Clinical Recovery from CNS Damage

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Clinical Recovery from CNS Damage

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Contents

VII Preface
Naritomi, H. (Osaka); Krieger, D.W. (Copenhagen)

1 Mechanisms of Functional Recovery after Stroke
Ko, S.-B.; Yoon, B.-W. (Seoul)

9 Diagnostic Approach to Functional Recovery: Functional Magnetic Resonance Imaging after Stroke
Havsteen, I. (Copenhagen); Madsen, K.H. (Hvidovre); Christensen, H.; Christensen, A. (Copenhagen); Siebner, H.R. (Hvidovre)

26 Diagnostic Approach to Functional Recovery: Diffusion-Weighted Imaging and Tractography
Raffin, E.; Dyrby, T.B. (Hvidovre)

36 Compensatory Contribution of the Contralateral Pyramidal Tract after Experimental Cerebral Ischemia
Takatsuru, Y. (Maebashi); Nakamura, K. (Okazaki/Hayama); Nabekura, J. (Okazaki/Hayama/Kawaguchi)

45 Compensatory Contribution of the Contralateral Pyramidal Tract after Stroke
Otsuka, N.; Miyashita, K. (Suita); Krieger, D.W. (Copenhagen); Naritomi, H. (Osaka)

54 Regeneration of Neuronal Cells following Cerebral Injury
Dailey, T.; Tajiri, N.; Kaneko, Y.; Borlongan, C.V. (Tampa, Fla.)

62 Translational Challenge for Bone Marrow Stroma Cell Therapy after Stroke
Kuroda, S. (Toyama/Sapporo); Houkin, K. (Sapporo)

69 Experimental Evidence and Early Translational Steps Using Bone Marrow Derived Stem Cells after Human Stroke
Kasahara, Y.; Ihara, M.; Taguchi, A. (Kobe)

76 Therapeutic Drug Approach to Stimulate Clinical Recovery after Brain Injury
Krieger, D.W. (Copenhagen)

88 Rehabilitation and Plasticity
Luft, A.R. (Zürich)

95 A Brain-Computer Interface to Support Functional Recovery
Kjaer, T.W. (Copenhagen); Sørensen, H.B. (Lyngby)

101 Novel Methods to Study Aphasia Recovery after Stroke
Hartwigsen, G. (Leipzig/Kiel); Siebner, H.R. (Hvidovre)
112 Role of Repetitive Transcranial Magnetic Stimulation in Stroke Rehabilitation
   Pinter, M.M.; Brainin, M. (Krems)

122 Influence of Therapeutic Hypothermia on Regeneration after Cerebral Ischemia
   Yenari, M.A. (San Francisco, Calif.); Han, H.S. (Daegu)

129 High Voltage Electric Potentials to Enhance Brain-Derived Neurotrophic Factor Levels in the Brain
   Yanamoto, H. (Suita); Nakajo, Y. (Suita/Kyoto); Kataoka, H.; Iihara, K. (Suita)

139 Prevention of Post-Stroke Disuse Muscle Atrophy with a Free Radical Scavenger
   Naritomi, H.; Moriwaki, H. (Osaka)

148 Author Index

149 Subject Index
Preface

Over the last 3 decades, we have become witnesses of various successful and not so successful attempts to minimize sequelae after brain injuries. All of these strategies had one thing in common, the belief that time is brain and salvage becomes impossible at a point of no return. Advances in supportive care, in particular neurocritical care, enhanced the functional outcome even with severe brain injury. For quite some time, recovery from brain injury has been extremely dynamic and individual. Although our understanding of brain recovery is still in its infancy, many eye-opening discoveries will potentially lead to a sea change of neurorehabilitation.

We have believed for many years that injury to the central nervous system is permanent and does not permit compensatory revival of neuronal systems. Recent breakthroughs in neuroscience, however, suggest that recovery from central nervous system injury arises through neuroregeneration and neuroplasticity. Neurorehabilitation is transforming into a thriving field of preclinical and clinical research focusing on understanding the mechanisms of neurological recovery and enhancing repair. Aided by computer science and biotechnology, brain-machine interfaces are being created that can replace lost function but may also one day allow to communicate with unconscious patients. Neurorehabilitation has become the new arena where neuropharmacology, biotechnology, molecular biology and computer science meet traditional approaches, such as physiotherapy, speech therapy, psychology and social services. Novel therapies will require controlled clinical trials. New agents and procedures, such as stem cells, neurotransplantation, electromagnetic stimulation, brain-computer hybrids and neuropharmaceuticals, are being put to test to transform traditional neurorehabilitation. This book intends to provide a current overview of the most promising areas of research prepared by clinicians and scientists entrenched in the field of neurorehabilitation. Each chapter intends to give a concise overview of the basic science underpinning and clinical consequences of the particular area in neurorehabilitation. We have selected the areas according to their importance from a clinical perspective. All authors were invited based on their personal experience in the field and were aided by associates where appropriate. The targeted readership includes neuroscientists,
rehabilitation specialists, geriatricians, neuroscience nurses, ergo-, speech and physiotherapists.

We feel very honored by the distinguished contributions of all authors and the fruitful collaboration with the publishers on this endeavor so close to our hearts.

Hiroaki Naritomi, Osaka
Derk W. Krieger, Copenhagen