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<p>Lung cancer remains the leading cause of cancer mortality in the United States and Worldwide. Incidence and mortality have been on the decline in the United States, while worldwide cases continue to increase. Risk factor modification and screening are critical to improving survival in patients with lung cancer. Identifying at-risk populations for access to care and screening programs will improve overall outcomes. Understanding environmental and carcinogenic sources are integral to public health policy and education. Innovations in population health and translational research will be essential in the future to improve lung cancer survival.</p>	
<b>Extended Resections for Lung Cancer</b>	<b>345</b>
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<p>This article briefly reviews the literature supporting the practice of extended pulmonary resection followed by a comprehensive description of the indications, workup, and technique commonly used for patients requiring extended pulmonary resections for advance lung cancers. The article also provides up-to-date advances in the field that have aided in the safe and effective practice of extended pulmonary resections.</p>	
<b>Evaluation and Interventional Management of Cardiac Dysrhythmias</b>	<b>365</b>
Steven J. Hoff	
<p>This article focuses on the guideline-directed evaluation and management of cardiac dysrhythmias, particularly as they are important to the practice of a noncardiac surgeon. The focus is on atrial fibrillation (AF) as the most common arrhythmia encountered by surgeons. The authors discuss the importance of AF as a risk factor for perioperative morbidity and mortality. They pay particular attention to topics such as postoperative AF and options for its acute treatment and perioperative anticoagulation management. They discuss nonpharmacologic left atrial appendage management and nonpharmacologic AF management, including catheter-based therapy, surgical-based therapy, and hybrid therapies.</p>	

**Endobronchial Therapies for Diagnosis, Staging, and Treatment of Lung Cancer** 393

Sameer K. Avasara and Otis B. Rickman

Lung cancer is the leading cause of cancer-related death worldwide and within the United States. Although evidence-based screening has been shown to reduce cancer-related mortality, the late-stage presentation remains common. Bronchoscopy has been proven to be an essential tool in the diagnosis and management of lung cancer. Basic and advanced diagnostic bronchoscopic techniques offer a minimally invasive modality for diagnosing and staging patients with lung cancer. In patients with malignant endotracheobronchial disease, therapeutic bronchoscopy (flexible or rigid) is a safe procedure that palliates symptoms such as dyspnea and hemoptysis. In this article, we review the various endobronchial tools and strategies essential for the management of lung cancer.

**Surgical Management of Pneumothorax and Pleural Space Disease** 413

Andrew P. Dhanasopon, Justin D. Blasberg, and Vincent J. Mase Jr.

Pleural space diseases constitute a wide range of benign and malignant conditions, including pneumothorax, pleural effusion and empyema, chylothorax, pleural-based tumors, and mesothelioma. The focus of this article is the surgical management of the 2 most common pleural disorders seen in modern thoracic surgery practice: spontaneous pneumothorax and empyema.

**Interventional Therapies for Acute Pulmonary Embolism** 429

Asishana A. Osho and David M. Dudzinski

Pulmonary embolism (PE) is the third leading cause of cardiovascular mortality in the United States. Unfortunately, significant gaps exist in outcome data around many interventional therapies, a fact that is reflected in the low strength of management recommendations found in consensus major society guidelines. In addition to careful risk stratification, therapeutic anticoagulation generally should be an early part of PE management in all cases. For patients presenting with acute high-risk PE or intermediate-risk PE with higher risk features, consideration should be given to systemic thrombolysis after careful evaluation for potential bleeding complications. In patients with contraindications to systemic thrombolysis, failure of this therapy, or significant ongoing cardiopulmonary distress, consideration should be given to interventional therapies like catheter-directed lysis, catheter-directed embolectomy, surgical embolectomy, and mechanical circulatory support. Until more robust comparative outcome data are put forward, pulmonary embolism response teams (PERT) should be considered for multi-disciplinary patient evaluation and management.

