Does the operative experience of UK general surgery trainees reflect the entrustment model of competency?

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Supervision coding:
- Assisting
- Supervised, Trainer Scrubbed
- Supervised, Trainer Unscrubbed
- Performed
- Teaching a more junior trainee
1. To assess the **operative experience** of UK general surgery trainees with respect to **numbers of procedures** undertaken and the **supervision** of these procedures.

2. Can routinely collected **surgical training data** be used to as additional **evidence of competency** progression with a reflection of **entrustment decisions** through the course of a training scheme?
Methods

- Surgical training records
- 1st August 2007 - 1st June 2016
- Completed training only
- Exclusions consistent with current guidelines
Methods

- Calculated **operative experience** and the proportion of procedures at each **supervision level** by training stage

- Calculated proportion of trainees achieving a **Level 4 PBA** by training stage
### Results

**Demographics of included trainees (n=311)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age at start of training, median (IQR)</strong></td>
<td></td>
<td>30.7 (29.3-32.9)</td>
</tr>
<tr>
<td><strong>Gender n (%)</strong></td>
<td>Males</td>
<td>243 (78.1)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>68 (21.9)</td>
</tr>
<tr>
<td><strong>Time in Training (adjusted) median years (IQR)</strong></td>
<td></td>
<td>6.0 (6.0-6.5)</td>
</tr>
<tr>
<td><strong>Special interest n (%)</strong></td>
<td>Colorectal</td>
<td>126 (40.5)</td>
</tr>
<tr>
<td></td>
<td>Upper Gastrointestinal</td>
<td>76 (24.4)</td>
</tr>
<tr>
<td></td>
<td>Breast</td>
<td>45 (14.5)</td>
</tr>
<tr>
<td></td>
<td>Vascular</td>
<td>43 (13.8)</td>
</tr>
<tr>
<td></td>
<td>General/Transplant/Endocrine</td>
<td>21 (6.8)</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Mean total procedures, (SD)</th>
<th>Current UK requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendicectomy</td>
<td>148 (56)</td>
<td>80</td>
</tr>
<tr>
<td>Inguinal hernia repair</td>
<td>117 (44)</td>
<td>60</td>
</tr>
<tr>
<td>Cholecystectomy</td>
<td>175 (90)</td>
<td>50</td>
</tr>
<tr>
<td>Segmental colectomy</td>
<td>82 (48)</td>
<td>20</td>
</tr>
<tr>
<td>Hartmann’s procedure</td>
<td>14 (8)</td>
<td>5</td>
</tr>
<tr>
<td>Emergency Laparotomy</td>
<td>114 (42)</td>
<td>100</td>
</tr>
</tbody>
</table>
Appendicectomy

Changing supervision level of appendicectomies (n=45991) undertaken by general surgery trainees (n=311)

Percentage of procedures

Year 1 n=8028
Year 2 n=8344
Year 3 n=8455
Year 4 n=7751
Year 5 n=7301
Year 6 n=6122

Training Junior Colleague
Supervised, Trainer Unscrubbed
Assisting
Performed
Supervised, Trainer Scrubbed
Cholecystectomy

Changing supervision levels of cholecystectomies (n=56455) undertaken by general surgery trainees in the UK (n=311)

- **Year 1** (n=9415): 50% Assisting, 30% Supervised, Trainer Unscrubbed, 20% Performed, 10% Training Junior Colleague
- **Year 2** (n=10641): 40% Assisting, 30% Supervised, Trainer Unscrubbed, 20% Performed, 10% Training Junior Colleague
- **Year 3** (n=10841): 30% Assisting, 30% Supervised, Trainer Unscrubbed, 30% Performed, 10% Training Junior Colleague
- **Year 4** (n=10165): 20% Assisting, 30% Supervised, Trainer Unscrubbed, 30% Performed, 20% Training Junior Colleague
- **Year 5** (n=8105): 20% Assisting, 25% Supervised, Trainer Unscrubbed, 30% Performed, 25% Training Junior Colleague
- **Year 6** (n=7319): 10% Assisting, 25% Supervised, Trainer Unscrubbed, 30% Performed, 25% Training Junior Colleague

