

Cardiac Electrophysiology From Cell To Bedside

Provides an in-depth study of the theoretical and engineering principles behind the methods and technologies used to solve problems in experimental and clinical cardiac electrophysiology. Each chapter gives an extensive description of the principles underlying a simple method or technology and illustrates how it can be applied to solve problems in

This book provides undergraduate and postgraduate students with an accessible and comprehensive overview of the fascinating area of cardiac electrophysiology. Using plain language and well-designed illustrations, it attempts to overcome the preconceptions of the subject as difficult to approach, given the complexity of intricate electrical cellular processes within the human heart. Based on lectures presented to intercalating BSc medical students, this book has been designed with the undergraduate in mind, but offers enough scope to be worthwhile at the postgraduate level. Readers of this book will feel more confident and at ease with electrical concepts and the important physiological mechanisms that govern the initiation and regulation of the heartbeat. This volume intends to bridge that difficult region between basic undergraduate lecture notes and original papers in an approachable way. It will be useful to students studying medicine, physiology, pharmacology, pharmacy and biology, particularly where their curricula includes not only cardiac physiology, but also neurobiology and muscle physiology.

Rapid advancements in cardiac electrophysiology require today's health care scientists and practitioners to stay up to date with new information both at the bench and at the

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bedside. The fully revised 7th Edition of Cardiac Electrophysiology: From Cell to Bedside, by Drs. Douglas Zipes, Jose Jalife, and William Stevenson, provides the comprehensive, multidisciplinary coverage you need, including the underlying basic science and the latest clinical advances in the field. An attractive full-color design features color photos, tables, flow charts, ECGs, and more. All chapters have been significantly revised and updated by global leaders in the field, including 19 new chapters covering both basic and clinical topics. New topics include advances in basic science as well as recent clinical technology, such as leadless pacemakers; catheter ablation as a new class I recommendation for atrial fibrillation after failed medical therapy; current cardiac drugs and techniques; and a new video library covering topics that range from basic mapping (for the researcher) to clinical use (implantations). Each chapter is packed with the latest information necessary for optimal basic research as well as patient care, and additional figures, tables, and videos are readily available online. New editor William G. Stevenson, highly regarded in the EP community, brings a fresh perspective to this award-winning text. Expert Consult eBook version included with purchase. This enhanced eBook experience allows you to search all of the text, figures, images, videos (including video updates), glossary, and references from the book on a variety of devices.

Offering a clear and consistent framework for recognition, diagnosis, and treatment of a wide range of cardiac arrhythmia disturbances, Clinical Cardiac Electrophysiology: A Practical Guide covers the fundamental analytical skills needed in this challenging area. This portable, highly accessible handbook focuses on the basics of clinical electrophysiology- how and when to perform an electrophysiology study as well as principles of ablation and

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other invasive therapies—all in a succinct and modern format. Focuses on using an effective, consistent, decision-making process in recognizing, diagnosing, and treating rhythm disturbances of the heart, including supraventricular tachycardias, atrial fibrillation, ventricular tachycardias, and other rapid or irregular heartbeats. Covers anatomic fundamentals of cardiac structures, clinical indications for electrophysiology studies, practicalities and methodology of performing an electrophysiology study, and problems encountered during the procedure. Includes quick clinical summaries and more than 180 illustrations: electrophysiology recordings, ECGs, cardiac anatomy, radiographic images, and electroanatomic maps. Discusses key topics such as mechanisms of arrhythmias, conventional and electroanatomic mapping systems, fundamentals of cardiac mapping, biophysics of catheter ablation, and much more. Offers real-world guidance on contemporary practice from leading cardiac electrophysiologists Drs. Demosthenes G Katritsis and Fred Morady, with input from a multinational team of electrophysiology fellows and cardiologists. Ideal as a stand-alone resource or used in conjunction with Dr. Douglas Zipes' renowned textbook, *Cardiac Electrophysiology: From Cell to Bedside*. Enhanced eBook version included with purchase. Your enhanced eBook allows you to access all of the text, figures, and references from the book on a variety of devices.

At present, over 120 medications have been withdrawn from the major global pharmaceutical markets due to potentially lethal unwanted effects on the heart, namely ventricular fibrillation. With recent FDA guidelines recommending stringent testing of new pharmaceuticals on the heart, the importance of cardiac electrophysiology is affecting an increasing number of professionals in a range of industries. This book will equip readers with a clear and solid foundation

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in the fundamentals of electrophysiology and pharmacology of the heart, explore clinical disorders and treatments and relate this to the research and development of new medicines. Representing an integrative bench to bedside approach to understanding this critical drug safety phenomenon, this book begins with a comprehensive review of the mechanisms responsible for drug-induced arrhythmia, followed by an in-depth discussion of the current preclinical and clinical recording techniques. Additionally, a complete assessment of current methods to stratify cardiac risk in drug development is included. Most importantly, the book develops and outlines the novel strategies and key frameworks that increase the cardiac drug safety and drive down the risk of novel biopharmaceutical products in the future. Contents: Physiology of the Heart; Introduction to Electrophysiology: History, Ion Channels, Important Concepts; Electrophysiology of the Heart; Studying Cardiac Electrophysiology in the Laboratory and Clinic; Electrical Disorders of the Heart: From Cell to Bedside; The Impact of Cardiac Electrophysiology on Drug Development: History, Current Tests (Regulations, Requirements) and Their Shortcomings; Case Studies; The Future of Cardiac Drug Safety: Strategies to Reduce Risk and Ensure Continued Safety.

