

Preface

Neuropsychology is the study of brain–behavior relationships. This book attempts to provide a general review of the science and clinical practice of neuropsychology. The book was designed to offer those interested in neuropsychology a reference guide in the tradition of pocket references in medicine subspecialties. As such, information is presented to aide in the development of, and maintenance of, evidenced-based clinical neuropsychology practice (Chelune 2010).

Neuropsychology practice and science has exhibited an exponential growth to assist in the diagnosis and treatment of known or suspected dysfunction of the central nervous system. The clinical application of neuropsychological evaluation has increased in a variety of settings, including primary care offices, acute care (e.g., emergency departments, intensive care centers, acute trauma centers) as well as a multitude of tertiary care and rehabilitation centers. Furthermore, the research application of neuropsychology has expanded, with increased emphasis in measures of cognitive, behavioral and emotional functions (attention/executive, memory, language, visuoperceptual, and/or mood/affect) as important end points in a variety of treatment and research areas. Assessment of neuropsychological functions among individuals with diseases that are known or suspected to affect the central nervous system has become increasingly integrated in the management of patient health care. Furthermore, neuropsychological evaluation has become increasingly important in studies evaluating the effectiveness of pharmacologic and surgical therapies. Measurement of cognitive functions is also being used to assess for neuropsychological processes that may be early signs of disease or a marker for a disease course or outcome. In addition to scientific application of neuropsychological assessment to better understand brain processes, markers of disease, evaluate treatment course, or predict outcome, these data guide the emergence of evidenced-based clinical neuropsychology practice, and are being increasingly applied to clinical and forensic applications. Over the past decade, neuropsychological evaluations have become important in legal proceedings to assist in understanding the cause and ramifications of known or suspected central nervous system dysfunction on behavior, emotion and cognition, including decision-making and judgment.

Neuropsychological science has expanded at a breakneck pace, with an ever-increasing understanding of the processes underlying traditionally held models of neuropsychological functioning, such that new models for learning and memory,

visuoperceptual, and executive functions have emerged (e.g., Lezak et al. 2004; Heilman et al. 2007; Strauss et al. 2006). There has also been an evolution in task engagement or effort on testing, with a sea change in the appreciation of the impact of task engagement on neuropsychological evaluations, changing theories of dissimulation, somatization, and test taking effort, and in the development of measures to assess test taking effort (e.g., see Lezak et al. 2004; Strauss et al. 2006 for review). Finally, neuropsychology has seen the increasing emphasis on evidenced-based neuropsychology practice (Chelune 2010). With these advancements come increasing complexity. Neuropsychological practice has emerged as a true psychological subspecialty, requiring unique training and qualifications (e.g., Hannay et al. 1998; Reports of the INS-Division 40 task force on education, accreditation, and credentialing 1987). However, the practice of neuropsychology is not limited to clinical psychologists. The assessment of neuropsychological functions is routinely evaluated by various physician specialties including neurologists, neurological surgeons, and psychiatrists. This book aims to address the needs of licensed practitioners and to provide an overview of neuropsychology practice and science to medical and healthcare specialties having an interest in neuropsychology assessment. To meet these goals, the first three chapters provide an overview for understanding referrals from healthcare providers, how to read the medical chart when conducting a neuropsychological evaluation, and a primer to the clinical neuropsychologist for understanding the common short-hand and little notations made by physicians and nurses so often seen in the medical chart. For physicians in training (medical students, residents, and fellows), we include a special section in Chap. 1 about how to understand and interpret a neuropsychological evaluation report, what the qualitative descriptors mean to neuropsychologists, and the basic premises and theories underlying clinical neuropsychological practice. Chapter 3 provides a review of functional neuroanatomy.

A unique aspect of this book is neuropsychology science and practice is approached from two different perspectives. The first section of this book approaches neuropsychological evaluations from a presenting symptoms perspective. We believe the first section is particularly well suited to clinicians faced with common clinical practices. There is a patient referred for a clinical neuropsychological evaluation, and the diagnosis is unknown. What assessment procedures should be implemented and based on the history, behavioral observations, and obtained neuropsychological data, what might the clinician determine? Thus, the clinician may review chapters about attention problems (see Chaps. 4, 5, and 6) and/or forgetfulness (Chaps. 8 and 10) to obtain helpful assessment procedures which is then followed by diseases or neuroanatomical correlates of observed behavior and test scores. This provides a neuropsychological method to systematically assess cognitive and behavioral signs and symptoms in order to formulate hypothesis about lesion lateralization, localization, and diagnosis within a brief, consultative assessment framework. This, we believe, is complementary to the great tradition of neurology in which the question of where is the lesion leads to differential diagnoses of the etiology for the lesion.

The next section is a more traditional approach to neuropsychology principals and science, in which the diagnosis is specified (e.g., epilepsy, dementia, or stroke), and the neuropsychological evaluations attempts to answer questions based on this diagnosis. Thus, these chapters provide an overview of the disease states and how these may present clinically. Special emphasis is given to neuropsychological features of diseases, giving recommendations for assessment procedures and data to assist interpretation. Each chapter is designed with comprehensive neuropsychological evaluations in mind, with the authors providing their clinical pearls, recommendations of the neuropsychological, neurological, and psychological domains to assess as well as helpful clinical information such as Reliable Change Indices (RCI's, Jacobson and Truax 1991; Chelune et al. 1993) when these are available as of January 2009.

The book includes another section for the neuropsychologist, which is also likely to be of interest to consumers of neuropsychological evaluations (e.g., physicians, nurses, social workers, and our patients). A section includes a practical review of psychometrics including a clinically focused overview of measurement of change in cognitive functioning over time, RCIs, and issues about validity and common errors in interpreting neuropsychological data. Increasing sophistication in the measurement of neuropsychological processes and associated psychometrics along with better appreciation for the natural variation in neuropsychological function among healthy individuals has led to an evolution for the interpretation of neuropsychological data to identify disease. Chapters explicitly review methods to interpret neuropsychological data founded in psychometric principles and neuropathologic science, and subsequently to integrate data to improve the diagnostic accuracy of making diagnoses of neuropsychological impairment (i.e., cognitive disorders). In addition, this text provides a brief review of emerging technologies in the application of neuropsychological evaluation in rehabilitation and how an empirically validated intervention for changing a variety of health behaviors, termed Motivational Interviewing (Miller and Rollnick 2002, 2009), may be applied to neuropsychology practice. Collectively, we strongly believe the material provided this book provides a foundation for the clinician in evidence-based clinical neuropsychological practice.

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