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ABSTRACT

Objective: To determine if visuospatial perception testing is correlated to simulated surgical performance or to intraoperative surgical performance as rated by ACGME milestones.

Methods: Participants underwent three different types of tests: visuospatial perception testing (VSP) as per validated testing platform, fundamentals of laparoscopic (FLS) surgery peg transfer, and DaVinci robotic simulation peg transfer. The order of these tests was randomized. Demographic information was also collected including specialty, year of training, prior experience with simulated skills, and surgical interest. Standard statistical analysis using Student's t test were performed, and correlations were determined using adjusted linear regression models.

Results: 41 residents at two academic training institutions were surveyed, including 19 BWH OBGYN residents and 22 MAYO residents from 3 different specialties (OBGYN, general surgery, urology). In univariate analysis, BWH residents were significantly faster at FLS peg transfer (p = 0.00734), while MAYO residents were faster at robotic peg transfer (p=0.018) with higher overall scores (p=0.002). OBGYN residents were faster and had higher overall scores on robotic peg transfer (p = 0.0007 and p-0.0024 respectively), and a trend toward faster FLS peg transfer (p=0.07) than their counterparts from other specialties. There was no difference in VSP scores by program, specialty, or year of training. In adjusted linear regression modeling, VSP testing was correlated only to robotic peg transfer skills (average time p=0.006, overall score p=0.001). Milestones did not correlate to either VSP or surgical simulation testing.

Conclusions: VSP score was correlated with robotic simulation skills but not with FLS skills or ACGME milestones. This suggests that robotic competence may depend more heavily on spatial manipulation, while laparoscopic skills may require additional proficiency, such as manual dexterity, not accounted for in our analysis. Interestingly, milestones were not correlated to any testing, which could indicate that simulation does not predict intraoperative performance or that milestones themselves lack the granularity to stratify resident surgical ability.