The Added Value of the Perioperative Surgical Home

Keith A. (Tony) Jones, M.D.
Alfred Habeeb Professor and Chair
UAB Department of Anesthesiology and Perioperative Medicine
Conflicts of Interest

I regret that I have nothing to disclose
Objectives

• Review the national trends driving new opportunities (for anesthesiologists) to help hospitals achieve the “Triple Aim” of healthcare;
• Understand the CMS goals of value-based purchasing including Bundled Payments;
• Make the case for the PSH as a value-added care model; and
• Describe the UAB experience with the PSH: how we started, progress to date, and what we are doing now
Health Expenditures of OECD Countries (2011)-$ Per Capita

Source: OECD Health Data 2013, June 2013
Life Expectancy at Birth of OECD Countries: 2009

Source: OECD Health at a Glance, 2011
Ischemic Heart Disease: Number of Deaths Per Population Size

Source: OECD Health at a Glance, 2011
Variations in Practice and Spending
The Aging United States Population

Number of Americans 65 years and older (millions)

Projected Rise in Cases of Chronic Diseases, 2003-2023

Percentage Increase in Disease Prevalence in Patients > 65 Years of Age

- Cancers: 62%
- Mental Disorders: 54%
- Diabetes: 56%
- Heart Disease: 41%
- Hypertension: 39%
- Pulmonary Conditions: 31%
- Stroke: 29%

The Perfect Storm

• High, unsustainable, and *variable* rising cost
• Less favorable health statistics
• ACA and CMS payment models:
  – VBP
  – Payment reduction programs
• Increasing demand
  – Greater access
    • ACA
    • Aging Population
  – Greater disease burden
Objectives

• Review the national trends driving new opportunities (for anesthesiologists) to help hospitals achieve the “Triple Aim” of healthcare

• Understand the CMS goals of value-based purchasing including bundled payments

• Make the case for the PSH as a value-added care model

• Describe the UAB experience with the PSH : how we started, progress to date, and what we are doing now
Factors Contributing to High Cost

• Surgical care accounts for 52-62% of hospital admission expenses
• Some contributing factors
  – Fragmentation of care
  – Inefficiencies of care delivery models
  – Defensive medicine
  – Discordant incentives
  – Low emphasis on value
  – Perioperative complications
  – Futile spending and ineffective care
  – Minimal consumer transparency
The Change From Volume- to Value-Based Payments

• There is currently no incentive for better outcomes since increased utilization = increased payment
• Requiring providers to take ownership of their outcomes through financial means = higher quality and greater value to society
Healthcare Value Equation

Quality + Safety + Efficiency = Value

Total Cost - MSPBM*

*Medicare Spending per Beneficiary Measure
Goals for the CMS Initiatives

- Improve clinical quality
- Fix problems of underuse, overuse and misuse
- Encourage patient-centered care
- Reduce adverse events and improve safety
- Avoid unnecessary costs in care delivery
- Stimulate re-engineering of care delivery models
- Make performance transparent to consumers
- Reduce/prevent disparities
The Drivers of Value-Based Healthcare

- Increased Value
  - Centers for Medicare & Medicaid Services (CMS)
    - HRRP/HACRP/VBPP
  - Accountable Care Organizations (ACOs)
    - Population Health Management
  - Commercial Insurers
    - Specialty Care Programs
  - Regional Care Organizations (RCOs)
    - Medicaid Opt-Out States
  - Large Employers
    - Centers of Excellence
  - Patients
    - Greater Out-of-Pocket Expenses

- The Drivers of Value-Based Healthcare
Objectives

• Review the national trends driving new opportunities (for anesthesiologists) to help hospitals achieve the “Triple Aim” of healthcare
• Understand the CMS goals of value-based purchasing including Bundled Payments
• Make the case for the PSH as a value-added care model
• Describe the UAB experience with the PSH: how we started, progress to date, and what we are doing now
Accomplishing the Triple Aims So That Everyone Wins?

