Initial report on young cardiothoracic surgeons' first job: From searching to securing and the gaps in between

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ABSTRACT

Objective: Recent industry studies have projected a deficit in cardiothoracic surgeons by 2030. Little is known about the difficulties of the job search process after cardiothoracic training. The purpose of this study is to explore the current practices of the first job hunt and contract negotiation for young cardiothoracic surgeons, and to identify the gaps in resources available to applicants.

Methods: In October 2017, a 56-question survey was e-mailed to recent (2013–2017) board-certified cardiothoracic surgeons in the United States inquiring about their experience securing their first cardiothoracic job. The survey was administered via REDCap, and responses were accepted over 3 months.

Results: The response rate was 12.8% (61/475). The majority of cardiothoracic program graduates (86.9%) interviewed for jobs between October and March of their final cardiothoracic training year, and 79.7% of contracts were signed before completing training. Sixty-four percent of respondents negotiated their first contract. The most influential factor in job selection was partner mentorship. Average starting pretax salary for respondents was \$375,588 ($\pm$ \$107,265). More than half of respondents reported needing more resources and support for the identification (59%) and comparison (54.1%) of job opportunities, contract negotiation (70.5%), and salary guidelines navigation (77%).

Conclusions: Little guidance exists to support the search and securing of young cardiothoracic surgeons' first employment. Resources, whether institutional or organizational, are sparse and difficult to tailor to individual needs. Given the potential ramification of early career decisions, focused support is needed to remediate the lack of preparation available to the newest generations of cardiothoracic surgeons. (J Thorac Cardiovasc Surg 2019;158:632–41)

Young CT surgeons' interviewing and contract signing timeline.

Central Message

Limited guidance exists to support the search and securing of young CT surgeons' first job. Concerted career resources must be developed on the local and national levels.

Perspective

Despite lengthy technical training, little guidance exists to support the search and securing of young CT surgeons' first employment. Institutional and organizational resources are sparse and difficult to tailor to individual needs. Focused support is needed to remediate the lack of preparation and HR available to the newest generation of CT surgeons.

See Commentary on page 642.

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Becoming a cardiothoracic (CT) surgeon requires dedication, tenacity, and most importantly time: 10 years in a more traditional path with research and postgraduate CT fellowships. Yet for sacrifices made during their training, little support exists for CT trainees to find, select, and secure their first job. The streamlined residency match process, securing employment for many medical students each year, restricts job offerings and subsequent contractual decision-making for fresh graduates. Thus, physicians'

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Abbreviations and Acronyms

AATS	= American Association for Thoracic Surgery
ABTS	= American Board of Thoracic Surgery
CT	= cardiothoracic
HR	= human resources
STS	= Society of Thoracic Surgeons

postgraduate employment is the first time many surgeons face professional contract and benefits negotiations, with minimal experience in the area of human resources (HR) services.

As a specialty, the field of CT surgery can anticipate several challenges in future years. According to multiple reports, the CT surgery workforce is expected to experience a shortage of approximately 2000 employees in upcoming decades, attributed to the combination of an aging population's increased surgical needs and unpredictable CT fellowships application trends.¹⁻⁴ CT trainees cite a lack of early mentorship in the field, as well as concerns of unemployment and inadequate remuneration once board-certified.⁵ With the future of CT surgery in constant flux, the process of CT surgeons' first job hunt remains elusive. The aim of this study was to inquire about the process of job hunting and contract negotiation for young CT surgeons, and identify resources available through this critical, career-defining step.

MATERIALS AND METHODS

In October 2017, a 56-question, web-based survey was sent to recent (2013-2017) surgeons certified by the American Board of Thoracic Surgery (ABTS) inquiring about their experience securing their first CT job (Figure E1). The survey was approved by Boston Medical Center's Institutional Review Board and administered via REDCap. Reminder e-mails were sent 2 weeks after initial contact for nonresponders, and responses were accepted over a period of 3 months. Participation was voluntary, and personal identifiers were not collected. Response data from employed participants were used only for the purposes of contract and benefit result analyses. Unemployed participants' answers pertaining to job search and interviewing processes were included in the study's analyses.

Summary measures were obtained for all applicable variables. Significance of group differences was tested using a 2-sided chi-square test (categorical variables), analysis of variance, or Kruskal-Wallis tests (continuous variables). All analyses were conducted on complete data in SAS 9.4 (SAS Institute Inc, Cary, NC).

