

NEUROCOGNITIVE AND PSYCHOMOTOR PERFORMANCE ASSESSMENT AND REHABILITATION SYSTEM

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Ser. No. 10/340,473, filed Dec. 27, 2002; which claims benefit under 35 U.S.C. 119(e) to the provisional U.S. Patent Application No. 60/343,620, filed Dec. 27, 2001. The entire contents of each of the above referenced patent application are hereby expressly incorporated herein by reference.

FIELD OF THE INVENTION

[0002] This invention relates generally to a computerized test system for assessment of cognitive status, and more specifically to a Neuropsychological! NeuroCognitive and Psychomotor Performance Assessment and Rehabilitation system that is designed for use on a handheld computer system.

BACKGROUND OF THE INVENTION

[0003] Computerized test systems are increasingly used for assessment of cognitive status in a wide range of situations that produce changes in brain function. An example of a computerized test battery is the Automated Neuropsychological Assessment Metrics (ANAM) Battery, developed by the U.S. Armed Forces, consists of a library of tests and batteries designed for a broad spectrum of clinical and research applications. This library of computerized tests was constructed to meet the need for precise measurement of cognitive processing efficiency of military personnel in a variety of psychological assessment contexts that include neuropsychology, fitness for duty, neurotoxicology, pharmacology, and human factors research. The tests assess sustained concentration and attention, mental flexibility, spatial processing, cognitive processing efficiency, mood, arousal/fatigue level, and short-term, long-term and working memory.

[0004] Computerized test systems may be employed in the evaluation of patients having traumatic head injury, stroke, various disease conditions, rapid decompression, shift work, jet lag, sports injuries, and exposure to toxic chemicals. Presently such test systems are available only on costly, full-featured desktop and notebook computers. The cost and the physical size of the systems render their use impractical in many situations, for example, for on-the-spot evaluation of personnel.

[0005] These systems present further disadvantages for testing personnel in the field. Specifically, these systems save results in computer files that must be post-processed for interpretation and for the presentation of the results. This data analysis step frequently delays knowledge of results for days or weeks after the test is completed. The lag between test administration and availability of results has largely limited computerized cognitive testing to research applications where the time delay is not critical. If computerized cognitive tests are to guide decision makers, be they clinicians, industrial supervisors, military commanders, or even the test-takers themselves, results must be available immediately, in a form that is easily understood and that maximizes utility.

[0006] Therefore, a need remains for a computerized, flexible, human performance test system that can be used to guide decision making in clinical, industrial, and field settings. A

further need remains for a system that generates point-of-use cognitive status reports that provide immediate comparisons with appropriate normative data and/or to the individual's past performance, providing timely feedback to test administrators, supervisors, clinicians, and those taking the tests so that appropriate actions can be taken based upon the test results.

SUMMARY OF THE INVENTION

[0007] It is an advantage of the present invention to provide a flexible computerized Neuropsychological/NeuroCognitive and Psychomotor Performance Assessment and Rehabilitation System for testing an individual's performance to guide decision making in clinical, industrial, and field settings. The assessment system can generate point-of-use Cognitive Status Reports (CSR) that provide immediate comparisons with appropriate normative data and/or to the individual's past performance so that timely and appropriate actions can be taken based upon the test results.

[0008] It is another advantage to provide a handheld computer, such as Personal Digital Assistants (PDAs), for a portable and cost efficient platform for administration of an assessment and rehabilitation system of the present invention. The portability and relatively low cost of the handheld computer and the test system software provides a highly attractive test platform.

[0009] Still another advantage is to provide a computerized neuropsychological testing system that presents different sets of cognitive tests (i.e., test batteries) to maximize utility and validity of the results in order to meet the needs of many different testing situations in varying environments, e.g., evaluation of stroke patients or evaluation of the fitness of a truck driver for duty.

[0010] It is yet another advantage of the present invention to provide a decision aid which presents immediate results in the form of a Cognitive Status Report (CSR) to a user in an easily understood form. The test system algorithms and procedures generate the CSRs for two general types of situations, that is, screening and repeated testing. Screening applications of the present invention utilize use demographically appropriate norms for generating a CSR. The goal of testing in these situations is to determine whether the individual being tested is different from the normative group, such that the individual requires a therapy or an intervention. Repeated testing situations require a CSR that indicates significant change from the subject's past performance to objectively evaluate efficacy of therapies or medications.

[0011] In the exemplary embodiment of the present invention a computerized Neuropsychological! NeuroCognitive and Psychomotor Performance Assessment and Rehabilitation System, referred to herein as "the assessment and rehabilitation system" or "the system", is designed to operate on handheld computers such as Palm Operating System (OS) and Microsoft Windows CE and Merlin compatible Personal Digital Assistants. The assessment and rehabilitation system also includes software utilities that allow the handheld computer to operate in conjunction with a host desktop or laptop computer for test battery configuration, complex data analysis, and archival data storage.

[0012] The assessment and rehabilitation system of the exemplary embodiment of the present invention provides point-of-use interpretations and reports of results of an individual's test. Components of the assessment and rehabilitation system include an executive program, test modules, inter-