

Computed Tomography Of The Cardiovascular System

In the intervening 10 years tremendous advances in the field of cardiac computed tomography have occurred. We now can legitimately claim that computed tomography angiography (CTA) of the coronary arteries is available. In the evaluation of patients with suspected coronary artery disease (CAD), many guidelines today consider CTA an alternative to stress testing. The use of CTA in primary prevention patients is more controversial in considering diagnostic test interpretation in populations with a low prevalence to disease. However the nuclear technique most frequently used by cardiologists is myocardial perfusion imaging (MPI). The combination of a nuclear camera with CTA allows for the attainment of coronary anatomic, cardiac function and MPI from one piece of equipment. PET/SPECT cameras can now assess perfusion, function, and metabolism. Assessing cardiac viability is now fairly routine with these enhancements to cardiac imaging. This issue is full of important information that every cardiologist needs to now.

CT is an accurate technique for assessing cardiac structure and function, but advances in computing power and scanning technology have resulted in increased popularity. It is useful in evaluating the myocardium, coronary arteries, pulmonary veins, thoracic aorta, pericardium, and cardiac masses; because of this and the speed at which scans can be performed, CT is even more attractive as a cost-effective and integral part of patient evaluation. This book collates all the current knowledge of cardiac CT and presents it in a clinically relevant and practical format appropriate for both cardiologists and radiologists. The images have been supplied by an experienced set of contributing authors and represent the full spectrum of cardiac CT. As increasing numbers have access to cardiac CT scanners, this book provides all the relevant information on this modality. This is an extensive update of the previous edition bringing the reader up-to-date with the immense amount of updated content in the discipline.

Leading clinicians and researchers from around the world review the full scope of current developments, research, and scientific controversy regarding the principles and applications of cardiac CT. Richly illustrated with numerous black-and-white and color images, the book discusses the interpretation of CT images of the heart in a variety of clinical, physiological, and pathological applications. The authors emphasize current state-of-the-art uses of CT, but also examine developments at the horizon. They also review the technical basis of CT image acquisition, as well as tools for image visualization and analysis.

'Handbook of Cardiac CT' is a primer for the practical performance and interpretation of cardiovascular computed tomography. This manual serves as a companion to the textbook: 'Cardiac CT Imaging: Diagnosis of Cardiovascular Disease' and provides essential concise and practical text summary of each topic, with additional tables, algorithms, protocols and key images for orientation to and familiarization with important disease processes. This manual targets a reading audience who are in the training phase of performance and interpretation of cardiovascular CT and is designed as an easily accessible pocket reference.

Atlas of Cardiac CT, by Allen J. Taylor, MD, is a practical cardiac imaging reference that provides comprehensive coverage of all aspects of this modality. Inside you'll find user-friendly case-based structured sections that offer a brief clinical introduction, multiple CT images, highlights of strengths and pitfalls, brief commentary, and further suggested readings-equipping you with everything you need to know to obtain the best imaging results. Expert Consult functionality further enhances your reference power with convenient online access to the complete contents of the book-fully searchable-along with additional images and videos. Features a clinically oriented, case-based and evidence-based approach for coverage that you can readily apply in your daily practice. Offers the guidance of today's experts in cardiac CT, along with input of the editorial team behind Braunwald's Heart Disease, to ensure that you have only the best knowledge at your fingertips. Includes a final chapter, Which Modality for Which Disease, to help you determine the best imaging modality to use for a specific problem. Presents abundant high-quality images that clearly depict the use of cardiac CT and visually reinforce the text. Provides complete guidance on obtaining the best image quality possible and the avoidance of artifacts. Uses a consistent chapter format that makes it easy to find the information you need. Offers access to the complete contents online, fully searchable, along with additional images and videos, at expertconsult.com. 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. 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.

