Resident-as-Teacher Programs in General Surgery Residency: Context and Characterization

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OBJECTIVE: Teaching medical students and junior residents are key components of a surgical resident's role. How surgical residents are formally prepared for their teaching role is not well described. The aim of this study was to characterize the status of formal Resident-as-Teacher Programs (RATPs) in U.S. general surgery residency programs. We also sought to understand current attitudes towards teaching by residents.

DESIGN: A survey regarding the presence of RATPs and attitudes toward teaching by residents was sent through the Association of Program Directors in Surgery (APDS) to general surgery program directors (PDs).

SETTING: The study was conducted using an electronically distributed survey.

PARTICIPANTS: Program directors of general surgery residencies were contacted through the APDS.

RESULTS: Program directors from 105 institutions completed the survey; one did not respond to the question about RATPs. 27 (26%) indicated they utilized a RATP. Of these programs the majority, 25 (93%), were developed at the institution and only 2 (6%) used a published curriculum. For the programs without a RATP, 47 (61%) of PDs indicated they were interested in establishing one. Respondents not interested most often cited other resident obligations and time constraints as limiting factors.

CONCLUSIONS: Fewer than one third of responding programs have an established RATP; of those programs that do not have a RATP, the majority are interested in establishing one. Residents clearly play an important role teaching and PDs acknowledge teaching is an important part of residents' daily job, thus formal preparing residents for their teaching role is important. Development and dissemination of a RATP that can be easily incorporated in to general surgery programs would meet an identified need in general surgery training. (J Surg Ed 76:1205−1210. © 2019 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: Resident as teacher, Surgical education, Medical education, Program evaluation

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

INTRODUCTION

Teaching is an integral part of academic general surgery and an essential resident responsibility. The Accreditation Council for Graduate Medical Education (ACGME) requires senior residents to complete a minimum of 25 surgical cases in which they act as teaching assistant.[1] The Milestone Project developed in collaboration with the American Board of Surgery identifies teaching as a separate practice domain in which residents should demonstrate competency.[2] Additionally, the Liaison Committee on Medical Education requires that residents receive training to fulfill their educational obligations toward medical students.[3] Despite this, most medical students enter residency having received no formal training regarding teaching.[4]

To equip residents with required teaching skills, over 80% of general medicine and pediatric residency programs incorporate formal resident-as-teacher programs (RATPs).[5,6] In contrast, utilization of RATPs in general surgery residencies is not well characterized. In a review of published studies on RATPs by Bree et al., only 3 of 39 programs were aimed entirely or in part at residents in surgical specialties.[7] An updated literature review conducted at our institution identified 7 RATPs specifically aimed at surgical residents.[8] The underlying driving

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forces of this discrepancy between what is reported in the literature for general surgery as opposed to other specialties are not clear.

Given the important role, residents play in teaching and that governing bodies mandate residents are trained to teach and demonstrate teaching competency, the goal of this study was to investigate the utilization of RATPs in general surgery residency programs and the contexts in which they exist. In order to accomplish this, we surveyed program directors (PDs) about how residents view their teaching role, how teaching is fostered, and what curricula or programs are in place to teach residents to teach.

MATERIALS AND METHODS

A 23-item survey was developed regarding current RATPs in general surgery residency training programs in the United States. The survey also asked questions about attitudes toward teaching by residents and teaching climate. The entire survey can be found in Supplement A. The questions explored attitudes about teaching by residents; how resident teaching is assessed; and presence of, or desire for, a formal RATP at the institution. Questions consisted of multiple choice and best fit, multiple response, Likert scale-based, and open-ended question. The survey was reviewed for content and relevance by one of the authors (DTH), the general surgery residency PD at our institution. The survey was prepared for electronic distribution using SurveyMonkey.

The project and survey were submitted for review by the Association of Program Directors in Surgery (APDS) research committee and endorsed by the committee. A link to the web-based survey was electronically distributed by the APDS through their listserve. At the time of the distribution of the survey, there were 267 general surgery residency programs, 251 accredited by the ACGME.

In the introductory email PDs were asked to complete the survey. There were 3 recruitment rounds over 3 months to maximize the response rate. Surveys were distributed between January and March of 2017 and the survey was closed in May of 2017. Participation in the survey was anonymous and voluntary. Responses were collected via SurveyMonkey and exported as an Excel file for analysis. Data analysis was performed only on received responses. Nonresponse to a given question was not characterized as a negative response. Quantitative analysis was performed in Excel. Qualitative analysis of open-ended questions was performed by exploring the responses for themes.

