Cardiovascular System Dynamics

Regulation of Coronary Blood Flow

Microfluidics and Nanofluidics Handbook

The Microfluidics and Nanofluidics Handbook: Two-Volume Set comprehensively captures the cross-disciplinary breadth of the fields of micro- and nanofluidics, which encompass the biological sciences, chemistry, physics and engineering applications. To fill the knowledge gap between engineering and the basic sciences, the editors pulled together key individuals, well known in their respective areas, to author chapters that help graduate students, scientists, and practicing engineers understand the overall area of microfluidics and nanofluidics. Topics covered include Cell Lysis Techniques in Lab-on-a-Chip Technology Electrofluidics in Electrochemical Energy Conversion Systems: Microstructure and Pore-Scale Transport Microscale Gas Flow Dynamics and Molecular Models for Gas Flow and Heat Transfer Microscopic Hemorheology and Hemodynamics Covering physics and transport phenomena along with life sciences and related applications, Volume One: Chemistry, Physics, and Life Science Principles provides readers with the fundamental science background that is required for the study of microfluidics and nanofluidics. Both volumes include as much interdisciplinary knowledge as possible to reflect the inherent nature of this area, valuable to students and practitioners.

The Glaucoma Book

Handbook of Active Materials for Medical Devices

A comprehensive review of all aspects of hypertension in the elderly using the most current clinical data. Topics range from basic concepts, epidemiology and trials, and evaluation and management, to pharmacologic treatment, special populations, and adherence, all presented with an emphasis on the optimal management of patients. The authors examine in detail the mechanisms of hypertension in the elderly, the lifestyle trials and outcomes trials that were conducted in older persons, as well as the problems of clinical evaluation, secondary hypertension, adherence, and target organ damage. Extensive discussions of pharmacologic therapy detail the role of all the major drug classes.

Microcirculation Imaging

This comprehensive handbook presents fundamental aspects, fabrication techniques, introductory materials on microbiology and chemistry, measurement techniques, and applications of microfluidics and nanofluidics. The second volume focuses on topics related to experimental and numerical methods. It also covers fabrication and applications in a variety of areas, from aerospace to biological systems. Reflecting the inherent nature of microfluidics and nanofluidics, the book includes as much interdisciplinary knowledge as possible. It provides the fundamental science background for newcomers and advanced techniques and concepts for experienced researchers and professionals.
Handbook of Hemorheology and Hemodynamics

Cardiovascular Hemodynamics for the Clinician, 2nd Edition, provides a useful, succinct and understandable guide to the practical application of hemodynamics in clinical medicine for all trainees and clinicians in the field. Concise handbook to help both practicing and prospective clinicians better understand and interpret the hemodynamic data used to make specific diagnoses and monitor ongoing therapy. Numerous pressure tracings throughout the book reinforce the text by demonstrating what will be seen in daily practice. Topics include coronary artery disease; cardiomyopathies; valvular heart disease; arrhythmias; hemodynamic support devices and pericardial disease. New chapters on TAVR, ventricular assist devices, and pulmonic valve disease, expanded coverage of pulmonary hypertension, fractional flow reserve, heart failure with preserved ejection fraction and valvular heart disease. Provides a basic overview of circulatory physiology and cardiac function followed by detailed discussion of pathophysiological changes in various disease states.

Exercise Physiology

MICHEL E. SAFAR and MICHAEL F. O’ROURKE One of the principal problems of hypertension is the precise definition of blood pressure as a cardiovascular risk factor. Clinicians indicate peak systolic pressure and end diastolic pressure in the brachial artery as the principal criteria for blood pressure measurement. Consequently, these values are as indicators for clinical management and therapeutic adjustment. This used methodology, based on indirect blood pressure measurements at the site of the brachial artery relates only to the highest and lowest pressure in that vessel, and does not give any information of the blood pressure curve itself; this carries more information than peak systolic pressure and end diastolic pressure. As a first step in better analysis of the blood pressure curve, research workers in experimental hypertension defined in addition to peak systolic pressure and end diastolic, another blood pressure value, mean arterial pressure, i. e. the average pressure throughout the cardiac cycle, and about which pressure fluctuates. This is the pressure recorded by Hales [1] and by Poiseuille [2] in their pioneering studies. By application of Poiseuille's Law, this definition of mean arterial pressure led to the concept that increased mean arterial pressure (and therefore hypertension) was related, at any given value of cardiac output, to an increase in vascular resistance, i. e. to a reduction in the caliber of the small arteries.