RESULTS

Demographics

A total of 475 survey requests were e-mailed to 83 female surgeons (17.5%) and 392 male surgeons (82.5%). The response rate was 12.8% (61/475). Demographic results of the 61 respondents are shown in Table 1. Two of the 61 respondents reported not currently being employed as

TABLE 1. Respondent characteristics

Variables	Data (N = 61)
Gender	
Male	50 (82.0)
Female	11 (18.0)
US medical graduates	53 (86.9)
Age at completion of CT training, y, mean (SD)	35.7 (2.3)
Advanced training	22 (36.1)
Congenital cardiac surgery	10 (47.6)
Minimally invasive surgery*	5 (23.8)
Transplant	3 (14.3)
Endovascular surgery	2 (9.5)
Interventional cardiology	1 (4.5)
Mechanical circulatory support	1 (4.5)

Values are n (%) unless otherwise indicated. CT, Cardiothoracic; SD, standard deviation. *Thoracic, esophageal, cardiac, and valve minimally invasive surgery.

surgeons, listing "I am looking for a job as a surgeon" as the reason for present unemployed status.

Job Search and Interviewing

Resources used for the job search process are shown in Figure 1. Interviewing timeline is shown in Figure 2. Respondents attended a median of 4 interviews (range, 3-6), with 77.9% of participants attending 2 or more separate-visit interviews for the position accepted. The majority of respondents (79.7%) reported taking less than 1 month off between completion of CT surgery training and the start of their first job.

Job Selection

The 2 highest ranked factors affecting job selection were partner mentorship and type of practice (academic vs private practice). The lowest ranked factors pertained to the ability to work with medical trainees and call frequency. Other influential factors included spousal and family accommodations (20.3%), nature of surgical practice (mixed vs thoracic or cardiac only; 8.5%), professional growth potential, and research opportunities. Breakdown of practice settings is reported in Figure 3. Of those working in university programs (n = 42), 7.1% had no academic rank, 4.8% were clinical instructors, 85.7% were assistant professors, and 2.4% were associate professors.

First Job Contracts

Contracts for first employment were signed before completing CT training in 79.7% of cases (Figure 2). Contract negotiation describes a discussion between job applicants and hiring parties during which specific contractual modifications are requested by the applicant, such as an increase in salary or addition of benefits such as signing bonuses, relocation packages, or research funding. With 64.4% of respondents negotiating their first contract, a

FIGURE 1. Resources used during first CT surgery job search. CT, Cardiothoracic.

greater proportion of female CT surgeons was found to enter negotiations (72.7% vs 62.5% of male applicants, $P = .52$). Twenty-one of the 36 surgeons working in academics negotiated their contract (58.3%), compared with 17 of 23 employed in other settings (73.9%) ($P = .27$). Of those who negotiated, 65.8% reported receiving assistance from

existing CT surgeon advisors. Ultimately, 47.5% of all contracts were reviewed by lawyers before signature. The most common contract duration was 3 years (45.8%). Moving funds were received by 83.1% of respondents, covering up to \$20,000, or 100%, of moving expenses. Likewise, 59.3% of respondents received a signing bonus

FIGURE 2. Interview (N = 61) and contract signing (N = 59) timeline. CT, Cardiothoracic.

FIGURE 3. Distribution of practice setting among survey respondents.

with a median amount of \$25,000 (interquartile range, \$15,000-\$40,000). Only 1 respondent incorporated student loans repayment as part of their contract in the amount of \$150,000.

Average starting pretax salary for respondents was \$375,588 ($\pm$ \$107,265). Salaries were most commonly guaranteed for 2 to 3 years (78.0%). Surgeons who negotiated reported a higher median starting salary compared with non-negotiators (\$375,000 vs \$325,000, $P = .05$). Starting salaries for academic versus nonacademic jobs were significantly different (\$325,000 vs \$437,500 $P = .002$). Median starting salaries were identical for female and male respondents (\$350,000).

Benefits

When prompted about benefits, 22% of respondents reported having designated nonclinical time in their contract, from 10% to 60% of active work time. The majority of respondents reported having continuing medical education funding (88.1%) and time off (76.3%) included in their contract. Nearly all participants (98.3%) reported having contractual annual vacation time off, and 59.3% revealed taking 10 or more monthly call-days. Only 54.5% of women and 50% of men reported having parental leave provisions in their benefits. Health, disability, and retirement benefits were included in the majority of contracts (93.2%, 91.5%, 94.9%, respectively). A large portion of participants (40.7%) reported being unsure of the specific type of malpractice insurance included in their contract. Other benefits included academic degrees, housing-related benefits, research and laboratory startup funds, nonproductivity bonuses, membership dues, child education fund, academic stipend, and company stock options.

Resources and Impressions

When prompted about the resources available to them during the job search process, survey respondents reported needing assistance in several areas, as shown in Figure 4.

