

Editorial Opinion

Vascular surgery career resource

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Abstract. Vascular surgery has undergone a minimally invasive revolution in the past 15 years. The subspecialty emerged with many changes to its training paradigms that have made this field more attractive to both medical student and general surgery resident candidates. Commitment to diagnosis and treatment of arterial, venous, and lymphatic systems disorders remains the cornerstone of this profession, but an entirely new generation of endovascular treatments has been added to the staple of open surgical procedures used to treat these diseases. A wide variety of practice options are available, ranging from high-stress, technologically demanding complex arterial repairs to low-risk, outpatient, venous insufficiency treatment and all combinations in-between. Many online resources are available to allow an interested candidate to stay current with all the exciting changes in the field. This information is maintained by strong national organizations of vascular surgeons.

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Vascular surgery is a subspecialty devoted to the diagnosis and treatment of diseases of the arteries, veins, and lymphatics. This allows the surgeon a wide variety of practice options. Some surgeons focus on complex aneurysms, requiring a hospital-based practice, a high level of skill, and significant technological support. Some surgeons focus only on ambulatory venous disease, which can be performed in an outpatient center, requiring no on-call commitment and allowing part-time practice. Many vascular surgeons pursue a more general practice and care for a mixed patient population both in age, disease severity, and demographic background. Many of the diseases and interventions supervised by vascular surgeons require extensive follow-up evaluation, so vascular surgeons enjoy establishing long-term relationships with their patients.

Many current interventions are performed less invasively, affording the patient lower risk for complications and death, and promoting a speedy recovery with less discomfort. Most of these interventions are performed using fluoroscopy and remote access to the site of intervention using wires and catheters. Medical and preventive treatment of vascular diseases is receiving new emphasis and currently is an important part of most surgeons' practices. Another important aspect of providing quality care for vascular patients is the ability to interpret vascular images. Vascular surgery training programs should

include significant experience in vascular ultrasound, noninvasive arterial testing, and catheter-based imaging (angiography and venography). Knowledge of cross-sectional imaging techniques (computed tomography and magnetic resonance) is also very important.

Vascular surgery formed in the middle of the last century. Early in its history, surgeons interested in diseases of the arteries practiced a broad range of surgeries that included many early cardiac procedures. The Society of Vascular Surgery first met in 1947, and it had 31 original members.¹ Dr Alden Ochsner was the first president. Over the ensuing decades, division of vascular and cardiac surgery as separate disciplines occurred. In 1982, the American Board of Surgery established a distinct certification in vascular surgery.² The *Journal of Vascular Surgery* was established during this same time interval.¹ Vascular surgery continued to distinguish itself from other surgical specialties, obtaining a primary certificate from the American Board of Surgery in 2006.² Primary certification means that certification in general surgery is not required to become certified in vascular surgery. This event, combined with a commitment to shorten training programs, has allowed vascular surgery to offer multiple training programs to attain certification.

Training requirements

There are 4 distinct training options currently. This can be very confusing, and this information changes frequently, so the interested student or resident needs to stay in touch

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with vascular surgery program directors. Fortunately, there is a lot of information available on the internet, and the websites listed in the references should be checked frequently. Changes in programs are ongoing. There are 95 accredited programs in vascular surgery, with 121 available residency positions.³ In the past 4 years, 23 of these programs became integrated (0 + 5), and more are added every year.^{3,4} Several other types of residencies were approved during this transition. These include 4 + 2 and 3 + 3 programs.^{3,4} Most institutions decided not to pursue these types of programs, and these combinations of requirements are difficult for the general surgery program and the vascular surgery program to maintain. Accreditation Council for Graduate Medical Education (ACGME) accreditation is required for trainees' eventual eligibility for board certification. Application for residency positions are made through the National Resident Matching Program. All the training paradigms mentioned in this paragraph are defined below.⁵

5 + 2

Most practicing vascular surgeons were trained in a 5 + 2 program, and this is the current mainstay of entry into the profession. General surgery residency (requiring 5 clinical years) is acquired before a 2-year vascular surgery residency is completed. Most candidates apply for the vascular surgery training during their fourth clinical year in general surgery, allowing them to enter vascular surgery residency immediately upon completion of general surgery residency. Trainees then are eligible for board certification in both general and vascular surgery.

0 + 5

Many programs are shifting to a 0 + 5 paradigm with the advent of the vascular surgery primary certificate. This means that vascular programs are recruiting medical students directly, with no general surgery requirement. A 5-year program then is completed, and the candidate is eligible for primary certification in vascular surgery. They are not eligible for general surgery certification.

