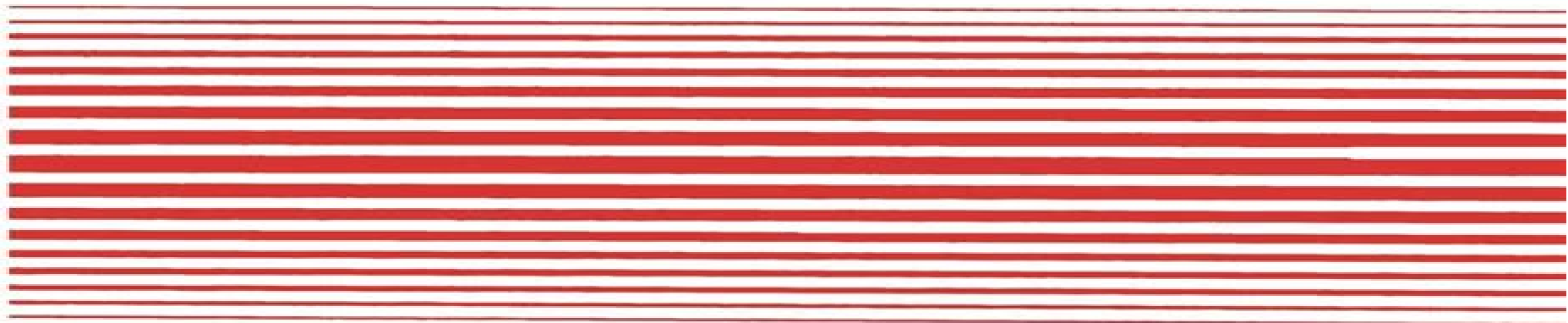


# **NEW DEVELOPMENTS IN QUANTITATIVE CORONARY ARTERIOGRAPHY**

edited by  
**J.H.C. Reiber and P.W. Serruys**



# New Developments In Quantitative Coronary Arteriography

**A. L. Baert, F. H. W. Heuck**



## **New Developments In Quantitative Coronary Arteriography:**

**New Developments in Quantitative Coronary Arteriography** Johan H. C. Reiber, P.W. Serruys, 2012-12-06 There are few techniques that have influenced therapeutic strategies in modern cardiology to a similar extent as coronary arteriography. Bypass surgery as well as transluminal coronary angioplasty would not have been possible without coronary angiography serving as a midwife in their evolution. Despite the widespread and long standing use in clinical practice however the interpretation of coronary angiograms has not changed very much since the early days. Most angiograms are still reviewed in a visual and semi quantitative and thus often very subjective way. In the face of an almost exploding field for interventional catheterization including thrombolysis balloon dilatation and other rapidly evolving techniques for transluminal revascularization or recanalization a more detailed and quantitative analysis of coronary arteriograms is urgently required. In addition to the delineation of coronary morphology we need dynamic and functional information about flow and perfusion to understand the physiological significance of anatomic abnormalities. Coronary arteriography contains and can provide most of this information. With the application of appropriate techniques it can be made available in the catheterization laboratory even during the patient's investigation thus facilitating and improving clinical decision making. Objective and reproducible analysis will furthermore enhance our understanding about the pathophysiology of coronary disease. Advances in

Quantitative Coronary Arteriography Johan H. C. Reiber, P.W. Serruys, 2012-12-06 In this fourth book in the series on quantitative coronary arteriography QCA with the earlier three volumes published in 1986 1988 and 1991 the latest developments in this exciting field are covered. Both the methodological and clinical application aspects of these advances are presented in a comprehensive manner in a total of 37 chapters by world renowned experts. The book is subdivided into a total of eight parts beginning with the more methodological issues such as QCA and other modalities 3 chapters cine film versus digital arteriography 3 chapters quality control in QCA 4 chapters and coronary blood flow and flow reserve 3 chapters. Since QCA has been well established as the technique for the assessment of regression and progression in atherosclerotic disease and of restenosis after recanalization procedures major clinical trials in both groups are described extensively by their principal investigators in a total of 11 chapters. In addition the QCA results after the application of various recanalization techniques are presented in another eight chapters. In the last part the experiences with various intracoronary prostheses with the emphasis on QCA are discussed in five chapters. This large increase in application oriented chapters means that QCA is well alive and gaining momentum. Although the accuracy and precision of the analytical methods steadily improve with the increasing complexity of the algorithms there is still always the human factor involved in these processes in terms of frame selection segment definition etc. **Quantitative Coronary Arteriography** Johan H. C.

