Spend a morning in my clinic and it becomes clear that many U.S. medical schools have no formal training in vascular disease. Certainly the symptoms of PAD are never taught; otherwise, why am I being referred so many patients with spinal stenosis? Some days I would have more use for an MRI than for my vascular lab. Then again, reviewing the aftermath of patients “treated” by other specialties, maybe some are better off going undiagnosed.

What I believe is needed is a longitudinal medical school curriculum in peripheral vascular disease. From the basic sciences to the clinical clerkships, a comprehensive education is essential. Undoubtedly vascular surgeons can provide this, but first we must understand the roadblocks to curriculum change, and they are significant.

In the early 1900s, Abraham Flexner was commissioned by the Carnegie Foundation to survey the quality of North American medical schools. During his travels, Flexner visited 155 schools and found that many had little staffing, no research, and poor or absent clinical facilities. A number of schools were simply money-making enterprises with dubious educational content. Flexner pulled few punches in his descriptions, calling some institutions “indescribably foul” and “the plague spot of the nation.” He published his findings in the Flexner Reports of 1910 and 1912.

These documents shaped modern medical education in the U.S. Flexner urged schools to adopt new standards of curriculum, including a model dividing the 4 years of school into 2 years of basic science and 2 years of clinical experience.

In the wake of the Flexner Reports, half of U.S. medical schools were forced to merge or close. Still, a standardized system for accreditation was lacking. In 1942, the American Medical Association (AMA) and the Association of American Medical Colleges (AAMC) established the Liaison Commission for Medical Education (LCME) to meet this goal. Today the LCME provides accreditation for U.S. medical schools through an 8-year review cycle.

The LCME defines core curriculum as “the required components of a medical curriculum, including all required courses/modules and clinical clerkships/rotations.” Reviewing the LCME documents, one finds the specifications for curricular content are amazingly vague and astonishingly brief. Terms like “biochemistry,” “anatomy,” or even “surgery” are not mentioned.

Per LCME standards, it is the faculty of a medical school who define the competencies to be achieved by the students. The curriculum is then essentially reverse engineered to achieve these competencies. So while the SVS could attempt
to open a discussion with the LCME regarding vascular education, it appears change must happen at the individual school level.

The good news is that US medical school curricula are now exceptionally fluid. According to the 2017-2018 AAMC survey, 85% of schools report a significant curriculum transformation within the past 3 years. Flipped classrooms, longitudinal courses, standardized patients, and team-based learning have become standard methods of medical teaching. The most common change reported is the enhanced integration of basic science content into organ system/case-based curriculum (97/147 schools). Pass/fail grading standards in basic science courses have also been widely adopted to encourage team learning. Those of us who review student applications to residency programs can vouch for the prevalence and extent of these changes. Many dean’s letters now border on the absurd:

Dear Program Director,
At the Medical College of the Everglades, we feel our students achieve a broad range of outcomes. Therefore we assign grades on an unintelligible scale of color hues. In that light, we are pleased to recommend Josh Atkins, MD, as a LEMON DROP YELLOW candidate for your residency.

Plainly we are evolving from the Flexner system which required 2 years of basic science classwork. This traditional medical education forced a divide between the basic sciences and their clinical relevance. Students were asked to memorize facts out of context as passive learners. Then, in the clerkships, would the truths of the Kreb’s cycle magically appear through the wonders of ENT clinic? Not likely. Recently I opened my biochemistry textbook for the first time since medical school (honestly, I don’t think I opened it too many times there). I thumbed through the prelude, which distressingly discusses the new (!) technology of recombinant DNA (I’m old – sigh.).

The rest of the text is hundreds of pages of biomolecules and glycolysis, but no mention of disease or any clinical application. AAMC surveys show that students report biochemistry and histology as the most deficient courses in terms of preparing them for clinical duties. Neurology and OB/Gyn receive the lowest scores of the required clinical clerkships.

Think of how much time you spent in medical school learning the signs, symptoms, and treatments of endocrine disorders such as Cushing’s syndrome, Graves’ disease, and primary hypoparathyroidism. Together they are found in less than 500,000 Americans annually. PAD affects over 10 million. If we are graduating students with a poor understanding of vascular disease, change is needed. Shoehorning vascular education into the surgical clerkship is a weak solution.

