

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.

Cases are drawn from a number of different laboratories using different instruments, acquisition techniques, display formats, and radiopharmaceuticals. Basic acquisition information is given for each case, allowing the interested reader to draw some inferences about technique and final results. Unfortunately, specifications of most of the cameras used, are not detailed in the text and important factors such as imaging time, number of projections, matrix size, and processing algorithms are not mentioned.

The volume is not an authoritative text, but an interesting introductory atlas for residents and practicing physicians who have not had extensive experience in the field. The emphasis is on clinically relevant and widely available techniques and the variety of excellent cases makes for easy and enjoyable reading.

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MOTOR DEVELOPMENT IN CHILDREN. 1994. Edited by E. Fedrizzi, G. Avanzina and P. Crenna. Published by John Libbey & Company Limited. 185 pages. \$C41.00

As stated in the introduction "*Motor Development in Children*" by Hinz Precht, this book is the result of a post-graduate teaching course and the topic of motor development only covers certain aspects of motor development per se. Unfortunately, the title of motor development is, in this context, a misnomer since only a small section or extract of chapters refers to the neonate or infant and the developmental aspect of the system discussed in the appropriate section. Many of the chapters are not reviews but a description of an hypothesis with the appropriate experiment aimed at proving the hypothesis. The book can be grossly divided in three major sections: Chapter 2, motor assessment of the neonate; Chapter 3, reaching and grasping; and Chapter 4 on fine manipulative abilities. These three chapters basically cover the topic of their specific aspect of motor development in an extremely good and interesting fashion as well as with well-documented studies and references. It certainly would be very useful for a physician working in a neonatal unit, pediatric neurologists as well as professionals interested in the developmental aspect of the newborn, i.e., physiotherapists and occupational therapists. Some of the descriptive aspects of these chapters, however, are fairly complex and probably in the context of their initial presentation which is a post-graduate course or associated with a video description which certainly would help the understanding of the description, especially on the motor assessment of Chapter 2.

The chapter on the anthology of language is more likely to be appreciated by PhD's as it requires extensive background and refers more to a clinical experiment rather than a review of the topic as well as its maturational process. It has little clinical usefulness.

The second section mainly aimed at motor assessment has been, to me, very deceptive. It has hardly any relevance to

the motor development of the neonate or the child per se. The chapters are constructed with the peripheral evaluations, electromyographic assessment of the peripheral neuromuscular system, mainly the motor performance assessment, motor reaction, feed back control, anticipatory control, basis of human locomotion, head-trunk coordination, posture and gait as well detection of pathophysiological factors contributing to gait. All are better appreciated by peripheral neurologists, psychiatrists but more likely kinesiologists interested in the peripheral evaluation as well motor control and motor balance or imbalance between agonist or antagonist with little, however, discussion with regard to the suprasegmental control, their main influences and nothing on the maturational aspect, developmental aspect, pertinent to the normal neonates and children. The section for clinicians is deceptive as there is no or very little clinical impact and is only useful for its peripheral assessment.

The third section aimed on the evaluation and development of the vision, one deals with saccades, pursuit, optokinetic nystagmus, is particularly well done and interesting. It is relevant to many people in the field of child development, i.e., pediatric neurologists, physiotherapists, occupational therapists, psychologists as well as speech and hearing specialist as the discussion-presentation and explanation are very clear always revealed a clear understanding of the inquisition made by neonates, the contribution of different portions of the nervous system with regard to the function that is addressed.

Finally, the first chapter which is a review of the developmental aspect of the nervous system is a rapid overview and one needs an extensive neurobiological as well as neurological background to read. It would certainly be of interest to people in the field. It should also be noted that on page 7, Table 2, Section 3 written proencephalon when dividing the arrows at D, should probably not be myelencephalon but diencephalon. Also, page 10, last paragraph, I have some difficulty with the understanding. It should probably start, not "in humans" but in "neonates" or in "neonatal humans" as in the previous paragraph they mention that the adult striatum has zones poor in acetylcholinesterase which are named striosomes and then states that in humans, the striosomes are very intensely labelled with the same acetylcholinesterase. This should be brought to the attention of the author, at least for clarification.

Overall, Chapters 2, 3, 4, 13, 14, 15, 16, 17 and 18 are pertinent to their specific contribution to motor development are well done and interesting, and cover a wide variety of specialties interested in motor development. On the other hand, Chapters 1, 5, 6, 7, 8, 9, 10, 11 and 12 do not meet the expected topic discussing mainly peripheral neuromuscular influences with the "little discussion" concept or development on maturation aspect and acquisition of the neonates through his/her development. In that respect, the title is slightly a misnomer.

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