The Perioperative Surgical Home: Where Do We Stand?

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January 8, 2016

Vanderbilt Department of Anesthesiology
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Disclosures
• I have no conflict of interests to disclose

Outline
• Define the Perioperative Surgical Home (PSH)
• Discuss evidence for the PSH
• Discuss the Vanderbilt Perioperative Consult Service
How did we get here?

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US Health Care Reform
What is the Perioperative Surgical Home?

- A system of coordinated care aimed at:
  - Improving patient experience
  - Making surgical care safe
  - Improving efficiency
  - Improving outcomes
  - Decreasing Cost

Typical Surgical Patient

Two teams that don’t discuss perioperative goals:

- Individualized (to surgeon and anesthesiologist),
- Uncoordinated Care Across the Entire Perioperative Period

Perioperative Surgical Home:

One team with one shared goal:

- Safe, Effective, Efficient, and Coordinated Care Across the Entire Perioperative Period
What do we know?

- University of California – Irvine
  - Total Knee Replacement
  - Total Hip Replacement
- University of Alabama at Birmingham
- Vanderbilt University Medical Center
University of California – Irvine

- Median LOS TKA – 3 days
- Median LOS THA – 3 days
- Approximately half of patients were discharged somewhere other than home

Vanderbilt University

- Perioperative Consult Service
  - Covers six service lines
  - Provides perioperative coverage of pain, nausea, fluids, and optimization of medical conditions
Where were: Care Pathways and Guidelines

Verticalls: Longitudinal through the care path of a patient population or procedure type - ERAS

June 2014

Horizontal: Across all or many patients by disease or entity
- PONV Prophylaxis
- Management of patient w/ CHF
- Mgmt of Cardiovascular medications
- Future Horizontals

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August 2015

Horizontal: Across all or many patients by disease or entity
- PONV Prophylaxis
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- Mgmt of Cardiovascular medications
- Intraoperative Vent/NMB mon
- Future horizontals
Paradigm Shift: ERAS via APCS

- Key factors prolonging stay after surgery:
  - Ileus
  - Need for IV analgesia
  - Need for IVF secondary to gut dysfunction
  - Bed rest caused by lack of mobility due to the above

- APCS + ERAS represents a paradigm shift in perioperative care:
  - Re-examines traditional practices, replacing them with evidence-based best practices when necessary.
  - Comprehensive in scope, covering all components of patient’s perioperative journey with surgeon and anesthesiologist

Our Methods

- Philosophy
  - Standardization, where possible, improves routine processes of care
  - Adherence to principles more important than recipe
  - Warning, this is a protocol – it does not have a brain

- Metrics
  - LOS, Readmissions
  - Pre-op/Intraop “Compliance”
  - Postoperative “Compliance”
  - PDSA to Learn of Other Areas for Improvement

Vanderbilt Colorectal ERAS Perioperative Components
Table 3

Effect of Implementation of Major Study Outcomes

<table>
<thead>
<tr>
<th>Phase</th>
<th>N=179</th>
<th>N=124</th>
<th>N=241</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Resource LOS (days)</td>
<td>5.3</td>
<td>4.9</td>
<td>4.3</td>
</tr>
<tr>
<td>Median Resource LOS (days)</td>
<td>4.3</td>
<td>4.2</td>
<td>4.0</td>
</tr>
<tr>
<td>Reoperation</td>
<td>(10.1%)</td>
<td>(13.5%)</td>
<td>(10.3%)</td>
</tr>
<tr>
<td>Readmissions</td>
<td>(1.1%)</td>
<td>(4.0%)</td>
<td>(1.4%)</td>
</tr>
<tr>
<td>Hospital Cost</td>
<td>% Non-parametric Median Test for no difference in median cost among all phases</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Started June 2014: Exemplary Level (top decile) for LOS in NSQIP and have reduced median rLOS by 22% and cost by 17% since then.

Use of Postoperative ERAS Bundle Components for Multimodal Analgesia Before and After Implementation of the ERAS Pathway for Colorectal Patients

<table>
<thead>
<tr>
<th>Component</th>
<th>Phase 0</th>
<th>Phase 1</th>
<th>Difference</th>
<th>% Change</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ketorolac</td>
<td>80%</td>
<td>70%</td>
<td>-10%</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>APAP</td>
<td>70%</td>
<td>60%</td>
<td>-10%</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Gabapentin</td>
<td>60%</td>
<td>50%</td>
<td>-10%</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>PCA</td>
<td>50%</td>
<td>40%</td>
<td>-20%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td>40%</td>
<td>30%</td>
<td>-30%</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Percentage (% ) of Patients Receiving Component

Ketorolac
APAP
Gabapentin
PCA
Nausea

Surgical Oncology ERP

<table>
<thead>
<tr>
<th></th>
<th>Phase 0 (N=95)</th>
<th>Phase 1 (N=239)</th>
<th>Difference (days)</th>
<th>% change</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean rLOS</td>
<td>8.26</td>
<td>6.61</td>
<td>-1.65</td>
<td>-20%</td>
<td>0.02</td>
</tr>
<tr>
<td>Median rLOS</td>
<td>6.26</td>
<td>5.32</td>
<td>-0.94</td>
<td>-15%</td>
<td>ns</td>
</tr>
<tr>
<td>SD</td>
<td>6.40</td>
<td>3.84</td>
<td>-2.55</td>
<td>-40%</td>
<td>ns</td>
</tr>
</tbody>
</table>

Surgical Weight Loss ERP

<table>
<thead>
<tr>
<th></th>
<th>Phase 0 (N=188)</th>
<th>Phase 1 (N=213)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean resource rLOS*</td>
<td>3.97 (0.58)</td>
<td>2.97 (0.40)</td>
<td>0.03</td>
</tr>
<tr>
<td>Median resource rLOS*</td>
<td>3.00 (0.40)</td>
<td>2.87 (0.35)</td>
<td>0.11</td>
</tr>
<tr>
<td>LOS&gt;2 days</td>
<td>83%</td>
<td>89%</td>
<td>0.05</td>
</tr>
<tr>
<td>Mean Discharge Time</td>
<td>14:47</td>
<td>14:18</td>
<td>0.02</td>
</tr>
<tr>
<td>Readmission*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Readmit within 7 days</td>
<td>2.8%</td>
<td>3.1%</td>
<td>ns</td>
</tr>
<tr>
<td>Readmit within 30 days</td>
<td>7.5%</td>
<td>8.3%</td>
<td>ns</td>
</tr>
<tr>
<td>ED Visit within 7 days</td>
<td>5.4%</td>
<td>5.3%</td>
<td>ns</td>
</tr>
<tr>
<td>ED Visit within 30 days</td>
<td>10.1%</td>
<td>10.0%</td>
<td>ns</td>
</tr>
<tr>
<td>Total Hospital Costs***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean*</td>
<td>2.09 (0.27)</td>
<td>0.88 (0.19)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Median***</td>
<td>1.30 (0.27)</td>
<td>0.86 (0.17)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Started Jan 2015 as a top performer for LOS and have increased the % home on POD1 (liberated ~50 bed-days) and reduced cost by 14%. McEvoy MD, et al., 2015 Symposium.