

ultimate goal. The equivalent of completing case numbers in a calculus class is not considered sufficient to pass calculus. But more importantly, this is not calculus class; the stakes are vastly higher.

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Commentary: Are cardiothoracic trainees operating enough?

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The goal of cardiothoracic surgery training programs is to produce surgeons who enter the workforce with appropriate medical decision-making and operative proficiency. Previous literature has shown that increased case volumes lead to an increased confidence level among graduating trainees.¹ Although there are many factors that create a great surgeon, operative volume will always be a key factor. As such, trends of overall case volume among trainees are important to understand.

Improvements in medical therapies and endovascular approaches have led to a greater proportion of coronary and valvular disease being treated without traditional surgical approaches.^{2,3} Despite this increase, the manuscript by Shah and colleagues⁴ showed that cardiothoracic surgery residents have performed more cases over the last 4 years. There was a more significant increase in the number of general thoracic cases performed than cardiac cases. This trend is likely the result of an increase in minimally invasive thoracic surgery performed over time.⁵ The shift toward more minimally invasive surgery has prevented nonsurgical



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CENTRAL MESSAGE

Training the proficient resident remains the primary goal of cardiothoracic training programs. Understanding changes in case volumes is vital to prepare each trainee adequately.

options like cryoablation from becoming more prevalent. There has not been as rapid a rise in minimally invasive surgical options for cardiac surgery.

Despite using a relatively short time period in their study, Shah and colleagues showed that case volumes are increasing for cardiothoracic trainees. Training this generation of cardiothoracic residents has been affected by duty hours, greater scrutiny of outcomes by hospital administration, and increased use of nonsurgical options for cardiac disease.^{6,7} Nevertheless, it appears that the case volume for each trainee has not decreased. Cardiothoracic surgery will continue to evolve, and with it so will the training being provided. Not only do trainees have to know how to do more types of surgeries, but they will also face more complex surgeries in patients who do not respond to nonsurgical

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management. It is reassuring to see that case volumes will probably continue to increase, but training programs will have to adapt to train residents appropriately. Use of simulation labs and comprehensive didactic sessions will be paramount to yield proficient surgeons.

Recently, more attention is being given to milestone-based operative education as a marker of surgical competency.⁸ Trainees learn different skills at varying speeds and comfort levels. While case logs do not accurately depict proficiency, they are a useful metric. As integrated cardiothoracic residencies become more commonplace, we will be training younger, less-developed residents. There will be a wider range of preparation and readiness among trainees. Programs will have to devote more time to maturation processes that previously had occurred during a general surgery residency. Case volume will be just one component in creating a competent cardiothoracic surgeon going forward.

The field of cardiothoracic surgery is changing. With these changes, programs will need to evolve how they train residents. Shah and colleagues have shown that case volume for each trainee is increasing. However, case volume will

need to be complemented by many other elements to train proficient surgeons for the future.

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Check for updates

Commentary: The kids are alright

Gurion S. Lantz, MD, and Frederick A. Tibayan, MD

The growth of percutaneous coronary and valvular interventions, as well as improvements in medical management, are associated with decreases in the number of bread-and-butter cardiac surgeries, such as coronary artery bypass grafting (CABG) and surgical aortic valve replacement (SAVR).¹



Gurion S. Lantz, MD (left), and Frederick A. Tibayan, MD (right)

CENTRAL MESSAGE

Despite the changing clinical landscape and decreasing numbers of cardiac surgery cases nationwide, the average resident cardiac surgical volume increased from 2016 to 2019.

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