Managing the Challenge of the Relationship between Low Volume Surgery and Quality

Paul Cordts, MD, FACS
Michael Kanter, MD
Robert Rush, MD, FACS
Gregory York, MD, FACS
Eric Elster, MD, FACS

December 6, 2016

Nothing to Disclose

The presenter has no relevant financial or nonfinancial relationship(s) within the services described, reviewed, evaluated or compared in this presentation.
Panel Objectives

- Review current research on the relationship between patient safety, volume, and culture to expand the audience’s knowledge of trends associated with surgical outcomes in low volume facilities

- Examine the approaches used in the Military Health System and Kaiser Permanente to address the low volume/quality issue

- Explore the feasibility of these approaches for use in participant’s system
  
  OR
  
  Contrast approaches for feasibility of use in participant’s system

Presentation Agenda

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction and Background on the Low Volume/Quality Issue</td>
<td>Paul Cordts, MD FACS</td>
<td>10 min</td>
</tr>
<tr>
<td>Exploring the Challenge of Low Volume Surgery and Quality</td>
<td>Michael Kanter, MD</td>
<td>10 min</td>
</tr>
<tr>
<td>The “War” on Low Volume Surgery</td>
<td>Robert Rush, MD FACS</td>
<td>10 min</td>
</tr>
<tr>
<td>Small Hospitals’ Clinical Skills Enhancement</td>
<td>Gregory York, MD FACS</td>
<td>10 min</td>
</tr>
<tr>
<td>Leveraging Culture</td>
<td>Eric Elster, MD FACS</td>
<td>10 min</td>
</tr>
<tr>
<td>Questions</td>
<td>All</td>
<td>25 min</td>
</tr>
</tbody>
</table>
Introduction and Background on the Low Volume / Quality Issue

Paul Cordts, MD, FACS
Director, Functional Champion MHS

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

December 6, 2016

Military Health System (MHS) Overview

The MHS is a large healthcare system whose mission is to provide optimal health services in support of our nation’s military mission.

- $48B organization
- Serves over 9.4M beneficiaries
- Payer and provider
- Facilities
  - 55 Hospitals (41 in US)
  - 373 Clinics (315 in US)
  - 251 Dental Clinics (201 in US)
  - 253 Veterinary Facilities (198 in US)

The MHS Quadruple Aim – better health, better care, lower cost, and readiness – reflects the system’s vision of providing a coordinated continuum of preventive and curative services while supporting the Services’ warfighter needs.
Background on the Low Volume / Quality Issue

Studies have demonstrated that high volume facilities and surgeons have considerably lower mortality rates than their lower volume counterparts

- **Pancreatectomy for cancer:** low volume hospitals have 4x mortality rate of highest volume hospitals

- **Vascular surgery:** higher operator volume correlates with lower rate of mortality and complications

- **Lung cancer resection:** mortality rates are significantly higher in low volume facilities, and 2x higher in non-teaching facilities

The Leapfrog Surgical Volume Standard

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Minimum surgeon volume (per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG</td>
<td>100</td>
</tr>
<tr>
<td>PCI</td>
<td>75</td>
</tr>
<tr>
<td>Aortic Valve Replacement</td>
<td>22</td>
</tr>
<tr>
<td>Elective AAA repair</td>
<td>8</td>
</tr>
<tr>
<td>Pancreatic resection</td>
<td>2</td>
</tr>
<tr>
<td>Esophagectomy</td>
<td>2</td>
</tr>
<tr>
<td>Bariatric</td>
<td>20</td>
</tr>
</tbody>
</table>

Managing the Challenge of the Relationship between Low Volume Surgery and Quality
Background on the Low Volume / Quality Issue

There are strategies to mitigate the challenges and risks associated with low volume surgery for facilities that do not meet established volume thresholds

- System characteristics
  - High nurse ratios
  - Providing complex surgery services such as bariatric, medical oncology, and lung transplant
  - Availability of PET scanners
- Improving hospital infrastructure
- Increasing access to care
- Simulation / surgeon rotation with high volume centers
- Designing immediate feedback loops

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

References


Exploring the Challenge of Low Volume Surgery and Quality

Michael H. Kanter, MD
Executive Vice President and Chief Quality Officer of the Permanente Federation
Regional Medical Director for Quality and Clinical Analysis, Southern California
Permanente Medical Group

