Session Objectives

After this presentation, participants will be able to:

- Describe the surgical safety projects- standardized pre-operative medical assessment, team training in the OR, vascular surgery co-management and care of the obese surgical patient

- Discuss strategies and challenges for implementation of the surgical safety projects

- Identify process and outcome measures from the surgical safety projects
Presenters & Disclosure Information

Patricia Kischak, RN, MBA - moderator
Vice President & Chief Nursing Officer, Hospitals Insurance Co.
Nothing to disclose

Cali Santana, MD - co-presenter
Associate Director of Quality, Department of Medicine, Montefiore Medical Center
Associate Professor of Medicine, Albert Einstein College of Medicine
Nothing to disclose

Michael L. Brodman, MD - co-presenter
Professor and Chairman, The Ellen and Howard C. Katz Chairman’s Chair
Department of Obstetrics, Gynecology and Reproductive Science
Icahn School of Medicine at Mount Sinai
Nothing to disclose

Ronald Kaleya, MD - co-presenter
Director, Gastrointestinal Surgical Oncology
Nothing to disclose

I. Michael Leitman, MD, FACS - co-presenter
Senior Associate Dean for Graduate Medical Education
Professor of Medical Education and Professor of Surgery
Icahn School of Medicine at Mount Sinai
Nothing to disclose

Hospitals Insurance Company: Hospital Clients

Maimonides Medical Center
Montefiore Medical Center
Mount Sinai
Mount Sinai Beth Israel
Mount Sinai Brooklyn
Mount Sinai Hospital
Mount Sinai Queens
Mount Sinai Roosevelt
Mount Sinai St. Luke’s
New York Eye and Ear Infirmary of Mount Sinai
Can we improve patient safety? Can we decrease claims?

- Build on Experience with Obstetrics
- Convene Clinical Leadership
- Standardize Care
  - Identify medical comorbidities
  - Quantify risk
  - Optimize patient

Frequency - Open & Closed Claims

- Surgery: 37%
- Other: 17%
- Anesthesiology: 3%
- Radiology: 4%
- Gynecology: 5%
- Emergency Medicine: 7%
- Internal/Family Medicine: 9%
- Medical Specialties: 11%
- Obstetrics: 7%
Client Demographics – Surgeries

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient</td>
<td>34,815</td>
</tr>
<tr>
<td>Same Day Admissions</td>
<td>35,906</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>72,673</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>143,394</strong></td>
</tr>
</tbody>
</table>

Surgical Safety Initiatives

- Pre-op medical assessment
- OR team training (TeamSTEPPS)
- Co-management/perioperative medicine
- Care of the obese surgical patient
Pre-operative Medical Assessment: Evaluation and Optimization of High-Risk Patients

Calie Santana, MD, MHS

39% of high-risk patients did not get preoperative medical assessments

<table>
<thead>
<tr>
<th>Assessment author</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical attending</td>
<td>47</td>
</tr>
<tr>
<td>Medical attending co-signature</td>
<td>14</td>
</tr>
<tr>
<td>No attending co-signature or not present</td>
<td>39</td>
</tr>
</tbody>
</table>

Only 4% had a risk assessment score e.g. RCRI

n = 498, Nov. 2011
FOJP/HIC Hospitals

"Patient is medically clear for surgery"
Process to develop the Intervention

- Content: Surgery, Anesthesia, Medicine
- Audit: Risk score, Recs, Surgeon note
- Message: Targets, NEW Workflows
- Leadership: Performance, Resources
- HARD STOP!: Required for success

Pre-Operative Medical Assessment Form

CONTENT:
Consensus of clinical leadership convened by FOJP/HIC
Implementation of Preoperative Medical Assessment Form (POMAF)

- High-risk inpatients (ASA III-IV, BMI >=40)
  - Medical consult
  - Medical attendings
  - Specialists
  - Attending surgeon must acknowledge

- ADD Same-day cases
  - Preoperative units at Teaching Medicine practices
  - 6 sessions