This research project was reviewed by the Institutional Review Board of Boston University/Boston University Medical Center and qualified for an exemption determination.

RESULTS

Respondents

After 3 recruitment rounds, we received 116 responses to the survey. Assuming all PDs subscribe to the APDS listserve, the response rate was 43%. Of the respondents, 11 (9%) did not answer questions beyond demographics of their programs; these responses were excluded. Of the remaining 105 respondents, 1 answered questions about teaching attitudes but not those regarding the RATP; this response was included only for the analysis of teaching attitudes.

Of the 105 respondents, 68 (65%) were from an academic institution; 22 (21%) were from community-based programs affiliated with a medical school; and the remaining 15 (14%) were community programs without a medical school affiliation. Programs graduated a minimum of 2 and a maximum of 13 chief residents.

Teaching Attitudes

Nearly all respondents (103, 98%) reported that teaching by residents was valued at their institution. A total of 101 (96%) felt that teaching was an important part of a resident's job; 67 (65%) indicated that teaching in fact was extremely important. Similarly, 98 (93%) PDs felt that developing teaching skills was an important aspect of residents' career; of these 52 (50%) indicated it was extremely important. PDs felt that residents viewed teaching other residents more favorably than teaching medical students (Table 1).

Teaching Expectations

Sixty (57%) PDs responded that teaching expectations for residents were explicitly outlined. Primarily, these expectations were centered on teaching junior residents and medical students at a postgraduate year-appropriate level. Open-ended responses outlined that expectations included leading didactic sessions, teaching during rounds, and coordinating journal clubs.

For the programs with explicit teaching expectations, consequences for not meeting these expectations included a note in residents' evaluation (37, 62%), an informal discussion about expectations (23, 38%), or a formal citation in residents' files (3, 5%). A combination was used at 2 programs. At 14 (23%) of the programs with explicit teaching expectations there was no consequence if teaching expectations were not met. A portion of PDs at

TABLE 1. Distribution of Responses to the Question Regarding PDs' Perception of Residents' Attitude Toward Teaching Medical Students and Other Residents

How much do you think residents enjoy...	Teaching medical students? Responses, *n* (%)	Other residents? Responses, *n* (%)
Love teaching	12 (11)	25 (24)
Like teaching	59 (56)	70 (67)
Neutral about teaching	28 (27)	9 (8)
Would rather not be teaching	5 (5)	1 (1)
Hate teaching	1 (1)	0 (0)

programs that did not explicitly outline teaching expectations did have mechanisms in place to cite residents who did not engage in teaching. This included notation in residents' evaluation at 9 (20%) or an informal discussion at 7 (16%) programs. One program without outlined teaching expectations used both in combination.

Teaching Evaluations

Quality of teaching was predominantly assessed using medical student evaluations of teaching either in isolation (17, 20%) or in combination with other means of assessment (69, 80%). The other means of assessment included addition of resident self-evaluations (24, 35%), faculty observation of teaching (8, 12%), or a combination of both (29, 42%). At 8 programs (12%) peer evaluations were also considered.

Good teaching was generally rewarded through recognition with a teaching award, given at 67 (64%) programs; at 29 (28%) programs this included a monetary stipend. Residents were also given informal feedback about their teaching at 64 (61%) programs or a note was made in the residents' evaluation at 45 (43%) programs. The numbers do not add up to 100% as some programs used a combination of mechanisms to reward teaching. Of note, one program selected the best resident teacher to travel to Surgical Education Week.

Resident-as-Teacher Programs

There was no formal resident-as-teacher program in place at 77 (74%) responding institutions. While the majority of respondents indicated they would be interested in launching a RATP, 30 (39%) of the respondents from programs without a formal resident-as-teacher program were not interested in developing or starting one. Of those respondents who indicated they were not interested in launching a RATP at their institution, only 14 (47%) provided an explanation. Most (6, 43%) felt residents do not have time or have too many other obligations to meet. Four (29%) cited lack of resident interest in teaching or limited interactions between residents and medical students. Three (21%) indicated that the residents' needs regarding preparing them for their teaching role were already being met through other means. One respondent reported lack of knowledge about RATPs as reason not to launch a program at their institution.