Kaiser Permanente

Eight Regions
Two types of surgical procedures

- Those performed at only specialized medical centers
  - Low volume high risk (Whipple, esophagotomy)
  - Surgeries that require expensive specialized equipment (robotic prostatectomy)
- High volume low risk
Procedures performed at only specialized medical centers

- Need to balance proximity to patients, minimum volumes needed for quality and cost effectiveness, and projections for growth of members
  - Regional teams of surgeons and analysts meet and make recommendations
  - Review quality outcomes
  - Periodically reassess

High volume low risk surgeries

- Are usually performed at all hospitals but should all surgeons in a hospital perform these?
- Complications are generally lower but because the absolute number of cases done is higher, the risk to a population may actually be greater than low volume high risk cases
- Examples include hysterectomy for benign diseases and neonatal circumcision
Limitations of Medical Literature on Quality-Volume Relationship

- Generalizability to one's own institution
  - Most physicians think they are better than average
- Most literature has arbitrary cut points on volume based on a set number and/or quartiles/percentiles
  - Does just missing a cut point on volume mean outcomes will be worse?
  - This ignores the continuous distribution of surgical volumes among surgeons in practice
  - This ignores how cases may be redistributed among remaining surgeons

Concentration Curve - Circumcisions

Circumcisions performed in 2013-2015 were sorted by surgeon volume from low to high. The cumulative percent of reoperations was graphed against the cumulative percent of surgeries. The curve above the green diagonal line indicates concentration of reoperations among low volume surgeons.

Example:
- 17% of circumcisions cumulatively accounted for 39% of reoperations.
- Were performed by 476 (69%) surgeons with the volume of 53 or fewer circumcisions in 3 years.
Concentration Curve - Hysterectomies

Cumulative Percent of Returns to OR

<table>
<thead>
<tr>
<th>Cut-Off</th>
<th>Surgeon Volume Category</th>
<th>Number of Patients</th>
<th>30 Day Return to OR n (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Volume - 13.3%</td>
<td>&lt;=115 / 3 YEARS</td>
<td>186</td>
<td>44 (2.3%)</td>
<td>0.0202</td>
</tr>
<tr>
<td>Total Volume - 13.3%</td>
<td>115+ /3 YEARS</td>
<td>12510</td>
<td>186 (1.5%)</td>
<td></td>
</tr>
<tr>
<td>Highest Volume - 20%</td>
<td>&lt;90 / 3 YEARS</td>
<td>2866</td>
<td>60 (2.1%)</td>
<td>0.0329</td>
</tr>
<tr>
<td>Highest Volume - 20%</td>
<td>90+ /3 YEARS</td>
<td>11530</td>
<td>170 (1.5%)</td>
<td></td>
</tr>
<tr>
<td>Lowest Volume - 30%</td>
<td>&lt;=48 / 3 YEARS</td>
<td>4266</td>
<td>81 (1.9%)</td>
<td>0.0756</td>
</tr>
<tr>
<td>Lowest Volume - 30%</td>
<td>48+ /3 YEARS</td>
<td>10130</td>
<td>149 (1.5%)</td>
<td></td>
</tr>
</tbody>
</table>

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

Surgeon Volume Redistribution

<table>
<thead>
<tr>
<th>Hysterectomy Surgeon Volume Categories</th>
<th>Number (%) of Surgeons</th>
<th>Actuals (2015)</th>
<th>Redistirution Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-15</td>
<td>193 (44%)</td>
<td>5 (1%)</td>
<td></td>
</tr>
<tr>
<td>16-34</td>
<td>164 (37%)</td>
<td>257 (74%)</td>
<td></td>
</tr>
<tr>
<td>35+</td>
<td>84 (19%)</td>
<td>84 (24%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>441 (100%)</td>
<td>346 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

- **Method**: redistribution of procedures from the physicians with the lowest volume to the physicians with a higher volume, but less than 16 procedures a year, to increase their volume to 16+ procedures a year.
- **Results**: procedures from 95 surgeons performing <=7 procedures a year are redistributed to 93 surgeons increasing their volume to 16+ procedures a year.
- **Note**: based on the volume of complicated and uncomplicated hysterectomies.
Conclusions

- Creating policies for minimum volumes of surgeries is complex and dependent on the context of the practice.
- One should consider the continuous nature of the relationship between surgical volume and quality outcomes in creating such policies.
- Such policies are likely to be controversial.
Disclosures

