

## Study may show whether neurofeedback helps people with ADHD and other disorders

The costly, controversial therapy is getting its first federally funded test



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Gulf War veteran Lynn Gibbons has awful memories of combat with her fourth-grade son, Brent. "He was an out-of-control monster whenever you asked him to do something," the former Air Force computer operations officer recalls. Brent, who had received a diagnosis of attention-deficit hyperactivity disorder, was also flailing in his classes at Saratoga Elementary School in Springfield -- unable, says his mom, to write a coherent paragraph.

That was seven years ago. Today Brent is taking advanced-placement high school courses, maintaining a 3.5 grade-point average, playing guitar in a band and -- drum roll -- helping with chores. Says Gibbons: "I am no longer afraid that jail time will be in his future."

What made the difference, she's convinced, is a high-tech intervention called neurofeedback, also known as EEG biofeedback. Ordinary biofeedback is a kind of mind-over-body training in which a person uses electronic equipment to monitor an involuntary physiological process such as heart rate and learns to gain some control over it. Neurofeedback operates on the same principle -- except in this case, it's mind over brain.

Proponents claim neurofeedback can help alleviate a broad range of problems, including not only ADHD but anxiety, depression, autism and brain injuries. Yet the costly, time-

consuming therapy has long been dogged by skeptics who call it a placebo at best, a rip-off at worst.

Both sides may soon get more clarity. The National Institute of Mental Health (NIMH) is sponsoring the first government-funded, peer-reviewed study to put heady claims such as Gibbons's to the test, investigating whether the offbeat therapy makes sense for some of the millions of American children and adults coping with ADHD and similar disorders.

Disclosure: Based on my own experience, I share Gibbons's enthusiasm. My son and I have both been given diagnoses of ADHD, and I believe that our simultaneous neurofeedback sessions last year helped us survive his middle school.

### **A lack of data**

In a typical neurofeedback session, a therapist attaches electrodes to your scalp, sending information about your brain's electrical activity to a computer. The computer is programmed to reward you -- with pleasant sounds, for instance -- the more you are able to control your mental states. My therapist used software displaying a scene of a meadow that bloomed into color and detail, with a soundtrack of chirping birds, whenever I succeeded in staying calm and focused.

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Ohio State University child psychiatrist L. Eugene Arnold, the NIMH project's director, says the institute agreed to fund the study as a result of new interest by the influential national advocacy group Children and Adults with Attention Deficit/Hyperactivity Disorder. CHADD receives about one-third of its revenues from pharmaceutical firms and historically has vigorously supported medication as a first-line treatment for ADHD. Yet in recent years the group has grown more willing to consider nondrug therapies.

"A lot of CHADD's members wanted to know about neurofeedback," says Arnold, who is on the group's advisory board. "The claims looked pretty good, but there wasn't enough data to make the recommendation."

For Arnold's study, the results of which should be published next summer, researchers are recruiting 36 participants, ages 6 through 12, and randomly assigning them to one of two groups. All the children are hooked up to neurofeedback equipment, after which they play a video game in which they are told they can make a car race ahead by staying calm and focused. For one group, the equipment works as described; for the other, the cars race or stop independent of the children's mental behavior.

Seventeen children have completed the testing thus far. Arnold says he has received reports of significant changes in some of the children's abilities, outside the lab, to pay attention, stay focused and finish tasks. Still, he can't yet say whether the children are

being helped by the treatment, since neither the participants nor the researchers will learn who was in which group until the results are analyzed.

Mainstream ADHD experts have pointed to serious flaws in many of the studies that private neurofeedback practitioners have published to date. Some dismiss the therapy altogether. The prominent ADHD researcher William Pelham of the University of Buffalo includes neurofeedback on a list of common but ineffective treatments that also includes "horse therapy."

Even so, an increasing number of parents with children with ADHD swear by neurofeedback. Lynn Gibbons was so encouraged by the results of her son's treatment that she's now studying to become a neurofeedback practitioner herself, a testimonial that's becoming increasingly common, according to Judy Crawford, director of certification at the Biofeedback Certification Institute of America, which is located outside Denver.

"I'm getting calls and e-mails at least twice a week from people who say neurofeedback has made such a difference for them that they want to go into the practice," Crawford says. "Neurofeedback is really reaching out to the unreachable -- people who haven't been helped by medication or other therapies."

### **Alluring but expensive**

Regina Casciato of San Francisco says neurofeedback treatments produced "profound" improvements in her 14-year-old daughter, Victoria, who suffered from insomnia and impaired concentration due to a disorder of the central nervous system. "Within a week, she was able to sleep through the night, and her anxiety has been cut in half."

Casciato's friend Tracy Edwards was so impressed by Victoria's progress that she brought her 13-year-old daughter, Maya, who had received a diagnosis of ADHD, in for training. After 30 sessions, Edwards, too, became a neurofeedback fan.

"There are all these little changes," she says. "Like she's now getting up a half-hour earlier each morning, without me saying a word. She's even finally managing to turn off the shower so it doesn't drip."

Undergoing neurofeedback demands an extraordinary commitment of time and money. A typical therapist will recommend at least 40 half-hour sessions to treat ADHD and charge as much as \$100 per session. Practitioners also commonly require a diagnostic "brain map" at the start of treatment, adding as much as \$900. And -- with so many questions about neurofeedback still unanswered by mainstream research -- none of this is normally covered by insurance. (Some plans, including Kaiser Permanente, do cover biofeedback for stress relief.)

The promise nonetheless remains alluring, especially for many long-frustrated parents of children with ADHD. Advocates describe lasting improvements compared with stimulant medication, whose effects wear off as soon as the drug leaves the bloodstream and whose side effects include stunted growth, facial tics, loss of appetite and insomnia.

Psychologist Joel F. Lubar, a past president of the International Society for Neurofeedback and Research, says that while neurofeedback might not reliably substitute for medication, it often helps patients reduce their doses.

Houston rabbis Kenny and Amy Weiss tried neurofeedback for their two sons, ages 10 and 12, both of whom had received diagnoses of ADHD. They believed the treatment was helping, but couldn't afford to keep up the office visits. So they bought a \$1,600 BrainMaster machine, the kind used in many neurofeedback offices, to try at home, checking in periodically with their therapist for advice about what to do next.

"Depending on where I put the electrodes, I saw them being calmer, happier, and not as tense," Amy Weiss says of her sons. But the cost of the machine and consultations was still high, and it became such a hassle to get the kids to sit down regularly by herself and to deal with the mechanics, including attaching the electrodes with conductive goop, that the Weisses soon dropped the at-home approach. Today, their sons continue to take stimulants despite their parents' worries about the long-term impacts. "The boys are so much more successful and happy being on the medication that we cannot imagine taking them off," says their mother.

If the NIMH study finds benefits from neurofeedback, it could eventually help increase competition, lower treatment costs and lead to more standardization of a largely unregulated field.

I'm certainly cheered by this possibility -- as long as I keep my mind off what neurofeedback has done to my bank account. Like Brent Gibbons, my son has become somewhat easier to live with after several sessions of neurofeedback. But now I've started to hope that with maybe a few more sessions, he'll start helping with the dishes.