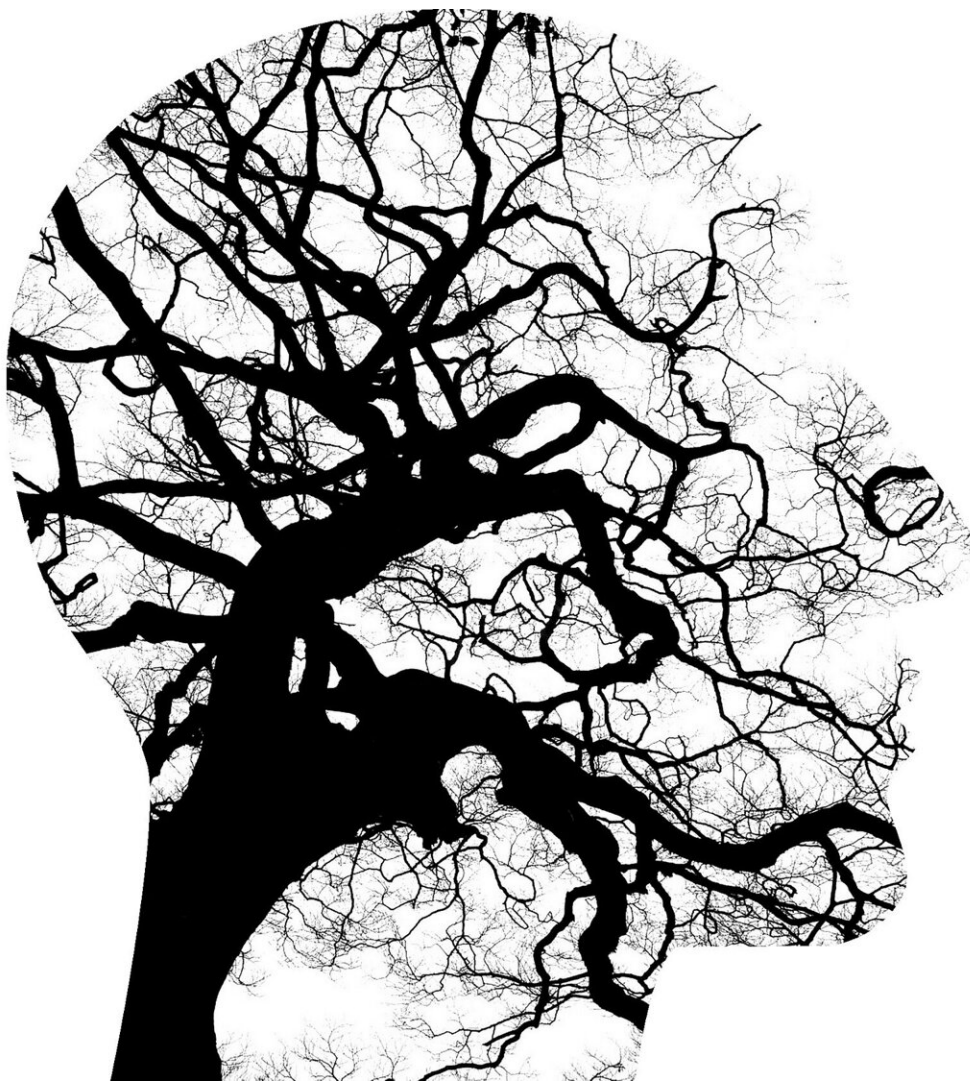


The role of neuropsychological assessment in rehabilitation after neurological injury or disease

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Neuropsychological assessment is an integral component of rehabilitation for individuals with a history of neurological illness or injury. In this [themed issue](#) of *NeuroRehabilitation*, international experts discuss its clinical and therapeutic applications, performance, and symptom validity.

Neuropsychology integrates information from various health and behavioral sciences to produce a refined and comprehensive clinical picture informing [cognitive performance](#), diagnostic probabilities, and rehabilitation interventions. A neuropsychological evaluation measures how well a person's brain is working. The abilities tested include reading, language usage, attention, learning, processing speed, reasoning, remembering, problem-solving, mood, and personality.

This themed issue on the clinical and therapeutic applications of neuropsychological [assessment](#) is guest-edited by Daniel Klyce, Ph.D., ABPP, Central Virginia VA Health Care System; Virginia Commonwealth University Health System and Sheltering Arms Institute, Richmond, VA, U.S.; Ana Mills, PsyD, Virginia Commonwealth University Health System, Richmond, VA, U.S.; and Paul Dukarm, Ph.D., Virginia Commonwealth University Health System, Richmond, VA, U.S..