This issue of the Cardiac Electrophysiology, edited by Dr. Masood Akhtar, will cover the physiological and pathological aspects of the His-Purkinje System in depth. This content will be supported by a variety of clinical cases that explore various aspects of and issues encountered involving the His-Purkinje System compliment the pathology and physiology. Electrocardiography of Arrhythmias: A Comprehensive Review equips you with the core knowledge and clinical competencies you need to accurately interpret electrocardiograms (ECG) and ace the ECG part of cardiology boards or the ABIM ICE ECG certifying exam. Co-

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written by world-renowned cardiologists Mithilesh K. Das and Douglas P. Zipes, this companion study guide to Cardiac Electrophysiology: From Cell to Bedside offers a concise yet definitive review of electrocardiography, complete with online access to the complete text and image collection at www.expertconsult.com, making this is the perfect review and exam prep tool. Obtain a realistic simulation of the actual exam experience. Each ECG is accompanied by a brief clinical history in board format. Review a full range of ECG images - from simple to complex - reflecting both common and rare conditions. Get the most from your board or certification prep by pairing this review with its parent text, Cardiac Electrophysiology: From Cell to Bedside, for detailed explanations and an enhanced learning experience. Take it with you! Access the fully searchable, complete text and image collection from any computer or mobile device at expertconsult.com Be prepared for the ECG section of cardiology boards or the ABIM ICE ECG certifying exam with this definitive review resource

About: Practical Electrophysiology is a detailed presentation of the fundamental aspects of electrophysiology written by an internationally recognized group of experts. To fully engage the reader and to help facilitate the learning process, 77 case studies covering ECGs, SVTs, atrial fibrillation, ventricular tachycardia and more are included not only with questions, but also with a full discussion of the answers. From the Preface: A plethora of significant new research and findings makes it difficult to keep up with the ever-changing field of electrophysiology. Despite these constant advances, there are fundamental aspects of the science that need to be understood by students of electrophysiology. This book was created to educate and uses cases and questions to keep the reader engaged. Chapter and case topics were chosen so that the information presented is useful for years to come. My

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associate editors and I are hopeful that this book will prove a useful tool for those interested in the field of electrophysiology. We also are very grateful to all the contributing authors for spending their time and effort to help create this handy but comprehensive and interesting work.
Jasbir Sra, Milwaukee

Covering all aspects of electrocardiography, this comprehensive resource helps readers picture the mechanisms of arrhythmias, their ECG patterns, and the options immediately available - as well as those available for a cure. Illustrations and descriptions help the reader visualize and retain knowledge on the mechanisms of cardiac rhythms to pave the way for a systematic approach to ECG recognition and emergency response. This new, eighth edition guarantees the best possible patient outcomes by providing complete coverage - from step-by-step instruction to the more advanced concepts of ECG monitoring. New chapters have been added on The Athlete's ECG, In-Hospital Ischemia Monitoring, and Brugada Syndrome. Clear, consistent writing and organization are featured throughout. The mechanisms of cardiac rhythms are explained and illustrated for easier comprehension. Knowledge builds logically from mechanisms of arrhythmias, axis, and normal rhythms, to arrhythmia recognition. Pediatric implications are provided for appropriate arrhythmias. Differential diagnoses for arrhythmias are provided to cover all the possibilities of the patient's clinical status. A consulting board made up

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of internationally known experts in ECG recognition assures the content is as accurate and up-to-date as possible. Revised and updated chapters include new information regarding mechanisms, risks, diagnosis, therapy, and cures - changing the way patients with arrhythmias and myocardial infarction are managed. The chapter on Congenital Long QT syndrome has been thoroughly revised with new information on the recognition of this inherited disease as well as its precipitating circumstances. The Acquired Long QT syndrome chapter has been thoroughly revised to describe this life-threatening arrhythmia and list all of the non-cardiac drugs that are now known to cause it. The Atrial Flutter chapter has been completely revised to incorporate new diagnostic techniques and improvements in acute and long-term management. A new chapter on Brugada Syndrome (Chapter 27) teaches early identification and treatment of those at risk of sudden death from this dangerous ECG pattern. A new Athlete's ECG chapter (Chapter 20) describes how intense physical training is associated with ECG patterns that are a consequence of physiologic adaptations of the heart. A new chapter on In-Hospital Ischemia Monitoring (Chapter 31) measures the patient's response to therapy and provides an important determinant for survival from myocardial infarction and ischemia. Handbook of Cardiac Electrophysiology provides a comprehensive introductory-level guide to invasive

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cardiac EP studies. Its focus is to enable the reader to understand and interpret the recording and stimulation techniques used during an EP study. The primary emphasis is on tachyarrhythmia diagnosis, but the book also includes bradycardias, the principles of catheter ablation and new mapping techniques. The main concepts are explained diagrammatically in a 4 colour format with clinical multichannel intracardiac recordings being used to illustrate the concepts discussed. The book provides sufficient practical information to enable the reader to plan an EP study and interpret the intracardiac recordings of most common tachycardias.