Twenty-seven (26%) programs had a formal RATP in place at the time of this survey. Participation was mandatory for 25 (93%) programs. Twenty-five (93%) of the programs were home-grown; one was adapted from a previously published curriculum and one used a previously published curriculum. Of the programs that were developed within the institution, the majority (14, 60%) were designed by surgeons; of these, half had a formal background in educational theory and half did not. The remainder were designed in collaboration of surgeons and nonphysician educators (3, 13%), by nonphysician educators alone (3, 13%), surgeons with and without an education background working together (2, 9%), or provided by the institution's graduate medical education office (1, 4%). The majority (15, 55%) of these reported RATPs focused on a combination of clinical and skill or procedural teaching. Ten (37%) of RATPs focused mainly on clinical teaching skills and only a minority (2, 7%) focused on skill or procedural teaching.

Most frequently RATPs were offered as multiple session lectures (13, 48%); at 3 residency programs, these lectures were complemented with workshops. A single-session lecture was used by 7 (26%) residency programs; multiple session workshops by 4 (15%); and distribution of single delivery web-based content by 3 (11%). Three (11%) residency programs also used supervised participation of senior residents in educational endeavors, such as teaching in the simulation center and proctoring mock oral examination. Of note, no program reported using a designated teaching rotation or web-based spaced education sessions.

RATPs were evaluated most frequently through resident satisfaction or self-efficacy surveys, which were used by 14 (52%) of programs. These were typically used in combination with other means to evaluate teaching skills, including peer evaluation, students' evaluations, and observation of teaching by faculty. Seven

(26%) of programs did not have a formal process in place to evaluate their RATP.

DISCUSSION

Teaching by residents has demonstrable value. Peer teaching, learners teaching other same-level or near-level learners, has demonstrated benefits for both parties. The shared experience, social status, and knowledge base between trainees can enable better level-appropriate communication.[9] Beyond this, positive student-resident interactions have been shown to have a significant influence on students' future career choices and can encourage students to pursue careers in surgical specialties.[10,11] In the age of impending general surgeon shortages,[12] effective education and this positive recruitment effect should not be undervalued. Finally, resident teaching skills are an important component of surgical career development. In one series, nearly 20% of available US general surgical staff positions were at a regional academic metropolitan center as opposed to a community institution.[13] Residents filling these positions will be expected to be effective educators as well as clinicians. Much is written about how surgical residents acquire medical knowledge and technical skills. However, there is a relative lack of understanding how residents are being prepared for their roles as educators.

Currently, there is no comprehensive description of the number or characteristics of formal RATPs employed in general surgery residency programs across the nation. This gap in the literature makes it difficult to appreciate the response of general surgery as a field to the ACGME teaching milestone or the Liaison Committee on Medical Education mandate that residents be prepared for their teaching role.[2,3] Furthermore, the lack of literature leaves questions regarding best strategies and potential unique barriers to training general surgery residents how to teach, which may differ from other specialties. This study characterizes teaching expectations for resident educators, how PDs view the residents' role in education, and provides new insight into currently established surgical RATPs. To our knowledge this is the first study exploring the prevalence of general surgery specific resident-as-teacher programs. We found that programs directors in surgery recognized the value of resident teaching, but that most did not have established formal curricula to help prepare residents become effective educators.

In 1990, Anderson et al. explored the surgical resident educator climate and found that more than half of PDs in surgery did not believe that formal instruction in teaching was important for residents.[14] At that time, the authors called on PDs to re-examine how surgical residents are prepared for their teaching roles.[14] Based on our data, there seems to have been a culture shift. The majority of PDs surveyed now believe that resident teaching is valuable and recognize the importance of teaching junior residents and medical students in surgical residency. The institution of the ACGME/American Board of Surgery general surgery milestones in 2013, which highlight the importance of cultivating resident teaching skills,[2] may have influenced this change.

Overall, PDs believed that their residents enjoyed teaching; however, programs expressed that residents were less likely to enjoy teaching medical students than junior residents. While the reasons behind this difference were not explored in this study, reasons might include resident's lack of teaching confidence or motivation to teach in the absence of formal teaching training.[15,16] Alternatively, medical student teaching may be neglected in the setting of increased pressures from duty hour restrictions at institutions where the resident teaching role is not emphasized.[17] Teaching an engaged, invested audience, such as junior residents, may also be perceived as more enjoyable than teaching than all-comers. Given the impact of resident teaching and mentorship on recruitment, further research is needed to explore this topic more thoroughly.

