ADVANCES IN MEDICAL EDUCATION TECHNOLOGY

Brought to you by the Medical Education Committee
CCOM, PNWU-COM, UNE-COM & UP-KYCOM
Objectives

- New developments with simulation technology
- Innovative ways to approach standardized patients
- Pros and cons of increasing use of technology in medical education
Overview

- Goals of technology in medical education
  - Create realistic learning environments
  - Experience with devices that will become common in practices
  - Increase patient safety

- More recent advances
  - Simulation labs
  - Computerized models
  - Many more!
3-D Printing in Medicine
Current Use in Surgery

- Useful tool to train residents and students
- Having a tangible model of a patient’s anatomy available for a physician to study or use to simulate surgery
- Rural and Underserved areas can practice with rare surgeries that they may not see often
Why 3-D Printing is Awesome...
More on how Awesome 3-D printing is...
Just checked again: 3-D printing is still awesome!!
The future of 3D Printing

- Creating entirely new organs
  - Lessen the backlog on Kidney transplant lists
  - Regulate Diabetes
- Grafting skin onto burn victims
- Making prostheses resemble the original missing limb
- Addressing poor Americans’ dental health needs
MEDICAL SIMULATION
Why do we need Medical Simulation?

- Patient Safety and Medical Errors
  - New report cites that possibly 210,000 fatalities due to medical errors in the last year.
  - Identify bottle necks and improve team efficiency
  - Hone clinical skills
Simulation use with Medical Students

Figure 1. Simulation Use with Medical Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Medical School</th>
<th>Teaching Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>84%</td>
<td>22%</td>
</tr>
<tr>
<td>2nd</td>
<td>91%</td>
<td>28%</td>
</tr>
<tr>
<td>3rd</td>
<td>94%</td>
<td>55%</td>
</tr>
<tr>
<td>4th</td>
<td>89%</td>
<td>69%</td>
</tr>
</tbody>
</table>
Current Medical Simulation technologies

High Fidelity Simulators

Part or Partial Task Trainers
Current Medical Simulation Technologies: Screen Based/ Virtual Reality Simulators

- Minimally invasive surgery training
- Hysteroscopy
- Interventional Radiology
Future...where are we headed?

- **Oculus Rift 3D-Medical Training**
  - Experiential Model
  - Visualize and interact with virtual medical environments.
The First Oculus 3-D Surgery

https://www.youtube.com/watch?feature=player_embedded&v=pKT7zZ7Lo6w#t=62
“To Med Ed or Not to Med Ed?”

- At first glance, the benefits of Med Ed Tech to the public are seemingly obvious:
  - Increased patient safety
  - Practice on the most recent med tech
  - Creating a positive PR aesthetic

- But there are also many benefits to the student:
  - The ability to provide feedback
  - Repetitive Practice
  - Curriculum integration

- Plus: Student’s Prefer Simulation to Didactic Lecture!
  - 95% find it to be good use of time while 83% prefer it to didactic lecture.
But what are some pitfalls of this relatively new movement?
Just follow the money...

If Med Tech was a restaurant on yelp™, it would probably be rated $$$$$

*Depending on the tech, range can be from $6000-250,000*

*Also must factor in maintenance + hiring special faculty*

*Possible solution: redistribute the expense through development of multidisciplinary centers.*
Is Med Ed effective in the Clinic?

- Few studies have actually shown the direct improvements in clinical outcomes from the use of simulation technology tech…So where is the proof?
  - In a study conducted by Okuda et al., it was found that simulation was most helpful in reinforcing the basic sciences, procedural skills, team work, and communication but made little difference at the Residency level.
  - As simulation becomes increasingly prevalent in medical school and resident education, more studies are needed to see if simulation training improves patient outcomes.
The moral of the story...

We develop new ways to do Med Ed Tech so that we can

- Have safer healing environments for pts
- Provide the kind of learning our students want & deserve
- Keep up with the dynamic horizon of hospital medicine

Despite the pitfalls, the trends show that we will continue to integrate med ed technology into our curricula
Thank you COSGP for a Perfect Year!!!! Med Ed Loves you!!!!
References