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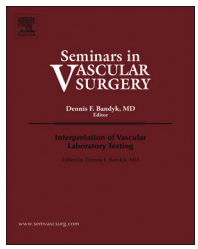

Vascular surgery resident training in Canada

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ABSTRACT

The training of vascular surgeons in Canada has evolved over the past decade. Direct entry into a vascular surgery training program after medical school has been offered since 2012. At some institutions, it is the only option for surgery training. The smaller population of Canada and a single-payer health care system has resulted in unique opportunities and challenges for the training of vascular surgeons and providing opportunities for trainees to transition into clinical practice.

1. Introduction

Although there are many similarities between Canada and other countries with regard to the training of vascular surgeons, significant differences are evident. The sheer number of trainees and training programs in the United States compared to Canada, for example, as well as the model of trainee advocacy (Resident Doctors of Canada) are major differences. Although duty hours remain a critical issue in both the United States and Canada, the approach to regulation differs. Trainees in both countries complete their residency or fellowship fully trained, the completion of examinations differs greatly, and the role of fellowships is also markedly different. The following discussion outlines the training in Canada, emphasizing aspects that differ from US training.

2. Training paradigms

2.1. Direct entry

As of July 2012, the Royal College of Physicians and Surgeons of Canada (RCSC) has outlined specialty training requirements in vascular surgery to include a 5-year training residency [1]. There are currently 10 vascular surgery training programs in Canada offering a total of 7 to 12 positions in the Canadian Resident Matching Service match each year. The residents are required to have 2 years (26 blocks) of foundational training in surgery that includes a minimum of 2 blocks of critical care, 4 to 9 blocks vascular surgery, a minimum of 1 block each of general surgery, internal medicine, or a medicine subspecialty, a service providing initial trauma management.

At the senior resident level, the RCSC specifies that the senior vascular surgery resident must be in charge of a vascular surgery with no other resident intervening between the senior resident and the staff surgeon. Senior vascular surgery residents have 13 blocks of selective rotations, which can include a combination of vascular surgery (up to 7 blocks), cardiac surgery (up to 4 blocks), thoracic surgery (up to 4 blocks), noninvasive vascular laboratory (up to 4 blocks), vascular radiology (up to 7 blocks), community surgery (up to 4 blocks), research in vascular surgery (up to 10 blocks), general surgery (up to 3 blocks), or training relevant to the resident's career goals [1]. These options are much more broad and flexible than those prescribed in the United States. Because of the options for rotations away from the home institution at the senior level, trainees have the option to incorporate these outside rotations into their job search. This ability to work as a trainee and showcase one's ability is a key feature in identifying jobs that suit both the future employer and employee, and may contribute to improved satisfaction in vascular surgeons first job selection.

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2.2. *Subsequent entry*

After general surgery, cardiac surgery, or thoracic surgery training, a 2-year vascular surgery training program (ie, fellowship) is outlined to include up to 10 blocks in vascular surgery, which the resident is regularly entrusted with complete (preoperative, intraoperative, and postoperative) care of the patients, including those with complex problems. The additional blocks can include cardiac surgery, thoracic surgery, noninvasive vascular laboratory, vascular radiology or interventional cardiology, endovascular therapy and/or academic enrichment (ie, research, university degree) [1].

Because of the competitiveness of the vascular surgery specialty and the centralization of training at academic centers, many trainees obtain advanced degrees during or immediately after surgical training. In many cases, the impetus to obtain the degree is to assure job placement in an academic center.

3. Certifying examinations and degrees

3.1. *Royal College Surgical Foundations*

As part of the Competence by Design program, vascular surgery trainees participate in the Surgical Foundations curriculum and subsequent examination. This 2-year curriculum is required for multiple medical specialties and includes categories of medical expert, which includes the ability to perform patient-centered clinical assessment and establish a management plan, plan and performance of procedures and therapies, establishing plans for ongoing care, involvement in care team; communicator, which includes establishing therapeutic relationship with patients and families; collaborator; leader; health advocate; scholar; and professional [2]. The Surgical Foundations examination is taken during the fall of the second year of residency. Passing the examination is required to ultimately take the surgical specialty examination, but not required to continue to the Core of Discipline stage of residency.

3.2. *Royal College Vascular Surgery written and oral examinations*

Similar to the American Board of Surgery, the Royal College requires written and oral examinations at the completion of vascular surgery training, regardless of track. Prior to taking these examinations, the program director completes a Final in-Training Evaluation Report/Comprehensive Competency Report. As opposed to the American Board of Surgery examinations, the Canadian examination is taken in the spring of the final year of training, and essentially must be passed in order to establish a practice following graduation (ie, there is not a "board-eligible" track). Candidates take a 3-hour, 45 to 55 short-answer question written examination, and do not know their results before taking the oral examination approximately 4 weeks later. The oral examination includes two, 1.25-h sessions with clinical scenario-based questions with images. The content of the examination, to include arterial, vein, lymphatic, open, and endovascular knowledge, is similar to the US American Board of Vascular Surgery certification examination.

