

oversight may divert vital resources and expertise away from these immediate clinical needs.

Although participation in QI adds another competing demand to the CT surgery resident's busy schedule, it is obvious that the burgeoning field of surgical QI delivers value beyond the scope of operating room instruction and M&M conferences, with groups such as Moffatt-Bruce and colleagues leading the way.⁵ As the future of CT surgery faces an increasing demand for services and a shortage of surgeons, we must address errors from a birds-eye view to foster a greater culture of safety and accountability.

See Article page 1255.



Commentary: The power of qi: Teaching future surgeons about quality improvement and generating momentum for a culture of change

Jules Lin, MD

In this issue of the *Journal*, Moffatt-Bruce and colleagues¹ discuss the importance of training cardiothoracic surgery residents on quality improvement. Participation in patient safety activities is now a required component of residency training,² and aspects of quality improvement and patient safety are reflected in more than 40% of milestones from 26 residency programs across all specialties.³ Including residents in quality improvement initiatives is essential, since they are responsible for the delivery and documentation of



In Chinese tradition, qi (or ch'i) is the vital force underlying all life. (https://commons.wikimedia.org/wiki/File:Ki_obsolete.svg)

CENTRAL MESSAGE

As health systems shift to value-based care, teaching our residents to incorporate quality improvement into practice is essential if we are to adapt and generate momentum for a culture of change.

References

1. Moffatt-Bruce SD, Lee M, Kneuert P. Quality improvement in cardiothoracic surgery residency: training in the culture of change. *J Thorac Cardiovasc Surg.* 2020; 160:1255-60.
2. Barmparas G, Imai TA, Gewertz BL. The millennials are here and they expect more from their surgical educators! *Ann Surg.* 2019;270:962-3.
3. Bohnen JD, Chang DC, Lillemoe KD. Reconceiving the morbidity and mortality conference in an era of big data: an "unexpected" outcomes approach. *Ann Surg.* 2016;263:857-9.
4. Common Program Requirements; . Available at: <https://www.acgme.org/What-We-Do/Accreditation/Common-Program-Requirements>. Accessed March 16, 2020.
5. Milojevic M, Bond C, Theurer PF, Jones RN, Dabir R, Likosky DS, et al. The role of regional collaboratives in quality improvement: time to organize, and how? *Semin Thorac Cardiovasc Surg.* 2020;32:8-13.

From the Section of Thoracic Surgery, Department of Surgery, University of Michigan Medical Center, Ann Arbor, Mich.

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 April 21, 2020; accepted for publication April 21, 2020; available ahead of print May 4, 2020.

Address for reprints: Jules Lin, MD, Section of Thoracic Surgery, 1500 E. Medical Center Dr, 2120TC/5344, Ann Arbor, MI 48109-5344 (E-mail: juleslin@umich.edu).

J Thorac Cardiovasc Surg 2020;160:1262-3
0022-5223/\$36.00

Copyright © 2020 by The American Association for Thoracic Surgery
<https://doi.org/10.1016/j.jtcvs.2020.04.092>

frontline care in most academic centers. Engaging residents in quality improvement resulted in improved documentation and a reduction in patient length of stay.⁴ A quality improvement project using an algorithm outlining indications for testing was also able to change medical resident test ordering behavior and prevented unnecessary downstream testing leading to a decrease in costs.⁵

Moffatt-Bruce and colleagues argue that cardiothoracic residents are uniquely positioned, due to the complexity of cardiothoracic surgery with a dependence on

multidisciplinary teams, to participate as collaborators in system-based quality improvement initiatives. The advent of 6-year integrated programs may also help to increase awareness of these quality improvement issues, with residents spending a larger proportion of their residency on cardiothoracic services. However, there are also challenges with multiple competing requirements, including learning complicated technical skills, clinical care, and research with limited time within the 80-hour work week. The increasing use of advanced practice providers could also have adverse effects by reducing the hours of direct patient contact and decreasing continuity of care. In addition, a survey of resident attitudes toward quality improvement found challenges in understanding basic aspects, whether their contributions were valued, and challenges in prioritizing their responsibilities.⁶

Incorporating quality improvement into residency training is important in teaching future surgeons the value of a learning health care system. Charles and colleagues⁷ found that engaging trainees in the root cause analysis process had a dual benefit of educating residents about patient safety while producing meaningful improvements in patient care. A structured curriculum incorporating quality improvement projects for neurosurgery residents resulted in sustained process changes, and the majority of residents felt formal training improved their confidence in quality improvement and was a valuable tool for their future careers.⁸ Mentorship is also vital, and Wong and colleagues⁹ found that co-learning with faculty and residents learning together was effective in improving faculty knowledge and their ability to teach quality improvement skills. Another example given by Moffat-Bruce and colleagues was the Inaugural Resident and Fellow Quality Improvement Symposium, an event attended by patients and their families. The authors encourage taking advantage

of “low hanging fruit,” high-yield projects that lead to practical changes without requiring great effort.

Engaging trainees as key stakeholders not only increases accountability, but like qi, the vital life force that underlies all life in Chinese tradition, teaching future surgeons about QI (quality improvement) will generate momentum for life-long continuous quality improvement, creating a culture of change.

References

1. Moffatt-Bruce SD, Lee M, Kneuert P. Quality improvement in cardiothoracic surgery residency: training in the culture of change. *J Thorac Cardiovasc Surg.* 2020; 160:1255-60.
2. Accreditation Council for Graduate Medical Education. ACGME. ACGME Program Requirements for Graduate Medical Education in General Surgery. Available at: https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/440_general_surgery_2017-07-01.pdf. Accessed April 19, 2020.
3. Lane-Fall MB, Davis JJ, Clapp JT, Myers JS, Riesenber LA. What every graduating resident needs to know about quality improvement and patient safety: a content analysis of 26 sets of ACGME Milestones. *Acad Med.* 2018; 93:904-10.
4. Johnson CE, Peralta J, Lawrence L, Issai A, Weaver FA, Ham SW. Focused resident education and engagement in quality improvement enhances documentation, shortens hospital length of stay, and creates a culture of continuous improvement. *J Surg Educ.* 2019;76:771-8.
5. Gupta SS, Voleti R, Nyemba V, Demir S, Lamikanra O, Musemwa N, et al. Results of a quality improvement project aimed at eliminating healthcare waste by changing medical resident test ordering behavior. *J Clin Med Res.* 2017;9: 965-9.
6. Butler JM, Anderson KA, Supiano MA, Weir CR. “It feels like a lot of extra work”: resident attitudes about quality improvement and implications for an effective learning health care system. *Acad Med.* 2017;92:984-90.
7. Charles R, Hood B, DeRosier JM, Gosbee JW, Bagian JP, Li Y, et al. Root cause analysis and actions for the prevention of medical errors: quality improvement and resident education. *Orthopedics.* 2017;40:e628-35.
8. Clarke MJ, Steffens FL, Mallory GW, Starr SR, Porter BL, Krauss WE, et al. Incorporating quality improvement into resident education: structured curriculum, evaluation, and quality improvement projects. *World Neurosurg.* 2019;126: e1112-20.
9. Wong BM, Goldman J, Goguen JM, Base C, Rotteau L, Van Melle E, et al. Faculty-resident “co-learning”: a longitudinal exploration of an innovative model for faculty development in quality improvement. *Acad Med.* 2017; 92:1151-9.