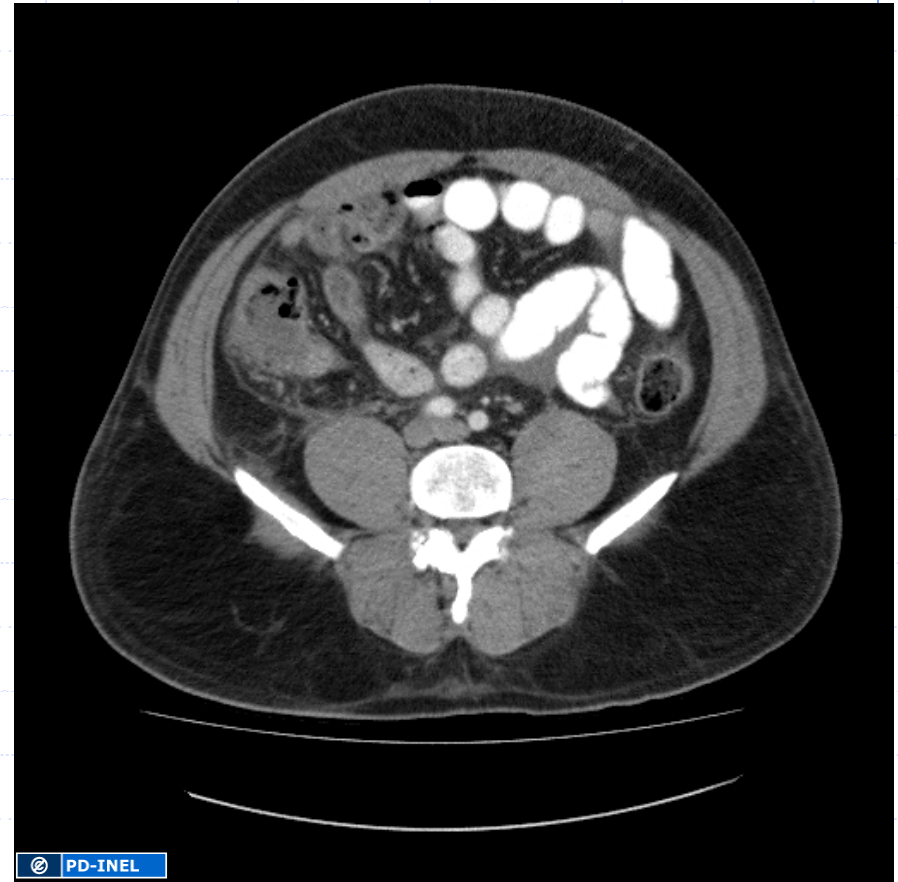


Use the power of the group

To think differently about common problems



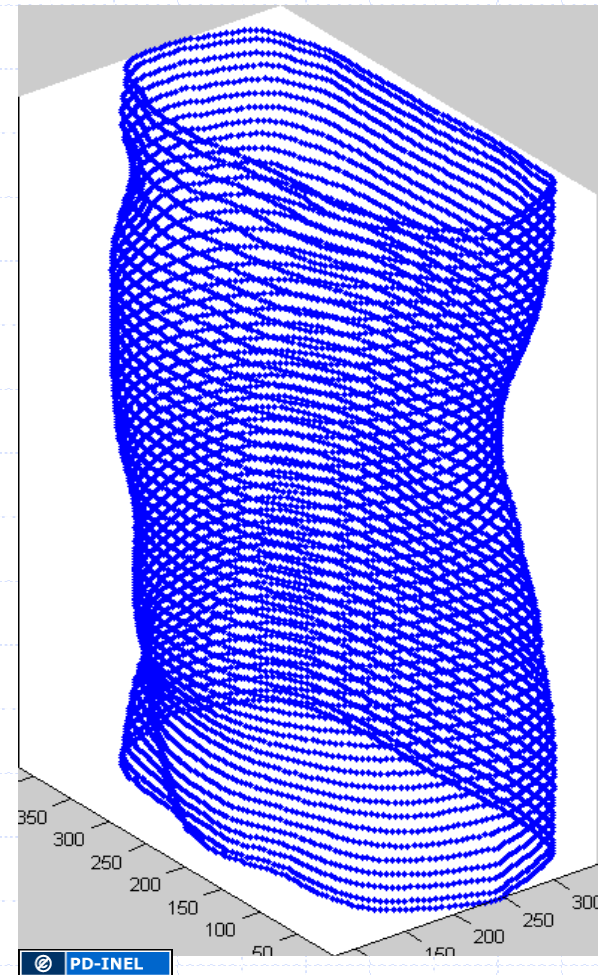
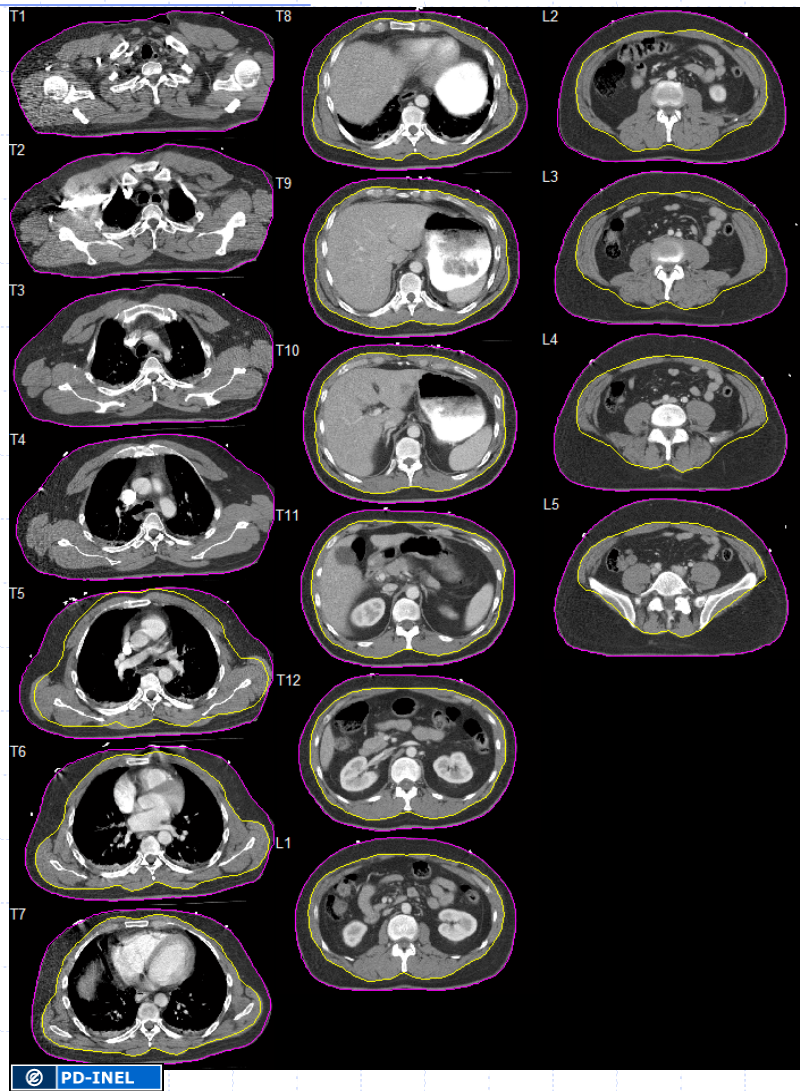
**58 year old male with diabetes,
previous myocardial infarction, and
COPD who is pre-operative for a
colectomy**



**58 year old male with diabetes,
previous myocardial infarction, and
COPD who is pre-operative for a
colectomy**

Analytic Morphomics

Body Composition



Analytic Morphomics

Core Muscle Size



Adjusted Complication Rates following Elective General and Vascular Surgery Stratified by terciles of Core Muscle Size

