Endovascular repair of thoracic aortic aneurysms

Background

A thoracic aortic aneurysm (TAA) is a serious health condition that affects 15,000 Americans each year. These aneurysms occur in the upper portion of the body’s largest artery, the aorta, above the diaphragm. Aneurysms form when flowing blood pushes on a weakened spot in the aortic wall and creates a bulge that can rupture, leading to rapid blood loss and often death. Among patients who get to the hospital after experiencing a rupture, only 20%-30% survive, according to the Society for Vascular Surgery (SVS).

TAAs affect both men and women and the risk grows as an individual ages. They are sometimes the result of a genetic condition, such as Marfan’s or Ehlers-Danlos syndrome, according to the Centers for Disease Control and Prevention. Other risk factors include high blood pressure, smoking, and high cholesterol, according to the National Institutes of Health. Some TAAs may be caused by trauma, such as a car crash.

While many aneurysms are asymptomatic and go undetected, in some cases if they are found physicians can head off a rupture by treating the aneurysm through open surgery or a less invasive alternative known as endovascular repair using a stent graft. During this procedure the physician inserts a stent into the vessel, providing a new, sturdy conduit for the blood to pass through. The stent takes the pressure off the weakened section preventing further strain. While this is an endovascular procedure, there is a surgical component, and for this reason it has been historically performed by a team of physicians from different specialties.

Patients who have one of these procedures typically take less time to recover and suffer fewer immediate complications compared to patients who have open surgery. However, not everyone is a candidate for this procedure and it comes with its own risks, such as leaks in the graft and infection.

Involved specialties

Thoracic surgeons, cardiothoracic surgeons, vascular surgeons, cardiac surgeons, interventional radiologists, and interventional cardiologists
Positions of specialty boards

**ABIM**

The American Board of Internal Medicine (ABIM) grants certification in the subspecialty of interventional cardiology. To become certified, physicians must meet the following requirements:

- Hold previous certification in internal medicine by the ABIM
- Have satisfactorily completed the requisite graduate medical education fellowship training
- Demonstrate clinical competence, procedural skills, and moral and ethical behavior in the clinical setting
- Hold a valid, unrestricted, and unchallenged license to practice medicine
- Pass the Interventional Cardiology Certification Examination

The training pathway requires 12 months of satisfactorily completed clinical fellowship training in interventional cardiology, in addition to the required three years of accredited cardiovascular disease training. During training in interventional cardiology, the fellow must have performed at least 250 therapeutic interventional cardiac procedures, documented in a case list and attested to by the training program director.

ABIM does not publish requirements specific to endovascular repair of TAA.

**AOBIM**

The American Osteopathic Board of Internal Medicine (AOBIM) offers a certificate of added qualifications (CAQ) in interventional cardiology. Applicants for the CAQ must complete three years of subspecialty training in cardiology approved by the American Osteopathic Association (AOA), followed by one year of training in interventional cardiology in an AOA- or Accreditation Council for Graduate Medical Education (ACGME)–accredited cardiology training program.

During training, applicants should participate in a minimum of 300 cardiac interventional procedures, and must serve as the primary operator in a minimum of 200 of those cases.

AOBIM does not publish requirements specific to endovascular repair of TAA.

**ABR**

The American Board of Radiology (ABR) grants certification in vascular/interventional radiology. The ABR requires that candidates for certification complete one year of fellowship training in a vascular and interventional radiology program accredited by the ACGME or by the Royal College of Physicians and Surgeons of Canada (RCPSC), following residency. ABR also requires an
additional year of practice or approved training, with one-third of that year spent in vascular and interventional radiology.

ABR does not publish requirements specific to endovascular repair of TAA.

ABR does not publish requirements specific to endovascular repair of TAA.

AOBR

The American Osteopathic Board of Radiology (AOBR) offers a CAQ in vascular and interventional radiology. Applicants for the CAQ must be diplomates of the AOBR in diagnostic radiology, and must complete one year of formal concentrated study in vascular and interventional radiology approved by the AOA.

AOBR does not publish requirements specific to endovascular repair of TAA.

ABS

The American Board of Surgery (ABS) grants certification in vascular surgery. Successful completion of both the vascular surgery qualifying examination and the vascular surgery certifying examination is required for board certification in vascular surgery.

According to ABS, applicants must be certified in general surgery by the ABS if general surgery training was completed prior to July 1, 2006. Additionally, applicants must satisfactorily complete an accredited graduate medical educational program in vascular surgery and be actively engaged in the practice of vascular surgery.

ABS does not publish requirements specific to endovascular repair of TAA.

AOBS

The American Osteopathic Board of Surgery (AOBS) offers certification in general vascular surgery. Candidates for certification who began their residency training prior to 2008 must complete four years of general surgery, followed by one year of training in general vascular surgery. Candidates who began residency training with the required OGME-1R internship year effective in 2008 must complete five years of training in general surgery, followed by one year of training in general vascular surgery.

