Cryoablation of Cardiac Arrhythmias
Audrius Bredikis, MD, and David Wilber, MD, eds

The principles of cryobiology were originally established with investigations on the treatment of frostbite and pain management, cellular and tissue preservation, and destruction of malignant tumors. However, since its initial use in successful intraoperative ablation of accessory pathways by John Gallagher and colleagues in 1977 at Duke University, cryoenergy has also emerged as a highly effective and minimally invasive alternative to surgical and heat-based therapies for successful treatment of cardiac arrhythmias. Cryoablation now plays a critical role in surgical ablation such that in many variants of the surgical Maze procedure, the incisions of the cut-and-sew technique have been replaced almost entirely by cryothermal lesion sets. During the last decade, with the advent of more precise catheter design and capabilities, cryoablation has been increasingly used in most electrophysiology laboratories worldwide, and more recently it has gained widespread recognition and prevalence for ablation of atrial fibrillation. Cryothermal energy may also offer certain advantages over other energy modalities, including reduced endothelial disruption, tissue fibrosis, and endocardial perforation; decreased propensity for thrombosis and transmural necrosis; diminished risk of atrioesophageal fistulization; and reduced likelihood of vascular stenosis (eg, pulmonary vein, superior vena cava).

Cryoablation of Cardiac Arrhythmias is an editorial collaboration between Drs Bredikis and Wilber and is a complete and up-to-date overview of this specialized topic. This book, more than 240 pages long and with more than 60 contributors, is a well-written and well-organized text that is divided into 4 main sections and 20 elaborate chapters, beautifully illustrated with numerous colorful images and figures. Starting with a comprehensive historical perspective of cryoablation in both cardiac surgery and electrophysiology, section I is dedicated to the fundamental aspects of cryoablation. In this section, the mechanism and specific characteristics of cryothermy and ablation are closely examined, compared, and contrasted with other energy modalities such as radiofrequency and ultrasound. Chapter 2 is an excellent resource for understanding the fundamentals of cryoablation at both the tissue and cellular level. This section also highlights the clinical experience with cryoablation of pulmonary veins in the experimental setting, as well as its thermal effects on the esophagus and coronary vascular system. Section II provides a detailed overview of different cryotechnologies and the available tools and products related to them. It also introduces certain evolving concepts, such as near-critical cooling and its utility in establishing a new generation of powerful cryotechnologies. Section III delves into the clinical applications of cryoenergy in cardiac electrophysiology. This section also provides a superb and comprehensive review of the reported and published experience with cryoablation of the atrioventricular node and various cardiac arrhythmias, such as atrioventricular nodal reentrant tachycardia, accessory pathways, atrial flutter, atrial fibrillation, and finally, ventricular tachycardia. It also addresses the role for focal and balloon-based cryoablation, as well as certain specific topics such as epicardial and superior vena cava ablation. Last but not least, this section examines the role for cryoablation in pediatric patients and provides a succinct analysis of the clinical data surrounding the use of cryoablation in this specific patient population. The final and final section of this book describes the role, tools, and current applications of cryoablation in cardiac surgery for treatment of atrial fibrillation and ventricular tachycardia.

Most chapters in this book provide a thorough but practical compendium of the available knowledge and published data pertaining to cryoablation. As with any multiauthor book, there is some degree of repetition, which is to a great extent unavoidable. Aside from some subtle commercial overtones detected in chapter 7, which is primarily dedicated to the description of a specific cryotechnology, the remaining chapters and material depicted in this book are presented scientifically and in a fair and unbiased manner. Conclusions are drawn and discussions are rendered objectively with a well-balanced approach by various authors, supported largely by scientific facts and reported data, generally allowing the reader to form his or her own conclusions on given topics.

In summary, this book portrays a complete but practical overview of cryoablation as it pertains to cardiac electrophysiology. It provides the basis for its role, mechanism, and various methodologies in ablating a variety of cardiac arrhythmias. Each chapter is well organized and presented with a high level of thoroughness and detail, yet with a simplicity of explanation that can be appreciated by clinicians with both advanced and rudimentary knowledge of the subject. Overall, we consider this book to be an excellent and quintessential resource on this subject matter, and we would highly recommend it to anyone engaged in the practice of cardiac electrophysiology. Furthermore, we would like to commend the authors for producing this relevant and valuable review on cryoablation of cardiac arrhythmias.

Disclosures
None.

Arash Aryana, MD
Regional Cardiology Associates and Mercy Heart & Vascular Institute
Sacramento, CA

André d’Avila, MD, PhD
Helmsley Cardiac Arrhythmia Service
Mount Sinai School of Medicine
New York, NY

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