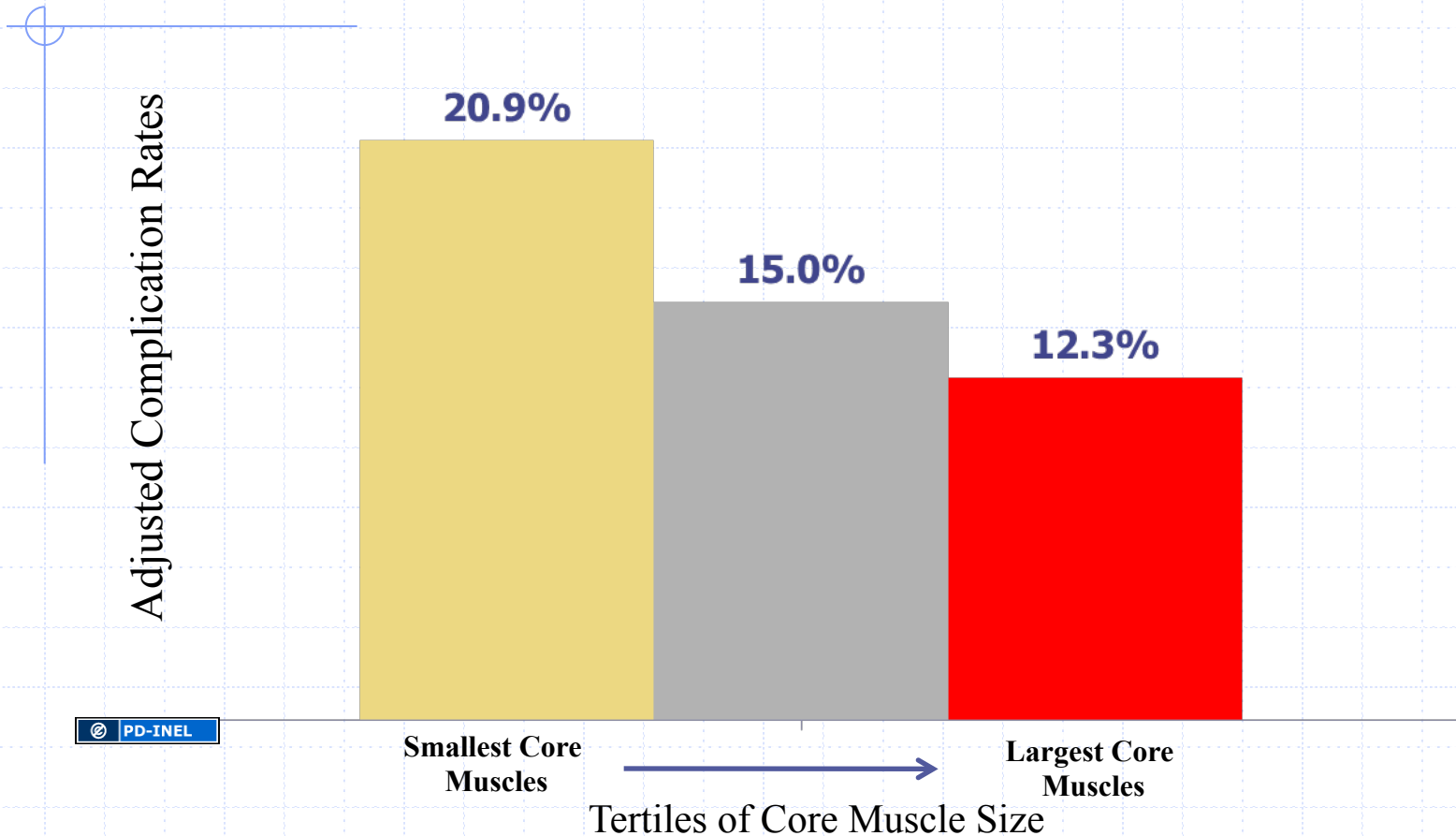
