



Guidelines for hospital privileges in vascular and endovascular surgery: Recommendations of the Society for Vascular Surgery

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The Clinical Practice Council of the Society for Vascular Surgery (SVS) was charged with providing an updated consensus on guidelines for hospital privileges in vascular and endovascular surgery. One compelling reason to update these recommendations is that vascular surgery as a specialty has continued to evolve with a significant shift towards endovascular therapies. The Society for Vascular Surgery is making the following four recommendations concerning guidelines for hospital privileges for vascular and endovascular surgery. First, anyone applying for new hospital privileges to perform vascular surgery should have completed an Accreditation Council for Graduate Medical-accredited vascular surgery residency and should obtain American Board of Surgery certification in vascular surgery within 3 years of completion of their training. Second, we reaffirm and provide updated recommendations concerning previous established guidelines for peripheral endovascular procedures, thoracic and abdominal aortic endograft replacements, and carotid artery balloon angioplasty and stenting for trainees and already credentialed physicians who are adding these new procedures to their hospital credentials. Third, we endorse the Residency Review Committee for Surgery recommendations regarding open and endovascular cases during vascular residency training. Fourth, we endorse the Inter-societal Commission for Accreditation of Vascular Laboratories (ICAVL) recommendations for noninvasive vascular laboratory interpretations and examinations to become a registered physician in vascular interpretation (RPVI) or a registered vascular technologist (RVT). (*J Vasc Surg* 2008;47:1-5.)

The following recommendations of the Clinical Practice Council of the Society for Vascular Surgery (SVS) are meant to provide guidelines for granting hospital privileges to perform peripheral vascular interventions, including open surgical and endovascular procedures.

The most recent guidelines for credentialing and hospital privileges in vascular surgery were published in 2002.¹ Since that time, the specialty has continued to evolve, with a continuous shift toward endovascular therapies and the creation of primary board certification such that general surgery certification is no longer a prerequisite when new training paradigms are pursued. Although the ultimate determination of who should and should not practice vas-

cular and endovascular surgery in a given hospital remains the primary responsibility of each hospital as determined by its administrative structure, these guidelines endorsed by the SVS should provide reference for hospital credentialing committees.

DEFINITION OF VASCULAR SURGERY

Vascular surgery is the specialty that deals with the diagnosis and management of disorders of the arterial, venous, and lymphatic systems, exclusive of intracardiac and intracranial vessels. We wish to emphasize that a fully trained "vascular surgeon" should be considered to be a vascular specialist who performs traditional open surgery but who also performs endovascular interventions and is competent to treat vascular diseases with noninterventional and nonsurgical means. A fully trained vascular surgeon must have advanced knowledge and experience in the following areas:

1. The understanding of the pathophysiology of the formation and natural history of arterial and venous disorders to include atherosclerosis, intimal hyperplasia, non-atherosclerotic arterial disorders, acute and chronic

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Competition of interest: none.

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- venous and lymphatic diseases, and end-organ disorders.
2. Clinical evaluation of vascular patients, including history, physical examination, and medical management including pharmacotherapy and risk factor reduction.
 3. Noninvasive and invasive diagnostic testing of vascular disease, including but not limited to duplex ultrasound scanning, Doppler testing, plethysmography, magnetic resonance imaging, computed tomography angiography, contrast angiography and venography, and intravascular ultrasonography.
 4. Indications and techniques for open surgical treatment of vascular disorders, including congenital, occlusive, traumatic, aneurysmal, and inflammatory disease involving the arteries in the cerebrovascular system. This includes the carotid artery and its branches, the upper extremity arteries, intrathoracic arch branches, the aortic arch and descending thoracic aorta, the abdominal aorta, the visceral and renal arteries, the pelvic and lower extremity arteries, and the venous system of the neck, chest, abdomen, pelvis and upper and lower extremities. Vessels usually excluded from consideration include intracranial vessels and vessels intrinsic to the heart.
 5. Indications and techniques for endovascular interventions, including balloon angioplasty, stenting, and disobliteration procedures of all vessels (excluding intracranial and coronary arteries); thoracic and abdominal aortic and peripheral vascular endovascular graft placement; thrombolysis; and other endovascular adjuncts for vascular reconstruction.
 6. Critical care management, including the preoperative and postoperative evaluation and treatment of vascular patients in the intensive care setting. This management includes understanding the indications and techniques for the insertion of peripheral artery, central venous, and pulmonary artery catheters for hemodynamic monitoring.

