Cardiothoracic Surgery Residency Frequently Asked Questions

What percentage of graduating CT surgery fellows (integrated vs traditional) are getting jobs within the first 12 months after graduation?

Overall, the job market is doing very well. Anecdotal evidence from the University of Michigan, MD Anderson, and Emory shows that in the past 2 years, CT surgery residents applying for cardiac surgery (private practice) and general thoracic surgery (academic and private practice) positions have had a large increase in the number of job interviews. Current trainees are going on five to seven interviews each.

The exact number of fellows being hired within 12 months is difficult to provide. The Thoracic Surgery Residents Association (TSRA) conducts a survey of all trainees during the In-Training Examination every spring. The survey asks those trainees who are actively looking for a job to identify how many job interviews they have had at the time of the survey. The question is broken up by the type of job that is being pursued (private practice, academic cardiac, academic general thoracic, etc.); data on the frequency of job interviews overall are not available.

Among the respondents who were completing residency in 2016 who reported they were seeking employment, the percentage of trainees who had at least one job interview by spring 2016 by job type is:

- 71% mixed adult cardiac/general thoracic private practice
- 41% general thoracic private practice
- 49% adult cardiac private practice
- 29% mixed adult cardiac/general thoracic academic practice
- 51% general thoracic academic practice
- 58% adult cardiac academic practice
- 7% congenital heart surgery academic practice

Some respondents may have been looking within multiple types of jobs (i.e., both a thoracic private practice and a thoracic academic practice), so the true percentage of job interviews for each trainee may be higher.

Among the respondents who were completing residency and seeking employment in 2016, the percentage of trainees who had at least one job offer by job type is:

- 61% mixed adult cardiac/general thoracic private practice
- 32% general thoracic private practice
- 46% adult cardiac private practice
- 32% mixed adult cardiac/general thoracic academic practice
- 38% general thoracic academic practice
- 46% adult cardiac academic practice
- 7% congenital cardiac surgery academic practice

The integrated 6-year programs (I6) are very young and, as such, only a few have graduated any trainees. While there is no repository of these data, correspondence with the few graduates reveals that all who applied for a job are currently employed.

How many unfilled positions for CT surgery attendings are there across the US?

This number varies by location but is undoubtedly increasing. A large number of senior surgeons are still practicing, limiting the number of open positions. Due to retirement of this population AND overall aging of the U.S. population, there are more CT surgeons needed than in the past. There may be more programs looking for CT surgeons as 1) surgeons retire, 2) younger surgeons are interested in flexible positions with better work-life balance, and 3) the aging population increases the number of people with heart and lung disease. This is not a number that is readily available, and it varies from month to month. One barometer, although limited, would be the number of job offerings posted on CTSNet or in professional journals. However, these usually reflect only a fraction of the jobs available at any one time.

What is the projected need for CT surgeons over the next 10 years?

Overall, we anticipate a significant growing need over the next 10 years. It is difficult to estimate the exact need as we must factor in a growing population of elderly, changes in procedure volume secondary to other technologies, and changes in patient demographics and standards of patient care.

What we can estimate is how many CT surgeons will be practicing. STS conducts workforce surveys periodically. Previously, these have shown that the total workforce would decline if only 100 surgeons per year are trained, which is roughly the current number of graduates each year. Therefore, even with an increase in the number of trainees completing training, with the influx of I6 programs, the workforce appears to be stable at best.

While some might worry that certain procedures will become less frequent due to new technology, we must also factor in the development of new procedures. Also, even if a procedure is performed in a smaller fraction of patients, the predicted increases in the population of patients being served (i.e., aging baby boomers) may still mean that the actual volume of procedures being performed remains the same or even increases.

According to a presentation at the American Association for Thoracic Surgery 96th Annual Meeting in 2016, there will be a shortfall of cardiothoracic surgeons by 2035, and the demand for cardiothoracic surgeons could increase by as much as 46% by 2025.

According to TSRA's 2016 Pre In-Training Exam Survey results, 47% of respondents were planning on additional training after their cardiothoracic surgery residency in aortic surgery, endovascular/TAVR surgery, mitral valve surgery, minimally invasive cardiac or thoracic surgery, cardiac or lung transplant/assist devices, congenital cardiac surgery or critical care.

What are the prospects for the field?

The prospects for the field are bright. Cardiac surgery is one of the most innovative fields with increasing work being done to address heart failure (such as ventricular assist devices), which affects millions of Americans. Endovascular valve repair and aortic aneurysm repair are growing rapidly, and cardiac surgeons will remain an integral part of this technology. Minimally invasive techniques, including robotic surgery, continue to grow, and the demand for surgeons facile in these techniques will grow as senior

surgeons retire. Adult congenital heart surgery is also on the rise as the first generations of pediatric patients are now older and require the attention of highly trained adult congenital surgeons. Thoracic surgery, perhaps more than any other discipline, has seen the largest penetration of minimally invasive technology with robotics, video assisted, and endoscopic technology breaching every aspect of care. The now clearly defined role of lung cancer screening will also increase the volume of disease that will need to be addressed.