Since Paul Cranefield published his monograph, *The Conduction of the Cardiac Impulse*, in 1975, much has been learned about the role of the slow inward current in cardiac electrophysiology. Because of this expanse in know ledge, both basic and clinical, it appeared reasonable to review in a mono graph once again what was known. When Martinus Nijhoff first approached us to undertake the task of updating this information, we were initially reluctant for several reasons. First, we did not feel that the subject could be adequately and thoroughly reviewed, from the cell to the bedside, by a single person. Second, time constraints on all of us precluded even attempting such a task. However, we were encouraged by several of our friends ('egged on' one might even say, since they wished the job done but did not want

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to do it themselves!) who promised faithfully to contribute chapters on time if we accepted the task. So we did, and most of them did also.

The molecular basis for atrial fibrillation continues to be largely unknown, and therapy remains unchanged, aimed at controlling the heart rate and preventing systemic emboli with anticoagulation.

Familial atrial fibrillation is more common than previously suspected. While atrial fibrillation is commonly associated with acquired heart disease, a significant proportion of individuals have early onset without other forms of heart disease, referred to as "lone" atrial fibrillators. It is also well recognized that atrial fibrillation occurs on a reversible or functional basis, without associated structural heart disease, such as with hyperthyroidism or of atrial fibrillation following surgery. It remains to be determined what percentage in these individuals is familial or due to a genetic predisposition. Mapping the locus for familial atrial fibrillation is the first step towards the identification of the gene. Isolation of the gene and subsequent identification of the responsible molecular genetic defect should provide a point of entry into the mechanism responsible for the familial form and the common acquired forms of the disease and eventually provide more effective therapy. We know that the ionic currents responsible for the action potential of the atrium is due to multiple channel proteins as is electrical conduction

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throughout the atria. Analogous to the ongoing genetic studies in patients with familial long QT syndrome, it is highly likely that defects in each of these channel proteins will be manifested in familial atrial fibrillation.

A singular focus on the clinical aspect of cardiac arrhythmias, this book makes it easy to apply today's most up-to-date guidelines for diagnosis and treatment. An expert author team provides clear, clinically focused guidance on all types of cardiac arrhythmias, including practical techniques for managing complex patients. Stay up to date with new chapters on molecular mechanisms of cardiac electrical activity, cardiac ion channels, ventricular tachycardia in nonischemic dilated cardiomyopathy, epicardial ventricular tachycardia, ventricular arrhythmias in hypertrophic cardiomyopathy, ventricular arrhythmias in inherited channelopathies, ventricular arrhythmias in congenital heart disease, atrial arrhythmias in congenital heart disease, and complications of catheter ablation of cardiac arrhythmias. Including optical mapping of reentrant ventricular arrhythmias, 3-dimensional mapping of arrhythmias using different mapping and navigation modalities, and fluoroscopy images illustrating techniques for electrophysiologic catheter positioning, atrial septal puncture, and pericardial access. Gain a new understanding of hot topics such as mechanisms of arrhythmias, electrophysiologic

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testing, mapping and navigation modalities, ablation energy sources, sinus node dysfunction, conduction disturbances, atrial tachyarrhythmias, preexcitation syndromes and all types of ventricular and supraventricular tachycardias.

Cardiac Arrhythmias: New Insights for the Healthcare Professional: 2011 Edition is a ScholarlyPaper™ that delivers timely, authoritative, and intensively focused information about Cardiac Arrhythmias in a compact format. The editors have built Cardiac Arrhythmias: New Insights for the Healthcare Professional: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Cardiac Arrhythmias in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Cardiac Arrhythmias: New Insights for the Healthcare Professional: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

The first practical, user-friendly guide to the theory

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and practice of a routinely used technique, this new manual provides the specialist in training with a thorough grounding in the equipment, procedures, and clinical findings with which clinicians need to be familiar. Conceived as an alternative to the large and expensive texts aimed at specialists, the handbook is divided into two sections, which present: a review of the main kinds of arrhythmia, with illustrations of typical ECG findings supported where appropriate by correlative imaging the principal diagnostic and therapeutic procedures, including implantation of pacemakers, resynchronization therapy, use and placement of catheters and ablation techniques Providing practical guidance on clinical applications, and illustrated with numerous graphics, checklists and flowcharts to enable readers to locate information quickly and easily, Handbook of Cardiac Electrophysiology is an accessible resource covering a widespread, but complex technology.