3.2.1. *Advanced degree (Masters, PhD)*

Because of the competitiveness of the vascular surgery specialty and the centralization of training at academic centers, many trainees obtain advanced degrees during or immediately after surgical training. In many cases, the impetus to obtain the degree is to assure job placement in an academic center.

3.2.2. *Accreditation*

The Royal College of Physicians and Surgeons is currently converting to a competency-based curriculum that focuses

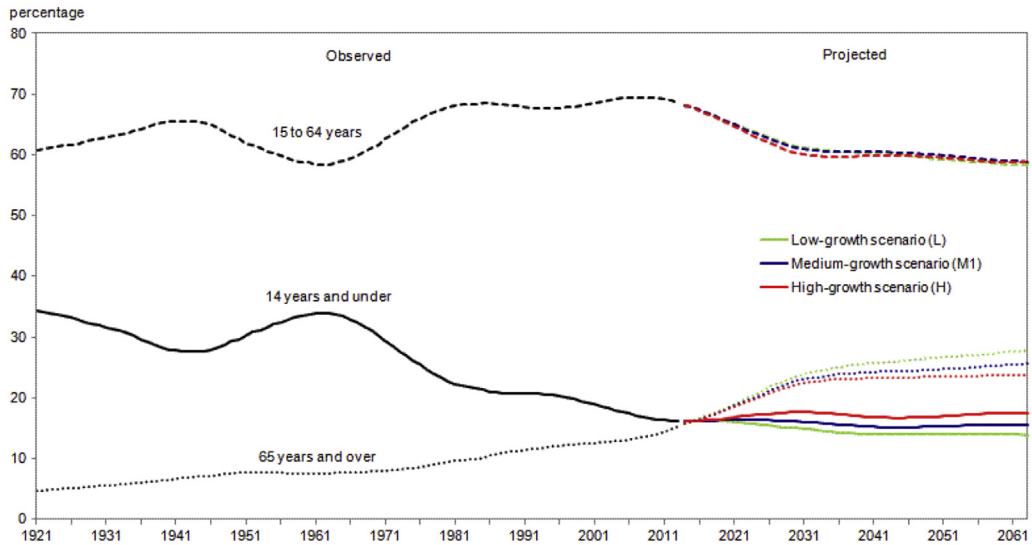

Fig. 1 – Distribution of the total population by age group, observed (1921–2013) and projected (2014–2063) according to the low growth (L), medium growth (M1), and high growth (H) scenarios, Canada [5].

more on trainee outcomes and learning than time. Competence by Design is currently being rolled out into each specialty and has parallels to the Accreditation Council for Graduate Medical Education milestone system. Vascular surgery will likely enter in 2020–2021. The stages of competence after entry to residency include: transition to discipline, with associated orientation and assessment, foundations of discipline, core of discipline followed by Royal College examinations; transition to practice, certification, continuing professional development; and finally, transition out of professional practice. At each level, responsibilities correspond roughly to current junior and senior resident role, and gradually increase to the eventual transition to practice [3].

3.2.3. *Resident representation*

Resident professional associations (such as the Professional Association of Residents of Ontario (http://www.myparo.ca) or Professional Association of Residents and Interns of Manitoba [http://www.parim.org]) are well-developed advocate organizations that act on behalf of the trainees in each province. The seven provincial groups are resident professional associations that address professional and educational issues, such as contracts, duty hours, salary, work–life balance, educational needs, medical leave, and they may assist in supporting trainees through grievances when conflicts occur. These provincial groups are collectively known as the Provincial Housestaff Organizations and together they partner with the Resident Doctors of Canada, a national not-for-profit organization providing support to trainees [4].

2.3.4. *Training challenges*

Resident wellness remains a global issue, with increasing paperwork demands and concerns about balancing duty hours versus training hours. Most training institutions have an office of resident wellness associated with their university, providing confidential support and advice. These offices may work closely with the program director to provide guidance for struggling residents.

Job availability after completing vascular surgery is currently difficult, especially for trainees who wish to remain in particular geographic locations. Although the population >65 years old is rising steadily, the growth rate is anticipated to slow around 2026, therefore, the generations of vascular surgeons that follow may not need to be substantially larger (Fig. 1). This growth rate differs from that in the United States, which has a markedly larger growth rate in the population >65 years old, and therefore a greater need for vascular surgeons at this time [5].

4. Conclusions

Although the discipline of vascular surgery itself is practiced similarly in the United States and Canada, certain key components differ. In general, because of the funding model and resources, patient care is more centralized in Canada, which can increase the trainee's exposure to a diverse patient group. Endovascular devices differ subtly, with more devices available in Canada that have been vetted in Europe but are not yet available in the United States. However, other devices and companies have a smaller distribution in Canada compared to the United States, likely based on fee schedules and reimbursement.

Because trainees must pass their Royal College written and oral examinations before completing residency, there is considerable stress in the second half of the final year of training during examination preparation. Time spent toward examination preparation reduces training time, but allows the graduate to be completely Royal College–certified when he or she is done. All things considered, the training programs in Canada, with the infrastructure of the Royal College of Surgeons, are well-organized with excellent standards to train future generations of vascular surgeons.

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