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Christopher R. Burke, MD (left), and Nahush A. Mokadam, MD (right).

Central Message

Simulation-based training has proved a beneficial adjunct to traditional operative experience. Immersive simulation-based curricula should play an essential role in cardiothoracic training.

See Article page 1151.

The training model for surgical residents has changed relatively little in the past century from the Halsted model, a time-based apprenticeship model with graduated responsibility pioneered in the early 20th century. Changing societal norms, however, with increased emphasis on patient safety, surgical outcomes, and efficiency within the operating room, have challenged this notion of progressive responsibility. Adjuncts to traditional cardiothoracic surgical training have therefore been developed and refined, and these include experiential learning. Simulation-based training has been shown by Feins and colleagues¹ to improve resident performance on both component tasks and complete cardiac surgical procedures. This curriculum focuses heavily on component task analysis and a deliberate practice model, 2 essential elements of skills acquisition that are also a notable limitation in exclusive apprenticeship-type learning.

In this issue of the *Journal*, Nesbitt and colleagues² present a comprehensive, month-long cardiac surgical simulation training program for new surgical trainees. They present details of an immersive experience with a curriculum based on the Cardiac Surgery Simulation Curriculum developed by the Agency for Healthcare Research and Quality Study.¹ An essential component of this month-long program was the nearly complete removal of new residents from clinical duties, with an emphasis on both didactic and simulation-based skills acquisition. The faculty unanimously agreed to conceive a system of decreased resident clinical coverage during this month-long program, which was considered justified because of the perceived benefits of the curriculum. The goals of this program were to prepare new thoracic surgical residents better for the daunting challenge of cardiac surgery and to increase familiarity before beginning their training on “real-life patients.” This program has been extremely well received by both residents and faculty. Nesbitt and colleagues² are to be commended for this ambitious endeavor to improve resident preparedness and educational experience.

On January 15, 2009, US Airways captain Chesley “Sully” Sullenberger successfully executed an emergency landing on the Hudson River after both of his engines lost power shortly after takeoff. All his passengers survived this emergency landing, and he received expansive accolades for his calm demeanor and thoughtfulness during the harrowing ordeal. It is notable that Captain Sully had received extensive simulation training on similar disaster scenarios, however, which likely played a crucial role in his ability to safely execute an emergency landing. Given the prominent role simulation has played in airline pilot training, why do we as a field continue to believe that simply performing graduated responsibilities within the operating room on real patients is the only (and best) way to train residents? There is little question that “real-life” operative experience is the foundation of surgical skills acquisition (and will continue to be so in the future), but given the changes within health care, and specifically with resident education, adjuncts to the traditional apprenticeship model are desperately needed. Similar cardiac surgical “boot camp” experiences, designed to increase preparedness of new trainees, have previously shown utility in skill acquisition and resident confidence both in the United States and in Europe.³⁻⁵ Simulation training has also been shown to reinforce positive teaching behaviors in surgical faculty, and these programs therefore may provide an important role in faculty development.⁶ Opponents of an immersive experience such as that described by Nesbitt and colleagues² will bemoan the “lost clinical time” both in the

operating room and on the wards. Certain programs may further cite staffing issues with the loss of junior residents for a prolonged period. With the availability of allied health professionals at most centers and an increase in the number of I-6 training programs (with availability of a host of trainees), however, it seems likely that a majority of programs should aim to overcome these staffing issues.

It is our responsibility to ensure that new cardiothoracic surgical trainees are appropriately equipped to start work in a cardiac surgical operating room, both for the benefit of the trainees' education and, more importantly, for patient outcomes. Simulation training has repeatedly shown benefit as an educational adjunct in cardiothoracic surgery. We could all benefit from critically evaluating the program presented by Nesbitt and colleagues² and incorporating similar curricula into other training programs.

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