The Bias Against Integrated Thoracic Surgery Residency Applicants During General Surgery Interviews

James M. Meza, MD, John E. Rectenwald, MD, and Rishindra M. Reddy, MD

Department of Surgery, Duke University Medical Center, Durham, North Carolina; and Sections of Vascular Surgery and Thoracic Surgery, Department of Surgery, University of Michigan Medical School, Ann Arbor, Michigan

Background. **New paradigms for training cardiothoracic surgeons have been introduced, including the integrated thoracic surgery residency. Currently, a limited number of these programs exist, and all candidates apply to both integrated thoracic and general surgery residencies. We sought to investigate the applicants' experiences applying for both types of positions.**

Methods. **An online survey was distributed to applicants to three integrated thoracic surgery programs during a 2-year period.**

Results. **The response rate was 50% (90 of 180). Most respondents were fourth-year medical students (81%; 72 of 89) and were interested in adult cardiac surgery (81%; 73 of 90). Sixty-one percent (55 of 90) had an interest in cardiothoracic surgery before clinical clerkships, and 93% (84 of 90) tailored their clinical education to this interest. Fifty-seven percent (49 of 86) scored above 230 on the USMLE Step 1 examination. Ninety-two percent (80 of 87) performed research during medical school, and 78% (62 of 80), specifically within cardiothoracic surgery; 76% (61 of 80) published their work. The number of general surgery interviews varied widely, but 46% (36 of 79) interviewed at one to five integrated thoracic surgery programs, and 39% (31 of 79) interviewed at six to ten integrated thoracic surgery programs. During general surgery interviews, 36% (24 of 66) received negative comments regarding applying to integrated thoracic residencies. Fifty-two percent (38 of 73) thought that their application to integrated thoracic programs diminished their chances to match at a general surgery program.**

Conclusions. **The applicants to the integrated thoracic surgery residencies become interested in cardiothoracic surgery early and tailor their clinical education to this interest. Although they are academically successful, they report significant negativity regarding their applications to both general surgery and integrated thoracic residencies.**

(Ann Thorac Surg 2015;99:1206–12)

The field of cardiothoracic (CT) surgery is predicted to face a shortage of up to 1,500 to 2,000 surgeons during the next decade in the United States. Greater than 51% of CT surgeons are older than 55 years, and waves of retirements are expected as this decade ends [1, 2]. This exodus from the field is occurring just as millions of new patients will become insured under the Affordable Care Act and as the baby boom generation reaches 65 years of age and becomes eligible for Medicare.

Concurrently, despite the fact that CT surgery had been historically viewed as among the most competitive fields to enter, the number of surgeons deciding to pursue a career in CT surgery has decreased dramatically. Post–general surgery CT surgery residency, ie, fellowship, positions in the United States have not been filling, a trend that began during the mid-1990s and continues today [3]. The subspecialty reached its lowest fellowship match rate in the mid-2000s, with as many as 55% of positions going unfilled during this period [4]. Decreased interest in CT surgery as a career has been attributed to multiple reasons, including but not limited to the length of training, a demanding lifestyle, inability to find a job after training, and the rise of percutaneous interventions [3].

According to survey data of general surgery residents, the duration of training represents a serious barrier to many who may consider a career in CT surgery [3]. Traditionally, a minimum of 7 years of training was required to complete a 5-year general surgery residency plus a 2-year CT surgery residency or fellowship. Residents training at academic institutions who pursue dedicated research time may have added 1 to 3 more years. Also, many traditional CT residencies are 3 years instead of 2. Therefore, the training of a CT surgeon often stretched past 10 years, with one study reporting 9.3 years as the average length of training for traditional residents [5].

To address these issues, several new paradigms for training aspiring CT surgeons have emerged. Several programs now use a "4+3" or "fast-track" model in which a resident completes 4 clinical years of general surgery

Accepted for publication Nov 24, 2014.

Presented at the Sixtieth Annual Meeting of the Southern Thoracic Surgical Association, Scottsdale, AZ, Oct 30–Nov 2, 2013.

Address correspondence to Dr Reddy, University of Michigan, Section of Thoracic Surgery, 1500 E Medical Center Dr, 2120 Taubman Center, Ann Arbor, MI 48109-5344; e-mail: reddyrm@med.umich.edu.

