

Association of Faculty Entrustment With Resident Autonomy in the Operating Room

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 Invited Commentary

IMPORTANCE A critical balance is sought between faculty supervision, appropriate resident autonomy, and patient safety in the operating room. Variability in the release of supervision during surgery represents a potential safety hazard to patients. A better understanding of intraoperative faculty-resident interactions is needed to determine what factors influence entrustment.

OBJECTIVE To assess faculty and resident intraoperative entrustment behaviors and to determine whether faculty behaviors drive resident entrustability in the operating room.

DESIGN, SETTING, AND PARTICIPANTS This observational study was conducted from September 1, 2015, to August 31, 2016, at Michigan Medicine, the University of Michigan's health care system. Two surgical residents, 1 medical student, 2 behavioral research scientists, and 1 surgical faculty member observed surgical intraoperative interactions between faculty and residents in 117 cases involving 28 faculty and 35 residents and rated entrustment behaviors. Without intervening in the interaction, 1 or 2 researchers observed each case and noted behaviors, verbal and nonverbal communication, and interaction processes. Immediately after the case, observers completed an assessment using OpTrust, a validated tool designed to assess progressive entrustment in the operating room. Purposeful sampling was used to generate variation in type of operation, case difficulty, faculty-resident pairings, faculty experience, and resident training level.

MAIN OUTCOMES AND MEASURES Observer results in the form of entrustability scores (range, 1-4, with 4 indicating full entrustability) were compared with resident- and faculty-reported measures. Difficulty of operation was rated on a scale of 1 to 3 (higher scores indicate greater difficulty). Path analysis was used to explore direct and indirect effects of the predictors. Associations between resident entrustability and observation duration, observation month, and faculty entrustment scores were assessed by pairwise Pearson correlation coefficients.

RESULTS Twenty-eight faculty and 35 residents were observed across 117 surgical cases from 4 surgical specialties. Cases observed by postgraduate year (PGY) of residents were distributed as follows: PGY-1, 21 (18%); 2, 15 (13%); 3, 17 (15%); 4, 27 (23%); 5, 28 (24%); and 6, 9 (8%). Case difficulty was evenly distributed: 36 (33%) were rated easy/straightforward; 43 (40%), moderately difficult; and 29 (27%), very difficult by attending physicians. Path analysis showed that the association of PGY with resident entrustability was mediated by faculty entrustment (0.23 [0.03]; $P < .001$). At the univariate level, case difficulty (mean [SD] resident entrustability score range, 1.97 [0.75] for easy/straightforward cases to 2.59 [0.82] for very difficult cases; $F = 6.69$; $P = .01$), PGY (range, 1.31 [0.28] for PGY-1 to 3.16 [0.54] for PGY-6; $F = 22.85$; $P < .001$), and faculty entrustment (2.27 [0.79]; $R^2 = 0.91$; $P < .001$) were significantly associated with resident entrustability. Mean (SD) resident entrustability scores were highest for very difficult cases (2.59 [0.82]) and PGY-6 (3.16 [0.54]).

CONCLUSIONS AND RELEVANCE Faculty entrustment behaviors may be the primary drivers of resident entrustability. Faculty entrustment is a feature of faculty surgeons' teaching style and could be amenable to faculty development efforts.

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Fragmented faculty exposure to trainees, more stringent supervision requirements, duty hour regulations, and institutional pressure for efficiencies contribute to faculty and resident dissatisfaction with surgical training experiences.¹⁻⁵ In addition, 25% of graduating residents in general surgery believe the current curriculum does not fully prepare them to practice as independent surgeons.⁶ Highly variable intraoperative teaching approaches within and across institutions coupled with the exponential growth of surgical knowledge and technical expertise residents must achieve has resulted in residents who are inadequately prepared for independent practice at the end of their training.⁷ Optimizing intraoperative education is critical for the development of autonomy among residents.^{2,8,9}

Entrustable professional activities are part of an educational framework that considers the competence of the trainee and the level of faculty supervision required for activities essential to the specialty. The principles of this framework help us better understand how faculty make entrustment decisions and what behaviors drive resident entrustability in the operating room.^{10,11} We define faculty *entrustment* as actions that impart trust and responsibility for patient care to residents while providing appropriate supervision. Resident *entrustability* shifts the focus to residents, who must demonstrate behaviors and decision making that warrant entrustment and must actively participate in driving their own learning. Entrustment and entrustability are part of a dual educational responsibility.

