

Shaping GME: The Future of Vascular Surgery

Major Revisions to the Program Requirements for Vascular Surgery

Summary of Themes and Insights

Overview

Every 10 years, the ACGME Review Committees are required to evaluate the applicable specialty-specific Program Requirements for revision. In 2017, the ACGME re-envisioned the process by which this is done and piloted a new approach within the specialty of internal medicine. The new process, which includes scenario-based strategic planning, requires a writing group (composed of Review Committee members and ACGME Board members, including public members) and the specialty community to think rigorously and creatively about what the specialty will look like in the future prior to proposing any revisions, recognizing the future is marked with significant uncertainty.

Key Insights about the Practice of the Vascular Surgeon of the Future

Several themes emerged from the scenario planning efforts that provide insight into the vascular surgeons of the future and their practice. It is recognized that the vascular surgeon of the future will not achieve mastery of all these competencies during residency alone. Residency must serve as the foundation for career-long professional development and adaptation to a changing health care system and community need.

Proposed Definition of the Vascular Surgeon

Vascular surgeons provide comprehensive care. They care for patients with conditions caused by occlusive, aneurysmal, inflammatory, traumatic (both iatrogenic and noniatrogenic), compressive, and other etiologies of the arterial, venous, and lymphatic circulatory systems exclusive of those circulatory vessels intrinsic to the heart and brain. Comprehensive care requires expertise in evaluation, diagnosis, operative (including open, endovascular, and hybrid approaches), and non-operative treatment of patients with acute and chronic vascular disease. They provide care across a spectrum of health care settings ranging from highly specialized to resource-limited environments.

Vascular surgeons are professionals. Professionalism includes high ethical standards, stress tolerance, and empathy. Vascular surgeons promote sustainable and equitable delivery of vascular care through resource stewardship, and identify and mitigate the effects of health care inequities on patient outcomes. They advocate for patients and their profession by continuously striving for diversity, inclusion, and equity in the clinical learning and practice environments, as well as in organizational leadership. Vascular surgeons recognize the importance of personal well-being and use skill sets that promote resilience, work-life integration, and career longevity.

Vascular surgeons are patient centered. They provide care that is humanistic, ethical, and value directed. Vascular surgeons emphasize primary and secondary prevention of disability and death while providing education that prioritizes quality of life. Vascular surgeons diagnose and treat patients in a holistic and longitudinal manner, using the entire spectrum of available treatment options. Their judgement and expertise in the medical management of vascular disease, in addition to their interventional training, allow them to lead complex, shared decision

making and offer patients the most appropriate treatment options while focusing on the long-term implications of each choice.

Vascular surgeons are critical for multidisciplinary management of patients. They are leaders in the care of patients with wounds, venous disease, and chronic limb-threatening ischemia. Vascular surgeons focus on limb salvage and preservation of function, performing amputations when necessary. They work with other clinicians by providing vascular exposure, managing iatrogenic and traumatic vascular injury, and restoring blood flow to ischemic tissue. Vascular surgeons play a significant role in the provision and maintenance of vascular access and the care of critically ill patients. Vascular surgeons are proficient in the acquisition and interpretation of vascular laboratory and imaging studies.

Vascular surgeons are scholars. They contribute to and analyze the scientific literature, including translational science. They practice evidence-based care, interpret and report patient-centered outcomes, and utilize data management science for ongoing professional learning and continuous quality improvement. Vascular surgeons are creative and adaptive lifelong learners who design and assimilate new technologies and scientific advances. Vascular surgeons are committed educators. They communicate fluently and clearly explain complex data and concepts to all stakeholders, especially patients and their surrounding communities.

Future Vascular Surgery Residency Education and Training

In each strategic planning scenario, strategies were developed to successfully educate and train the vascular surgeon of the future. The strength of each strategy was then assessed in each of the other three scenarios. Strategies that were most successful across scenarios were considered most likely to be useful in any potential future. Eight themes emerged from the consolidation of the diverse strategies, with specific sub-themes described below:

1. The Learning Continuum
2. Professional Focus
3. Professionalism, Ethics, and Compassion
4. Integrating Technology
5. Integrating Health Care and Economics, Accountability, and Resource Management
6. Leadership and Team Integration
7. Physician Well-Being
8. Strengthening the Pipeline

1. The Learning Continuum

Vascular surgeons are lifelong learners. They develop and adapt training paradigms to ensure the most sustainable and equitable care across a spectrum of health care settings.

