TIMING OF POSTOP AMBULATION

November 8, 2019

Outline

• Revisit our own findings of ambulation on postop day #0 within MSSIC

• Survey of literature on more granular timing of postop ambulation.

• Results of new MSSIC analysis into time to postop ambulation
Performance measures for 2020

- Ambulation within 24 hours is so 2017...

- Ambulating within 8 hours of surgery is the way of the future
  – Did we just make this up?

A Stroll through MSSIC History

- When looking at our original core QI targets (urinary retention, 90-day hospital readmissions and SSI) we discovered an association between ambulation on POD #0 and improved outcomes

- This became the basis for QI measures for 2018 and 2019
Analytics behind POD #0 Ambulation

- Ran regression models on matched cohort of lumbar patients to account for confounding factors and attempt to compare similar patients who were ambulated POD #0 and those that were not ambulated until POD #1 or later.

- Ran models separately on full cohort as well as subgroups based on fusion/decompression on single/multiple levels.
Association Between Ambulation on POD 0 and Odds of UTI

- Full Cohort
- Single-Level Decompression
- Multi-Level Decompression
- Single-Level Fusion
- Multi-Level Fusion

Ambulation on POD 0 Odds Ratio

0.10 0.25 0.50 1.00 2.00 5.00

Association Between Ambulation on POD 0 and Odds of Readmission in 30 Days

- Full Cohort
- Single-Level Decompression
- Multi-Level Decompression
- Single-Level Fusion
- Multi-Level Fusion

Ambulation on POD 0 Odds Ratio

0.10 0.25 0.50 1.00 2.00 5.00
What is POD #0??

• How far does someone have to walk to be considered “ambulated”?

• What is the time frame?
  – If a patient is a late afternoon case and arrives to the GPU at 11 pm, does that mean they only have an hour to ambulate at POD#0 or do they have until the next day?

• Starting July 2018, started to track exact time of ambulation after surgery
Can we do better than POD #0?

• Is there additional benefit to ambulating a post-operative spine patient <24 hours
• If so what is the magic number?
  – 2 hours
  – 8 hours
  – 12 hours

Original Proposed protocol, ambulation within **6 hours** of surgery

Purpose: Minimize fear-avoidance of movement after surgery
  – Some literature to suggest fear-avoidance is associated with increased pain and decreased functional status after elective lumbar surgery
• ERAS protocol, ambulation before **6 hours**
• Pre-op, Intra-op, Peri-op, and Post-op suite of ERAS interventions
• Results: At 1-month post-surgery smaller proportion of ERAS patients using opioids compared to control (38.8% vs 57.7%)

• Cleveland Clinic protocol
• Ambulation within **8 hours**
• Cited Adogwa et al, Spine 2017, Sept 15
• Hospital for Special Surgery (NY, NY)
• Outpatient protocol for elective 1-level ACDF and CDA
• Mandatory 5-hour PACU stay with ambulation prior to discharge

Is there anything within MSSIC that would support these protocols?
Time to Ambulation Data in MSSIC

• Tracking time to postop ambulation since July 2018.

• Since then, we have 11,120 cases with time to ambulation data out of 18,000 (62%)

Current Analysis of MSSIC Data

• Inclusion Criteria:
  – Lumbar and Cervical cases
  – No wheelchair bound patients
  – No 4+ level fusions
  – No postop CSF leak or durotomy
  – Length of stay of at least 1 day (exclude true outpatient surgeries)
# Time to Ambulation Summary

![Bar chart showing the distribution of patients across different time frames: 5171 (59%) < 8 Hours, 3034 (35%) 8 - 24 Hours, and 550 (6%) > 24 Hours.](chart.png)