"Neuropsychological assessments and interventions are designed to promote a person's health and wellness, maximize functioning, and promote independence," explained the guest editors. "The field continues to demonstrate that neuropsychological practice is more than just a one-time assessment of a person's ability; it is a dynamic process that contributes significant meaning to holistic treatment programs."

These articles demonstrate the wide-ranging value that

neuropsychological assessment contributes to the science and practice of neurorehabilitation and further understanding of how individuals perform on cognitive testing and how their brains respond to certain types of interventions designed to address neurocognitive dysfunction. For example, modifying existing tests or adapting them for different contexts can provide fresh insights into a person's abilities or recovery potential.

The contributing researchers and clinicians are international experts in performance validity and effort testing, the expanding role of neuroimaging in neurorehabilitation, and the clinical and therapeutic applications of neuropsychological assessment.

Two articles address performance validity testing (PVT), which the National Academy of Neuropsychology and the American Academy of Clinical Neuropsychology identify as a standard of practice in neuropsychological evaluation. One study illustrates the use of PVTs in the telehealth setting, with particular applicability to the COVID-19 pandemic during which teleneuropsychology has rapidly evolved. It lends validity to telephone-based PVT screening, an important finding for future use of teleneuropsychology in rehabilitation care. Another article makes a compelling argument for researchers and practitioners to view PVT performance on a continuum, rather than a dichotomous pass/fail outcome. "This perspective is an important step toward a more nuanced interpretation of an individual's performance across tests," commented co-guest editor Daniel Klyce.

Two contributions cover advanced efforts to enhance understanding of performance and patterns of neurocognitive functioning through neuropsychological assessment, including an assessment of an adapted Symbol Digit Modalities Test (SDMT) based on whether the response modality is written or oral. Although accuracy was not affected by the adapted response modalities for the SDMT, performance efficiency

among those who provided written responses was significantly affected.

"These findings will inform ongoing efforts to address limitations of the SDMT, a test that is a core component of neuropsychological assessment among individuals with a history of neurological illness or injury," noted co-guest editor Ana Mills.

The second article describes a unique association between the duration of posttraumatic amnesia (PTA) and impaired memory functioning among individuals with a history of moderate-to-severe traumatic brain injury (TBI). The investigators found a persistent association between the duration of PTA and delayed verbal recall in the chronic phase of recovery from TBI.

Several articles explore the nexus of neuropsychology and neuroimaging, such as the application of quantitative radiographic technology to neurorehabilitation. A clinical commentary on the concept of plasticity from a neurorehabilitation perspective uses imagery to demonstrate that advances in the field of neuroimaging have relevance for the future development of neuropsychological rehabilitation. "Advances in neuroimaging appear poised to confer considerable interpretative or predictive power to neuropsychological assessment," stated co-guest editor Paul Dukarm.

The issue concludes with four articles that demonstrate the therapeutic value of integrating neuropsychological assessment into the rehabilitation treatment process. Studies illustrate the utility of neuropsychological measures in evaluating novel rehabilitation interventions, particularly for computer-based interventions that have seen a marked increase in use during the COVID-19 pandemic; the role of neuropsychological assessment and intervention in a return-to-driving program for individuals with a history of brain injury, which is a meaningful rehabilitation goal for many individuals; a formal, evidence-informed

approach to integrating psychotherapeutic techniques into [neuropsychological assessment](#) throughout the rehabilitation process; and a model of Integrative Cognitive Rehabilitation Psychotherapy which provides a framework to apply empirically supported therapeutic interventions across a range of theoretical orientations and within a biopsychosocial approach inclusive of cognitive, spiritual, and cultural factors.

"Taken together, the articles in this issue demonstrate the breadth and depth that clinical neuropsychology contributes to the neurorehabilitation process," explained the guest editors. "While some topics represent nuanced examination of perennial discussions, such as the use of performance validity testing, other topics offer explorations of emerging science."

The guest editors stress that further research is needed to bridge the gap between neuroimaging, neuropsychological test performance, and intervention methods among demographically diverse populations with neurological illnesses or injuries. Understanding how these findings correspond to patients' day-to-day functioning in their environment and communities will continue to be important work for the field of neurorehabilitation.

More information: Ana Mills et al, The science and practice of neuropsychological assessment in neurorehabilitation: An introduction to the special issue, *NeuroRehabilitation* (2021). [DOI: 10.3233/NRE-218018](#)

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