Hemolysis in Capillary Flow

The Arterial System in Hypertension

Haemorheology is the study of how the blood, the blood cells and the vessels can function and interact as parts of the living organism. It is presented in this text as a sensitive tool for the recognition of the functional evidences and defects of blood flow.

Oxford Handbook of Cardiology

Handbook of Hemorheology and Hemodynamics

Most strokes are attributed to atherosclerosis of neck and intracranial arteries, brain embolism from the heart, and penetrating artery disease; these are discussed in detail in many other books. This compendium fills an important niche by providing authoritative discussions on the other, less common causes of stroke, including various forms of angitis, coagulation disorders, infective, paraneoplastic and metabolic disorders that may be associated with stroke, and a number of rare syndromes such as Eales disease and Fabry's disease. This new edition contains detailed, up-to-date information about the nature, diagnosis, and treatment of those relatively uncommon types of cerebrovascular disease that cause strokes. It is therefore a unique scientific and clinical resource that provides a useful reference to help physicians diagnose and treat stroke patients who do not fit well into the usual clinical categories. New chapters include stroke in patients with Lyme disease, scleroderma, Cogan's syndrome, Chagas' disease, and HIV.

Basic Sciences for MCEM


The Microfluidics and Nanofluidics Handbook: Two-Volume Set comprehensively captures the cross-disciplinary breadth of the fields of micro- and nanofluidics, which encompass the biological sciences, chemistry, physics and engineering applications. To fill the knowledge gap between engineering and the basic sciences, the editors pulled together key individuals, well known in their respective areas, to author chapters that help
graduate students, scientists, and practicing engineers understand the overall area of microfluidics and nanofluidics. Topics covered include Cell Lysis Techniques in Lab-on-a-Chip Technology, Electrochemical Energy Conversion Systems: Microstructure and Pore-Scale Transport, Meso/ Microscale Gas Flow Dynamics and Molecular Models for Gas Flow and Heat Transfer, Microscopic Hemorheology and Hemodynamics. Covering physics and transport phenomena along with life sciences and related applications, Volume One: Chemistry, Physics, and Life Science Principles provides readers with the fundamental science background that is required for the study of microfluidics and nanofluidics. Both volumes include as much interdisciplinary knowledge as possible to reflect the inherent nature of this area, valuable to students and practitioners.

**Advances in Hemodynamics and Hemorheology**

This book provides a detailed review of state of the art knowledge on critical care topics as well as the latest research findings. It covers the core aspects in excellent detail, but is not so comprehensive as to make its daily use unfeasible. For each condition considered, discussion of the pathophysiology is integrated with observations on diagnosis and treatment in order to allow a deeper understanding. The book is scientifically based, with extensive references to published research. This will allow readers to investigate their individual interests further and will enable physicians to justify measures by providing a coherent, evidence-based strategy and relevant citations where needed. Core Knowledge in Critical Care Medicine will appeal to experienced practitioners as an aide-mémoire, but will also be of great value to a wide range of more junior staff wishing to complement their background knowledge with important facts applicable to everyday practice.

**Microfluidics and Nanofluidics Handbook**

Adopting a multidisciplinary approach with input from physicists, researchers and medical professionals, this is the first book to introduce many different technical approaches for the visualization of microcirculation, including laser Doppler and laser speckle, optical coherence tomography and photo-acoustic tomography. It covers everything from basic research to medical applications, providing the technical details while also outlining the respective strengths and weaknesses of each imaging technique. Edited by an international team of top experts, this is the ultimate handbook for every clinician and researcher relying on microcirculation imaging.

**Clinical Hemorheology**

**The Scientific Basis of Integrative Health**

The Oxford American Handbook of Cardiology captures the latest knowledge in the rapidly expanding field of cardiovascular medicine and delivers essential, practical advice for clinical cardiologists.

**Hemorheology in Practice**

The WHO guidelines on assessing donor suitability for blood donation have been developed to assist blood transfusion services in countries that are establishing or strengthening national systems for the selection of blood donors. They are designed for use by policy makers in national blood programmes in ministries of health, national advisory bodies such as national blood commissions or councils, and blood transfusion services.