Despite the fact that surgical residents have been reported to spend as much as 25% of their time supervising, teaching, and evaluating medical students,[18] explicit teaching expectations were only outlined at just over half of responding programs. This was juxtaposed with our finding that most responding programs reported following teaching assessments via medical student and peer evaluations. Despite the gap in expectation communication, these teaching assessments, positive and negative, were relayed to residents via informal feedback and in their resident evaluations. Good teaching was rewarded with formal teaching awards with and without monetary stipends at many institutions which is consistent with our finding that institutions believe resident teaching is valuable. This is an improvement upon that data presented by Anderson et al. nearly 30 years ago, when only 36% of programs provided teaching evaluations,[14] but the continued discordance between expectation and assessment may also contribute to residents' limited teaching self-confidence and lack of investment in teaching. Without clear expectations or incentives, residents may not seek out opportunities to improve upon their teaching skills.

In contrast to our findings that surgical residency programs find resident teaching valuable, less than one-third of programs had established a RATP at the time of this survey. More than half of the residency programs without a RATP expressed interest in instituting such a program but have not yet done so. This scarcity of surgical RATPs in comparison to other specialties seen in this survey has likely occurred in the setting of limited access to preexisting surgical RATP guidelines or curricula.[8,14] While we did not address this question specifically in our study, we do now know that of the existing RATPs, surgeons with and without formal educational training reported developing their own, individual, typically multisession curricula. It is easy to imagine that developing and implementing robust RATP curricula from scratch would be time and resource consuming. Institutions that are smaller or lack faculty with educational training may find these barriers insurmountable. Further, programs may be less likely to invest in such a program in the setting of concerns about limited resident buy-in and prior time commitments.

The American College of Surgeons has implemented a highly rated and well-established annual 3-day program at their Chicago headquarters to help prepare surgical residents to be more effective leaders and educators.[19] However, attendance is limited by the associated fees, travel expenses, and time away from residency training. An alternative solution is to develop a standardized program that can be disseminated and utilized across programs nationally then tailored to each program specifically. This could relieve institutions' individual burdens of having to develop a new curriculum at each place. Longitudinal RATPs with both electronic and in-person formats are feasible for delivery of content that will satisfy the ACGME mandate.[8] Until a standardized program package exists, established RATPs in general surgery should be more widely published so that programs can choose formats and topics that best fit their needs. We do believe that aiming RATPs at surgical residents is important. While some teaching skills certainly are universal, surgical residents train and teach both in and outside of the operating room and under time constraints, justifying targeted programming.

There are several limitations of this study. The response rate of 43% may be reflective of steeply declining survey response rates in the era of survey fatigue.[20,21] While this raises concerns that nonresponders may be systematically different from the study population, literature supports that there are few differences in physician characteristics between early and late responders and between responders and nonresponders.[22] In this study, the mix of respondents is distributed across residency programs and so likely does give an accurate insight. Participation in the study and answering the survey questions was voluntary and without incentives. Respondents were not obligated to answer every question, and many chose not to answer the open-ended questions. This limited our ability to delve deeper into the nuances of each response.

We are also limited by the use of the APDS listserve. The listserve is not exclusively sent to general surgery PDs but reaches a diverse group, including administrators, residents, and other individuals with an interest in surgical education. Also, it is not certain that all general surgery PDs in fact subscribe to the listserve. This raises concern that we may have received responses from individuals who were not PDs or missed some PDs who may have otherwise provided valuable insight on this topic but did not have access to the survey. Given that there were no incentives to survey completion, we hope that non-PD members would not have completed the survey after reading the recruitment email and instructions. It is possible, however, that this occurred and diluted our responses. Conversely, our response rate may have actually been as high as 46% given that there were only 251 ACGME accredited programs at the time of survey distribution.

CONCLUSIONS

Today, nearly all PDs in surgery recognize the value of surgical residents as educators of junior residents and medical students. However, discordance still exists between expectations of resident teaching, or lack thereof, and resident teaching evaluations. Additionally, fewer than one-third of respondents reported having an established formal RATP at their institution despite a national mandate. Existing RATPs tend to be homegrown, reflective of a paucity of general surgery-specific RATPs. Encouragingly, more than half of the programs without formal programs are interested in instituting one. These findings reinforce the conclusions in our previous review of surgery specific RATP curricula[8]; there is a need for standardized curricula that can be easily implemented and disseminated.

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SUPPLEMENTARY INFORMATION

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