



## Riding the Brain Waves

by Elliot Cole, PhD

Providing tele-rehabilitation services for patients with traumatic brain injury can lead to clinical and financial reward.

**F**or the acquired brain injury post-acute care facility, tele-rehabilitation is both a clinical strategy and a business strategy. Telemedicine technology gives clinic-based therapists the ability to work intensively with patients in their homes, across town or across the continent. And it can provide significant competitive advantages for your facility.

### THE CONTEXT FOR TELE-REHAB

There is a burgeoning equipment market for telemedicine products. Medicare has been conducting clinical field trials, al-

though it currently does not reimburse telemedicine services. Senator J. Jeffords (R-Vt.) introduced the "Telehealth Improvement and Modernization Act of 2000" in the most recent session of Congress to provide increased access to health care for Medicare beneficiaries through telemedicine. When passed, it will become part of the Balanced Budget Act amendments.

Tele-rehab will benefit from the accelerating momentum of the telemedicine industry. One area of particular need is in the treatment of people with acquired brain injury who suffer enduring cognitive deficits.

While general services such as occupational therapy, speech therapy and physical therapy are widely available in most communities, specialized rehab services such as brain injury rehabilitation are not.

Several initiatives that have placed tele-rehab on the map suggest its significant commercial potential. One is a \$16 million foundation grant received by Shepherd Hospital in Atlanta for the development of tele-rehab for TBI and spinal cord injury. Other initiatives include activities in Missouri, University of Texas, Catholic University of America, National Rehabilitation ▶

ILLUSTRATION BY JON HUNT



## TBI Tele-rehab Case Study

This case study shows how tele-rehab technology can increase the rate of recovery, the therapist's productivity and the marketing opportunities for facilities that offer these programs.

TN, a woman in her mid-30s, was medically compromised by multiple-system problems and then suffered a brain aneurysm. After a brief inpatient stay, she began outpatient services. Her weak stamina restricted the level of outpatient services to one therapy session a day, five days a week. She had profound executive dysfunction, which compromised her short-term memory. She didn't experience hunger or thirst, and dehydration and malnutrition were serious problems. She had excellent language skills and high motivation, but the 20-minute commute to the clinic left her too exhausted for effective therapy. A therapist at the facility remembered ICP's program and referred her. Her insurance company agreed to pay for a half-day hospital program.

We installed a patient workstation in her home, with some difficulty because of the clutter and disorganization. But the tele-rehab program proved ideal for her. The initial rehab tasks were to address taking water, food and some of her many medications. She and her therapist worked closely on the design of her initial prosthetic software. These interventions were successful quickly in restoring eating and drinking to normal levels, and her stamina increased. With the prosthetic software, her level of organization increased and distractibility decreased. Her ability to design her own prosthetic applications grew significantly. With her therapist's encouragement, she began spending hours each day developing coping strategies.

Another intervention focused on her medication regimen, which includes several injections a day; soon there was physiologic evidence of enhanced functioning in several systems. Because stamina was still a problem, her therapist taught her to use the Internet for shopping—a burdensome, non-social chore. Her successes fueled her stamina and sense of accomplishment.

She had been interested in graphics, and with her therapist located an appropriate (and inexpensive) distance-learning site with graphics courses for Web design. Because of the cognitive demands of the distance-learning course, the therapist's active and frequent involvement was very important in turning what could have been a failure into a success. She is still taking courses and doing some Web design, which has become a cottage industry. The patient is delighted with her progress, the therapists are proud of their work and the program director is pleased with the reimbursement.

—Elliot Cole, PhD

tele-rehab

Hospital, Sister Kenny Institute, Kessler Rehabilitation Institute, University of Pittsburgh and SUNY Buffalo.

### CLINICAL APPROACHES

ICP has harnessed two emerging rehab trends that, independently, are showing clinical benefits in tele-rehab. The first involves working with TBI patients in their natural environment. Studies indicate that patients achieve a higher level of independent functioning at a faster rate.<sup>1</sup> A second trend involves the use of computer-based cognitive assistive technology. For a decade, studies have indicated that this approach can yield greater clinical outcomes in day-to-day functioning.<sup>2</sup> Computer-based cognitive assistive technology can play an important role both early in rehab during restorative therapy and later when compensatory strategies become the key to restoring function.

Combining these two trends, patients keep a computer in their home, where they receive intensive therapy by skilled clinicians who conduct several weekly sessions during the early stages of therapy.