- No financial disclosures

- DHA & Army Medical Command NSQIP Surgeon Champion and Chair of DoD NSQIP Collaborative

- General Surgery Consultant to the Army Medical Department’s Central Simulation Committee

- I am a low volume surgeon
Agenda

- Definitions of low volume
- Effects of a decade of war
- Lingering collateral damage
- Reliance on systems
- What can a low volume surgeon/hospital do?
  - An example

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

Health systems set minimum volume standards

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Minimum hospital annual volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bariatric staple surgery</td>
<td>40</td>
</tr>
<tr>
<td>Esophagus cancer resection</td>
<td>20</td>
</tr>
<tr>
<td>Lung cancer resection</td>
<td>40</td>
</tr>
<tr>
<td>Pancreatic cancer resection</td>
<td>20</td>
</tr>
<tr>
<td>Rectal cancer resection</td>
<td>15</td>
</tr>
<tr>
<td>Carotid artery stenting</td>
<td>10</td>
</tr>
<tr>
<td>Complex abdominal aortic aneurysm repair</td>
<td>20</td>
</tr>
<tr>
<td>Mitral valve repair</td>
<td>20</td>
</tr>
<tr>
<td>Hip replacement</td>
<td>50</td>
</tr>
<tr>
<td>Knee replacement</td>
<td>50</td>
</tr>
</tbody>
</table>

- Three prominent healthcare systems
  - Dartmouth-Hitchcock Medical Center
  - Johns Hopkins Medicine
  - University of Michigan Hospital
- Sets minimum volume standards for hospitals (and physicians) in their system
## Complex Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Surgeon Volume-Outcome Association?</th>
<th>Hospital Volume-Outcome Association?</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal Cancer Resection</td>
<td>N/A (no study identified)</td>
<td>Weak (mortality); None (LOS and complications)</td>
<td>Kozower and Stukenborg (2012); Meguid et al (2009)</td>
</tr>
<tr>
<td>Lung Cancer Resection</td>
<td>N/A</td>
<td>Weak (longer term mortality); None (inpatient mortality)</td>
<td>Rosen et al (2014); Kozower and Stukenborg (2011); Cheung et al (2009)</td>
</tr>
<tr>
<td>Pancreatic Cancer Resection</td>
<td>N/A</td>
<td>Strong (mortality; LOS)</td>
<td>Swanson et al (2014); Hollenstein et al (2007)</td>
</tr>
</tbody>
</table>

**Defining the type of surgeon volume that influences the outcomes for open abdominal aortic aneurysm repair**

J. Gregory Modrall, MD, a,b Eric B. Rosero, MD, a,b Jayer Chung, MD, b Frank R. Arko III, MD, b R. James Valentine, MD, b G. Patrick Clagett, MD, b and Carlos H. Timaran, MD, a,b *Dallas, Tex*

**Surgeon case volume, not institution case volume, is the primary determinant of in-hospital mortality after elective open abdominal aortic aneurysm repair**

James T. McPhee, MD, *William P. Robinson III, MD,* Mohammad H. Eslami, MD, b Elias J. Aroon, MD, b Louis M. Messina, MD, b and Andres Schanzer, MD, b *Worcester, Mass*
13 Years of Continuous Learning

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

Military Surgeon Case Volumes

Saving the Military Surgeon: Maintaining Critical Clinical Skills in a Changing Military and Medical Environment

COL Mary J Edwards, MD, FACS, M
COL Christopher White, MD, FACS
COL Stacy Shackelford, MD, FACS, F
Evaluation of Low Volume High Acuity Surgical Procedures based on NSQIP – MHS vs CIV

**Takeaways**
- Represents 85% of complex surgical cases performed in MHS (MTFs > 5 years with NSQIP)
- MHS MTF rates comparable/better than civilian rates

**Procedure Index**
- AAA= Abdominal Aortic Aneurysm
- BAR= Bariatric Surgery
- CEA= Carotid Stenting
- ESO= Esophagectomy
- LUN= Lung cancer resection
- PAN = Pancreatic cancer surgery
- PRO= Rectal Cancer Surgery
- THA= Total hip arthroplasty
- TKA= Total knee arthroplasty
- AVE= Average

