Medical Simulation-Perfect Practice Makes Perfect

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Disclosure

I do not have any relationship(s) to disclose. Funded by AHRQ and AAMC/Donaghyue Foundation

Note-For All Screen shots of EPIC
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What is Simulation?

- Simulation is a technique, not a technology and the educational strategies chosen to achieve identified teaching and learning outcomes will guide the type of technology chosen (Gaba 2004).

- A Simulator is a setting device, computer program or system which reproduces a real life situation.
Simulation in Other Areas
Better Training of Pilots
Airline Industry Response

SOURCE: Aviation Safety Network
“None of you guys are students, right? ‘Cause I’m not gonna sit here and play Guinea pig for some schmuck in training.”
Problem...
Simulation in Medicine
Advantages of Simulation
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“PRACTICE DOES NOT MAKE PERFECT. ONLY PERFECT PRACTICE MAKES PERFECT.”

VINCE LOMBARDI
Advantages to Simulation

50% of Device recall due to user interface problems
Fidelity-Degree of Realism

- Psychological- Does it Feel Real?
- Environmental- Does it feel like the place you would practices?
- Equipment- Are you using what you would use in the real world?
Aah! I see you have the machine that goes 'ping'. This is my favourite. You see, we lease this back from the company we sold it to, and that way, it comes under the monthly current budget and not the capital account.

Monty Python's The Meaning of Life 1983
Task Trainers
Standardized Patients
High Fidelity Mannaquins
Simulated Medical Records
Debriefing… The Key
Does It Make A Difference?

• Improves proficiency with procedures
  – Decreased complications from procedures
• Can replace upto 50% of nursing student clinical exposure with simulation
• Improves communication of teams
  – Cardiac arrest teams
• Integral component to safety initiatives
Simulation To Understand Team Performance

Kessler J Emerg Med 2015
### Table 2

Simulation task completion, pre-test, and post-test scores. MS, medical student.

<table>
<thead>
<tr>
<th></th>
<th>Task completion (%)</th>
<th>Pre-test score (%)</th>
<th>Post-test score (%)</th>
<th>2-week post-test score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS I (N = 16)</td>
<td>95.2 ± 3.9</td>
<td>51.4 ± 10.4</td>
<td>81.6 ± 10.3</td>
<td>74.3 ± 13.3</td>
</tr>
<tr>
<td>MS II (N = 16)</td>
<td>92.9 ± 8.3</td>
<td>54.2 ± 10.8</td>
<td>84.4 ± 7.4</td>
<td>81.9 ± 9.4</td>
</tr>
<tr>
<td>MS III (N = 15)</td>
<td>91.7 ± 8.1</td>
<td>56.3 ± 12.4</td>
<td>86.3 ± 8.4</td>
<td>81.0 ± 10.7</td>
</tr>
<tr>
<td>MS IV (N = 16)</td>
<td>96.2 ± 4.0</td>
<td>67.7 ± 12.7</td>
<td>90.3 ± 7.2</td>
<td>86.3 ± 6.9</td>
</tr>
<tr>
<td>All Students</td>
<td>94.1 ± 6.0</td>
<td>57.5 ± 13.0</td>
<td>85.6 ± 8.8</td>
<td>80.9 ± 10.9</td>
</tr>
</tbody>
</table>

* P-value < 0.05, compared with pre-test score.
First Year Residents Outperform Third Year Residents

Bedside Assessment Score (%)

N=27

N=40

Traditionally-Trained Third-Year Residents

Simulator-Trained First-Year Residents

P<0.001

Error bars: 95% confidence interval

Singer Sim health Care 2012
Team Based Simulation Training
(20) Standardized Patient Rooms
8 Bed Clinical Skills Training Room
Med Supply Rooms

Debrief Rooms
Reception / Lobby
Support and Prep Offices

~8K sq ft
(8) Flexible Simulation Rooms
(2) Multi-Purpose Rooms
Med Supply Rooms
Debrief Rooms
Control Rooms
Reception / Lobby
Support and Prep
Offices
Biomedical Support

~12K sq ft
Surgical simulation training – ‘on the hill’

Richard Jones Hall:
- VirtuOHSU Simulation & Surgical Training Center
  - Human tissue (fresh/embalmed) & animal labs
  - Video linked to CLSB and surgical suites
  - Flexible environment to train at all levels

~8.5 K sq ft
Conclusions

• Simulation is proving to be a cornerstone of medical education.
• Allows for training of complex teams in a manner which does not affect patient safety.
• Technology has been key to allowing us to achieve the necessary fidelity.
• Continued technological advances will allow for greater use of simulation throughout the spectrum of medical training.
• Simulation is a powerful modality to optimize team performance for diseases like sepsis.