This issue of Cardiac Electrophysiology Clinics examines Arrhythmias in Cardiomyopathies. Articles include Atrial and Ventricular Arrhythmias in Hypertrophic Cardiomyopathy and Its Variants; Role of Cardiac MRI in Risk Stratification of Hypertrophic Cardiomyopathy; Arrhythmogenic Right Ventricular Dysplasia/Cardiomyopathy; Exercise-Induced Right Ventricular Cardiomyopathy; Dilated Cardiomyopathy; Sarcoidosis; Amyloidosis; Chagas Disease; Fabry Disease; Left Ventricular

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Hypertrophy; Ventricular Arrhythmias and SCD; Left Ventricular Non-compaction; Mitochondrial Cardiomyopathy and Related Arrhythmias; Arrhythmias in Viral Myocarditis and Pericarditis Cardiomyopathy; Takotsubo Cardiomyopathy; Post-partum Cardiomyopathy; Arrhythmias in Alcohol- and Drug-Associated Cardiomyopathies; Arrhythmias in Neuromuscular Dystrophies; Cardiomyopathies Related to Anti-cancer Therapy– and Radiation-Induced Heart Disease; Arrhythmias After Myocardial Stem Cell Therapy; and more.

This thoroughly updated Second Edition is a comprehensive, practical guide to all current techniques and procedural aspects of interventional electrophysiology. A leading international group of experts describe in depth the procedures and techniques, the rationale for their use, and the available alternatives. Complementing the text are more than 600 illustrations, including spatially oriented "how-to" line drawings, radiographs, and conceptual diagrams. This edition features an extensively updated program of illustrations and includes the latest information on dual chamber defibrillators, atrial defibrillators and ablation techniques, and ablation and catheters.

Knowledge of the basic mechanisms of cardiac excitation is a prerequisite to the understanding of cardiac arrhythmias and their response to therapy. The goal of this book is to provide readers

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unacquainted with the matter with the information necessary to develop pathophysiologically oriented clinical reasoning in this area. Besides covering normal aspects of cardiac cellular and tissue electrophysiology, *An Introduction to Cardiac Electrophysiology* illustrates recently acquired information on electronic abnormalities associated with cardiac disease and on molecular mechanisms of anti-arrhythmic drug action. The language used is suitable to address non-specialists, and the reference to physics has been limited to very basic principles. Enclosed with the book is an interactive computer model for cardiac action potential, that can be easily run on any IBM compatible PC, thus allowing readers to test the effects of changes in individual ionic currents on the shape and properties of the cardiac act.

This book translates fundamental knowledge in basic cardiac electrophysiology from the bench to the bedside. Revised and updated for its second edition, the text offers new coverage of the molecular mechanisms of ion channel behavior and its regulation, complex arrhythmias, and the broadening roles of devices and ablation. Clear, straightforward explanations are illustrated by plentiful diagrams to make the material accessible to the non-specialist. *Methods in Cardiac Electrophysiology* simplifies procedures used in this highly technical field. It covers problems, pitfalls, and tips for solving these

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difficulties within the methodology, allowing for successful application of the techniques. This book features the latest methods in studying heart physiology from the single cell level to the whole heart. Research trends such as the molecular biology of ion channels, cardiac action potential recording, patch clamp (whole cell), and single channel analysis are reviewed. In addition to presenting the most cutting-edge technology available, *Methods in Cardiac Electrophysiology* will aid in avoiding typical problems in establishing an electrophysiological technique, putting your research on the right track.

Easy to read and abundantly illustrated, *Electrocardiography of Arrhythmias: A Comprehensive Review, 2nd Edition*, provides the core knowledge and clinical competencies you need to accurately interpret ECGs in preparation for cardiology boards and clinical practice. World-renowned cardiologists Mithilesh K. Das and Douglas P. Zipes offer a concise yet definitive review of all the ECG basics with realistic scenarios and detailed explanations for a wide range of ECG applications. Use this outstanding review tool alone or as a companion to *Cardiac Electrophysiology: From Cell to Bedside*. Provides a solid understanding of normal electrocardiograms and common abnormal findings, preparing you to accurately interpret ECGs and ace the ECG part of

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cardiology boards or the ABIM ICE ECG certifying exam. Contains realistic cases that simulate the clinical exam experience, and each ECG includes a brief clinical history in board format. Features more than 250 ECGs that demonstrate virtually any arrhythmia you're likely to encounter. Includes new ECGs covering intracardiac electrophysiology, atrial fibrillation, ablation of many arrhythmias, arrhythmias associated with valvular surgery, idiopathic PVCs, arrhythmias associated with structural heart disease, ARVC, Brugada syndrome, and others. Covers key topics such as AV conduction abnormalities, complex atrial and ventricular arrhythmias, idiopathic ventricular tachycardia, and inherited arrhythmia syndromes.