### Complication Rates

<table>
<thead>
<tr>
<th>Complication Rate</th>
<th>AAA</th>
<th>BAR</th>
<th>CEA</th>
<th>COL</th>
<th>ESO</th>
<th>LUN</th>
<th>PAN</th>
<th>PRO</th>
<th>THA</th>
<th>TKA</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHS</td>
<td>1.65</td>
<td>1.2</td>
<td>1.2</td>
<td>1.5</td>
<td>0.5</td>
<td>1.8</td>
<td>2</td>
<td>1.3</td>
<td>1.1</td>
<td>1.2</td>
<td>1.4</td>
</tr>
<tr>
<td>CIV</td>
<td>2.1</td>
<td>1.4</td>
<td>1.5</td>
<td>1.7</td>
<td>2.6</td>
<td>1.8</td>
<td>1.9</td>
<td>1.6</td>
<td>1.2</td>
<td>1.2</td>
<td>1.7</td>
</tr>
</tbody>
</table>

### Survival Rates

<table>
<thead>
<tr>
<th>Survival Rate</th>
<th>AAA</th>
<th>BAR</th>
<th>CEA</th>
<th>COL</th>
<th>ESO</th>
<th>LUN</th>
<th>PAN</th>
<th>PRO</th>
<th>THA</th>
<th>TKA</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHS(%)</td>
<td>100</td>
<td>99.9</td>
<td>98.3</td>
<td>99</td>
<td>100</td>
<td>99.4</td>
<td>94</td>
<td>98.3</td>
<td>99.8</td>
<td>99.9</td>
<td>98.7</td>
</tr>
<tr>
<td>CIV(%)</td>
<td>86.2</td>
<td>99.9</td>
<td>98.3</td>
<td>96.7</td>
<td>96.4</td>
<td>98.6</td>
<td>98</td>
<td>98.7</td>
<td>99.3</td>
<td>99.9</td>
<td>97.3</td>
</tr>
</tbody>
</table>

- Managing the Challenge of the Relationship between Low Volume Surgery and Quality

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**Deployment Effect**

**Perceived effects of deployments on surgeon and physician skills in the US Army Medical Department**


aDepartment of Surgery, bDepartment of Obstetrics and Gynecology, and cDepartment of Medicine, Anderson Simulation Center, Madigan Army Medical Center, Uniformed Services University of the Health Sciences, University of Washington School of Medicine, Tacoma, WA, USA

- Skills eroded after 6 months (perceived)
- 1-6 months to re-acquire complete comfort
- 3-6 month deployments best
- Ideal time between deployments not asked
- Most discomfort with cognitive skills (not technical)
Deployment Effect

- Repeated survey with more procedure-specific questions
  - Discomfort with open abdominal solid organ procedures was greatest
  - Discomfort with bariatrics was second but only when stratifying between bariatric surgeons and non-bariatric surgeons

- Measured Surgeon Technical Skills
  - Analyzed by a standard virtual simulator
  - No skill degradation measured in virtual FLS or simple GS and GYN procedures (Lap Chole, Lysis of Adhesions and Lap BSO)
Laparoscopic Cholecystectomy

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-deployment</th>
<th>Post-deployment</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Time to Complete</td>
<td>7.9 +/- 2.4 (min)</td>
<td>6.6 +/- 3.9 (min)</td>
<td>0.16**</td>
</tr>
<tr>
<td>Exceeded Procedure Time</td>
<td>2/11</td>
<td>2/11</td>
<td>1.00**</td>
</tr>
<tr>
<td>(TRUE/FALSE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Electrosurgery Time (sec)</td>
<td>29.2 +/- 6.6 (sec)</td>
<td>30.7 +/- 23.2 (sec)</td>
<td>0.81**</td>
</tr>
<tr>
<td>Total Blood Loss (cc)</td>
<td>30.5 +/- 46 (cc)</td>
<td>60.0 +/- 119 (cc)</td>
<td>0.39**</td>
</tr>
<tr>
<td>% of Tissue Covering Calots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triangle Dissected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Clips Placed</td>
<td>8.2 +/- 2.1</td>
<td>6.6 +/- 3.5</td>
<td>0.17**</td>
</tr>
<tr>
<td>Number of Clips Dropped</td>
<td>0.72 +/- 1.4</td>
<td>0.90 +/- 1.8</td>
<td>0.82**</td>
</tr>
<tr>
<td>Total Hand Path Length</td>
<td>11.6 +/- 2.6 (m)</td>
<td>9.8 +/- 6.2 (m)</td>
<td>0.30**</td>
</tr>
</tbody>
</table>

