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REPLY: PRACTICE MAKES PERMANENT

Reply to the Editor:



In this letter, Olive and colleagues¹ provide an update on how the coronavirus disease 2019 (COVID-19) pandemic has influenced trainee operative experience, recruitment of applicants to integrated cardiothoracic surgery (CTS) residency programs, and interview opportunities in the recent cycle. Two groups of learners are discussed: residents and applicants/prospective students. Amidst the ever-changing landscape of health care since March 2020, our field continues to value learner experience while creating new ways to engage prospective applicants. Resourceful development and adaptability have historically allowed our specialty to make ground-breaking strides in surgical technique. In the present, they move the specialty forward by creating new ways for operative practice and program presentation that have the potential to influence trainees' experience long-term.

In resident training, practice is an essential element for operative growth and mastery of case components. Olive and colleagues emphasize the commitment of CTS trainees to overcome decreased operative volume by creating at-home simulations for key elements of cardiac operations. This innovative approach addresses diminished operative time during significant windows of training. However, it is important to consider the translation between simulation and the operating room. Key elements of successful simulation are deliberate practice and the presence of coaches with specified goals and curricula.² This has been shown to be effective in coronary anastomotic skills of early trainees.³ The design of low-cost simulators has expanded to include practice in aortic, venous, and bicaval cannulation.⁴ For at-home simulation practice, it will be important to track deliberate use and to design specific curricula for individual training programs. In addition, the growing backlog of CTS cases has started and will continue to provide residents with 2-fold operative opportunity in the coming months.⁵ As residents strive to reach operative milestones, old and

new techniques in simulation have the potential to provide meaningful augmentation of missed operative experience. However, the extrapolation of simulation efficacy from basic to more advanced skills is somewhat lacking in evidence.

For applicants, access to away-rotations and in-person interviews continues to change with guidelines from the Association of American Medical Colleges in 2021. Students this cycle can participate in only one away rotation per specialty. Given that applicants will select one specific location, it begs the question if their chosen locations will correlate with increased levels of interest in the selected program more significantly than in previous years. To augment these experiences, social media is referenced as an important tool for increasing program visibility and access to information about the culture of each institution and its individuals. Despite the challenges of 2020, 97.8% of spots for thoracic surgery were filled in the 2021 National Resident Matching Program Match.⁶ Whether hybrid interviews or virtual sessions are maintained moving forward, the influence of the pandemic for improving online visibility and CTS in media will be important to engage young, upcoming applicants moving forward.

One additional group to consider in the setting of COVID-19 is the rising first- to third-year medical students who have lost opportunities to attend CTS operations or meetings due to the pandemic. This engagement is essential for applicant pools over the next few seasons. For those who have expressed interest in CTS but have been unable to participate in the usual experiences, simulation with direct supervision by fellows and residents may have the potential to increase interest in hope of securing future pools of applicants with adequate exposure to the field.⁷

The options for operative practice and recruitment are broad and will continue to evolve. CTS programs, residents, and applicants have relied on flexibility and innovation to adapt. Our field has persistently pioneered new paths in medicine, and programs and residents continue to embody this attitude in responding to the COVID-19 pandemic.

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References

1. Olive JK, Luc JGY, Preventza O. The status of cardiothoracic surgery trainee education and recruitment: an update one year into the COVID-19 pandemic. *J Thorac Cardiovasc Surg Open*. 2021;8:538-9.
2. Feins RH, Burkhart HM, Conte JV, Coore DN, Fann JJ, Hicks GL, et al. Simulation-based training in cardiac surgery. *Ann Thorac Surg*. 2016;103:312-21.

3. Enter DH, Lou X, Hui DS, Andrei AC, Barner HB, Sheen L, et al. Practice improves performance on a coronary anastomosis simulator, attending surgeon supervision does not. *J Thorac Cardiovasc Surg.* 2015;149:12-6. 17.e1-2.
4. Kelly JJ, Han JJ, Patrick WL, Mays JC, Iyengar A, Helmers MR, et al. Do-it-yourself simulators and building a culture of practice in the virtual era. *J Thorac Cardiovasc Surg Tech.* 2021;8:100-11.
5. Salenger R, Etchill EW, Ad N, Matthew T, Alejo D, Whitman G, et al. The surge after the surge: cardiac surgery post-COVID-19. *Ann Thorac Surg.* 2020;110:2020-5.
6. National Resident Matching Program. *Results and Data: 2021 Main Residency Match.* Washington, DC: National Resident Matching Program; 2021.
7. Lou X, Enter D, Sheen L, Adams K, Reed CE, McCarthy PM, et al. Sustained supervised practice on a coronary anastomosis simulator increases medical student interest in surgery, unsupervised practice does not. *Ann Thorac Surg.* 2013;95:2057-63.

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