Case difficulty and years of faculty experience are often cited as primary factors affecting resident entrustability in the operating room.^{8,12} Research indicates that more complex procedures have greater autonomy gaps.^{13,14} Studies have also looked at supervisor characteristics and have suggested that faculty clinical experience with performing an operation plays a role in resident autonomy.¹²⁻¹⁴ However, these research findings are based on faculty and resident perceptions of these factors and are not objectively documented or conclusive.

There is little empirical evidence evaluating intraoperative faculty-resident interactions and how entrustment progresses in real time. The OpTrust tool was developed to address this gap and assesses intraoperative faculty entrustment and resident entrustability.⁵ To our knowledge, this is the first study to look at faculty and resident entrustment behaviors in the operating room as independent observable measurements, thus allowing objective reporting of these behaviors, which previously were measured by self-perception. In this study, we sought to use OpTrust to identify the primary driver of resident entrustability in the operating room, which we hypothesized was faculty entrustment.

Methods

Study Design

An observational study was conducted from September 1, 2015, to August 31, 2016, at Michigan Medicine, Ann Arbor. The OpTrust tool (Figure 1) was used to score intraoperative faculty-resident interactions.⁵ OpTrust scores 5 domains: type of ques-

Key Points

Question Do faculty behaviors drive resident entrustability in the operating room?

Findings In this study that used the OpTrust tool to assess 117 direct intraoperative observations involving 35 residents and 28 faculty, surgical faculty entrustment behaviors were significantly associated with resident entrustability behaviors. Neither case difficulty nor faculty years of experience was significantly associated with faculty entrustment or the level of resident entrustability demonstrated.

Meaning Faculty entrustment is a critical and teachable component for advancing resident autonomy in the operating room.

tions asked, operative plan, instruction, problem solving, and leadership by the surgical resident. OpTrust uses descriptive anchors that explicitly delineate behaviors for progression toward independence from novice to expert. Entrustment levels need not linearly align, allowing OpTrust to be used across surgical specialties with variable years of training. OpTrust has a high degree of interrater reliability⁵; it was created in keeping with the Accreditation Council for Graduate Medical Education milestones structure and emphasizes observable outcomes that are benchmarks for assessment of progressive entrustment.² This study was approved by the University of Michigan Institutional Review Board. All Department of Surgery faculty and residents were informed about the scope of the study, and participants provided oral consent. Patients provided written informed consent before the observation.

Measures

Year of faculty experience was obtained from the Department of Surgery administrative offices. Case difficulty was assessed by asking the attending physician, "Specific to this operation, how would you rate the difficulty of this case?" Difficulty was measured on a 3-point scale, where 1 indicates easy/straightforward; 2, moderately difficult; and 3, very difficult. Postgraduate year (PGY) was collected from the Department of Surgery Education. Because PGY begins in July and ends in June of the next calendar year, July was considered month 1; August, month 2; and so on ending with June as month 12. Observation month was the month the observation took place. The mean number of cases observed each month was 10 (range, 3-29). Observation duration was measured by recording the amount of time (in hours) the case was observed. Faculty and resident entrustment scales were measured by OpTrust (Figure 1).⁵ Without interfering in the faculty-resident interaction, researchers observed cases and wrote notes describing behaviors, verbal and nonverbal communication, and interaction processes. Immediately after the case, the observers reviewed their notes and completed an OpTrust assessment.

