

EDITORIAL

Trusting the "Process" to Revitalize a Cardiac Surgery Program

Harold L. Lazar , MD

To “get ahead” in the modern healthcare industry, hospitals have become “lean and efficient,” trimming their labor force, including nurses and physicians, reducing in-hospital beds, cutting back on equipment and supplies, and shifting resources to more lucrative outpatient procedures, such as knee replacements. The coronavirus disease 2019 pandemic exposed these weaknesses, which resulted in decreased intensive care unit (ICU) beds, protective equipment, ventilators, supplies, and, most important, vital hospital personnel, such as physicians, nurses, and respiratory technicians required to meet the needs of critically ill patients in the ICU. Unfortunately, these unmet needs contributed to the increased morbidity and mortality in patients with coronavirus disease 2019.

See Article by Brown et al.

These same strategies were used by hospital administrators to deal with low-volume cardiac surgery programs. As the volume of cardiac surgery decreased over the past decade, hospital administrators began shifting resources away from in-house, complex, open cardiac procedures, to percutaneous catheter-based procedures, which could be performed as an outpatient or as same-day surgery. This may work for outpatient procedures, such as arthroscopic surgery for knee disorders and hernia repairs in low-risk patients, but not for open heart cardiac surgical procedures performed on high-risk patients. A common comment among hospital administrators was “we are only going

to pay for what we need”; but who determines “what we need,” a hospital administrator knowledgeable in finance or a cardiac surgeon with expertise in patient care? This gap between administration and cardiac surgeons contributed to increased morbidity and mortality in low-volume cardiac surgery programs.¹ It was hypothesized that better outcomes at higher-volume centers were explained by the presence of an organized infrastructure, a critical mass of highly specialized physicians, surgeons, allied healthcare providers, and ancillary personnel that would allow for more comprehensive care. This critical mass was thought to be more difficult to assemble at smaller centers. However, other studies, such as the California Coronary Artery Bypass Graft (CABG) Outcomes Reporting Program, found that volume is not as important as the “process of care” in determining outcomes following CABG procedures, and that systemic factors might be more important in determining outcomes rather than individual surgeon volume and experience.² These data suggested that optimization of the structure of a healthcare system can improve quality and outcomes, which can ultimately decrease medical costs.

In this issue of the *Journal of the American Heart Association (JAHA)*, Brown et al demonstrate how using the donabedian principles of structure, process, and outcomes was used to “revitalize” a failed cardiac surgery program in an underserved minority population.³ This involved establishing working relationships and cooperation between hospital administrators, physicians, nurses, and allied healthcare workers, developing and optimizing patient care protocols, and continuously monitoring patient outcomes. This

Key Words: Editorials ■ cardiac surgery ■ coronary artery bypass graft surgery

Correspondence to: Harold L. Lazar, MD, Boston University School of Medicine, 80 E Concord St, Boston, MA 02118. E-mail: harold.l.lazar@gmail.com

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

For Disclosures, see page 2.

© 2020 The Author. Published on behalf of the American Heart Association, Inc., by Wiley. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

JAHA is available at: www.ahajournals.org/journal/jaha

program had previously performed <20 procedures per year, with a high mortality in a region of heavily uninsured minority patients with multiple comorbidities and limited access to health care. Morbidity and mortality were increased, and there was a lack of equipment and a deficient number of trained personnel needed for a successful cardiac surgery program. Lines of communication between the administration and physicians were poor, and the program lacked structure and identity. A totally revitalized program, the University of Maryland Capital Region Health (UMCRH) Cardiac Surgery Program, was created and a partnership with the University of Maryland Medical Center was formed. Preoperative, intraoperative, and postoperative protocols were instituted, including Society of Thoracic Surgeons (STS) guidelines for glycemic control in cardiac surgery⁴ and the American Association for Thoracic Surgery guidelines for the prevention and treatment of sternal wound infections.⁵ The program hired additional nurse practitioners, physician assistants, perfusionists, and anesthesiologists, all with extensive experience in cardiac surgery. In-house training in the care of cardiac surgical patients was provided for all nursing personnel. Essential equipment was purchased and updated for the operating room and the ICU. Overall, these expenditures to hire new staff, provide training, and purchase new equipment totaled 3.2 million dollars. A database was created to continuously monitor patient outcomes in conjunction with the national STS database for Adult Cardiac Surgery that was also used for in-house quality improvement and to identify ongoing deficiencies.⁶ Operative techniques were standardized, and ICU care was optimized by a designated ICU cardiac intensivist assisted by cardiac surgeons and physician assistants. Most important, a cardiac surgery trained physician assistant provided overnight coverage, working in conjunction with the cardiac surgeon on call to provide continuity of care throughout the postoperative period. As a result of these interventions, the observed 30-day mortality for isolated CABG surgery was 0.3%, significantly lower than the national STS mortality, despite the fact that UMCRH patients had a higher incidence of smoking, chronic obstructive pulmonary disease, and diabetes mellitus. In addition, UMCRH patients, when compared with the STS database, had a significantly lower incidence of major complications, strokes, postoperative renal failure, deep sternal wound infections, and prolonged ventilatory support, and significantly shorter length of hospital stay. Aggressive lowering of hospital stay can lead to increased readmission rates, but this was not the case at UMCRH. The readmission rate following CABG was only 4.0% versus 10.1% in the STS database ($P<0.0001$). Limiting readmissions following CABG surgery is now a quality