AOBS also offers certification in cardiothoracic surgery. Candidates for certification who began their residency training prior to 2008 must complete four years of general surgery, followed by two years of training in cardiothoracic surgery. Candidates who began residency training with the required OGME-1R internship year effective in 2008 must complete five years of training in general surgery, followed by two years of training in cardiothoracic surgery.

AOBS does not publish requirements specific to endovascular repair of TAA.
**ABTS**

The American Board of Thoracic Surgery (ABTS) awards certification in thoracic surgery. Residents may complete one of following four pathways to achieve certification:

➤ Successful completion of a full residency in general surgery approved by the ACGME, followed by the successful completion of an ACGME-approved thoracic surgery residency. Successful completion of a four-year general surgery/three-year thoracic surgery (4/3) joint training program approved by the ACGME fulfills the requirements of Pathway One.

➤ Successful completion of a full residency in general surgery or cardiac surgery approved by the RCPSC, followed by the successful completion of an ACGME-approved thoracic surgery residency.

➤ Successful completion of a six-year integrated thoracic surgery residency developed along guidelines established by the Thoracic Surgery Directors Association and approved by the ACGME.

➤ Successful completion of an ACGME-approved vascular surgery residency that can lead to primary certification, followed by the successful completion of an ACGME-approved thoracic surgery residency.

Residents must perform an annual average of 125 major operations during training. They must also successfully complete both a written and an oral examination prior to certification.

ABTS does not publish requirements specific to endovascular repair of TAA.

**ABVM**

The American Board of Vascular Medicine (ABVM) is an independent organization that offers certification in endovascular medicine. In order to achieve this certification, candidates must possess a valid, unrestricted license to practice medicine in the jurisdiction of practice. Candidates must also hold primary board certification from ABIM, AOBIM, ABS, or ABR, or have specialty board certification in cardiology, cardiothoracic surgery, interventional radiology, vascular surgery, or have certification in vascular medicine via ABVM’s general examination.

ABVM offers certification through a practice pathway or a fellowship training pathway. Applicants who pursue the practice pathway must meet the following requirements:

➤ Active hospital privileges for diagnostic and interventional peripheral procedures

➤ Performance of peripheral interventional procedures for at least 12 months prior to application

➤ Performance of at least 100 diagnostic peripheral arteriograms with at least 50 as the primary operator at the attending physician level (cases performed as a trainee are not counted toward this total) in the hospital where the applicant holds privileges
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➤ Performance of at least 50 therapeutic peripheral interventional procedures with at least 25 as the primary operator at the attending physician level (cases performed as a trainee are not counted toward this total) in the hospital where the applicant holds privileges

All qualifying procedures must have been performed within two years of application.

Applicants who pursue the fellowship training pathway must meet the following requirements:
➤ Successful completion of a formal ABIM-, ABS-, or ABR-accredited fellowship that included training in peripheral interventional procedures
➤ Performance of the requisite number of diagnostic (100) and therapeutic (50) peripheral interventional procedures, at least half as primary operator
➤ Written attestation of acceptable performance of peripheral procedures by the fellowship program director

ABVM does not publish requirements specific to endovascular repair of TAA.

Positions of societies, academies, colleges, and associations

STS/AATS

In a position statement called Guidelines for Credentialing of Practitioners to Perform Endovascular Stent-Grafting of the Thoracic Aorta, published in 2006, The Society of Thoracic Surgeons (STS) and the American Association for Thoracic Surgery (AATS) states that physicians performing endovascular stent-grafting of the thoracic aorta must have a broad understanding of the disease entity, as well as knowledge of, and expertise in, all of the available therapeutic options, including, but not limited to, endovascular stent-grafting. Physicians must also possess the ability to care for patients in the post-procedural period and to deal with the potential complications of a specific therapy. The statement also notes that physicians must receive technique-specific training.

According to STS and AATS, physicians who care for patients with diseases of the thoracic aorta should have completed an educational program that encompasses the longitudinal care of patients with major thoracic aortic disease. Physicians who are to be involved with endovascular stent-grafting procedures of the thoracic aorta should have more extensive experience, including the following:
➤ Involvement in the evaluation and management of a minimum of 20 patients with diseases of the thoracic aorta in the two-year period immediately prior to application for privileges to perform these procedures
➤ Experience accumulated in an ACGME-approved cardiothoracic surgical training program
➤ Clinical expertise from continuing education
➤ Participation in CME programs dedicated to endovascular stent-grafting procedures
The statement lists the following essential skills that physicians who perform thoracic endovascular stent-grafting procedures should possess:

➤ Experience in the management of thoracic aortic disease by conventional open surgical techniques
➤ Completion of an ACGME-accredited training program in which the surgical management of thoracic aortic disease is a primary focus
➤ Participation in a minimum of 10 open surgical procedures on the thoracic aorta in the previous two years prior to credentialing
➤ Successful performance of a minimum of 25 catheter placements involving guide-wire technology and/or steerable catheters in the two years prior to credentialing
➤ Participation in the successful placement of 10 abdominal or five thoracic aortic endovascular stent grafts
➤ Experience with placement of large-bore catheters into the femoral and iliac arteries
➤ Experience with retroperitoneal exposure of the iliac artery and performance of surgical procedures (e.g., bypass grafts, endovascular stents) on the iliac and femoral arteries

STS and AATS recognize that a single physician may not have the necessary experience and expertise listed above, and as such the statement recommends and encourages physicians to partner with other physicians (e.g., vascular surgeons, cardiologists, interventional radiologists) who possess those skills that the applicant for credentialing may lack.

The document also states that physicians seeking credentialing should participate in at least one course on thoracic endovascular stent-grafting sponsored by STS, AATS, or the SVS. This could include, but should not be limited to, courses sponsored by industry leaders that are endorsed by one or more of the above organizations.

**SVS/SIR/SCAI/SVMB**

SVS, Society of Interventional Radiology (SIR), The Society for Cardiac Angiography and Interventions (SCAI), and Society for Vascular Medicine (SVMB) published consensus recommendations related to TEVAR called *Clinical Competence Statement on Thoracic Endovascular Aortic Repair (TEVAR)—Multispecialty Consensus Recommendations* in 2006, which outline the minimum training and experience requirements for physicians performing TEVAR.

It states that any physician looking to perform TEVAR should have the highest level of certification (or eligibility) in his or her specialty, including the following:

➤ Vascular and interventional radiology, from ABR
➤ Vascular surgery, from ABS
➤ Interventional cardiology, from ABIM
➤ Thoracic surgery, from ABTS
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Certification from ABIM with additional certification in endovascular medicine through the ABVM

In addition, the document outlines four knowledge and skill set requirements that individual physicians or a team of physicians must possess. The first is a familiarity with selecting patients, interpreting CT scans and 3-D reconstructions, measuring, planning, and performing endovascular aneurysm repair, as evidenced by successful performance as the primary operator of 25 abdominal endografts (EVAR) in the previous two years or of 10 thoracic endografts in the previous two years. EVAR is a procedure that is most technically similar to TEVAR, and may provide similar opportunities to develop the necessary skills, according to the committee.

Physicians should also have peripheral intervention skills to perform aortography, bail out covered side-branch vessels, and treat access artery injuries, as evidenced by competency in catheter-based peripheral intervention, as defined by successful performance of the specified number of endovascular procedures in either of the two commonly adopted endovascular credentialing standards:

1. The American College of Cardiology/American College of Physicians/SCAI/SVMB/SVS clinical competence statement on vascular medicine and catheter-based peripheral vascular interventions
2. The American Heart Association training standards for physicians performing peripheral angioplasty and other percutaneous peripheral vascular interventions

The third skill set requirement outlined in the statement notes that physicians should have knowledge of thoracic aortic pathology; its diagnosis, natural history, and management options; and recognition and treatment of common complications, such as spinal cord ischemia, renal failure, stroke, myocardial ischemia, and atheroembolization, as evidenced by certification in vascular surgery by ABS, certification in thoracic surgery by ABTS, or attendance at a minimum of 20 hours of CME specifically devoted to endovascular repair of thoracic aortic pathology in the previous two years.

Regardless of surgical board certification, all physicians participating in the team should have completed a minimum of 10 hours of CME specifically devoted to endovascular repair of thoracic aortic pathology within the previous two years.

A comprehensive understanding of the indications for intervention on the various thoracic aortic pathologic processes that can be treated by TEVAR is required to ensure appropriate application of the procedure. Physicians must also be familiar with the diagnosis and management of TEVAR complications, including stroke, paraplegia, microembolization, and renal failure.

A volume of 10 TEVAR procedures over two years would be considered to be the minimum necessary to maintain an active TEVAR program, according to the statement.
Finally, physicians should have the capability to obtain and repair access to the vascular system at the brachial, common femoral, or common iliac artery levels and to perform brachiocephalic transposition or extra-anatomic revascularizations, as evidenced by certification in vascular surgery by ABS or certification in thoracic surgery by ABTS.

A qualified vascular or cardiovascular surgeon in all TEVAR procedures is imperative due to issues associated with obtaining, maintaining, and repairing vascular access vessels, as well as the not-infrequent need for brachiocephalic revascularization, according to the statement.