** Paired t-test

Post-deployment scores trended toward better results except blood loss (NS)

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

The Cycle of the Military Surgeon (or physician/nurse/medic)

Deployed -
Variable clinical experience

Individual Refresher Training

Medical Team Training

Working hard at home -
Making up for potentially degraded skills

Skills Maintenance

Train-up for deployment -
Variable value (usually done at remote sites away from home)

Individual Deployment Medical and Trauma Training

Managing the Challenge of the Relationship between Low Volume Surgery and Quality
Quality Initiatives: The strength of collaboration

- NSQIP
- SCOAP
- Michigan Collaborative
- South Carolina
- All have shown improved outcomes in low and high volume centers

### MHS Performance: Mortality and Morbidity

<table>
<thead>
<tr>
<th>Medical Center</th>
<th>July '12-June '13</th>
<th>July '13-June '14</th>
<th>Jan '14-Dec '14</th>
<th>Jan '15-Dec '15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mortality</td>
<td>Morbidity</td>
<td>Mortality</td>
<td>Morbidity</td>
</tr>
<tr>
<td>AIR FORCE</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>ARMY</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>NAVY</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>NCR</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

- * Exceeds Standards
- * Meets Standards
- * Needs Improvement
- Data Unavailable
Going to Zero!

**Individual surgeon competency**
- Initial training
- Ongoing learning and assessment
- Experience (volume or years?)
- Peer review
- Insight
- 360 evaluations
- Risk adjusted outcomes
- A mindset change on dealing with error, blame, and the willingness to embrace and trust the system we are a part of – LEADER PRESENCE on all levels

---

**A BROAD ARRAY OF IMPROVEMENTS**
- Individual surgeon competency
  - Residency
  - Ongoing learning and assessment
  - Volume
- Inter-professional team training
- Hospital systems (Break down silos)
- National Healthcare Systems
  - [not “A National Healthcare System” – or should it be?]
A Proposed “Pre-Flight” Checklist

- How many cases of this kind have I done?
- When was the last one I did?
- Have I done similar cases of equal complexity?
- Is this an easy case of this type? (case selection)
- Is there a simulator I can practice on?
- What are my outcomes?
- What are my system’s outcomes?
- Day of surgery: Is there anything missing?
  - Yes => cancel case

A practical application of what to do in applying a system’s approach with simulation intervention
Small Hospital Clinical Skills Enhancement

Gregory B. York, Col, USAF, MC, FS
Surgical Services Consultant to the USAF/SG
Chief, Provision of Medical Care Division
Air Force Medical Operations Agency
(AFMOA)

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

This presenter has nothing to disclose

Nothing to Disclose

I have no relevant financial or nonfinancial relationship(s) within the services described, reviewed, evaluated or compared in this presentation.
Overview

- Surgical Volume vs Quality
  - The Facility
  - The Surgeon
  - The Literature
  - Associations

- The Environment(s)

- Way Forward

- Small Hospital Clinical Skills Enhancement

Surgical Volume vs Quality

- The Facility
  - Higher hospital volume is associated with better patient outcomes
  - Strength of association is VARIABLE
  - Strongest associations are with more complex/less frequent procedures
  - Mortality may be more related to systemic issues (staffing, technology, teaching status) versus complications
Surgical Volume vs Quality

The Surgeon
- In aggregate, high volume surgeons have better outcomes – but much variability
- Some large institutions have self-imposed volume thresholds
- Experience, years in practice, and “full-time” status have been shown to be important to outcomes – maybe more than volume
- High volume surgeons may provide care at a lower cost

Study Design
- Mortality is the MOST commonly studied outcome
- Complication rates or failure to rescue may be more appropriate
- Volume Definitions differ across studies: Low, Medium, High
- Most studies use volume ONLY and lack consideration for skill levels, staffing ratios, technology, GME presence, etc.

