The Behavioral and Cognitive Neurology of Stroke

The care of stroke patients has changed dramatically in recent years. As well as improvements in the emergency care of the condition, there have been marked advances in our understanding, management and rehabilitation of residual deficits. This book is about the care of stroke patients, focusing on behavioral and cognitive problems. It provides a comprehensive review of the field covering the diagnostic value of these conditions, in the acute and later phases, their requirements in terms of treatment and management, and the likelihood and significance of long-term disability. This book will appeal to all clinicians involved in the care of stroke patients, as well as to neuropsychologists, other rehabilitation therapists and research scientists investigating the underlying neuroscience.

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The Behavioral and Cognitive Neurology of Stroke

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During the last years, the care of stroke patients has dramatically changed with the advent of new treatments such as thrombolysis, and the development of specialized units such as stroke units. Following the acute phase, the management of residual signs is also evolving with the development of specialized rehabilitation units, the treatment of dementia and new hopes for the future such as cell transplantation, Transcranial Magnetic Stimulation or cortical stimulation. These advances stress the need for an accurate determination of stroke signs and complications both at the acute and late phases. This is a vast domain considering the extraordinary complexity of the brain and the multiple mechanisms of stroke. This domain is also rapidly evolving owing to the major advances in neurosciences and neuropsychology.

For the clinician, the development of cognitive and clinical neurosciences has shed light on the interpretation, assessment, diagnosis and prognosis value of stroke signs and their treatments. The objectives of cognitive examination differ according to the phase. At the hyperacute phase, the recognition of stroke signs is essential for diagnosis and prognosis purposes. Unusual and misleading clinical presentations (e.g. delirium-like state due to cortical blindness or to acute dysexecutive syndrome), the high frequency of some deficits in the first hours (e.g. right hemineglect in left hemisphere stroke), the fast course of deficits in the first hours (e.g. global aphasia evolving to Broca aphasia of lower severity; severe right hemisphere syndrome evolving to left hemineglect of mild severity) which parallels the course of ischemia territory, and the characteristics of behavioral changes and reactions to acute distress are now better documented. Following the hyperacute phase, the identification of complications and their significance (e.g. the presence of delirium state and its relation with pre-existing dementia), the recognition of persisting signs and the determination of appropriate care are essential and this covers a very wide range of cognitive and behavioral changes. Such purpose is also present after the acute phase where the functional assessment of stroke forms the basis of the rehabilitation strategy at home or
in a specialized center. At the late phase, it is essential to identify residual signs and sequel, (including post-stroke dementia which is underdiagnosed and due to multiple mechanisms) and complications which appear in the long term (e.g. dystonia and other movement disorders).

Following the initial report of aphasia, stroke has long been a unique window on brain functions and functional organization. The examination of functional deficits in stroke patients has provided a major contribution to our knowledge on cognitive functions of the human brain. Research in this still active area now requires precise information on lesion location and brain pathology in order to analyze more deeply the relations between brain structures and functions.

In order to fill the gap between clinical and cognitive neurosciences in the domain of stroke, our objective was to provide basis on the main brain functions (perception, motor, behavior and cognition) and their disorders according to recent developments from basic neurosciences, to provide a comprehensive review of the specificity of disorders observed in stroke patients (including the hyperacute phase), their relations with stroke mechanisms, their assessments (including validated tests) and management.

We hope this book will provide valuable information for all clinicians involved in care of stroke patients from the acute to the late phase, in stroke unit, neurology and rehabilitation departments. We also hope that it will be useful for neuroscientists and neuropsychologists and that it will contribute to further research in the domain of cognitive neurosciences and neuropsychology.

Olivier Godefroy and Julien Bogousslavsky