**Platelet-vessel Wall Interactions in Hemostasis and Thrombosis**

Focuses on the macro- and micro-rheological behavior of blood and its formed elements, on interactions between the formed elements and blood vessel walls, and on the microvascular aspects of hemodynamics. This book provides a general overview of both basic science and clinical hemorheology and hemodynamics.

**Uncommon Causes of Stroke**

The task the editors have set themselves is to survey the field of clinical hemorheology from basic principles to up-to-date research. It is only in a new science like this that it is possible to span the whole field in a book of this size. Hemorheology, as a new approach to the study and management of a wide range of circulatory diseases, is now beginning to appear with increasing frequency in general as well as specialized medical journals. Hemorheology is also just beginning to creep into the undergraduate medical curriculum. Therefore, the majority of graduate doctors are unequipped to assess the place of hemorheology in the overall framework of circulatory physiology and pathology or to assess its relevance to their everyday practice. It is hoped that this book will fill this gap. The approach of the book is interdisciplinary. The first part deals with basic principles of blood flow, circulation and hemorheology. It has been written with the general doctor in mind, who has no special knowledge of hemodynamics and rheological concepts, terminology or methodology. To maintain the
emphasis on practical clinical applications, all the chapters in the second part of the book have been written by clinical specialists practicing in the individual areas of disease. The book is so designed that clinicians may be able to read the relevant chapters in the second part of the book in isolation, using the basic science aspects contained in the first part of the book as reference chapters.

**Biomechanical Transport Processes**

Since the first suffering supplicant offered a prayer to his god or the first mother cradled an ailing child in her caring arms, we have witnessed how human health and healing go beyond any inventory of parts and infusion of chemicals. We humans are a complex melding of thought, emotion, spirit and energy and each of those components is as critical to our well-being as our physiological status. Even if we are just beginning to quantify and document these seemingly intangible aspect, to ignore them in the practice of medicine is neglect and an invitation to do harm. The Scientific Basis of Integrative Health has been extensively updated and expanded to provide a comprehensive guide to integrative medicine. Taking a balanced and objective approach, this leading text bridges the gap between Western science and Eastern philosophy. It provides doctors and other health practitioners with information on complementary and alternative approaches to health, that is authoritative, evidence based, and epidemiologically substantiated. Written for doctors and healthcare professionals by pioneering practitioners and updated with the newest research across and increasing range of possibilities, this third edition includes nine new chapters covering topics such as: Electrophotonic imaging; Neuroacupuncture; Naturopathic medicine; Integrative nutrition.

**Manual of Neurosonology**

**Core Knowledge in Critical Care Medicine**

This book covers biodevices, mainly implantable or quirurgical, for the diagnosis or treatment of different pathologies, which benefit from the use of active materials as sensors or actuators. Such active or "intelligent" materials are capable of responding in a controlled way to different external physical or chemical stimuli by changing some of their properties. These materials can be used to design and develop sensors, actuators, and multifunctional systems with a large number of applications for developing biodevices and medical appliances. Current work on these fields entails problems related to synthesis, characterization, modeling, simulation, processing, and prototyping technologies, as well as device testing and validation, all of which are treated in depth in this book, for the several types of active or intelligent materials covered. The research presented in this book helps further development of medical devices, based on the additional functionalities that the use of active or "intelligent" materials, both as sensors and actuators, supplies. The main results exposed may help with the industrial expansion of this kind of materials as part of more complex systems.

**Encyclopedia of Exercise Medicine in Health and Disease**

A thorough procedural guide covering applications of neurosonology to diagnosis, monitoring of cerebrovascular and other neurological diseases.

**Handbook of Hypertension**

Complete evidence-based medical and surgical management of glaucoma for both the general ophthalmologist in practice and residents. The only book that covers the new generation of glaucoma procedures including trabectome, trabecular bypass and canoloplasty, by the experts who developed them. Includes the latest laser treatments for glaucoma including micro diode and titanium saphire trabeculoplasty as well as laser from an external approach. The most comprehensive coverage of the optic nerve and the importance of nerve fiber layer hemorrhage. Provides an integrated approach to neovascular glaucoma merging treatment to the retina, with the use of new anti-VEGF drugs, tubes, and shunts to achieve the best outcome. Integrates clinical science with basic science to outline the next steps in glaucoma therapy.

