



## Preface

# Cardiothoracic Surgery: Present and Future



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*Editor*

Interventional treatments to manage diseases of the chest have existed since the time of Hippocrates. An understanding of the role of tracheal intubation and thoracotomy for the treatment of empyema thoracis dates back to antiquity.<sup>1</sup> Francisco Romero performed the first pericardial window in 1801 to relieve a symptomatic pericardial effusion.<sup>2</sup> Following John Gibbon's repair of an atrial septal defect using cardiopulmonary bypass in 1953, the world entered a new era of cardiac surgery.<sup>3</sup> The pace of innovations in the discipline of cardiothoracic surgery rivals that seen in any field of medicine.

Furthermore, diseases of the chest present a significant burden to US and global health. Based on data from the American Cancer Society, over 250,000 cases of lung cancer were diagnosed in 2021 in the United States. Lung cancer remains the leading cause of cancer death irrespective of gender.<sup>4</sup> Heart disease remains the leading cause of death across gender, racial, and ethnic groups, accounting for 1 in every 4 deaths in the United States.<sup>5</sup> Significant disparities exist among certain groups, which are discussed in the following articles.

Along with significant innovations in the field of cardiothoracic surgery, there has been a paradigm shift in the surgical training pathway. Accreditation Council for Graduate Medical Education general surgery training no longer requires experience in cardiac surgery. The minimum requirement in thoracic surgical caseload for a

general surgical resident is 20 cases, 5 of which must be performed via thoracotomy. Over the past 10 years, there has been a 30% decrease in the number of traditional cardiothoracic residency programs with a shift to integrated (I-6) programs.<sup>6</sup> In total, over 97% of training slots are filled, which is a significant increase from 68% in 2008.<sup>6</sup> These I-6 programs have shifted the decision to pursue cardiothoracic surgery to earlier in medical training.

Simultaneously, as the pace of innovation increases, the management of cardiothoracic disease has become increasingly complex and multidisciplinary. Discussions on the management of coronary artery disease, valvular heart disease, and thoracic oncology now frequently fall to the Heart Team or Tumor Board. Surgeons in-training now choose from either the cardiothoracic or general thoracic training pathways. Although initial certification is accomplished via a common examination, subsequent maintenance of certification allows for differentiation based on a predominantly cardiac or thoracic practice. As the respective fields continue to advance at unprecedented rates, further divergence into two distinct fields may eventually be required.

As with the changing nature of cardiothoracic surgical training, the tools of the trade are ever evolving. The skills of open and thoracoscopic surgery are now further complemented by endovascular, endobronchial, and robotic technologies and techniques. Full-spectrum cardiac and thoracic surgical care now requires this understanding and a partnership with our colleagues in cardiology, pulmonology, and interventional radiology. As medicine continues to develop a deeper understanding of the biology of cancer, surgeons must now keep pace with the ever-changing role of chemotherapy, radiation therapy, and immunotherapy. As leaders on multidisciplinary teams, surgeons must be aware of the full spectrum of treatment options available for the care of our patients.

The future of cardiothoracic surgery has never been brighter. The following articles covers a broad spectrum of the disease processes encountered by cardiothoracic surgeons. Although not all-encompassing, the authors present an expert perspective on the burden of disease, management, and advanced interventional techniques. Both benign and malignant diseases of the thorax affect patients throughout the health care system, and a familiarity with their treatment is important for all surgical disciplines. In this unprecedented time of health care upheaval from the COVID-19 pandemic, I would like to commend the authors on their resiliency and perseverance.

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