

their location and function/functional relationships, which covers 30 pages. The second section contains sagittal, axial and coronal CT and MR images, and a small section of 3D images with corresponding line drawings.

The Glossary section is succinct and is the only strength of this book. The descriptions in this section would be appropriate for an audience of undergraduate level. Unfortunately, the second section of the book contains CT and MR images of disappointingly low quality. Many of the structures labelled on the corresponding line diagrams can hardly be visualized on the cross-sectional images. In the Preface, the authors state that the atlas is intended as a reference book, but it is of insufficient detail to serve that purpose, and would, at best, be of limited use as an introductory learning tool for undergraduate medical trainees.

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DIFFUSION AND PERFUSION MAGNETIC RESONANCE IMAGING: APPLICATIONS TO FUNCTIONAL MRI. FIRST EDITION. 1995. Edited by Denis Le Bihan. Published by Raven Press, Ltd. 374 pages. \$C207.00

There are few books currently available which deal exclusively with diffusion and perfusion imaging by Magnetic Resonance Imaging (MRI). Most of the information available for physicists and imagers is to be found either as sections of current texts on MRI, or journal articles. This book brings together accumulated experience with diffusion and perfusion MRI.

Edited by one of the experts in the field, and with contributions from most, if not all of the leaders researching this subject, the book reviews current knowledge of diffusion and perfusion imaging using Magnetic Resonance Imaging, including blood oxygen level dependent -BOLD- imaging or functional MRI.

The first section of the book deals with the physics of diffusion imaging, the measurement of molecular movement and displacement in tissue, as done by MRI. Chapters in this section deal with acquisition of diffusion data, using various pulse sequences (spin echo, stimulated echo, echo planar and steady state free precession), and the theory behind such sequences. There is an excellent chapter on hardware requirements for the different types of sequences, which is well written and illustrated. Also in this section is a highly technical chapter discussing the derivation of the b factor, from which the Apparent Diffusion Coefficient (ADC) is derived, and a very complex appendix dealing with computer codes used to derive the b matrix. The section contains chapters dealing with motion artifacts that may occur in diffusion MRI, with a good discussion of ways to reduce or correct the artifacts, as well as effects of magnetic susceptibility variations which may degrade image or distort diffusion data. Last in this section are chapters on clinical applications, with appropriate images, and a short section on temperature imaging by MR.

The second section, on perfusion imaging, deals with physics of the delivery of blood to areas within the brain at a capillary level. It discusses various models of tracer kinetics, as well as exogenous contrast agents, and magnetic labelling. The clinical chapters in this section deal mostly with stroke and brain tumor,

but also mention Alzheimer's disease, and compare the MRI findings with traditional methods of perfusion imaging such as PET. Most of the applications described for spin labelling, or flow-compensated/flow dephased imaging, however, deal with animals with various models of disease. Also contained in this section are chapters on brain function mapping, which are very well written, and are recommended reading for newcomers to functional MRI.

The last section of the book deals with the current hot topic in MRI – functional MRI using BOLD imaging. After a discussion of the actual BOLD effect, clinical applications are discussed. While there are no color images directly in this section, there is a central collection of color plates in the book which are of excellent quality showing representative clinical images, and black and white images are in this section.

In general, the book is well written, illustrated and referenced. Only a few sections may be out of place – one chapter on diffusion imaging of the kidney is included in perfusion imaging, and the chapter on brain function mapping in the section on perfusion imaging might have been better included in the last section on BOLD imaging.

As an imager, there were sections that I found highly technical, difficult to read and understand, and of little relevance to clinical practice. However, the physicists in our research group were excited by the physical aspects of diffusion and perfusion imaging covered in the book. Sections I found particularly useful were those on functional MRI, and clinical applications of brain diffusion imaging.

This book will thus form a seminal reference manual for researchers involved in diffusion and perfusion imaging with MRI.

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CEREBRAL SPECT IMAGING, 2ND EDITION. 1994. Edited by R.L. Van Heertum and R.S. Tikofsky. Published by Raven Press. 233 pages. \$C182.00

The current volume has been significantly expanded since the first edition which was published in 1989. The emphasis is on SPECT brain perfusion imaging which should be available clinically in most centres. PET studies and receptor imaging which often form the major part of reviews on the topic are mentioned only by way of comparison. Introductory chapters discuss instrumentation, radiopharmaceuticals, and normal gross and functional anatomy. The coverage is concise but superficial, and specialists in Nuclear Medicine and referring clinicians in the Neurosciences who are the target audience identified in the preface, will wish to be selective in their reading based on their areas of expertise. References are not comprehensive but do include major reviews of the various topics.

The main strength of the book is as a clinical atlas which includes over 100 well documented cases, illustrating findings and uses in evaluation of cerebrovascular disease, dementia, seizure disorders, trauma, and psychiatric conditions. Each chapter begins with a summary of key features and is followed by a series of clinical cases. There is good correlation with CT and MRI, and followup studies where appropriate. Particular teaching points are highlighted for most cases.