



Thoracic surgery training in the United States 6th Oriental Conference on Thoracic Surgery

K. Robert Shen

Division of General Thoracic Surgery, Department of Surgery, Mayo Clinic, Rochester, MN, USA

Correspondence to: K. Robert Shen. Division of General Thoracic Surgery, Department of Surgery, Mayo Clinic, 200 First St. SW, Rochester, MN 55905, USA. Email: shen.KRobert@mayo.edu.

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History of thoracic surgical education in the US

In 1925, representatives from the American Association for Thoracic Surgery (AATS) met with members of the National Board of Medical Examiners to discuss whether specialty certification was needed in thoracic surgery. The conclusion at that time was that there was no need for specialty thoracic surgery certification. The first thoracic surgery residency in the US was started in 1928 by John Alexander at the University of Michigan. In an article published in the *Journal of Thoracic Surgery*, the journal of the *American Association for Thoracic Surgery*, in 1928, Dr. Alexander stated the “two years of intensive study and practice in an active thoracic surgery clinic are sufficient to take the examination of the board”, but “a greater length of time would be desirable” (1). At this time, the scope of thoracic surgery practice was mostly limited to treatment of empyema and tuberculosis. In 1936, a questionnaire was sent out by the AATS to its members and concluded again that thoracic surgery should be practiced as part of general surgery, and that no specialty certification was needed.

The second world war changed the landscape for thoracic surgery. During the war, special expertise was gained for handling thoracic trauma and several advances in the treatment of thoracic disease emanated from the war experience. In 1945, Claude Beck, then President of the AATS, re-commissioned a committee to re-examine the issue of thoracic surgery specialty certification. The committee surveyed the membership of the AATS and the report which was presented at the 1946 AATS meeting in Detroit concluded that thoracic surgery should be a

separate specialty and thoracic surgeons should be certified by a specialty board. A recommendation was made that a Board of Thoracic Surgery be created. This new board would be an affiliate of the American Board of Surgery (ABS), rather than an independent board. An AATS committee was appointed to work with a similar committee appointed by the ABS. The committee submitted their report which was approved at the AATS meeting held in St. Louis in May 1947. The ABS and AATS approved the proposed plan in Quebec in 1948. The first organizational meeting of the new Board of Thoracic Surgery was held in Detroit in October of 1948. The initial requirements for certification for thoracic surgery included: ABS certification, 2 years of training in a Board of Thoracic Surgery approved residency program, and successful completion of written, oral and practical examinations. The first written Board of Thoracic Surgery examinations were given in 1949 and the first oral examination was given in Chicago in October of 1949. On January 01, 1971, the Board of Thoracic Surgery became a stand-alone board, independent of the American Board of Surgery. The name was also changed to the American Board of Thoracic Surgery (ABTS). The ABTS is a member of the American Board of Medical Specialties (ABMS) which encompasses 24 medical and surgical specialties. The main mission of these Boards is to certify physicians who have completed an ACGME-approved residency in a specialty. They also ensure that practicing physicians remain current in their knowledge of the specialty through their Maintenance of Certification (MOC) programs.

Pathways in thoracic surgery residency training

Traditional pathway (5 years of general surgery plus 2–3 years of thoracic surgery)

For the first 75 years after the first thoracic surgery residency program was started in 1928, there was a single pathway to ABTS certification. This pathway, which now is commonly referred to as the “Traditional Pathway”, consists of 5 years of general surgery residency followed by 2 or 3 years of thoracic surgery residency. In the fourth year of medical school, students apply to and complete a categorical general surgery residency program (5 clinical years, with many academic programs also requiring 1 or 2 years of dedicated research time). During the fourth general surgery clinical training year, residents interested in additional thoracic surgery training, apply for a residency position in thoracic surgery. Positions in both general surgery residency programs as well as thoracic surgery residency programs in the US are administered by the National Resident Matching Program (NRMP) Main Residency Match. The NRMP was created in 1952, to provide a fair and orderly system to match the preferences of prospective trainees with the preferences of the institutions offering medical and surgical training. Thoracic surgery training programs are 2 or 3 years in length. In the traditional pathway, residents who have successfully completed both general and thoracic surgery residency are eligible to apply for certification by both the American Board of Surgery and the American Board of Thoracic Surgery.

