



TRACKING *the* TRENDS

Information, research and news about trends in brain injury rehabilitation and recovery

Telerehabilitation uses technology to bridge gaps in care

by Sharon Rolenc

Rehabilitation can be a long and arduous process for patient and therapist alike. Add barriers like distance, transportation and the physical limitations of the patient and recovery can sometimes seem insurmountable.

Telemedicine – the ability to deliver medical services over a distance using technology – offers a promising solution for persons with brain injury who have barriers to conventional rehabilitation.

While telemedicine isn't necessarily a new or cutting-edge development, its application in the mainstream healthcare system is still a ways off.

Sister Kenny Rehabilitation Services in Minneapolis, a unit of Allina Hospitals and Clinics, is exploring the use of telerehabilitation (telerehab) as a way to bridge the gap between therapists and patients in remote or underserved populations.

Under a five-year grant funded by the National Institute on Disability and Rehabilitation Research (NIDRR), Sister Kenny partnered with the National Rehab Hospital and the Catholic University of America – both located in Washington D.C.

As part of the Rehabilitation Engineering Research Center on Telerehab, Sister Kenny was chosen because of its connection to both therapists and rural partners.

The telerehab research at Sister Kenny focuses on occupational, physical, speech and vocational therapy.

Matthew White, an occupational therapist at Sister Kenny, is working with two clinics. The first clinic, a member of the Minnesota Rehab Initiative, is located in Elbow Lake, Minn. Located in the Pacific Rim (PACRIM), the second clinic sees patients from American Samoa. A third clinic is in the works on an Indian reservation in northern Minnesota.

specialists, where in the past they would have had to drive hundreds of miles for service.

"The therapist out in Elbow Lake might need someone who has an orthopedic specialty, so we'll provide that specialist here from Sister Kenny and at the other end will be the referring physical therapist and the patient present," said White.

White said that most any therapy exercise can be conducted via teleconference, but it's important to have a family member or healthcare aid on the other side to assist the person and assure safety.

"It really makes you be creative with your treatment plans. A lot of times you're using people on the other end – the family members, the rehab aides or the physical therapists – you're using them to be your hands, to complete the assessments and follow through with the recommendations," said White.

"I can tell a patient, 'raise your arm up over your head' and I can see how far they can go up. If they can't go as far as I'd like them to, then I can get their family member involved to try and help them with their range of motion. It can be as basic as that," he added.

Currently White is utilizing teleconferencing, which requires a facility to facility connection due to the high cost of equipment.

The downside to the teleconferencing technique is that patients still have to get to a facility that can accommodate a teleconference.

Patients that are uncomfortable in a clinic setting will have the same challenge with telerehab utilizing teleconferencing technology.

The next level of telerehab involves the use of videophones to enable in-home rehab sessions.

Shelley Santrach, the telerehab coordinator at Sister Kenny, partnered with Hibbing-based HomeCare

Minnesota, also in Hibbing, to explore the use of videophones.

The focus of Santrach's work are persons who have experienced strokes.

"The idea is to access whether or not using a video phone could help people achieve their vocational and independent living goals," said Santrach.

She was in Hibbing last fall installing the first of five pairs of interactive videophones.

Santrach has seen an increased level of productivity in telerehab sessions.

"You actually get more out of people when you do video interaction because they are required to concentrate. You don't have anybody filing their nails during a video conference because they have to pay attention," she said.

White said that Sister Kenny's research focuses more on the physical side of rehabilitation and he would like to see a partnership formed with organizations that also focus on cognitive rehabilitation, like the Institute for Cognitive Prosthetics (ICP) in Pennsylvania.

Under the direction of founder Dr. Elliot Cole, ICP has been in the business of technology based medicine since 1985.

When one of Bell Laboratory's scientists had a stroke and everyone had given up on her recovery, they came to Cole for help in the early nineties. Thus began ICP's focus on telerehab and brain injury.

A leader in the telerehab world, ICP has been conducting telerehabilitation sessions -- and getting it reimbursed by insurance providers - since 1994.

"We deliver services to the patients' natural setting. They are working with our therapists that have a remote connection. They are using our specialized software that is highly customized to empower people who have had a brain injury who may have problems with conventional software," said Cole.

For more information on telerehabilitation:

Sister Kinney's research as part of the Rehabilitation Engineering Research Center on Telerehab

www.telerehab-nrh.org
or call Matthew White at 612-863-7642

The Institute for Cognitive Prosthetics www.brain-rehab.com
or email Elliot Cole at ecol@brain-rehab.com

monitors, the Institute's proprietary software and in some cases a cell phone. The set-up fluctuates depending on the unique needs of the individual and the level of their proficiency.

Computer commands are carried out in different ways and are adjusted to the needs of the user. For persons with eye-hand coordination problems who may have problems using a mouse, they can use keystroke commands or function keys. For persons with arthritis, voice commands can be utilized. Color-coding is used for people that prefer visual cues. "Part of the process is to really empower them from the beginning. The idea is to get individuals to tell us what presses their buttons – what gets their attention and what draws their eye to something and how they want to be able to tune things themselves," said Cole.

"We know that every brain injury is different and that people with brain injury need software that is original and designed for them. And when it's well designed, they can use it, and when it isn't well designed they can't. Part of my challenge is the design of user-friendly systems," said Cole. Ultimately, the software works as a bridge for particular deficits caused by a brain injury, freeing the person to use their other abilities.

For example, after her brain injury, Bell Lab's scientist couldn't understand a newspaper or a magazine, but Cole happened to notice her thumbing through a computer manual.

much, much more difficult to read than a newspaper, yet there she was reading the manual," said Cole.

As a result of their observations, Cole adjusted the software to highlight certain sentences and then had the computer speak the sentences to her. As a result, she was able to get back to reading high-powered technical journals.

"She did have receptive aphasia, but the technology was able to overcome that by the combination of highlighting and speaking," said Cole.

Cole has also found that telerehab helps individuals get back to their lives quicker than some conventional forms of rehab. ICP conducted several case studies in the early nineties, funded through the National Institute of Health and Bell Labs.

"We chose activities that they wanted to do and were unsuccessful in doing using traditional techniques used by their therapists. We used the new computer based techniques using highly customized computer software and generally in less than a week they were able to perform the activity that had remained beyond them until that time," said Cole.

Dr. Sonja Wilt, a speech therapist with ICP and chair of the Pennsylvania Board of Examiners of Speech and Language Pathologists, is a firm believer of telerehab's potential with patients who experience trouble with conventional rehab.