According to the AAMC, the average number of required weeks on surgery is less than 8. Only about one-third of schools mandate a rotation on surgical specialties. There is time available for a longitudinal integrated curriculum in vascular disease, but not in the clinical years. Medical schools report an average of 12 elective weeks in each of the first 2 years. Here is where we can establish our course. There is, however, one more barrier to change — the “shadow curriculum” of the U.S. medical schools.

As medical students strive to earn positions in competitive residencies, they must differentiate themselves. But, as I have previously pointed out, more schools are adopting pass/fail grading systems rendering their class rank structures nebulous. What will make a residency application stand out? Personal statements are subjective at best. Faculty letters of recommendation? Unfortunately, these are often wild collages of impossible math, broad generalizations, and ambiguous superlatives.

“Kyle definitely rotated with us.”
“Top 5.8% of students I’ve worked with!”
“The residents seemed to like him.”
“Would do well in YOUR program.”

While “great,” “excellent,” and “outstanding” are synonyms in Webster’s Dictionary, for many surgeons they are proxies for “imbecile,” “meh?”, and “somewhat good.” With few objective measures of academic performance to select candidates for interviews, most residencies are turning to the USMLE scores as a barometer. Medical students have noticed.
The USMLE is a joint program of the Federation of State Medical Boards and the National Board of Medical Examiners (NBME). The exam was implemented in 1992 with the stated goal to provide medical licensing authorities with meaningful information regarding the ability of physicians to provide safe and effective patient care.

I was a first-year medical student when the process began. Medical schools at the time had a general consistency in the basic science topics taught, but wide variations in the depths to which these subjects were covered. So while my pathology course lasted 4 weeks and gross anatomy a full year, on the USMLE Step 1 exam, this emphasis was essentially reversed. Pathology accounted for nearly half of the material, while anatomy was less than 10% of the test. Medical schools bristled against the idea of “teaching to the exam.”

Little if any USMLE prep books were available, so the goal was merely to achieve a passing score. Today, as the preclinical courses move to lower stakes pass/fail grading, students are abandoning their school curriculum and focusing their efforts on the Step 1 exam. Even as schools try to de-emphasize subjects like biochemistry and histology, these topics still account for about one-third of the Step 1 content.

The USMLE subject matter has become the de facto curriculum of U.S. medical schools. The traditional “2 weeks, 2 days, 2 pencils” algorithm for preparing for Steps 1-3 has been abandoned. Many students now spend months studying for the pivotal Step 1 exam. As evidence, scores have been steadily rising as students seek to increase the competitiveness of their residency applications.

A recent commentary in Academic Medicine makes a compelling argument for ending the use of Step 1 scores when selecting residency applicants. The authors compare this practice to the use of an off-label drug for an untested purpose. They also note the exam’s restraining effect on curriculum change, the inordinate amount of time and money students spend preparing, as well as unintended consequences such as discouraging students with average scores from pursuing competitive residencies.

They even note that the stress of the exam likely contributes to student burnout. The remarkable thing about this commentary is that its senior author is the president and CEO of the NBME, which sponsors the USMLE. Of course, the USMLE could end all of this tomorrow by publicly reporting only pass/fail scores. Unfortunately, they have openly stated they have no intention to do so.

It is imperative that vascular surgeons establish themselves as the experts in the diagnosis and treatment of peripheral vascular disease at the medical school level. Existential threats to our specialty abound. A poll of recent medical student graduates revealed that more would consult interventional radiology (56%) than vascular surgery (39%) for the performance of a peripheral angiogram. There is a void in medical education that we must fill. Recently the Chairs of the Peripheral Vascular Disease section of the American College of Cardiology and the Peripheral Vascular Disease Council of the American Heart Association cowrote an editorial claiming “the lack of an American Board of Internal Medicine-certified specialty focused on patients with PAD has undermined their medical care.”

While we know time spent on vascular surgery rotations increases knowledge and interest, many specialties are competing for this time. A longitudinal curriculum could be established during the available elective blocks in the first 2 years of medical school. Unfortunately, due to the reliance of the LCME on individual schools to set up their curricula, this effort will require a national grassroots campaign.

There are many LCME standards that can be referenced to make our case. ED-33 requires schools to monitor the content in each discipline “including the identification of omissions.” IS-16 notes the importance of meeting the health care needs of “medically underserved populations”, groups which have a disproportionate prevalence of PAD. The SVS, in collaboration with the other major regional and national societies, has the opportunity to lead this campaign to improve the care of vascular patients and solidify the future of our specialty.

References


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