Organizations
- Promote referrals based on volume guidelines
- Surgical Societies
  - Acknowledge the “issue”
  - Few have recommended/set volume standards
- Little data on effectiveness of setting minimum volume standards
Volume – Quality Association

- CAUSAL relationship has NOT been established
- Mortality related to complications?
  - Vs increased failure to rescue
  - Failure to rescue is a systemic issue
- The Problem IS MULTIFACTORIAL
- There ARE low volume hospitals with good outcomes

Factors in Quality Surgical Outcomes

- Volume: Hospital & Surgeon
- Clinical Practice Guidelines/Protocols
- Specific Procedure(s)
- Staffing Ratios
- Teaching Status (ie. GME, etc.)
- Surgeon Experience
- Technology
The Environment

Small/Rural Hospitals

- **Criteria**
  - Fewer than 100 beds
  - 4,000 or fewer admissions annually
  - Located outside metropolitan area

- **Characteristics**
  - May be a “Critical Access” Hospital
  - Care to “geographically-challenged” areas
  - Approximately half of U.S. Hospitals
  - 23% of U.S. population lives in a rural area
  - Only care available

Military Hospitals

- Generally healthy population
- Many with less than ADPL of 20
- Compared to civilian facilities/surgeons
  - Most military hospitals are “small” hospitals (78%)
  - Many military surgeons are “low volume” surgeons

“Small” Military Hospitals

- Location: Mission-specific/Readiness
- Many overseas locations
- Only care available
- Many junior staff
Way Forward

The Facility – Recapturing “Currency”
- Re-evaluation of Business Practices
  - Capabilities listing/Referral Management
  - Staffing Models
  - Marketing Strategies
- Reformation of Clinical Processes
  - Making room for “more business”
  - Clinic/OR/Ward efficiencies – “safety & quality focus”
  - Non-value added tasks
- Growing eMSM partnerships
- Growing DoD/VA healthcare partnerships

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

Way Forward

The Surgical Team
- Civilian Initiatives
  - Military Health System Strategic Partnership with the American College of Surgeons (MHSSPACS)
  - Military Health System – Institute for Healthcare Improvement Strategic Partnership
  - National Surgical Quality Improvement Program (NSQIP ®)
  - Ambulatory Surgery Center Association
- Service Initiatives
  - Small Hospital Clinical Skills Enhancement (SHCSE) Program (USAF)
  - Regional Currency Sites

Managing the Challenge of the Relationship between Low Volume Surgery and Quality
SHCSE - Overview

Program Priorities
- Patient safety and quality care are high priorities
- Clinical skills enhancement through tiered approach

Tiered Approach
- AFMS “Trusted Care” – HRO Principles
- TeamSTEPPS®
- Event-Based Simulation Team Training
- Critical Specialty Expert Staffing
- Telemedicine

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

AFMS “Trusted Care”

Concepts
- Culture of Safety
- Continuous Process Improvement
- Leadership Commitment

Operations
- Leadership HRO Course / Educational Opportunities
- Leadership Rounds – Weekly requirement
- Prioritize quality and patient safety
- MTF Performance Improvement plans
TeamSTEPPS®

Concepts
- Highly effective medical teams optimizing people, resources, and information
- Improved information sharing – COMMUNICATION

Operations
- TeamSTEPPS® Training – Within 6 months of arrival
- Workcenter Huddle Checklist – Daily requirement
- Performance Observation Tool – Monthly requirement

Event-Based Simulation Team Training

Concepts
- Increase healthcare team skills/confidence/communication
- Scenario design related to current safety and quality issues

Operations
- AFMMAST Collaboration
- Structured Monthly Topics/Scenarios
- Monthly Requirement: Minimum 1 scenario/team
Critical Specialty Expert Staffing

Concepts
- AFMS maintains a wealth of clinical expertise
- Sharing of critical specialty expertise
- Mentoring and oversight for junior staff

Operations
- DEROS/Assignment 24 month Curtailment
- Senior Mentor Rotation – 3 months/year; specific curriculum
- Currency Augmentation – Critical specialties to currency site (i.e. RCS, C-STARS, etc.)

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

Conclusion

Low Volume Surgical Facilities
- Patient demand necessitates existence
- Required for the Military mission
- Can have good outcomes

Low Volume Surgeons
- A "product" of the system
- “Other” factors are significant

VOLUME cannot be the SURROGATE of Quality

The ISSUE is MULTIFACTORIAL – so must be the SOLUTION!
Managing the Challenge of the Relationship between Low Volume Surgery and Quality

This presenter has nothing to disclose

Leveraging Culture

Eric Elster, MD, FACS
CAPT, MC, USN
Professor and Chair
USU Walter Reed Surgery

December 6, 2016
Nothing to Disclose

I have no relevant financial or nonfinancial relationship(s) within the services described, reviewed, evaluated or compared in this presentation.

