CLINICAL MR NEUROIMAGING: DIFFUSION, PERFUSION AND SPECTROSCOPY. 2005. Edited by Jonathan Gillard, Adam Waldman, Peter Barker. Published by Cambridge University Press. 827 pages. C$396 approx.

This book contains chapters written by specialists in their field, who all have multiple publications in peer-reviewed journals. It deals with three recent usages of MRI which are either becoming widely available on current MR scanners, like MR spectroscopy and diffusion imaging, or are commonly used in current research.

Introductory sections deal with fundamentals, quantification and analysis of MR spectroscopy; diffusion MR imaging including diffusion tensor imaging; and MR tractography, and diffusion MR artifacts, and perfusion MR with either intravenous contrast agents or arterial spin labeling, as well as artifacts and pitfalls of perfusion MRI. Subsequent large sections deal with cerebrovascular disease, adult neoplasia, infection, inflammation and demyelination, seizure disorders, psychiatric and neurodegenerative diseases, trauma and pediatrics.

The cerebrovascular section contains chapters on MR spectroscopy, diffusion and perfusion MRI in stroke and cerebrovascular insufficiency due to obstructive carotid disease, and imaging of migraines. The adult neoplasia section contains chapters on MR spectroscopy, diffusion imaging and perfusion imaging in brain tumors. The infection, inflammation, and demyelination section deals with MR spectroscopy in infection and demyelination, as well as HIV-associated brain diseases, and the role of diffusion imaging in infection, inflammation and demyelination. The section on seizures covers MR spectroscopy and diffusion and perfusion imaging in seizures. The section on neurodegenerative disease covers the use of MR spectroscopy and diffusion imaging in neuropsychiatric and neurodegenerative disorders and aging. The section on trauma covers the use of MR spectroscopy and diffusion and perfusion imaging in trauma. The pediatric section covers the evaluation of normal development and developmental delay, hypoxic ischemic injury, pediatric tumours, inborn errors of metabolism, and pediatric white matter disease using these modalities.

The subjects covered are dealt with in depth, so that someone new to the field can become versed with the topic, and those familiar with the subject can get additional information or a good overview of current usages. There are representative case reports in the various clinical sections which deal with a specific entity, for example reversible diffusion imaging in stroke, metabolic heterogeneity in glioma or tumefactive multiple sclerosis, diffusion tensor imaging in diffuse axonal injury, or adrenoleukodystrophy. There is an extensive list provided of abbreviations used in the text, which someone unfamiliar with specific abbreviations (e.g. UNFAIR for perfusion imaging by un-inverted flow sensitive alternating inversion recovery) is recommended to read or photocopy to have available when reading certain sections. The images are of high quality, and there are both colour and black and white images. The list of references in each section is also extensive, so readers can obtain specific references easily.

The sections are, for the most part, well edited, though some words are occasionally missed and require insertion by the reader (e.g. page 12, a sentence in the first paragraph reads "...it appears likely that in NAA do indeed correspond to irreversible neuronal loss"). However, these errors are, for the most part, minor. For the unitiated, there is a fair amount of physics in the introductory sections on diffusion and diffusion tensor imaging. Otherwise, the clinical sections are up to date, pertinent to practice or state-of-the-art.

This is a highly recommended text for Neuroradiologists, Neuroscientists dealing with clinical MR spectroscopy, diffusion or perfusion imaging, or Neurologists or Neurosurgeons wishing to get a good overview of the current status of these MR sequences in patient care.

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