Respondents also indicated that more assistance is needed in the evaluation of potential partners' mentorship. Open-text advice from survey respondents focused on the need for early interviewing, the importance of networking, and the primordial importance of mentorship and contract negotiation (Table E1).

DISCUSSION

We investigated the steps, resources, and participants' impressions on the process of finding, interviewing for, and securing a first job after the completion of CT surgery training. Despite the low response rate of 12.8%, the information gathered through this survey gave the investigators a unique insight into important factors involved in first-time hires' career planning and decision-making. Select factors are discussed next.

Demographics

Of the 475 ABTS diplomats surveyed, 83 (17.5%) were female and 392 (82.5%) were male surgeons, compared with 18% female and 82% male participants, making our respondent sample representative of the surveyed sample. A higher proportion of women CT surgeons participated in our study compared with previous Society of Thoracic Surgeons (STS) and American Association for Thoracic Surgery reports (6.9% and 4.6%, respectively).^{3,6} Although the proportion of women responding to our survey was exceptional, it unfortunately does not reflect the fact that as of 2015, only 3% of all ABTS-certified thoracic surgeons were women.⁷ With female representation in CT training up to 21% as of 2012, women aspiring to become CT surgeons have access to valuable resources for mentorship connections, scholarship opportunities, and career development in particular through Women in Thoracic Surgery.^{8,9}

Job Search and Interviewing

The 2 main websites used by CT surgery job seekers include CTSNet.org and AAMC.org. Based on the

FIGURE 4. At which point in your transition to practice would you have desired more assistance or resources?

assumption that the majority of our respondents used internet-based resources during their job search, this study aimed to determine what other, less-tangible resources CT surgeons used to discover job openings. The 3 most common responses collected included soliciting CT surgery program directors and faculty's assistance (63.9%), prior knowledge of openings (50.8%), and cold calling (34.4%). These findings demonstrate that workplace connections from senior surgeons continue to be the most commonly used job-finding resources and underscore the need to reach beyond one's inner professional network to explore options.

As shown in the first known visual representation of CT surgery job application timeline (Figure 2), peak interview season occurs in the winter and spring of an applicant's final year of training, with the peak acceptance period occurring in the late winter and spring months of that same year. A study analyzing the 2010 Thoracic Surgery Residents Association workforce survey administered during CT residents' annual in-service exam (in March or April of each year) found that 45% of graduating CT surgeons were still looking for jobs when taking the exam.⁵ Ultimately, our survey respondents attended a median of 4 interviews, with slightly lower numbers compared with those reported by the STS Workforce on Career Development of 5 to 7 interviews per applicant.¹⁰

Contracts

Much has been written on the topic of gender pay gap in medicine. A 2017 study found that female CT surgeons made approximately \$44,000 less than their male counterparts in similar positions.¹¹ However, our study was unable to find a significant gender gap in median starting salaries for young CT surgeons (both at \$350,000). An interesting

point to investigate in future studies would be to compare male versus female CT surgeons' rate of salary increase with respect to career progression, as well as maximum salaries.

Median starting salaries of academic and nonacademic jobs were significantly different: \$325,000 versus \$437,500 ($P = .002$). Although data support higher average earnings in private practice, academic medicine offers exciting avenues for surgeons' career advancement: research opportunities, undergraduate and graduate-level medical education, administrative duties, and regulatory and ethical endeavors.¹² With multiple advancement possibilities including leadership appointments and sequential title progression (ie, assistant professor to associate), academic surgeons' career evolution and subsequent compensation have greater potential for growth compared with nonacademic careers, despite the fact that maximum salary may still be higher in nonacademic jobs. Separating general thoracic surgery and cardiac surgery practitioners' incomes may also facilitate more accurate quantitative analyses.

Research opportunities such as startup funds and protected time were cited as factors influencing job selection, underscoring the importance of research for the next generation of CT surgeons. Yet a 2008 study investigating National Institutes of Health funding for CT surgery research found that the per capita funding awarded to CT surgeons was lower compared with other specialties.¹³ The difficulties in obtaining an R01 award may influence young surgeons' decisions when choosing practice setting, steering some away from academic jobs. As such, the STS' Career Resources blog suggests leveraging institutions for research resources and seeking institutional funding or early career grants from professional societies.¹⁴

The latest Thoracic Surgery Residents Association report revealed an unsettling trend: The proportion of residents reporting education-related debt of more than \$200,000 doubled from 8% to 17% between 2007 and 2010.⁵ This trend is predicted to continue as the cost of medical school has increased by 317% and 151% over the past 2 decades in public and private institutions, respectively.¹⁵ With a median medical student debt of \$190,000 in 2016,¹⁶ only 1 respondent received student loan repayment (\$150,000) as part of their contract. This uncommon finding is useful to both applicants and hiring parties, because it can encourage young CT surgeons to sensibly negotiate for debt repayment and suggests that employers can use this unexplored benefit as a competitive hiring advantage.