4 + 2

Four years of general surgery training are followed by 2 years of vascular surgery training at the same institution. This pathway allows candidates eligibility for both general and vascular board certification.

3 + 3

Three years of general surgery are followed by 3 years of vascular surgery training at the same institution. Completion of this training confers board eligibility in vascular surgery only. Currently, no programs are accredited by the ACGME to offer this pathway.

American Board of Surgery certification

Vascular surgery certification consists of both qualifying (written) and certifying (oral) examinations. The vascular surgery examination can be taken as a primary certificate (for candidates who complete 0 + 5 or 3 + 3 pathways), but the Surgical Principles Examination must be passed first. General surgery certification consists of a qualifying (written) and a (certifying) examination. Passing the general surgery qualifying examination or the Surgical Principles Examination and completion of an approved vascular surgery residency are required for consideration of the vascular surgery board examinations for trainees from the 5 + 2 or 4 + 2 pathways.

Research opportunities and funding

The American Vascular Association, the American College of Surgeons, and the National Heart Lung and Blood Institute of the National Institutes of Health all co-sponsor early career grants in vascular diseases. These opportunities include K08 and K23 grants for trainees and early career applicants. Lifeline also sponsors separate medical student and resident research prizes and stipends.⁶ The E. J. Wylie traveling fellowship also is awarded annually. This list compiles the available national awards available through the Society of Vascular Surgery. Most other national and regional vascular societies offer other awards and stipends.

Professional societies

The Society of Vascular Surgery (SVS) is the premier international professional community for vascular surgeons. They support an annual meeting that lasts for 5 days in June. Students and residents are encouraged to attend this meeting to meet vascular surgeons from all over the world and enjoy the outstanding educational program. The SVS also provides an outstanding website that has rich resources for the interested student, resident, and practitioner. An entire section exists for medical students and residents, complete with recent podcasts that cover many topics of interest.⁷ Historically, the SVS shared its premier position with the American Association Vascular Surgery and the North American chapter of the International Society of Cardiac and Vascular Surgeons. The SVS and the American Association Vascular Surgery merged to form the current SVS in 2003.

North American regional vascular societies are then divided geographically. These include the Canadian Society for Vascular Surgery, Western and Eastern Vascular Societies, the New England Society for Vascular Sur-

gery, the Midwestern Vascular Surgical Society, and the Southern Association of Vascular Surgery. Also, several other prominent national societies exist, with specific interests including the Society for Clinical Vascular Surgery, the Peripheral Vascular Surgery Society, the American Venous Forum, and the Association for Program Directors in Vascular Surgery. The ability to join many of these societies exists for students, residents and fellows. The Society of Vascular Surgery website has links to all of these societies and more local and regional groups.⁸

Conclusions

Vascular surgery has grown stronger through its endovascular revolution. Practice opportunities are varied and stimulating, and commitment to understanding diseases and using the best treatments available has kept the profession strong. Significant changes in residency training opportunities mirror the changes in practice and will keep the next generations of vascular surgeons at the forefront of specialists treating vascular diseases. The strength of the profession is shown through its many organizations. These societies provide information about the specialty and are committed to education. Many opportunities for membership and research funding are available for interested candidates.

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References

1. Available from: http://www.vascularweb.org/professionals/Podcasts/Vascular_Health_Podcasts.html History of vascular surgery, John R. Ricotta, MD, Chair, Department of Surgery Washington Hospital Center. Accessed: March 14, 2010.
2. Available from: <http://www.absurgery.org>. Accessed: March 14, 2010.
3. Available from: <http://www.acgme.org>. Accessed: March 14, 2010.
4. Available from: http://www.vascularweb.org/Residents_and_Students/New_Vascular_Surgery_Training_Paradigms/New_Vascular_Surgery_Training_Paradigms.html. Accessed: March 14, 2010.
5. Available from: <http://www.nrmp.org>. Accessed: March 14, 2010.
6. Available from: http://www.vascularweb.org/professionals/Awards/_intro/INTRO.html. Accessed: March 14, 2010.
7. Available from: http://www.vascularweb.org/professionals/Podcasts/Vascular_Health_Podcasts.html. Accessed: March 14, 2010.
8. Available from: http://www.vascularweb.org/Affiliated_Societies/index.html. Accessed: March 14, 2010.