

cessfully trained capuchins (also known as organ-grinder monkeys) to assist people who are quadriplegic, giving them increased self-reliance. The monkeys follow verbal commands and visual cues from laser-pointers, to open or close doors, change books or magazines for reading, feed their owner, serve food from a microwave, clean up afterwards, retrieve objects, and more. These "formidably bright" animals, that learn new tasks in a single half-hour session, have a performance reliability rate close to 100%. They live 30 years, and are toilet-trained, clean, affectionate, loyal, and highly entertaining.

One of the first participants in the program was Sue Strong, who became quadriplegic after an auto accident 15 years ago. Strong said that having her capuchin, Henri or Henrietta, has completely changed her life. A simple thing like getting a meal could be delayed hours if an attendant arrived late. For Strong, the mouthstick is the primary tool for dialing a telephone, turning pages, and just about everything. When Strong drops it, she says, "Mouth, Henri. Mouth!" The capuchin searches until it finds the tool and gently returns

it to Strong's mouth. The monkeys are rewarded after each completed task with a bit of fruit juice.

When Henri is dispatched to the kitchen for a sandwich, she returns and positions it in the holder to the feeding tray. When she takes a small bite for herself, she instantly realizes the error of her ways and clammers to her cage, almost before her mistress gives the command. When Strong says disapprovingly, "Door, Henri," the capuchin yanks the cage door closed, and looks out, awaiting her reprieve.

Strong gives in, "Oh, all right." The capuchin is liberated. Then Henri settles at her mistress's ankles, craning her neck to gaze up at Strong, the very picture of contrition. Strong, laughs, says, "Look at that, will you. A face only a mother could love."

There are a broad range of technologies out there, addressed to almost all levels of the patient's needs. For instance, simple electronic switches, like light switches, that usually sell for under a dollar can be adapted for use by any individual. As one carpenter explained, "whatever the person can move, if it is only one finger, we can hook something up

The Eyegaze System: a window on the world

The Eyegaze System for the physically disabled was developed by Dixson Cleveland and Joe Lahoud of LC Technologies, Inc., in Fairfax, Virginia. Nancy Cleveland, R.N., B.S.N., is the wife of Dixson Cleveland and is medical and technical coordinator for LC Technologies. In an interview with Marianna Wertz, excerpted here, she presented some case histories of patients who have been helped by the system:

There's a minister in Connecticut who's 30, and who's locked in. His church bought him this computer; they raised the funds in 24 hours. His goal is to write sermons that somebody else can read.

There's an 11-year-old kid in Florida who's doing his homework on Eyegaze. He was hit by a car and broke his neck so high up that he's on a respirator and he can't speak. He goes to school on a respirator with an attendant, comes home and does his homework on Eyegaze. He calls his friend down the block, using his eyes to dial the telephone. . . .

There is a woman in her mid-20s, who has had cerebral palsy. She was in a wonderful residential school program until age 22, at which point the state that she lived in said,

"You're past the age, you have to leave."

She was in this program, though it was designed for developmentally disabled/mentally retarded people. She wasn't retarded. She couldn't talk, she had spasticity, so she couldn't control her movements, but the staff at this place recognized that she was a smart young woman, and she had spent years being involved socially with the staff, going shopping, going to the movies, being involved with them, rather than with her peers in the program who were retarded. . . .

She then ended up at home, with a loving mother but losing all her support. She became suicidal and decided that she wanted to die. She had nothing to look forward to in her life, and she stopped eating.

Her mother just told me this story a couple of weeks ago, when we were delivering her computer to her. The doctors told the mother that if she lost 25% of her body weight, they'd never be able to save her, because she was tiny to begin with. She weighs maybe 60 pounds. She was a pound away from that irreversible weight loss when her family tracked us down, found out about Eyegaze, and drove hundreds of miles to a conference where we were exhibiting and sat her in front of the computer, and she ran it. They vowed they were going to get her the computer somehow, and it took two years to do it. They did fundraising and applied to their state and got some funding through a state agency.

Once she ran the computer and knew that she was going to get it, she started eating again. It's taken her two years to regain the weight that she lost.