Participants

Observations took place across 4 surgical specialties: general, plastic, thoracic, and vascular. Purposive sampling was

Figure 1. The OpTrust Tool

Domain	Low Entrustability	Medium Entrustability	High Entrustability	Full Entrustability
Type of Questions Asked	<input type="checkbox"/> Faculty: does not ask resident questions for majority of case	<input type="checkbox"/> Faculty: asks leading question or closed questions that require yes/no response from resident for majority of case	<input type="checkbox"/> Faculty: extends knowledge with open-ended questions	<input type="checkbox"/> Faculty: is approachable as a consultant to support resident's higher-level thinking and problem solving
	<input type="checkbox"/> Resident: does not ask faculty questions for majority of case	<input type="checkbox"/> Resident: asks questions related to anatomy and foundational knowledge for majority of case	<input type="checkbox"/> Resident: asks questions about upcoming steps in the procedure or procedural flow	<input type="checkbox"/> Resident: asks questions of additional learner; asking questions of faculty for goal-oriented feedback; no questioning necessary while fully independent
Operative Plan	<input type="checkbox"/> Faculty: sought minimal to no input from resident for intraoperation steps/plan	<input type="checkbox"/> Faculty: asks residents for intraoperative steps/plan, but did not include resident's suggestions into faculty plan	<input type="checkbox"/> Faculty: asks resident for intraoperative steps/plans and integrates resident's ideas	<input type="checkbox"/> Faculty: directly followed the resident intraoperative steps/plans for the procedure
	<input type="checkbox"/> Resident: minimal input provided intraoperatively for operative plan	<input type="checkbox"/> Resident: suggests some steps intraoperatively for operative plan	<input type="checkbox"/> Resident: forward thinking and suggests tentative plan for entire operation	<input type="checkbox"/> Resident: provides full operative plan, which is then carried out
Instruction	<input type="checkbox"/> Faculty: identifies landmarks for majority of procedure or provides step-by-step instructions	<input type="checkbox"/> Faculty: asks residents to provide landmark identification; provides close instruction and instrument orientation	<input type="checkbox"/> Faculty: provides minimal instruction during portions of procedure and only provides step-by-step instruction when resident is struggling	<input type="checkbox"/> Faculty: provides feedback on refinement of technical skills but otherwise provides no instruction
	<input type="checkbox"/> Resident: pauses frequently and awaits instruction from faculty	<input type="checkbox"/> Resident: steady progression of case and/or cues faculty for moderate instruction due to lack of progress	<input type="checkbox"/> Resident: fully advances case while requesting or receiving minimal instruction from faculty	<input type="checkbox"/> Resident: progresses case efficiently with no instruction from faculty
Problem Solving	<input type="checkbox"/> Faculty: does not include resident in problem solving and/or takes away the case after a near miss or error and never returns case	<input type="checkbox"/> Faculty: problem solves with resident by showing and telling what the faculty would do (thinking out loud), but faculty fixes the problem	<input type="checkbox"/> Faculty: raises caution and/or problem solves with resident and then has resident solve the problem with step-by-step instruction from faculty	<input type="checkbox"/> Faculty: follows the resident's lead in solving the problem by integrating the resident's ideas/suggestions
	<input type="checkbox"/> Resident: does not participate in problem solving or does not understand what comes next in procedure	<input type="checkbox"/> Resident: identifies potential solutions and faculty addresses problem	<input type="checkbox"/> Resident: brings forward solutions or concerns and fixes the problem with faculty guidance	<input type="checkbox"/> Resident: identifies problem and implements solution with no guidance from faculty
Leadership by the Surgical Resident	<input type="checkbox"/> Faculty: performs majority of procedure and allows resident minimal opportunity to participate in operation	<input type="checkbox"/> Faculty: provides significant cueing and leads for the majority of the case	<input type="checkbox"/> Faculty: allows resident to progress with minimal cueing up until critical parts of the case and then supports resident's lead with close instruction	<input type="checkbox"/> Faculty: is in supervisor role while resident progresses the case until no more progress is made
	<input type="checkbox"/> Resident: is in first-assist role and primarily observes, but is also allowed to work in briefly	<input type="checkbox"/> Resident: demonstrates an increasing ability to perform different basic parts of the operation with close faculty supervision	<input type="checkbox"/> Resident: is able to safely execute majority of steps in procedure with faculty in first-assist role	<input type="checkbox"/> Resident: leads operation and recognizes when to seek help/advice (resident knows personal limits)

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used when selecting cases to generate variation in type of operation, case difficulty, faculty-resident pairings, faculty experience, and resident training level (PGY-1 through PGY-6).