Alternative pathways: important milestones

Interest in surgery as a career choice for graduating US medical students began to decline in the 1990s. The number of US medical school graduates matching in general surgery residencies declined from 12.1% in 1981 to 5.1% in 2002 (2). Since historically successful completion of a general surgery residency and ABS certification were prerequisites for thoracic surgery residency, the decline in interest in general surgery also had a negative impact on interest in thoracic surgery residency programs beginning in the late 1990s. The number of institutions offering thoracic surgery training is currently around 90 programs with 140 positions available. Both of these figures have remained relatively stable over the past two decades. However, the number of applicants for these positions declined from 167 in 1994 to 99 in 2004 (3). In response to this decline in interest in thoracic surgery residency, the ABTS

implemented a number of changes to create new innovative pathways into thoracic surgery. In 2002, the ABTS began initial discussions of a 4/3 Fast-Track Pathway in Thoracic Surgery. In 2003, the ABTS dropped the requirement for American Board of Surgery certification to be eligible for ABTS certification and also formed a committee to study the issue of early specialization in thoracic surgery. In 2006, the ABTS approved the first residency programs for 4/3 General Surgery/Thoracic Surgery Joint Training Program.

4/3 General Surgery/Thoracic Surgery Joint Training Program aka “Fast-Track” Pathway or 4/3 Pathway (4 years General Surgery plus 3 years Thoracic Surgery)

Medical students with an interest in a career in thoracic surgery and/or cardiac surgery, can apply to one of the general surgery residency programs that have been approved by the ABTS to offer the 4/3 General Surgery/Thoracic Surgery Joint Training Program. They are matched through the NRMP to a categorical general surgery residency program at that institution, with no assurances at that time of a future commitment by either the trainee or the institution for thoracic surgery training. Residents are eligible to request appointment into the 4/3 General Surgery/Thoracic Surgery Joint Training Program once they have completed their second year of general surgery. The appointment must be made before the end of the third clinical year of general surgery. For a given institution’s fast-track program, only general surgery residents at that same institution are eligible to be appointed. Residents do not enter a separate NRMP match to secure a position for thoracic surgery training. The process typically involves informal discussions between the general surgery and thoracic surgery program directors. Residents who complete this track are eligible for board certification by both the American Board of Surgery and the American Board of Thoracic Surgery.

Integrated pathway aka I-6 or 0-6 (6 years Thoracic Surgery)

Medical students apply directly to an integrated thoracic surgery residency program through the NRMP Main Residency Match. There are currently 27 programs offering this pathway. Trainees in this pathway typically spend the first clinical year rotating through various surgical disciplines to learn the basics of surgery. The subsequent 5 years are focused on a comprehensive training in all

aspects of cardiovascular and thoracic diseases. This pathway emphasizes multidisciplinary training and may include rotations in interventional cardiology, interventional radiology, pulmonary medicine, medical oncology, vascular surgery, gastroenterology, and other specialties that have not typically been included in thoracic surgery training in the past. Residents completing this pathway are eligible for American Board of Thoracic Surgery certification, but not for the American Board of Surgery certification.

Summary

For more than 75 years after the first thoracic surgery residency program was begun in 1928, the training of a thoracic surgery in the US remained fairly constant. Medical students would complete a 5 clinical years of training in a general surgery residency program that would often include 1–2 years of dedicated research time during the general surgery training. This was followed by 2–3 years of thoracic surgery residency training, for a total of 7–10 years after medical school graduation to be trained as a thoracic surgeon. This lengthy training interval has been perceived by leaders in the specialty as being one of several impediments to graduating medical students choosing to enter the specialty. Numerous workforce studies commissioned by the AATS and Society of Thoracic Surgeons have forecast severe shortages in the number of practicing cardiothoracic surgeons in the coming decades (4). This combined with an aging US population, with an anticipated increased need for cardiovascular and thoracic surgery care, has resulted in the ABTS implementing several changes in the requirements to train in thoracic surgery. These changes have resulted in the creation of several new training pathways in thoracic surgery, several of which reduce the training duration to 6 or 7 years from 7–10 in the traditional pathway. Whether these new training pathways will result in a thoracic surgical workforce that is adequately trained or even superior to that of previous generations remains to be seen.

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