**Management of Coronary Artery Disease** 449

Eric Francis Sulava and Jeffery Chad Johnson

This article reviews the surgical management of coronary artery disease (CAD). The authors cover the background, presentation, diagnosis, heart team evaluation, and development of treatment strategies tailored to individual patients with significant CAD. Special attention is given to conduit selection and configuration as well as alternative revascularization approaches that differ from traditional coronary artery bypass grafting.

- Evaluation and Treatment of Massive Hemoptysis** 465
- Beau Prey, Andrew Francis, James Williams, and Bahirathan Krishnadasan
- Massive hemoptysis is appropriately defined as life-threatening hemoptysis that causes airway obstruction, respiratory failure, and/or hypotension. Patients with this condition die from asphyxiation, not hemorrhagic shock. Any patient who presents with life-threatening hemoptysis requires immediate treatment to secure the airway and stabilize hemodynamics. Early activation and coordinated response from a multidisciplinary team is critical. Once the airway is secure and appropriate resuscitation is initiated, priorities are to localize the source of the bleeding and gain hemorrhage control. Nonsurgical control of hemorrhage is superior to surgery in the acute situation.
- Minimally Invasive and Sublobar Resections for Lung Cancer** 483
- Caroline M. Godfrey, Hannah N. Marmor, Eric S. Lambright, and Eric L. Grogan
- Current guidelines for non-small cell lung cancer (NSCLC) recommend segmentectomy over lobectomy for patients with poor pulmonary reserve or for peripheral nodules less than or equal to 2 cm with adenocarcinoma in situ histology, greater than 50% ground-glass opacity on computed tomography, or radiologic doubling time greater than or equal to 400 days. However, emerging data suggest oncologic equivalence of segmentectomy to lobectomy for less than or equal to 2 cm, peripheral stage IA NSCLC regardless of histologic type or radiographic findings.
- Chemo and Immuno-Therapeutic Options for Non-small Cell Lung Cancer Lung Cancer** 493
- Rafael Santana-Davila
- Over the last decade, the use of immune checkpoint inhibitors (ICI) has dramatically changed the treatment paradigm and outcome of patients with non-small cell lung cancer (NSCLC) across all stages of the disease. In this review, we provide a concise history of the use of ICIs in the treatment of NSCLC and review discuss the data behind the different indications.
- Epidemiology of Coronary Artery Disease** 499
- John P. Duggan, Alex S. Peters, Gregory D. Trachiotis, and Jared L. Antevil
- Although the mortality of coronary artery disease (CAD) has declined over recent decades, CAD remains the leading cause of death in the United States (US) and presents a significant economic burden. Epidemiologic studies have identified numerous risk factors for CAD. Some risk factors—including smoking, hypertension, dyslipidemia, and physical inactivity—are decreasing within the US population while others, including advanced age, diabetes, and obesity are increasing. The most significant historic advances in CAD therapy were the development of coronary artery bypass grafting (CABG), percutaneous coronary intervention (PCI), and lipid-lowering medications. Contemporary management of CAD includes primary and secondary prevention via medical management and revascularization when appropriate based on best available evidence. Despite the increasing prevalence of CAD nationwide, there has been a steady decline

in the number of CABGs and PCIs performed in the US for the past decade. Patients with CABG are becoming older and with more comorbid conditions, although mortality associated with CABG has remained steady.

### **Epidemiology of Valvular Heart Disease**

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Alex S. Peters, John P. Duggan, Gregory D. Trachiotis, and Jared L. Antevil

Acquired diseases of the aortic and mitral valves are the most common cause of morbidity and mortality among Valvular heart diseases. Aortic stenosis (AS) is increasing in incidence in the United States (4,43 US), driven largely by an aging demographic. Aortic valve replacement is the only effective treatment of AS and has a dramatic mortality benefit. Mitral valve regurgitation (MR) is the most common form of valvular heart disease (VHD) in the US, whereby MR is most often the result of mitral valve prolapse; rheumatic heart disease (RHD) is a more common etiology of MR in underdeveloped countries. interventions for MR in the US are increasing.