



ABC NEWS ORIGINAL REPORT

Robot Guides Stroke Patients' Recovery

Electronic Arm Helps Patients Practice Movements

By NED POTTER

May 16, 2005 — Nancy Wheelen is gradually learning to use her right hand again. Parts of her brain were damaged by a stroke last year.

Most of the time, she goes to a physical therapist at Banner Good Samaritan Regional Medical Center in Phoenix. But lately she has had a second trainer: a robotic arm strapped to her own.

"To me," she said, "it is a beautiful merger of technology with empathy and compassion."

The developers of the arm call it RUPERT, short for Robotic Upper Extremity Repetitive Therapy.

It guides her, again and again, through the job of reaching for a cup on a computer screen. Over time, they hope, the repetition will make it possible for her to take over and make the motions on her own.

"This repetitive therapy tries to stimulate the sections of the brain involving the movement as much as possible," said Dr. Jiping He, professor of bio-engineering at Arizona State University, who co-developed RUPERT. "Then the brain starts to relearn the ability to control the arm."

Doctors have found the brain is remarkably adaptable. If one part is damaged, by a stroke or other serious injury, other sections can often be trained to take over.

'Practice, Practice, Practice'

"As we know from musicians who get to Carnegie Hall, 'practice, practice, practice,' " said Dr. Laura Lennihan, chief of neurology at Helen Hayes Hospital in West Haverstraw, N.Y. "And that is true for people recuperating from a stroke, that repetition contributes in the long run to recovery."

But such therapy can take months or years, and insurance companies object to the price tag.

"There is not enough time allotted for the therapy in the clinic to do all the repetitions necessary," said Jim Koeneman, co-founder of Kinetic Muscles, Inc., the company that built RUPERT in cooperation with He.

Koeneman said he hopes that, eventually, patients will take the robot home with them between visits to the therapist. That way, they would get more practice for fewer dollars.

"The length of stay and the amount of reimbursement for outpatient services is becoming so restrictive that whatever the patient can do in the home environment can only augment the success of the function of training," said Dr. Steven Wolf of Emory University Medical School in Atlanta, one of the leading researchers in stroke rehabilitation.

RUPERT is still experimental. Eight patients tried using an early version; government-approved clinical trials may not begin until late this year.

But someday, the researchers say, their work could help up to a third of stroke patients relearn basic motions.

Wheelen has her own personal list of the abilities she wants to regain. She says would like to play the piano again, and she misses being able to put her hands on her hips.