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common abnormal findings, preparing you to accurately interpret ECGs and ace the ECG part of cardiology boards or the ABIM ICE ECG certifying exam. Contains realistic cases that simulate the clinical exam experience, and each ECG includes a brief clinical history in board format. Features more than 250 ECGs that demonstrate virtually any arrhythmia you're likely to encounter. Includes new ECGs covering intracardiac electrophysiology, atrial fibrillation, ablation of many arrhythmias, arrhythmias associated with valvular surgery, idiopathic PVCs, arrhythmias associated with structural heart disease, ARVC, Brugada syndrome, and others. Covers key topics such as AV conduction abnormalities, complex atrial and ventricular arrhythmias, idiopathic ventricular tachycardia, and inherited arrhythmia syndromes. Enhanced eBook version included with purchase. Your enhanced eBook allows you to access all of the text, figures, and references from the book on a variety of devices.

In Heart Cell Communication in Health and Disease an extensive review of different aspects of heart cell communication is presented. The book starts with the fundamental concept that cardiac cells are communicated, and then proceeds to the role of gap junctions in heart development, the molecular biology of gap junctions, the biophysics of the intercellular channels, the control of junctional conductance and the influence of gap junctions on

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impulse propagation. This is the first time that a single volume has described cell communication in the normal heart and under different pathological conditions such as heart failure, coronary disease, myocardial ischemia and cardiac arrhythmias. In this way the process of cell communication is analyzed at different levels of complexity, providing the reader with a wide view of this field and its relevance to cardiology.

Cardiac Electrophysiology: From Cell to Bedside puts the latest knowledge in this subspecialty at your fingertips, giving you a well-rounded, expert grasp of every cardiac electrophysiology issue that affects your patient management. Drs. Zipes, Jalife, and a host of other world leaders in cardiac electrophysiology use a comprehensive, multidisciplinary approach to guide you through all of the most recent cardiac drugs, techniques, and technologies. Get well-rounded, expert views of every cardiac electrophysiology issue that affects your patient management from preeminent authorities in cardiology, physiology, pharmacology, pediatrics, biophysics, pathology, cardiothoracic surgery, and biomedical engineering from around the world. Visually grasp and easily absorb complex concepts through an attractive full-color design featuring color photos, tables, flow charts, ECGs, and more! Integrate the latest scientific understanding of arrhythmias with the newest clinical

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applications, to select the right treatment and management options for each patient. Stay current on the latest advancements and developments with sweeping updates and 52 NEW chapters - written by many new authors - on some of the hottest cardiology topics, such as new technologies for the study of the molecular structure of ion channels, molecular genetics, and the development of new imaging, mapping and ablation techniques. Get expert advice from Dr. Douglas P. Zipes - a leading authority in electrophysiology and editor of Braunwald's Heart Disease and the Heart Rhythm Journal - and Dr. Jose Jalife - a world-renowned leader and researcher in basic and translational cardiac electrophysiology. Access the full text online at Expert Consult, including supplemental text, figures, tables, and video clips. Your purchase entitles you to access the web site until the next edition is published, or until the current edition is no longer offered for sale by Elsevier, whichever occurs first. If the next edition is published less than one year after your purchase, you will be entitled to online access for one year from your date of purchase. Elsevier reserves the right to offer a suitable replacement product (such as a downloadable or CD-ROM-based electronic version) should online access to the web site be discontinued.

Long QT syndrome is a heart rhythm disorder that

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can cause fast, chaotic heartbeats. In some cases, long QT syndrome can cause sudden death. Long QT syndrome may result from a genetic mutation or be caused by certain medications and medical conditions. The condition is treatable with medication, surgery, or an implantable device. Because it may have serious consequences, it's important for electrophysiologists to know about long QT syndrome.

With its unique, singular focus on the clinical aspect of cardiac arrhythmias, *Clinical Arrhythmology and Electrophysiology: A Companion to Braunwald's Heart Disease* makes it easy to apply today's most up-to-date guidelines for diagnosis and treatment. An expert author team provides clear, clinically focused guidance on all types of cardiac arrhythmias, including practical techniques for managing complex patients. Find the information you need quickly with a consistent organization in all chapters, written to a template that shows every arrhythmia type in a similar manner. Access the fully searchable contents online at www.expertconsult.com, in addition to downloadable images and dynamic video clips. Fully understand the rationale for treatment of specific arrhythmias with practical techniques that are grounded in the most recent basic science. Stay up to date with new chapters on molecular mechanisms of cardiac electrical activity, cardiac ion channels, ventricular

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tachycardia in nonischemic dilated cardiomyopathy, epicardial ventricular tachycardia, ventricular arrhythmias in hypertrophic cardiomyopathy, ventricular arrhythmias in inherited channelopathies, ventricular arrhythmias in congenital heart disease, atrial arrhythmias in congenital heart disease, and complications of catheter ablation of cardiac arrhythmias. View videos of 27 key techniques online, including optical mapping of reentrant ventricular arrhythmias, 3-dimensional mapping of arrhythmias using different mapping and navigation modalities, and fluoroscopy images illustrating techniques for electrophysiologic catheter positioning, atrial septal puncture, and pericardial access. Gain a new understanding of hot topics such as mechanisms of arrhythmias, electrophysiologic testing, mapping and navigation modalities, ablation energy sources, sinus node dysfunction, conduction disturbances, atrial tachyarrhythmias, preexcitation syndromes and all types of ventricular and supraventricular tachycardias.