TRIPLE AIM 1
Improve the individual experience of surgical care

TRIPLE AIM 2
Improve health of the defined surgical population

TRIPLE AIM 3
Reduce/control per capita cost of surgical care

Surgical Triple Aim INTEGRATOR
Perioperative Surgical Home Model
One Definition of the Perioperative Surgical Home

- Patient-centered, *(institution-led)* interdisciplinary and team-based system of coordinated care that guides the patient through the entire surgical continuum, from the decision for the need for surgery to discharge from a medical facility and beyond.

- Its greater integration and alignment seek to deliver an enhanced surgical experience, recovery, and outcomes.

*Source: American Society of Anesthesiologists Committee on Future Models of Anesthesia Practice (March 2013)*
Donabedian Model for Examining Healthcare Services and Quality

Structure Structure Outcome
Anesthesia Care Sites
UAB Highlands Hospital

- 140 Beds (10-15 patients)
- 32 Surgeons
- 16 ORs, 1 endoscopy suite, 2 regional block suits (19 sites and 12,000 cases annually)
- Outpatient Pain Treatment Clinic
- Physical Rehabilitation
- 10-bed medical-surgical ICU (5-8 patients)
- 23-hour stay unit (5-8 patients)
UAB Highlands Hospital

• Orthopedic Surgery (75% of surgical cases)
  – Bone and Joint Program
  – Fragility Fracture Program
  – Chronic Pain and Supportive Care Management

• Geriatric Medicine-Hospitalists

• General Internal Medicine-Hospitalists
  – All subspecialty medicine consults from UH
  – Cardiology on site

• General Surgery, GI Surgery, Urology, Plastic Surgery, ENT, Neurosurgery (gamma knife)
UAB University Hospital

- Level 1 trauma center with 1020 beds
- 7 departments (128 surgeons/proceduralists)
- 52 ORs, 4 endoscopy rooms, 4 EP rooms (53,000 anesthetics annually)
- 5 ICUs
  - SICU (20 beds), NSICU (42 beds), CICU/ECMO (20 beds), TBICU (26 beds)
- 24-7 inpatient pain service
- 24-7 obstetric service
What Problems Are We Trying to Fix at Highlands Hospital?

- Incomplete-inconsistent patient preparation for surgery
- Incomplete-inaccurate medication reconciliation
- Incomplete documentation of patient co-morbidities
- Prolonged assessment-consultation
- Irregular-inefficient patient throughput and scheduling
- Persistent case delays and cancellations
What Problems Are We Trying to Fix at Highlands Hospital?

- Lower than desired patient and family satisfaction
- Higher than desired patient readmission rates
- Poor HCAHPS pain scores
- Greater than desired morbidity and mortality
- Difficulty with compliance with key performance measures
- Excessive and variable cost per episode of surgical care
- Continued failure to rescue and never events
- Poor discharge planning
PSH Structure at Highlands

- Preoperative Assessment, Consultation, Treatment Clinic (2010)
- Multispecialty Anesthesia Services (2008)
- Perioperative Pain Management (2009)
- Medical-Surgical Critical Care Management (2012)
- Postoperative Care Management (2012)
Leveraging the ICU Team to Extend to Perioperative Care

- ACCM Physicians, Fellows, and 6 APPs
- APP floor presence (2 FTEs)-triage and risk stratification
- Informatics for MEWS
- MET
Total Patient Encounters

<table>
<thead>
<tr>
<th>Month</th>
<th>ICU</th>
<th>HAMM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-13</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Dec-13</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>Feb-14</td>
<td>400</td>
<td>100</td>
</tr>
<tr>
<td>Apr-14</td>
<td>500</td>
<td>100</td>
</tr>
<tr>
<td>Jun-14</td>
<td>600</td>
<td>100</td>
</tr>
<tr>
<td>Aug-14</td>
<td>700</td>
<td>100</td>
</tr>
<tr>
<td>Oct-14</td>
<td>800</td>
<td>100</td>
</tr>
<tr>
<td>Dec-14</td>
<td>900</td>
<td>100</td>
</tr>
<tr>
<td>Feb-15</td>
<td>1000</td>
<td>100</td>
</tr>
<tr>
<td>Apr-15</td>
<td>1100</td>
<td>100</td>
</tr>
<tr>
<td>Jun-15</td>
<td>1200</td>
<td>100</td>
</tr>
<tr>
<td>Aug-15</td>
<td>1300</td>
<td>100</td>
</tr>
</tbody>
</table>
Funds Flow Revenue ($)


