Mushabbar A. Syed
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Editors

Basic Principles of Cardiovascular MRI

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To the source of my inspiration, my wife Humaira and my children Daneyal, Ameena, and Aleena.

Mushabbar A. Syed

To the mentors, colleagues, and students.

Subha V. Raman

To my loving wife, Lynn.

Orlando P. Simonetti

Preface

Cardiovascular magnetic resonance (CMR) has evolved into a routinely used imaging modality in clinical practice. Indications for CMR continue to expand which have led to the development of appropriate use criteria by the relevant medical societies including the American College of Cardiology, Society for Cardiovascular Magnetic Resonance, and the European Society of Cardiology. CMR is a relatively complex modality that requires good understanding of the basic principles including the relevant physics. Fellowship training programs have been developed to provide CMR training to cardiologists and radiologists using a combination of didactic teaching, clinical experience, and hands-on experience. Didactic training in the basic principles of CMR is mostly completed in the form of lectures and self-study. However, most of the available texts on MRI physics are not specific to CMR or are not up to date. The objective of writing this book was to develop a comprehensive and contemporary text on the basic principles and imaging techniques of CMR that will serve as a main reference source for both trainees and faculty. In doing so, we have chosen authors that are highly regarded as CMR experts, researchers, and teachers. Many authors direct CMR fellowship programs and are actively involved in training and education. We believe that this book will not only be useful for CMR fellowship trainees, cardiologists and radiologists who want to learn or expand their knowledge but also for CMR experts and physicists to use as a reference material.

The book is divided into two parts. Part one includes Chaps. 1 through 8 and focuses on the basic principles of CMR, MRI safety, and high field imaging. This part forms the basis for understanding of advanced techniques discussed in part two. Part two includes Chaps. 9 through 22 that discuss various techniques used in CMR including a review of advanced and emerging techniques. Tables and figures are included where appropriate and key references are included at the end of the chapter. This book is available in both print and electronic formats.

The success of any textbook depends on its ability to satisfy the needs of readers. We hope that readers will appreciate the clarity and thoroughness of each chapter and the hard work that went into developing this text. We will welcome any feedback comments to help improve the future editions.

Last but not the least, we want to extend our sincere thanks to Tracy Marton (Developmental Editor, Springer) for her invaluable help in completing this book and Grant Weston (Senior Editor, Medicine, Springer) for his insight, support, and overseeing this work to completion.

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