
Preface

Progress in the field of interventional MRI is truly an interdisciplinary endeavor involving input at all stages of development and from people with different backgrounds, such as technicians, engineers, computer scientists, physicists, physicians, managers, or marketing specialists. It takes the invaluable efforts of all of them to continually define the path that interventional MRI is heading.

From the mid-1990s on, the field has long revolved around subjects like magnet design, scanner performance, pulse sequences, processing speed, MR-compatible tools, and proper devices for image-guided therapy. While these issues remain at the heart of technological developments, the last years have put clinical and user needs back into focus and have also seen an increasing commercial support.

It is our hope that this book will not only provide a comprehensive snapshot of the field, but will also illustrate that, despite the challenges that still lie ahead, interventional MRI holds out the prospect of improving patient care in many different medical areas. As for other innovations, not all ideas, methods, and developments will ultimately find their way into clinical practice, but without all these efforts and time, the broad body of equipment, techniques, and applications, that we see and use today, would simply not be available.

This book starts with introductory chapters on interventional MRI systems and technical considerations like pulse sequences, instruments, guidance, safety, and anesthesia, while the second part comprises a number of non-thermal clinical procedures in body regions from head to toe. The third section highlights the ongoing developments in MRI-guided thermal therapies under laser, radiofrequency, focussed ultrasound, or microwave exposure and is headed by two overview chapters on thermal ablation techniques and MR thermometry. The last section presents some new concepts that may take interventional MRI to yet another level by either looking into information carriers on the molecular scale or combining the power of MRI with that of clinically established techniques like X-ray, ultrasound, or endoscopy.

We are deeply grateful to our authors, all renowned experts in their research areas, who have not only devoted themselves to sharing their profound insights and knowledge, but who have also written outstanding chapters within a relatively short amount of time, ensuring that the topics and information covered in this book are up to date. We would like to acknowledge the editorial and production staff at Springer, in particular Daniela Brandt and Corinna Schäfer, for their extensive support at all times as well as Gregor Thörmer for his assistance in finalizing the book.

Last but not least, we would also like to acknowledge the interventional MRI community as a significant force, made up of enthusiasts from around the globe. They can be found in interventional sessions of larger radiological or MRI meetings but have also managed to create and maintain a meeting platform of their own. Over nearly two decades, the biennial Interventional MRI Symposium has been driven by some of the pioneers, in particular by co-organizers Ferenc Jolesz and Jonathan Lewin, and has helped researchers, clinicians, and industrial partners alike to interact with each other. Without the ongoing ambitions of the entire community, the field of interventional MRI, and somehow this book as well, would look a lot different today.

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