- Training course on proper assessments

- Quality standards
- Impact on surgical mortality cases

Results: Preoperative Medical Assessment

Assessment (POMAF) Compliance - May 2013 to August 2015

**include Same Day Admit patients**
Results: Preoperative Medical Assessment

Adequacy of Pre-operative Evaluation
According to Anesthesiologists

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre Intervention¹</th>
<th>Post Intervention²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were all preoperative medical problems identified when I first evaluated the patient?</td>
<td>90% 10%</td>
<td>83% 7%</td>
</tr>
<tr>
<td>Were all preoperative medical problems adequately addressed when I first evaluated the patient?</td>
<td>85% 15%</td>
<td>90% 10%</td>
</tr>
<tr>
<td>Were all relevant consults obtained?</td>
<td>88% 11%</td>
<td>94% 6%</td>
</tr>
</tbody>
</table>

¹as of November 2011
²as of November 2014
    "UPH Hospitals"

Results: Preoperative Medical Assessment
(Room for Improvement)

90% of failures stem from SDA cases

- No Surgeon Note: 52%
- No Preop Medical Assessment: 25%
- No Assessment of Surgeon Note: 20%
- No Signatures on Documents: 3%
### Lessons Learned/Next Steps

<table>
<thead>
<tr>
<th>Problems we Anticipated</th>
<th>Initial Strategy</th>
<th>Second-level strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDs not comfortable doing the assessment</td>
<td>Reference Guide</td>
<td>Online Course&lt;br&gt;Revamped guides&lt;br&gt;Mobile App</td>
</tr>
<tr>
<td>Quality of Assessments will be uneven</td>
<td>Start with inpatients</td>
<td>Online Course&lt;br&gt;Restricting credentialing</td>
</tr>
<tr>
<td>Surgeons will refuse to request an assessment</td>
<td>Audit/Feedback</td>
<td>Division Chiefs&lt;br&gt;Surgical Coordinators&lt;br&gt;Pay for Performance</td>
</tr>
<tr>
<td>Surgeons will not acknowledge/implement recommendations</td>
<td>Audit/Feedback</td>
<td>Revamped informed consent&lt;br&gt;Communication/Documentat ion training</td>
</tr>
<tr>
<td>Impact on patient outcomes/safety/claims hard to measure</td>
<td>Concentrate on process</td>
<td>Review surgical mortality cases</td>
</tr>
</tbody>
</table>

#### Pre-Operative Medical Assessment

### Q & A
"…poor care is inevitable when a complicated patient is cared for by myriad individuals who have not been trained to communicate effectively as a team."

Gerald B. Healy, MD, FACS
Presidential Address
93rd Clinical Congress – American College of Surgeons
October 8, 2007

Teamwork

Going from a team of experts to……

An expert team!
OR Team Training (TeamSTEPPS)

TeamSTEPPSTM

Strategies and Tools to Enhance Performance and Patient Safety

Why TeamSTEPPS for the OR?

TeamSTEPPSTM: Benefits Increase Over Time

Neily, J. et al. JAMA 2010;304:1693-1700
TeamSTEPPS Training

- Custom designed program
  - 1.5 day off-site
  - Content
  - Coaching
  - Needs analysis
- Multi-disciplinary faculty and participants

---

**TeamSTEPPS Training**

**Off-site Day # 1**  
Friday, May 11, 2012

- 1:30 – 2:00 Lunch
- 2:00 – 2:10 Welcome
- 2:10 – 3:00 Introduction/Icebreaker
- 3:00 – 3:30 Module 1: Introduction to TeamSTEPPS
- 3:30 – 3:45 Break
- 3:45 – 4:00 Polling Survey
- 4:00 – 5:00 Module 2: Team Structure
- 5:00 – 6:30 Dinner
- 6:30 – 8:20 Module 3: Leadership
- 8:20 – 8:30 Wrap-up, Next Day

