What do Young Colorectal Surgeons Value From Their CRS Residency Training?

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OBJECTIVE: Colorectal surgery (CRS) training has seen many changes over the years. This study sought to identify aspects of CRS residency curriculum that were most valued by recent graduates and what changes could be made to improve training.

DESIGN: Semistructured interviews were performed with board-certified colorectal surgeons 2 to 7 years removed from their CRS residency. Interview responses were qualitatively analyzed and converted to coded, categorizable data. Subjects were recruited via a snowball sampling method.

SETTING: Interviews were conducted in person and via telephone with surgeons in a variety of practices across the United States and Canada. Analysis was performed by a team at Lahey Clinic, Burlington, MA, an academic, tertiary care center.

PARTICIPANTS: Board certified colorectal surgeons 2 to 7 years removed from CRS residency.

RESULTS: Twenty surgeons from 11 different CRS residencies were interviewed. At the time of the interview, surgeons were employed in 13 states and 1 foreign country. When asked what aspects of their CRS residency were of value, surgeons produced 74 comments emphasizing: volume of cases (65% of subjects), variety of cases (55%), development of technical skills (40%), management of specific diseases (35%), faculty (30%), mentorship (30%), and practice management (15%). With regard to technical skills, surgeons cited pelvic surgery (40%) and minimally invasive techniques (45%) as the exposures that helped them become successful. When discussing what could be added to training, subjects made 54 comments identifying: more robotic exposure (35%), more anorectal disease (30%), more pelvic floor exposure (25%), and practice management/billing (35%) as items to incorporate. Sixty five percent of subjects believed that "nothing" should be eliminated from their training.

CONCLUSIONS: Young colon and rectal surgeons valued their training highly and strongly declined to eliminate any substantial part of the existing curriculum. They also expressed a strong desire to add more elements to the CRS residency including further robotic training, more anorectal, more pelvic floor, and further training in practice management. (J Surg Ed 76:720–726. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: colorectal surgery residency, colorectal surgery curriculum, colorectal surgery education needs assessment

COMPETENCIES: Patient Care, Interpersonal and Communication Skills, Systems-Based Practice, Medical Knowledge

INTRODUCTION

Colorectal surgery (CRS) training has had a long and evolving existence in the United States. The American

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Proctologic Society (now, the American Society of Colon and Rectal Surgery) was formed in 1899 and the American Board of Proctology was recognized as an independent entity in 1949.[1] Over the years, the specialty has transformed from one solely addressing anorectal complaints to a specialty treating the full spectrum of colon and rectal disease. With these changes, training requirements for the specialty have adjusted in kind. Currently, the Accreditation Council for Graduate Medical Education dictates that the CRS residency be 12 months in length with broad curricular requirements including exposure to disease processes including anorectal disease, colorectal cancer, colorectal physiologic disorders, diverticular disease, inflammatory bowel disease, and relevant genetic disorders. In addition, there are operative requirements including 120 abdominal operations, 60 anorectal operations, and 185 procedures evaluating the gastrointestinal tract and pelvic floor (endoscopy and pelvic floor testing).[2] Beyond these basic curricular requirements, programs are allowed to characterize the residency as they see fit.

Over the last 20 years, there have been rapid changes in the practice of CRS. For many diseases treated by the colorectal surgeon, an increasing array of diagnostic and therapeutic medical interventions is now available. There is also an expanded repertoire of procedures with which a colorectal surgeon must be familiar. New technologic platforms like robotic surgery, advanced endoscopy, and transanal approaches show promise in revolutionizing the field. These techniques all have significant learning curves and require time and exposure to develop expertise.[3,4] With this rapid increase in available therapeutic options, there is utility in assessing whether CRS residency is best meeting the needs of young colorectal surgeons. This qualitative study sought to identify the aspects of CRS residency curriculum that were most valued by recent graduates and what changes could be made to improve training.

MATERIALS AND METHODS

Study Design: This was a qualitative research project using a general inductive approach. Twenty semistructured interviews consisting of 31 questions were performed with American Board of Colon and Rectal Surgery certified, colorectal surgeons 2 to 7 years removed from their CRS residency. The interview script is attached as Appendix A. Interviews were performed in person or via telephone between October 1, 2017 and November 30, 2017 and lasted 20 to 40 minutes. Each interview was recorded and transcribed verbatim.

