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Commentary: All roads lead to Rome: General surgery still a noble path to cardiothoracic surgery

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The need for cardiac and thoracic surgeons has never been greater in this country, with an estimated 650,000 people succumbing to cardiovascular disease yearly, accruing more than 200 billion dollars in health care costs annually.¹ The elderly cohort of the population is increasing, and as the current active workforce ages and retires, there is a growing shortage of trained cardiothoracic surgeons to care for these patients.^{2,3}

The problem was identified in the early 2000s, as there was a concurrent underfulfillment of cardiothoracic surgery (CTS) fellowship positions by general surgery applicants. One solution to attract intelligent and driven individuals was to create an integrated training pathway, recruiting medical students to complete a 6-year residency (I-6) combining general surgery and CTS training. To that end, the I-6 program has been a success, as the pathway remains highly competitive, with all positions filled annually by a talented and accomplished application pool.^{4,5} It has been suggested this paradigm represents the future of CTS training, as the field grows increasingly complex and more subspecialized, requiring longer training to become proficient. Over the past decade, although the total number of CTS training programs has remained stable, the number of traditional training programs has significantly decreased whereas the number of integrated programs has reciprocally increased.⁵ Moreover, many have postulated the caliber of general surgery residents applying to CTS fellowship has

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CENTRAL MESSAGE

General surgery-trained applicants to cardiothoracic surgery remain academically accomplished—still the best and brightest.

declined, and we are no longer recruiting the best and brightest.

In this issue of the *Journal*, Deboever and colleagues⁶ clarify this important nuance of CTS training. Using data from the application pool at the authors' institution for the past 5 years, they demonstrate the continued strength of general surgery residents as they applied for traditional CTS training positions.⁶ The applicants have remained very academically productive, with stable high standardized test scores. There are some limitations worth mentioning. Namely, the authors only reviewed the academic accomplishments and number of letter of recommendations. There was no investigation of the numerous other qualities that make an accomplished and capable cardiothoracic surgeon: grit, resilience, leadership, and interprofessional and interpersonal skills, to name a few. This limitation is not unique to this paper or to program directors across the country, as these are difficult characteristics to determine, quantify, and compare. Furthermore, there is a natural maturation that occurs during the 5 years of general surgery training that cannot be denied.

This work serves as an important reminder that qualified and ambitious applicants interested in pursuing a career in CTS continue to come from general surgery training. As the number of traditional training programs decrease, we would be remiss, as a field, to neglect or disregard this group of applicants. The field of CTS needs to continue to attract a diverse group of bright individuals, both as medical students and surgical residents.

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Commentary: Characteristics of traditional pathway applicants may be stable, but for how long?

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Cardiothoracic surgery training pathways have changed over the past 20 years. The introduction of the I-6 programs in conjunction with the traditional 2- or 3-year pathway, generally completed following a general surgery residency, has resulted in 2 distinct groups of trainees. Existing study data largely involve the I-6 trainees. In this edition of the *Journal*, Deboever and colleagues¹ attempt to identify trends in traditional-pathway applicants.

The authors' study analyzes characteristics of traditional-pathway applicants from 2015 to 2020. Data are sourced from applications received at the authors' institution, a well-known training program. The authors' institution received a total of 572 applications over the study period, which accounted for 72% of all applicants over the study time. General scholarly activity including number of publications and presentations were examined, as well as USMLE (United States Medical Licensing Examination)

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CENTRAL MESSAGE

Characteristics of applicants to the authors' home institution traditional-track training program have remained largely unchanged over the 5-year study period. This will likely change.

and American Board of Surgery Inservice Training Examination scores. The authors concluded that the characteristics of the applicants have largely remained unchanged, with a significant increase seen in USMLE examination scores.

The question the authors attempt to answer is indeed an interesting one. However, the limitations of the study make hard conclusions difficult. The applications received by the authors' institution account for 72% of total applicants, a reasonable sample size, but is this representative of the total applicant body? There may be underlying nuances in the type of applicants attracted to the authors' institution. USMLE step one scores have increased steadily for all-takers from 2010 to 2020, perhaps diluting the significance seen in a reciprocal increase in traditional-pathway applicants. It is unfortunate that data regarding the

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