Vascular surgery residency programs will:

- Train residents to be creative, adaptive, innovative lifelong learners.
- Provide broad training in resource stewardship.
- Allow temporal fluidity in training to accommodate individual training needs and personal and family well-being, while ensuring documented achievement of competence.
- Sponsor and/or collaborate with training paradigms that serve learners from different specialty training backgrounds.
- Provide a core, standardized curriculum including diagnosis, procedural skills, management and treatment of vascular emergencies, vascular medicine, imaging modalities, research methods, and team-based approach to care.

- Ensure that residents demonstrate procedure-level competence based upon a tiered approach, acquiring independence initially for core benchmarked technical skills in vascular surgery, followed by additional disease-specific competencies that will be accessible over the course of a career.

2. Professional Focus

Vascular surgeons use their knowledge, skills, and clinical practice to meet contemporary and evolving needs. They work and learn alongside their professional colleagues in local, national, and global communities of care.

Vascular surgery residency programs will:

- Train residents and fellows as comprehensive vascular specialists and ensure they learn all applicable technical approaches
- Train residents and fellows to practice preventive medicine and participate in community education and outreach to increase public awareness of vascular disease and knowledge of when to seek medical care.
- Train residents and fellows to assimilate new technology (such as artificial intelligence, enhanced imaging, and novel endovascular devices) while maintaining the ability to function independent of the technologies.
- Ensure that residents and fellows learn to deliver appropriate vascular care across a spectrum of health care settings, including evaluation and management of patients at centers with low resources or without advanced specialized care.
- Be encouraged to develop and seek accreditation for innovative post-training fellowships in areas of enhanced expertise where such training may be beneficial..

3. Professionalism, Ethics, and Compassion

Vascular surgeons employ a systematic approach to reducing health care disparities and employ a humanistic approach to the delivery of health care. They foster public trust through their ethical and professional behavior.

Vascular surgery residency programs will:

- Teach residents and fellows how to create and deliver patient-centered, humanistic, ethical, and cost-effective care using established evidence-based guidelines and verified technology-driven treatment algorithms.
- Educate residents and fellows on preserving humanistic patient care while providing education on the value of virtual technology and simulation.
- Educate residents and fellows to identify the impacts of health care inequities and act to mitigate the effects on patient outcomes.
- Inculcate the principles of professional integrity, including the recognition and management of conflicts of interest.
- Provide education on the principles of palliative care and its role in the treatment of vascular surgery patients.
- Be aware of the potential impacts of climate change on the delivery of health care.

4. Integrating Technology

Vascular surgeons develop, assess, and adapt to new technologies in the clinical care of patients. They also use new technology to measure and improve training and clinical practice.

Vascular surgery residency programs will:

- Train residents to evaluate the use of new and emerging technologies and their applicability to surgical training, practice, and patient care.
- Incorporate simulation throughout training to enhance both open and minimally invasive techniques. Residents will receive analysis of and feedback about their performance on the simulators.
- Ensure training encompasses education in and interpretation of all vascular imaging modalities, including those used in pre-operative, intra-operative, and post-operative settings.

5. Integrating Health Care and Economics, Accountability, and Resource Management

Vascular surgeons understand the multi-dimensional outcomes of their care, including safety, access, and cost effectiveness of treatment in patients and populations.

Vascular surgery residency programs will:

- Ensure that residents and fellows demonstrate competence in data analysis, finance, and health care economics across a variety of practice settings, to better understand trade-offs between resources and outcomes.
- Train residents to identify, interpret, and report their own patient-centered outcomes within the training program, including an evaluation of cost effectiveness.

6. Leadership and Team Integration

Vascular surgeons work as leaders and participants in team-based care. They interact and build relationships with patients, patient support teams, care teams, health care managers, and other members of the patient's community.

Vascular surgery residency programs will teach collaborative leadership and principles of participation in interprofessional multidisciplinary teams, including complex high-risk cases.

7. Physician Well-Being

Vascular surgeons recognize the importance of a healthy work environment, both for themselves and their colleagues. They recognize the joy and sense of accomplishment in a fulfilling career.

Vascular surgery residency programs will:

- Display and provide education on specific skill sets that promote ethical, mental, and physical resilience, adaptability to change, work-life integration, and career longevity.
- Train residents to recognize their own and others' well-being, including the use of self-assessment tools and other strategies, to optimize their mental health.

8. Strengthening the Pipeline

Vascular surgeons use a lens of equity and inclusion in identifying, recruiting, and retaining future generations of vascular surgeons.