TRAINING AND CERTIFICATION IN VASCULAR SURGERY

There are four pathways approved by the Accreditation Council for Graduate Medical Education (ACGME) available for training in vascular surgery.

1. Traditional. The most traditional pathway involves a paradigm where vascular residency training follows a completed general surgery residency from an ACGME-approved general surgery training program such that trainees become eligible for board certification in both general and vascular surgery. A minimum of 2 years of vascular residency training is required for vascular residents who started training in July 2007 (prior guidelines called for a 1 clinical year curriculum) and this assumes the equivalence of 1 year of vascular surgery training during the previous 5-year ACGME-accredited general surgery residency.

2. Early specialization. In the Early Specialization Program (ESP), selected trainees spend 4 years training in general surgery residency, followed by 2 years training in vascular surgery at the same institution. ESP graduates are

eligible to obtain board certification in both general and vascular surgery.

3. Integrated. Recently, the ACGME approved a 5-year integrated vascular surgery training pathway that accepts trainees directly after completion of an MD or DO degree from an institution accredited by the Liaison Committee of Medical Education (LCME) or by the American Osteopathic Association (AOA). During the 5-year curriculum, trainees are exposed to 2 years of core general surgery and 2 years of vascular surgery training, integrated over the first 4 years, plus a final fifth year of chief residency devoted exclusively to vascular surgery. Such trainees are only eligible for board certification in vascular surgery.

4. Independent. This paradigm involves 3 years of training in core general surgery, followed by 3 years of concentrated training in vascular surgery, after which trainees are eligible for board certification in vascular surgery only. All training should be performed in the same ACGME-accredited institution. A transitional year may not be used to fulfill any part of the 3 years of designated preliminary surgery requirement. The last year of the program must comprise chief resident responsibility on the vascular surgery service at an integrated institution.

All training programs in vascular surgery must be accredited by the ACGME through the Residency Review Committee for Surgery (RRC-S). Only individuals completing ACGME-accredited programs are eligible for American Board of Surgery (ABS) certification in vascular surgery. The purpose of the RRC-S is to ensure that programs provide a broad and comprehensive exposure to the field of vascular surgery and meet other educational and administrative requirements.

After successful completion of an ACGME-accredited residency, candidates are eligible to sit for examinations leading to ABS board certification in vascular surgery. The Vascular Surgery Board of the ABS (VSB-ABS) is the entity responsible for the design and implementation of examinations. The VSB-ABS provides a certifying mechanism to determine whether an individual meets rigorous standards for cognitive knowledge and clinical application through hypothetical case management. This comes in the form of a written examination (qualifying examination), followed by an oral examination (certifying examination) consisting of hypothetical case management scenarios. The VSB-ABS also determines the requirements for Maintenance of Certification (MOC) that include recertifying examinations at periodic intervals.

Graduates from general surgery or cardiothoracic surgery residencies are not eligible for ABS vascular surgery board certification unless they have completed an ACGME-accredited vascular surgery residency. The field of vascular surgery has evolved to the degree that mere exposure to the field during other residencies, such as in general or cardiothoracic surgery, is not sufficient to acquire the experience and judgment necessary for vascular surgery practice.

TRAINING REQUIREMENTS FOR VASCULAR SURGERY RESIDENTS

I. Open surgery

The vascular surgery resident is expected to have performed a sufficient number of the full spectrum of open operations in the field of vascular surgery. The requirement is carefully evaluated by the RRC-S. The RRC-S and the ABS track individual components of complex operations, whether endovascular or open, and consider all components when evaluating programs and trainees. The RRC-S has established minimum criteria for major open vascular reconstructive procedures performed by vascular surgery trainees, which include 30 abdominal vascular operations, 25 cerebrovascular, 45 peripheral, and 10 complex. In addition, the current RRC guidelines require a total major vascular reconstructive experience of 250 cases, and this includes open and major endovascular procedures. These cases should reflect an adequate representation of current practice as well as breadth and balance of experience in the surgical care of vascular diseases. These numbers are continually being scrutinized and are subject to change. For more up-to-date information, readers should refer to the ACGME Web site (<http://www.acgme.org/acWebsite/home/home.asp>).