This book collates all the current knowledge of cardiac CT and presents it in a clinically relevant and practical textbook format appropriate for both cardiologists and radiologists. The images have been supplied by an experienced set of contributing authors and represent the full spectrum of cardiac CT. The field of Cardiovascular CT has experienced continued rapid evolution due to: 1) advances in technology, 2) expanded spectrum of cardiovascular applications and 3) significant growth in published data including large prospective multicenter studies. As increasing numbers have access to cardiac CT scanners, this book provides all the relevant information on this modality. This is an extensive update of the previous edition bringing the reader up-to-date with the immense amount of updated content in the discipline.

This new third edition of The ESC Textbook of Cardiovascular Medicine is a ground breaking initiative from the European Society of Cardiology that is transforming reference publishing in cardiovascular medicine in order to better serve the changing needs of the global cardiology community. Providing the evidence-base behind clinical practice guidelines, with in-depth peer-reviewed articles and broad coverage of this fast-moving field, both the print and digital publication are invaluable resources for cardiologists across the world. Overseen by Professors A. John Camm, Thomas F. Lüscher, Patrick W. Serruys, and Gerald Maurer, supported by an editorial board of subject experts, and more than 900 of the world's leading specialists from research and the clinic contributing, this dynamic encyclopaedic resource covers more than 63 disciplines within cardiology. Split into six key parts; Introduction to the cardiovascular system; Investigations; Heart diseases; Vascular disease; Special populations, and Other aspects of cardiology, providing readers with a trustworthy insight into all aspects of cardiovascular medicine. To respond nimbly to the rapid evolution of the field the digital publication, ESC CardioMed, is continuously updated by the author teams. With expert editors and authors, and stringent peer-review, the publication combines the discoverability of digital with the highest standards of academic publishing. Highly illustrated with embedded multi-media features, along with cross-referenced links to ESC Clinical Practice Guidelines, related content and primary research data in European Heart Journal, as well as all other major journals in the field, ESC CardioMed provides users with the most dynamic and forward thinking digital resource at the heart of cardiology. As a consistently evolving knowledge base, the ESC Textbook of Cardiovascular Medicine 3e together with the online counterpart ESC CardioMed, equips all those, from trainees and consultants, to device specialists and allied healthcare professionals with a powerful, multifaceted resource covering all aspects of cardiovascular medicine.

Recent years have seen a marked increase in cardiovascular computed tomography (CT) imaging, with the technique now integrated into many imaging guidelines, such as those published by ESC and NICE. Rapid clinical and technological progress has created a need for guidance on the practical aspects of CT image acquisition, analysis and interpretation. The Oxford Specialist Handbook of Cardiovascular CT, now revised for the second edition by practising international experts with many years of hands-on experience, is designed to fulfil this need. The Handbook is a practical guide on performing, analysing and interpreting cardiovascular CT scans, covering all aspects from patient safety to optimal image acquisition to differential diagnoses of tricky images. It takes an international approach to both accreditation and certification, highlighting British, European, and American examinations and courses. The format is designed to be accessible and is laid out in easy to navigate sections. It is meant as a quick-reference guide, to live near the CT scanner, workstation, or on the office shelf. The Handbook is aimed at all cardiovascular CT users (Cardiologists, Radiologists and Radiographers), particularly those new to cardiovascular

CT, although even the advanced user should find useful tips and tricks within.

This atlas is a comprehensive visual reference for the use of cardiovascular computed tomography (CT) containing photomicrographs, anatomic illustrations, tables, and charts paired with extensive legends and explanations that are supplemented by extensive research, peer-reviewed articles, and textbooks. In addition to providing historical perspective and current direction for CT, this new edition of *Atlas of Cardiovascular Computed Tomography 2e* focuses on research involving coronary artery diseases and anomalies, congestive heart failure, atherosclerotic plaques and asymptomatic disease, as well as imaging techniques, including preparation, acquisition, and processing, involving the great vessels and carotids, the peripheral vasculature, and coronary and pulmonary veins. The increasing role of CT in the emergency room and in private cardiology practice is also reviewed thoroughly, making this an essential read for all involved in cardiac imaging, cardiology and emergency medicine.