The guideline states that the requisite annual volume a physician needs to perform to maintain clinical competence is unknown, and suggests that maintenance of certification may be more appropriate for the TEVAR program rather than for its individual physicians due to the typical team approach and various members involved in the procedure.

The guideline recommends that individual physicians should be expected to maintain certification and privileges in their respective core disciplines and to participate in 10 hours of CME specifically devoted to TEVAR every two years, the combination of which would be believed to be sufficient for maintenance of their individual TEVAR privileges.

According to the guideline, for the program as a whole to be sufficiently active to warrant continuation of TEVAR, it would be expected to have successfully performed at least 10 TEVAR procedures over the previous two years.

**ACGME**

ACGME publishes *Program Requirements for Graduate Medical Education in Interventional Cardiology (Internal Medicine)*, which states that educational programs in interventional cardiology must be 12 months in length. All 12 months must include clinical experiences, and fellows must participate in training using simulation.

Fellows must demonstrate competence in the prevention, evaluation, and management of patients with acute ischemic syndromes, bleeding disorders or complications associated with percutaneous intervention or drugs, chronic ischemic heart disease, and valvular and structural heart disease.

Fellows must perform a minimum of 250 coronary interventions, including the following:
- Application and usage of balloon angioplasty, stents, and other commonly used interventional devices
- Femoral and brachial/radial cannulation of normal and abnormally located coronary ostia
Fellows must also demonstrate competence in the performance of coronary arteriograms, Doppler flow, intracoronary pressure measurement and monitoring, coronary flow reserve, hemodynamic measurements, intravascular ultrasound, and ventriculography and aortography.

The guidelines do not specifically mention endovascular repair of TAA, but stents are included within the required 250 coronary interventions.

ACGME publishes *Program Requirements for Graduate Medical Education in Vascular Surgery*. According to these guidelines, residents can complete either an integrated or an independent program in vascular surgery.

In the integrated program, residents complete five years of vascular surgery education, which must contain two years of core surgical education and three years of educational experiences concentrated in vascular surgery. Residents must perform a minimum of 500 operations, including 250 major procedures that reflect an adequate breadth and balance of experience in the surgical care of vascular diseases.

The independent program consists of a minimum of three years in a general surgery residency program and three years in vascular surgery, both within the same institution. Residents in independent programs should perform a minimum of 250 major vascular reconstructive procedures.

Both programs must expose residents to opportunities working as members of effective interprofessional teams, and must include collaboration with fellow surgical residents.

The guidelines do not contain specific requirements for endovascular repair of TAA.

ACGME also publishes *Program Requirements for Graduate Medical Education in Thoracic Surgery*. Residents can pursue education in thoracic surgery in one of three formats. The independent program or traditional format consists of the successful completion of an ACGME-accredited surgery residency program, followed by two years of thoracic surgery education.

The joint surgery/thoracic surgery program, or 4 + 3 program, consists of seven total years of training, all of which must be completed at the same institution. The first four years focus on surgery training, while three additional years are devoted to thoracic surgery.

The third format, the integrated program, consists of six years of thoracic surgery education, with a minimum of 24 months and a maximum of 36 months to include education in core surgical education, and the remainder of the curriculum to include education in oncology, transplantation, basic and advanced
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laparoscopic surgery, surgical critical care and trauma management, thoracic surgery, and adult and congenital cardiac surgery.

Residents must gain a minimum annual operative experience of 125 major cases, which should include the following categories of procedures:

- Lungs, pleura, and chest wall
- Esophagus, mediastinum, and diaphragm
- Thoracic aorta and great vessels
- Congenital heart anomalies
- Valvular heart diseases
- Myocardial revascularization
- Cardiac pacemaker implantation
- Mediastinoscopy
- Pleuroscopy
- Flexible and rigid esophagoscopy and bronchoscopy
- Endoscopic ultrasound
- Endoscopic approaches to thoracic and esophageal disease
- Multidisciplinary approaches to the treatment of thoracic malignancy
- Required experience in endovascular stents

Residents must also develop and execute patient care plans, demonstrate technical ability, use information technology, and evaluate diagnostic studies.

ACGME publishes *Program Requirements for Graduate Medical Education in Vascular and Interventional Radiology*. According to these guidelines, programs should be one year in length, following the satisfactory completion of a diagnostic residency program. Fellows must participate in a minimum of 500 vascular and interventional procedures that cover the entire range of the specialty. Vascular procedures include, but are not limited to, the following:

- Arteriography
- Venography
- Lymphography
- Angioplasty
- Vascular stenting
- Percutaneous revascularization procedures
- Embolotherapy
- Transcatheter infusion therapy
- Intravascular foreign body removal
- Percutaneous placement of endovascular prostheses such as stent grafts and inferior vena cava filters
- Insertion of vascular access catheters

Fellows must be provided with instruction in the use of needles, catheters, guide wires, balloons, stents, and other interventional devices, and must be directly supervised and given graduated responsibility in the performance of procedures as competence increases.
AOA

AOA publishes *Specific Basic Standards for Osteopathic Fellowship Training in Interventional Cardiology*. Training programs should be 12 months in duration, following the successful completion of a three-year general cardiology fellowship. Fellows must gain experience in the diagnosis of cardiovascular disease and indications for catheter-based interventions, as well as indications for urgent catheterization in the management of patients with acute coronary syndromes. Fellows must also learn proper technical placement of intra-aortic balloon counterpulsation devices and emergency temporary pacemakers. Fellows should also learn to select and use vascular access devices, guiding catheters, guide wires, and balloon catheters.