Tele-rehabilitation enables the therapist and patient to work together at a distance. With the patient at home and the therapist in the office, the therapy can truly revolve around the patient's daily activities, rather than the patient's day revolving around therapy. Patients are able to engage in meaningful pre-morbid activities at home sooner and more successfully than if they had to first develop skills within simulations and practice sessions in the clinic. Clinicians address cognitive skills within the context of daily activities and find that patients who return to daily activities sooner exhibit faster skill recovery and independence.

### A LOOK AT THE TECHNOLOGY

TBI rehab still requires face-to-face therapy sessions, and videoconferencing makes this possible. Increasingly, high-quality (and fairly low-cost) videoconferencing involves the use of computer technology and high-speed Internet services.

Tele-rehab requires a desktop computer, which can link many other devices to facilitate therapy. Patients can use pagers to remind themselves to ini-

tiate a specific activity, or to serve as a contact for the clinician. Cell phones can also be linked to the computer. With special software, patients can send themselves an audio message or receive beeper text messages. GPS features can give the patient precise driving or walking directions. Hand-held computers have many advantages, such as storing schedules and making appointments.

Personal computers can provide tremendous support for TBI patients, both at a fixed location and in the community. But the technology is of little use without the active involvement of a therapist to manage the process.

### BUSINESS TOOLS

Brain injury rehabilitation, like health care in general, is struggling to respond to a changing industry, with reduced inpatient length of stay, reduced reimbursement and shifting rehabilitation to outpatient services. Competition in all areas of the continuum is keen.

Four advantages make tele-rehab a competitive strategy:

**1. Convenience.** Patients don't need to arrange transportation to outpatient rehab. This factor alone can relieve some pressure from a household disrupted by a loved one's TBI. Also, it becomes much easier for staff to have family conferences when they're all in one place.

**2. Cognitive assistive technology.** Prosthetic computer software has major competitive advantages for memory, organization and initiation over the traditional memory log.

**3. Integration into daily life.** Community-based rehab is the first step in this process. Patients can prepare food in their own kitchen and can pay bills from their own files. They can run errands and put needed items in their proper place.

**4. Preserving patients' stamina.** Traveling to and from rehab is tiring for most patients. Therapy is much more efficient when the patient is rested.

As a marketing strategy, tele-rehab offers several advantages for both regional and national markets. Here's a look at each.

• **Regional competition.** The first facility in a regional market that provides tele-rehab will enjoy a competitive advantage. It will expand the size



of a facility's service area, providing new revenue streams.

Some types of facilities will be able to realize revenues faster than others. Rehab hospitals with both intensive outpatient rehab programs and inpatient rehab will enjoy an extra competitive advantage. These facilities potentially can retain all of their inpatients as outpatients. Otherwise, discharge planning would involve selecting a convenient place for outpatient services. But the situation changes dramatically with tele-rehab. Facilities can retain patients that they would normally place in another organization's program, building the revenue stream.

For hospitals with inpatient rehab units, tele-rehab reduces sales costs and effort substantially. Retaining a patient is easier and less expensive than finding a new one. Also, a relationship with the third-party payer is set.

• **National competition.** Branding a tele-rehab TBI program is a viable marketing opportunity for both post-acute inpatient and outpatient services. Using the Internet—a natural component of brand mar-

keting—a tele-rehab program makes it possible for distant clients to become patients.

Before the availability of tele-rehab, establishing and capitalizing on a brand name meant carefully selecting a metropolitan area for a satellite facility. Tele-rehab reduces the barriers to creating a national market for a brand-name outpatient program. The problems of attracting and maintaining a minimum onsite census don't apply, and a tele-rehab program can be integrated easily into a program at an existing local facility.

#### ICP'S EXPERIENCE

For over a decade, ICP has provided neurorehabilitation services exclusively via tele-rehab along a broad continuum of care. The continuum begins when the patient is appropriate for post-acute services, and some patients require daylong attendant care in addition to intensive therapy. Therapy can continue through return to school and work, with job coaching or academic support. The setting is typically the home, but also can be school or office.

Located in suburban Philadelphia, ICP

serves a nationwide clientele. We treat patients from 5 miles away to thousands of miles away. Since 1994, insurance companies have been paying for these services as conventional medical services, rather than experimental services.

We apply computer science theory and methods to problems in ABI rehab—far different from mere computer programming. Computer scientists, clinicians and patients work together to blend the use of commonly available rehab methods and develop new methods to fill in the gaps.

After all, well-designed technology should enable the patient and the therapist alike. ■

*For a list of article references, go online to [www.advanceforPAC.com](http://www.advanceforPAC.com), and click on the "References" button.*

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