**Oxford American Handbook of Cardiology**

The decade since the first Handbook on Hyperbaric Medicine has seen major advances: studies have clarified the actions of hyperbaric oxygenation; clinical practice is becoming more scientific; various organisational and operational guidelines are now widely accepted. This new Handbook arises from the EU Co-operation in Science and Technology (COST) programme for hyperbaric medicine, COST B14, in combination with the results of a number of recent experimental and clinical studies.

**Handbook of Physiology**

This book is a dedicated resource for those sitting the Part A of the MCEM (Membership of the College of
Emergency Medicine) examination. It forms an essential revision guide for emergency trainees who need to acquire a broad understanding of the basic sciences, which underpin their approach to clinical problems in the emergency department. Common clinical scenarios are used to highlight the essential underlying basic science principles, providing a link between clinical management and a knowledge of the underlying anatomical, physiological, pathological and biochemical processes. Multiple choice questions with reasoned answers are used to confirm the candidates understanding and for self testing. Unlike other recent revision books which provide MCQ questions with extended answers, this book uses clinical cases linked to the most recent basic science aspects of the CEM syllabus to provide a book that not only serves as a useful revision resource for the Part A component of the MCEM examination, but also a unique way of understanding the processes underlying common clinical cases seen every day in the emergency department. This book is essential for trainees sitting the Part A of the MCEM exam and for clinicians and medical students who need to refresh their knowledge of basic sciences relevant to the management of clinical emergencies.

**Pharmacology of Hydroxyethyl Starch**

Red blood cells in humans—and most other mammals—have a tendency to form aggregates with a characteristic face-to-face morphology, similar to a stack of coins. Known as rouleaux, these aggregates are a normally occurring phenomenon and have a major impact on blood rheology. What is the underlying mechanism that produces this pattern? Does this really happen in blood circulation? And do these rouleaux formations have a useful function? The first book to offer a comprehensive review of the subject, Red Blood Cell Aggregation tackles these and other questions related to red blood cell (RBC) aggregates. The book covers basic, clinical, and physiological aspects of this important biophysical phenomenon and integrates these areas with concepts in bioengineering. It brings together state-of-the-art research on the determinants, mechanisms, and measurement and effects of RBC aggregation as well as on variations and comparative aspects. After an introductory overview, the book outlines factors and conditions that affect RBC aggregation. It presents the two hypotheses—the bridging model and the depletion model—that provide potential mechanisms for the adhesive forces that lead to the regular packing of the cells in rouleaux formations. The book also reviews the methods used to quantify RBC aggregation in vitro, focusing on their importance in clinical practice. Chapters discuss the effect of RBC aggregation on the in vitro rheology of blood as well as on tube flow. The book also looks at what happens in the circulation when red blood cells aggregate and examines variations due to physiological and pathophysiological challenges. The concluding chapter explores the formation of red blood cell aggregates in other mammals. Written by leading researchers in the field, this is an invaluable resource for basic science, medical, and clinical researchers; graduate students; and clinicians interested in mammalian red blood cells.

**Microvascular Networks**

The Encyclopedia of Exercise Medicine is intelligently structured, easy accessible and user-friendly: A-Z format, clear, concise language and uniform essay structure as well as extensive cross references between keywords and related articles enables efficient searches in a user-friendly manner both for experts and newcomers. It is intended to be a comprehensive up-to-date data base on the adaptation of the human body to exercise and on the therapeutic use of exercise with up to 2,000 keywords. It covers all aspects within the full range of modern exercise medicine of each particular scientific discipline (cancer, parasitology, aging, etc.). This includes information on methodological approaches to measuring the principle components of motor fitness, and practical aspects of their enhancement by trainings regimes as well as by nutrition and the application of drugs. Such a wide range of entries, all written by leading experts in their respective fields, will therefore address both the basic/clinical scientist as well as the practitioner. Moreover, the Encyclopedia of Exercise Medicine is aimed at people in related fields, health care professionals, physiotherapists, trainers, students, informed athletes and interested laypersons. It is available both in print and as a fully searchable and hyperlinked electronic online edition.

**Blood Donor Selection**

Focuses on the macro- and micro-rheological behavior of blood and its formed elements, on interactions between the formed elements and blood vessel walls, and on the microvascular aspects of hemodynamics. This book provides a general overview of both basic science and clinical hemorheology and hemodynamics.