## Demographic and Clinical Characteristics that Varied the Most Across Postop Ambulation Times

<table>
<thead>
<tr>
<th>Variable</th>
<th>&lt; 8 Hours (N = 5171)</th>
<th>8 - 24 Hours (N = 3034)</th>
<th>&gt;24 Hours (N = 550)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>1172 (23%)</td>
<td>776 (26%)</td>
<td>148 (27%)</td>
</tr>
<tr>
<td>CAD</td>
<td>664 (13%)</td>
<td>482 (16%)</td>
<td>103 (19%)</td>
</tr>
<tr>
<td>ASA Grade &gt; 2</td>
<td>2676 (52%)</td>
<td>1769 (58%)</td>
<td>371 (67%)</td>
</tr>
<tr>
<td>PROMIS Baseline</td>
<td>36.1 ± 6.5</td>
<td>35.1 ± 6.6</td>
<td>33.8 ± 6.2</td>
</tr>
<tr>
<td>Independently Ambulatory</td>
<td>4397 (85%)</td>
<td>2385 (79%)</td>
<td>383 (70%)</td>
</tr>
<tr>
<td>Fusion</td>
<td>3338 (65%)</td>
<td>2230 (74%)</td>
<td>432 (79%)</td>
</tr>
<tr>
<td>Number of Levels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2425 (47%)</td>
<td>1348 (44%)</td>
<td>204 (37%)</td>
</tr>
<tr>
<td>2</td>
<td>1740 (34%)</td>
<td>1002 (33%)</td>
<td>201 (37%)</td>
</tr>
<tr>
<td>3+</td>
<td>1006 (19%)</td>
<td>683 (23%)</td>
<td>145 (26%)</td>
</tr>
</tbody>
</table>
Outcomes by Time to Postop Ambulation

<table>
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<tr>
<th>Variable</th>
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<th>8 - 24 Hours (N = 3034)</th>
<th>&gt; 24 Hours (N = 550)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary Retention</td>
<td>163 (3%)</td>
<td>140 (5%)</td>
<td>45 (8%)</td>
</tr>
<tr>
<td>30-Day Readmission</td>
<td>159 (3%)</td>
<td>136 (4%)</td>
<td>39 (7%)</td>
</tr>
<tr>
<td>90-Day Readmission</td>
<td>271 (5%)</td>
<td>198 (7%)</td>
<td>49 (9%)</td>
</tr>
<tr>
<td>SSI</td>
<td>80 (2%)</td>
<td>55 (2%)</td>
<td>13 (2%)</td>
</tr>
<tr>
<td>Discharge Home</td>
<td>4883 (94%)</td>
<td>2699 (89%)</td>
<td>396 (72%)</td>
</tr>
<tr>
<td>At Least 1 Complication</td>
<td>655 (13%)</td>
<td>516 (17%)</td>
<td>121 (22%)</td>
</tr>
<tr>
<td>Satisfied with Surgery at 90 Days</td>
<td>2112/2476 (85%)</td>
<td>1255/1487 (84%)</td>
<td>189/243 (78%)</td>
</tr>
<tr>
<td>PROMIS MCID at 90 Days</td>
<td>916/1597 (57%)</td>
<td>505/875 (58%)</td>
<td>67/127 (53%)</td>
</tr>
<tr>
<td>Returned to Work at 90 Days</td>
<td>716/2510 (29%)</td>
<td>333/1488 (22%)</td>
<td>47/245 (19%)</td>
</tr>
</tbody>
</table>

Multivariable Analysis

- Created regression models for each surgical outcome listed in previous table to adjust for potential confounding factors.
- Models adjusted for age, sex, diabetes, scoliosis, coronary artery disease, ASA grade, baseline PROMIS, insurance, fusion, number of levels, surgery duration, and area of spine (cervical or lumbar).
- Model for return to work also adjusted for preop employment status and education.
Summary

• There is a precedent established within the literature to aim for <24 ambulation after surgery, often within 8 hours
• Within a limited time frame of data collection we can demonstrate positive associations with less than 8-hour ambulation as compared to 8 to 24 hours
• Findings still somewhat preliminary but are encouraging nonetheless

Questions?
Join us next year!

Block off your calendars.