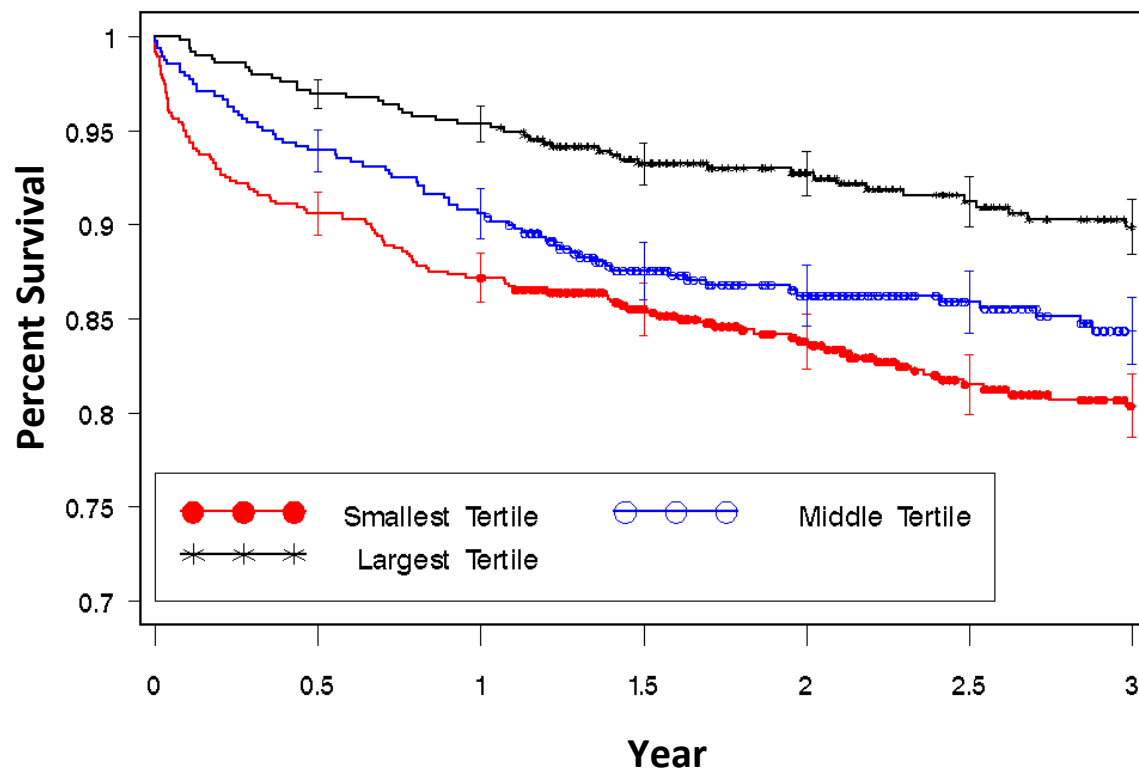