II. Endovascular interventions

All vascular surgery residents currently are expected to have acquired sufficient training to perform vascular catheter-based interventions, and previous guidelines have been published.² Residents are expected to submit their caseload experience as verified by the program director. The RRC-S has recently established minimum numbers of endovascular procedures for training, and these include 80 endovascular therapeutic procedures, 100 endovascular diagnostic procedures, and 20 endovascular aortic aneurysm repairs (EVAR).

Diagnostic catheterizations should be balanced among the various vascular beds,² and at least half should be selective catheterizations with 75% being arterial and 25% venous.³ Similarly, at least 75% of the therapeutic procedures should be on the arterial system.³ The reason for these figures is that venous interventions such as for hemodialysis fistulas, grafts, and catheters should not constitute the most significant endovascular experience for any resident.

The recommended minimum number of EVAR cases represents an increase over the 2002 RRC minimum of five cases as the primary operator. It reflects the current practice of aortic aneurysm repair and is consistent with current training.

Thoracic endovascular aortic repair and carotid artery stenting credentialing guidelines for recent vascular surgery graduates entering practice. Recent guidelines have been published for thoracic endovascular aortic repair (TEVAR).⁴ Requirements include full basic endovascular privileges with an experience of at least 25 EVARs, with 12 as primary operator.⁴ The term “full basic endo-

vascular privileges” means that the operator is fully qualified as defined by either American Heart Association guidelines² or multispecialty guidelines.³ Upon completion of their training, vascular residents performing TEVAR should be familiar with the perioperative management of aortic surgical patients and are expected to have experience in performing adjunctive procedures for TEVARs, including iliac conduits, femoral artery exposures and repairs, and carotid–subclavian bypasses. The surgeon does not have to have pre-existing open thoracoabdominal privileges.⁴

Credentialing guidelines for carotid stenting were recently published and have been endorsed by the SVS as well as radiology and cardiology societies (Society for Vascular Medicine and Biology, and Society for Cardiovascular Angiography and Intervention).⁵ In addition to specifying minimal knowledge and clinical skills, the document recommends a minimum of 30 diagnostic cervicocerebral angiograms with half as the primary operator, and a minimum of 25 carotid stent procedures with half as the primary operator. It also specifies that diagnostic and stenting procedures may both be counted if performed during the same procedure.

III. Noninvasive vascular laboratory diagnosis

In order to interpret vascular laboratory studies, a graduating vascular resident must meet certain basic requirements. These include:

1. Knowledge of the vascular anatomy and physiology, as well as ultrasound physics.
2. Clinical experience in the treatment of vascular disorders as seen in postgraduate training or practice patterns.
3. Evidence of continuing medical education (CME) activity specific to noninvasive vascular diagnostics. Recent graduates of postgraduate ACGME-approved training programs where interpretation of vascular laboratory studies was an integral component of the training program are initially exempt from this requirement for 3 years after completion of their ACGME-approved training program.

As suggested by the Inter-societal Commission for Accreditation of Vascular Laboratories (ICAVL), a minimum number of supervised interpreted studies during postgraduate training are required for individuals wishing to apply for privileges in interpretation of specific individual areas of the vascular laboratory:

- Peripheral arterial physiologic test, 100
- Peripheral arterial duplex scanning, 100
- Peripheral venous duplex scanning, 100
- Carotid duplex scanning, 100
- Transcranial duplex/Doppler scanning, 100
- Visceral vascular duplex scanning, 75

It is recognized that not all individuals interpreting vascular laboratory studies will wish to interpret studies in all the areas of the vascular laboratory or will be qualified to interpret studies in all the areas noted above. Individuals

may therefore elect to seek privileges only in those areas that they have sufficient qualifications and training.

The American Registry of Diagnostic Medical Sonographers (ARDMS) now provides a certification of registered physician in vascular interpretation (RPVI). Obtaining this credential, or a registered vascular technologist (RVT) credential, is encouraged but not mandatory for vascular residents. The RVT and the RPVI credentials are obtained by passing examinations administered by the ARDMS. Both examinations have specific prerequisites that must be met before one can sit for either examination.

IV. Medical management

Training in medical management of peripheral vascular disease is an expected part of a vascular residency. Vascular residents should have a thorough understanding of vascular disease risk factors and their management. Vascular residents are also expected to be closely involved in the management of vascular surgical patients in intensive care units and should have an active role in all critical care management decisions for these patients.

