A System for Real-Time Evaluation of Thoracic Resident Operative Autonomy and Formative Feedback

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The Operating Room in 2016

- Resident Issues
  - Duty hours
  - Service responsibilities
  - Less preparation?

- Faculty Issues
  - Time
  - Patient safety
  - Outcomes
  - Medicolegal
  - RVUs
Can our graduates operate?

Bell RH, Surgery, 2009
• Performs routine open lung resection
• Performs basic video-assisted thoracoscopic surgery (VATS) procedures
The “Zwisch” Scale

- Supervision only
- Passive Help
- Active Help
- Show and Tell
Implementation

Zwisch Me

Resident Evaluation
Zwisch Me!! App

New Case

Pending Cases

Completed Cases

Menu

New Case

Date of Case

Attending Surgeon

Procedure

Approach (optional)

Zwisch Stage
Resident View - New Case Entry

Attending Surgeon: Dr. Shari Meyerson
Procedure: Lung and airway: Lobectomy
Approach (optional): VATS
Zwisch Stage: Active help
Difficulty: Average

Difficulty Levels:
- Easiest one-third
- Average
- Hardest one-third
Resident View - Pending Cases

New Case

Pending Cases

Completed Cases

Lung and airway: Lobectomy
Jan 15, 2016: Case #1 with Dr. Shari Meyerson
Attending View - Pending Cases

Lung and airway: Lobectomy
Jan 15, 2016

To: Joel Sternbach,

Your attending has completed your case evaluation. Tap &lt;a href="zwischmeApp://"></a>

Send
Resident View - Completed Cases

Completed Cases

Cases to Review
Lung and airway: Lobectomy
Jan 15, 2016: Case #1 with Dr. Shari Mey...

Cases Already Reviewed
Case components: Sternotomy and closure
Jan 14, 2016: Case #1 with Dr. Shari Mey...

Case Detail
Procedure Type: Lung and airway
Procedure Detail: Lobectomy
Approach: VATS
Resident Zwisch: Active help
Stage: Average
Resident Difficulty: Active help
Attending Zwisch: Easiest one-third
Stage: You were one plane off
Attending Difficulty: getting around the vessels,
Comments: dissection needs to be right on the surface.
Initial Data - Northwestern

- 295 (44%) with 7 participating cardiothoracic residents
- 185 (63%) “Zwisch-ed”
- 167 (90%) responded by attending
- 122 (73%) with formative feedback
Influence of year of training on autonomy
General Thoracic Cases

*p<0.001 vs. 2nd and 3rd year fellows*
Adult Cardiac Cases

* p=0.02 vs. all other groups
Influence of Case Difficulty on Autonomy

\[ r = -0.35, p<0.001 \]
## Formative Feedback

<table>
<thead>
<tr>
<th>Case</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomic resection - VATS</td>
<td>You need to make sure you know the steps and landmarks for each lobe. For example the importance of identifying the middle lobe airway in a lower lobectomy.</td>
</tr>
<tr>
<td>Aortic valve replacement</td>
<td>Work on gentle tying of valve stitches.</td>
</tr>
<tr>
<td>Ascending aortic aneurysm</td>
<td>Work on even spacing for annular stitches.</td>
</tr>
</tbody>
</table>
## Milestones Reports

<table>
<thead>
<tr>
<th>Case</th>
<th>Milestone</th>
<th>Resident</th>
<th>Peer Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ST</td>
<td>AH</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sternotomy and closure</td>
<td>IHD 2(5)</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Proximal anastomosis</td>
<td>IHD 2(7)</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Routine CABG</td>
<td>IHD 3(5)</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Redo CABG</td>
<td>IHD 5(1)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cardiopulmonary bypass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axillary/femoral cannulation</td>
<td>CPB 2(1)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cannulate and institute-routine</td>
<td>CPB 3(1)</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Wean and decannulate-routine</td>
<td>CPB 3(3)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Institute temp circ support</td>
<td>CPB 3(4)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cannulate and institute-complex</td>
<td>CPB 4(1)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Wean and decannulate-complex</td>
<td>CPB 4(3)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>LVAD or transplant</td>
<td>CPB 5(2)</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
How can you get involved?

- Multicenter study currently enrolling
- Endorsed by TECoG
- Zwisch Me!! Version 2.0 now available
- Administrative reporting website
  - Allow programs to retrieve own reports