This is the first major textbook to address both computed tomography (CT) and magnetic resonance (MR) cardiac imaging of adults for the diagnosis and treatment of congenital heart disease (CHD). Since the introduction of faster CT scanners, there has been tremendous advancement in the diagnosis of CHD in adults. This is mostly due to the higher spatial resolution of CT compared to MR, which enables radiologists to create more detailed visualizations of cardiac anatomic structures, leading to the discovery of anomalous pathologies often missed by conventional MR imaging. This book is unique in highlighting the advantages of both CT and MR for the diagnosis of CHD in adults, focusing on the complementary collaboration between the two modalities that is possible. Chapters include discussions of case examples, clinical data, MR and CT image findings, and correlative cadaveric pictures. The chapters focus not only on the diagnosis of the primary problem, but also give readers information on visual clues to look for that often reveal associated pathologies. This book appeals primarily to diagnostic and interventional radiologists, as well as cardiologists and interventional cardiologists.

This book serves as a comprehensive guide to pediatric cardiac computed tomography (CT), particularly for patients with congenital heart disease. Congenital heart disease (CHD) is the leading cause of congenital abnormalities (8/1000 of live births). Over the past two decades, the diagnostic medical approach has significantly changed with a considerable increase in the number of CT studies in pediatric patients. Preoperative surgical or interventional planning for children with CHD remains crucial and challenging, but despite this and the advancement in the development of new CT techniques and radiation dose reduction methods, there are limited books addressing pediatric cardiac CT. This work fills that gap by offering a complete look at the techniques and clinical utilization for pediatric cardiac CT with liberal use of images. The text begins with overarching themes of pediatric cardiac CT, like its advantages and techniques, and moves into covering different areas of the heart and possible presentations, like atrioventricular connections and cardiac tumors. Each chapter begins with a short introduction section followed by preoperative and postoperative cardiac CT imaging, management approach, and short-term and long-term outcomes. This book also describes the novel technologies being used for three-dimensional modelling and three-dimensional printing in the surgical preparation of patients with complex congenital heart disease. This book is the first to address pediatric cardiac CT image fusion to fluoroscopy to guide cardiac catheterization in patients with complex congenital heart disease. Radiation dose reduction during cardiac catheterization is also an important part of diagnostic and interventional cardiac catheterization that is covered in detail. The book concludes with an overarching look of the role cardiac CT plays in the pre- and post-operative evaluation of congenital heart disease in children. This book is an ideal guide for pediatric radiologists, pediatric cardiologists, pediatric cardiothoracic surgeons, related trainees, and any physician interested in advanced cardiac imaging.

This is the first textbook in DECT focussing especially on the cardiovascular field. DECT was developed many years ago but has recently spread its clinical utility. Many new applications have been developed over the last years and the cardiovascular system has benefited from these advances. New protocols will be used in the near future which will help to optimize results obtained until now with single energy CT, such as a more precise quantification of coronary artery stenosis using either different monochromatic levels or material decomposition, reduction of beam hardening artifacts in perfusion studies and optimizing endovenous contrast, among others.

CT is an accurate technique for assessing cardiac structure and function, but advances in computing power and scanning technology have resulted in increased popularity. It is useful in evaluating the myocardium, coronary arteries, pulmonary veins, thoracic aorta, pericardium, and cardiac masses; because of this and the speed at which scans can be performed, CT is even more attractive as a cost-effective and integral part of patient evaluation. This book collates all the current knowledge of cardiac CT and presents it in a clinically relevant and practical format appropriate for both cardiologists and radiologists. The images have been supplied by an experienced set of contributing authors and represent the full spectrum of cardiac CT. As increasing numbers have access to cardiac CT scanners, this book provides all the relevant information on this modality.

