Dissecting Attending Surgeons' Operating Room Guidance: Factors That Affect Guidance Decision Making

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PURPOSE: The amount of guidance provided by the attending surgeon in the operating room (OR) is a key element in developing residents' autonomy. The purpose of this study is to explore factors that affect attending surgeons' decision making regarding OR guidance provided to the resident.

METHODS: We used video-stimulated recall interviews (VSRI) throughout this 2-phase study. In Phase 1, 3 attending surgeons were invited to review separately 30 to 45 minute video segments of their prerecorded surgical operations to explore factors that influenced their OR guidance decision making. In Phase 2, 3 attending surgeons were observed and documented in the OR (4 operations, 341 min). Each operating surgeon reviewed their videotaped surgical performance within 5 days of the operation to reflect on factors that affected their decision making during the targeted guidance events. All VSRI were recorded. Thematic analysis and manual coding were used to synthesize and analyze data from VSRI transcripts, OR observation documents, and field notes.

RESULTS: A total of 255 minutes of VSRI involving 6 surgeons and 7 surgical operations from 5 different procedures were conducted. A total of 13 guidance decision-making influence factors from 4 categories were identified (Cohen's $\kappa = 0.674$): Setting (case schedule and patient morbidity), content (procedure attributes and case progress), resident (current competency level, trustworthiness, self-confidence, and personal traits), and attending surgeon (level of experience, level of comfort, preferred surgical technique, OR training philosophy, and responsibility as surgeon). A total of 5 factors (case schedule, patient morbidity, procedure attributes, resident current competency level, and trustworthiness) influenced attending surgeons' pre-OR guidance plans. "OR training philosophy" and "responsibility as surgeon" were anchor factors that affected attending surgeons' OR guidance decision-making patterns.

CONCLUSIONS: Surgeons' OR guidance decision making is a dynamic process that is influenced by 13 situational factors. These factors can be used by residency programs to tailor strategies designed to increase resident autonomy in the OR. (J Surg 72:e137-e144. © 2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: operating room (OR) guidance, surgical education, OR teaching, resident autonomy, decision making

COMPETENCIES: Professionalism, Patient Care, Interpersonal Communication Skills, Practice-Based Learning and Improvement

INTRODUCTION

The concept of graded and progressive responsibility is one of the core tenets of surgery residency training. The goal of surgical training is to prepare the resident to function as an independent surgeon at the end of training. For a resident, one essential learning activity is the interaction with patients under the guidance of faculty members who give value, context, and meaning to those interactions. For a surgeon, guidance in the setting of residency training is responsible for assuring the provision of safe and effective care to the individual patient whereas also enabling each resident to develop the skills, knowledge, and attitudes required to enter the unsupervised practice of surgery. This is challenging; however, as surgery residents are infrequently allowed to carry out operations independently with minimal guidance during the course of their training.[1]

Increasing concern exists about the ability and confidence of surgery residents to practice independently following

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graduation.[2-6] Guidance provided by the attending surgeon in the operating room (OR) is a key element in developing resident autonomy and directly influences resident confidence and the ability to operate independently when transitioning from resident to attending surgeon. However, attending surgeons tend to underestimate the amount of guidance they provide to residents in the OR,[7] and residents have significantly different perceptions about OR guidance from attending surgeons.[8] A recent survey[9] reported several factors that limited attending surgeons to transition autonomy to surgical residents in the OR. For attending surgeons, determining when to decrease the amount of OR guidance provided to residents can be difficult in the challenging intraoperative environment. The decision making of OR guidance is a complex process characterized by multiple variables and dynamic situations of uncertainty. Thus, the purpose of this study is to explore factors that affect attending surgeons' decision making regarding guidance provided to the resident in the OR.

METHODS

Video-Stimulated Recall Interview Method

The method of video-stimulated recall interviews (VSRI) was used throughout this 2-phase study. VSRI is a research method that invites participants to view a video sequence of their behavior and then reflect on their decision making during the videotaped events.[10,11] VSRI has been widely used in social science and educational studies, especially in research on teachers' decision-making processes in relation to teaching practices.[12] In our study, the VSRI method involved videotaping attending surgeons during surgical operations with residents via 2 to 3 cameras from different angles in the OR. Wireless microphones worn by surgeons and residents captured all conversations during the operation. After the operation, attending surgeons viewed their videotaped surgical operation separately and were interviewed on their decision-making process regarding guidance events.

Data Collection and Analysis

During Phase 1 of this study, 3 surgeons were invited to review separately 30 to 45 minute video segments of their own prerecorded surgical operations (2 open inguinal hernia repairs and 1 laparoscopic ventral hernia repair) to explore factors that influenced their OR guidance decision making. In Phase 2, 3 surgeons were observed, and videotaped in the OR during 4 surgical operations (laparoscopic cholecystectomy, arteriovenous fistula revision, arteriovenous fistula creation, and laparoscopic-assisted jejunostomy tube placement). One of these surgeons performed 2 surgical cases in Phase 2. To enhance the representative nature of the sampled cases, we chose cases that differed in difficulty levels (as determined by the attending surgeon), and cases with residents from various postgraduate years (PGY) levels. Each operating surgeon was then reviewed 30 to 45 minutes of their videotaped surgical performance within 5 days of the operation to reflect on factors that affected their decision making during the targeted guidance events. These events were identified and classified using the previously established Teach-Direct-Assist guidance taxonomy.[13]

The operating surgeon was asked to narrate his/her performance when viewing the video segments. The interviewer paused at the targeted guidance event (for example the attending surgeon verbally directed the resident to "*go up a little bit higher*") to explore the operating surgeon's decision-making factors. To obtain a deeper understanding of the attending surgeons' OR guidance decision making, we used "why" and "what" probing questions (e.g., "why did you take over at this point?") during the interview according to Pendleton's Rules for providing feedback.[14] All VSRI were captured by Techsmith Camtasia (Techsmith, Okemos, MI)—a software application that records the observer's voice, video playing screen, and onscreen mouse movement. A total of 2 experienced qualitative researchers, with advanced degrees in education and multiple years of research and peer review experience, applied thematic analysis and manually coded VSRI transcripts. These coded transcripts were then combined with data from OR observation notes for final analysis. Pratt's General Model of Teaching[15] was used to develop the coding framework. Researchers identified key themes and discussed disagreements until reaching consensus. The process was continued until all new themes had been identified. Inter-rater agreement was measured by Cohen's κ.

RESULTS

A total of 255 minutes of VSRI involving 6 surgeons and 7 operations were conducted (Table 1). Operating residents' training level ranged from PGY2 to PGY5. Half of the operating surgeons (3/6) had more than 15 years work experience as attending surgeons. Operating surgeons reported providing substantial guidance to residents in 2 of 7 (28.6%) operations, moderate amount of guidance in 4 of 7 (57.1%) operations, and minimal guidance in one (14.3%) operation.

Totally 13 factors were identified that affected guidance decision making (see Table 2 for definitions, examples and determinant categories). Using Pratt's General Model of Teaching,[15] these 13 factors were grouped into 4 categories of determinants: setting, content, resident, and attending surgeon. Most factors (9/13) fell into the residents and attending surgeons categories.

Totally 5 factors (case schedule, patient morbidity, procedure attributes, resident current competency level, and trustworthiness) influenced attending surgeons' pre-