

Clinical Handbook of Cardiac Electrophysiology

Benedict M. Glover
Pedro Brugada
Editors



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*BMG: Pro auxilio sempiterno eorum, toti
familiae meae, maxime, uxori, Nualae et
filiae, Luciae et filio, Hugo, maximas gratias
ago. Cum amore, Benedictus*

Foreword

Clinical Handbook of Cardiac Electrophysiology, written and edited by Benedict M. Glover and Pedro Brugada, is a unique book. As the authors acknowledge in the preface, many excellent textbooks have been published on this topic. However, Glover and Brugada make the point that few provide a practical synopsis to bridge the chasm separating basic physiology, anatomy, and pharmacology from its practical application. That is the admirable goal of this book: to serve as the conduit between the basic scientist and beginner, for cardiology fellows, residents, and support personnel. The first three chapters lay a foundation for the rest of the book, including cardiac anatomy and basic electrophysiology (Chap. 1); the electrophysiology study, maneuvers, and ablation (Chap. 2); and electroanatomic mapping (Chap. 3). This book then embarks on a journey discussing the major cardiac arrhythmias including AV nodal reentrant tachycardia (Chap. 4), accessory pathway conduction (Chap. 5), atrial tachycardia (Chap. 6), atrial flutter (Chap. 7), atrial fibrillation (Chap. 8), ventricular tachycardia (Chap. 9), and antiarrhythmic drugs (Chap. 10).

I found this book to be authoritative and to the point with its main strength being the presentation at a level easily comprehended by the early learner. The many figures are very well done in that regard, very helpful and easily comprehended. This book will serve as an excellent stepping-stone for those who wish to delve further into electrophysiology mysteries, or as a final resting place for those contents with a basic understanding. Either way, *Clinical Handbook of Cardiac Electrophysiology* is an important contribution for learners.

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Preface

Cardiac arrhythmia management has evolved as one of the most rapidly expanding fields within medicine. The development of catheter ablation has transformed the treatment of many arrhythmias, providing highly effective treatment options for the majority of tachyarrhythmias. There is also considerable research and development of more effective antiarrhythmic and anticoagulant drugs. Despite these huge technical advances, it is important to understand the basic principles of arrhythmia mechanisms in order to help make a diagnosis and choose an effective treatment strategy.

Although there are many excellent and detailed reference texts in this field, there are few handbooks which provide a practical overview bridging the gap between basic physiology, anatomy, pharmacology and interventional catheter ablations with precise details which should help in the intricate management of the patient.

This book covers all the important aspects of cardiac electrophysiology, presented in an easy-to-use format. For each arrhythmia, the aetiology, classification, clinical presentation, mechanism, electrophysiology set up (including precise set up and ablation parameters) and trouble-shooting are presented and demonstrated using illustrations, fluoroscopy images, ECGs and endocavity electrograms.

The overall aim of this book is to provide a logical and practical approach to cardiac arrhythmia management. We hope that this provides a useful resource and, importantly, helps to promote this wonderful sub-specialty.

This book is aimed at cardiac electrophysiologists, fellows, cardiologists, physicians, family practitioners, cardiology trainees, students, allied professionals and nurses. Given its succinct summary of electrophysiology, this should be available as a reference guide in the electrophysiology laboratory. We hope that this reaches a truly international audience and provides an important guide for those studying for heart rhythm exams.

Kingston, ON, Canada
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Chapter 1

Cardiac Anatomy and Electrophysiology

Benedict M. Glover, Orla Buckley, Siew Yen Ho, Damian Sanchez-Quintana, and Pedro Brugada

Abstract Cardiac electrophysiology has rapidly moved from the mapping and ablation of accessory atrioventricular connections and ectopic foci to more extensive mapping and substrate modification. Training in cardiac electrophysiology requires a detailed knowledge of the anatomy and physiology of the heart. In order to understand the basis of cardiac electrophysiology it is important to discuss the different phases of the cardiac action potential, variability in morphology and duration throughout the heart and the most important ion channels and electrolyte shifts responsible for depolarization and repolarization of the cardiac cells. Electrophysiology continues to rely heavily on an understanding of these basic principles as well as the relevant anatomy of all cardiac chambers and surrounding structures. It is therefore fundamental to have a thorough understanding of cardiac anatomy as visualized on fluoroscopy, echocardiography, CT, MRI and 3 dimensional cardiac mapping systems.

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