Our study found that only 64.4% of respondents negotiated their first contract but doing so resulted in a significantly higher median starting salary compared with those who did not (\$375,000 vs \$325,000, $P = .05$). Anecdotally, academic employment offers less ability to negotiate contracts, possibly biasing the negotiation response rate found in our study. This idea was mirrored in our study's finding that 58.3% of academic applicants negotiated their contracts compared with 73.9% of nonacademic applicants ($P = .27$). The importance of negotiating a first contract cannot be sufficiently underscored, and many of our participants' final comments recommended discussing needs and wants with future employers and securing negotiated details in writing.

Benefits

When inquiring about benefits, only 54.5% of women and 50% of men reported having explicit parental leave provisions as part of their contracts. Although 86% of American employees do not benefit from paid leave, many forward-thinking companies are redesigning their HR policies to attract and retain top prospects.¹⁷ A 2018 study found that 53% of the top 91 US medical teaching institutions offered some form of protected parental leave to its surgical faculty. Interestingly, the availability of parental leave policy occurred more frequently (70% vs 38%, $P < .01$) and granted longer paid absences (>6 weeks) in private institutions compared with public ones.¹⁸ In recent press, both the American College of Physicians and the American College of Surgeons expressed their support for a minimum 6 weeks of paid parental leave.^{19,20} Yet although theoretical efforts are being made to support surgeons' access to paid parental leave, a catalytic change within the field is still needed to standardize viable parental leave policies for both female and male surgeons. As young CT surgeons with growing or prospective families search for their first job, hiring institutions have the opportunity to capitalize on family-friendly incentives in a field where protected time off is invaluable.

With 18.9% of CT surgeons facing a malpractice claim each year, it is essential for future surgeons to comprehend the mechanics of malpractice insurance.²¹ We found that 40.7% of respondents were unsure about the details of their coverage. This unsettling result demonstrates a need for medical programs to better educate trainees about malpractice litigation.²² With a reported 40% of surgeons experiencing 1 or more injuries in the workplace, we hope that the 8.5% of survey respondents who reported not having disability insurance as part of their first contract were unaware of their coverage or purchased their own private disability insurance.²³ Ultimately, young CT surgeons must understand and demand adequate insurances to establish legal and financial security early in their careers.

Job Search Resources

Nonstandardized CT job search process, lack of malpractice insurance awareness, and inadequate parental leave provisions all suggest that the upcoming generations of CT surgeons would benefit immensely from career-planning support. Future CT surgeons should have a clear understanding of job search and interviewing timelines, contract content and negotiation, as well as the local, national, and online resources available for career development. In an effort to consolidate existing career-related content, [Tables 2](#) and [3](#) summarize current conference-associated and online resources.

A recent study by Stephens and colleagues²⁴ found that CT residents ranked career path counseling, assistance with interviews, and networking as 3 of the top 4 characteristics sought out in mentors. In our study, participants listed mentorship at their future workplace as the number 1 factor affecting their first job selection. This finding leads to the following questions: How can the CT community ensure that residency mentors have the tools to guide their trainees' career planning, and how can graduating applicants gauge the quality of mentorship at future jobs? Gathering future employers (surgical chairs, department heads) in a forum where training resources and manpower needs can be shared would be conducive to the dissemination of educational best practices, while allowing for mentors to be in-the-know of upcoming job openings for their trainees. Program directors could sponsor career-related sessions as a standard part of the postgraduate curriculum, hosting negotiating or interviewing workshops, and targeting less familiar topics like malpractice insurance.

Effectively assessing the quality of mentorship at future job sites is a delicate endeavor. Although industry workers consult resources such as Glassdoor.com, a forum where employees review workplaces, such a platform does not exist in the surgical world. The low number of training positions, with only 1 to 2 CT trainees per year per program, compromises the anonymity required to operate this type of website. As an alternative, employers could recruit

TABLE 2. Summary of conference-associated career planning resources

AATS	Annual conference, April/May	AATS/TSRA Preparing Yourself for an Academic Career Cardiothoracic Careers College	Informal session designed for Residents, Fellows, and Medical Students invested in becoming CT surgeons. Day-long forum facilitated by AATS members covering salient topics pertaining to career planning.*
STS	Annual conference, January	Residents Symposium Residents Luncheon STS/CTSNet Career Fair	Half-day forum facilitated by STS members covering early career information such as job search and transition to practice.* Informal session designed for residents to have small-group networking opportunities with STS members. Direct opportunity for candidates and employers to connect and network.
WTSA	Annual conference, June	Residents Symposium	Half-day forum covering early career information such as job search and contract negotiation.