ICU  HAMM
The Perioperative Continuum

PACT

OR

Postop
Preoperative Value Stream Pilot

- Surgical Clinic Evaluation and Decision to Operate
- Surgical Posting of Case on OR Schedule
- PACT Clinic Evaluation, Optimization, and Clearance
- Patient Arrives on DOS with "Anesthesia Clearance"*
PACT Interventions to Optimize Patient-Family Experience and Patient Outcomes

- Patient info, edu, and instruction*
- Pain Rx planning and consent
- Max blood ordering schedule
- Anticoag standardized
- Vascular Stent Guidelines
- Preoperative anemia management
- PROMPT™ (62)**

* Vetter, TR: Anesthesiology 2014

**Perioperative Risk Optimization and Management Planning Tool
Relationship Between Blood Transfusion and Sigmoid Cancer Recurrence

Transfusion Complications

- Cancer survival
- Infections
- Lung injury
- Multi-system organ failure
- Thrombosis
Blood Conservation Initiative: #RBCs Transfused Annually
The Perioperative Continuum

“Virtual Stepdown” ICU
## Baseline Statistics (Median)

<table>
<thead>
<tr>
<th></th>
<th>Patient Census</th>
<th>Readmit (#)</th>
<th>Readmit (%)</th>
<th>Total ICU Mortality</th>
<th>Readmit ICU Mortality</th>
<th>Hospital LOS</th>
<th>Readmit Hospital LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UH SICU</td>
<td>1443</td>
<td>131</td>
<td>9.07%</td>
<td>76/ 5.26%</td>
<td>32/24.4%</td>
<td>4.9 days</td>
<td>12.8 days</td>
</tr>
<tr>
<td>Literature*</td>
<td></td>
<td>6-7%</td>
<td>3.6 (%)</td>
<td>21.3%</td>
<td></td>
<td>4.5 days</td>
<td>13.3 days</td>
</tr>
</tbody>
</table>

December 2012 through November 2013

<table>
<thead>
<tr>
<th>CY 2013-2014</th>
<th>Readmitted to an ICU</th>
<th>Not readmitted to an ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charges</td>
<td>$264178.70</td>
<td>$123973.50</td>
</tr>
<tr>
<td>Direct Costs</td>
<td>$37765.07</td>
<td>$17230.35</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$58811.81</td>
<td>$27103.11</td>
</tr>
</tbody>
</table>
Leveraging the ICU Team to Extend to Perioperative Care at NP

- ACCM Physicians, Fellows, Residents, and APPs
- APP floor presence (2.5 FTEs) - triage and care stratification
- Medical Emergency Team
- Informatics for MEWS
Donabedian Model for Examining Healthcare Services and Quality

Structure  Process  Outcome
Anesthesiologist Impact on Surgical Outcomes

• Studied 7,920 Patients
  – Undergoing Isolated CABG in 2009-2010
  – New York State Cardiac Surgery Reporting System
  – Included
    • 91 Anesthesiologists
    • 97 Surgeons
    • 23 Hospitals

Glance et al: Anesthesiology 2015;120:530
Anesthesiologist Impact on Surgical Outcomes

• Risk factors
  – Age
  – Sex
  – Obesity
  – Cardiac disease severity
  – Comorbidities

• Primary outcome – composite of 4 factors
  – Death
  – Q-wave MI
  – Renal failure
  – Stroke

● Studied outcomes occurring anytime during hospitalization
Anesthesiologist Impact on Surgical Outcomes

Glance et al: Anesthesiology 2015;120:530
Anesthesiologist Impact on Surgical Outcomes