Participants were selected via a snowball sampling method. As a result, initial research subjects were known to the research team, while, later research subjects were unknown to the research team prior to approaching them for study purposes. Forty-two potential subjects were approached via an email explaining the study and 20 subjects completed the interview process. Subjects who responded to our emails were no different than those who did not (similar in gender, number of years out of training, and type of current practice). No subjects dropped out of the study once the interview was initiated.

The initial interview questions were created by the research team and then piloted on the first 2 participants. The research team then reviewed and edited the questions to better optimize the interview process. The first 2 research subjects were then reapproached to clarify questions that had either been changed or added to the interview script.

Data saturation was discussed by the research team and was felt to have been met in all arenas of questioning by the later interviews. Transcripts were not returned to participants for comments or corrections.

Research team: Interviews were conducted by 1 colorectal surgeon 20 years in practice and 1 CRS resident. Both researchers were female.

Analysis: Interview responses were qualitatively analyzed and coded by 2 members of the research team. Themes were derived from the data following completion of the research collection. Both members of the research team were required to reach consensus regarding comment categorization and theme representation. No software was used to manage the data. Quotations were used to exemplify each theme and were not attributed to specific interview subjects (Table 2). For quantitative analysis, answers to open-ended questions were converted to coded data and the frequency of responses was tallied.

The study received IRB approval from the Lahey Clinic. Informed consent was provided verbally at the initiation of each interview. Guidelines for qualitative research as described by COREQ were followed.[5]

RESULTS

Demographics: Twenty surgeons from 11 different residencies were interviewed and their demographics are included in Table 1. They were 3.5 years (mean) out from residency. Residencies included single resident programs and multiresident programs (mean 1.9 residents per program). Current employment locations included 13 states and 1 foreign country in jobs that were described as academic (16 subjects), hospital-employed (1 subject), private practice (2 subject), and military (1 subject). Forty five percent of interview

TABLE 1. Demographics of the Interview Subjects

Demographics	Percentage [Range]
Female	50%
Mean number of residents per program	1.9 [1-5]
Age	37.7 years [33-43]
Mean time out from CRS residency	3.5 years [2-7]
Current employment: Academic practice	80%
Current employment: Private practice	10%
Current employment: Hospital owned	5%
Current employment: Military	5%
Current mean hours a week worked	59.5 [45-80]
General surgery call	45%
OR days a month	9.9
Married/committed relationship	85%
Mean number of children	1.1 [0-3]
Currently pregnant	20% (females)

subjects participated in some general surgery call as part of their current employment and they operated a mean of 10 days a month. Fifty percent of interview subjects were female. Eighty five percent were married or in a committed relationship. As a group, they had a mean of 1.1 children each. Two of the 10 female subjects were pregnant at the time of the interview.

Coded Categories: Table 2 demonstrates the most common coding categories used to score the questions supplied to the interview subjects. It also includes examples of comments illustrative of each category.

What was valued: When queried about what aspects of their colorectal residency made them successful in their current career, interview subjects produced 74 comments (range of 1-6 comments per interviewee). Of the subjects: Sixty five percent mentioned high volume of cases, broad variety of cases (55%), development of technical skills (40%), management of specific disease processes (35%), faculty (30%), mentorship (30%), and practice management (15%) as aspects of colorectal residency that made them successful. When specifically queried about what operative skills gleaned from their residency were the most formative, subjects made 34 comments. They again emphasized overall high volume and variety (20% of subjects), pelvic surgery (40%), minimally invasive techniques including robotic and laparoscopic (45%), anorectal approaches (20%), and complex inflammatory bowel disease procedures (15%) as the aspects of operative exposure they found the most helpful in their current practice (Table 3).