Figure 5

Survival (Kaplan-Meier) following major surgery

Stratified I



Time 0: n=586 for tertile 1, 450 for tertile 2, 449 for tertile 3
Time 1 year : n=505 for tertile 1, 406 for tertile 2, 426 for tertile 3
Time 3 years: n=223 for tertile 1, 170 for tertile 2, 207 for tertile 3



The NEW ENGLAND JOURNAL of MEDICINE

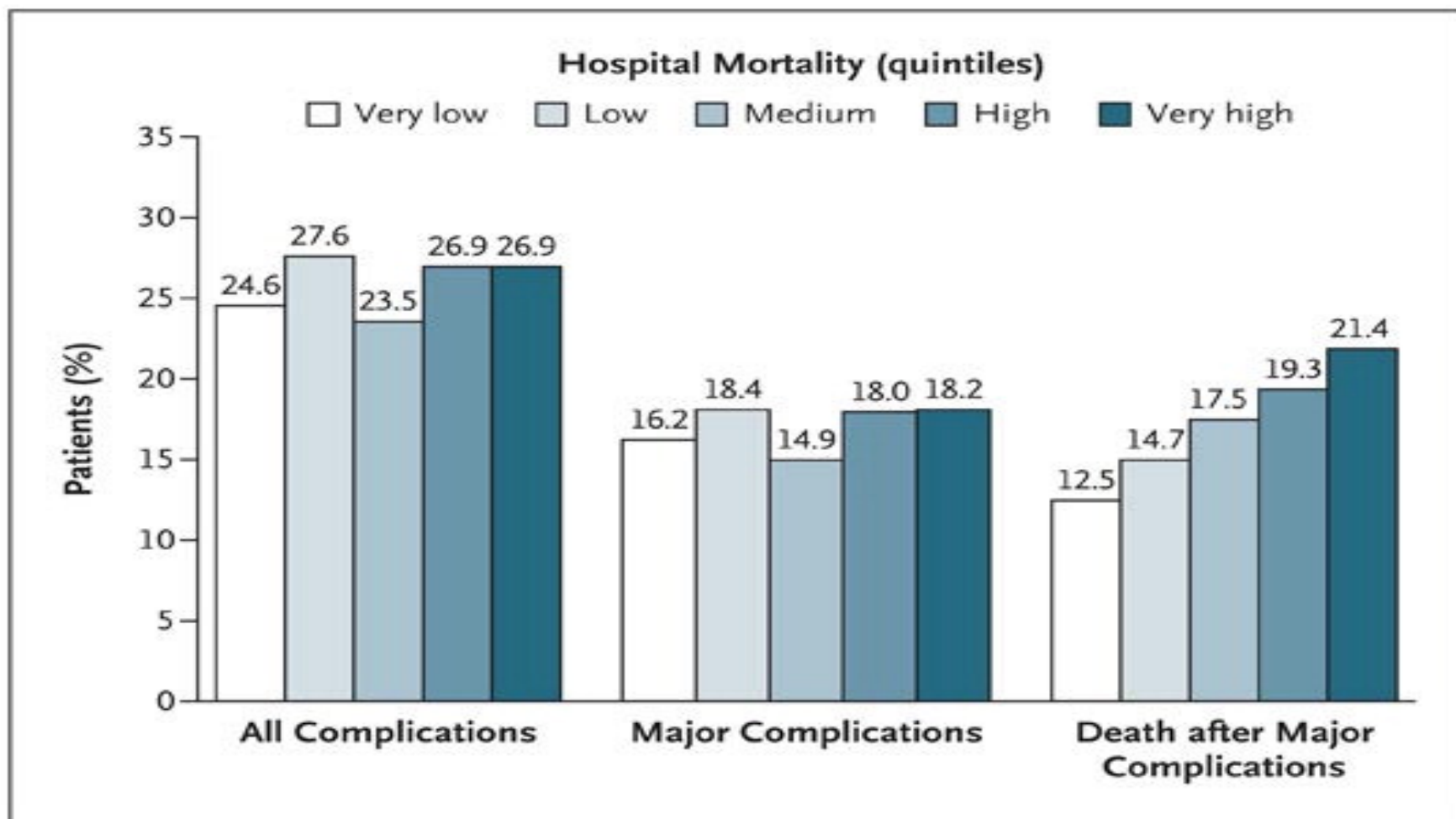
[HOME](#)[ARTICLES ▾](#)[ISSUES ▾](#)[SPECIALTIES & TOPICS ▾](#)[FOR AUTHORS ▾](#)[CME ▸](#)

