Textbook of Neural Repair and Rehabilitation, Volume I: Neural Repair and Plasticity & Volume II: Medical Neurorehabilitation

Michael Selzer, Stephanie Clarke, Leonardo Cohen, Pamela Duncan, and Fred Gage, editors. Published by Cambridge University Press; Copyright © 2006 Volume I: 687 pages, $190.00; Volume II: 753 pages, $190.00.

This book is about the fascinating science and practice of neurological rehabilitation, presented in two volumes. These two volumes are designed to be used either separately or as an integrated whole.

Volume I: Neural Repair and Plasticity introduces the reader in a comprehensive but not at all long-winded way to the basic sciences relevant to neurorehabilitation and is subdivided into two main sections. Section A: Neural Plasticity starts off with an overview of morphological and molecular mechanisms of nerve regeneration as well as elementary processes of learning and memory. By addressing plasticity mechanisms in the spinal cord and in somatosensory, motor, visual, and auditory systems, a more comprehensive view of plasticity processes is developed in successive chapters. Section A ends with remarks on postinjury mechanisms of spinal cord and brain plasticity in animal models. Section B, Neural Repair, begins with cellular and molecular processes of neural death and axon degeneration. This is followed by an up-to-date summary of our knowledge about stem cells and neurogenesis in the adult brain, as well as chapters dealing with molecular components inhibiting and promoting axon regeneration. Volume I closes with a concise overview on the development and application of neural transplantation techniques and trophic factor delivery by gene therapy in specific disease models, such as spinal cord injury, Parkinson, Huntington, and Alzheimer diseases.

Volume II: Medical Neurorehabilitation is a clinical handbook that contains state-of-the-art guidelines on rehabilitation approaches for the major categories of disabling neurological disorders based on scientific principles presented in Volume I. This volume is subdivided into three sections. Section A: Technology of Neurorehabilitation provides information on outcomes measurement, diagnostic techniques, and neurorehabilitation engineering (from electrical stimulation and wheelchair design to employment of virtual reality in neurorehabilitation). Section B, Symptom-Specific Neurorehabilitation, highlights rehabilitation approaches to various neurological symptoms that are common to many types of neurological diseases, such as chronic pain, spasticity, balance, sexual or cognitive dysfunction. Section C, Disease-Specific Neurorehabilitation Systems, collates the considerable theoretical and practical knowledge of a number of experts in rehabilitation of patients with specific diseases, such as traumatic brain and spinal cord injury, epilepsy, multiple sclerosis, stroke and neurodegenerative diseases.

The book is generally well-written and follows a logical progression. Each chapter comprises a combination of illustrations, diagrams, tables, and an updated reference list. A detailed subject index at the end of each volume is a helpful addition that allows a quick orientation for a further in-depth review of special topics. This book is remarkable in that the texts are not repetitive as often occurs in multi-authored books. Throughout both volumes cross-references to other chapters that deal with relevant material at different levels support the integration and non-redundancy of the content. Overall, these two freestanding but linked volumes constitute an excellent resource of information for neuroscientists and provide a foundation for the work of clinical neurorehabilitation professionals. I have only one quibble. Several photos are reproduced in black and white. Surely, more colors could have emphasized the eye-catching effect of the photos. Nonetheless, in its wide scope, comprehensiveness and currency this book is the best of its kind, and although the obstacles to repair and rehabilitation resulting from CNS damage still appear formidable, after reading this text one is led to believe that they will, in time, be overcome. Until then, no matter how much is discovered, a lot more remains.

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