Statistical Analysis

Means, SDs, and/or proportions were examined for each variable. One-way analysis of variance was used to compare resident entrustability scores by case difficulty, faculty experience, and PGY. The pairwise Pearson correlation coefficient was used to assess the association between resident entrustability and observation duration, observation month, and faculty entrustment scores. Resident entrustability and faculty entrustment scales were derived by combining 5 validated questions from OpTrust; each question was scored on a scale of 1 to 4, with 4 indicating full entrustment/entrustability. Principal component analysis assessed the unidimensionality of the entrustment scales, and Cronbach α was used to measure the reliability.

Path analysis, a form of structural equation modeling, was used to explore direct and indirect effects of the predictors. As the oldest member of the structural equation modeling family, path analysis was established to examine the effects of hy-

pothesized models in phylogenetic studies.¹⁵ The strength of path analysis is that it allows researchers to study direct and indirect effects simultaneously with multiple independent and dependent variables.¹⁶ Our hypothesis was ideally suited for path analysis because it estimates all proposed theoretical relationships among the variables simultaneously. Model fit was assessed by the χ^2 statistic¹⁷; root-mean-square error of approximation with its 90% CI, in which values of 0.05 or less indicate close fit¹⁸; Tucker-Lewis index, in which values greater than 0.95 indicate good fit¹⁸; and the Bentler comparative fit index, in which values greater than 0.95 indicate good fit. All analyses were conducted in Stata, version 13 (StataCorp).¹⁹ The level of significance was set at 2-sided $P < .05$.

Results

Twenty-eight faculty and 35 residents were observed by 2 surgical residents, 1 medical student, 2 behavioral research scientists, and 1 surgical faculty member across 117 surgical cases. The 28 observed faculty had 3 to 42 years of experience, with 51 cases (44%) having been performed by faculty with 6 to 14

Table 1. Association of Years as Faculty, Case Difficulty, PGY, Observation Duration, Month of Observation, and Faculty Entrustment With Resident Entrustability

Characteristic	Resident Entrustability Score, Mean (SD)	F or R ² ^a	P Value
Resident entrustability	2.13 (0.07)	NA	NA
Faculty level (years of experience)			
Junior (1-5)	2.22 (0.78)	F = 0.47	.62
Midlevel (6-14)	2.17 (0.85)		
Senior (≥15)	2.04 (0.78)		
Case difficulty			
Easy/straightforward	1.97 (0.75)	F = 6.69	.01
Moderately difficult	1.98 (0.74)		
Very difficult	2.59 (0.82)		
PGY			
1	1.31 (0.28)	F = 22.85	<.001
2	1.6 (0.42)		
3	1.96 (0.65)		
4	2.22 (0.64)		
5	2.72 (0.7)		
6	3.16 (0.54)		
Observation duration, h	1.97 (0.75)	R ² = 0.19	.04
Month of observation, 1-12	7.44 (3.55)	R ² = 0.05	.62
Faculty entrustment	2.27 (0.79)	R ² = 0.91	<.001

Abbreviations: NA, not applicable; PGY, postgraduate year.

^a Data are given as 1-way analysis of variance (F) or pairwise Pearson correlation coefficient (R²).

Table 2. Direct and Indirect Associations Between Predicting Factors and Resident Entrustability

	Direct Association With Resident Entrustability		Indirect Association via Faculty Entrustment	
	β (SE)	P Value	β (SE)	P Value
Faculty entrustment	0.78 (0.04)	<.001	NT	NT
Faculty level ^a	-0.00 (0.00)	.21	NT	NT
Difficulty of case	0.04 (0.04)	.33	NT	NT
PGY	0.12 (0.02)	<.001	0.23 (0.03)	<.001
Observation duration	-0.01 (0.04)	.86	NT	NT
Observation month	0.02 (0.01)	.03	NT	NT

Abbreviations: NT, not tested; PGY, postgraduate year.