SPECIAL ARTICLE

Variation in Hospital Mortality Associated with Inpatient Surgery

Amir A. Ghaferi, M.D., John D. Birkmeyer, M.D., and Justin B. Dimick, M.D., M.P.H.

N Engl J Med 2009; 361:1368-1375 | [October 1, 2009](#)



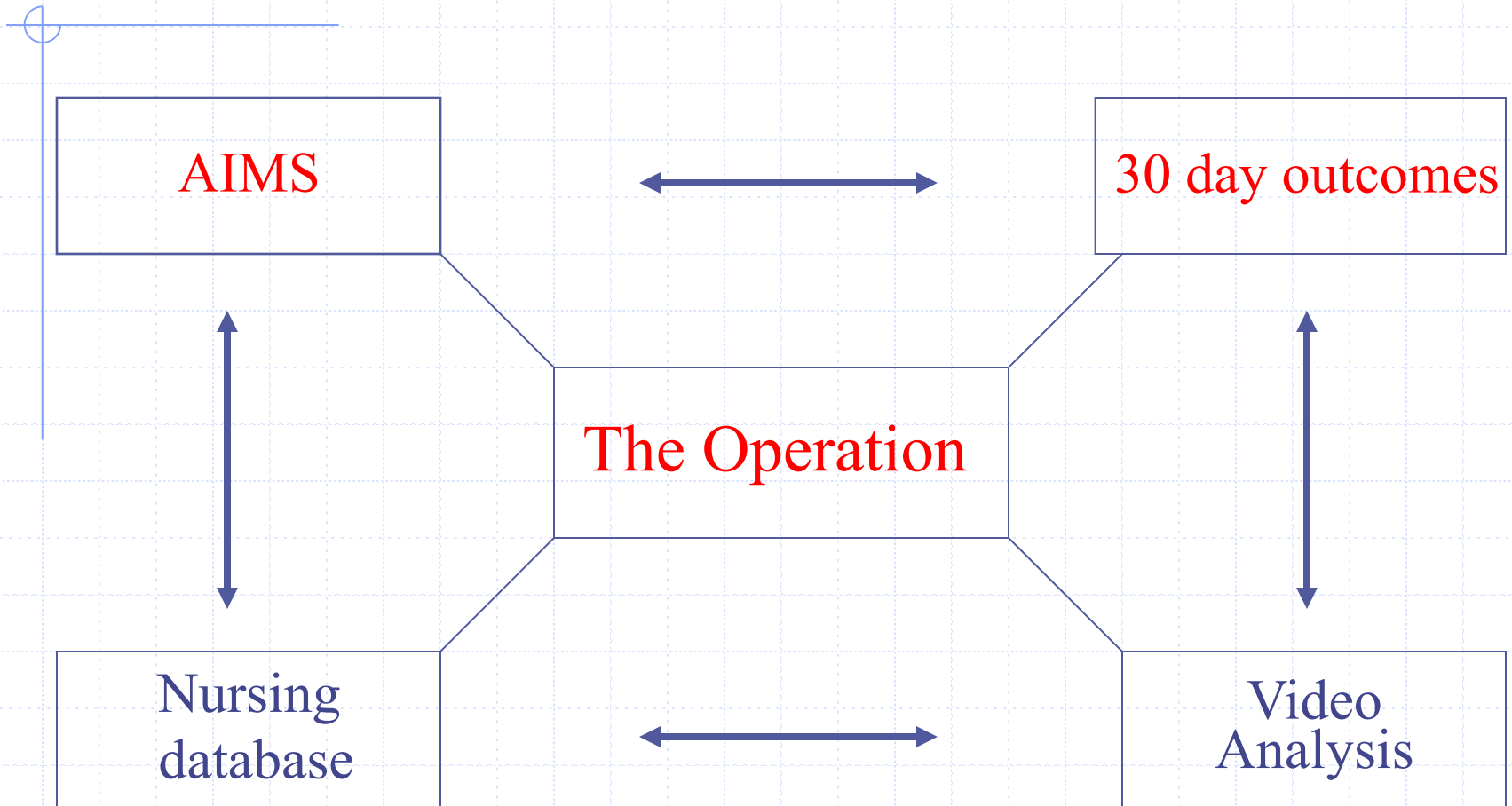
“Rescue” after a complication

- ◆ Large variation among MSQC hospitals
- ◆ ICU staffing “closed” or not
- ◆ Academic vs community
- ◆ Nurse staffing
- ◆ Weekend coverage
- ◆ Rapid Response Team
- ◆ Sepsis identification protocol

Linkage with anesthesia

Complications after surgery are more closely associated with anesthetic management than we have ever imagined

The OR of the Future



Anesthetic variables added to MSQC

- ◆ Total fluid given, and type, total out
- ◆ Blood product replacement
- ◆ Temp, glycemic control
- ◆ Anesthetic technique, agent
- ◆ Neosynephrine, hypotension
- ◆ Epidural placement, level
- ◆ Art line, CO monitoring
- ◆ BIS monitoring



