MRI Basic Principles and Applications

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Contents

Preface

Magnetic Resonance Imaging (MRI) continues to be an integral component of medical imaging. New measurement techniques and applications continue to be developed nearly thirty years after the initial clinical scanners were installed. Even so, the basic principles behind the measurement techniques remain as true today as then. This book was written to present the fundamental concepts of MRI in a clear and concise manner, minimizing the mathematical formalism yet providing a foundation to understand the results that are obtained with today's clinical scanners.

Since the fourth edition, parallel imaging and high channel-count coil arrays have become mainstream clinical tools. We have added material describing the physics behind these modern techniques. We have also added a focus on material that is relevant to radiologist board exams. Such material is highlighted in the text and will now be easier to find and identify. It is interspersed with other material that remains important for a deeper understanding of the physics of MRI and provides additional clarity. New and updated figures are included throughout the book.

As always, many people must be thanked for their help in this. First, we would like to thank the technical staff at the Siemens Training and Development Center and the faculty, fellows, and staff at the University of North Carolina for their interest in this project and their assistance in its completion. In addition, thanks to Wolfgang Rehwald, James R. MacFall, and H. Cecil Charles for providing images. Finally, thanks to our families for their support and patience in this project.

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ABR study guide topics

Where you see text within lines and accompanied by the  **logo, this indicates content that would be especially useful for those studying for the American Boards of Radiology.**

The list below indicates the location of that content throughout the book.

Magnetic fields
- Magnetic susceptibility – 1.6
- Types of magnetic materials – 1.6
- Magnetic Fields (B) – 1.1
- Magnetic moment interaction with an external field (B0): the Larmor equation and precessional frequency – 1.4
- Net magnetization due to B0 and field strength – 1.5

Nuclear MR and excitation – 2.1

MR signal properties
- Spin density (proton) – 3.1
- *T2* (transverse) relaxation – 3.2
- *T2** relaxation – 3.2
- *T1* (longitudinal) relaxation – 3.1
- *T1* weighting, *T2* weighting, proton density-weighting – 6.1

Pulse sequences and contrast mechanisms
- Echo time (TE), repetition time (TR), and inversion time (TI) – 6.1, 6.4
- Spin-echo (SE) pulse sequences – 6.1
- Inversion-recovery spin-echo pulse sequences – 6.4
- Gradient-echo (GE or GRE) pulse sequences – 6.2
- Echo-planar (EPI) pulse sequences – 6.3
- Fast- or turbo-spin-echo (FSE) pulse sequences – 6.1
- Manipulation of pulse sequence characteristics – 7.1

MR instrumentation
- Static magnetic field (B0) systems – 14.2
- Gradient fields and the gradient subsystem – 14.3
- Shimming and shim coils – 14.2
- Radiofrequency transmitter (B1) subsystem – 14.4
- Radiofrequency receiver subsystem – 14.5
- Radiofrequency coils – 14.5

Spatial localization
- Slice-selection – 4.2
- Phase-encoding – 4.4
- Frequency-encoding – 4.3

Two-dimensional Fourier transform (2DFT) image reconstruction – 5.3
- k-space description – 5.5
- Methods of filling k-space – 5.6, 5.7

Image characteristics
- Factors affecting spatial resolution – 4.2, 4.3, 4.4
- Factors affecting signal-to-noise ratio (SNR) – 5.4, 7.3.2
- Tradeoffs among spatial resolution, SNR, and acquisition time – 5.4, 7.3
- Factors affecting image contrast – 7.1, 7.3.1

Contrast agents – 15

Spatial saturation and fat suppression – 8.1, 8.3, 8.4

Special acquisition techniques
- Angiography – 11
- Diffusion, perfusion and neuro imaging – 12.1, 12.2, 17.3.1
- Functional MRI (fMRI) – 12.3
- Magnetization transfer contrast (MTC) – 8.2

Artifacts – 9

Safety, bioeffects, and FDA limits
- Static magnetic field (ferromagnetic materials) – 16.1
- Radiofrequency field (heating) – 16.4
- Gradient field (nerve stimulation) – 16.3
- Contrast agent safety issues – 16.5