^a Faculty level categories were junior (1-5 years of experience), midlevel (6-14 years), and senior (≥15 years).

years of experience. The cases of the 35 observed residents were distributed by PGY as follows: 36 (31%) at the junior level (PGY-1 and PGY-2), 44 (38%) at the senior level (PGY-3 and PGY-4), and 37 (32%) at the chief resident level (PGY-5 and PGY-6). Of the chief residents, 9 (8%) were PGY-6 chief residents in plastic surgery. Cases observed by PGY of residents were distributed as follows: PGY-1, 21 (18%); 2, 15 (13%); 3, 17 (15%); 4, 27 (23%); 5, 28 (24%); and 6, 9 (8%). Case difficulty was evenly distributed: of 108 cases, 36 (33%) were rated easy/straightforward; 43 (40%), moderately difficult; and 29 (27%), very difficult by the attending physician. Nine cases were not rated.

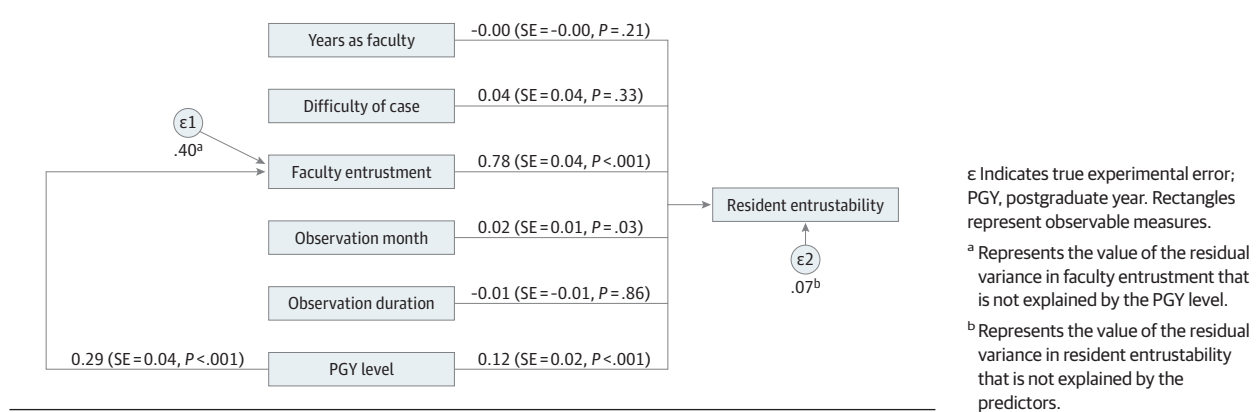
At the univariate level (Table 1), case difficulty (mean [SD] resident entrustability score range, 1.97 [0.75] for easy/straightforward cases to 2.59 [0.82] for very difficult cases; F = 6.69; P = .01), PGY (range, 1.31 [0.28] for PGY-1 to 3.16 [0.54] for PGY-6; F = 22.85; P < .001), and faculty entrustment (2.27 [0.79]; R² = 0.91; P < .001) were significantly associated with resident entrustability. The association of case difficulty attenuated when other predictors were accounted for in multivariable analyses (β correlation [SE], 0.04 [0.04]; P = .33). Faculty years of experience was not significantly associated with

resident entrustability (mean [SD] resident entrustability score range, 2.22 [0.78] for 1-5 years of experience to 2.04 [0.78] for ≥15 years; F = 0.47; P = .62). Resident entrustability scores were highest for very difficult cases (2.59) and PGY-6 (3.16).

The results from the principal component analysis and Cronbach α provided evidence that supported the creation of resident and faculty scores from the combination of the 5 OpTrust questions. The principal component analysis yielded 1 factor with eigenvalues >1.00, and all items loaded on 1 component for each scale. The Cronbach α for resident entrustment was 0.86; faculty entrustment was 0.89.

