training program should be based not only on the heritage of past great surgical educators, but also on training the new generation of surgeons (-scientists)-teachers. New locomotives are needed for the moving train.

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Check for updates

Commentary: Resident education in congenital heart surgery: Is this the best we can do?

James Jaggars, MD, and Emily A. Downs, MD

"Now this is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."
—Winston Churchill

The responsibilities of a surgical educator are many: responsibility to their patients, learners, colleagues, and community. This study by Cleveland and colleagues¹ reports their 10-year experience in educating congenital cardiac surgical residents in which surgical mortality was no different between resident or attending primary surgeon. They go on to report that all their residents met their case requirements and have confirmed that 8 of 9 residents who pursued congenital cardiac surgery careers are board certified and actively practicing. This represents an excellent achievement, and we all recognize these authors as master educators and outstanding surgeons with a high-quality program. The study validates our own educational history, bolsters our ideals of traditional surgical education, but likely reinforces our own cognitive biases.

Is the strategy described in this report the best we can do? One year of graduated surgical experience culminating in

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James Jaggars, MD, and Emily A. Downs, MD

CENTRAL MESSAGE

Congenital cardiac surgery training is a lifelong endeavor. Fellowship is the end of the beginning. More years of training may not result in better education or better surgeons.

"adequate" total cases, with an average of 5.4 complex procedures over the year of training. Is this enough to instill the confidence for the resident to practice independently? Of course not, nor has it ever been. Completion of residency is just the beginning.

Despite the authors' success highlighted in this current report, they, like others, are changing to a 2-year program. Do we really believe that the extra year will translate into readiness for independent practice? I have doubts. Significant improvements in our training program may require implementing new innovations in education. Work smarter, not harder (or longer). Simulation for example, has been shown to be effective in preparing the learner in specific technical skills necessary to accomplish complex repairs in a timely manner,² an effective strategy to triage skill-building early in fellowship. Surgical simulation with 3-dimensional printed models of complex defects allows the resident to become familiar with the cogent anatomy and rehearse the operation before live surgery.³ It offers the potential of individualization, allowing progression or

remediation as needed. Another useful adjunct, coaching, provides a means to extract additional meaning and learning from a surgical case, using specific feedback mechanisms like video assessments to help a resident improve beyond the value of serving as primary surgeon.^{4,5}

Historically, we have been suspicious of anything other than traditional, attending-supervised surgical education, but we need to be better. As educators, we are responsible for preparing our resident for eventual independent practice. But residency is only “end of the beginning.” Adding additional years of residency to an already-grueling 7 to 10 years is unlikely to improve readiness. The most critical time is the first 3 to 5 years after residency, when most young surgeons accumulate experience in complex repairs as primary surgeon, hopefully in a mentored environment. We need to explore strategies that allow our residents to start their careers but still be supported and mentored. We have an opportunity in the next few years to modernize

our resident education, expand the toolbox, and incorporate innovative methods to help the resident get the most out of their training.

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Commentary: Getting along?

Richard D. Mainwaring, MD

I would like to congratulate Cleveland and colleagues¹ for their excellent article on the subject of resident training and education in congenital heart surgery. This is a timely subject given the ever-increasing tension between providing residents with experience and education while under intense scrutiny on clinical outcomes and the pressure for public reporting. The authors describe the approach that they have developed for their ACGME congenital cardiac surgery training program. The analysis spanned 10 years and summarized data for 3406 surgical

Richard D. Mainwaring, MD

CENTRAL MESSAGE

Residents can be trained for a career in congenital heart surgery, but can you find them a job?

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cases. The headline conclusion was that cases performed by the resident as “surgeon” did just as well as the cases performed by the attending surgeons. I have a few points of commentary.

The first is that we are currently graduating approximately 10 residents per year from the ACGME-accredited congenital training programs. However, a work force study