Vascular surgery residency programs will:

- Recruit candidates who demonstrate core characteristics associated with an enduring career, including professionalism, high ethical standards, stress management/developing resilience skills, emotional intelligence, empathy, and innovative thinking.
- Encourage participation in pathways and pipeline programs and recruit candidates from diverse backgrounds and experiences.

- Encourage mentorship programs across varying career paths (e.g., clinical, education, research, global health, administrative leadership) and at all levels of education and training.
- Ensure an environment of equity, inclusion, and belonging.

Next Steps

The Vascular Surgery Writing Group respectfully requests feedback regarding the major themes described above, including the vision of the future vascular surgeon and program strategies. The group seeks diverse perspectives—from the public, patients, families of patients, community agencies, clinicians within and outside vascular surgery, and all stakeholders in health care and population health.

The feedback received will help inform the development of the new Program Requirements for Vascular Surgery, which will then be posted for public comment.

Questions for Stakeholders to Consider

Considering that the training requirements developed under the above program strategies will affect physicians practicing from approximately 2025-2050:

- What, if any, additional educational experiences should be considered in support of meeting the aspirational definition of the vascular surgeon, as proposed above?
- Describe any potential challenges your program might face in providing the experiences described above. What additional resources might be required to support implementation of these experiences?
- In addition to the themes and strategies described above, what, if any, additional issues should be addressed in the revised Program Requirements?
- Describe any potential unintended consequences that may result from implementing the strategies above.
- What general areas within the existing Program Requirements for Vascular Surgery do not support the future strategies described above?

Addendum

What is scenario-based planning?

Scenario-based planning is a technique by which organizations develop and test their readiness for the future using a range of alternative futures or scenarios. In this case, these scenarios are detailed, systematically developed descriptions of operating environments that the US medical profession might face over the next 25 years or more. This is a technique for managing uncertainty, risk, and opportunity. It yields a strong strategic framework for understanding future needs and a practical basis for immediate action. The intent is not to predict what the future will be and then build a master plan, but rather to ask what the future might hold and identify actions that can be taken today that are most likely to be valuable regardless of how the future turns out. As a result, the technique relies far more on expert judgment and less on quantitative trend forecasts.

What has taken place so far?

In 2013, the ACGME Board of Directors engaged in a scenario-based planning exercise using four widely varied, plausible, internally consistent scenarios describing the range of the future context for health care delivery. These same scenarios were used again during two workshops for the Review Committee for Internal Medicine's Program Requirement revision process in 2017 ("Internal Medicine 2035").

The process resulted in a summary of general insights about the practice of medicine in the future, followed by key insights about the internist in 2035 that worked well and were viable regardless of scenario, and final recommendations for what residency programs should do to prepare the internal medicine resident to practice in 2035. The Review Committee for Internal Medicine then used this information to design the recent major revisions to the Program Requirements for Graduate Medical Education in Internal Medicine.

The process was refined as a result of the experiences with internal medicine, and subsequently with family medicine, pediatrics, general surgery, and emergency medicine. Vascular surgery is the sixth specialty to embark on this new major revision process through scenario-based planning. New scenarios were developed and updated for envisioning the future in 2050 or beyond. These are:

- Now You're on Your Own – A dynamic, high-technology world characterized by a novel mix of libertarian economics and progressive social policies, with a rich economy.
- New New Deal – Following decades of political division and economic stagnation, this world is based on social democracy, civic unity, bold government actions, economic rebound, and public optimism.
- Ex Uno, Plures – A world with a weak federal government, strong independent states, divisive culture wars, no safety nets, isolationism, and near-depression economics.
- One Giant Leap – A world of rapid temperature rise and extreme weather causing havoc and widespread anxiety, and a large shift in government priorities, with sluggish economics.

Thirty participants representing the vascular surgery community, other specialties, and related fields attended a workshop in September 2022. The focus was to provide the Review Committee with insights regarding what the practice of vascular surgery could look like in each scenario.

Additionally, a literature review on key topics identified by the Vascular Surgery Writing Group was conducted, along with a series of one-on-one interviews with patients, vascular surgeons who recently completed training, and health care channel influencers.

Above is a summary of the results of these efforts—key insights about the vascular surgeon of the future that worked well and were viable regardless of the scenario, and recommendations for what programs should do to prepare vascular surgery residents to practice in 2050. The Writing Group will use these findings and public comments to begin its major revision process later this year.