ERAS: Optimizing Care for the Spine Surgery Patient

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Introduction: ERAS

- Target specialty-specific high risk groups in our patient population
- Targeted post-operative protocols for specific areas of improvement
  - VTE
  - Patient communication
  - Early mobilization
  - Pain Control
- Goals:
  - Improve patient outcomes, reduce LOS, improve efficiency, and reduce narcotic use
Preoperative Optimization for Elective Spine Surgery
  - Smoking Cessation
  - Blood Glucose Optimization
  - Frailty Assessment and Pre-habilitation
  - Anemia Screening and Optimization
  - Obesity

ERAS: Day of Surgery and Intraoperative Standardization
  - Oral Hydration
  - Intraoperative Multimodal Pain Management
  - Perioperative use of Lidocaine, Ketamine
  - Blood Management: TXA, Transfusion
  - Blood Glucose Management

Postop Protocol
  - Early ambulation
    - Reduces perioperative complications
    - LOS 34% shorter (3d)
    - More likely d/c to home (71 vs 22%)
    - Adogwa, et al., Spine 2017
  - Post-operative Pain Management
  - Geriatric Management
ERAS: Day of Surgery and Intraoperative Standardization

• Standardization of Nomenclature

<table>
<thead>
<tr>
<th>Minor Spine Surgery  (EBL &lt; 100 ml)</th>
<th>Major Spine Surgery  (EBL 100-1000 ml)</th>
<th>Complex Spine Surgery  (EBL &gt; 1 L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ACDF/PCDF</td>
<td>• &lt; 3 level ALIF/TLIF/DLIF</td>
<td>• Pedicle subtraction osteotomy</td>
</tr>
<tr>
<td>• Decompression or micro discectomy without fusion ≤2 levels</td>
<td>• &lt; 2 Anterior/posterior fusion</td>
<td>• Tumor corpectomy/debulking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ≥3 levels anterior/posterior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fusion/instrumentation</td>
</tr>
</tbody>
</table>
Results

• Preliminary data analyzing hospital length of stay, intraoperative transfusion usage, postoperative pain management, and readmission/reoperation rate

• Surgeries analyzed include:
  - Cervical/Thoracic/Lumbar decompression
  - Cervical/Thoracic/Lumbar instrumentation via anterior or posterior approach
  - Vertebroplasty/kyphoplasty
  - Adult spinal deformity
# Blood Management

<table>
<thead>
<tr>
<th>Blood Management Referrals - Spine</th>
</tr>
</thead>
<tbody>
<tr>
<td>June, July, August 2017</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Referrals</strong></td>
<td>63</td>
</tr>
<tr>
<td><strong>Total # Treated</strong></td>
<td>11 0 transfused</td>
</tr>
<tr>
<td><strong>Not Treated – Pre-op Hgb Acceptable</strong></td>
<td>46 7 transfused; 2 intra-op, 5 post-op</td>
</tr>
<tr>
<td><strong>Not Treated – Referred to PCP/CKD/Mult. Co-morbidities-outside PBM guidelines</strong></td>
<td>6 0 transfused – 2 have not had surgery yet</td>
</tr>
</tbody>
</table>
Blood Management

- Stratified by Surgeon

<table>
<thead>
<tr>
<th>Inpatient Encounter</th>
<th>Inpatient Encounter with Transfusion</th>
<th>Transfusion Rate</th>
<th>RBC Units Per Patient</th>
<th>Pre-surgical Anemia Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>6</td>
<td>16.67%</td>
<td>1.6</td>
<td>20.00%</td>
</tr>
<tr>
<td>83</td>
<td>11</td>
<td>13.25%</td>
<td>2.3</td>
<td>24.10%</td>
</tr>
<tr>
<td>82</td>
<td>9</td>
<td>10.98%</td>
<td>1.4</td>
<td>13.41%</td>
</tr>
<tr>
<td>64</td>
<td>7</td>
<td>10.94%</td>
<td>2.4</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

- As protocol has only recently been implemented, concrete data is actively being acquired and analyzed.
- Lack of statistical significance may be related to underpowered nature of study.
- Early data from blood management demonstrates decreased incidence of intraoperative transfusions for deformity corrective procedures.
Conclusions

• Standardization is key to improving quality
  - Can’t influence your output without understanding your inputs
• Creation of an iterative standard pathway is possible (although difficult)
• Effectiveness at improving outcomes, efficiency, and patient satisfaction remains to be seen
• Early evidence suggests effectiveness in decreased hospital length of stay and intraoperative use of blood transfusions