**Off-site Day # 2**  
Saturday, May 12, 2012

- 7:00 – 8:00 Breakfast
- 8:00 – 8:15 Overview of the day
- 8:15 – 9:10 Module 4: Situation Monitoring
- 9:10 – 10:00 Module 6: Communication
- 10:00 – 10:20 Module 5: Mutual Support
- 10:20 – 11:00 Break
- 11:00 – 12:40 Module 9: Coaching
- 12:40 – 1:30 Lunch
- 1:30 – 3:30 Breakout sessions-SWOT
- 3:30 – 4:00 Summary-Pulling it together
TeamSTEPPS Training

- Used OR late days for the sessions
- Each hospital trained 800 – 1200 staff
- Videotaped the sessions
- Hospital validated 100% of the OR staff received training

OR Team Training Observations

- Met with 25-30 surgeons, anesthesiologists and nurses
- Reviewed and discussed the TeamSTEPPS tools & strategies
- Identified Brief and Debrief as consistent times to observe team work
- Determined tools & strategies unique for surgery briefings (time-outs)
- Real-time observations performed by dedicated observers, staff in the OR and hospital administrative staff
- Observations performed via OR cameras
Next steps

- Improvement in Briefs and Debriefs
  → Provide real-time feedback

- Expand to other critical areas
  → L & D already done
  → ?E.D., ICUs

- Expand to PACU and hand offs
Background

- Surgical patients are older and the surgery is becoming more complex

- Projected in the next two decades:
  50% rise in surgical cost
  100% rise in surgical complications

- The difference between the “high” and “low” performing hospitals is the RESPONSE to adverse outcomes

Background (cont,d)

- Failure to Rescue: mortality following adverse event in a hospitalized patient

- Complication rates following surgery same in “best performing” and “worst performing” hospitals

  Complications: 24.6 vs 26.9
  Mortality: 3.5% vs 6.9%

  (Ghaferi AA . NEJM 2009;361:1368-750)
Background (cont’d)

● Short term surgical outcomes are determined by the quality of postoperative care
  (Pucher PH Ann Surg 2014;259:222)

● Early intervention by skilled providers improves outcome for deteriorating patients
  (McNeill G, Resuscitation 2013;84:1652-67)

● Surgical residents lack the skill set to manage common co-morbidities; e.g. DM, HTN, ACS, CKD, CHF, COPD

Pre-Emptive Co-Management

![Diagram showing the progression of disease and the role of pre-emptive intervention and rapid response teams.]

Disease Progression

- Compensated Stability
- Decompensating Pseudo-stability
- Physiologic Derangement
- Critical Event

Pre-emptive Intervention

- Rapid Response Team

Opportunity to Rescue

Shift to the Left
Target Population and Implementation

- Goal of co-management is to mitigate the need to “rescue” patients by pre-emptive attention to co-morbidities and clinical deterioration
- Hired “hospitalists” whose ONLY responsibility was co-management of high-risk surgical patients
- Population: patients at risk for peri-operative deterioration
  - ASA ≥ 3
    - All hospitals: vascular expanded to other services

Role of the Co-Managing Hospitalist

- Daily discussion about plan of care.
- Pre-emptively manage medical problems
- Provide medical evaluation before and after surgery
- Communicate with surgeon, nurses, other doctors and team members
- Transition of care to community caregivers, SNFs, and rehabilitation facilities
Outcomes Measured

- Complications using risk-adjusted NSQIP calculator
- Patient, Physician, Nurse and Resident satisfaction
- Readmission: 30 day
- Number of different services consulted
- ICU transfers
- Unplanned re-intubations

Workflow Modifications and Patient Safety
Initiatives Implemented Simultaneously

- 95% of ASA ≥3 undergo a formal pre-operative medical assessment
- Risk stratification by RCRI, POSSUM and NSQIP risk assessment tools
- Co-management of surgical patients by internists
  Initially on ASA >3 Vascular and General surgical patients
- Currently co-managing approximately >400 patients/month throughout the collaborative
NSQIP Risk Calculator Observed/Expected Complications Before and After Implementation