Legend:
- Purple: Training Junior Colleague
- Red: Performed
- Dark Blue: Supervised, Trainer Unscrubbed
- Green: Supervised, Trainer Scrubbed
- Light Yellow: Assisting
Colectomy

Changing supervision levels of segmental colectomies (n= 26086) undertaken by general surgery trainees in the UK (n=311)

Percentage of procedures

Year 1 (n=3448)
- Training Junior Colleague
- Supervised, Trainer Unscrubbed
- Assisting

Year 2 (n=4276)
- Training Junior Colleague
- Supervised, Trainer Unscrubbed
- Assisting

Year 3 (n=4414)
- Training Junior Colleague
- Supervised, Trainer Unscrubbed
- Assisting

Year 4 (n=4500)
- Supervised, Trainer Scrubbed
- Supervised, Trainer Unscrubbed
- Assisting

Year 5 (n=4792)
- Supervised, Trainer Scrubbed
- Supervised, Trainer Unscrubbed
- Assisting

Year 6 (n=4656)
- Supervised, Trainer Scrubbed
- Supervised, Trainer Unscrubbed
- Assisting
## PBA attainment

<table>
<thead>
<tr>
<th>Training Year</th>
<th>Appendicectomy</th>
<th>Cholecystectomy</th>
<th>Segmental colectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48 (15.4%)</td>
<td>10 (3.2%)</td>
<td>7 (2.3%)</td>
</tr>
<tr>
<td>2</td>
<td>113 (36.3%)</td>
<td>57 (18.3%)</td>
<td>28 (9.0%)</td>
</tr>
<tr>
<td>3</td>
<td>170 (54.7%)</td>
<td>116 (37.3%)</td>
<td>67 (19.6%)</td>
</tr>
<tr>
<td>4</td>
<td>214 (68.8%)</td>
<td>190 (61.1%)</td>
<td>128 (41.2%)</td>
</tr>
<tr>
<td>5</td>
<td>245 (78.8%)</td>
<td>251 (80.7%)</td>
<td>205 (65.9%)</td>
</tr>
<tr>
<td>6</td>
<td>266 (85.5%)</td>
<td>284 (91.3%)</td>
<td>248 (79.7%)</td>
</tr>
<tr>
<td>P value for trend</td>
<td>0.15</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>
# PBA attainment by completion of training

<table>
<thead>
<tr>
<th>Index procedure</th>
<th>One Level 4 PBA</th>
<th>Current UK requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trainees, n (%)</td>
<td>Median operations to 1&lt;sup&gt;st&lt;/sup&gt; L4 PBA, n (IQR)</td>
</tr>
<tr>
<td>Cholecystectomy</td>
<td>284 (91.3)</td>
<td>60 (38- 83)</td>
</tr>
<tr>
<td>Segmental colectomy</td>
<td>248 (79.7)</td>
<td>32 (19- 44)</td>
</tr>
<tr>
<td>Appendicectomy</td>
<td>266 (85.5)</td>
<td>53 (27- 86)</td>
</tr>
</tbody>
</table>
Conclusions

• **Changing autonomy**, alongside formal summative competency assessments, may provide **evidence of changing entrustment decisions**

• **Increased understanding** of trainee competency (not just simple counting)

• “One size doesn’t fit all”
Questions

Acknowledgments:

Royal College of Surgeons of Edinburgh
National Institute of Health Research
Joe West, David Humes, Gareth Griffiths
Cristel Santos
Strengths and Limitations

National data sources, entire training scheme.

Careful and considered data management.

Operative experience supported by competency assessment data.

Supervised vs unsupervised does not necessarily reflect competency, just assistant availability.

Explicit vs ad hoc entrustment decisions and influence of contextual factors.

Misuse of competency assessment- tick box attitudes