TRAINING REQUIREMENTS FOR NEW PROCEDURES FOR ALREADY CREDENTIALLED SURGEONS

A recent multidisciplinary group recommended credentialing guidelines for physicians performing TEVAR.⁴ These include 10 TEVARs be performed within the past 2 years and 10 CME hours devoted to TEVAR. The procedural numerical requirement may be reduced for surgeons with robust EVAR experience of at least 25 EVARs. The surgeon does not have to have pre-existing privileges for open thoracic or thoracoabdominal aneurysm repair. Similar to recent graduates of vascular residencies, credentialed surgeons already in practice performing TEVAR should be familiar with the perioperative management of aortic surgical patients and are expected to have experience in performing adjunctive procedures for TEVARs, including iliac conduits, femoral artery exposures and repairs, and carotid-subclavian bypasses. The surgeon does not have to have pre-existing open thoracoabdominal privileges.⁴

Regarding carotid artery stenting, the same numbers mentioned for vascular residents entering practice apply to credentialed surgeons already in practice. Successful completion of an industry-sponsored course by credentialed surgeons in practice may also be desirable to ensure familiarity with the nuances of various devices; however, this should not be equated with having achieved competency in the overall procedure. For credentialed surgeons in practice, 15 hours of CME activity specific to noninvasive vascular diagnostics should be obtained every 3 years.

Regarding new procedures, vascular surgeons are expected to acquire proficiency in new and evolving procedures. An example is the new atherectomy procedure, which has been performed in increasing numbers. As new procedures are introduced, it is important that

practitioners be properly credentialed, which should include evidence of participation in CME courses relevant to the topic. Many new devices, however, can be used without special certification by physicians trained in endovascular interventions. Whether a mentor is required will depend on the complexity of the procedure and will need to be determined on a case-by-case basis.

REQUIREMENTS FOR HOSPITAL PRIVILEGES

All new applicants for hospital privileges in vascular surgery should have completed an ACGME-accredited vascular surgery residency and should obtain ABS board certification within 3 years of completion of their training.

The renewal of privileges for surgeons currently privileged to perform vascular surgery should be granted on the basis of an analysis of their outcomes in comparison with local and regional standards. The SVS strongly endorses outcome analysis and voluntary participation in registries that allows regional benchmarking. Because of different referral patterns, it is important that outcome comparisons be risk-adjusted as best as possible. General and cardiothoracic surgeons with current vascular privileges who do not have ABS certification in vascular surgery should maintain a valid and current ABS certificate in general surgery. In addition to passing the ABS recertification examination in general surgery, the other requirements for MOC must be fulfilled. Proof of CME in the specific field of vascular surgery is also required as recommended by the ABS for MOC. This consists of 30 hours of category 1 CME and a total of 50 category 1 and 2 CME credits in vascular surgery each year.

Hospitals should have access to a registry of vascular and endovascular cases for physicians performing these procedures regardless of specialty or the location where they are performed. Outcome parameters should be maintained by the various departments or divisions in each hospital. These data are required for MOC purposes by the ABS. Moreover, monitoring is now mandated for certain procedures such as carotid artery stenting for reimbursement purposes by the Centers for Medicare and Medicaid Services. For such purposes, the hospital may maintain its own registry or choose to participate in the Vascular Registry developed by the SVS and endorsed by the Society of Interventional Radiology.⁶

Mechanisms for audit, morbidity reviews, and corrective actions may be the responsibility of a subcommittee of the credentials committee¹ or a special balanced multidisciplinary quality assurance committee.²

For nonvascular certified physicians lacking noninvasive vascular laboratory training and wishing to obtain privileges interpreting studies, supervised experience is required. Forty hours of relevant CME should be obtained in a 3-year period, and a minimum number of cases should be interpreted under supervision, with the same number of cases that apply to vascular residents applying to these individuals. Obtaining an RPVI credential from the ARDMS should be construed as having fulfilled the requirements for vascular laboratory credentialing because

the ARDMS requires a specific number of cases and experience before allowing physicians to sit for the examination.

This document was reviewed and approved by the VSB-ABS as well as the Association of Program Directors in Vascular Surgery.

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COLLECTIONS OF PAPERS

On the Web version of the Journal, selected articles have been grouped together for the convenience of the readers. The current collections include the following:

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Lifeline Research Meeting Abstracts
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