Innovation in cardiothoracic surgical training

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Training of cardiothoracic surgeons is evolving from its origins in an apprenticeship-type model. Education organizations in different countries have introduced learning objectives to help structure the expectations of training, and recently simulation-based curricula have enabled the teaching and practicing of surgical skills outside the operating room. Simulation has provided residents with opportunities to develop skills while mitigating concerns about patient safety and operating room efficiency. However, the experience provided in any given program likely varies significantly across the many CT programs worldwide and we have minimal comparative data on curriculum design, methodology for delivery, consistency, and efficacy of training.

To standardize training, a collaborative of departments of cardiothoracic surgery in the United Kingdom have worked together to establish an impressive curriculum for cardiothoracic surgical training, published in this issue of the *Journal* by Moorjani and colleagues.¹ Adhering to best educational practices, the needs of residents were assessed and a comprehensive program across 6 years of training was established, evaluated, and modified. This program has some clear strengths, which should be a model for other regional or national programs. Many programs are challenged in providing learning opportunities that are specific to each year or level of training, because there are usually not enough residents in any program at each level to make tailored training practical. The UK program, however, brings residents from across the country to sessions at a single site that address learning objectives that are appropriate for each year or level of training. The curriculum has been well planned and provides the trainee with factual knowledge and a variety of skills, which are taught with various simulation and education modalities appropriate to the level of training. All residents across the country are exposed to the same curriculum, thereby establishing consistency across programs. The program also provides protected time away from the rigors of clinical work. This seems to enable more focused learning, as evidenced by the increased confidence and competence reported by trainees. In addition, the program includes a review for Board certification examinations.

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Central Message

A comprehensive CT surgical training program developed in the UK results in greater resident confidence and improved examination results. It provides a model for improvements in CT surgical training.

See Article page 2009.

Trainee assessment strategies seem limited to self-evaluation of confidence and competence, although examination pass rates are used as a surrogate marker for course efficacy. It is unclear how knowledge acquisition is measured during the courses and reported back to the trainee. The program could be strengthened by more structured skills assessment. There are some objective scoring scales that could be adopted to provide trainees with objective feedback during simulation activities. These scales could also be used in trainees' individual programs for more prospective feedback from their surgical supervisors to help bridge the assessment of their progress from the courses back into the clinical setting.

Funding of the program seems to be a significant issue, with the courses and travel being costly. A single company provided financial support and their training facilities, which may not be acceptable in some parts of the world and raises issues about conflict of interest for resident training. Although independent funding would be ideal, it might be challenging for individual departments to underwrite this program. Should this be something that national specialty organizations help to fund, or could registration fees help to cover costs? An alternative might be to pool educational funding from a number of industries, which could also support the provision of equipment and supplies from a variety of companies, thereby reducing the reliance on a single source and minimizing the potential sense of obligation or allegiance to any single company. There are

increasing numbers of certified simulation centers associated with hospitals and universities that could potentially be used for all or parts of the program and decrease the reliance on an industry facility.

The program presented in this article by Moorjani and colleagues¹ provides an example of a collaborative approach to improve residency training that seems to be associated with improved outcomes in board examinations.

As a community of cardiothoracic surgical educators, this should help motivate us to continue to improve the learning experience of our trainees.

Reference

1. Moorjani N, Lewis ME, Shah RD, Barnard S, Graham TR, Rathinam S. Implementation of a novel portfolio of structured, curriculum-aligned, simulation-based, cardiothoracic surgery training courses: evolving the delivery of surgical education. *J Thorac Cardiovasc Surg.* 2017;154:2009-16.