Does Virtual Simulation in a Busy Surgical Residency Need to be Optimized?

Selvan, Ben, MBBS; Williams, Noel, MD; Morris, Jon, MD; Resnick, Andrew, MD; Mittal, Mayank, MBBS; Dumon, Kristoffel, MD

Penn Medicine Clinical Simulation Center, Department of Surgery, University of Pennsylvania, Philadelphia, Pennsylvania

**BACKGROUND**

- Basic surgical skills and procedural skills training on virtual trainer have become an integral part of a good surgical residency program.
- The literature supports the fact that the skills on lap mentor has construct and face validity.
- Data on whether the basic skills training can complement the procedural skills are lacking.

**AIM**

- Basic skills training in lap mentor could minimize the error committed during the procedural skills (laparoscopic cholecystectomy)?
- Basic skills training could be compromised by having to do the procedural skills first?

**METHODS & MATERIALS**

- This is a prospective study.
- 15- PGY1 residents in general surgery residency program used lap mentor during their simulation rotation.
- Basic and procedural tasks (lap cholecystectomy) were practiced.
- The tasks in basic skills were camera manipulation, clip application, two handed maneuvers, transfer of objects and cutting.
- Group I had their procedural skills followed by basic skills training.
- Group II had their basic skills training followed by the procedural skills.
- Their performance in total cautery time, efficiency of cautery (%), accuracy rate - applied clips (%), number and economy of movements of instrument (%), total path length of clipper and instrument (cm), were compared between two groups.

**STATISTICAL**

- T-tests and Mann-Whitney test were employed to compare their performance.
- P value < 0.05 was considered as statistically significant.

**Basic Surgical Skills**

- Efficiency of Cautery
- Clipping Attempts
- Economy of Movement

**Procedural Skills – Lap Cholecystectomy**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Range (Min – Max)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of the left instrument</td>
<td>I</td>
<td>3.29</td>
<td>0.4832</td>
<td>2.3-3.9</td>
<td>0.01‡</td>
</tr>
<tr>
<td>instrument movement</td>
<td>II</td>
<td>1.97</td>
<td>0.60</td>
<td>1.3-2.9</td>
<td></td>
</tr>
</tbody>
</table>

**CONCLUSIONS**

- The performance of the residents who had their basic skills training followed by the procedural skills was better.
- The errors committed in the procedural skills were minimized significantly.
- In a busy residency program, the virtual simulation training has to be standardized and optimized.