What could have been added? When queried about what could have been added to their colorectal residency, subjects produced 54 comments. Two subjects independently stated that they would have added a second year to the residency. Others identified technical skills (60%), exposure to specific disease management (50%), information about practice management (5%), and time for research (10%) as potential additions to residency training that would have been valuable. Sixty percent of interview subjects made 18 comments identifying various technical

TABLE 2. Examples of Most Common Coding Categories

Categories:	Examples
Volume is beneficial	*"just doing higher volume of cases. . .and also seeing more complications"*
More time for fellowship	*"Two years would have given me more time to do the research and become a little more independent with the deep pelvic dissection"*
More anorectal	*"the things that frustrate me the most [now that I am out of training] are really a lot of anorectal"*
Would not eliminate anything	*"I don't think I would eliminate anything. It's a short fellowship."*
Clinic time was appropriate	*"each month you were with certain attendings. . .which meant I had their schedule so every time they were in clinic I was in clinic"*
More clinic time would have been valuable	*"in hindsight, I should have spent more time in clinic"*
Autonomy not of high value	*"One of the things that I feel is underappreciated is that when doing a fellowship compared to a general surgery residency, is the value of seeing an expert do the operation"*

TABLE 3. What was Valued in Fellowship, What Could be Added, What Could be Eliminated?

Query:	Number of Independent Comments/Percentage of Interviewees Who Made a Comment
What was Valued in Fellowship?	**74 (range 1-6)**
Volume	13 (65%)
Variety	11 (55%)
Technical aspects	9 (MIS 2, robotic surgery 1, endoscopy 4, re-operative pelvis 1) (45%)
Exposure to disease processes	8 (anorectal 2, colorectal cancer 2, IBD 3, pelvic floor 1) (40%)
Faculty	8 (40%)
Mentorship	6 (30%)
Practice management	3 (15%)
Items to add to fellowship?	**54 (range 1-6)**
Technical aspects	18 (rectal cancer 3, colonoscopy 3, complex endoscopy 1, laparoscopic 2, robotic surgery 7, TAMIS/TEM 1, IPAA 1) (90%)
Exposure to disease processes	13 (IBD 1, pelvic floor 5, anal intraephithelial neoplasia 1, anorectal 6) (65%)
Practice management	8 (40%)
Clinic	4 (20%)
Time	2 (10%)
Research	2 (10%)
Advanced degree	1 (5%)
Things to Eliminate?	**12 (range 1-2)**
Service obligations	2 (10%)
Travel time	3 (15%)
Robotic surgery	1 (5%)
Not done in current practice	5 (25%)

aspects that they thought could have been added to residency: these included more rectal cancer/pelvic surgery, colonoscopy, complex endoscopy, laparoscopic exposure, robotic exposure, TAMIS/TEM exposure, and ileoanal pouches. In regards to wider exposure to specific disease processes, subjects identified inflammatory bowel disease (5%), pelvic floor (25%), anal intraepithelial neoplasia (5%) and anorectal disease (30%) as areas of which they would have liked to have seen more. Out of all the categories (operative, disease process, practice management), the items which more than 25% of young surgeons would have liked to have more experience included robotic surgery (35% of subjects), anorectal procedures (30%), pelvic floor evaluation (25%), and practice management/billing (35%).

What could have been eliminated: When asked what aspects of their colorectal residency could have been eliminated, 65% of subjects responded "nothing." The 35% of subjects who did suggest items to eliminate made 12 comments describing items such as service obligations, outmoded interventions, advanced endoscopy, anorectal procedures, nonoperative robotic console time, and travel requirements within the residency. From this data, it is clear that young colorectal surgeons were more in favor of adding components (54 comments) to CRS residency rather than eliminating components (12 comments.)

Clinic: Interview subjects were asked if they were happy with the amount of time they spent in clinic during their residencies. Fifty five percent of subjects were happy with the amount of time they had spent in clinic. One subject believed they had spent too much time in clinic and 40% of subjects thought that they could have used more time in clinic. Examples of ways in which clinic was incorporated into residency included an apprenticeship model, where residents worked with only 1 attending and followed them from clinic to operating room to endoscopy suite, a specialized clinic/endoscopy rotation, and prescheduled clinic days each week. Of those who were unsatisfied with the time they had spent in clinic, 50% stated that they did not have an official clinic requirement in their residency (Table 4).