<table>
<thead>
<tr>
<th></th>
<th>2012 n=432</th>
<th>2014 D N=453 (*P&lt; .05)</th>
<th>NSQIP Calculator</th>
<th>Change AE Better / Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>O/E</td>
<td>0.46 O/E</td>
<td>Delta O/E</td>
<td>Expected (%)</td>
</tr>
<tr>
<td>Serious Complication</td>
<td>1.04</td>
<td>0.71*</td>
<td>0.58</td>
<td>3.4</td>
</tr>
<tr>
<td>Any Complication</td>
<td>1.03</td>
<td>0.66</td>
<td>0.37</td>
<td>24.6</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>0.63</td>
<td>0.44</td>
<td>0.19</td>
<td>2.0</td>
</tr>
<tr>
<td>Cardiac</td>
<td>1.48</td>
<td>0.56</td>
<td>0.92</td>
<td>2.8</td>
</tr>
<tr>
<td>Surgical Site Infection</td>
<td>0.74</td>
<td>0.74</td>
<td>-</td>
<td>4.2</td>
</tr>
<tr>
<td>UTI</td>
<td>0.70</td>
<td>0.76</td>
<td>0.06</td>
<td>2.0</td>
</tr>
<tr>
<td>VTE</td>
<td>1.17</td>
<td>0.75</td>
<td>0.42</td>
<td>1.2</td>
</tr>
<tr>
<td>Renal failure</td>
<td>0.75</td>
<td>1.03</td>
<td>0.28</td>
<td>2.0</td>
</tr>
<tr>
<td>Return to OR</td>
<td>1.00</td>
<td>0.51*</td>
<td>0.49</td>
<td>13.0</td>
</tr>
</tbody>
</table>

Subjective Outcomes

- Nursing staff – Safer environment, better communication, improved care for unstable patients
- Residents – Learned medical management
- Patients – Despite pamphlets and education material, there was no perceived benefit
- HCAHPS: Provider and patient satisfaction scores improved
Sustainability

- Estimate 4 hospitalist/100 patients/month
- Need to balance cost (about $1000/pt) and benefit.
- Complications increase hospital costs
  (Zogg Ann Surg 2015 Oct 31 (epub))

<table>
<thead>
<tr>
<th>Complication</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any complication</td>
<td>9100-11000</td>
</tr>
<tr>
<td>Cardiac</td>
<td>4100-6900</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>8000-10000</td>
</tr>
<tr>
<td>UTI</td>
<td>2100-4200</td>
</tr>
</tbody>
</table>

Sustainability

- Our data shows a reduction in “any complication” by ~9/100 patients
- Each “any complication” increases cost by $9-10000/event or $81000/100 patients treated recouping ~$800/pt of the $1000 cost/pt
- This does not include
  - Poorer patient outcomes
  - Loss of opportunity costs for increased LOS
  - Increased liability costs
  - Lower patient satisfaction scores
  - Payment penalties for complications and readmissions
Summary

- Co-management of high-risk surgical patients is an improvement over the traditional medical consult model
- Using pre-emptive, patient-centric, risk-stratified intervention, medical complications are reduced
- Co-management, when applied to an appropriate patient population, is cost-effective and represents a safer surgical care model

Co-management/perioperative medicine

Q & A
Session Objectives

- The participant will understand why patients with morbid obesity are at increased risk following surgery
- The participant will learn opportunities to enhance safety for patients undergoing surgery with morbid obesity
- New technology to monitor patients for apneic episodes following surgery will be discussed
Persons who are naturally very fat are apt to die earlier than those who are slender

-Hippocrates

Just the facts....