Fellows must participate in a minimum of 400 interventional procedures in the course of the fellowship, with a minimum of 250 cases as primary operator. Fellows must also actively participate in the diagnosis and treatment of cardiac disorders requiring interventional management, and must function in the role of consultant in interventional cardiology.

AOA publishes *Basic Standards for Fellowship Training in Neuroradiology, Pediatric Radiology, and Vascular and Interventional Radiology*, which states that a fellowship in vascular and interventional radiology should be a minimum of one year and should expose fellows to both the clinical applications of vascular and interventional radiology, as well as the skills necessary to develop the proper attitudes toward patients, professional staff, and administration. Fellows must successfully complete a diagnostic radiology preliminary year and a diagnostic radiology residency prior to entering fellowship training in vascular and interventional radiology.

Fellows must participate in a minimum of 500 procedures during training. Training should provide fellows with the following:

➤ Instruction in the use of needles, catheters, and guide wires

➤ Understanding of the physical properties and physiologic responses of all short- and long-term implantable devices as they pertain to interventional radiology

➤ Instruction in the clinical aspects of patient assessment, patient management, clinical indications, risks, and limitations of vascular and interventional procedures

➤ Understanding of physiologic monitoring devices, their interpretations, as well as proper interpretation of noninvasive tests as they pertain to vascular and interventional radiology

➤ Experience in vascular procedures, including but not limited to:
  – Arteriography
  – Venography
  – Lymphography
  – Angioplasty
  – Vascular stenting
  – Percutaneous revascularization procedures
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- Embolotherapy
- Transcatheter infusion therapy
- Intravascular foreign body removal
- Percutaneous placement of endovascular prostheses such as stent grafts and inferior vena cava filters
- Insertion of vascular access catheters

➤ Experience in nonvascular procedures, including but not limited to:
  - Percutaneous imaging-guided biopsy
  - Percutaneous gastrostomy
  - Percutaneous nephrostomy
  - Uteral stenting and other transcatheter genitourinary procedures for diagnosis and for treatment of lithiasis, obstruction, and fistula
  - Percutaneous transhepatic and transcholecystic biliary procedures
  - Percutaneous drainage for diagnosis and treatment of infections and other fluid collections
  - Percutaneous imaging-guided procedures such as ablation of neoplasms and cysts

➤ Clinical time dedicated to performance and interpretation of vascular ultrasound studies, magnetic resonance angiograms, and CT angiograms

AOA publishes *Basic Standards for Residency Training in Surgery and the Surgical Subspecialties*, which includes training requirements for residency programs in cardiothoracic surgery. Training should be two years following the successful completion of an AOA-approved general surgery residency program, including an OGME-1R internship year, and the final 12 months of the two-year program should be spent as chief resident. Training should address the operative, perioperative, and critical care of patients with pathological conditions within the chest, including pulmonary, esophageal, mediastinal, chest wall, diaphragm, and cardiothoracic disorders. Training should cover the following competency areas:

➤ Cognitive
➤ Psychomotor and technical skills
➤ Communications skills
➤ Practice management
➤ Professional attitudes and abilities

Each resident must participate in 255 major surgical procedures in the following categories:

➤ Congenital heart disease
➤ Adult cardiac
  - Acquired valvular heart
  - Myocardial revascularization
  - Reoperation
  - Aorta
  - Other
➤ Lung, pleura, chest wall
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- Pneumonectomy
- Lobectomy
- Segmentectomy
- Other
➤ Mediastinum (resection)
➤ Esophageal
  - Resection
  - Benign esophageal disease
  - Other
➤ Video-assisted thoracic surgery (VATS)

Residents should also have experience in the following:
➤ Endoscopy
  - Bronchoscopy
  - Esophagoscopy
  - Mediastinoscopy
➤ Consultation experience
  - New patient
  - Follow-up

The training guidelines do not include specific requirements for endovascular repair of TAA.

