PANEL DISCUSSION

Reimagining the Next Generation of the Vascular Care Workforce

Unique attributes of the next generation of vascular interventionalists, essential skills, the evolution of education and training, trends in staffing, and ways to improve diversity and inclusion.

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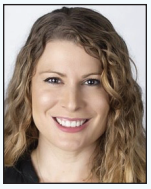

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What will be unique about the next generation of physicians to enter the various fields that comprise vascular intervention?

Dr. Dake: The next generation of vascular specialists will be armed with a much more quantifiable and objectively validated armamentarium. It's been more art than science up until now: What lesion gets treated with what, for example, is sort of a dealer's choice. We've been on a slow evolution toward practicing evidence-based medicine, but we're poised on the threshold of entering an era where it will be common knowledge on what lesions to treat and what should be the first and second approaches, and again, always keeping in mind that we don't want to burn any bridges. This will be enabled through a deeper understanding by our current trainees of probabilistic reasoning—not necessarily memorizing facts but rather knowing how to curate information and reasoning based on the available data. Not only will they be better prepared to do that efficiently, but they'll also be more oriented to make that a practice. That should result in a better standardization of care and better outcomes.

The one problem I don't have an answer for is how we care for patients with vascular disease who live in rural areas and lack access to health care or where it may be less desirable for specialists to work. This gets into health equity issues. How can we take care of those individuals? I don't think anyone has a solution for that yet, and that's a challenge we'll all have to face. I think it might start from the ground up, with a better penetration of primary care physicians who have a strong understanding of specialty vascular care and the importance of getting these patients in the right hands.

You can't legislate people to work in areas where they don't want to practice, but a very real conundrum is how we get care to areas where it's not currently being provided at the highest level.

Dr. Gomez-Sanchez: The next generation of physicians entering the field will be increasingly more diverse. There has been a growing understanding of the need for more comprehensive representation within medicine, and that has been reflected in medical school and residency recruitment efforts. This will bring new perspectives to the field and hopefully represents an opportunity to address health care disparities across the United States. Additionally, I think the next generation has different expectations about work-life balance than past generations. There is a greater understanding that to practice medicine well, the physician workforce itself must be well.

Dr. Kashef: The next generation of interventionalists—whether interventional radiology (IR), vascular surgery, or cardiology—will need to have an overarching approach to vascular patients, including health education, prevention, medical therapies, and endovascular and open interventions. We also need to move away from the turf wars and silos and focus more on who has the right skill set to operate on these patients. Working together is the only way forward. This is an evolutionary process that we are only at the start of.

What will the essential skills for this generation comprise?

Dr. Kashef: This first rule is teamwork! During training, teach multispecialty collaboration and eliminate bad behaviors and undermining attitudes. We need to respect each other's skills and what we all bring to the table. We need to work toward a common goal—patient-centered care.

Dr. Dake: It will require a heightened understanding of not only surgical options but also endovascular techniques, and I think there will be further melding of specialties. We haven't seen it fully yet, but I think there will be a continued push toward specialty vascular centers—some outpatient rather than hospital-based. That's the undeniable trend, and I think it will draw from the best of all specialties interested in vascular care.

The importance of cultivating empathy and compassion is emphasized to our trainees more now than it was in the past. For vascular patients, that's critical. I'm recognizing in trainees an increased sensitivity to patient needs and providing them with not just patency outcomes but real functional benefits. This has not been emphasized enough in the past, but it is what patients want. Being sensitive to patients' wishes and their perception of "benefit" is key.

Along with that, we will see pre- and postcare involvement with artificial intelligence (AI) that will benefit patients. A lot of what we do is still procedural- or open interventional–based. I think we'll be informed by machine learning and better health informatics in terms of the pre- and postintervention phase—knowing at what point we might expect something to fail, being prepared for that, and potentially reconsidering our options prior to a failure happening.

Dr. Gomez-Sanchez: Vascular providers need to have a wide range of skill sets as vascular technologies become increasingly complex. Although endovascular skills are essential to any modern vascular interventionalist, open surgical techniques have their place, and these skill sets should also be valued. It is essential that practitioners develop pragmatic evidence-based algorithms for management so that patients receive efficient and evidence-based treatments that may require multidisciplinary approaches. Communication skills are ever more important in this setting.

What are some of the ways education will evolve in the near future? What are the key departures from past standards?

Dr. Gomez-Sanchez: Over the past 2 decades, there has been a changing landscape in residency education toward greater degree of supervision, with a resulting decrease in autonomy during technical procedures. Although this is appropriate in terms of patient safety, it can mean less opportunity for education of surgical trainees. Many programs around the country have tried to address this by investing in simulation opportunities for trainees to practice essential skills in low-risk environments. There are relatively inexpensive models that can be assembled for practicing vascular skill sets, such as ultrasound-guided vascular access, vascular anastomoses, and vascular dissection, that promote development of both manual and cognitive skills. For vascular trainees specifically, open curricula for procedural skills are more developed than endovascular curricula; this is a major frontier in surgical education.

Dr. Dake: Talking about trends we observe can allow us to project what will be different in the future. For example, more medical students are pursuing dual degrees now (public health, law, business, etc). Our goal is to have 20% dual degrees among our medical school

graduates. With this, we will see more undergraduates moving to health-related areas (eg, medical devices, programs). I think the landscape for health education will broaden in the future, because that's where the jobs are. More and more people are becoming conscious that this is an area we need to invest in.