- Increased morbidity and mortality
- Increased risk of rhabdomyolysis
- Increased risk in skin breakdown
- Increased incidence of wound infection
- Increased operative time
- Prevalence of obstructive sleep apnea
  - BMI 40-40.9 kg/m2, 74%
  - BMI 50-59.9 kg/m2, 77% per cent.
  - >BMI 60 kg/m2 95%
Obstructive Sleep Apnea

June 20, 2013 Vol. 368 No. 25

A Rude Awakening — The Perioperative Sleep Apnea Epidemic
Stavros G. Mentzosoudis, M.D., Ph.D., Melanie C. Besalides, Dr.F.H., and Madhu Mazumdar, Ph.D.

According to the Centers for Disease Control and Prevention, the rate of sleep disorders dominated, prospective studies to evaluate the impact of OSA and related interventions are avail-

Implementation Process

- Review of pertinent medical literature
- Review of medical malpractice claims
- Content experts (bariatric surgeons) engaged to learn best practices
- Education of nursing, surgeons, anesthesiologists and residents
Obese Surgery Patient Care Map – BMI ≥40

<table>
<thead>
<tr>
<th>Pre-op</th>
<th>Intra-op</th>
<th>Post-op</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing admission assessment</td>
<td>Intubation with presence of two Anesthesia providers</td>
<td>Anesthesia Attending assessment prior to leaving PACU</td>
</tr>
<tr>
<td>DVT Prophylaxis</td>
<td>Compliance with SCIP antibiotic protocol</td>
<td>Nursing protocols: education in mobilization, nutrition, skin care</td>
</tr>
<tr>
<td>Special additional informed consent</td>
<td>Instruments and trocar availability</td>
<td>Bariatric beds, gowns, infrastructure support</td>
</tr>
<tr>
<td>Pre-op medical risk assessment using HIC format</td>
<td>Physical environment, OR tables, gurneys, b/p cuffs</td>
<td>Pain management protocol</td>
</tr>
<tr>
<td>Anesthesia assessment for ASA III, IV patients</td>
<td>Yearly training for OR staff in paraesthesia/pressure sore prevention</td>
<td>Discharge plan reviewed by Attending Surgeon specific for obese patients</td>
</tr>
</tbody>
</table>

### Supplemental Informed Consent for Surgical Procedure for BMI 40 and Over

<table>
<thead>
<tr>
<th>Weight</th>
<th>Height</th>
<th>BMI</th>
<th>Sex</th>
<th>Age</th>
<th>Date</th>
</tr>
</thead>
</table>

Please read each of the items on this form and initial the box to the right of each item if you understand it. Do not initial any boxes or sign this form until you have read each carefully and understood its contents.

**Patient’s name:**

**Planned Surgical Procedure**

The following has been explained to me in general terms and I understand that:

1. I am being asked to sign an additional consent form because my body mass index (BMI), which is calculated from my height and weight, is greater than or equal to 40.
2. I am at high risk for blood clot formation in my legs and/or my lungs. To reduce this risk, I may be given a blood thinner, which can potentially increase the risk of bleeding.
3. New and increased risk of surgical and medical complications, including but not limited to infection, development of pressure sores, swelling, hair loss, respiratory distress, pulmonary edema, respiratory failure, blood clots, heart, liver, kidney, gastrointestinal, and death.
4. I may be given narcotics, medications to help relieve postoperative pain and associated complications or the BMI, varying from a mild to more pronounced, may result in further complications.
5. I have the right to freely decide whether to accept or refuse this treatment, and to withdraw this consent at any time during the procedure.
6. No guarantees have been made to me concerning the results of this procedure.

I hereby voluntarily consent to the performance of the procedure as described above by my surgeon and any other assistants, physicians, nurses, or other medical personnel who may be involved in the course of my treatment. All my questions have been answered satisfactorily.