Basic Standards for Residency Training in Surgery and the Surgical Subspecialties also contains training requirements for general vascular surgery. General vascular surgery programs should be two years in length following completion of an AOA-approved general surgery residency program, including an OGME-1R year. Training should cover the following competency areas:
➤ Cognitive
➤ Psychomotor and technical skills
➤ Communications skills
➤ Practice management
➤ Professional attitudes and abilities

Residents must document completion of a minimum of 200 major vascular surgery procedures performed as surgeon or as first assistant. The guidelines do not include specific requirements for endovascular repair of TAA.

Positions of subject matter experts

Nicholas T. Kouchoukos, MD
St. Louis

Nicholas T. Kouchoukos, MD, a cardiothoracic surgeon at Missouri Baptist Medical Center in St. Louis, says endovascular repair of TAA is typically
performed by thoracic, cardiothoracic, or vascular surgeons or interventional radiologists. Rarely, cardiologists will also perform the procedure.

Any physician performing this procedure should be board certified in his or her specialty. Although it is somewhat new, this procedure has been incorporated in the ACGME curriculum for the main specialty areas, Kouchoukos says. Device manufacturers also offer training related to this procedure, but it is typically provided in conjunction with other specialty organizations.

The number of procedures required for a physician to obtain competence varies by specialty, says Kouchoukos, who supports the recommendations issued in the paper *Guidelines for Credentialing of Practitioners to Perform Endovascular Stent-Grafting of the Thoracic Aorta*.

**Timothy Murphy, MD**

*Providence, R.I.*

Timothy Murphy, MD, medical director of the Vascular Disease Research Center at Lifespan Health System in Providence, R.I., says that ACGME has established pathways related to this procedure for surgeons, cardiologists, and radiologists in the main specialty areas associated with this procedure, which are interventional radiology, vascular surgery, and cardiology.

Murphy says that a physician should typically perform 10 thoracic and abdominal endovascular repair procedures to become competent and perform another five procedures every two years to maintain competence. Because this procedure is often performed by a team, Murphy says his facility allows two operators to receive credit for a single procedure, with one as the first operator and the other as the second operator.

According to Murphy, it’s important for physicians to maintain their subspecialty certification, and credentialing staff should focus on the outcomes of the procedure when making privileging decisions in this area.

**Positions of accreditation bodies**

**CMS**

CMS has no formal position concerning the delineation of privileges for endovascular repair of TAA. However, the CMS *Conditions of Participation (CoP)* define a requirement for a criteria-based privileging process in §482.22(c)(6) stating, “The bylaws must include criteria for determining the privileges to be granted to individual practitioners and a procedure for applying the criteria to individuals requesting privileges.”

§482.12(a)(6) states, “The governing body must assure that the medical staff bylaws describe the privileging process. The process articulated in the bylaws,
rules or regulations must include criteria for determining the privileges that may be granted to individual practitioners and a procedure for applying the criteria to individual practitioners that considers:

- Individual character
- Individual competence
- Individual training
- Individual experience
- Individual judgment

The governing body must ensure that the hospital’s bylaws governing medical staff membership or the granting of privileges apply equally to all practitioners in each professional category of practitioners.

Specific privileges must reflect activities that the majority of practitioners in that category can perform competently and that the hospital can support. Privileges are not granted for tasks, procedures, or activities that are not conducted within the hospital, regardless of the practitioner’s ability to perform them.

Each practitioner must be individually evaluated for requested privileges. It cannot be assumed that every practitioner can perform every task, activity, or privilege specific to a specialty, nor can it be assumed that the practitioner should be automatically granted the full range of privileges. The individual practitioner’s ability to perform each task, activity, or privilege must be individually assessed.

CMS also requires that the organization have a process to ensure that practitioners granted privileges are working within the scope of those privileges.

CMS’ CoPs include the need for a periodic appraisal of practitioners appointed to the medical staff/granted medical staff privileges (§482.22[a][1]). In the absence of a state law that establishes a time frame for the periodic appraisal, CMS recommends that an appraisal be conducted at least every 24 months. The purpose of the periodic appraisal is to determine whether clinical privileges or membership should be continued, discontinued, revised, or otherwise changed.

**The Joint Commission**

The Joint Commission has no formal position concerning the delineation of privileges for endovascular repair of TAA. However, in its *Comprehensive Accreditation Manual for Hospitals*, The Joint Commission states, “The hospital collects information regarding each practitioner’s current license status, training, experience, competence, and ability to perform the requested privilege” (MS.06.01.03).

In the introduction for MS.06.01.03, The Joint Commission states that there must be a reliable and consistent system in place to process applications and verify credentials. The organized medical staff must then review and evaluate
the data collected. The resultant privilege recommendations to the governing body are based on the assessment of the data.