Reiber, P.W. Serruys, 2012-12-06 In June 1989 a third conference concentrating on the progress in quantitative coronary angiography and related techniques was held in Rotterdam again very successful as the two preceding events in 1985 and

1987 Technical as well as clinical aspects of digital and digitized coronarography morphometry parametric imaging and functional quantification of the human coronary circulation were presented and discussed by prominent exponents of those groups who have been active in this particular field for many years This book contains the chapters representing the lectures held by leading experts during the symposium that update the knowledge currently available including most recent aspects in angioscopy and intravascular ultrasound imaging It also includes a historical review on the development of angiographic techniques from the very early days on to our times given by one of the pioneers in heart catheterization and angiography Dr Kurt Amplatz Those who had the chance to listen to his talk will surely remember his impressive humorous lecture as one of the highlights of this meeting

*Current Catalog* National Library of Medicine (U.S.), First multi year cumulation covers six years 1965-70

**Cardiovascular Medicine** James T. Willerson, Jay N. Cohn, Hein J.J. Wellens, David R. Holmes, 2007-12-06 This book offers the most up to date user friendly guidance on the evaluation diagnosis and medical and surgical treatment of heart and vascular disease The book and DVD package is designed to provide comprehensive coverage of every aspect of cardiovascular medicine The book has consistent chapter organization relevant to modern cardiovascular practice clear design and engaging text The reader will have all the guidance to diagnose and manage the full range of cardiovascular conditions in one textbook resource while also benefiting from access to additional video material from the integral DVD ROM This includes over 100 individual heart sounds

*Coronary Artery Disease* James T. Willerson, David R. Holmes, Jr., 2015-03-11 Cardiovascular Medicine Coronary Artery Disease will offer today's most up to date user friendly guidance on the evaluation diagnosis and medical and surgical treatment of this most important aspect of cardiovascular disease and will be on the wish list for every trainee and practising cardiologist cardiac surgeon vascular surgeon diabetologist cardiac radiologist and any physician who manages cardiac patients The book is dedicated to providing comprehensive coverage of every aspect of coronary arterial medicine from cardiac signs and symptoms through imaging and the genetic basis for coronary disease to surgery interventions treatment and also to preventive cardiology The Editor and a group of contributing world authorities offer their decades of scientific and clinical experience A major selling point is the consistent chapter organization clear design and engaging text that includes user friendly features such as tables lists and treatment boxes The reader will have all the guidance to diagnose and manage a full range of conditions in a series of textbook resources while also having access to additional video material from the integral website

**Lipid-Lowering Therapy and Progression of Coronary Atherosclerosis** A.V. Bruschke, Johan H. C. Reiber, K.J. Lie, Hein J.J. Wellens, 2012-12-06 A unique overview of all major angiographic lipid intervention trials presented by their principal investigators Basic mechanisms and methodological aspects including biochemical as well as angiographic aspects are discussed by experts in these fields A careful comparison of all available data permits an analysis to be made of what may currently be considered proved which aspects merit further investigation and which hypotheses should be rejected Audience Clinicians involved in the practice of lipid lowering and

investigators involved in lipid lowering clinical trials Scientists involved in other areas of lipid research and investigators conducting coronary angiographic trials designed to study the influence of different interventions will find a wealth of information and practical guidelines in this book

**State of the Art in Quantitative Coronary Arteriography** Johan H. C. Reiber, P.W. Serruys, 2012-12-06 Over the past twenty years technical advances in coronary arteriography have contributed to our understanding of the pathophysiologic aspects and natural history of coronary artery disease Probably more than 700 000 coronary arteriograms are performed annually throughout the world Usually these arteriograms are interpreted visually to determine the morphologic extent and severity of coronary artery disease These subjective determinations which are hampered by relatively large intra and interobserver variations are used as a basis for critically important therapeutic decisions Which arteries are to be revascularized which lesions are suitable for coronary bypass surgery or for percutaneous coronary angioplasty To improve on this clinical decision making on the treatment and follow up of such patients new objective and reproducible techniques for the assessment of the extent and severity of coronary artery disease both in terms of anatomy and functional significance of the lesions must be made widely available With such new procedures and technologies the efficacy of new therapeutic procedures the effects of vasodilating and constricting drugs and the results of long term studies on the regression and progression of atherosclerotic plaque can be determined in an objective and cost effective manner