This book covers the main mathematical and numerical models in computational electrocardiology, ranging from microscopic membrane models of cardiac ionic channels to macroscopic bidomain, monodomain, eikonal models and cardiac source representations. These advanced multiscale and nonlinear models describe the cardiac bioelectrical activity from the cell level to

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the body surface and are employed in both the direct and inverse problems of electrocardiology. The book also covers advanced numerical techniques needed to efficiently carry out large-scale cardiac simulations, including time and space discretizations, decoupling and operator splitting techniques, parallel finite element solvers. These techniques are employed in 3D cardiac simulations illustrating the excitation mechanisms, the anisotropic effects on excitation and repolarization wavefronts, the morphology of electrograms in normal and pathological tissue and some reentry phenomena. The overall aim of the book is to present rigorously the mathematical and numerical foundations of computational electrocardiology, illustrating the current research developments in this fast-growing field lying at the intersection of mathematical physiology, bioengineering and computational biomedicine. This book is addressed to graduate student and researchers in the field of applied mathematics, scientific computing, bioengineering, electrophysiology and cardiology.

Cardiac Electrophysiology: From Cell to Bedside defines the entire state of current scientific and clinical knowledge in this subspecialty. In response to the many major recent developments in the field, Drs. Zipes and Jalife have completely updated this modern classic, making the 5th Edition the most significant revision yet. From our latest

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understanding of ion channels, molecular genetics, and cardiac electrical activity through newly recognized syndromes, unique needs of special patient populations, and new diagnostic and therapeutic options, you'll find all the state-of-the-art guidance you need to make informed, effective clinical decisions. What's more, a significantly restructured organization, a new full-color layout, and full-text online access make reference easier than ever. Integrates the latest scientific understanding of arrhythmias with the newest clinical applications, giving you an informed basis for choosing the right treatment and management options for each patient. Synthesizes the knowledge of preeminent authorities in cardiology, physiology, pharmacology, pediatrics, biophysics, pathology, cardiothoracic surgery, and biomedical engineering from around the world, giving you a well-rounded, expert grasp of every issue that affects your patient management. Contains 24 new chapters (listed below) as well as exhaustive updates throughout, to keep you current with new scientific knowledge, newly discovered arrhythmia syndromes, and new diagnostic and therapeutic techniques.

Developmental Regulation of Cardiac Ion Channels
Neural Mechanisms of Initiating and Maintaining Arrhythmias
Single Nucleotide Polymorphisms and Acquired Cardiac Arrhythmias
Inheritable Sodium Channel Diseases
Inheritable Potassium Channel

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Diseases Inheritable Diseases of Intracellular Calcium Regulation Morphological Correlates of Atrial Arrhythmias Andersen-Tawil Syndrome Timothy Syndrome Progressive Cardiac Conduction Disease Sudden Infant Death Syndrome Arrhythmias in Patients with Neurologic Disorders Autonomic Testing Cardiac Resynchronization Therapy Energy Sources for Catheter Ablation Linear Lesions to Ablate Atrial Fibrillation Catheter Ablation of Ventricular Arrhythmias in Patients with Structural Heart Disease Catheter Ablation of Ventricular Arrhythmias in Patients without Structural Heart Disease Catheter Ablation in Patients with Congenital Heart Disease Features a completely new section on "Arrhythmias in Special Populations" that explores arrhythmias in athletes ... gender differences in arrhythmias ... arrhythmias in pediatric patients ... and sleep-disordered breathing and arrhythmias. Offers an attractive new full-color design featuring color photos, tables, flow charts, ECGs, and more, making clinically actionable information easy to find and absorb at a glance. Includes full-text online access via Expert Consult, making reference easier for busy practitioners. This book focuses on the practical aspects of clinical electrophysiology of cardiac arrhythmias in the young. It represents a compilation of the clinical course, electrophysiologic studies, pharmacological management, and transcatheter ablation therapy in

