The glass is half full

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The French physician Nostradamus became famous by writing *The Prophecies*, which publicized his visions gained from meditation. His works are often cited and believed by those who read them. Subject to interpretation, his quatrains remain a source of entertainment, vision, and fear for many.¹ In this issue of *The Journal of Thoracic and Cardiovascular Surgery*, Moffatt-Bruce and colleagues² offer a provocative and dire vision for our specialty compared with predictions before it, which emphasized the decline of cardiothoracic surgery. This article depicts a harrowing picture of physician overload and burnout as a result of the aging population and an inadequately prepared workforce. From a number of well-regarded projections, Moffatt-Bruce and colleagues² predict an average case-load increase of 120% per surgeon by 2035. Other groups have made similar projections. Etzioni and colleagues³ anticipate that the demand for valvular and coronary procedures will increase about 50% in the next 10 to 15 years.

During the past 2 decades, we have witnessed a technological revolution in cardiothoracic surgery. Within the adult cardiac space, transcatheter valves and repair techniques, miniaturized ventricular support devices, endovascular aortic surgery, and hybrid cardiac surgery have all contributed to a rejuvenated frontier. Complex interventions may now be safely completed in patients with higher risk profiles, often without a sternotomy or cardiopulmonary bypass. Landmark surgical clinical trials, along with their medical counterparts, continually populate the headlines of *The New England Journal of Medicine*, *JAMA*, and *The Lancet*. Coronary revascularization, which at one time had the bleakest of futures, has reclaimed credibility with total arterial revascularization. In general thoracic surgery, we have seen new invigoration in lung cancer screening.⁴ We have also seen advances in tumor biology facilitating personalized medicine and advances in chemoradiation allowing previously unresectable tumors to reenter the surgical realm. Similarly, in congenital heart surgery, catheter-based technologies are providing alternate treatment strategies, powerful imaging tools and 3-dimensional printing are increasingly being used for surgical planning,

Nahush A. Mokadam, MD (left), and Kevin J. Koomalsingh, MD (right)

Central Message

Workforce predictions may be dire, but our specialty is well equipped to evolve with the changing landscape in cardiothoracic surgical services in the future.

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and the field of regenerative medicine is vying for bioengineered replacement tissue.⁵

To be complete, some of these disruptive technologies may also reduce the clinical need for surgical specialists. As transcatheter valves continue to decrease their profiles, the need for surgical partnership may decrease, or even disappear. The novel uses of immunotherapy may create a vacuum in resective therapy for thoracic malignancies. New percutaneous techniques may offer children with congenital heart disease alternatives to the traditional approaches. The projected increase in surgical volume may not, in fact, come to fruition.

We have already witnessed the value of a multidisciplinary approach to cancer care and solid-organ transplantation. The extension to cardiac care and the implementation of a heart team is the burgeoning criterion standard. With the integration of care among various specialists, patients will receive individualized therapy in a best-practice environment. Some may view the evolving clinical landscape with trepidation. We are more optimistic. Cardiothoracic surgeons are reentering a golden era with contemporary tools, a broadening skill set, and a multidisciplinary approach to complex patient care. New recruits will be magnetized to the field. *Carpe diem*. It is our opportunity and our responsibility to accept the challenge.

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