**Cardiovascular Hemodynamics for the Clinician**


**Hypertension in the Elderly**

Cardiovascular disease remains the major cause of morbidity and mortality throughout developed countries and is also rapidly increasing in developing countries. Cardiovascular medicine and the specialty of cardiology continue to expand, and the remit of the cardiologist is forever broader with the development of new sub-
specialties. The Oxford Handbook of Cardiology provides a comprehensive but concise guide to all modern cardiological practice with an emphasis on practical clinical management in many different contexts. This second edition addresses all the key advances made in the field since the previous edition, including interventional cardiology, electrophysiology, and pharmacology. It expands the remit to medical students and the more junior doctor while retaining the level of detail required by more senior practitioners within the field.

**Biofluid Mechanics**

There is no doubt that if the field of exercise physiology is to make further advancements. The various specialized areas must work together in solving the unique and difficult problems: of understanding how exercise is initiated, maintained and regulated at many functional levels, and what causes us to quit. Exercise is perhaps the most, complex of physiological functions, requiring the coordinated, integrated activation of essentially every cell, tissue and organ in the body. Such activation is known to take place at all levels - from molecular to systemic. Focusing on important issues addressed at cellular and systemic levels, this handbook presents state-of-the-art research in the field of exercise physiology. Each chapter serves as a comprehensive resource that will stimulate and challenge discussion in advanced students, researchers physiologists, medical doctors and practitioners. Authored by respected exercise physiologists from nineteen countries, each chapter has been significantly updated to provide up-to-date coverage of the topics and to offer complete descriptions of the many facets of the most physiological responses from a cellular to an integrative approach within individual body systems in normal and disease states and includes some chapters that are rarely addressed in exercise physiology books, such as the influence of exercise on endothelium, vasomotor control mechanisms, coagulation, immune function and rheological properties of blood, and their influence on hemodynamics. This book represents the first effort to provide such a work.

**Microfluidics and Nanofluidics Handbook**

Platelets are essential mediators of the physiologic process of hemostasis and pathologic thrombosis. While platelets do not interact with vascular walls under normal conditions, vascular injury or inflammation result in a coordinated series of events including platelet adhesion, aggregation, and promotion of coagulation. In this review, we describe the primary mechanisms involved in these responses in various vascular beds of both macro- and microvessels, and outline key unresolved aspects of these important interactions.

**Hemomath**

This book provides tabular and text data relating to normal and diseased tissue materials and materials used in medical devices. Comprehensive and practical for students, researchers, engineers, and practicing physicians who use implants, this book considers the materials aspects of both implantable materials and natural tissues and fluids. Examples of materials and topics covered include titanium, elastomers, degradable biomaterials, composites, scaffold materials for tissue engineering, dental implants, sterilization effects on material properties, metallic alloys, and much more. Each chapter author considers the intrinsic and interactive properties of biomaterials, as well as their appropriate applications and historical contexts. Now in an updated second edition, this book also contains two new chapters on the cornea and on vocal folds, as well as updated insights, data, and citations for several chapters.

**Handbook of Biomaterial Properties**

Proceedings of a NATO ARW held in Cargese, France, October 9-13, 1989

**Book Review Index**

Research centering on blood flow in the heart continues to hold an important position, especially since a better understanding of the subject may help reduce the incidence of coronary arterial disease and heart attacks. This book summarizes recent advances in the field; it is the product of fruitful cooperation among international scientists who met in Japan in May, 1990 to discuss the regulation of coronary blood flow.

**Red Blood Cell Aggregation**

This book illustrates applications of mathematics to various processes (physiological or artificial) involving flowing blood, including hemorheology, microcirculation, coagulation, kidney filtration and dialysis, offering a historical overview of each topic. Mathematical models are used to simulate processes normally occurring in flowing blood and to predict the effects of dysfunctions (e.g. bleeding disorders, renal failure), as well as the effects of therapies with an eye to improving treatments. Most of the models have a completely new approach that makes patient-specific simulations possible. The book is mainly intended for mathematicians interested in medical applications, but it is also useful for clinicians such as hematologists, nephrologists, cardio-surgeons, and bioengineers. Some parts require no specific knowledge of mathematics. The book is a valuable addition.
to mathematics, medical, biology, and bioengineering libraries.

**Handbook on Hyperbaric Medicine**

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