See Article page 503.

Commentary: It's time... to decide.

James I. Fann, MD

Partly because of environmental and regulatory challenges over the years, Lin and colleagues¹ posit that it is evident that the current training system is not adequate and that more effective educational methods are needed. Many contemporary challenges are not new: They were identified more than a decade ago by other educators, including those in the Joint Council on Thoracic Surgery Education, and foreseen by Ludmerer in 1999.² What is notable is that this conversation persists among another generation of surgeons, notwithstanding efforts to improve surgical education. To measure the influence of the argument presented by Lin and colleagues,¹ we must ask again whether our graduates and their senior colleagues are satisfied with the end result of residency training.

To be fair, the lack of major structural changes in surgical education is in part predicated on the belief by a segment of our educators that the existing paradigm, steeped in tradition, has been and remains good to excellent, at least at their institutions. In this case, there is no perceived need to adopt any major changes, beyond perhaps the development of an integrated residency program. On the other hand, as pointed out by Lin and colleagues¹ and by others, challenges remain: increased clinical demands on faculty, work-hour restrictions, less exposure to cardiothoracic surgery during general surgery residency, and graduated skills training for integrated residents. The question is whether there is common ground. Can we parse the education problem so answers that we generate are sufficiently compelling to effect change?

First, let's look at data overload. The quantity of information has exceeded anyone's ability to be an expert in all

James I. Fann, MD

CENTRAL MESSAGE

By clarifying the expectations of both educators and trainees, the merits of new systems can be evaluated based on their relevance.

aspects of cardiothoracic surgery. What is generally expected during residency training is the development of a robust understanding of and the ability to treat common and many not-so-common cardiac and thoracic disorders. Regarding cognitive overload in nonsurgical specialties, the adopted remedy is that there is less need for memorization because information is easily searchable. Not surprisingly, this framework is less applicable to our specialty, because it is not practical, at least with current technology, to search the Internet during an operation. Further, the integration of knowledge and surgical care does not occur after a brief foray online. Means to facilitate knowledge acquisition, such as enhanced learning content management systems and study aids generated by the Thoracic Surgery Directors Association, Thoracic Surgery Residents Association, Society of Thoracic Surgeons, the American Association for Thoracic Surgery, and the American Board of Thoracic Surgery, provide value. But the hard work remains—residents must dedicate much time to reading, memorizing, and critically evaluating the literature as has been done traditionally, supplemented and guided by dedicated faculty.

In terms of development of surgical skills and intraoperative judgment and situation awareness, the questions relate to whether the current paradigm adequately serves our trainees. If the answer is mostly yes and sometimes no, then the current model can be modified to be more flexible in accommodating those who can benefit from additional training, practice (or simulation), coaching, and online

From the Department of Cardiothoracic Surgery, Stanford University, Stanford, Calif. Disclosures: The author reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Sept 2, 2020; revisions received Sept 2, 2020; accepted for publication Sept 3, 2020; available ahead of print Sept 10, 2020.

Address for reprints: James I. Fann, MD, Department of Cardiothoracic Surgery, Stanford University, 300 Pasteur Dr, Stanford, CA 94305 (E-mail: jfann@stanford.edu).

J Thorac Cardiovasc Surg 2021;162:512-3

0022-5223/\$0.00

Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2020.09.016>

learning. Maximal benefit may be derived from faculty focusing on areas for individual remediation to optimize skills acquisition and judgment. Stated another way—and as a response to the examples offered by Lin and colleagues¹—if most residents ultimately meet their proficiency goals, then one can argue that the current system works, for the most part.

Whether our residency programs adequately train our residents also can be reframed as a case of expectation versus reality. In this case, we should really decide what we wish our trainees to look like at the end of training, recognizing a variety of ideal phenotypes, and whether their scope of abilities meet the expectations in their practice environments. The elephant in the room has been whether we expect a high level of proficiency in all aspects of cardiothoracic surgery. Given the realities of modern surgical practice, the basis for this expectation becomes tenuous. What is not controversial is that the trainees should understand key concepts in all aspects of cardiothoracic surgery, but we do not require them to be able to operate on all patients requiring cardiac and thoracic surgery. We need to rethink what we expect our thoracic-track residents to be able to do with respect to cardiac surgery, and vice versa. It is time to determine the diseases and procedures that all must learn (cognitively and technically) and how subsequent training, often termed fellowships, should be

structured. For those who wish to specialize in congenital heart surgery or heart failure management and transplantation, the requisites of these disciplines have been well-defined. Being more explicit in other specialized areas would facilitate how we counsel our trainees—to balance what they wish to do, what specific skills they will require, and how they can succeed in their future practice.

Recognizing the value of the status quo, it is worthwhile to consider thoughtful proposals that may improve our training paradigm, such as promoting structured faculty development and providing resources and support for our educators. To extend the proposals offered by Lin and colleagues,¹ let's critically review the current paths in our training programs. By clarifying the expectations of the educators and those of the trainees, the merits of new systems can be evaluated based on their relevance. It will take some time for any novel approach to wind its way through the various stakeholders (eg, Thoracic Surgery Directors Association, American Board of Thoracic Surgery, and the Accreditation Council for Graduate Medical Education). But in the meantime, we need to decide what we want.

References

1. Lin J. Evolution of the thoracic surgeon educator: incorporating education science into our DNA. *J Thorac Cardiovasc Surg*. 2021;162:503-9.
2. Ludmerer KM. *Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care*. New York, NY: Oxford University Press; 1999.