**What's New in Cardiovascular Imaging?** Johan H. C. Reiber, Ernst E. van der Wall, 2012-12-06 What's New in Cardiovascular Imaging is a bibliographical image of a Symposium held June 22-24 1998 in Leiden the Netherlands At this Symposium all the major advances in cardiovascular imaging in all the cardiovascular imaging modalities X-ray intravascular ultrasound magnetic resonance scintigraphy and CT were addressed by the leading authorities in this field Based on the presentations of the invited Faculty this book consists of a compilation of manuscripts related to most of the topics discussed at this particular meeting We express our gratitude to all authors and coauthors for having made great efforts in preparing their superb up to date chapters under a great time pressure so that this book was available at the time of the Symposium The authors are all excellent investigators in one or more fields of cardiovascular imaging and they have stimulated progress in cardiovascular imaging with the aim to improve patient care and clinical research This book consists of a total of 32 chapters subdivided into seven Parts Each part describes a particular field in cardiovascular imaging These Parts are Coronary quantitation by QCA and intracoronary ultrasound QCU angiographic trials progress in intravascular ultrasound magnetic resonance MR coronary and vascular imaging nuclear cardiovascular imaging echocardiography and cine and spiral CT coronary imaging In general each Part begins with a chapter that provides a broad overview of the advances in the field described in that particular Part as well as a view towards the future

Cardiac Arrhythmias, Pacing & Electrophysiology P.E. Vardas, 2012-12-06 Europace 97 was held in Athens Greece on 8-11 June Leads were as usual an important topic with the earliest mention of the then

new polyurethane leads Future Though now held in modern surroundings and meeting conferences elaborated on these basic topics while providing facilities the influence of the ancient city state was ungressively adding sensors and sensor function dual mistakable with the architecture and learning of antiquity chamber pacing and recognising the development of looming over the city by its influence over the intellectual clinical cardiac electrophysiology activities of the symposium The ancient magnificence of Clinical cardiac electrophysiology and comprise the site was matched by the novelty of modern art and extension of arrhythmias has been largely a development science Europe is a European symposium begun in of the twentieth century With the description and 1979 and has occurred every second year since Con recording of the bundle of His depolarisation by direct system with its importance and continental reach the actual access and by catheter modern clinical investigation of symposium has moved to different cities throughout arrhythmias and cardiac electrophysiology began The Western Europe The first symposium was held in London disciplines of cardiac stimulation and of investigation of and subsequent symposia have been held in Torremolinos arrhythmias impulse formation and A V conduction Ostend Florence Istanbul and other cities Because of the were essentially separate for many years

**National Library of Medicine Current Catalog** National Library of Medicine (U.S.),1987

**Frontiers in European Radiology** A. L. Baert,F. H. W. Heuck,2012-12-06 Contents Abdominal and Thoracic Magnetic Resonance Angiography Challenges Technical Approaches and First Clinical Applications H U Kauczor R Hausmann W Semmler Magnetic Resonance Spectroscopy of Skeletal Muscle F Tr ber W A Kaiser G Layer C Kuhl M Reiser Hepatic Tumors Relaxometry and Quantitative Tissue Characterization with Magnetic Resonance Imaging A Steudel F Tr ber M Reiser Liver Specific Particulate Contrast Agents An Overview I Ivancev A Lunderquist Contrast Medium Induced Nephropathy Animal Experiments H S Thomsen et al Rheological Properties of Blood after Diagnostic Cardiac Catheterisation with Iopromide R Bach et al Color Coded Doppler Sonography of the Male Urethra During Voiding New Observations of Flow in an Aqueous Medium and Their Physical Foundations P H bsch F Hager E Benes Development of a Model of Arterial Stenosis Analysis Using Digital Subtraction Angiography A Parametric Study of Image Quality C Renaudin I Magnin A Amiel Arterial Calcifications in Thoracoabdominal Computer Tomography Frequency and Correlation with Risk Factors and Cardiovascular Diseases J Grich et al