Obtaining and interpreting images of the heart is critical to the successful management of any cardiac disorders. Several imaging modalities are used to help cardiologists correctly diagnose these disorders and initiate the most appropriate form of treatment. Since the first publication of this book, the use of cardiovascular CT imaging has increased exponentially. Revised and updated, *Cardiac CT Made Easy: An Introduction to Cardiovascular Multidetector Computed Tomography, Second Edition** captures these advances in CT scanner technology and clinical experience. For the first time, this new edition includes online access to imaging video clips. Combining the expertise of leading cardiovascular imaging groups in North America, Europe, and Asia, this second edition continues to serve as a comprehensive introduction to the field. It focuses on the principles of multidetector computed tomography (MDCT) for cardiovascular applications, practical aspects of scan acquisition and interpretation, clinical indications and imaging protocols, and clinical findings of common cardiovascular disease conditions. The book is an essential resource for those new to the

field and a trustworthy reference for those needing answers to specific questions or looking to update their knowledge.

*Now includes an identical eBook version from VitalSource with access to video material

A Doody's Core Title 2012 New applications of echocardiography, nuclear magnetic resonance, cardiovascular magnetic resonance, and cardiac computed tomography are rapidly developing and it is imperative that trainees and practitioners alike remain up to date in the latest developments. It is becoming increasingly difficult to remain abreast of these advances in each individual modality and thus it is no longer practical to focus on one at a time. In addition, training guidelines are changing and multimodality training has become the norm. Multimodality Imaging in Cardiovascular Medicine presents a clear and in-depth review of the available technologies and evidence supporting their appropriate clinical applications. Hundreds of outstanding images are included to support and augment the discussions from the leading experts in each modality. For maximum clinical value, rather than organize the content by imaging modality, the book is organized by disease so that the reader can utilize the book in real-time problem solving and decision making in daily clinical practice. Features of Multimodality Imaging in Cardiovascular Medicine Include More than 350 multimodality imaging examples of cardiovascular pathophysiology Corresponding text places the images into context at the interface with patient care State-of-the-art chapters contributed by the leading imaging experts

Computed tomography of the heart and cardiovascular system continues to show an impressive and tremendously successful development. Technical improvements translate into new applications and enhanced diagnostic accuracy and the new diagnostic opportunities may potentially be beneficial for many individuals with known or suspected cardiovascular dis

Updated to reflect the notable advances in cardiac computed tomography (CT) imaging, the Second Edition of the best-selling Computed Tomography of the Coronary Arteries provides cardiologists and radiologists with a practical text that explains the basic principles and applications of CT. Written by renowned international experts in the field, this

Cardiac catheterization and coronary angiography remain key tools in the management of patients with coronary heart disease. Although this is the most frequently used method of coronary revascularization, general training in cardiology rarely offers more than the opportunity to assist a more senior operator to perform angioplasty procedures. This textbook, covering key procedures and fully revised and updated to include the latest trials, technology, and new techniques, is essential reading. The Oxford Textbook of Interventional Cardiology, 2nd edition spans the whole spectrum of interventional cardiology procedures, including a novel section on the future of interventional cardiology, and multiple new chapters covering special devices in percutaneous coronary intervention. Written by an expert team of international authors, this book offers guidance on all aspects of interventional cardiology according to the European curriculum, and covers the evidence-based guidelines for a comprehensive view of the field. This second edition adheres to the guiding principles of the first edition while serving as a useful and up to date manual on the theory, performance and application of CCTA. Since the publication of the first edition of this work, cardiac CT angiography (CCTA) has come a long way. It is now a main stream, well established cardiac diagnostic imaging modality with wide spread acceptance and application.

This careful revision keeps pace with developments in the field, with new chapters on PET Metabolism, CT and MRI in the Emergency Department, Image-Guided Electrophysiology Mapping and Ablation, and Identification of Vulnerable Atherosclerotic Plaque by Radionuclide and CT techniques, plus the introduction of new contributors Udo Hoffman and Stephan Achenbach. Praised in its previous edition as a concise source of essential information, this new edition presents the most recent information in an accessible format and serves as an excellent reference source for all cardiologists, radiologists and nuclear medicine physicians.

