ventricular assist devices; and more, underscores the expanding armamentarium available to modern heart teams. Further, surgeons must remain integral not only in the case selection and planning for the short term, but also for a path of interventions that encompasses the rest of a patient's lifetime. For patients with aortic stenosis, this may include TAVR, valve-in-valve TAVR, surgical aortic valve replacement with bioprosthetic or mechanical prostheses, or some combination. The value of a cardiac surgeon on a multidisciplinary valve team is not limited to the ability to cut, sew, and tie, but rather in his or her in-depth knowledge of cardiac anatomy and tissues, the feasibility of surgery in complex cases, and an understanding of how what been done in prior operations (root replacements) influences anatomy and function. Although surgical bailout is rare, this rarity is in part due to surgeons' expertise not only in the conduct of the procedure, but also in patient selection for open versus transcatheter intervention.

We certainly agree that as cardiothoracic surgery practice changes, cardiothoracic training must keep pace. The Accreditation Council for Graduate Medical Education case requirement of 5 TAVR cases as primary operator can likely be accomplished in 2 days in most programs, out of a several-year training pathway. It is time to increase this case requirement, and also to implement a benchmark for structural case planning and/or attendance in a multidisciplinary valve conference. As the field evolves, it is incumbent on us to train our future colleagues to be integral members of heart teams, not just along for the ride in the hybrid room.

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See Article page 2166.

Commentary: Twenty-first century adult cardiac surgery training: Modernization

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The growing indication for transcatheter heart valve therapies (THV) has driven patients to less-invasive procedures and fueled the need for additional training for cardiac surgeons. The Centers for Medicare and Medicaid

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CENTRAL MESSAGE

Current training in adult cardiac surgery fails to prepare trainees in structural heart and valve disease. Structured curricula for transcatheter interventions must be developed and maintained.

Services 2012 decision memo formalized use of a heart team for transcatheter aortic valve replacement and called for patient assessment by 2 cardiac surgeons.¹ During 2019, the requirement was updated to 1 cardiac surgeon

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and an interventional cardiologist. The multidisciplinary team approach is also extended to preoperative evaluation for percutaneous mitral valve interventions.²

Kilcoyne and colleagues³ address the challenge of training adult cardiac surgeons in the modern era. As educators, the days of teaching residents routine surgical aortic valve replacement are vanishing. Now, transcatheter aortic valve replacement exceeds the number of surgical aortic valve replacement procedures annually,⁴ underscoring the need for standardized transcatheter skills training and the growing need for structural heart and valve (SH&V) surgeon specialists to complement structural interventionalists. Cardiac surgery education leaders have placed the onus on the learner to obtain the necessary skills to meet Board requirements. Unfortunately, as the authors so elegantly reveal, the American Board of Thoracic Surgery minimum requirement fails to meet necessary levels of proficiency and so-called superfellowships are few in number.^{5,6} Traditional thoracic surgery training, a comprehensive curriculum encompassing adult cardiac, thoracic, and congenital surgery, may better represent a bygone era. Cardiac surgeons who specialize in adult patients are exposed to congenital heart surgery during training, but lack competency or certification to operate on pediatric patients and adult congenital subspecialization makes extensive knowledge of congenital surgeries less relevant. Expertise in transcatheter therapies is far more necessary for modern cardiac surgeons who specialize in the care of adults as the number of THV cases and devices to treat a broader range of valvular pathologies increase.^{7,8} Beyond catheter and wire skills, to truly integrate into a heart team, surgeons must master preoperative planning, imaging, device selection, and lifetime management of SH&V patients—all contemporary focuses of heart teams.⁹

The current knowledge gap can be addressed in 2 separate pathways. First, the requirements to become an SH&V surgeon specialist could be integrated into a tracked curriculum within adult cardiac surgery training, with increased emphasis on skills acquisition and case volume, such as the authors have presented. Alternatively, an SH&V superfellowship, designed in conjunction with structural interventionalist training, could achieve skillset-based credentialing, instead of specialty-specific training. However, we must proceed with caution to not disincentivize

trainees from entering the field by making advanced superfellowship training a barrier to entry.

With the growing number of devices implanted into younger, low-risk patients we are just now entering the era of the failed THV.^{10,11} An SH&V surgeon must master transcatheter procedure and responsibly counsel patients on the risks and benefits of all options in shared decision making. When THV therapies fail, an SH&V surgeon must assess candidacy for reintervention whether that is another transcatheter modality or surgery.⁹ Like the evolution of congenital heart surgery and adult congenital, we must be preparing for a future of a subspecialty of failed THVs where the surgeon takes the lead.

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