**Vascular Diagnostics** Peter Lanzer,Josef Rösch,2012-12-06 In the past few years the most exciting advances have occurred in vascular diagnostics First of all well established techniques like ultrasound have been further refined and developed intravascular ultrasound Furthermore diagnostic investigations could be linked to treatment itself More and more interventional techniques the most popular is still percutaneous transluminal angioplasty PTCA have been introduced into daily routine Radiologists and cardiologists are working more and more together a fact which is reflected by the international group of experts bringing here the knowledge from both fields together for the first time

**Molecular Physiology and Pharmacology of Cardiac Ion Channels and Transporters** M. Morad,S. Ebashi,W. Trautwein,Yoshihisa Kurachi,2012-12-06 Knowledge of cardiac ion channels and transporters has advanced

remarkably in the last two decades with the development of patch clamp and molecular biological techniques This textbook offers a comprehensive overview of structures and functions of ion channels and transporters in the heart Readers are first introduced to the molecular biology and electrophysiology of all the important ion channels After discussing their developmental changes the pharmacology and pathophysiology of clinically relevant ion channels are reviewed Molecular aspects of the cardiac excitation contraction coupling and intracellular  $Ca^{2+}$  regulation by ion transporters are also described The book will be useful to electrophysiologists cardiac physiologists and pharmacologists and molecular biologists interested in ion channels at all levels For research specialists the book will provide a perspective of the field The book can be used as a reference source for working scientists in the fields of ion channels biophysics cardiac electrophysiology and pharmacology It is aimed at graduate and medical students designed for use as a textbook for graduate and medical courses

*Coronary Radiology* Matthijs Oudkerk, 2013-06-29 Due to the enormous progress in multidetector CT technology as well as in magnetic resonance angiography non invasive coronary imaging has matured to become a clinical tool in daily radiologic practice Therefore this book is a timely addition to the series Medical Radiology Diagnostic Imaging This is the most comprehensive and up to date work on all aspects of non invasive visualization of the coronary arteries that is currently available The very latest developments in the field are all described in this superbly illustrated volume I am very much indebted to the editor of this volume Professor M Oudkerk a well known international expert in cardiac radiology for his immense dedication and his tireless efforts to prepare and edit this outstanding volume in such a short time I would like to congratulate him and the contributing authors all selected for their exceptional expertise on the superb quality of the different chapters and the wide range of topics covered This work will be a daily source of reference for all radiologists and cardiologists involved in non invasive coronary imaging and will provide a solid base of information for those taking their first steps in this fascinating field I am confident that this outstanding volume will meet considerable success with the readership of our series

Quantitative Coronary Angiography in Clinical Practice P.W. Serruys, D.P. Foley, Pim J. de Feyter, 2013-04-17 Quantitative coronary angiography has become an invaluable tool for the interventional cardiologist providing objective and reproducible measurements of coronary artery dimensions which can be used to study progression or regression of coronary atherosclerosis as well as the immediate and long term effects of percutaneous interventions Until recently this powerful imaging technology was confined to a small number of so called high level institutions Fortunately with the development of digital cardiac imaging equipment and adaptation of cine angiographically based computer software for on line use in the catheterization room quantitative coronary angiography is now available to all interventionalists This book is a timely guide for the impending QCA user providing practical as well as theoretical and scientific information A comprehensive evaluation of the clinical usefulness of QCA is covered from the fundamental principles through experimental validation studies application to clinical trials of a wide range of pharmacological and interventional therapies in the full spectrum of clinical

presentation of coronary disease syndromes evaluation of the therapeutic efficacy of various new devices for coronary intervention together with extensive presentation of its physiological functional and anatomical correlations by comparison with other intracoronary measurement and imaging techniques In addition evolving theories and concepts in the ever topical restenosis phenomenon after percutaneous intervention based on serial QCA studies are presented and discussed and a potentially unifying methodological approach to further study of this ubiquitous problem is offered This book thanks to the collaboration of many experts in the field of intracoronary imaging and measurement provides stimulating interesting and practical information both for the academic scientist and practising clinician

