

Contents

MR Techniques: Principles	1
1 Basis of MR Contrast MARK A. HORSFIELD	3
2 Hardware for Magnetic Resonance Imaging KENNETH W. FISHBEIN, JOSEPH C. MCGOWAN, and RICHARD G. SPENCER	13
3 Spin- and Gradient Echo Imaging DARA L. KRAITCHMAN	29
4 Fast Imaging with an Introduction to k-Space JOSEPH C. MCGOWAN	41
5 Magnetization Transfer JOSEPH C. MCGOWAN	57
6 Quantitative Diffusion Imaging PETER C.M. VAN ZIJL, LIDIA NAGAE-POETSCHER and SUSUMU MORI	63
7 MR Methods to Measure Cerebral Perfusion SCOTT D. SWANSON	83
8 Functional MRI PETER JEZZARD and AHMED TOOSY.....	93
9 MR Spectroscopy ROBERT E. LENKINSKI	115
10 Molecular Imaging and High-Field MRI in Multiple Sclerosis ALAYAR KANGARLU	129
Disorders of Myelination	149
11 MR Imaging of Brain Development CHARLES RAYBAUD	151
12 Imaging of Inherited and Acquired Metabolic Brain Disorders MAURICIO CASTILLO	177
13 Proton MR Spectroscopy in Metabolic Disorders of the Central Nervous System NICOLA DE STEFANO and MARZIA MORTILLA.....	195

Demyelinating Diseases	209
14 Conventional MRI Techniques in Multiple Sclerosis ANTHONY TRABOULSEE, DAVID K.B. LI, GUOJUN ZHAO, and DONALD W. PATY ...	211
15 Multiple Sclerosis: Other MR Techniques MASSIMO FILIPPI and MARIA A. ROCCA	225
16 Variants of Multiple Sclerosis JACK H. SIMON and BETTE K. KLEINSCHMIDT-DEMASTERS	241
17 Acute Disseminated Encephalomyelitis STEFAN SCHWARZ and MICHAEL KNAUTH	255
18 Demyelinating Diseases of the Spinal Cord ROLAND BAMMER, FRANZ FAZEKAS, and SIEGRID STRASSER-FUCHS	269
19 Demyelinating Diseases of the Optic Nerve SIMON J. HICKMAN and DAVID H. MILLER	279
Immune-Mediated Disorders	291
20 Primary Angiitis of the Central Nervous System DARIN T. OKUDA and TIMOTHY L. VOLLMER	293
21 Neuro-Psychiatric Systemic Lupus Erythematosus BART J. EMMER, TOM W. J. HUIZINGA, and MARK A. VAN BUCHEM	311
22 Non-MS Inflammatory Diseases of the CNS: MR Features in Addition to the White Matter MARIO MASCALCHI and FABRIZIO SALVI	331
23 White Matter Pathology in Systemic Immune-Mediated Diseases MARCO ROVARIS and MASSIMO FILIPPI	343
White Matter Disorders Related with Aging	353
24 Neuroimaging of Normal Brain Aging GIOVANNI B. FRISONI	355
25 White Matter Abnormalities in Patients with Cerebrovascular Disease JOAO A. GOMES and LOUIS R. CAPLAN	363
26 Neurodegenerative Diseases with Associated White Matter Pathology MARIO MASCALCHI	377

White Matter Changes Secondary to Other Conditions 389

27 Viral and Non-Viral Infections in Immunocompetent
and Immunocompromised Patients
VINCENT DOUSSET..... 391

28 Neoplastic Disorders
ALBERTO BIZZI, BIANCA POLLO, and CARLO MARRAS..... 411

29 Head Trauma
CHI-SHING ZEE, MARCEL MAYA, JOHN L. GO, PAUL E. KIM,
and ILHAMI KOVANLIKAYA 441

29 Psychiatric Disorders
FABIO SAMBATARO and ALESSANDRO BERTOLINO 453

Subject Index 465

List of Contributors 475