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# Guest Editorial

Consistent advances in medical science continue to make more and more previously fatal conditions survivable. As with all things, this benefit comes with a price. The most obvious and well-publicized part of the price is the increasing cost of providing the most effective treatments and therapies that are now available. A lesser recognized, yet perhaps even more costly, component of that price centers on the large and increasing population of individuals whose permanent cognitive disabilities substantially limit their ability to function in our society without some form of assistance. Fulfilling that large, growing, fundamental need is the challenge and opportunity for cognitive prosthetic systems.

Improvements in a number of technologies have enabled real progress in the development of capable and practical cognitive prosthetic systems. This volume highlights several of the most promising pioneering developments, covering a wide spectrum of the focus area. It includes contributions representing diverse approaches from authors in North America, Europe, and Asia who have extraordinary experience and accomplishments in the development, implementation, and evaluation of cognitive prosthetic systems and related intervention protocols.

Dr. George Prigatano and his associate Susan Kime present the results of a study examining the on-going effectiveness of Memory Compensation Training for patients with a variety of brain dysfunctions and the willingness of patients to continue to use memory compensation techniques over time.

Dr. Barbara Wilson and her colleagues discuss NeuroPage, a service designed to reduce daily living memory and planning problems for individuals with cognitive disabilities. They also report results and selected case studies from the first clients of a nationwide commercial NeuroPage service established in the UK.

The PC-based Essential Steps system is described by Dr. Marilyn Bergman. She also discusses the application of that system to facilitate skill acquisition and enhance life management by individuals with cognitive disabilities and reviews data demonstrating the effectiveness of the system.

A small, wearable cognitive prosthetic system, the ISAAC system, is addressed by Dr. Patrick Gorman and his colleagues. Dr. Gorman describes the system capabilities, discusses how it is individualized to provide the specific supports needed by patients, and presents case studies of TBI patients who have used the system.

Dr. David Man discusses a concept for a web-based expert system with both therapist and patient functionalities. The therapist functionality is designed to support better practitioner decision-making in developing interventions for individuals with cognitive disabilities. The patient functionality is intended as a means to remotely provide interventions and supports for individuals' cognitive impairments.

Megan O'Connell and her associates examine the related and essential process and considerations involved in selecting an external cueing system that is likely to be effective for a given patient. They further address considerations involved in providing the necessary training for the patient once a system has been selected and then gauging the system's efficacy for the patient.

After reading about these systems, the capabilities they offer, and the successes that have been achieved with them, one might well wonder why we still don't see these systems in use widely. Particularly, given the large and ever growing number of individuals with significant functional limitations resulting from cognitive disability. One of the major reasons is the position currently taken by third party payers on reimbursement for cognitive rehabilitation and assistive technology.

Over the past several years, most third party payers in the U.S. have been successful in all but eliminating coverage for the meaningful treatment of the cognitive effects of diseases and injuries. And it is not unusual for many of those that don't explicitly exclude coverage to effectively avoid it by requiring convoluted documentation and authorization procedures to process payments.

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Complex benefit preauthorization procedures are all too often overwhelming for persons with self-initiation and short term memory dysfunctions. As a result, many individuals eligible for coverage of more complete and effective cognitive therapy and supports are effectively sidetracked from accessing those benefits.

The closure of many post-acute brain injury rehabilitation facilities and programs in the U.S. since the mid-1990s demonstrates the degree to which third party payers have successfully refused or avoided paying for adequate cognitive rehabilitation and supports. Most of the remaining cognitive rehabilitation programs have been gutted, since they are reimbursed for only short-term treatment that barely scratches the surface of many patients' cognitive rehabilitation potential. As a practical matter, the funding necessary for long-term supports and reinforcement are essentially non-existent.

Third party payers have so far been allowed to get away with dealing with cognitive disability as a transient condition – as though it were something "curable" under a limited benefits structure, like flu or a fracture – rather than as a permanent condition requiring on-going monitoring and supports. In most cases, therefore, it falls to families, public agencies, and charitable organizations to provide or subsidize what interventions are available. Even in the best of cases, this usually results in a patchwork of uncoordinated partial interventions, rather than a coherent on-going plan of treatment and supports. As yet, there is no widespread realization of the degree to which that approach is financially short-sighted, often even for the third party payers themselves, and almost always for families, public agencies, and society as a whole.

The developers of most of the systems discussed in this volume agree that the obstacles they found, and continue to find, most challenging aren't those that they anticipated when they began developing their innovations. The common perception was that once the technology and protocols for use were developed, a system would be embraced and become widely available for a large number of the patients for whom it is appropriate. In reality, the chief obstacles to realizing the potential of these systems are not technical issues. Instead, they are lack of awareness by treating practitioners of the existence and benefits of the systems that are available and the current ability of third party payers to avoid covering cognitive assistive technology and adequate related services. Beyond that, lack of sufficient understanding of the systems often results in unrealistic goals and expectations for them even when they are applied. In addition to interfering with the application of these systems for individual patients, those factors inhibit a coherent marketplace for cognitive assistive technology products of all types. This, in turn, prevents industry from embracing cognitive prosthetic products and making them widely available and supported.

The cognitive prosthetic systems included in this volume already offer significant practical capabilities. And, the maturation of several technologies – most notably battery, low-power processor, and short-range wireless technologies – now make substantial improvements in system mobility, reliability, and practicality possible. But again, the mainstream assistive and rehabilitative technology industry is understandably unwilling to commit resources to develop, produce, market, and support cognitive prosthetic products until the necessary funding sources are available so they can find their way to the population of patients who need them.

Hopefully the joint efforts of practitioners and advocates will bring visibility and positive change to this situation. If so, current and future cognitive prosthetic systems may one day soon be allowed to fulfill their potential to improve the overall self-sufficiency and quality of life of individuals with cognitive disabilities, while also reducing the long term costs associated with their care and support.

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