Glance et al: Anesthesiology 2015;120:530
Anesthesiologist Impact on Surgical Outcomes

Maxwell BG, Hogue CW, Pronovost PJ: Anesth Analg 2015; 120: 500
The Process of Increasing Value

UAB Care

Foundation For the Future

Chartis

Cost Efficiency
Care Variability Reduction and Outcome Improvement Strategies

- Structure Perioperative Medicine
- Process PROMPT™ (DRGs)
- Process ERAS/ICPs (CPTs)

Reduce Care Variability
• Task-orientated care plans that detail the essential steps or elements in the care of all patients undergoing a specific surgical procedure

• Then collect data to highlight and address any lack of process standardization and resulting inefficiencies, rework, and waste
Perioperative Risk Optimization and Management Planning Tool

• Conventional national clinical practice guidelines can have limited local clinician buy-in and adoption

• **PROMPT™** is a task-orientated care plan that details the essential steps or elements in the care of all patients with a specific co-morbidity

• Local clinician-designed/driven approach:
  – Accommodates patients' individual differences
  – Respects and **seeks** local providers' clinical acumen
  – Keeps pace with the rapid growth of medical knowledge
Some examples of PROMPT™:

- PONV; intraoperative protective lung ventilation; postoperative delirium; patient-centered blood management; perioperative anticoagulant therapy; OSA; anemia

PROMPT™ is not prescriptive “cook-book” medicine but a local best practices-based decision support tool.
PROMPT® Strengthen ERAS/ICP

PROMPT™

Care Plan

ICP/ERAS

Risk
Outcome
Satisfaction

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
ERAS/PROMPT™ PROCESS

1. PLAN
   - Draft (revise) PROMPT™ and disseminate to stakeholders
   - Period of electronic commentary and dialogue by stakeholders
   - Final version of PROMPT approved by PROMPT Steering Committee

2. DO
   - Collect pre-intervention clinician practice pattern, outcomes, fiscal data
   - Implement PROMPT™

3. STUDY
   - Collect post-intervention data
   - Analyze these pre- versus post-intervention data
   - Collect clinician input on reasons for “opt out”

4. ACT
   - Report post-intervention clinician performance, patient outcomes and fiscal data
   - Revise existing PROMPT based upon clinician feedback, data, and any new published evidence

Series of PDSA cycles
People Do What You Measure

- Surgical Schedule
- Dashboard®
- CERNER
- AIS
- Others
Tidal Volume Per Ideal Body Weight

- n = 996 of 16062
- Mean = 7.6
- S.D. = 1.9
Objectives

- Review the national trends driving new opportunities (for anesthesiologists) to help hospitals achieve the “Triple Aim” of healthcare
- Understand the CMS goals of value-based purchasing including Bundled Payments
- Make the case for the PSH as a value-added care model
- Describe the UAB experience with the PSH: how we started, progress to date, and what we are doing now
Healthcare Value Equation

Quality + Safety + Efficiency = Value

Total Cost - MSPBM*

*Medicare Spending per Beneficiary Measure
Operating Room Throughput Initiative:
Current OR Utilization

<table>
<thead>
<tr>
<th></th>
<th>UH (excl. Cysto and Endo)</th>
<th>HH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilized</td>
<td>69%</td>
<td>58%</td>
</tr>
<tr>
<td>Available</td>
<td>31%</td>
<td>42%</td>
</tr>
</tbody>
</table>

UH (excl. Cysto and Endo) | 69% Utilized | 31% Available |
HH | 58% Utilized | 42% Available |
Donabedian Model for Examining Healthcare Services and Quality

Structure  Process  Outcome
OR Throughput Initiative: Committee Structure and Purpose Statements

**Perioperative Chairs**
- Makes recommendations and decisions regarding effective functioning of Perioperative Services, including: policy development and adherence, clinical practice, patient safety, operations, facilities, and equipment.

**HS Perioperative Services Mgmt Group**
- Provides input and recommendations to Executive Committee and ensures effective communication among Medical and hospital staff.