Military Culture and Healthcare

- Military has been able to adapt to change on a dynamic basis and incorporate new technology and strategy
- Pace has been slower in medicine, no more so then in the area of safety and the culture behind implementing such changes
- In this regard, both the military and surgery share the same problems and challenges, however the military has evolved at a more rapid pace
Operational Risk Management

- Culture of safety without sacrificing operational capability
- The key cultural elements
  - Structure and principles
  - Direct leadership support
  - Communication
- Across the spectrum of military operations throughout a decade of conflict

Lessons from Cardiac and Transplant Surgery

- Team Approach
- Role of Attending Surgeon
- Outside Support
- Standardization
- Outcomes Review
Team Approach

- At least two attending-level surgeons involved in every patient’s pre-operative, intraoperative, and postoperative care
- Ensure "ancillary" personnel have significant prior experience with care of complex surgery patients at higher volume centers
  - Perfusionists
  - Coordinators
  - Anesthesia
  - ICU Nursing Staff

Role of Attending Surgeon

- Heavy direct attending surgeon involvement in post-operative care
- No significant clinical decisions delegated
- All urgent/significant clinical decisions involve input of multiple attending-level surgeons
Use of Outside Support

Outside "expert" assistance available for complex or particularly high-risk cases (at a minimum):
- Expands armamentarium to procedures outside local level of independent comfort/training
- Facilitates greater levels of patient reassurance, quality assurance, and institutional protection

Standardization

- Practical importance at high-volume centers (for efficiency purposes)
- Even more critical for quality at low-volume surgery program to minimize variability
- Standards should be “conservative”
- Surgical techniques, equipment, postoperative management, etc.
- Also contributes to cost savings
Outcomes Review

- All outcomes tracked continuously and rigorously using risk-adjusted analysis
- All events reviewed in both institutional and military-wide settings
- Every cardiac and transplant surgical case followed by debrief amongst involved attending surgeons to discuss any opportunities for improvement

Cardiac Surgery Outcomes

### Table: Observed and expected complication rates, cardiac surgery, FY-15 Society of Thoracic Surgeons (STS) index cases (75 cases)

<table>
<thead>
<tr>
<th></th>
<th>Renal Failure</th>
<th>Prolonged Ventilation</th>
<th>Deep Wound Infection</th>
<th>Reoperation</th>
<th>CVA</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observed (O)</strong></td>
<td>2.8% (2)</td>
<td>10.8% (8)</td>
<td>1.3% (1)</td>
<td>9.3% (7)</td>
<td>1.3% (1)</td>
<td>1.3% (1)</td>
</tr>
<tr>
<td><strong>Expected (E)</strong></td>
<td>4.9%</td>
<td>12.6%</td>
<td>0.5%</td>
<td>7.1%</td>
<td>1.5%</td>
<td>2.9%</td>
</tr>
<tr>
<td><strong>O:E Ratio</strong></td>
<td>0.57</td>
<td>0.86</td>
<td>2.6</td>
<td>1.31</td>
<td>0.87</td>
<td>0.45</td>
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</tbody>
</table>

### Table: Observed and expected complication rates, cardiac surgery; LEFT: FY-15 Euroscore index cases (25 cases); RIGHT: All cardiac case 30-day mortality (100 cases)

<table>
<thead>
<tr>
<th></th>
<th>4b</th>
<th>Mortality</th>
<th>4c</th>
<th>Mortality</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Observed (O)</td>
<td>0%</td>
<td>Observed (O)</td>
<td>1% (1)</td>
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<tr>
<td></td>
<td>Expected (E)</td>
<td>8.5%</td>
<td>Expected (E)</td>
<td>4.3%</td>
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<td></td>
<td>O:E Ratio</td>
<td>NA</td>
<td>O:E Ratio</td>
<td>0.23</td>
</tr>
</tbody>
</table>
Transplant Volume

OPTN Transplant Data

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

Transplant Outcomes

Managing the Challenge of the Relationship between Low Volume Surgery and Quality

http://optn.transplant.hrsa.gov/

http://srtr.org
Lessons Learned

- Leadership embraces ORM culture
- Teamwork and multi-disciplinary care
- Standardization
- Understanding limitations
- Outcomes review
- Ownership

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- CAPT Eric Elster MC USN (USU WR Chair)