



## Editorial

# Calling All Fellows and Program Directors: We Need Novel Solutions to Reinvent Interventional Fellowship

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Fellowship training in interventional cardiology represents the last step of a long and arduous educational journey that begins 15 or more years from the start of undergraduate studies. The last stages of training in many fields are often a final consolidation of knowledge or perhaps a clinical research experience wherein trainees feel that they have already surpassed the steep portions of a clinical mastery learning curve, but for a procedural subspecialty such as interventional cardiology, the single year allocated to fellowship training through the Accreditation Council for Graduate Medical Education (ACGME) can be a dense crescendo encompassing unfamiliar cognitive, clinical, and technical advanced skills.

Although diagnostic cardiac catheterization is a core element of general cardiovascular fellowship training, for most trainees, exposure to the full depth and breadth of interventional cardiology typically only occurs with dedicated training within the interventional fellowship. Similarly, although general cardiology trainees evaluate and manage patients before and after interventional procedures and rotate through the cardiac catheterization laboratory, the experiential knowledge gained from just the first months of an interventional cardiology fellowship is uniquely different, and the learning curve is steeper than virtually at any other period of training. Unlike procedural surgical specialties (such as cardiac surgery), which are enveloped within protracted surgery residency programs with redundant and familiar environmental and technical skills training, the early stages of an interventional fellowship should be likened to a “trip to the moon.”

A complete understanding of interventional cardiovascular medicine requires not only expertise in performing an ever-expanding number of procedures but also necessitates a keen awareness of the indications, expectations, complications, and benefit/risk trade-offs of each procedure. Of course, these all must be contextualized for the individual patient under evaluation. Gaining the required knowledge base alone is daunting, and combining that knowledge with “hands-on” independence and clinical experience takes several years. It is vital to recognize that proficiency as an interventional cardiologist extends well beyond the accredited single fellowship

year. Many fellows look back on the first few years after fellowship (sometimes including additional advanced interventional fellowships) as equally or more formative to their professional development than the ACGME dedicated year.

Reconciling these facts with the themes outlined in the most recent Advanced Training Statement on Interventional Cardiology from the American College of Cardiology, American Heart Association, and Society for Cardiovascular Angiography & Interventions<sup>1</sup> is a challenge. The document establishes detailed training standards designed to establish competency for interventional fellows across the 6 domains established by the ACGME ranging across the areas of coronary, peripheral vascular, and structural intervention. The exhaustive document was derived by consensus and underwent extensive refinement through solicitation of feedback from multiple stakeholders with a broad expertise. The document is well written and impressive in attention to detail and scope, but from the perspective of both a fellowship director and a trainee, it is virtually impossible not to be intimidated by the amount of material that one would need to amass and assimilate to be declared competent, let alone proficient, as an optimally trained interventionalist.

Much thought and deliberation went into the compromises that were made to establish some of the more controversial parts of the statement, such as the procedure volume thresholds. One does not envy the writing committee who had to weigh current realities (such as declining percutaneous coronary intervention volume, a pandemic, and proliferation of fellowship spots) against an evolving field. These more practical areas of the document stand in contrast to the more aspirational text, which accurately reflect the expansiveness of our field. For example, do we really feel that 25 coronary procedures that involve intravascular imaging are sufficient for a trainee to become proficient, especially in the context of the American College of Cardiology Interventional Council's endorsement of broader use of intravascular imaging as a part of contemporary practice?<sup>2</sup> Certainly not, but if a threshold of 50 procedures had been adopted, it would have rendered most current fellows (and even attendings on an annualized basis) well short of that threshold.

DOI of original article: <https://doi.org/10.1016/j.jscai.2022.100575>.

Keywords: interventional cardiology; catheterization laboratory; training.

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<https://doi.org/10.1016/j.jscai.2023.100596>

Received 25 January 2023; Accepted 25 January 2023

Available online 16 February 2023

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This is not a criticism of the writing committee. They were left with the Herculean task of tabulating and anticipating the growth sectors in our field within a single document and to suggest a route for establishing competencies, typically within the structure of a single year of training. In other words, they could not directly state the obvious: that at the majority of interventional cardiology fellowship programs, it is nearly impossible to achieve broad-based proficiency within a single year. Even at the busiest programs it is difficult, which is why many such programs have adopted or offered a de facto additional year of training for interventional fellows, similar to the field of electrophysiology. Unfortunately, at present, these additional years of training are poorly standardized,<sup>3</sup> and training metrics are scant and less well-developed than the current training standards document.

It is certainly not our desire to extend medical training any longer than necessary, which is why we deliberately cataloged at the outset of this piece the years of training currently necessary to become an interventional cardiologist. But, we would be naïve to ignore plain facts—that our field has grown immensely, and the single ACGME year originally conceived for coronary training is increasingly inadequate, especially with the growing complexity of patients with coronary artery disease<sup>4</sup> and with further expansion into the peripheral vascular and structural heart disease realms. The training standards document recognizes this conundrum, at various points suggesting the use of supplemental “skills laboratories,” “simulation training,” or “proctoring after fellowship” as adjuncts to traditional training models that depend so heavily upon a single year of direct hands-on experience. It is crucial for us as a field to trial, test, and implement these new techniques to buttress our training programs and to reinvent the ways our trainees can learn. We should also explore condensing other areas of training, as our cardiothoracic surgical colleagues have done, as a means of balancing any additional training time that is added. It is ironic that at a time when medical communities are clamoring for multidisciplinary heart teams to manage complex cardiovascular patients,<sup>4</sup> recognizing the need for integrated care dispersion, the training standards increase the burdens of a single year program in arguably the fastest growing cardiovascular subspecialty.

Nevertheless, we should be optimistic and view this as a golden opportunity to provoke meaningful training program changes in the future. By outlining in painstaking detail all that a potential trainee would need to achieve and how truly daunting that would be to accomplish in a single year, the writing committee has given us a working substrate to explore ways to make our field better. It is incumbent upon all of us to accept the challenge and charge our societies to take the next step beyond cataloging volume training standards and to concentrate next on creative implementation pathways.

#### Declaration of competing interest

Ajay J. Kirtane reports institutional funding to Columbia University and/or Cardiovascular Research Foundation from Medtronic, Boston Scientific, Abbott Vascular, Amgen, CSI, Philips, ReCor Medical, Neurotronic, Biotronik, Chiesi, Bolt Medical, Magenta Medical, Canon, SoniVie, Shockwave Medical, and Merck. In addition to research grants, institutional funding includes fees paid to Columbia University and/or Cardiovascular Research Foundation for consulting and/or speaking engagements in which Dr. Kirtane controlled the content. Personal: Consulting from IMDS; Travel Expenses/Meals from Medtronic, Boston Scientific, Abbott Vascular, CSI, Siemens, Philips, ReCor Medical, Chiesi, OpSens, Zoll, and Regeneron. Martin B. Leon has received grants from Abbott, Boston Scientific, Edwards, and Medtronic.

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