Finally, probably the best indicator of the bright future is the significant increase in applicants to The Society of Thoracic Surgeons Looking to the Future Scholarship program. Each year, we get more and more phenomenal applicants to this program. Their heightened interest alone should be a strong indicator of the bright future for our field. By 2018, nearly 500 medical students and general surgery residents were awarded a Looking to the Future scholarship.

What is the difference between a 2- and 3-year cardiothoracic surgery residency? Is one recommended more than the other?

Your choice is mostly a matter of personal preference. There are advantages and disadvantages to each and even variation within the same type of program.

CT surgery residency programs are accredited by the Accreditation Council for Graduate Medical Education, and all programs must provide their trainees with an adequate educational environment to meet the requirements set forth by the American Board of Thoracic Surgery (ABTS). In terms of fulfilling requirements, there are no differences between 2- and 3-year programs. Of course, there is variation among all programs. The case volume and the mix of complex and basic cases will vary from program to program. In addition, some programs will have a clear clinical focus, such as aortic, transplant or oncology, that will differentiate a program irrespective of that program's duration of training. The availability of clinical research, simulation, and other elements of training also varies.

In general, there is no real advantage of one program over another. However, personal issues and program variability will influence one's selection. For example, an applicant's desire to pursue additional training after his/her CT surgery residency (e.g., congenital, aortic, etc.) might lead him/her to select a 2-year program. Alternatively, if an applicant interviews at different programs and feels that one offers a stronger training curriculum (e.g., case volume, clinical focus on transplants, etc.), that may be the deciding factor, rather than the training duration.

How does one ensure a more "cardiac track" based residency when applying?

In the 70s and 80s, almost all the residencies were "cardiac" oriented with regards to volume. In the early 80s, a few programs began experimenting with "general thoracic" directed training, designed to give thoracic-oriented residents more time to focus on thoracic surgery (usually 12 months vs 4-6 months in a 2-year program). As the number of these programs grew, the ABTS created the "track" system in 2007, with two tracks available: cardiothoracic and general thoracic. These tracks are available to all training paradigms: traditional 2-year, traditional 3-year, 4/3, and integrated 6-year programs. The only defined difference between the two tracks is the numbers of specific types of cases that must be obtained to sit for ABTS certification. Therefore, to obtain a more "cardiac track" residency, you should seek a cardiothoracic track.

Not all programs are created equal. The best source of information comes from the trainees. Be sure to ask questions of the trainees currently enrolled in a program. They can tell you about case volume, experience, and the effectiveness of the teaching. Either spend some time with them, or ask if you can reach out by email or phone at a later date. In the end, it is called a match for a reason; what may seem like a weakness to you may convey strength to another applicant. Find the program that best suits your needs.

Are the I6 programs going to make it more difficult to find a residency program after a general surgery residency since that is an area that is expanding?
No. The interest in I6 programs has begun to plateau. The number of cardiothoracic positions in traditional training programs (those available after general surgery training) also remains robust. 2014 survey data demonstrates that 50% of cardiothoracic surgeons still finalize their decision to pursue CT surgery during their general surgery training. Our profession recognizes this and will ensure that training opportunities for those interested in the specialty remain available.

What may change, however, are the specific programs that have traditional positions available at the time one applies. Programs with both a traditional program and an I6 program may fill their complement with either I6 or traditional trainees, and the mix may vary from year to year depending on the quality of the applicant pool. While overall there may be stability and an effort on the part of our profession to maintain all types of programs, there will be variability from year to year.

Am I at a disadvantage applying after a general surgery residency rather than doing an I6 program?
Absolutely not. Excellent training programs are available and will remain available. The specialty will not handicap itself by turning away a quality applicant only because they arrived at the decision to pursue CT surgery later in their training. We recognize that many trainees simply were never exposed to CT surgery during medical school and therefore could not make an informed decision. Our profession recognizes that individuals who remain committed and grow during their general surgery residency will need to have exposure and access to the specialty. One advantage of doing a traditional residency (general surgery followed by a 2- or 3-year cardiothoracic surgery residency) is the ability to be certified by the American Board of Surgery.

How would coming from a community program affect my application process?
The program itself will have less impact then what you do while you are there. Clearly, some programs will have greater access to research opportunities. Prior research can be considered advantageous by CT surgery residency programs that focus on training academic CT surgeons. However, in general, high-quality applicants come from both community and academic general surgery residency programs. Other factors, such as ABSITE and USMLE performance, letters of recommendations, rotations on CT surgery and away rotations with other CT surgery departments, can all help influence an applicant's desirability.

What are some of the aspects in a candidate that programs are looking for?
Cardiothoracic surgery is a rigorous field that requires dedication to skills development and continuous improvement. The specific aspects vary from program to program. You are strongly urged to ask this very question while on the interview trail. It is called a "match" for a reason. Your strengths may match

perfectly with one program but not another. Some programs value trainees with advanced technical skill upon arrival, some value inquisitiveness, some value the ability to think independently, and still others may value interpersonal skills. Take the time to find out and then consider strongly those programs that match your strengths.