*Advances in Imaging Techniques in Ischemic Heart Disease* Ernst E. van der Wall, Thomas H. Marwick, Johan H. C. Reiber, 2012-12-06 In recent years there have been tremendous advances in cardiac imaging techniques covering the complete spectrum from echocardiography nuclear cardiology magnetic resonance imaging to contrast angiography With respect to these noninvasive and invasive cardiac imaging modalities marked technological developments have allowed the cardiologist to visualize the myocardium in a far more refined manner than conventional imaging was capable of Echocardiography has extended its domain with intravascular ultrasound cardiovascular nuclear imaging has added positron emission tomography to its line of research magnetic resonance imaging has been broadened with magnetic resonance angiography and spectroscopy and finally contrast angiography has widened its scope with excellent quantitation programs For all these imaging modalities it is true that the application of dedicated quantitative analytic software packages enables the evaluation of the imaging studies in a more accurate reliable and reproducible manner It goes without saying that these extensions and achievements have resulted in improved diagnostics and subsequently in improved patient care Particularly in patients with ischemic heart disease major progress has been made to detect coronary artery disease in an early phase of the disease process to follow the atherosclerotic changes in the coronary arteries to establish the functional and metabolic consequences of the luminal obstructions and to accurately assess the results of interventional therapy

**Surgical Options for the Treatment of Heart Failure** R. Masters, 2007-12-14 Despite the significant decline in heart disease mortality rates over the last 25 years heart failure has remained a significant problem We are now confronted with large numbers of terminally ill patients for whom conventional therapies for heart failure have been exhausted and for whom repeated hospital visits are necessary There now is a major thrust towards a management strategy which embraces a comprehensive approach including vigorous preventive measures and earlier surgical interventions This book outlines the major surgical options for the treatment of heart failure and brings together a very broad base of opinions with contributions from several outstanding individuals With the improved knowledge and techniques to control rejection transplantation has become the central pillar in the surgical management of this group of patients Unfortunately because of limited donor supply the technique cannot be applied to large numbers of patients A great deal of excitement however exists in the potential for xenotransplantation as a supplement to



homotransplantation The use of cardiac assist devices has become a reality with several hundred LVADS and BiVADS implanted throughout the world and cardiac replacement with total artificial hearts continues to be used successfully as a bridge to transplantation We are on the threshold of the broad application of assist devices to provide prolonged relief of heart failure and restore patients to an ambulatory home environment and hopefully return to the work force in significant numbers

**The Coronary Vascular System in Angina Pectoris** P. A. van Zwieten, Kong Ing Lie, 1992 *Cardiovascular Imaging* Johan H. C. Reiber, Ernst E. van der Wall, 2012-12-06 In the past coronary arteriography was the only modality available to provide high quality images of the coronary anatomy Quantitative coronary arteriography QCA was developed implemented validated and extensively applied to obtain accurate and reproducible data about coronary morphology and the functional significance of coronary obstructions Over the last few years extensive basic technological research supported by clinical investigations has created competing modalities to visualize coronary morphology and the associated perfusion of the myocardial muscle Currently the following modalities are available X ray coronary arteriography intracoronary ultrasound contrast and stress echocardiography angioscopy nuclear cardiology magnetic resonance imaging and cine and spiral CT imaging For all these imaging modalities the application of dedicated quantitative analytical software packages enables the evaluation of the imaging studies in a more accurate reliable and reproducible manner These extensions and achievements have resulted in improved diagnostics and subsequently in improved patient care Particularly in patients with ischaemic heart disease major progress has been made to detect coronary artery disease in an early phase of the disease process to follow the atherosclerotic changes in the coronary arteries to establish the functional and metabolic consequences of the luminal obstructions and accurately to assess the results of interventional therapy Aside from all these high tech developments in cardiac imaging techniques the transition from the analogue to the digital world has been going on for some time now For the future it has been predicted that the CD R will be the exchange medium for cardiac images and DICOM 3 the standard file format This has been a major achievement in the field of standardization activities Since these developments will have a major impact on the way images will be stored reviewed and exchanged in the near future an important part of this book has been dedicated to DICOM and the filmless catheterization laboratory Cardiovascular Imaging will assist cardiologists radiologists nuclear medicine physicians image processing specialists physicists basic scientists and fellows in training for these specialties to understand the most recent achievements in cardiac imaging techniques and their impact on cardiovascular medicine

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