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patients from infancy through young adulthood. Topics include the mechanism, ECG characteristics, electrophysiologic findings, treatment, and prognosis of tachyarrhythmias and bradyarrhythmias; specialized subjects including syncope, cardiac pacemakers, and implantable cardiac defibrillators; pharmacology of antiarrhythmic agents; and the roles of allied healthcare professionals in the management of arrhythmias in the young. This revised edition includes new or expanded chapters on the molecular biology mechanisms that underlie the structure and function of the cardiac conduction system; new navigation technologies for detecting cardiac arrhythmias while minimizing radiation exposure; genetic disorders of the cardiac impulse; and sudden cardiac death in the young, particularly athletes. Featuring contributions from practicing clinical cardiac electrophysiologists affiliated with the Michigan Congenital Heart Center at the University of Michigan, *Clinical Cardiac Electrophysiology in the Young, Second Edition*, is a premier reference for cardiologists, residents, and medical students. *Cardiac Electrophysiology: From Cell to Bedside* puts the latest knowledge in this subspecialty at your fingertips, giving you a well-rounded, expert grasp of every cardiac electrophysiology issue that affects your patient management. Drs. Zipes, Jalife, and a host of other world leaders in cardiac electrophysiology use a comprehensive,

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multidisciplinary approach to guide you through all of the most recent cardiac drugs, techniques, and technologies. Consult this title on your favorite e-reader, conduct rapid searches, and adjust font sizes for optimal readability. Compatible with Kindle®, nook®, and other popular devices. Get well-rounded, expert views of every cardiac electrophysiology issue that affects your patient management from preeminent authorities in cardiology, physiology, pharmacology, pediatrics, biophysics, pathology, cardiothoracic surgery, and biomedical engineering from around the world. Visually grasp and easily absorb complex concepts through an attractive full-color design featuring color photos, tables, flow charts, ECGs, and more! Integrate the latest scientific understanding of arrhythmias with the newest clinical applications, to select the right treatment and management options for each patient. Stay current on the latest advancements and developments with sweeping updates and 52 NEW chapters - written by many new authors - on some of the hottest cardiology topics, such as new technologies for the study of the molecular structure of ion channels, molecular genetics, and the development of new imaging, mapping and ablation techniques. Get expert advice from Dr. Douglas P. Zipes - a leading authority in electrophysiology and editor of Braunwald's Heart Disease and the Heart Rhythm Journal - and Dr. Jose Jalife - a world-

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renowned leader and researcher in basic and translational cardiac electrophysiology. Access the full text online at Expert Consult, including supplemental text, figures, tables, and video clips. This book is devoted to computer-based modeling in cardiology, by taking an educational point of view, and by summarizing knowledge from several, commonly considered delimited areas of cardiac research in a consistent way. First, the foundations and numerical techniques from mathematics are provided, with a particular focus on the finite element and finite differences methods. Then, the theory of electric fields and continuum mechanics is introduced with respect to numerical calculations in anisotropic biological media. In addition to the presentation of digital image processing techniques, the following chapters deal with particular aspects of cardiac modeling: cardiac anatomy, cardiac electrophysiology, cardiac mechanics, modeling of cardiac electro mechanics. This book was written for researchers in modeling and cardiology, for clinical cardiologists, and for advanced students. Cardiovascular disease is the major cause of mortality and morbidity in the Western Hemisphere. While significant progress has been made in treating a major sub-category of cardiac disease, arrhythmias, significant unmet needs remain. In particular, every day, thousands of patients die because of arrhythmias in the US alone, and atrial

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fibrillation is the most common arrhythmia affecting millions of patients in the US alone at a given time. Therefore, there is a public need to continue to develop new and better therapies for arrhythmias. Accordingly, an ever increasing number of biomedical, pharmaceutical, and medical personnel is interested in studying various aspects of arrhythmias at a basic, translational, and applied level, both in industry (ie Biotech, Pharmaceutical and device), and in academia. Not only has our overall understanding of molecular bases of disease dramatically increased, but so has the number of available and emerging molecular, pharmacological or device treatment based therapies. This practical, state-of-the art handbook will summarize and review key research methods and protocols, their advantages and pitfalls, with a focus on practical implementation, and collaborative cross-functional research. The volume will include visual and easy-to-use graphics, bulleted summaries, boxed summary paragraphs, links to reference websites, equipment manufacturers where appropriate, photographs of typical experimental setups and so forth, to keep this book very focused on practical methods and implementation, and yet, provide enough theory that the principles are clearly understood and can be easily applied.

Fully revised and updated, Dr. Josephson's classic text provides a thorough understanding of the

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mechanisms of cardiac arrhythmias and the therapeutic interventions used to treat arrhythmias. This edition has a new full-color design, and a companion Web site offers the fully searchable text. With its unique, singular focus on the clinical aspect of cardiac arrhythmias, *Clinical Arrhythmology and Electrophysiology: A Companion to Braunwald's Heart Disease* makes it easy to apply today's most up-to-date guidelines for diagnosis and treatment. An expert author team provides clear, clinically focused guidance on all types of cardiac arrhythmias, including practical techniques for managing complex patients. Find the information you need quickly with a consistent organization in all chapters, written to a template that shows every arrhythmia type in a similar manner. Access the fully searchable contents online at www.expertconsult.com, in addition to downloadable images and dynamic video clips. Fully understand the rationale for treatment of specific arrhythmias with practical techniques that are grounded in the most recent basic science. Stay up to date with new chapters on molecular mechanisms of cardiac electrical activity, cardiac ion channels, ventricular tachycardia in nonischemic dilated cardiomyopathy, epicardial ventricular tachycardia, ventricular arrhythmias in hypertrophic cardiomyopathy, ventricular arrhythmias in inherited channelopathies, ventricular arrhythmias in congenital heart disease,