The hypothesized model with path coefficients, SEs, and P values can be found in Table 2. The model fit the data well; χ² was 4.25 and was nonsignificant (P = .37), the root-mean-square error of approximation was 0.024 (90% CI, 0.0-0.15), Bentler comparative fit index was 0.99, and Tucker-Lewis index was 0.99, all indicating good model fit. The path coefficients from years of faculty experience (β correlation [SE], -0.00 [0.00]; P = .21) and case difficulty (0.04 [0.04]; P = .33) were nonsignificant. Postgraduate year was directly and indirectly significantly associated with resident entrustability; the

Figure 2. Path Model Showing the Association of Faculty Entrustment With Resident Entrustability



direct association with resident entrustability had a β correlation (SE) of 0.12 (0.02) ($P < .001$), and the indirect association through faculty entrustment had values of 0.23 (0.03) ($P < .001$). As hypothesized, faculty entrustment was significantly associated with resident entrustability as assessed by OpTrust (β correlation [SE], 0.78 [0.04]; $P < .001$) (Figure 2).

Discussion

The OpTrust assessment tool enabled us to independently capture faculty entrustment and resident entrustability behaviors that inform operative autonomy. The analysis supports the hypothesis that faculty entrustment scores have a direct association with resident entrustability scores when controlling for the factors of years of faculty experience, observation duration and month, and case difficulty. Our research confirms our hypothesis: faculty entrustment was associated with resident entrustability in the operating room. It is faculty behavior that propels resident entrustability forward.

This evidence supports the premise that faculty entrustment is a feature of an attending physician's teaching style and therefore could be amenable to faculty development. Faculty are trained physicians, but most are not trained educators. Interventions to improve faculty teaching behaviors may strengthen faculty educational skill sets and change the trajectory of resident entrustability. How faculty impart entrustment in the operating room has appropriately changed from total independence with no supervision to supervised graduated autonomy. Faculty must learn to be present without driving the operation. Faculty development can help cultivate strategies for carefully balancing patient obligations while furthering resident independence. This balance ensures the safety of the patient before them as well as that of future patients whom the resident will care for once training is complete.

The factors of case difficulty and years of faculty experience did not demonstrate a significant association in this study. We hypothesize that our results differ because existing research analyzes these factors largely based on faculty and resident self-perception. In previous studies,^{8,13} case complexity has been collected as a self-reported measure, which is subject to recall and rater bias. Using OpTrust, we were able to aug-

ment self-reporting and assess individual entrustment behaviors as a third-party objective measurement. Case difficulty was collected as a self-reported variable; however, it is a fixed measure specific to a patient, case, and resident intraoperative interaction, which allows for a more explicit and robust measurement of the variable. Studies that examine how faculty experience affects resident autonomy also rely on resident-based perception that faculty with more clinical experience are more likely to impart resident autonomy.¹² There is an inherent risk of subjectivity in such measurements.^{13,14} Our study analyzes the association between faculty experience and measurements of directly observed entrustment behaviors. Entrustment and autonomy are distinct behaviors, and although faculty entrustment and resident entrustability help inform resident autonomy, they must be measured differently and independently. In addition, we did not see a significant association after controlling for observation month or observation duration. We controlled for these factors to ensure that significance was not related to time points during a resident's yearly rotation or to the amount of time the procedures were observed. Postgraduate year, however, proved to be significantly correlated with faculty entrustment and resident entrustability behaviors, as it affects resident entrustability directly and indirectly through faculty entrustment.

The significance of PGY was anticipated, as competence is expected to increase throughout residency and should be reflected in promotion from one PGY to the next. However, more research is needed to understand the association of PGY with resident entrustability. We believe that faculty use PGY as a proxy for ability owing to their fragmented exposure to residents. Implicit associations are made about ability based on PGY rather than demonstrated competence. There is an expectation among faculty that more skilled performance will be obtained from a PGY-2 than a PGY-1 resident, from a PGY-3 than a PGY-2 resident, and so on. As for residents, they are becoming more comfortable in the operating room with each PGY. They have more operative exposure, feel more confident, and demonstrate higher entrustability behaviors, which may account for this increase year over year.