The Joint Commission introduces MS.06.01.05 by stating, “The organized medical staff is responsible for planning and implementing a privileging process.” It goes on to state that this process typically includes:

➤ Developing and approving a procedures list
➤ Processing the application
➤ Evaluating applicant-specific information
➤ Submitting recommendations to the governing body for applicant-specific delineated privileges
➤ Notifying the applicant, relevant personnel, and, as required by law, external entities of the privileging decision
➤ Monitoring the use of privileges and quality-of-care issues

MS.06.01.05 further states, “The decision to grant or deny a privilege(s) and/or to renew an existing privilege(s) is an objective, evidence-based process.”

The EPs for standard MS.06.01.05 include several requirements as follows:

➤ The need for all licensed independent practitioners who provide care, treatment, and services to have a current license, certification, or registration, as required by law and regulation
➤ Established criteria as recommended by the organized medical staff and approved by the governing body with specific evaluation of current licensure and/or certification, specific relevant training, evidence of physical ability, professional practice review data from the applicant’s current organization, peer and/or faculty recommendation, and a review of the practitioner’s performance within the hospital (for renewal of privileges)
➤ Consistent application of criteria
➤ A clearly defined (documented) procedure for processing clinical privilege requests that is approved by the organized medical staff
➤ Documentation and confirmation of the applicant’s statement that no health problems exist that would affect his or her ability to perform privileges requested
➤ A query of the NPDB for initial privileges, renewal of privileges, and when a new privilege is requested
➤ Written peer recommendations that address the practitioner’s current medical/clinical knowledge, technical and clinical skills, clinical judgment, interpersonal skills, communication skills, and professionalism
➤ A list of specific challenges or concerns that the organized medical staff must evaluate prior to recommending privileges (MS.06.01.05, EP 9)
➤ A process to determine whether there is sufficient clinical performance information to make a decision related to privileges
➤ A decision (action) on the completed application for privileges that occurs within the time period specified in the organization’s medical staff bylaws
Information regarding any changes to practitioners’ clinical privileges, updated as they occur

The Joint Commission further states, “The organized medical staff reviews and analyzes information regarding each requesting practitioner’s current licensure status, training, experience, current competence, and ability to perform the requested privilege” (MS.06.01.07).

In the EPs for standard MS.06.01.07, The Joint Commission states that the information review and analysis process is clearly defined and that the decision process must be timely. The organization, based on recommendations by the organized medical staff and approval by the governing body, develops criteria that will be considered in the decision to grant, limit, or deny a request for privileges. The criteria must be consistently applied and directly relate to the quality of care, treatment, and services. Ultimately, the governing body or delegated governing body has the final authority for granting, renewing, or denying clinical privileges. Privileges may not be granted for a period beyond two years.

Criteria that determine a practitioner’s ability to provide patient care, treatment, and services within the scope of the privilege(s) requested are consistently evaluated.

The Joint Commission further states, “Ongoing professional practice evaluation information is factored into the decision to maintain existing privilege(s), to revise existing privileges, or to revoke an existing privilege prior to or at the time of renewal” (MS.08.01.03).

In the EPs for MS.08.01.03, The Joint Commission says there is a clearly defined process facilitating the evaluation of each practitioner’s professional practice, in which the type of information collected is determined by individual departments and approved by the organized medical staff. Information resulting from the ongoing professional practice evaluation is used to determine whether to continue, limit, or revoke any existing privilege.

**HFAP**

The Healthcare Facilities Accreditation Program (HFAP) has no formal position concerning the delineation of privileges for endovascular repair of TAA. The bylaws must include the criteria for determining the privileges to be granted to the individual practitioners and the procedure for applying the criteria to individuals requesting privileges (03.01.09). Privileges are granted based on the medical staff’s review of an individual practitioner’s qualifications and its recommendation regarding that individual practitioner to the governing body.

It is also required that the organization have a process to ensure that practitioners granted privileges are working within the scope of those privileges.
Privileges must be granted within the capabilities of the facility. For example, if an organization is not capable of performing open-heart surgery, no physician should be granted that privilege.

In the explanation for standard 03.01.13 related to membership selection criteria, HFAP states, “Basic criteria listed in the bylaws, or the credentials manual, include the items listed in this standard. (Emphasis is placed on training and competence in the requested privileges.)”

The bylaws also define the mechanisms by which the clinical departments, if applicable, or the medical staff as a whole establish criteria for specific privilege delineation.

Periodic appraisals of the suitability for membership and clinical privileges is required to determine whether the individual practitioner’s clinical privileges should be approved, continued, discontinued, revised, or otherwise changed (03.00.04). The appraisals are to be conducted at least every 24 months.

The medical staff is accountable to the governing body for the quality of medical care provided, and quality assessment and performance improvement (03.02.01) information must be used in the process of evaluating and acting on re-privileging and reappointment requests from members and other credentialed staff.