**Signatures**

**Patient/Parent/Guardian:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**

**Witness:**
Are you a:

1. Ambulatory patients, what discharge pain prescriptions would you write for:
   a. Mild pain score 0-3: Drug: ___________________ Quantity Prescribed: ____________
   b. Moderate pain score 4-6: Drug: ___________________ Quantity Prescribed: ____________
   c. Severe pain score 7-10: Drug: ___________________ Quantity Prescribed: ____________

2. Are you a:
   a. Surgical Attending ___________________ Physician Assistant ___________________ Nurse Practitioner ___________________
   Years in Practice: □ <5 □ 5-10 □ 11-15 □ >15
   b. Surgical Resident
   PGY: □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 or greater

3. Are you involved in care of patients undergoing ambulatory surgery?
   □ Yes (answer Q4-6) □ No (stop)

4. Is there a BMI above which you will not perform ambulatory surgery on an obese patient?
   a. Yes → Please circle one: <30 30-35 36-40 >40
   b. No

5. For obese ambulatory patients, what discharge pain prescriptions would you write for:
   a. Mild pain score 0-3: Drug: ___________________ Quantity Prescribed: ____________
   b. Moderate pain score 4-6: Drug: ___________________ Quantity Prescribed: ____________
   c. Severe pain score 7-10: Drug: ___________________ Quantity Prescribed: ____________

6. For non-obese ambulatory patients, what discharge pain prescriptions would you write for:
   a. Mild pain score 0-3: Drug: ___________________ Quantity Prescribed: ____________
   b. Moderate pain score 4-6: Drug: ___________________ Quantity Prescribed: ____________
   c. Severe pain score 7-10: Drug: ___________________ Quantity Prescribed: ____________
Remote Monitoring

Touch Screen, Easy to Use, Compatible with Bar Code Scanners, Many Mounting Possibilities.

Single and Multi-parameter Scoring Options (ETCO2 only or MEWS)

Configurable screen and text. Language can match hospital policy for the next steps

A smart key can be configured to call the RRT

Options for different profiles for different patient populations (Pediatric, Sedation, ETCO2, etc.)

PCA/RN Completes MEWS (Modified Early Warning Score) upon admission to general care floor, then every 30 minutes for 1 hour, then every hour for 4 hours, and finally every 4 hours for the remainder of the 48 hours of intended monitoring time. Focus note for changes in patient's condition. NOTE: MEWS score does not replace clinical judgment

Green 0 – 1
- No intervention
- PCA continues assessments per protocol timing

Yellow 2 – 4
- PCA notifies RN
- If unstable, notify RRT
- If new deterioration, RN assesses and treats patient, review concerns and recheck MEWS
- Notify LIP
- Check MEWS every hour for the next 4 hours or as ordered
- Document change in condition and develop plan of care
- Consider patient acuity

Orange 5 – 6
- PCA notifies RN immediately
- If unstable, notify RRT
- RN evaluates patient
- RN notifies LIP as per evaluation & orders
- Document change in condition and develop plan of care
- Recheck VS and MEWS every 30 minutes x2 and every hour x4 hours
- Reassess as per orders

Red 7+
- RN / PCA calls for RRT
- Notify LIP
- Crash cart moved to patient room
- Stay with patient until RRT arrives
- RN places defibrillator pads on patient and connects to defibrillator
- Assess and treat patient as per orders
- Consider transfer / elevation of care
- Vitals / MEWS as per RRT
- Document change in condition and develop plan of care
Figure 1: Excerpt from monitoring of 70 y/o female (BMI 43.60) s/p right total hip replacement with previous history of obstructive sleep apnea
Change Practice Overall: Anesthesia vs. Surgeons

- **Anesthesia (p=0.0130)**
  - 2012: 88
  - 2015: 92

- **Surgeons (p<0.0001)**
  - 2012: 68
  - 2015: 84

- **TOTAL (p<0.0001)**
  - 2012: 72
  - 2015: 88
How we did it….

- Started planning in 2011
- Developed one project at a time with key stakeholders
- Implemented each project over a period of time
- Audits started 2013
- Completed first round of audits 2014
- In the process of completing the second round of audit

Take away—

start small, reward your successes!
Thank you

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