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## Biofeedback Offers Help to Hyperactive Children

By JIM ROBBINS

HELENA, Mont. -- In May 1987 Mary Obringer and her husband adopted a 5-month-old South Korean infant. But there were problems with the baby they named Max. "He had speech disabilities, motor skill problems, was hyperactive and had trouble concentrating," Ms. Obringer said. He could not be in a large group of people without hitting, kicking and screaming.

When he was 5, they started him in school in their hometown, Jackson, Wyo., "and it was clear right away he wasn't going to be able to stay," Ms. Obringer said. Doctors diagnosed his condition as attention deficit disorder, and put him on the drug Ritalin, which helped. But he still had numerous problems and stayed in a classroom for special students.

Ms. Obringer met a psychologist, Michael Enright, who urged her to let Max try a new kind of biofeedback technique in combination with the Ritalin.

"We started seeing immediate results," Ms. Obringer said. "Within a couple of weeks he could sit in a chair and not fidget. Two years later, he was like every other kid. No kicking, no hitting, no fighting."

Max, now 11, has been in regular classes for several years and does well in school, though he still takes Ritalin, at a much lower dose. The Obringers are among a growing number of people who, concerned about the amount of drugs their children are taking, are turning to a new kind of treatment called EEG biofeedback or neurofeedback, a technique that reads a patient's brain waves with standard electroencephalogram equipment, and displays them on a computer. Being able to see their brain waves, combined with video games that they perform based on brainwave states, allows patients and their doctors to exert a new level of control over brain waves. And that, some researchers say, improves and sometimes cures problems that have a physical component in the brain.

Proponents of the technique say some controlled studies and a large number of positive clinical results show that neurofeedback is very effective for patients with attention deficit disorder, attention deficit hyperactivity disorder or hyperactivity, epilepsy and closed head injuries.

Other scientists have a different view of the technique. "It's highly experimental" as a treatment for attention deficit disorder, said Russell Barkley, director of psychiatry and a professor of psychiatry and neurology at the University of Massachusetts Medical School, and an expert on attention deficit disorder, which is known as ADD.

"There's a tremendous placebo effect in a situation like this," Barkley said. "Case studies prove nothing because they're totally uncontrolled."

On the other hand, Barkley said, "we don't have any studies that say it's bad for you," adding: "I don't think it will do harm. But I don't think it should replace treatments that are cheaper. Basically, it's buyer beware."

The first part of treatment with neurofeedback is a diagnosis by a doctor or mental health professional. In a typical neurofeedback session, the user wears two sensing electrodes. The brain waves are amplified and displayed on one computer screen, while on the other a video game is displayed.

The computer is programmed to help the patient do well on a video game similar to Pac-Man, when he or she is creating the right brain waves. Sessions take 30 to 60 minutes and vary in cost from about \$60 to \$100. Some health insurance companies pay for sessions, and some do not. In Ms. Obringer's case, the school system paid. Biofeedback is based on a certain sort of electrical activity in the brain, which produces what are called alpha waves. The technique has been widely used since the 1970s to treat stress and migraines, and to help manage pain, but some doctors are skeptical about the wide range of claims attributed to biofeedback. In the 1970s researchers like Elmer and Alyce Green at the Menninger Clinic in Topeka, Kansas, found that biofeedback users could get into a deeply relaxed alpha state in just a session or two.

But alpha waves are only part of the brain's frequencies. There are several basic brain waves. Delta is the sleep state. Between sleep and wakefulness is theta. Next is alpha, a relaxed and mentally unfocused state. Beta brain waves indicate normal waking consciousness. There is also something called sensory motor rhythm, or SMR, which is a similar frequency to beta waves. Sensory motor rhythm governs body sensations and voluntary movement.

The new type of biofeedback trains the user in the beta and SMR ranges. "It's a lot of old ideas put together and made better by new technology," said Dr. M. Barry Sterman, the research director for EEG Spectrum, a company in Encino, Calif., that makes EEG systems and treats patients. "We can measure and analyze things we never could before."

For the past 30 years, working as a researcher at the Veterans Affairs Hospital in Sepulveda, Sterman found that by decreasing theta waves and increasing sensory motor rhythm he was able to help some epileptics reduce grand mal seizures. Working with people who did not respond to traditional therapies, Sterman reported an 80 percent seizure reduction in more than 60 percent of his patients.

Sterman, now a professor of neurobiology and biobehavioral psychiatry at the School of Medicine of the University of California at Los Angeles, says that biofeedback "can activate neurons that aren't being used, if they are intact." With more neurons, or brain cells, working in the part of the brain that governs a problem like epilepsy, for example, susceptibility to seizures drops. "We're not saying that people should go off medication," Sterman said. "But it helps people reduce the amount they take."

Other scientists are not convinced. Dr. Michael Goldstein is a neurologist in Salt Lake City and chairman of the Practices Committee of the American Academy of Neurology. He said that although he was not familiar with the studies of neurobiofeedback and its effect on epilepsy, there was no way such a system could work. He attributed success stories to people who might be able to control seizures naturally. There are some people who can do that, Goldstein said. "My guess is that would be one out of a thousand," he said.

A major proponent of neurofeedback is Joel Lubar, a professor at the University of Tennessee at Knoxville. He created the protocol for treatment of ADD with neurofeedback in the 1970s and has published a number of papers on the subject. He says 80 percent to 90 percent of people with attention deficit disorder and its subcategory ADHD, attention deficit hyperactivity disorder, can benefit substantially from the treatment.

Another area where progress has been reported with neurofeedback is in the treatment of closed head injuries, a banging of the brain against the inside of the skull, which causes damage to neurons. Symptoms range from psychological, like mood swings and irritability, to short-term memory loss, to headaches, nausea and blurred vision.

Dr. Jonathan Walker, a neurologist at the Neuroscience Center in Dallas, has been treating mild closed head injury patients with neurofeedback for three years. Of nearly 200 patients treated, he said, "the vast majority went back to work, got their memory back, and their headaches and blurred vision went away."

Many other uses of neurofeedback are being tried, for everything from menopause to Tourette's syndrome, without any sound evidence that it is useful in these cases.