Technologic advances in imaging now allow cardiologists to diagnose, noninvasively, a wide range of cardiac disorders, from subclinical atherosclerosis to obstructive coronary artery disease. This 500+ Question & Answer review book serves as the board prep product for all cardiologists/fellows/radiologists interested in certifying in this rapidly expanding area. All aspects of cardiovascular CT principles and physics, methodologies, and clinical practice are covered. Features Include: • Cost-effective board preparation; • MCQs that mimic the CCT boards; • Review questions in CT physics, study acquisition, and interpretation; • Online access to video clips and over 500 Q&As.

Based on advances in scanner and software technology, cardiovascular imaging with multidetector computed tomography (MDCT) is developing into an important clinical diagnostic tool for cardiac disease. Combining the in-depth coverage of a text with the diagnostic utility of a manual, Cardiac CT Made Easy: An Introduction to Cardiovascular Multidetector Computed Tomography provides a simple introduction to the principles of MDCT for cardiovascular applications from the perspective of the CT technologist as well as the clinician. Covering the essential topics in a detailed manner, this volume: Reviews the technical principles of CT Discusses characteristics of the normal heart as well as clinical cardiovascular indications Focuses on clinical manifestations of disease, diagnostic criteria, and options for management Reviews major anti-arrhythmic drugs and new agents coming into use Discusses clinical applications in comparison with other imaging modalities-- clarifying the strengths and the limitations of CT in the assessment of specific clinical problems Explores current standard applications such as imaging of the aorta, as well as emerging areas for coronary artery imaging Contains a large number of selected images to place the material in context Practical and fully up to date, this is an essential book for cardiovascular clinicians and technologists using CT imaging technology, cardiac specialists and nurses, and imaging physicists.

Spectral, Photon Counting Computed Tomography is a comprehensive cover of the latest developments in the most prevalent imaging modality (x-ray computed tomography (CT)) in its latest incarnation: Spectral, Dual-Energy, and Photon Counting CT. Disadvantages of the conventional single-energy technique used by CT technology are that different materials cannot be distinguished and that the noise is larger. To address these problems, a novel spectral CT concept has been proposed. Spectral Dual-Energy CT (DE-CT) acquires two sets of spectral data, and Spectral Photon Counting CT (PC-CT) detects energy of x-ray photons to reveal additional material information of objects by using novel energy-sensitive, photon-counting detectors. The K-edge imaging may be a gateway for functional or molecular CT. The book covers detectors and electronics, image reconstruction methods, image quality assessments, a simulation tool, nanoparticle contrast agents, and clinical applications for spectral CT. Written by internationally eminent experts in cardiovascular imaging, this volume provides state-of-the-art information on the use of

MRI and CT in the assessment of cardiac and vascular diseases. This third edition, now in four-color, reflects recent significant advances in cardiovascular MRI technology and the continuing emergence of multi-detector CT as an important diagnostic modality, particularly for ischemic heart disease. Seven new chapters have been added including chapters on anatomy, cardiovascular MR in infants/children, assessing myocardial viability, risk assessment in ischemic heart disease and MR guidance. Principles of Cardiac and Vascular Computed Tomography has everything you need to successfully obtain and interpret CT and CTA images. Stuart J. Hutchison—a premier cardiac imaging specialist—explains the dos and don'ts of CCT so you get the best images and avoid artifacts. Get only the coverage—from evidence-based CTA to noncoronary lesions—you need with clinically oriented, practical information presented in a consistent format that makes finding everything quick and easy. High-quality images and access to the text and more at Expert Consult makes this the one cardiovascular computed tomography resource that has it all. Access videos of CTA procedures at Expert Consult. Get only the coverage that you need—from evidence-based CTA to determination of coronary calcium to noncoronary lesions—from focused, clinically oriented, and practical information. Obtain the best image quality and avoid artifacts through instructions on how to and how not to perform cardiovascular computed tomography. Gain a clear visual understanding through high-quality images—many in color—that reinforce the quality of information in the text. Master probe settings and measurements using numerous tables with useful values and settings. Find information easily thanks to a consistent format.