Go where the money is

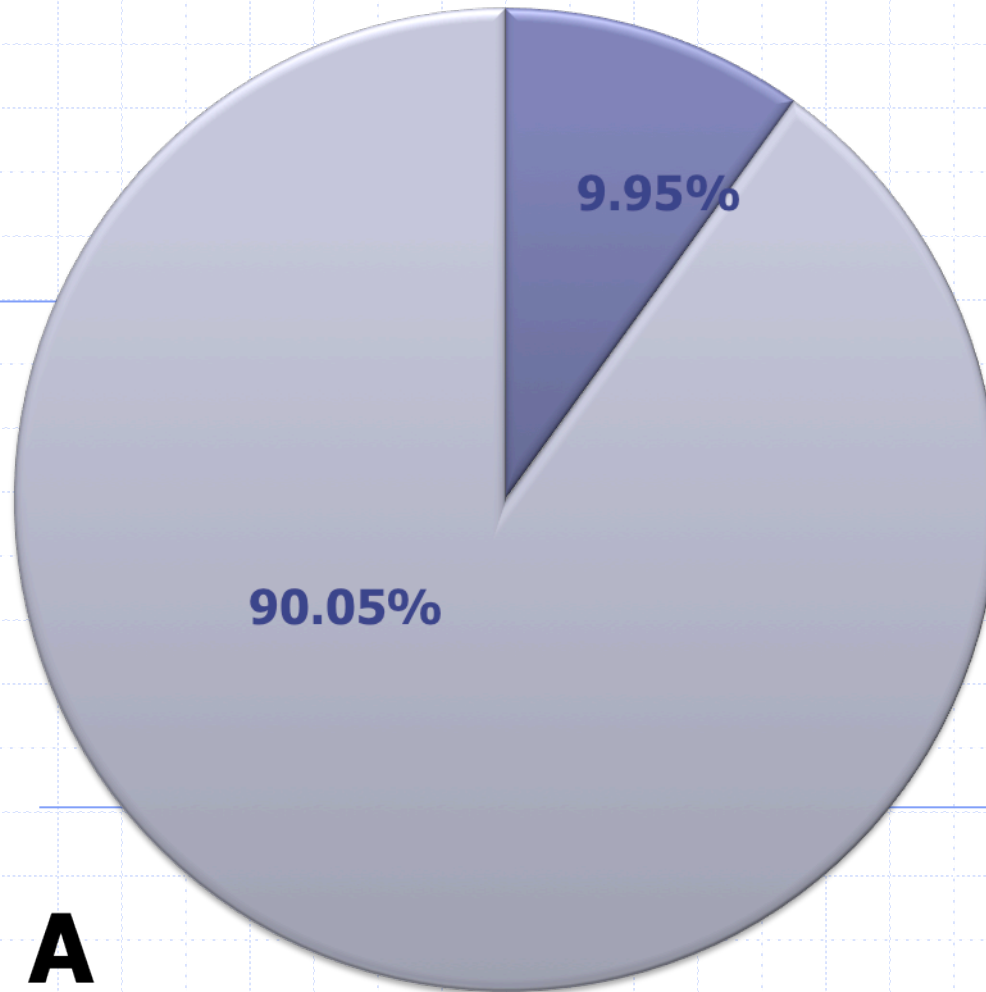
Emergency surgery



Case Breakdown

■ Emergent Cases ■ Elective Cases

n = 211,903

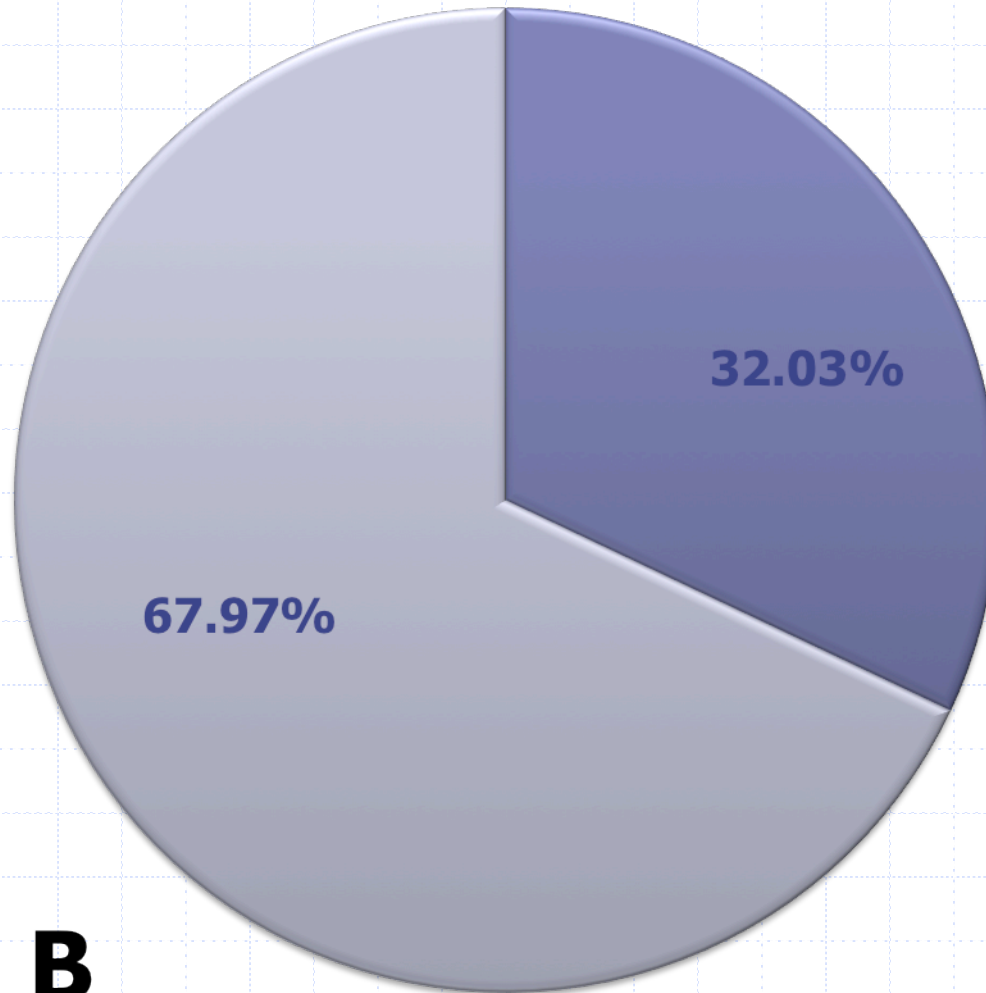


A

Mortality

■ Emergent Cases ■ Elective Cases

n = 4,899

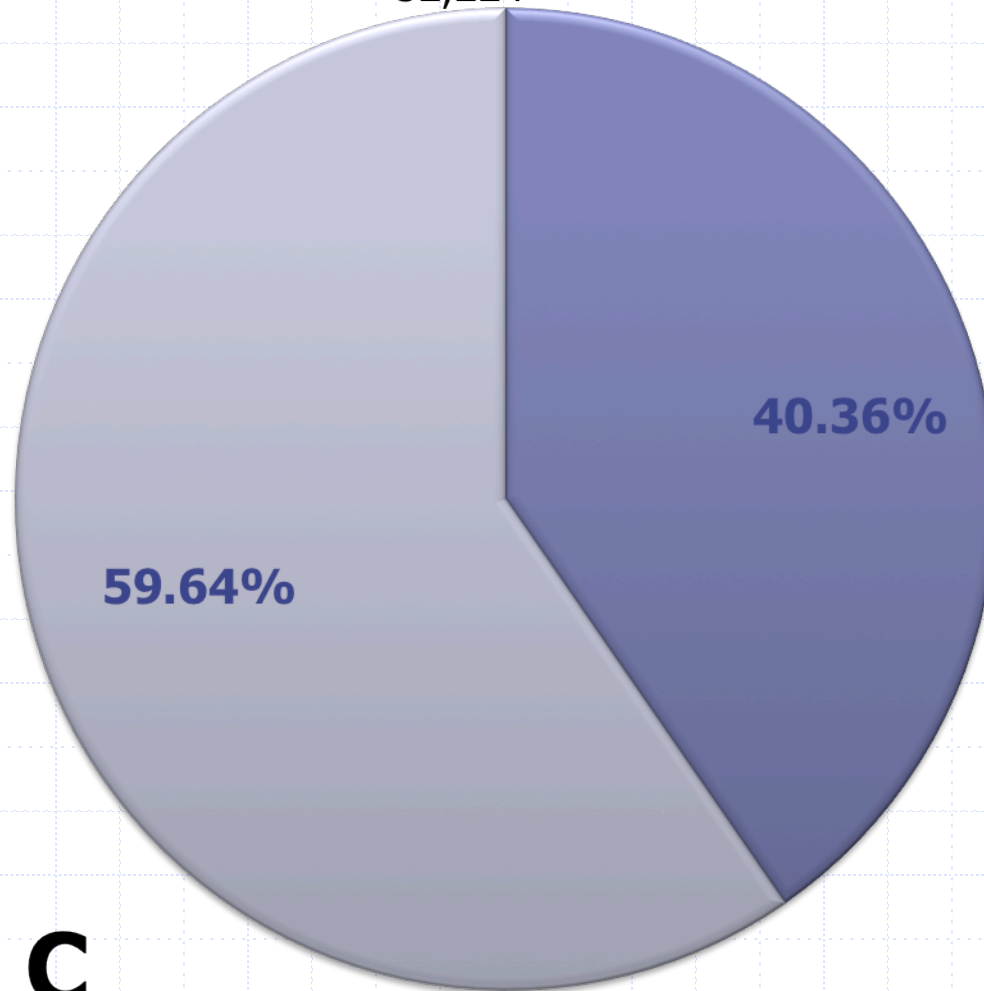


B

Complications

■ Emergent Cases ■ Elective Cases

n =
52,224



C

Costs from Complications

■ Emergent Cases ■ Elective Cases

n = 52,224

Elective Costs:
\$305,707,805

Emergent Costs:
\$206,870,755

D

Image Attributions

- “Ernest Amory Codman” by [unknown](#) is in the [Public Domain](#).
- “Fingerprint modified” by [pogoneo](#) is in the [Public Domain](#).
- “USMC-09249” by an [employee of the U.S. military or Department of Defense](#) is in the [Public Domain](#).
- “Surgeons at Work” by [SSgt. Derrick C. Goode, U.S. Air Force](#) is in the [Public Domain](#).
- ◆ “Clinicians in Intensive Care Unit” by [Calleamanecer](#) is under a Creative Commons license [CC BY-SA 3.0](#).