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BOOK REVIEW

Kluwe RH, Lüer G, Rösler F, editors. Principles of Learning and Memory. Basel: Birkhauser Verlag; 2003. 355 pages; ISBN 3-7643-6699-0; price: US$ 69.95

Field of medicine: Neuroscience, cognitive science, and biology.

Format: Hardcover.

Audience: This textbook is of interest to investigators and advanced students in biology, cognitive psychology, neuroscience, and cognitive science.

Purpose: The selected topics in this volume provide an interdisciplinary perspective on learning and memory. At the core of the volume is the presentation of specific phenomena and principles, which are well established and central for human learning and memory. The volume emphasizes connections between findings on different levels of analysis in cognitive science, neuroscience, and biology. This approach may help to develop a broader view and a broader understanding of human learning and memory since the editors try to overcome traditional borders separating the disciplines.

Contents: The book is divided in fifteen chapters that present fifteen principles, which seem to be most central for the ongoing interdisciplinary research in learning and memory. These principles (chapters) are subsumed under five main themes: (A) formation of memories; (B) organization of memories during encoding, storage and retrieval; (C) consolidation of memories; (D) control of memories during information processing; and (E) adaptive specialization of memories.

The first part of the book focuses on the mechanisms and underlying brain structures that participate in the formation of new memories, ie, on the processes that lead to the acquisition of knowledge. Authors discuss results from animal and human research that point to four basic principles: spatio-temporal contiguity, multiple brain structure underlying experience-related changes, brain plasticity, and emotional learning.

The chapters of the second part are focused on answering the question of relation between processes of encoding, storage and retrieval to brain structures, and neural processes. These chapters cover the principles of coding specific storage and retrieval, of multiple memory systems, and of separate systems of working memory.

The third part refers on the mechanisms and processes that support the consolidation of newly acquired knowledge and provide for enduring memories. These chapters cover the principle of memory consolidation and its pharmacological modulation, the principle of cross-cortical consolidation of episodic memories, and the principle of bottleneck structures necessary for consolidation and retrieval.

The chapters in the fourth section all deal with the basic mechanisms of how information is represented and how information transfer is controlled in the nervous system. First the principle of transient binding in the central nervous system is discussed. Next, several inhibitory mechanisms, relevant to working memory and long-term memory control, are related to their possible neural correlates. Final chapter of this part draws on recent evidence from behavioral, brain imaging, and single-cell recording work to sketch out an integrated view of the neurocognitive basis of executive control.

The chapters of the fifth part cover the principle of species independent learning phenomena and the principle of adaptive specialization. These chapters rely on a combination of approaches, engendered by evolutionary psychology that includes cognitive psychology's analysis of information processing and evolutionary biology's analysis of complex, adaptive behavior of species.

Highlights: The book integrates an immense amount of research on learning and memory in different scientific disciplines. With a list of over a thousand references, the book not only gives a detailed overview of the field, but also directs researchers and students to further, more detailed reading and investigation into the covered topics. Plenty of figures and diagrams help to the understanding of the text.

Limitations: The only limitation to this book might be a demand it places on the reader in terms of previous knowledge and understanding of principles of learning and memory. General readers interested in the topic might find themselves disappointed since the book is a high-level scientific material.

Darko Hren

The Burden of Musculoskeletal Conditions at the Start of the New Millennium. Report of a WHO Scientific Group. WHO Technical Report Series 919 Geneva: World Health Organization, 2003. 218 pages; ISBN 92-4-120919-4; price: US$ 31.50

Field of medicine: general medicine, epidemiology, internal medicine, rheumatology, and orthopedics.

Format: Paperback.

Audience: Scientists and professionals in epidemiology, anthropology, general practitioners, and health care policy makers.

Purpose: To provide information on the most frequent muskuloskeletal conditions (rheumatoid arthritis, osteoarthritis, osteoporosis, major limb trauma, and spinal disorders), which cause physical disability due to strong health impact and consequently a considerable economic. Geographical differences regarding the incidence, prevalence, and course of the conditions, as well as their economic burden are emphasized. This book should enable authorities of the developing nations to implement measures of data collection and processing in order to develop preventive measures for alleviating the health impact and economic burden.

Content: This book has nine chapters, acknowledgments, list of references, and an appendix containing estimates of incidence/prevalence of muskuloskeletal disorders for World health Organization (WHO) regions. After the introduction in the first chapter, an estimate and methodology of estimating of the global burden for the five conditions, with regard to the WHO regions, is presented in the second chapter. This includes information on the course, remission rate, accumulated disability, and mortality rates for these musculoskeletal conditions. The third chapter contains definition, incidence, prevalence, potential sources of further data, and recommendations for making estimates of incidence and prevalence rates of the global burden for each of the five conditions. The next chapter is dedicated to the severity and course of these conditions, taking into account specific requirements, such as grading system, staging, classifications, and including description of the model of the condition, quantification of health loss, and the impact of geographical and socioeconomic factors upon this condition. This is followed by presentation of health and economic indicators for each of the musculoskeletal conditions. On the individual patient level, suggestions are given for description of the health status and consequences of these illnesses or injuries. This chapter includes multidimensional approach to measuring health status and determining health domains for each of the analyzed condition, as well as possible instruments for measurement of these health domains. A special chapter is dedicated to an extensive inventory of published instruments (measures) for assessment of musculoskeletal conditions for which some reliability and validity data are available. As stated in the introductory part of this chapter, the purpose of the inventory is to serve as a resource during the Bone and Joint Decade Monitor Project regarding instruments/measures of musculoskeletal health. In the final chapter, recommendations are given for prediction of increase in the incidence of musculoskeletal conditions and subsequent disabilities, implementation of measures to change priorities, and development of preventive strategies. Basic requirements and definitions for the collection of data on musculoskeletal conditions are described in detail, including the health impact and economic burden at the population and individual patient level. Finally, recommendations of the Scientific Group for achieving data collection and assessment of the impact of muskuloskeletal conditions on health and economics are offered.

Limitations: The book is a specific compilation of information on the burden brought about by the most common five musculoskeletal conditions as prepared by the WHO Scientific Group.

Related reading: A selection of WHO publications of related interest covering osteoporosis, rheumatic diseases, prevention of chronic diseases, problems of obesity, preparation of dietary guidelines, promotion of healthy life and nutritional needs of older persons are listed on the inner page of back cover.

Commentary: This is a highly-specific reading prepared by experts of this field providing concise information, recommendations, and guidelines for assessment of health impact and economic burden of certain musculoskeletal conditions. In this sense, it is particularly valuable for decision making in the health care system of developed and developing countries.

Vesna Kušec