Acquire a thorough understanding of cardiac imaging! "I believe radiologists, cardiologists, and clinicians, as well as trainees, will find *The Complete Guide to Cardiac CT* to be an indispensable tool for learning the subject matter....It is practical in approach, but is solidly grounded in evidence-based medicine with a comprehensive review of the literature and timely references. The textbook provides an ideal resource for the cardiac imager and serves as an exceptional reference tool for understanding the anatomy and disease processes of the heart and coronary circulatory systems."--Theresa C. McLoud, MD, Dept. of Radiology, Massachusetts General Hospital, and Professor of Radiology, Harvard Medical School (from the foreword) Based on the popular review courses of educator and radiologist Dr. Simeon Abramson, *The Complete Guide to Cardiac CT* is a timely, hands-on learning tool—one that will help you master every important aspect of cardiac CT, from acquisition to interpretation. This unique guide translates complex concepts and topics into understandable, relevant subject matter and includes contributions from international leaders in cardiac CT. Designed for the practical, day-to-day application of cardiac CT, the text also serves as a comprehensive visual resource more than 1000 laser-precise images and illustrations, all of which reflect the latest clinical acumen and cardiac imaging technology.

FEATURES Focuses on the recognition, identification, and comprehension of heart and coronary circulatory pathology Valuable to clinicians at any experience level Logical 4-part organization consists of: Technology section that encompasses coronary CT angiography technique, radiation concepts, and successful application of radiation dose reduction tools—plus a detailed review of strategies for overcoming suboptimal examinations, complete with case examples. Coronary Arteries section that thoroughly examines plaque detection and characterization, stenosis assessment, stents and bypass grafts, and assessment of coronary artery anomalies. Beyond the Coronary Arteries details cardiac CT anatomy; myocardial, pericardial and valvular pathology; electrophysiology applications; and congenital heart disease in both pediatric and adult populations. Controversial topics focuses on the utilization of cardiac CT in the acute setting, institution of the triple rule-out protocol, and anatomic versus physiologic imaging with Rubidium PET/CT/ Helpful pedagogy includes numerous tables, diagrams, figures, and illustrations

Cardiovascular medicine has witnessed significant progress over the past century, incorporating the technical advances of each era to improve patient care. The introduction of the stethoscope, electrocardiography, roentgenography, angiography, invasive hemodynamics, ultrasonography, nuclear scintigraphy, and magnetic resonance have each, in turn, allowed progressively greater accuracy and precision in the diagnosis and treatment of cardiovascular disease. The advent of multidetector computed tomography (MDCT) using 64 detector rows provides the next leap forward in cardiovascular care by delivering on the promise of high-resolution visualization of cardiovascular structure and function noninvasively. *Cardiovascular Multidetector CT Angiography* demonstrates the clinical context within which this technology is useful for individual patient assessment, providing the technical information needed to perform cardiovascular CTA and focusing on the spectrum of clinical applications. Written by acknowledged experts in the CTA arena, the book contains an abundance of 64-slice images—the highest technical resolution available—to identify disease states. Topics covered include normal cardiac anatomy, abnormal coronary arteries, coronary anomalies, artifacts, left and right ventricular function and abnormalities, valvular heart disease, pericardium, and the aorta. The book also discusses cardiac masses, cardiac veins, peripheral artery disease, and congenital heart disease. Demonstrating the application of cardiovascular multidetector computed tomography from the perspective of patient care, the book is composed entirely of case studies—an excellent format for teaching those just beginning to work with CTA. The book is designed for cardiologists and radiologists alike, as well as primary care physicians, medical students, and other health care professionals who have the opportunity to use this technology to improve diagnosis and treatment for their patients with cardiovascular disease.

