Simulation: Are we there yet?

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Richard Lee, MD, MBA (left), and Dawn S. Hui, MD (right).

Central Message

The process of development and implementation of simulation in cardiothoracic surgical training is challenging.

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According to the most recent International Society for Minimally Invasive Cardiothoracic Surgery recommendations, endoscopic vein harvest rather than open vein harvest (OVH), is the standard of care (class I, level A).¹ At many centers, endoscopic vein harvest is performed by surgical assistants rather than residents. Studies have focused on the learning curve for and comparative patency of endoscopic vein harvest,^{2,3} but the resulting consequence of diminishing OVH experience and skills has perhaps fallen by the wayside. In contemporary practice, the need for OVH usually arises in the setting of emergency revascularization, such as coronary compromise complicating valvular or aortic root surgery. Thus, OVH can be seen as an infrequently used but critically important skill, and it therefore may be an ideal candidate skill for simulation.

A vision for simulation in cardiothoracic surgical training was laid out a decade ago by the Visioning Simulation Committee.⁴ In the Committee's 2008 report, Carpenter and colleagues⁴ proposed the possibility that simulation could "identify an aptitude, or lack thereof, for cardiothoracic surgery" and "identify the best candidates for subsequent training."

Further, simulation is an element of the Thoracic Surgery Directors Association core curriculum, with skill-specific modules outlined by the manual created by the Cardiac Surgery Simulation Consortium. Still, the proper tools, role, and implementation remain at various stages of development, many in nascency. In this edition of the *Journal*, the study by Duffy and colleagues⁵ highlights the many challenges of evaluating and incorporating simulation. Questions about any simulation model include the following: What is its role, how efficacious is the model, and is it cost-efficient?

As suggested previously, the primary roles of simulation are skill development and competency assessment. On the basis of the consistency of performance scores with previous experience, Duffy and colleagues⁵ find that their model may have value as an assessment tool. They also report that the data support the viability of the model, according to self-

reported measures of confidence and proficiency and qualitative feedback on model fidelity and utility. The validity of their findings, however, may be limited by the cohort. First, this was a convenience sample of only 14 subjects. Second, the high, low, and standard performance ranges were derived from the cohort under study, raising substantial concerns about the generalizability of the data. The assumption that previous experience is the standard with which performance should correlate is perhaps a fallacy, especially in such a limited sample. Further, there is scant evidence to support the validity of efficacy and proficiency that is self-assessed, particularly in highly technical fields such as cardiothoracic surgery. Duffy and colleagues⁵ do well to be cautious in defining any role for the model in skills development. Not only would this require more objective assessments, such as number and frequency of repetitions needed for competency achievement, it also raises the question of cost-efficiency, at \$150 for a single-use model.

The ideal simulation model would be useful as a skills development tool that translates to superior patient care; an assessment tool with high performance discrimination; portable; cost-efficient, and easily replicable. Whether a single model can achieve all these domains, and to what various degrees, will be important questions to answer before implementation. We commend Duffy and colleagues⁵ for taking the first steps on a very long road.

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