

Evaluating manual dexterity during Obstetrics and Gynaecology residency interviews – The use of a robotic surgical simulator

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Introduction & Objectives

Residency interviews aim to select candidates that have qualities for success in the long term. In a surgical speciality such as Obstetrics and Gynaecology (O&G), manual dexterity, spatial awareness and hand-eye coordination are essential skills¹.

Robotic surgery is playing an increasingly important role in benign and cancer gynaecology², and the da Vinci (Intuitive Surgical Inc.) robotic simulator has been shown to be a training tool with predictive validity³.

Currently, there are no validated objective measures for the assessment of spatial or manual skills at residency interviews⁴.

Objective: We aim to evaluate the effectiveness of a robotic surgical simulator for assessing manual dexterity aptitude at O&G residency interviews.

Methods

We incorporated the da Vinci robotic simulator as a station during our Residency interviews in November 2021. Built-in metrics were recorded to provide objective measures of performance.

Residency applicants were introduced to the robot console, and given time to go through a practice module on the simulator.

They proceeded to complete a second simulation module where their performance was assessed. The task involved participants picking up rings with one robot ‘hand,’ transferring the ring to the other ‘hand,’ and then placing it in designated areas. The whole assessment took approximately 10 minutes.

Overall performance scores obtained from a combination of objective metrics were generated by the robotic simulator and collated. All residency applicants and faculty members completed a questionnaire assessing their experience.



Figure 1. A participant using the robotic simulator

Results

- 10 applicants participated
- The mean time taken to complete tasks was 86.1 seconds + 14.2 (mean + SD)
- Overall mean performance score was 67.4 + 12.5 (mean + SD)
- Participants and faculty members responded favourably to the use of the robotic simulator.
- Residency candidates rated the robotic simulator as easy to use and realistic
- All participants felt that the simulator piqued their interest to learn more about robotic surgery
- One participant commented “it was a valuable hands-on experience to practice on the robotic console.”
- 88% of respondents agreed that the robot simulator should be integrated into future residency interviews.

	Strongly disagree	Disagree	Agree	Strongly agree
The robotic simulator is easy to use for a beginner	0	0	4 (50.0%)	4 (50.0%)
The robotic simulator was realistic	0	0	6 (75.0%)	2 (25.0%)
The robotic simulator allows me to complete my given task without difficulty	0	0	5 (62.5%)	3 (37.5%)
I felt stressed and discouraged practicing with the robotic simulator	4 (50.0%)	4 (50.0%)	0	0
The robotic surgical simulator is a good tool for evaluating manual dexterity	0	0	5 (62.5%)	3 (37.5%)
The robotic simulator should be integrated into future O&G residency interviews	0	1 (12.5%)	4 (50.0%)	3 (37.5%)
I am more interested to learn more about robotic surgery after using the robotic simulator	0	0	1 (12.5%)	7 (87.5%)

Table 1. Feedback on the robotic simulator by the candidates (n=8).c

	Strongly disagree	Disagree	Agree	Strongly agree
How effective do you think a robotic simulator is in assessing surgical skill for acceptance into residency?	0	0	3 (75.0%)	1 (25.0%)
The robotic simulator should be integrated into future O&G residency interviews	0	0	2 (50.0%)	2 (50.0%)

Table 2. Feedback on the robotic simulator by the faculty (n=4).

Discussion

This is the first study on the use of a robotic simulator at residency interviews. The Da Vinci robotic simulator was well received by both participants and faculty and was easy to use.

The incorporation of the robotic simulator into O&G residency interview process can provide additional objective metrics relating to a participant’s manual dexterity aptitude. Such testing can be conducted within the constraints of a standard residency interview day.

Future research should include longitudinal analysis of these assessments on residency admission success and future surgical aptitude.

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