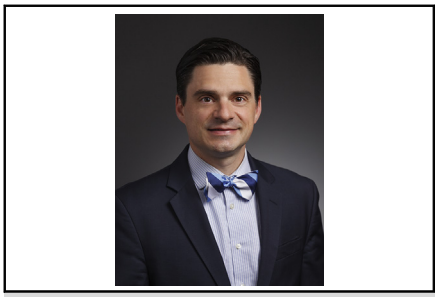
See Article page 524.

Commentary: Halsted meets Zoom

David L. Joyce, MD, MBA



David L. Joyce, MD, MBA

CENTRAL MESSAGE

Videoconferencing technology has created new opportunities and new challenges for thoracic surgery education.

No sooner had the words "shelter in place" been introduced to the world's vocabulary than the surge in demand for videoconferencing platforms became almost obscene. This instantaneous change in business practices transformed the world into a virtual metaverse, with disruptions across every industry. In some cases, innovative leaders had already become early adopters of the technology, as was the case at Tenwek Hospital in Bomet, Kenya, where residents were already attending weekly virtual lectures by American surgeons via the Society of Thoracic Surgeons online curriculum. The present work of Kenichiro and colleagues[1] represents the next iteration of innovation in online education, introducing new challenges and opportunities in the realm of simulation.

As with swinging a golf club or practicing scales on the piano, the benefits of repetitive, deliberate practice in the craft of performing coronary anastomoses have been well validated.[2-4] It is therefore not surprising that statistically significant improvement in the technical appearance of the anastomoses occurred between the first and last assessments of the exercise. While Zoom fatigue was not specifically addressed in this study, the high participant satisfaction scores suggest that these strategies hold promise as a sustainable approach for augmenting the existing simulation experiences that are currently employed across most residency programs.

Perhaps one of the most important implications for the future of simulation as a tool in the education of a cardiac surgeon has to do with some data not explicitly mentioned in the discussion but that can be easily appreciated when watching the video. Positioning the YOUCAN (EBM Corporation, Tokyo, Japan) anastomotic simulator within the Anastothon A-1 Kit (EBM Corporation) as the authors have done creates the opportunity for standardization of image capture. This provides the ideal conditions for the use of deep learning as a more accurate and objective assessment of resident performance. TensorFlow (https://www.tensorflow.org/) has come a long way from identifying cats in a You Tube video and has already been implemented in surgical education.[5] It seems to be a small step forward to build a library of videos that can produce new metrics for the assessment of technical precision.

The adoption of videoconferencing technology across educational platforms is not without its own limitations. It is not clear if the skills developed in a virtual teaching environment will translate easily into success in the operating rooms of the real world. It is possible that many members of the teaching faculty will struggle with the adjustment to this new way of learning. Forgetting to unmute one's microphone before berating a resident for poor performance seems to be just the tip of the iceberg when it comes to the pitfalls of integrating Zoom into the in-person system of graded enhanced responsibility that has dominated our profession for the past 117 years.[6] Nevertheless, this early experience suggests great promise for the future of simulation in cardiac surgery and creates the foundation for significant improvements in formative feedback.

From the Division of Cardiothoracic Surgery, Department of Surgery, Medical College of Wisconsin, Milwaukee, Wis.

Disclosures: The author reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Aug 23, 2021; revisions received Aug 23, 2021; accepted for publication Sept 10, 2021; available ahead of print Sept 28, 2021.

Address for reprints: David L. Joyce, MD, MBA, 8701 Watertown Plank Rd, Milwaukee, WI 53226 (E-mail: djoyce@mcw.edu).

JTCVS Open 2021;8:534-5

2666-2736

https://doi.org/10.1016/j.xjon.2021.09.010

References

1. Takahashi K, Numaguchi R, Kuroda Y, Nemoto H, Yoshino K, Noda M, et al. Remote simulator training of coronary artery bypass grafting during the coronavirus disease 2019 pandemic. *J Thorac Cardiovasc Surg Open*. 2021;8:524-33.

2. Lee R, Enter D, Lou X, Feins RH, Hicks GL, Gasparri M, et al. The joint council on thoracic surgery education coronary artery assessment tool has high interrater reliability. *Ann Thorac Surg*. 2013;95:2064-9; discussion 69-70.
3. Fann JI, Calhoon JH, Carpenter AJ, Merrill WH, Brown JW, Poston RS, et al. Simulation in coronary artery anastomosis early in cardiothoracic surgical residency training: the Boot Camp experience. *J Thorac Cardiovasc Surg*. 2010; 139:1275-81.
4. Fann JI, Caffarelli AD, Georgette G, Howard SK, Gaba DM, Youngblood P, et al. Improvement in coronary anastomosis with cardiac surgery simulation. *J Thorac Cardiovasc Surg*. 2008;136:1486-91.
5. Baloul MS, Yeh VJ, Mukhtar F, Ramachandran D, Traynor MD Jr, Shaikh N, et al. Video commentary & machine learning: tell me what you see, I tell you who you are. *J Surg Educ*. October 16, 2020 [Epub ahead of print].
6. Grillo HC. To impart this art: the development of graduate surgical education in the United States. *Surgery.* 1999;125:1-14.