skilled and innovative surgeons in the world, suggesting that perhaps one should not attempt to fix what is not by any means broken.

See Article page 166.

Commentary: Cardiothoracic surgery training: Global challenges without universal solutions

Johannes R. Kratz, MD, and Tom C. Nguyen, MD

The goal of all medical training programs regardless of specialty is the same: to produce ethical physicians competent to practice independently in as short a timeframe as possible. How this goal is achieved varies, depending on the specific demands of the specialty in question. For cardiothoracic surgery, the road to this goal has become bumpy as of late, owing to a variety of pressures faced by both our profession and our trainees. In the United States, we are confronted with a rapidly evolving technical and clinical skillset as nonsurgical interventions increase the pressure to perform more minimally invasive techniques in patients with increasingly severe pathophysiology and disease states. At the same time, continually rising health care costs, coupled with the desire to provide just care to all, demand that we provide a higher level of service and better outcomes despite increasing economic constraints. Finally, the opportunity costs incurred by our trainees to pursue careers in cardiothoracic surgery, combined with our desire to attract the best and the brightest, demand that we provide the highest possible level of training in the shortest and most efficient timeframe possible. When considered independently, each of these pressures poses a

Reference

1. Tanemoto K, Yokoyama H, Okita Y, Ueda Y, Takamoto S, Yaku H, et al. Cardiovascular surgery training in Japan. *J Thorac Cardiovasc Surg.* 2022;163:166-75.e5.

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CENTRAL MESSAGE

In Japan, simulator training, competency-based training, multiple training sites, and close mentorship after graduation are emphasized. Such approaches may be of benefit to programs everywhere.

formidable challenge to formal cardiothoracic surgery training. Taken together, however, these pressures pose a unique challenge for us as educators because they are often at odds with one another. For example, one convenient way to ensure higher quality and lower cost outcomes is to have attendings do more of the case and make more of the decisions surrounding perioperative care. Resident training and progress may be adversely affected however, and this model is therefore at odds with our desire to make training as efficient and short as possible. Training programs are often faced with the unenviable task of balancing amongst evils in order to achieve the greatest common good.

These challenges are not unique to training programs in the United States, Tanemoto and colleagues face similar pressures in Japan.¹ The authors describe the all-too-familiar difficulties of decreasing case volume, increasing patient and case complexity, decreasing operative times due to economic constraints, and reduced training time to remain attractive to the most talented medical students.

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They have responded by placing a heavy emphasis on simulator-based training, by structuring their training and accreditation systems to be competency-based rather than time-based, and by having trainees rotate at multiple sites run by different programs to gain breadth of experience in a variety of cardiothoracic operations. Although heavier responsibility is placed on a shared apprenticeship model during training than in the United States, almost all trainees in Japan continue to be carefully mentored as junior attendings until they achieve full independence as more senior surgeons.

Increased simulator training, competency-based training, shared program responsibility among multiple sites, and close mentorship after graduation may similarly benefit trainees everywhere. As the educational and professional challenges we face as an international cardiothoracic community converge more than they diverge, the solutions we each develop are as likely to be as effective globally as they are locally.

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1. Tanemoto K, Yokoyama H, Okita Y, Ueda Y, Takamoto S, Yaju H, et al. Cardiovascular surgery training in Japan. *J Thorac Cardiovasc Surg*. 2022;163:166-75.e5.