Cardiac computed tomography (CT) has become a highly accurate diagnostic modality that continues to attract increasing attention. This extensively illustrated book aims to assist the reader in integrating cardiac CT into daily clinical practice, while also reviewing its current technical status and applications. Clear guidance is provided on the performance and interpretation of imaging using the latest technology, which offers greater coverage, better spatial resolution, and faster imaging while also providing functional information about cardiac diseases. The specific features of scanners from all four main vendors, including those that have only recently become available, are presented. Among the wide range of applications and issues discussed are coronary calcium scoring, coronary artery bypass grafts, stents, and anomalies, cardiac valves and function, congenital and acquired heart disease, and radiation exposure. Upcoming clinical uses of cardiac CT, such as hybrid imaging, preparation and follow-up after valve replacement, electrophysiology applications, myocardial perfusion and fractional flow reserve assessment, and plaque imaging, are also explored.

Advances in Cardiac Imaging presents the latest information on heart disease and heart failure, major causes of death among western populations. In addition, the text explores the financial burden to public healthcare trusts and the vast amount of research and funding being channeled into programs not only to prevent such diseases, but also to diagnose them in early stages. This book provides readers with a thorough overview of many advances in cardiac imaging. Chapters include technological developments in cardiac imaging and imaging applications in a clinical setting with regard to detecting various types of heart disease. Presents a thorough overview of cardiac imaging technology Addresses specific applications for a number of cardiac diseases and how they can improve diagnoses and treatment protocols Includes technological developments in cardiac imaging

and imaging applications in a clinical setting

Accompanying DVD-ROM contains ... "high-quality three-dimensional displays of cardiac anatomy and more than 100 cine displays of cardiac function in real clinical applications."--Page 4 of cover. Fuller description of DVD-ROM contents on pp. ix-xi.

Computed tomography (CT) is seen increasingly to play a pivotal role in cardiovascular imaging, although a relatively new imaging technique compared to traditional methods of angiography. The flexibility, availability and clinical robustness of CT allows a comprehensive assessment of the patient's vasculature that can be matched only by more risky invasive procedures. The concept applies to all vascular regions of the human body, but, in particular, cardiac CT angiography is viewed as the potential modality of choice for primary cardiovascular risk stratification. This book presents the reader with a thorough grounding in the basics of cardiac CT, with particular reference to coronary artery disease. It is primarily a practical guide, reviewing basic techniques, optimization, data handling and reporting. The atlas is grounded firmly in a clinical context, comprehensively illustrated throughout and using detailed case studies to demonstrate the role of cardiac CT in a wide variety of clinical settings. This atlas is an essential reference for the hospital radiology department and for the trainee.

This book is a comprehensive and richly-illustrated guide to cardiac CT, its current state, applications, and future directions. While the first edition of this text focused on what was then a novel instrument looking for application, this edition comes at a time where a wealth of guideline-driven, robust, and beneficial clinical applications have evolved that are enabled by an enormous and ever growing field of technology. Accordingly, the focus of the text has shifted from a technology-centric to a more patient-centric appraisal. While the specifications and capabilities of the CT system itself remain front and center as the basis for diagnostic success, much of the benefit derived from cardiac CT today comes from avant-garde technologies enabling enhanced visualization, quantitative imaging, and functional assessment, along with exciting deep learning, and artificial intelligence applications. Cardiac CT is no longer a mere tool for non-invasive coronary artery stenosis detection in the chest pain diagnostic algorithms; cardiac CT has proven its value for uses as diverse as personalized cardiovascular risk stratification, prediction, and management, diagnosing lesion-specific ischemia, guiding minimally invasive structural heart disease therapy, and planning cardiovascular surgery, among many others. This second edition is an authoritative guide and reference for both novices and experts in the medical imaging sciences who have an interest in cardiac CT.