Dr. Kashef: The virtual platform that developed during COVID-19 pandemic has revolutionized education. We can learn anything, from anywhere, and at any time. We can keep up with continuing medical education, network globally, and learn from each other. In our institution, a trauma/vascular surgeon is teaching damage control surgery virtually to a surgeon in Ukraine! It seems there is nothing we cannot teach or learn these days virtually. However, bedside/hands-on teaching has a real place in learning interventions. The relationships we build with our juniors and trainees really helps inspire and encourage them. Virtual teaching is great for theory, but it shows the educator at their best. We need real-world, day-to-day teaching to show our trainees how to handle various situation, including nonclinical ones.

Robotics and AI have had limited role in interventional training; however, augmented reality training can really help build crucial skills during training without needing to operate on an actual patient. There are many exciting projects and upcoming research that will hopefully revolutionize training. Industry is also investing in training—including use of image fusions, three-dimensional (3D) imaging, and nonionization techniques for performing interventions (intravascular ultrasound, fiberoptic 3D imaging using light)—that will help future generations of interventionalists.

It has become clear that innovative staffing solutions for today's and tomorrow's care centers will be needed. What are some trends you see taking hold in this regard?

Dr. Dake: The key trend is patients going to outpatient surgical/vascular centers that incorporate a one-stop shop that's convenient for patients, including imaging and appropriate outpatient care. This will continue to grow. I see nothing that can possibly stop this change except the government, although it has the fundamentals that the government wants to support. It just requires appropriate controls on self-referral.

University-based institutions will remain the center for training, education, and innovation. The cycle of research, education, and clinical care is driven by innovation, so cutting-edge therapies will still be at university-based centers, whether discovered at the institution or brought from outside to be explored. I think this will filter out quickly to outpatient-based centers, but the ground zero will still be the university.

Dr. Kashef: Staffing in the United Kingdom has been a massive challenge for radiologists, interventional radiologists, nurses, and radiographers. Currently, only 48% of National Health Service trusts can offer 24/7 IR cover. This creates a postcode lottery, resulting in varying outcomes in conditions such as sepsis and postpartum hemorrhage.[1] Innovative ideas that have been considered include stand-alone day-case units and keeping hospitals as hot sites. This can help streamline the workload.

Working with industry is also quite important. We now have IR, vascular, and cardiology labs managed by industry, which is also plugging funding into education and training for doctors, radiologists, and nurses.

Investing in our staff and training and creating a workplace that nourishes and supports them can really help staff retention. Other considerations include integration of advanced practitioners and nonmedical teams into the team to help build a strong workforce. Diagnostic radiology has a radiology academy, but IR does not yet have a formal one. This is a great opportunity for us to help with staffing and workload.

How might the role of advanced practice providers (APPs) in vascular care evolve?

Dr. Gomez-Sanchez: The prevalence of vascular disease, in particular peripheral artery disease, is on the rise, and the physician workforce is already inadequate in number to keep up. I think APPs could ultimately help bridge some of this gap. Outreach clinics staffed with vascular-trained APPs (and supported remotely by vascular physicians) could make optimal medical therapies and wound care more accessible and hopefully help facilitate earlier recognition of patients who need interventions.

Dr. Dake: There are a lot of political issues here, but there may be an opportunity for specialty APPs to go into areas that are in need of vascular specialists, where patients may not have access to the care we'd like them to have, such as rural or border areas. These APPs can work with the primary care physician there and potentially do more to benefit more patients close to home.

What efforts to improve diversity in the interventional physician population might be most effective?

Dr. Kashef: We are currently losing women from when they enter medical school and then choose a specialty. The figure is slightly better for vascular surgery,

but both need improvement. We need to improve exposure to the specialty at an earlier stage—it is too late once they have graduated! I think education is needed on the effects of radiation, especially for women who wish to conceive. The logistics of having a family and doing interventions and surgery need to become a nonissue by setting up a robust, dynamic, flexible department. We need to remove the stigma of "less than full-time" working, which sadly still exists in many places for both men and women.

The British Society of Interventional Radiology and Cardiovascular and Interventional Radiological Society of Europe have done a lot of work to improve diversity in IR, and I think we are improving access to IR for everyone. We still have a lot of work to do to improve diversity of IR for people of different backgrounds, both culturally and socioeconomically. Identifying and acting on the issue is the first step, and we are constantly working on improving this to reach a point one day where equity, diversity, and inclusion is integrated so well that we can focus on developing services and patient-centered care.

Dr. Dake: I think the key is getting to people early on—individuals who are members of traditionally underrepresented populations. Programs can be aimed at introducing traditionally underrepresented individuals to vascular surgery, interventional procedures (cardiology or radiology), and research, connecting them with pre-med and medical students from similar backgrounds. We have programs like this here at the university, as well as a Bachelor of Science in medicine with 500 people in the program. We need to showcase to these populations the careers available throughout the spectrum of health care and then emphasize that diversity is power and strength. We need to make sure that patients throughout our communities are comfortable and have health care providers they can relate to with similar backgrounds and experiences.

Dr. Gomez-Sanchez: Mentorship is important, but especially sponsorship of trainees who are members of underrepresented groups starting from their early training years. There needs to be proactive work in professional societies to make sure meeting panels, editorial boards, and leadership nominations represent a diverse group of professionals. ■

Disclosures
Dr. Dake: None.
Dr. Gomez-Sanchez: None.
Dr. Kashef: Consultant to Rocket Medical and Guerbet.

1. The Royal College of Radiologists. 2022 RCR clinical radiology workforce consensus. Accessed July 24. 2023. https://www.rcr.ac.uk/sites/default/files/documents/rcr_clinical_radiology_workforce_census_2023.pdf