Autonomy: When surgeons were asked about autonomy in their residency, they had mixed feelings. Eighty

TABLE 4. Clinic and Autonomy

Query	Interview Subjects: (N = 20)
Happy with time in clinic	11 (55%)
Unhappy: spent enough time	1 (5%)
Unhappy: not enough time	8 (40%)
Happy with autonomy/ high autonomy program	9 (45%)
Happy with autonomy/ low autonomy program	7 (35%)
Would like more autonomy	4 (20%)

percent of surgeons were content with the amount of autonomy they experienced in colorectal residency. Forty five (9 of 20) described themselves as happy while listing traditional descriptors of autonomous behavior including operating independently or taking younger residents through cases. Thirty five percent (7 of 20) described themselves as happy and described higher levels of supervision with minimal autonomy. These surgeons acknowledged limited autonomous action in their programs, but stated that they did not think of that fact as detrimental to their education. They emphasized that autonomy was of minimal importance during colorectal residency as their goal was to learn from experts. Finally, 20% of interviewees (4 of 20) wished for more autonomy.

DISCUSSION

Our data demonstrate that recent graduates of CRS residency programs found a great deal of value in their training and would be reluctant to eliminate elements of the current curriculum. However, they were quick to suggest that additional robotic training, further anorectal surgery experience, more pelvic floor exposure, and more information about running a practice/billing would be of benefit to their current practice. Young surgeons also identified clinic or office time as an important aspect of their training. Finally, regarding autonomy, 80% of young surgeons were happy with the level of autonomy they experienced in CRS residency.

As evidenced, young colorectal surgeons were more in favor of adding components (54 comments) to CRS residency rather than eliminating components (12 comments). With a one-year residency that many young surgeons believed was already jam-packed, the question becomes whether there is enough time to give young colorectal surgeons what they want. This begs the question of whether CRS residency should be extended or the progression through general surgery to colorectal residency reworked. This is of particular interest given the current national conversation regarding length and focus of general surgery training.[6] Proposed changes to the current structure have included shortening the general surgery residency to 4 years while increasing the CRS residency to 2 years or allowing flexible subspecialty training to occur as early as the postgraduate fourth year of general surgery.[7] However, in 2009, a survey of 189 colorectal surgeons enrolled in the class years 2005, 2006, and 2007 were queried on the question of restructuring general surgery residency and colorectal residency to a 4+2 program with 55.6% of the respondents against restructuring versus 21.8% promoting restructuring.[8] While the interview subjects of our study were not specifically asked their views on restructuring CRS residency, their responses enumerating the aspects of CRS that could be added to their training may suggest that many of today's recent trainees would be in favor of such a change. Further evaluation of this question by current young surgeons and trainees is merited.

In regards to time spent in the office and clinic, young surgeons unanimously agreed that time in clinic in CRS residency was beneficial to their later selves. Many (45%) wished they had spent more time in clinic. While the Accreditation Council for Graduate Medical Education recommends that education of CRS residents occur in 5 different settings: ambulatory clinic, emergency department, endoscopy suite, inpatient hospital, and operating room, only the operating room and endoscopy suite have discrete numerical case requirements of residents.[2] For this reason, clinic-based education can be neglected in favor of the operating room. To combat this outcome, residencies had many different ways of integrating clinic into the training model. Some incorporated an apprenticeship paradigm in which the resident following an attending from clinic to operating room to endoscopy suite. Other programs focused on clinic time in specific rotations which included multiple clinic days a week. Some programs had a specific resident-run clinic. While the resident-run clinic was found to be of utility to participants, the subjects also emphasized the need of spending time in the office with the attendings going through the algorithms of patient care. Of those who were unsatisfied with the time they had spent in clinic, 50% stated that their programs had no official clinic requirement. This indicates that CRS residencies should consider implementing explicit clinic requirement for their trainees.

Colorectal surgeons did not value autonomy during their training as much as one might expect given their proximity to the conclusion of their training. These surgeons described mixed feelings about autonomy stating that they understood the benefit of autonomy, but also realized its downside: potential harm to the patient and less time learning from experts in an already short fellowship. This nuanced understanding of autonomy is in contrast to the current view of autonomy as it pertains to general surgery residency. There have been numerous recent publications lauding the initiation of attempts to increase general surgery resident autonomy ranging from resident run clinics to the use of smartphone based tools to rate autonomy after each operation.[9,10] Our study demonstrates that for many CRS surgeons, a high autonomy CRS residency was not something they thought was necessary for their future success. It may be that for one-year subspecialty residency following

5 years of general surgery residency, autonomy is not of great importance. Nonetheless, this discovery deserves further exploration.