**OR Executive Committee**
- Sets strategic direction and vision for Perioperative Services; final decision making group for policies, behavioral standards, faculty and staff education and capacity.
- Makes recommendations and decisions regarding effective functioning of Perioperative Services, including: policy development and adherence, clinical practice, patient safety, operations, facilities, and equipment.

**University Advisory Committee**
- Ensures local operations and care delivery are consistent with policies, procedures and standards of care established by Chairs, OR Executive Committee and regulatory and legal bodies. Ensures delivery of safe and effective patient care within each geography.
OR Throughput Initiative: Areas of Focus

1. **Block schedule:** Does allocation of block time match demand by service?

2. **Posting practices:** Are there opportunities to manage block release based on scheduling patterns for elective cases?

3. **Multiple rooms running:** How often are surgeons operating in more than one room?

4. **First case start time:** Are there gaps at the beginning of the day based on cases starting later than 7am?

5. **Surgeon and room turn around time:** Are there opportunities to reduce down time through more efficient turn around?
Utilization of total block time is highly variable across services.
OR Throughput Initiative: First Case Starts

13% of first cases start more than 2 hours after the ORs “open”. 
OR Throughput Initiative: Re-allocation of Surgical Block Time (April 2014)
OR Throughput Initiative: Utilization (2014)

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Available</th>
<th>Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Hospital</td>
<td>77.6%</td>
<td>22.4%</td>
</tr>
<tr>
<td>Highland Hospital</td>
<td>62.8%</td>
<td>37.2%</td>
</tr>
</tbody>
</table>
## OR Throughput Initiative: Aggregate Results

<table>
<thead>
<tr>
<th></th>
<th>Baseline*</th>
<th>May 2014**</th>
<th>May 2015***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilization (%)</td>
<td>64</td>
<td>73</td>
<td>78</td>
</tr>
<tr>
<td>On-time starts (%)</td>
<td>53</td>
<td>92</td>
<td>93</td>
</tr>
<tr>
<td>TAT (min)</td>
<td>47</td>
<td>34</td>
<td>33</td>
</tr>
<tr>
<td>Fraction after 5 pm</td>
<td>0.36</td>
<td>0.17</td>
<td>0.12</td>
</tr>
<tr>
<td>Number of ORs</td>
<td>57</td>
<td>57</td>
<td>53</td>
</tr>
</tbody>
</table>

* July 2012-December 2013  
** y-o-y 4% increase in surgical volume  
*** y-o-y 4.4% increase in surgical volume
Hospital *Quality* Initiatives

- Pharmacist-medication reconciliation (24%) “usable” records
- Point-of-care testing
  - Phlebotomy and ECG (patient care technician)
  - Transthoracic echocardiography (technician)-New
PACT Pharmacist Demonstration Project: Definitions

- Usable- discharging physician able to enter admission medication orders through medication reconciliation function without making corrections or additions of home medications
- Unusable
  - Missing medication
  - Incomplete medication (e.g., dosage missing)
  - Inaccurate medication (e.g., wrong dosage)
  - Duplicate medications
  - Medications patient no longer taking
PACT Pharmacist Demonstration
Project-Triage Process

• Any of the following types of surgery **or**
  – Total joint (hip, knee, shoulder, ankle) replacement
  – Long bone resection (e.g., femur mass resection)
  – ORIF
  – Thyroidectomy
  – Parathyroidectomy with dialysis
  – Abdominal wall reconstruction
  – Nephrectomy

• One of more of the following co-morbidities **and**
  – OSA, CHF, DM, para-quadriplegia, and BMI > 30

• All patients that will be admitted
PACT Pharmacist Demonstration Project:
Percent Usable (11/13’ – 2/14’)

Implementation

Usable (PACT)  Usable (Pharm)  Usable (All)
Improving Value

- Quality
- Cost
- Efficiency
Care Variability Reduction and Outcome Improvement Strategies

Reduce Care Variability

**Structure**
Perioperative Medicine

**Process**
PROMPT™ (DRGs)

**Process**
ERAS/ICPs (CPTs)