collaborative research with health care and technology companies. Cardiothoracic surgeons should take notice of the rapid development of noninvasive devices and their potential to change practice patterns. We urge our readers to have a basic understanding of data science and to be ready to adopt new technology into our patient care.

References

1. Kurlansky P. The rocky exhilarating journey from data to wisdom. *J Thorac Cardiovasc Surg.* 2021;162:1166-9.
2. Zhou N, Corsini EM, Jin S, Barbosa GR, Kell T, Antonoff MH, et al. Advanced data analytics for clinical research part I: what are the tools? *Innovations.* 2020; 15:114-9.
3. Zhou N, Corsini EM, Jin S, Barbosa GR, Kell T, Antonoff MH, et al. Advanced data analytics for clinical research part II: application to cardiothoracic surgery. *Innovations (Phila).* 2020;15:155-62.
4. Soffer S, Ben-Cohen A, Shimon O, Amitai MM, Greenspan H, Klang E. Convolutional neural networks for radiologic images: a radiologist's guide. *Radiology.* 2019;290:590-606.
5. Perez MV, Mahaffey KW, Hedlin H, Rumsfeld JS, Garcia A, Ferris T, et al. Large-scale assessment of a smartwatch to identify atrial fibrillation. *N Engl J Med.* 2019; 381:1909-17.

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Commentary: A statistical revolution: Channeling frustration to integration

Austin Cech, BS, and Nahush A. Mokadam, MD

Banks were initially created for individuals to receive loans, make deposits to keep their monies safe, and create savings accounts that earn interest. As societies developed and modernized, the system developed multifaceted functions of financing, bankruptcies, investments, credit cards, currency exchanges, and so on. Now, imagine this complex banking system if someone had to connect 2 separate structures to see all of his or her debt in 1 place and all of his or her financial assets in another. What if, to see your information, it would take an application and require 6 to 12 months of review, after which you may be informed that a request error was found and you have to start the process over again. Painful right?

Austin Cech, BS, and Nahush A. Mokadam, MD

CENTRAL MESSAGE

Administrative and clinical databases serve a crucial function in cardiothoracic surgery, but it would be best practice to evolve and integrate the 2 to provide seamless access to correct data.

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Kurlansky¹ summarized the growing pains and differences between administrative and clinical data sources. Both are crucial to understanding patient care within cardiothoracic surgery, serve as foundational pieces in quality improvement, and are accessed by different stakeholders in patient care. When organizations rely on these data sources separately, it creates significant burdens to combine the 2, causing limitations in available data and the speed at which it can be obtained. In part, the motivation for the American Association for Thoracic Surgery Quality Assessment Program was immediacy of data.^{2,3} Integration is emerging but controlled by big data warehouses that

present new problems.⁴ Clinical registries are labor-intensive, costly, and burdensome to maintain, yet include critical information.^{5,6} Administrative data provide quality benchmarking and metrics for readmissions, not to mention being easily accessible, uniform, and transferrable across systems.^{1,7}

We have reached a time when having 2 separate systems of data is no longer sustainable, and we need to create a new and useful integration system that will raise our current standards. What data are we overlooking by not having the 2 systems talk to each other? How much more data could we collect postoperatively to monitor long-term outcomes? Cardiothoracic surgery patients and providers deserve to have timely and accurate data accessible to them to decrease morbidity and mortality rates and increase the quality of care and life thereafter. As a system that thrives on efficiencies, how have we not been able to merge the multiple data sources to decrease duplicity? We need to find a way for the 2 systems to work together and be user-friendly, low cost, and technologically reorganized;

this will increase accessibility and, more importantly, improve patient care.

References

1. Kurlansky PM. The rocky exhilarating journey from data to wisdom. *J Thorac Cardiovasc Surg.* 2021;162:1166-9.
2. Blackstone E. A comprehensive AATS quality program for the twenty-first century. Read at the 99th Annual Meeting of The American Association for Thoracic Surgery, Toronto, Ontario, Canada, May 4-7, 2019.
3. American Association for Thoracic Surgery quality gateway. Available at: https://www.aats.org/aatsimis/AATSWeb/QAP/QAP_Program_Overview.aspx. Accessed June 29, 2020.
4. Krumholz HM. Big data and new knowledge in medicine: the thinking, training, and tools needed for a learning health system. *Health Aff.* 2014;33:1163-70.
5. D'Agostino RS, Jacobs JP, Badhwar V, Fernandez FG, Paone G, Wormuth DW, et al. The Society of Thoracic Surgeons adult cardiac surgery database: 2019 update on outcomes and quality. *Ann Thorac Surg.* 2019;107:24-32.
6. Jacobs JP, Shahian DM, He X, O'Brien SM, Badhwar V, Cleveland JC Jr, et al. Penetration, completeness, and representativeness of the Society of Thoracic Surgeons adult cardiac surgery database. *Ann Thorac Surg.* 2016;101:33-41.
7. Wadhera RK, Joynt Maddox KE, Wasfy JH, Haneuse S, Shen C, Yeh RW. Association of the hospital readmissions reduction program with mortality among Medicare beneficiaries hospitalized for heart failure, acute myocardial infarction, and pneumonia. *JAMA.* 2018;320:2542.