**DNV**

DNV has no formal position concerning the delineation of privileges for endovascular repair of TAA. MS.12 Standard Requirement (SR) #1 states, “The medical staff bylaws shall include criteria for determining the privileges to be granted to individual practitioners and a procedure for applying the criteria to those individuals that request privileges.”

The governing body shall ensure that under no circumstances is medical staff membership or professional privileges in the organization dependent solely upon certification, fellowship, or membership in a specialty body or society.

Regarding the Medical Staff Standards related to Clinical Privileges (MS.12), DNV requires specific provisions within the medical staff bylaws for:

➤ The consideration of automatic suspension of clinical privileges in the following circumstances: revocation/restriction of licensure; revocation, suspension, or probation of a DEA license; failure to maintain professional liability insurance as specified; and noncompliance with written medical record delinquency/deficiency requirements

➤ Immediate and automatic suspension of clinical privileges due to the termination or revocation of the practitioner’s Medicare/Medicaid status

➤ Fair hearing and appeal
The Interpretive Guidelines also state that core privileges for general surgery and surgical subspecialties are acceptable as long as the core is properly defined.

DNV also requires a mechanism (outlined in the bylaws) to ensure that all individuals provide services only within the scope of privileges granted (MS.12, SR.4).

Clinical privileges (and appointments or reappointments) are for a period as defined by state law or, if permitted by state law, not to exceed three years (MS.12, SR.2).

Individual practitioner performance data must be measured, utilized, and evaluated as a part of the decision-making for appointment and reappointment. Although not specifically stated, this would apply to the individual practitioner’s respective delineation of privilege requests.

**CRC draft criteria**

The following draft criteria are intended to serve solely as a starting point for the development of an institution’s policy regarding this procedure.

*Minimum threshold criteria for requesting privileges in endovascular repair of TAA*

**Basic education:** MD or DO  
**Minimal formal training:** Successful completion of an ACGME- or AOA-accredited postgraduate training program in cardiovascular disease, vascular surgery, thoracic surgery, radiology, or interventional cardiology, as well as successful completion of an STS-, AATS-, or SVS-sponsored endovascular training course. Applicants agree to limit procedure to use of endovascular graft device for which they have demonstrated training and experience. Qualifications should include experience with at least 10 open thoracic surgical procedures, a minimum of 25 wire/catheter placements, participation in 10 abdominal or five thoracic aortic endovascular stent-grafting procedures, experience with large-bore femoral sheath cannulation, and experience with retroperitoneal exposure of, and procedure on, the iliac arteries.  
**Required current experience:** Demonstrated current competence and longitudinal experience with patients with thoracic aortic diseases (20 patients in the past two years) and documentation of experience in at least 10 endovascular repairs of TAA procedures in the past 12 months, or completion of training in the past 12 months. In addition, supervision by a physician experienced in performing endovascular repair of TAAs is recommended for an applicant’s initial five cases.
References

If the applicant is recently trained, a letter of reference should come from the director of the applicant’s training program. Alternatively, a letter of reference may come from the applicable department chair and/or clinical service chief at the facility where the applicant most recently practiced.

Reappointment

Reappointment should be based on unbiased, objective results of care according to a hospital’s quality assurance mechanism.

Applicants for reappointment must demonstrate current competence and evidence of the performance of at least 10 endovascular repairs of TAA procedures in the past 24 months based on results of ongoing professional practice evaluation and outcomes.

In addition, continuing education related to endovascular repair of TAA should be required.

For more information

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Beverly, MA 01915
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Website: www.aats.org

American Board of Internal Medicine
510 Walnut Street, Suite 1700
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Endovascular repair of thoracic aortic aneurysms

Procedure 232

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Website: www.theabr.org

American Board of Surgery
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Philadelphia, PA 19103
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Website: www.absurgery.org

American Board of Thoracic Surgery
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Chicago, IL 60611
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Website: www.abts.org

American Board of Vascular Medicine
446 North Street
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Telephone: 440-247-4015
Website: www.vascularboard.org

American Osteopathic Association
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Fax: 312-202-8200
Website: www.osteopathic.org

American Osteopathic Board of Internal Medicine
1111 W. 17th Street
Tulsa, OK 74107
Website: www.aobim.org

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Endovascular repair of thoracic aortic aneurysms

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Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, MD 21244
Telephone: 800-633-4227
Website: www.cms.gov

DNV Healthcare, Inc.
1400 Ravello Drive
Katy, TX 77449
Telephone: 281-396-1000
Website: www.dnvusa.com

Healthcare Facilities Accreditation Program
142 E. Ontario Street
Chicago, IL 60611
Telephone: 312-202-8258
Website: www.hfap.org

The Joint Commission
One Renaissance Boulevard
Oakbrook Terrace, IL 60181
Telephone: 630-792-5000
Website: www.jointcommission.org

Lifespan Health System
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Website: www.lifespan.org

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Website: www.svmb.org

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