AATS, American Association for Thoracic Surgery; TSRA, Thoracic Surgery Residents Association; CT, cardiothoracic; STS, Society of Thoracic Surgeons; WTSA, Western Thoracic Surgical Association. *Presented material available online.

previous or current colleagues to volunteer as site ambassadors to answer nontraditional questions in a safe, informal setting. Such a forum could find a niche during conference breakout sessions where ambassadors would meet with applicants one-on-one; alternatively, conversations could occur through private online forums if anonymity is desired. Providing references to applicants in the form of ambassadors, while somewhat controversial, will help prospective employees make more secure decisions when selecting their first CT surgery job.

Study Limitations

Several study limitations must be acknowledged. First, our study's low response rate of 12.8% warrants a cautious interpretation of results. However, as the first study of its kind, and given that the survey did not benefit from the clout associated with conference-pitched questionnaires such as the STS or Thoracic Surgery Residents Association workforce reports, the authors are grateful for the responses collected. Validation of sampling adequacy was hindered by the lack of basic demographic information available regarding the surveyed group of recent ABTS diplomats.

Although gender was reliably inferred from online resources, other variables were not explicitly available for all surveyed surgeons. Next, the recruiting of ABTS certified-surgeons and the self-selection of survey respondents imply some degree of selection bias. Responder bias is another concern given the self-reporting nature of the survey form. Additionally, although residencies for cardiac and thoracic surgery remain combined, inherent career differences add a layer of complexity to the interpretation of data presented. As such, authors emphasize the informative nature of the novel data presented in this study and suggest that it be read through an HR-critical lens rather than from a strict scientific research angle.

CONCLUSIONS

Empowering young CT surgeons' abilities to secure their first job is an initiative that is both beneficial and feasible. The field of CT surgery is dedicated to evolution, as seen through the installation of I-6 and 4+3 programs, the offering of formal career-focused sessions at national conferences, and the growing female representation championed by organizations such as the Women in Thoracic Surgery. With this first glimpse into future hires' timelines and impressions, we hope that young CT surgeons readying for surgical practice can use our findings to guide their career planning and use this study as a source for professional discussions and personal thinking points. Although the exact applicability of this initial report remains to be determined, our study serves as a call for our field's leadership to continue providing trainees with career-focused mentorship, preparing them not only for the operating room but also for what awaits beyond academic training. In future studies, we hope to capture the professional development climate and propose plans to best support our rising colleagues by assessing the perceived career-planning needs of future CT surgeons while simultaneously gathering impressions of recent board-certified surgeons.

TABLE 3. Summary of online career planning resources

AAMC.org	CareerConnect	CT surgery job postings, job alerts
CTSNet.org	Job search	CT surgery job postings, resume manager, job alerts
STS.org	Career development	Frequently asked questions, blog, social media outreach, resident symposium slides, student and resident resources
TSRAnet.org	Various	Resource for Thoracic Surgery Residents, list of resident events occurring at national conferences
WTSnet.org	Career development	Job opportunities

CT, Cardiothoracic.

Conflict of Interest Statement

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Key Words: job negotiation, career planning, cardiothoracic surgery

Discussion

Dr Craig J. Baker. The discussion will be opened by Dr Errol Bush.

Dr Errol Bush (Baltimore, Md). I have 2 questions and some comments. You pointed out that 475 surveys were sent out and only a fraction of those, 61 surgeons, completed the survey in its entirety, which gave you a 13% response rate. As I mentioned, I participated in that survey, and so when I read that low, about 25% of the people didn't actually complete the survey, but responded, I had palpitations of trying to recall did I actually complete every single form? Anyway, so I'm glad it's anonymous. The 2014 STS Work Force, which was published in 2016, surveyed all the registered thoracic surgeons, which had a response rate from their survey of about 29% and a 2.3% margin of error. The work force demographics and the STS Work Force had 10% pediatric congenital surgeons, 18% private practice surgeons, and the highest in the history of the survey, 7% of the population were women. Your survey respondents' demographics were more balanced, and the work force comprised 16% congenital surgeons, about 40% private practice, 18% women, and, as you noted, there were no gender-based salary differences in terms of median salary. Although it is enlightening if our profession has truly become this progressive and these reductions in disparities are abounding, but with the low number of responses that you received in your survey, how can we be sure that significant error wasn't introduced into interpretation of these results and how can we be confident that these results represent the new thoracic work force or is it really the experience of a few vocal surgeons, and do you have any plans to partner with any larger societies to maybe administer this survey in a larger trial on a larger basis?