metric to evaluate cardiac surgery programs and has become a measure of CABG performance. A study from New York state found that CABG readmissions resulted in a 4-fold increase in 30-day mortality compared with patients who were not readmitted.⁷ These outstanding outcomes resulted in the UMCRH program receiving a 3 star rating from the STS, the highest quality tier.

Hospital administrators in low-volume programs have often accused their cardiac surgeons as being prone to “risk aversion” for not taking on more high-risk cases, to account for the program’s low case volume: “If we only had the right surgeon, our volume could be higher.” A good surgeon knows HOW to operate, but a BETTER surgeon knows WHEN to operate. The HEART TEAM approach, in which cardiac surgeons and cardiologists can discuss operative risks to determine whether to proceed with open surgery versus a percutaneous approach, has significantly decreased morbidity and mortality in cardiac surgery. The affiliation between UMCRH and the University of Maryland Medical Center allowed patients needing more advanced levels of care for high-risk procedures to be transferred to a tertiary care center for extracorporeal membrane oxygenation and ventricular assist device support, instead of undergoing a more high-risk, open procedure that would result in increased morbidity and mortality. UMCRH also instituted a campaign to promote the cardiac surgery program, including an outreach program, meeting with primary care physicians and referring cardiologists, advertising on TV, radio, and the internet, and hosting cardiac surgery seminars at UMCRH.

Brown et al are to be congratulated on their achievements in revitalizing the cardiac surgery program at UMCRH. They have demonstrated that having low volumes of CABG surgery does not preclude the ability to obtain excellent outcomes by implementing continuous quality improvement processes. More important, they have provided us with a successful plan for improving outcomes in cardiac surgery by integrating the support and cooperation between hospital administrators, surgeons, and allied healthcare workers. The UMCRH experience should serve as a role model for improving quality in both existing and newly established cardiac surgery programs that seek to optimize patient outcomes, while maintaining and even decreasing medial costs.

ARTICLE INFORMATION

Affiliations

Boston University School of Medicine, Boston, MA.

Disclosures

None.

REFERENCES

1. Shahian DM, O'Brien SM, Normand S-LT, Peterson ED, Edwards FH. Association of hospital coronary artery bypass volume with processes of care, mortality, morbidity, and the Society of Thoracic Surgeons composite quality score. *J Thorac Cardiovasc Surg.* 2010;139:273–282.
2. Carey JS, Parker JP, Brandeau C, Li Z. The "occasional open heart surgeon" revisited. *J Thorac Cardiovasc Surg.* 2008;135:1254–1260.
3. Brown JM, Hajjar-Nejad MJ, Dominique G, Gillespie M, Siddiqi I, Romine H, Odonkor P, Dawood M, Gammie JS. A failed cardiac surgery program in an underserved minority population county reimaged: the power of partnership. *J Am Heart Assoc.* 2020;9:e018230. DOI: 10.1161/JAHA.120.018230.
4. Lazar HL, McDonnell M, Chipkin SRR, Furnary AP, Engelman RM, Sadhu AR, Bridges CR, Haan CK, Svedjeholm R, Taegtmeyer H, et al. The Society of Thoracic Surgeons practice guidelines series: blood glucose management during adult cardiac surgery. *Ann Thorac Surg.* 2009;87:663–669.
5. Lazar HL, van der Salm TV, Engelman RM, Orgill D, Gorden S. Prevention and management of sternal wound infections. *J Thorac Cardiovasc Surg.* 2016;152:962–972.
6. Bowdish ME, D'Agostino RS, Thourani VH, Desai N, Shahian DM, Fernandez FG, Badwar V. The Society of Thoracic Surgeons adult cardiac surgery database: 2020 update in outcomes and research. *Ann Thorac Surg.* 2020;109:1646–1655.
7. Hannan EL, Zhong Y, Lahey SJ, Culliford AT, Gold JP, Smith CR, Higgins RS, Jordan D, Wechsler A. 30 Day readmissions after coronary artery bypass graft surgery in New York state. *JACC Cardiovasc Interv.* 2011;4:569–576.