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Making Brain waves

Biofeedback therapies offer new hope for hyperactive children

By Lois M. Collins, Staff Writer

Chris, 7, is training his brain to concentrate.

It's not hard work, just a little time-consuming. Twice a week, he sits in a lounge-like chair at Comprehensive Psychological Services in Brickyard Plaza while program coordinator Allyn Wilcock hooks him up to a computer, using sticky taped electrodes that rest on his scalp. Then the little boy watches a computer screen.

It looks like Pac Man. His brain is the mouse.

Diagnosed with attention deficit/hyperactivity disorder (ADHD), the boy as well as his parents have turned to a process called neurofeedback for relief. The fancy name is EEG Biofeedback. The theory is the brain, through the program, trains itself to focus at optimal levels. After enough sessions, the brain knows how to accomplish the task on its own. Proponents say the effects are permanent.

In another room, a golfer is going through the same process. But his goal is different. Like members of an Olympic bobsled team and executives who get "wired," he's seeking peak performance

It's not easy to understand or explain how neurofeedback works. And critics say it's nothing more than a "high-tech placebo" with further study needed to verify effectiveness. Proponents are thoroughly sold on it.

The theory is based on the basic frequency ranges in which the brain operates: delta, theta, alpha and beta. Delta is a sleep state where signals move through clusters of neurons very slowly, at about 4 cycles (hertz or Hz) a second. Theta is a deeply relaxed 4 to 8 Hz. Alpha is 8 to 13 Hz, while beta is the most alert state - normal, waking consciousness. Beta has its own broad range, from the relaxed 12 to 15 Hz to hyper beta, which can reach 35 Hz.

Neurofeedback is based on the belief that the brain sometimes gets out of balance. With underarousal, the brain speed is too low. With hyperarousal, it's too high. Neurofeedback tries to regulate the brain and teach it to operate at the optimal speed, according to psychologist Steve Szykula, director of Comprehensive Psychological Services.

"When you concentrate on anything," said Wilcock, "the brain fires a certain way - with a certain brainwave pattern."

The applications include seizure disorders, hyperactivity and peak performance training. Wilcock said children with attention deficit have too much "slow, dreamy brainwave and not enough beta, associated with focus." With seizure disorders, there are more fade-aways and sleepiness, too. That's why the stimulant Ritalin, commonly used to treat attention deficit, works. It calms down its subjects, who are trying, really, to stay awake.

Here's why it's hard to explain - and controversial. "There's no mantra or focal point," said Szykula. "The brain has no perception of what it does when it concentrates. Neurofeedback gives it a clue."

With the Pac Man-like program, the little creature gobbles pellets faster when concentration is better. It shows on a screen, accompanied by happy sounds. Another computer screen plots the brain's beta and theta lines. "The brain gets a perception of what it's like to concentrate. With practice, the brain knows and gets to that place automatically."

It's not a matter of willing the Pac Man to gobble. When this reporter tried thinking, "Go, go" not much happened. But by looking at the screen and focusing on the words to almost-forgotten songs, the creature made a rapid, purposeful feast of the pretend pellets. Different brains find different paths to concentration.

Szykula said studies have shown that with 100 sessions, "untreatable" children had their seizure disorders resolved. Learning disabilities, concentration deficits, behavior problems went away. And "three-year follow-up studies on treatment responders show that changes in the EEG maintain, the increased blood flow to the brain maintains, symptom improvements maintain." He likens it to riding a bicycle. After 20 years, you still know how.

He added, "biofeedback enhances the ability to organize and plan and have consciousness and conscience. Try getting that with a pill."

Still, it's a costly process. Each session is 45 minutes long and costs from \$50 to \$80. And it takes a lot of sessions to retrain the brain and lock it in, he said. Seizure disorders can take up to 200 sessions. ADHD takes about 40, as does peak performance. Most insurance companies don't pay for any of it.

What does it take to bring someone with problems into the "normal range of function"? Szykula said 20 to 30 percent find normal range without medications in 40-50 sessions. Another 50 percent see significant improvements and are able to reduce the amount of medication they must take. And there's hope that more sessions will resolve a condition entirely. Another 10 percent fail treatment for various reasons.

If it's hard to explain what it is and how it works, Szykula has no trouble saying what it isn't: "It's not relaxation therapy. That never works with ADHD and has minimal impact on migraines (another application for which neurofeedback shows some promise)."

And it's not a pill, but a "skill the brain develops," he said.