Dr Virginia Little (*Boston, Mass*). We don't have any specific plans right now. I agree that the response rate was low, and I should explain the reason for this. We sent this out through REDCap, we got the e-mails from the ABTS, and it turned out that some of the e-mails were not up-to-date, so we

did some leg work of going on CTSNet, tried to get accurate e-mails, and resend them to those people who weren't responding. We received feedback that some of the e-mails were probably going into spam, so it was hard to capture that. Although we have a low response rate, we think that because we had at least 61 people complete the survey, we thought that was helpful enough information that may contribute to our knowledge base on this topic and help us move forward on how to improve it for the young trainees and junior faculty. The goal in the future would be to agree to collaborate with a larger professional organization and to continue to follow these folks out further after we are able to secure accurate contact information, but I think it would be interesting to re-survey people in the future and find out if they went on to transition to different jobs and if they managed that differently. I think the purpose of this is to try to figure out how to address the current concerns of, at least I know it's just a small segment of the population, but figure out ways that we can still improve it for those who are training, and I agree, it would be helpful to partner with a larger organization.

Dr Bush. I agree, the follow-up behind this would be important, and the third reminder e-mail was very key. In your article, you called for senior CT surgeons and national organizations to provide trainees with a career focus mentorship as well as having sessions at national conferences. I'm proud that this year's program committee actually had a resident symposium where they reflected on some of these topics and the concerns that you raised: landing the job, contract negotiation, as well as things they never taught me in residency. I wonder if you believe that some of the difficulty residents encounter in sort of their perception in the ability to negotiate their contract is really a reflection of them not knowing what their abilities really are once they become an attending, meaning, so once they're independent. And not that these are personal data, but I could imagine that after 10 years of every day being told that you can do better, you can improve, this is how you can improve, that when you finish at the end of that 10 years, you don't really know who you are and how you compare with everyone else, so how can you really market your talent without having sort of a scouting report?

Dr Little. Wow, I'm sorry you feel that way.

Dr Bush. It's not personal data.

Dr Little. You've been polling your friends here at the meeting. I think that would be an important thing to do,

and one thing we've implemented in our general surgery curriculum at Boston University is what we call a "real-world curriculum" so that might be a nice thing to adapt into the CT surgery residencies as well, and that includes negotiation and insurance education, and maybe some ego boost somehow to make you all feel, you know, hey, you're great and you really can go out there and get a good job. You're right, some of the previous publications on this topic have suggested that it's difficult to recruit medical students into our specialty because they're concerned they may not even be able to get a job afterward, which is concerning. I don't have any other good insight on how to improve morale other than being proactive during the CT residency. We don't want anyone to get their ego too overblown here, but we do want to have those who are confident enough to know how to negotiate and learn how to really get the best job that they can.

Dr Robbin Cohen (*Los Angeles, Calif*). It's a great study, and I think disturbing because this is an issue that we've identified a long time ago. I personally did a Doti project to develop a curriculum for residents to answer all the questions that you've asked. The STS residency symposium has been

there for years, the WTSA symposium is excellent, and despite all of the information that we have and are trying to impart to our residents, we're clearly not doing it effectively. The question is, how do we get them to pay attention to the information that we have for them and where should it be? Obviously, putting it as part of the didactic part of each training program is one of the answers, and this actually goes out to all of our specialties. How do we communicate to our specialty all of the great information and the great things we're doing, e-mails, e-mail servers aren't working, ads in the STS News don't work, what can we do to bring our specialty into the next era of, you know, electronic education?

Dr Little. I don't have a good answer for that, but I think it is improving, and that might be another limitation of this study is that we looked at this 5-year cohort and maybe a lot of them didn't have the opportunity to participate in all these programs that are being put out by our professional organizations. It might be nice to repeat this again in collaboration with one of the larger organizations so that we can get more e-mails and a higher response rate but repeat it again in maybe another 5 years or even sooner hopefully, and then that could reflect the incorporation of these programs for our trainees.

Dr Marineh Bojalian (*Los Angeles, Calif*). Were your participants or survey responders from the Midwest or elsewhere because this is not a salary necessarily reflective of a first job in Los Angeles. I finished in 2009. My first job was that year, but if everyone can hold their gasp, my first salary was \$175,000 and a male colleague got the same job, same

offer I should say, for \$200,000. There were no moving expenses or signing bonuses; in fact, they signed me up for the hospital recruitment loan that really hurt me financially later on. It's been my personal quest to educate our residents to stay away from some of these issues and how to really market themselves despite all the grueling comments in residency. But I do wonder if your respondents were from a certain part of the United States.

