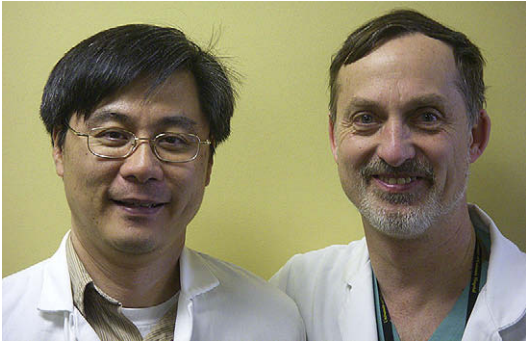


## Preface



S. James Chen, PhD, John D. Carroll, MD  
*Guest Editors*

This issue of *Cardiology Clinics* brings together contributions from around the world, investigators who are clinical versus imaging science in their orientation, and representatives from academic medical centers and the imaging industry. Each article is written to be accessible to those with a basic knowledge of coronary imaging but also to be stimulating and educational to those who are experts and investigators in medical imaging.

Attention has been paid to acknowledging contributions and relevant products from medical imaging companies. Advances in coronary angiography can make an impact on patient care only if they are made available in medical imaging equipment and other products found in the cardiac catheterization laboratory. Potential biases of the authors are dealt with by acknowledging affiliations and industry support, by describing all products that are available, and by avoiding product names unless necessary for clarity and potential need of the readership.

This monograph is organized into three major sections. The first section has to do with the acquisition of coronary angiographic images. The first article provides a background regarding the known limitations of current techniques and technology and the barriers to implementing improvements. Dr. Gurley presents the recent advances in flat detector technology with the critically important related issue of radiation safety. The new method of acquisition, rotational angiography, is presented by Drs. Klein and Garcia, two investigators with extensive practical knowledge. Drs. Messenger and Casserly of the University of

Colorado describe the techniques and products associated with catheter-based angiography, including the use of catheters, contrast media, and injection systems.

The second section covers where advances have been dramatic in the past decade and shows the major contributions of the imaging scientists and engineers from both academia and industry. Drs. Chen and Schäfer describe the modeling approach to produce a three-dimensional (3-D) representation of a patient's coronary tree from x-ray projection images. Subsequently, the multinational investigative team of Schoonenberg, Neubauer, and Grass show us the future with 3-D reconstruction techniques that will soon make the transition from imaging laboratory to clinical practice. Visualization of coronary arteries in 3-D is an exciting development in coronary angiography that has now led to enhanced visualization of what is done to treat the patient, including implantation of cardiovascular devices. The academic clinical team from the University of Utah, Drs. Rogers and Michaels, review their work and that of others on clinical aspects of enhanced coronary stent visualization. Subsequently, Schoonenberg and Florent show us the future in 3-D stent and other device visualization using rotational acquisitions.

The third section has an emphasis on quantification, multimodality integration, and other futuristic aspects of coronary angiography. Drs. Pantos, Efsthathopoulos, and Katritsis from Athens describe the approach to both traditional 2-D quantitative coronary angiography (QCA) and 3-D

QCA. Then Drs. Garcia and Movassaghi, a clinical investigator and an imaging scientist, present how computer applications can help the physician solve the imaging tasks inherent in the performance and interpretation of coronary angiography data. The next article deals with the need, the technology, and the initial experience in integrating computer tomographic angiography (CTA) into the work flow and performance of percutaneous coronary intervention (PCI). The multidisciplinary team of Drs. Wink, Hecht, and Ruijters provide the expertise of imaging scientists and a clinical CTA leader. Similarly, the Rotterdam group (Drs. Bruining, de Winter, and Serruys) present their work and that of others in the integration of intravascular ultrasound (IVUS) into the angiographic suite with true fusion of both kinds of images. Dr. James Chen, Adam Hansgen, and Dr. John Carroll close with a look into emerging technologies and applications that will define the cardiac catheterization laboratory of the not-too-distant future.

Advances in coronary angiography are occurring in a field dominated by the visual representation of moving objects. Angiography has moved from the black-and-white projection image to complementary color-coded computer graphics. We, as editors, greatly appreciate the support of Elsevier in allowing the authors to illustrate with color images and to include movies that can be accessed in the online version of this issue at <http://www.cardiology.theclinics.com>.

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