OPINION

Sustaining Change in Radiology Education: The Need for Universal Curricula

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The pace of change in today's graduate medical education (GME) environment has been swift [1]. For the better part of a decade, organizations such as the ACGME have contributed to a massive list of new requirements for postgraduate medical training. Many of these requirements call for individual programs to create their own educational content and assessment tools without meaningful guidance or tangible resources from the organizations requiring the changes. For most programs, compliance has been challenging.

EDUCATORS AS POLICY ENFORCERS

The barrage of new policy has indeed been substantial, as nearly every aspect of radiology residency training was overhauled between 2005 and 2015 [2-7]. To summarize, there has been a complete redesign of residency structure, an overhaul of the ABR board examinations, a new mandatory system of trainee evaluation that includes the use of specialty-specific milestones, a new system by which GME training programs are evaluated by the ACGME, and a controversial split of interventional radiology training from diagnostic radiology, the fallout from which we have yet to realize.

Other requirements mandated both before and during this perfect storm of change include the mandatory tracking of duty hours, case logs, procedure logs, trainee self-assessments, conference attendance, nuclear medicine training requirements, mammography training requirements, and 360-degree evaluations; required training elements such as learning portfolios, scholarly activity, quality projects, annual standardized testing, a 2-year repeating conference curriculum, 12 months of training before independent call, radiologic-pathologic training, and instruction in generating written reports; and competence in new required domains of education including the six ACGME core competencies, the numerous content areas found in the milestones, and other miscellaneous areas such as medical informatics, health services research, physician well-being, and cultural competency [2,6-9]. The summative impact of these changes on trainees and program directors has been staggering and yet little discussed in the radiology literature.

More is not necessarily better when it comes to GME regulation. Many program directors and coordinators spend so much of their time making measurements and enforcing accreditation policy that they are unable to spend meaningful time doing what attracted them to education in the first place, namely teaching and mentoring [10]. The mountain of new policy initiatives designed to further enhance trainee education, ironically, seems so onerous for some programs that it interferes with trainee education itself [11]. The sheer volume of these changes has likely contributed to feelings of burnout in even the most devoted of radiology educators [3,11].

Many program directors feel as if they are treading water to keep pace with current training guidelines and GME metrics. There are so many new accessory domains of information being added to the radiology training curriculum that accrediting organizations should no longer expect individual programs to have the time, resources, or expertise to create them [12]. Even curricula in areas that some might consider basic to GME today, such as quality, professionalism, and evidence-based practice, can be difficult to provide for many training programs with limited time or expertise. Unfortunately, extrapolation of the policy curve over the last 10 years tells us that there is more change to come.

Many experienced program directors who have witnessed the full impact of today's GME overregulation tell us they have one simple plea for

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accrediting organizations: "Don't just measure what you can measure, measure what matters." In fact, if the ACGME truly has the interests of trainees in mind, then they should pause to assess the summative impact of their current policies on training programs. Shouldn't ACGME policies be shown to actually improve educational outcomes before they are unveiled [13,14]? Shouldn't we expect that independent pilot studies are performed before the wholesale implementation of new requirements in a way that respects the ACGME's own core value of practice-based learning and improvement?

A CALL TO ACTION: THE NEED FOR UNIVERSAL CURRICULA

Although we may not be able to change the current accreditation culture, we can strive to make implementation of GME policy easier for trainees and educators. Occasionally, some programs succeed at creating truly novel curricula for new learning domains, often leading to publication in the radiology literature as a means to share best practices [15-28]. However, most program directors, particularly those with limited resources, have difficulty knowing where to even start when it comes to building or adopting comprehensive new learning modules in narrow specialty areas.

In discussions with radiology educators, often at annual meetings involving members of the Association of Program Directors in Radiology (APDR), one idea consistently recurs: how can we encourage experts within our national subspecialty societies to create universal educational curricula within their areas of expertise [11]? By establishing ad hoc committees to create core content for trainee education, societies such as the Society of Imaging Informatics in Medicine (SIIM), the American Association of Physics in Medicine (AAPM), and the ACR could add tremendous value to radiology education and the future of our specialty. If performed on a large enough scale, this kind of collaboration could free program directors from the heavy yoke of accreditation compliance, allowing them time to teach, innovate, and establish more meaningful relationships with their residents and fellows.

Such committees could flesh out the core content areas within their fields of expertise, establishing single nationwide repositories of information that are so desperately needed by residents and program directors. Ideally, committees would decide on essential topics for inclusion in their core curricula, create written educational content covering the various topics, provide helpful practice problems or clinical vignettes, and even create examinations based on the content. These curricula would need to have one unifying feature: that with regard to both "attaining competence" and defining the content to be tested on ABR examinations, they would include the entire core domain of information such that program directors would not need to seek out additional material to supplement it.

By allowing panels of subspecialty experts to establish these kinds of comprehensive, well-vetted curricula, the content could be used in many important ways. Each curriculum could serve as the core repository of a knowledge domain from which (1) trainees and practicing radiologists could learn and demonstrate competency; (2) ABR volunteers could write questions for the qualifying and certifying examinations; (3) ABR volunteers could write questions for maintenance of certification activities; and (4) academic and private radiology groups could create courses, lifelong learning modules, and continuing education examinations for their radiologists and trainees.

DOMAINS OF NEED

Several radiology organizations have already begun blazing the trail for universal curricula. One example is the AAPM partnership with RSNA to create the AAPM/RSNA Online Physics Modules. These modules highlight important concepts found in the AAPM physics curriculum. Originally developed in 2010 and later revised, this content currently consists of 45 individual physics learning modules spread over 10 basic categories. Although immensely helpful, these modules are only meant to serve as an educational supplement and study aid, however, and not as a comprehensive physics curriculum. Ideally, AAPM would flesh out a more comprehensive curriculum from which trainees could learn the fundamental principles of imaging physics and ABR could base their physics questions for the core examination.

Recently, a collaboration of organizations including the Society of Chairs of Academic Radiology Departments, SIIM, ACR, and RSNA has started a new online initiative aimed at providing important educational content in domains that are traditionally difficult for individual programs to provide for their trainees. Their initial focus will be on improving trainee proficiency in the vital areas of informatics, big data, and health services research. A week-long online course covering the basics of informatics has already been produced, covering essential topics such as computers and networking, PACS and archiving, information security, and the business of informatics.