Validity Evidence for the Use of ENDO Mentor Suite for the Fundamentals of Endoscopic Surgery Skills Examination

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Introduction

- The skills portion of the FES exam was developed on the Simbionix GI Mentor simulator (GIM).
- Simbionix has since developed a more comprehensive simulator, ENDO Mentor Suite (ES), to accommodate multidisciplinary skills labs.
- There is a need to establish validity evidence for FES scores obtained on ENDO Mentor Suite (ES) prior to allowing investing skills labs to function as FES testing centers.

Objective

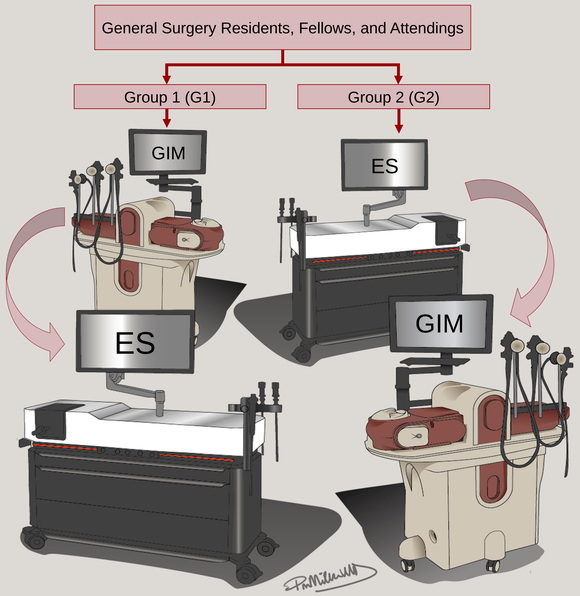
- The objective of this study was to assess the relationship to other variables (ROV) validity evidence for the ES compared to the GIM.

Materials & Methods

- 23 general surgery residents, fellows, and attendings were randomized into 2 groups, G1 (n=11) and G2 (n=12). Groups were matched by PGY level, upper and lower endoscopy experience, glove size, gender, and hand dominance.
- Each group completed the FES skills examination on both simulators. G1 completed the entire FES skills examination on the GIM, and then tested again on the ES. G2 completed the examination on the ES, followed by the GIM.
- FES examination scores were calculated by a standardized computer-based algorithm with is identical between the two simulators.

Results

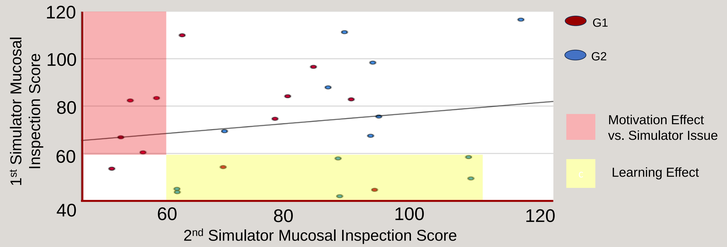
- All participants achieved passing scores on both machines.
- First simulator total FES scores and component task scores were similar between the two groups.
- On second simulator testing, G2 outperformed G1 overall, with statistically discernable differences on loop reduction and mucosal inspection tasks.
- Given the disparity in total and task scores on the second simulator trial, loop reduction and mucosal inspection were independently assessed on both simulation platforms by 5 experienced surgical endoscopists. The tasks were unanimously considered to perform similarly with respect to difficulty and domain of competency between the GIM and ES.



Demographic	G1	G2	P value
Level of Training	n=11	n=12	0.12
PGY1	0	0	
PGY2	2 (18)	0	
PGY3	0	4 (33)	
PGY4	5 (45)	3 (25)	
PGY5	3 (27)	2 (17)	
Fellow	0	2 (17)	
Attending	1 (9)	1 (8)	
Clinical Case Experience			
Upper Endoscopy	n=11	n=12	0.75
0-24	2 (18)	4 (33)	
25-49	3 (27)	2 (17)	
50-99	5 (45)	4 (33)	
100-199	0	1 (8)	
200 +	1 (9)	1 (8)	
Lower Endoscopy	n=11	n=12	0.3
0-24	4 (36)	3 (25)	
25-49	2 (18)	6 (50)	
50-99	4 (36)	1 (8)	
100-199	0	1 (8)	
200 +	1 (9)	1 (8)	
Glove Size	n=11	n=12	0.74
6 or Smaller	3	3	
7.5 or Larger	8	9	
Gender	n=12	n=13	0.9
Men	7 (58)	8 (62)	
Women	5 (42)	5 (38)	
Hand Dominance	n=11	n=12	0.6
Right	10 (91)	10 (83)	
Left	1 (9)	2 (17)	
First Time Pass	12 (100)	13 (100)	

Scores on First Simulator			
	G1	G2	P value
Navigation	Mean 81 (std 18)	90 (8)	0.1
Loop Reduction	66 (26)	72 (27)	0.6
Retroflexion	90 (10)	94 (9)	0.3
Mucosal Inspect.	74 (19)	71 (25)	0.7
Tool Targeting	93 (8)	96 (7)	0.4
Total FES Score	81 (12)	85 (10)	0.4

Scores on Second Simulator			
	G1	G2	P value
Navigation	89 (13)	91 (12)	0.8
Loop Reduction	68 (24)	98 (25)	0.005
Retroflexion	94 (7)	93 (10)	0.7
Mucosal Inspection	69 (16)	90 (18)	0.005
Tool Targeting	97 (8)	93 (8)	0.2
Total FES Score	84 (9)	93 (9)	0.02



Discussion

- Comparison of first simulator FES skills test performances supports the ROV validity evidence of the ENDO Suite Mentor simulator for the skills portion of the FES examination.
- Variability in total scores, loop reduction scores, and mucosal inspection scores on second simulator performance is likely attributable to fatigue or waning motivation given the equivalent scores on the first simulator. This conclusion is supported by the expert assessment of the tasks performing equally on each platform.
- The FES program will continue to prospectively monitor participant performance data to look for discrepancies between these platforms on these tasks.

References

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2. Lineberry, M., & Ritter, E. M. (2017). Psychometric Properties of the fundamentals of endoscopic surgery (FES) Skills Examination. Surgical Endoscopy, 31(12), 5219 5227.https://doi.org/10.1007/s00464-017-5590-1