There are limitations to this study. The main weakness was that this was a small study consisting of 20 surgeons representing 11 different residencies. Through virtue of our surgeon sample, the CRS residencies and current employment represented by our study favor academic CRS rather than the more community-based training available. Therefore, it is unclear if our findings are generalizable to the greater population of colorectal surgeons in the United States. Another weakness was that our results represented the mixed opinions and conflicting desires of a heterogeneous group of surgeons. Each surgeon was adept at identifying the curricular strengths and weaknesses of their own specific programs—but they were unable to comment on residencies different than their own. Therefore, many of the findings were contradictory. For example, some subjects were proponents of adding more robotic surgery, while others thought they had excessive time spent in robotic-assisted cases. These inconsistencies are inherent to a qualitative research project and are where interpretation by the researchers determines the message of the study. Finally, our interviews were performed by a colorectal resident and a colorectal attending who have their own biases regarding the questions at hand. In an effort to minimize the observer bias, the research team was required to reach consensus on interpretation and categorization of each subject's comments.

The strength of our study lies in its iterative, qualitative approach which provides a nuanced interrogation into the good and bad of CRS training. Our interview subjects, board-certified colorectal surgeons a few years out of residency, have a unique understanding of what CRS training should entail and they provide valuable insight into this question. The study also brings up the question of who should decide what should be included in subspecialty training. Assessing recent graduate opinions about the quality and appropriateness of their training may provide interesting and pertinent data to help in deciding these questions.

CONCLUSIONS

Young colon and rectal surgeons were content with a multitude of aspects of their CRS residency training; however, they also expressed a strong desire to add elements to their residency while declining to eliminate any substantial part of the existing curriculum. This raises the question of whether CRS training should be extended and expanded.

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SUPPLEMENTARY INFORMATION

Supplementary material associated with this article can be found in the online version at https://doi.org/10.1016/j.jsurg.2018.09.013.

APPENDIX A: INTERVIEW QUESTIONNAIRE

Demographics

1. What is your age?
2. What is your sex?
3. What year did you graduate from your Colon and Rectal Surgery Residency?
4. What kind of practice are you employed by?
5. If you are in an academic position, what is your rank?
6. How many hours a week on average are you working?
7. In what geographic location in the country are you located?
8. How many days a month do you operate?
9. Tell us a little bit about your current job.
10. Are you in a married or in a committed relationship?
11. Do you have children?
12. How many years has it been since you had your last child?

Fellowship Assessment

13. When thinking about your current career: What elements of your colorectal surgery fellowship have allowed you to be successful?
14. When thinking about your current career: What elements could have been added to your colorectal surgery fellowship to allow you to be more successful?
15. When thinking about your current career: What elements of your colorectal surgery fellowship could have been changed or eliminated?
16. When thinking about your current operative skills, what parts of your colorectal surgery fellowship were the most formative?
17. When thinking about your colorectal surgery fellowship, were you happy with the amount of time you spent in the clinic?
18. How much time did you spend in clinic a week?
19. When thinking about your colorectal surgery fellowship, were you happy with the amount of autonomy you experienced?
20. Are you satisfied with your current career progression?
21. When thinking about your current career progression: What strategies have you used to further your career?
22. When thinking about your current career progression: What barriers have you encountered?

Case Mix

23. When thinking about your current career: are you satisfied with your current volume?
    a. Can you tell me more?
24. When thinking about your current career: are you satisfied with your current operative case mix?
    a. Can you tell me more?
25. When thinking about your current career: can you describe the referral patterns at your institution?
26. When reflecting on your current operative case mix, do you feel like you have control over its composition?
27. When reflecting on your current operative case mix, what strategies have you used to create the case mix you want?
28. When reflecting on your current operative case mix: what barriers have prevented you from having the case mix you want?
29. Is a certain type of case mix important to career progression?

CLOSING

30. Anything else you want to add?
31. Do you know of any other young colorectal surgeons (1-7 years out) you could think of whom we could approach to participate (we are looking for balanced demographics, for example if you are a man—a female surgeon. Or if you are in an academic setting, someone in private practice)?