0003-4975/$36.00
http://dx.doi.org/10.1016/j.athoracsur.2014.11.053

and continues on into CT surgery training at the same institution for 3 years. This program enables residents to become board-certified in both general and thoracic surgery. Medical students may be slotted for this position during the match process or may have to match into the general surgery residency and subsequently compete for these positions during their first years of general surgery residency. The integrated thoracic surgery program was also developed, recognizing that CT surgery has evolved into its own field and that more time focused on CT surgery may be optimal. Concerns have been raised that current general surgery residents, working within the 80-hour workweek, may not be able to develop the skills or confidence during only 2 to 3 years of postgraduate training [6]. These residencies incorporate a varied amount of general surgery experience with earlier exposure to and training in CT surgery, with most requiring 6 years of training. Graduates are only eligible for board certification in thoracic surgery. Medical students must apply for these positions during their fourth year, and there is limited availability of these positions. Twenty-five integrated thoracic programs exist as of October 2013, with each accepting one or two applicants per year [7]. In 2011, the applicant: position ratio for Mount Sinai Medical Center's integrated residency was 131:1 [8]. Given the limited number of integrated programs, and the large number of applicants, most medical students have applied to both general surgery and integrated thoracic residencies. There has been anecdotal evidence of bias against integrated thoracic applicants during their non-thoracic surgery interviews. We sought to determine the academic background and quantify the experiences of those students during the application process.

Material and Methods

A survey of 42 questions was created using the online Qualtrics software suite (Qualtrics, Provo, UT) to assess the demographic and educational backgrounds of the integrated thoracic surgery residency applicants. Additional questions were focused on the experience of the integrated thoracic applicants during the general surgery residency interviews. The survey was validated using a small cohort of applicants to three programs. Minor modifications were made to improve the flow and clarity of the survey. The survey was then distributed to applicants to three integrated thoracic programs after completion of the interview period but before the match, at the University of Washington, the University of Virginia, and the University of Michigan, during a 2-year period (2012 and 2013). We specifically chose to survey applicants after their interviews and after rank lists were submitted, but before the match, in an attempt to obtain an unbiased response, which would not be confounded in any direction by the final match results. Applicants were contact directly by e-mail with an electronic survey invitation and a link to the survey. Applicants were notified that their responses were anonymous and did not affect their chances of matriculation. It is estimated that 180 unique students received an invitation, with some students receiving multiple invitations. Participation was voluntary and anonymous, and respondents were asked to complete the survey only once. Of the 180 invitations sent, 104 responses were received. Minimally completed surveys were removed, yielding a final sample of 90 completed responses. Respondents were analyzed as a single population (n = 90). The data were analyzed using Microsoft Excel (Microsoft Office 2008; Microsoft Corp, Redmond, WA). Frequency distributions for categorical variables and descriptive statistics for continuous variables were examined to identify basic distribution patterns among valid response and to summarize the responses to all survey questions.

Results

Applicant Demographics and Characteristics

The response rate was 50% (90 of 180). Table 1 demonstrates the applicants' demographic characteristics. Most respondents were fourth-year medical students (81%; 72 of 89). One was an attending surgeon abroad (1%; 1 of 90). The average age was 29 years old. The majority received honorsor scored higher than 230 on the United States Medical Licensing Exam (USMLE) Step 1 examination. The applicants were very academically productive as medical students, with 92% (81 of 89) performing research during medical school. Seventy-eight percent (63 of 81) of those who engaged in research specifically worked on projects within the field of CT surgery. Seventy-five percent (61 of 81) published their work, with 59% (36 of 61) applying to residency having published one to three papers. A significant number (38%; 23 of 61) were remarkably productive, publishing four or more times before application to residency. Seventy percent (62 of 88) of all applicants presented their work at a professional society meeting or conference. The number of presentations varied, with 40% (25 of 62) presenting once, whereas 37% (23 of 62) presented four or more times.

Table 1. Applicant Demographics and Characteristics

Variable	n = 90
Average age (y)	29 ± 4.5
Fourth-year medical students	81% (72/90)
Resident	19% (17/90)
Married	26% (21/80)
Have children	14% (11/80)
USMLE Step 1 score > 230	56% (55/90)
Received an "A" or honors for third-year surgical clerkship	61% (52/85)
Performed research	92% (80/87)
Performed research on a topic within CT surgery	78% (62/80)
Presented research at a conference	71% (62/87)
Published research manuscript	76% (61/80)
Interest in academic surgical career	85% (74/87)
Interest in private practice	1% (1/87)

CT = cardiothoracic; USMLE = United States Medical Licensing Exam.