This up-to-date textbook comprehensively reviews all aspects of cardiac CT and MRI and demonstrates the value of these techniques in clinical practice. A wide range of applications are considered, including imaging of atherosclerotic and non-atherosclerotic coronary artery disease, coronary revascularization, ischemic heart disease, non-ischemic cardiomyopathy, valvular heart disease, cardiac tumors, and pericardial disease. The numerous high-quality images illustrate how to interpret cardiac CT and MRI correctly for the purposes of diagnosis, treatment planning, and follow-up. Helpful summarizing sections in every chapter will facilitate rapid retrieval of information. This book will be of great value to radiologists and cardiologists seeking a reliable guide to the optimal use of cardiac CT and MRI in real clinical situations. An additional feature is the provision of QR codes allowing internet access to references, further figures, and motion pictures. The reader will be able to enjoy this book using a smartphone or tablet PC.

This open access book focuses on diagnostic and interventional imaging of the chest, breast, heart, and vessels. It consists of a remarkable collection of contributions authored by internationally respected experts, featuring the most recent diagnostic developments and technological advances with a highly didactical approach. The chapters are disease-oriented and cover all the relevant imaging modalities, including standard radiography, CT, nuclear medicine with PET, ultrasound and magnetic resonance imaging, as well as imaging-guided interventions. As such, it presents a comprehensive review of current knowledge on imaging of the heart and chest, as well as thoracic interventions and a selection of "hot topics". The book is intended for radiologists, however, it is also of interest to clinicians in oncology, cardiology, and pulmonology.

Seminar paper from the year 2011 in the subject Medicine - Other, grade: 1,3, University of Applied Sciences Ulm (Informatik), course: Medizinische Bildverarbeitung, language: English, abstract: This paper introduces into the essentials of computed tomography and gives a brief lead-in to Cardiac CT, which is the clinical application of computed tomography in cardiac imaging. At first, the usage of X-rays is explained and the resulting main task of a CT scanner: The reconstruction of a three-dimensional image from the X-ray shadows, that are captured by the digital radiation detector unit. This reconstruction problem is known as the inverse problem in mathematics, which was initially solved by Johann Radon. Transferred to the field of computed tomography, the inverse problem means the definition of a volume dataset by reconstruction algorithms like for instance the Fourier Transform, which is shortly introduced, as well as the filtered backprojection. The main issue of Cardiac CT is the steady movement of the heart and chest of an examined patient. To ensure high image quality the scanner is triggered by a concurrently recorded ECG. ECG Triggering can ensure that the scanner only captures images during the phases of the heartbeat, where movement is minimal. One major application of Cardiac CT is non-invasive coronary angiography, which possibly could substitute invasive diagnostic surgeries like cardiac catheterization of non-emergency patients.

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Obtaining and interpreting images of the heart is critical to the successful management of any cardiac disorders. Several imaging modalities are used to help cardiologists correctly diagnose these disorders and initiate the most appropriate form of treatment. Since the first publication of this book, the use of cardiovascular CT imaging has increased. Cardiovascular and Coronary Artery Imaging, Volume One covers state-of-the-art approaches for automated non-invasive systems in early cardiovascular disease diagnosis. The book includes several prominent imaging modalities, such as MRI, CT and PET technologies. A special emphasis is placed on automated imaging analysis techniques, which are important to biomedical imaging analysis of the cardiovascular system. This is a comprehensive, multi-contributed reference work that details the latest developments in spatial, temporal and functional cardiac imaging. Takes an integrated approach to cardiovascular and coronary imaging, covering machine learning, deep learning and

reinforcement learning approaches Covers state-of-the-art approaches for automated non-invasive systems for early cardiovascular disease diagnosis Provides a perspective on future cardiovascular imaging and highlights areas that still need improvement

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