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atrial arrhythmias in congenital heart disease, and complications of catheter ablation of cardiac arrhythmias. View videos of 27 key techniques online, including optical mapping of reentrant ventricular arrhythmias, 3-dimensional mapping of arrhythmias using different mapping and navigation modalities, and fluoroscopy images illustrating techniques for electrophysiologic catheter positioning, atrial septal puncture, and pericardial access. Gain a new understanding of hot topics such as mechanisms of arrhythmias, electrophysiologic testing, mapping and navigation modalities, ablation energy sources, sinus node dysfunction, conduction disturbances, atrial tachyarrhythmias, preexcitation syndromes and all types of ventricular and supraventricular tachycardias. Tackle the clinical management of cardiac arrhythmias with confidence with the most up-to-date guidance from the experts you trust. Your purchase entitles you to access the web site until the next edition is published, or until the current edition is no longer offered for sale by Elsevier, whichever occurs first. If the next edition is published less than one year after your purchase, you will be entitled to online access for one year from your date of purchase. Elsevier reserves the right to offer a suitable replacement product (such as a downloadable or CD-ROM-based electronic version) should access to the web site be discontinued.

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In response to the many major recent developments in the field, the authors have completely updated this modern classic, making this edition the most significant revision yet. Practitioners will find all the state-of-the-art guidance they need to make informed, effective clinical decisions.

Fully updated from cover to cover, Zipes and Jalife's *Cardiac Electrophysiology: From Cell to Bedside*, 8th Edition, provides the comprehensive, multidisciplinary coverage you need—from new knowledge in basic science to the latest clinical advances in the field. Drs. José Jalife and William Gregory Stevenson lead a team of global experts who provide cutting-edge content and step-by-step instructions for all aspects of cardiac electrophysiology. Packs each chapter with the latest information necessary for optimal basic research as well as patient care. Covers new technologies such as CRISPR, protein research, improved cardiac imaging, optical mapping, and wearable devices. Contains significant updates in the areas of molecular biology and genetics, iPSCs (induced pluripotent stem cells), embryonic stem cells, precision medicine, antiarrhythmic drug therapy, cardiac mapping with advanced techniques, and ablation technologies including stereotactic radioablation. Includes 47 new chapters covering both basic science and clinical topics. Discusses extensive recent progress in the understanding,

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diagnosis, and management of arrhythmias, including new clinical insights on atrial fibrillation and stroke prevention, new advances in the understanding of ventricular arrhythmias in genetic disease, and advances in implantable devices and infection management. Features 1,600 high-quality photographs, anatomic and radiographic images, electrocardiograms, tables, algorithms, and more., with additional figures, tables, and videos online. Recipient of a 2018 Highly Commended award from the British Medical Association. Enhanced eBook version included with purchase. Your enhanced eBook allows you to access all of the text, figures, and references from the book on a variety of devices.

Offering a clear and consistent framework for recognition, diagnosis, and treatment of a wide range of cardiac arrhythmia disturbances, *Clinical Cardiac Electrophysiology: A Practical Guide* covers the fundamental analytical skills needed in this challenging area. This portable, highly accessible handbook focuses on the basics of clinical electrophysiology—how and when to perform an electrophysiology study as well as principles of ablation and other invasive therapies—all in a succinct and modern format. Focuses on using an effective, consistent, decision-making process in recognizing, diagnosing, and treating rhythm disturbances of the heart, including supraventricular

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tachycardias, atrial fibrillation, ventricular tachycardias, and other rapid or irregular heartbeats. Covers anatomic fundamentals of cardiac structures, clinical indications for electrophysiology studies, practicalities and methodology of performing an electrophysiology study, and problems encountered during the procedure. Includes quick clinical summaries and more than 180 illustrations: electrophysiology recordings, ECGs, cardiac anatomy, radiographic images, and electroanatomic maps. Discusses key topics such as mechanisms of arrhythmias, conventional and electroanatomic mapping systems, fundamentals of cardiac mapping, biophysics of catheter ablation, and much more. Offers real-world guidance on contemporary practice from leading cardiac electrophysiologists Drs. Demosthenes G Katritsis and Fred Morady, with input from a multinational team of electrophysiology fellows and cardiologists. Ideal as a stand-alone resource or used in conjunction with Dr. Douglas Zipes' renowned textbook, Cardiac Electrophysiology: From Cell to Bedside.

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