Dr Little. We don't have any geographic data. We also didn't have any questions about I-6, traditional training, or alternative training programs, unfortunately, so we'd want to incorporate that into a follow-up survey.

Robert. This is an important topic, as Dr Cohen pointed out, and on behalf of some of those organizations that have a real interest in this, namely, our generational future, the STS sure would love to partner with you in developing a survey that would potentially provide more insight. One question I have for you is, we are a relatively small specialty, and are there any best practices out there in other areas such as neurosurgery, urology, other surgical disciplines, that we might draw some experience from? I don't know that I hear the same stories from them in terms of their trainees finding career opportunities and then being successful? Maybe that's an opportunity for us to learn from others. As we've heard, we've not been particularly successful. We started this in 2005 trying to help our trainees learn about career opportunities, a variety of initiatives, and some that you point out have not been successful. Maybe we can learn from other people. Do you have any insights, anybody in the audience have any insights about other disciplines that have done it well and it would be great to hear?

Dr Little. The background to this is that Sharon Stein is a colorectal surgeon, and she and I are on a Women in

Surgery committee for ACS. She was talking about a survey she was sending out to young faculty and young colorectal faculty, and I said hey, we should do that for CT surgery, so I took her survey and modified it, and my medical student modified it for CT. That was sort of the seed for this. But I don't have the results. She hasn't shared the results with me of her study, so I don't know if we're going to be able to get any insight from her in the colorectal field, but that is also a relatively small area, too. That's a good idea about inquiring with our vascular colleagues. I don't think they've looked into this, actually because I was trying to suggest to one of my vascular friends that he do the same thing, perform the same survey. And urology, that would be another good area to look into, that's a large specialty, so I don't have any answers for that right now, but that's an excellent idea and thank you for offering to help collaborate with STS.

Baker. Last question by one of our new members, Dr Hui.

Dr Dawn Hui (*St Louis, Mo*). This is a bit more of a response to Dr Bush. We just presented at the AATS survey we did of all surgeons in CTSNet who were compared with senior or mid-career partners to junior surgeons and asked them when did you think your junior partner was ready for operative independence? And it was a bit opposite to what you were proposing. Most junior surgeons reported they were independently operative at an earlier time point than what senior partners thought they were ready, so maybe you've got more, what you're describing is more in line with what senior surgeons think it should be, but I think that's another important aspect of the transition to a career.

Confidential

Page 1 of 14

Young CT surgeon surgeon

Dear colleague,

Congratulations on completing your cardiothoracic residency training and embarking on your first job! For those with a few years, we are sure you remember that finding your first job can be a daunting task. Very few resources exist to guide young cardiothoracic surgeons through the job search process or to provide benchmarks to inform contract negotiations. We would like to address this problem so we can help generations of young cardiothoracic surgeons be more savvy about what to expect with the job search process.

We ask that you take about 10-15 minutes to complete an anonymous survey about your experience finding your first job, the contract specifics, the resources utilized, and compensation details. Please follow the link below to begin the survey. We thank you in advance.

Sincerely,

Virginia R. Litle and Daniela Molena

Please complete the survey below.

Thank you!

Demographics

What year did you complete your cardiothoracic surgery training (fellowship, i-6, or 4/3)?

- ☐ 2012
☐ 2013
☐ 2014
☐ 2015
☐ 2016
☐ 2017

Age at completion of cardiothoracic surgery training?

Gender

- ☐ Male
☐ Female

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FIGURE E1. Survey. CT, Cardiothoracic.

TABLE E1. Open text advice and comments from survey respondents by topic category

