

IMPACT OF ROBOTIC SIMULATION TRAINING CURRICULUM IN FIRST YEAR GENERAL SURGERY RESIDENTS

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INTRODUCTION:

- Aim: to examine the effects of implementation of a robotic curriculum for first year general surgery residents while training at a VA Medical Center
- Simulation training is often used to improve robotic surgical skills
- The impact of exposure to a robotic curriculum early in general surgery residency has not been described
- Hypothesis: early exposure to a structured robotic curriculum will result in increased comfort with robotic manipulation and in turn result in a more robust robotic experience throughout residency

METHODS AND PROCEDURES: A robotic curriculum was implemented for first year general surgery residents during the 2018-2019 academic year. This curriculum involved didactics, simulation, and real case experiences. A year after implementation, surveys were distributed to PGY-1 residents (prior to starting robotic training), PGY-2 residents (completed curriculum), and PGY-4 &-5 residents (no formal robotic training). The surveys gathered subjective ratings of comfort level with robotic tasks (scale of 1-5), number of robotic cases logged, and likelihood of future robotic participation. Statistical analysis was performed using a Wilcoxon rank sum test for non-normally distributed variables. A p-value < 0.05 was considered significant.

	PGY-2 vs Intern	PGY-4 &-5 vs Intern	PGY-2 vs PGY-4 &-5
Comfort Docking Xi			
Mean Diff	3.00	0.43	2.57
p value	0.02	0.33	0.01
Comfort Docking Si			
Mean Diff	2.50	0.43	2.07
p value	0.02	0.33	0.02
Comfort Operating Console			
Mean Diff	2.75	0.57	2.18
p value	0.02	0.09	0.02
Comfort Switching Out Robotic Instruments			
Mean Diff	3.75	0.71	3.04
p value	0.02	0.18	0.01
Comfort Adjusting Ergonomics			
Mean Diff	3.75	0.29	3.46
p value	0.02	0.32	0.01
Comfort with Laparoscopic Instruments (not robotic)			
Mean Diff	1.75	4.00	-2.25
p value	0.02	0.00	0.003
Likelihood to Assign Self a Robot Case			
Mean Diff	3.25	0.93	2.32
p value	0.02	0.22	0.01
Likelihood to Actively Participate in Robot Case			
Mean Diff	2.00	1.21	0.79
p value	0.02	0.15	0.01
Likelihood to Use Robotics in Future Career			
Mean Diff	1.50	-0.57	2.07
p value	0.28	0.4	0.06

RESULTS: 15 general surgery residents completed the survey. 4/15 residents were PGY-1s, 4/15 residents were PGY-2s and 7/15 were senior residents (PGY-4 and -5). The PGY-2 residents who completed the robotic curriculum were significantly more comfortable with all surveyed aspects of operating the robot (p values <0.05) despite being less comfortable with laparoscopic instruments compared to the senior residents (p=0.003). Although they have completed several years of surgical training, the senior residents were not more comfortable with the robot than PGY-1s who had much less operative experience (p values >0.05). The PGY-2 residents were also more likely to assign themselves to a robotic case and actively participate than the PGY-1s (p=0.02) and senior level residents (p=0.04). There was no significant difference between any of the groups in likelihood to use robotics in a future career.

CONCLUSION:

- A structured robotic curriculum is important for general surgery training programs
- Intentional exposure to robotics in simulation and real case experiences improves residents' comfort with the technology and encourages future use throughout training career
- Deliberate early robotic exposure allows for a compounding effect on resident education
- A curriculum implemented at the VA was particularly advantageous due to less competition for console time and practice as compared to implementation at a tertiary medical center