

Table. Case Requirements

Variable	Proctoring requirement	Initial cases reviewed for quality	Minimum volume required for maintenance of privilege (per 12 mo)	Minimum volume required for proctor
Program with a defined requirement, n (%)	34 (82.93)	19 (46.34)	32 (78.05)	10 (24.39)
No. of cases, mean \pm SD	3.15 \pm 1.63	5.89 \pm 1.89	8.75 \pm 4.92	28.50 \pm 11.19

and privileging policies. Recently, the role of robotic technology manufacturers and hospital credentialing committees in ensuring surgeon competence has been the subject of legal challenges. Our aim was to examine existing institutional credentialing and privileging requirements for robotic surgery and assess their adequacy in ensuring surgeon competence.

METHODS: Robotic surgery credentialing and privileging policies for community and academic surgery programs were acquired and reviewed. Common criteria across institutions related to initial privileging and maintenance of privileges were identified and the mean and SD of required case numbers, if defined, were calculated. Criteria for proctors were also analyzed.

RESULTS: Policies from 41 geographically dispersed US hospitals were reviewed; 29 (70.73%) required relevant open or laparoscopic surgery privileges as a prerequisite for robotic credentialing; 34 (82.93%) programs required documentation of successful completion of a robotic training course (Table). Ongoing objective performance assessments and patient outcomes monitoring were rarely described.

CONCLUSIONS: Significant variability in credentialing policies exists in a representative sample of US hospitals. Most policies require completion of a robotic surgery training course and a small number of proctored cases. Few policies include specific requirements for maintenance of privileges and fewer require ongoing objective performance assessments and patient outcomes monitoring. Less than 25% of policies define the term *proctor*. Existing credentialing policies are often inadequate to ensure surgeon competence. Development of robust credentialing and privileging guidelines for robotic surgery can benefit patients, hospitals, and surgeons.

Are Surgical Resident Trainees More Likely to Receive a Patient Safety Report?

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INTRODUCTION: Poor interprofessional communication is one of the leading causes of patient care errors. We previously reported that male, non-white, and foreign-born trainees are more likely than their peers to receive a patient safety report. Anecdotal

evidence suggests that trainee specialty might also be a factor. Because hospital staff generally prefer empathetic, psychosocial communication, the typical surgeon communication style (directive and non-empathetic) can lead to a hostile work environment and the submission of patient safety reports. Therefore, we hypothesize that surgical trainees are more likely to receive a patient safety report compared to non-surgical trainees.

METHODS: Our large, midwestern university hospital uses the ICARE system (Marshall ClearSight) for patient safety reporting. We requested deidentified data from all ICARE reports involving resident and fellow trainees from 2018. The frequency of surgical trainees receiving an ICARE report was compared with non-surgical trainees.

RESULTS: In 2018, there were 819 trainees at our institution, of which 230 (28%) were surgical trainees. In that year, 162 ICARE reports involving trainees were submitted. Surgical trainees received 73 ICARE reports (45%, chi-square = 24.2; $p < 0.0000009$).

CONCLUSIONS: Surgical trainees are significantly more likely to receive a patient safety report than non-surgical trainees. This increased reporting pattern would support an implicit or explicit preference for more empathetic, psychosocial communication. Additional work will examine the reason for the increased reporting pattern. If communication style is the reason, then an intervention could be developed to improve surgical trainee communication, thereby promoting a healthy work environment and a culture of patient safety.

Assessing Human Factors in the Operating Theatre: Differences in Perceptions within the Surgical Team

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INTRODUCTION: Substantial data exist on the impact of training in human factor skills on surgical outcomes. However, except for the standardized time-out process, the best way to go about improving these skills remains unclear. The aim of this study was to gain more insights in the theatre staff's perception of human factors and their importance on surgical outcomes in the operating theatre.

METHODS: The Surgical Team Assessment Record questionnaire was used to study the role of human factors, such as situational awareness. The self-assessment questionnaire was filled out by the theatre staff, directly after the surgical procedure. Conditional logistic regression was used to identify the impact of the role in the operating theatre on the yes vs no answers.



RESULTS: Some 507 questionnaires were completed. Theatre staff rated their team's performance with a median of 4 (interquartile range 0.0, 5-point Likert scale). The staff surgeon (n = 119) indicated significantly more often that there were many distractions (51.3%, yes n = 61) and noticed aberrations (60.5%, yes n = 72) during the surgical procedure ($p < 0.0001$) compared with the rest of the operating team. Most aberrations reported by the surgeons were related to technical performance.