Job search
Apply and seek all opportunities and go to all interview invites. Contact program directors. It is hard to appreciate, even with some good counsel during the process just how the behind-the-scenes process is the dominant if not the only mechanism whereby CT jobs (definitely congenital jobs) are filled. By the time a job is posted on CTSNet or elsewhere, there is a 90+% chance that job is filled. None of the 3 jobs I interviewed for were posted or made publicly available. If someone does not have adequately connected faculty in their program, they should reach out to well-connected senior faculty in other programs to help identify the “real jobs” that are out there. Sending applications to CTSNet posted jobs is not effective job searching (at least for congenital). You have to find [if] the job opening exists via word of mouth and get an interview and get the job. Once the job is filled, it will be posted on CTSnet as a formality. It is a tricky process that depends so much on one’s network and connections as much or more than operative skill, clinical acumen, and research productivity. Look early and lock it up. Look early. Talk to your attendings as many of the best jobs are not advertised. Talk to those who have graduated recently. Start early. Start looking early (at least 1 y before finishing training)! This is a challenging endeavor that requires assistance from mentors and faculty. Failure to get help from these sources leads to extremely limited job opportunities. Understand why the job is open. Did someone leave because the job was unappealing or is it because there is potential for growth? Be sure there is a partner/mentor available to get you out of trouble and [sic] make difficult decisions or poor outcomes.
Interview
Don’t be afraid to interview, don’t be afraid to ask for what you want. Go to every possible interview. This will help you understand what you are worth in certain circumstances. Everything is negotiable, whether they say it is or not. Get whatever promises they make you written into your contract. Ask detailed questions regarding how you will get cases and how much help you will have starting out. It helped to interview in as many good job locations to then make a thoughtful list-driven decision to choose the best job for me and my family. It was helpful to look at many places for compare and contrast.
Job selection
Be honest with yourself and your prospective employers regarding your interests, goals, and aspirations. Choose wisely. Do research on the position/practice/institution, talk to fellow residents and other surgeons who know your future partners at that practice or institution, seek advice from trusted mentors. I think the most important thing is to make sure your partners are good people. That can be hard. I think one should be wary of 1 interview only. You need to go back to an institution multiple times to really know what the people are like and develop a relationship over time. Look for a job with senior partners willing to mentor you during your first years. Look for partners who will look after your interests and not just theirs. Go to a place whose culture is aligned with yours. Make sure that your mentor is what they say they are. Listen to others who have worked there before. If someone has a bad rep as a mentor with more than 1 person, they probably are not going to change. Make sure there is a senior surgeon interested on assisting you in your first cases. Make sure there is backup help for emergency cases. Mentorship at the first job is a critical requirement. Mentorship is the most critical aspect and should probably be prioritized over other things if possible. Training, as long as it is, rarely fully prepares one for independent practice right out of the gate. I am fortunate in having a partner and mentor who is fully committed to my development both in surgical skills/decision-making and professional skills, such as practice-building, dealing with hospital admin, leadership, and management. Many of my colleagues were not as fortunate and moved on from their first position within 2-3 y. Partner support and volume. Most important factors. Partners and mentorship are much more important the salary and compensation. Talk to recent graduates and ask for the inside scoop. Talk with recent graduates!!
Contracts
Always ask for more money. Hospitals will always give you a low offer, and do not be scared to walk away. You are worth more than you think. Do not be afraid to negotiate sensibly. Ask others for guidance when negotiating. Don’t let them screw you on the salary increases after your first year. Don’t undersell yourself. For academic practice, MGMA and AAMC salary ranges are seemingly kept intentionally away from the eyes of applicants coming out of fellowship. Get as many years guaranteed as you can. Negotiate specific instruments/equipment up front.

(Continued)

TABLE E1. Continued

Contracts	
It's really hard to negotiate until you have 3-5 y experience with proven outcomes. That's the key phrase for the good jobs. Until you have that you are an unproven entity. They all know that. Having a lawyer intervene will just tick people off [...]. Young surgeons need to know that they will get their pay off eventually, but finishing training just means you have the CHANCE to become a cardiac surgeon. You are not a cardiac surgeon until you prove you are a cardiac surgeon.	
Use a medical contact lawyer.	
You can negotiate for salary or everything else but likely not both in academic positions.	
You can't get everything you want. Prioritize and focus on the things that are most important. Pay close attention to the support you will get from partners and practice in building a practice.	
Nonspecific	
Basically it's a dog and pony show for pediatric heart surgeons starting out. You're not supposed to negotiate your salary. You're just supposed to be happy to have a job.	
Cardiac surgeons are undervalued and get abused by the system. We are just plow horses for the administration. They want to put you on a treadmill and never let you off. The compensation for the call and work is not nearly adequate.	
I completed 5+2 program. I do not feel I was completely ready for all aspects of CT surgery (cardiac and thoracic) immediately out of training. Thankfully, I ended up with great mentoring partners who have been willing to provide both advice and surgical assistance.	
I think we as fellows have no clue of our value. I made my salary in less than 6 mo my first year!!! I joined a very busy practice!!! I wish all my hard work and dedication were not abused after fellowship!!	
In congenital cardiac surgery jobs for a beginner, unfortunately one has to take what is thrown at you. Even that is considered fortunate.	
It was hard and the resources and support I had were minimal.	
It would be beneficial for residents to be taught how to look for in jobs and groups.	
Know that it will work out. Trust your gut. It's important to like your partners and know that you can get and should get what's important to you.	
Lots of variables involved including luck.	
Many jobs out there. Work until you find the perfect one.	
Not much guidance out there.	
Realize value of a well-trained cardiac surgeon in the current era of evolving training models.	

CT, Cardiothoracic; MGMA, Medical Group Management Association; AAMC, Association of American Medical Colleges.