Surgical Judgment of Attending Surgeons is More Stable Than Residents Across Surgical Situations

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INTRODUCTION

Hypothesis

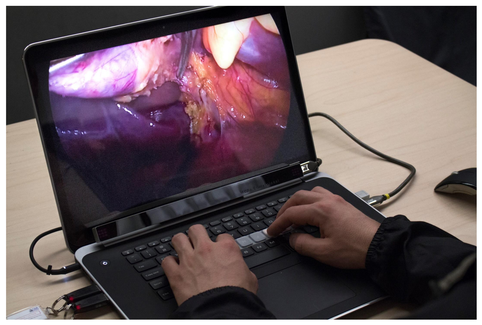
Anticipation of adverse events, surgical judgment, and assessment of surgical skill varies between resident and attending surgeons when watching surgical videos.

Background

- Surgical technical skills are more easily quantified and tested than non-technical skills such as surgical judgment[1]
- Studies have shown that these non-technical skills can have an impact on technical skills[2]
- As of now there are not many quantifiable measures of non-technical surgical skills[3]

MATERIALS & METHODS

- Twenty attending and resident surgeons rated their anticipation of an impending adverse event while watching twenty surgical videos with and without adverse events.
- After watching each video, they assessed the skill of the surgeon and self-assessed their anticipation ratings with respect to adverse events.
- All participants answered a general confidence questionnaire before and after the study. All survey questions were answered via Likert scale (1-5).



RESULTS

Videos with adverse events led to significantly higher anticipation of adverse events when comparing attending to resident surgeons (2.7 vs. 1.7, p<.001), lower surgeon skill rating (2.7 vs. 3.4, p<.001), and higher self-assessment in their anticipation ratings (attendings: +0.6, residents: +0.1, p<.05) for both participant groups. General confidence was significantly lower for residents than attending surgeons (3.5 vs. 4.5, p<.001).

Compared to the residents, attendings exhibited stronger and more stable correlations between measurements of surgical judgment (Table 1). When viewing videos with adverse events, attendings showed a significantly higher correlation between anticipation of an impending adverse event and skill assessment of the surgeon (Table 2).

		Without Event (N=90[1])		With Adverse Event (N=100)	
	Measures	*Skill assessment*	*Self-assessment*	*Skill assessment*	*Self-assessment*
Attending	*Anticipation*	**-0.718***	**0.335***	**-0.735***	**0.435***
	Skill assessment		**-0.437***		**-0.406***
Resident	*Anticipation*	**-0.654***	**0.259***	**-0.492***	**0.307***
	Skill assessment		-0.173		-0.175

*significant correlation, p<.05

Table 1 presents the non-parametric Spearman Rho correlation statistics between the measurements. The strongest correlation was observed between their *anticipation* of an impending adverse event and *skill assessment* of the surgeon. *Anticipation* of an impending event was moderately correlated with their *self-assessment* of their anticipation. Unique to the attendings was a negative, moderate correlation between *skill assessment* of the surgeon and the *self-assessment* of their anticipation ratings.

RESULTS (CONT.)

	Non-Event		Adverse Event	
Correlating Measures	Z-Statistics [Attending]-[Resident]	p-value	Z-Statistics [Attending]-[Resident]	p-value
Anticipation & Skill Assessment	-0.806	0.420	-2.787	0.005**
Anticipation & Self-assessment	0.554	0.579	1.034	0.301
Skill Assessment & Self-assessment	-1.936	0.053	-1.767	0.077

** significant, p<.05

Table 2: Significance testing for correlations (Spearman Rho) between attendings and residents for viewing videos with and without adverse events

CONCLUSIONS

- Our findings suggest that attending physicians exhibit more stable behaviors in their surgical judgment across situations than residents.
- The stability correlations between surgical judgment measurements could be an effective indicator of competency in a skill area and criteria for advancement of residents
- Differences in correlation of anticipation of adverse events and skill assessment could be a robust indicator of surgical expertise
- Future work may include other data collection modalities and performance measurements

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