Surgical education researchers are identifying educational strategies to accommodate the new complexities of surgical teaching.²⁰ Vygotsky's social development theory and

educational concept, the zone of proximal development (ZPD),²¹ serves as a useful framework for resident surgical education.²² The concept of the ZPD emphasizes that maximal learning and skill acquisition occur when functioning at the edge of one's ability rather than by performing repetitive tasks the individual has already mastered. Vygotsky's social development theory shifts the roles of teacher and student, constructing a more collaborative relationship in which students play an active role in learning and learning becomes a reciprocal experience.²³ Vygotsky's educational principles have been used in undergraduate medical education programs, resulting in significant improvement in the performance of basic surgical techniques.^{20,24,25}

Using a Vygotskian approach, faculty can provide an educational environment in which continual feedback strengthens a resident's core skills as the resident progresses through his or her ZPD. Faculty could continually apply the principles of constructive friction,²⁶ a back-and-forth educational negotiation between attending physician and trainee, to support incremental and continuous advancement, with the goal of operative autonomy. Each resident's ZPD will vary and steadily progress over time, requiring flexibility and adaptability in faculty teaching.²⁵ Promoting these educational practices may encourage faculty to become more confident regarding the measured risk of a resident performing new tasks and the purposeful integration of constructive friction when teaching within the space of a trainee's operative limitations.²⁷

Although clinical skill is often listed as the most important factor in increasing resident responsibility in the operating room,²⁸ entrustability is likely also informed by character assessments, including perceptions of honesty; disposition; perceived lack of confidence or overconfidence; experience; and intended field of specialty.²⁹ The fragmentary nature of faculty interaction with residents makes it difficult to assess these attributes and may affect faculty entrustment. Faculty may consult with colleagues and senior residents in evaluating a resident's proficiency.¹² These indirect assessments are implicit in the entrustment decisions made by faculty, and residents should be aware that they are constantly being evaluated.³⁰ Entrustment is not confined to the faculty-resident dyad. Faculty have cited policies, rules, and regulations as major concerns that dictate how they engage with residents.²

With OpTrust's facility to assess the level of faculty entrustment and resident entrustability as independent variables,⁵ it can be used to increase faculty awareness of entrustment behaviors they exhibit and to inform faculty about resident behavior and entrustability. The tool can assist faculty in identifying to what degree they are imparting entrustment and which entrustable behaviors need further develop-

ment. Faculty seeking to enhance intraoperative teaching interactions can utilize OpTrust in an interventionist manner. Entrustment can be assessed with directional feedback throughout the academic year to promote ongoing faculty development.

Residents must also garner entrustability by entering the intraoperative setting prepared with knowledge about the patient, case, and procedure and with the willingness to engage in a meaningful educational relationship with the attending physician.³¹ OpTrust's independent assessment of resident entrustability can help inform residents about behaviors that promote entrustment. It can assist residents by reporting how different faculty rate their entrustability. Residents then can develop better skills to self-regulate learning and work with faculty to address identified gaps as they progress toward autonomy.

Limitations

We recognize that there are limitations to our research. It was conducted at a single academic institution. The faculty/resident participant and observation numbers were statistically significant, but the sample was small. The significance of PGY according to our data model suggests that the PGY phenomenon as it relates to entrustability and entrustment must be explored in further research. A multi-institution OpTrust study is currently in development to extend our understanding of the complex nature of entrustment/entrustability in the faculty-resident learning dyad. This study will include a faculty-focused educational intervention that will explore how faculty entrustment feedback affects faculty entrustment behavior and resident entrustability. We believe the careful design of this study will provide insight into the bidirectionality of the faculty-resident relationship as well as the association of PGY with entrustability and faculty entrustment.

Conclusions

Consistent with our hypothesis, by using the OpTrust tool we found that surgical faculty may be the primary drivers of resident entrustability in the operating room. Cited inhibitors, case difficulty, and years of faculty experience are not significantly associated with resident entrustability and do not appear to be barriers to entrustment. These findings suggest that focused faculty development interventions identified using OpTrust can help surgical faculty develop skills to appropriately teach for and assess resident growth and development. Enhanced faculty entrustment behaviors can facilitate resident autonomy in the operating room within the context of appropriate faculty supervision.

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