CONCLUSIONS: Situational awareness might be less developed in members of operating teams compared with the surgeon. Additional work should elucidate the impact of human factor skills on team performance. A team-based approach to safety interventions is recommended. Future studies should determine what type of aberrations and distractions are most relevant and valuable to embark on with team training.

Assessing Various Non-Invasive Stress Indices to Predict Novice Surgeons' Performance During Basic Skills Training in a High-End Simulator

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INTRODUCTION: The absence of a single reliable detection method makes estimating surgeons' mental stress difficult to quantify and interpret. Although several non-invasive stress measuring methods have been proposed, most studies have used only 1 or 2 stress estimation parameters and produced conflicting results. This study concomitantly measures the responses of all previously reported non-invasive stress indices and compares them with the video score (VS) achieved by novice surgeons in a reproducibly stressful simulation environment.

METHODS: Twenty-three male novice trainees were enrolled. After an orientation phase, they wore a wrist device that measures heart rate (HR), interbeat interval (IBI) duration, and electrodermal activity (EDA). A saliva specimen was collected for cortisol (sC), α -amylase (sAA), and secretory immunoglobulin A (sIgA) measurements (baseline phase, BL). Then the simulation exercise phase (E) started, with the subjects trained on a basic suturing module for 15 minutes. Immediately after, another saliva sample was collected. The whole experiment was videotaped. The VS was calculated. The percentage $(E-BL)_{diff}$ of each of the 6 parameters was calculated and compared with VS using Pearson's correlation coefficient, as well as Akaike Information Criterion (Table).

RESULTS: The EDA_{diff} showed the best correlation with VS, followed by IBI_{diff} and HR_{diff} . Among the saliva biomarkers, sAA_{diff} showed the best correlation in comparison to $sIgA_{diff}$ and sC_{diff} (Table).

CONCLUSIONS: In our simulation setting, sympathetic ANS stress parameters (EDA, IBI, HR, sAA) could best describe the novice trainees' performance, but sC and IgA could not.

Table. Study Variables

Variable	Mean \pm SD	Range (min, max)	r	AICc
EDA_{diff}	795 \pm 379	275, 1532	-0.663	107.69
IBI_{diff}	1.74 \pm 8.88	-12.5, 14	0.634	109.49
HR_{diff}	-1.54 \pm 8.67	-15, 13	-0.624	109.07
Saliva α -amylase $_{diff}$	251 \pm 124	21, 445	-0.605	110.31
Saliva cortisol $_{diff}$	52 \pm 34	9, 120	-0.587	111.00
Saliva IgA $_{diff}$	294 \pm 129	88, 516	-0.554	112.19

AICc, Akaike Information Criterion; EDA, electrodermal activity; HR, heart rate; IBI, interbeat interval.

Benefit of Peer-to-Peer Instruction in Surgery Clerkship Orientation

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INTRODUCTION: Peer-to-peer instruction in medical education has proven to be effective for student-teachers and student-learners. This study investigated the utility of peer instruction in the Surgery Clerkship. The goal was to provide practical knowledge for incoming students directly from students who just completed the clerkship to increase confidence and improve performance.

METHODS: The peer-instruction course consisted of institution-specific overview of expectations, basic surgery terminology, and general tips from the student's perspective. Dressing supplies and basic wound care techniques were reviewed. Students also received a tour of the trauma bay and the operating room, with instruction on etiquette and practice with scrubbing. Pre- and post-surveys assessed the confidence and knowledge level in these areas using a Likert scale.

RESULTS: Fifteen student-learners from 2 incoming clerkship cohorts participated. There was a statistically significant ($p < 0.05$) increase in confidence of participating students after the intervention. Categories assessed: entering the operating room (mean pre-survey response [PRE] 2.7, mean post-survey response [POST] 4.4), efficiency and accuracy in scrub technique (PRE 2.8, POST 4.3), ability to navigate and function efficiently in the trauma bay (PRE 1.2, POST 4.5), knowledge of dressing supplies and wound care techniques (PRE 1.2, POST 4.1), and understanding of expectations (PRE 2.2, POST 4.5).

CONCLUSIONS: This study shows student-to-student instruction is an effective method of surgery clerkship enrichment. Student-learners reported an overall increase in confidence in all areas reviewed before entering their surgery rotation.