

# Brain-wave workout may help attention troubles

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**Plymouth Meeting, Pa.** -Eight-year-old Patrick Steenson was working hard to rack up points on his Superman computer game.

He used no joystick, no mouse. Only his brain controlled the computer.

Patrick was in the midst of a biofeedback session to train his brain to produce more fast brain waves and fewer slow ones. He had been diagnosed with Attention Deficit Hyperactivity Disorder, or ADHD, a common neurological disorder that makes it hard for children to sit still, concentrate and learn.

A tiny electrode attached to his head was monitoring his brain's electrical activity and converting that information into the computer program.

When Patrick's mind was alert and his body calm, Superman flew high and steady, a bell rang and points piled up. When Patrick became restless and lost concentration, Superman dipped, the bells stopped, a red light flashed, and he scored no points.

The hope was that by the time Patrick completed 40 sessions, he would be better able to pay attention and stay on task.

"What we see with kids with ADD (Attention Deficit Disorder) and ADHD is that their brains are underaroused. The brain is producing too much slow-wave activity," said Domenic Greco, who holds a doctorate in clinical psychology. Patrick was getting his biofeedback sessions at NeuroDynamix, a Philadelphia-area company where Greco is clinical director.

Through a system of "practice and feedback," Greco said, people with attention problems can learn to produce more of the fast waves associated with being calm, alert and focused.

While such neurofeedback, or EEG biofeedback, has been around for more than a decade, it is attracting more interest lately as parents look for alternative ways to treat their children with attention problems - a trend occurring in many fields of medicine.

Some parents won't consider giving their children a drug to treat ADHD. Others want to wean their children from medication such as Ritalin, which is considered standard treatment for ADHD, because it has lost its effectiveness or is causing side effects.

"We are not curing someone of ADHD," Greco said. "We're teaching them self-regulation."

The observations by him and other practitioners are backed up by some published scientific articles reporting varying degrees of success with neurofeedback.

But critics say the method is unproven and that there have been no carefully controlled studies done to say whether it has merit. They worry that parents are turning their backs on proven treatment and throwing away their money, typically \$3,000 or more for a 40-session program.

It is estimated that 3% to 5% of school-age children may be affected by ADHD, and some studies put the number much higher.

Children with the condition often can't concentrate in school, get bad grades and have difficulty getting along with peers because of their impulsivity. A recent study found that teens with the disorder who are not treated with drugs are at risk for substance abuse.

"My own assessment of "neurofeedback" is that it is at best still an experimental treatment, that the amount of research is very, very limited," said Russell Barkley, an expert on ADHD and director of psychology and professor of psychiatry and neurology at the University of Massachusetts Medical Center.

Barkley and other critics don't dispute that those with ADHD have differences in their brain-wave patterns.

Practitioners use EEGs (electroencephalography) to monitor the electrical activity of the brain and map brainwave patterns. People with ADD tend to produce an abundance of slow brain waves and show less fast-wave activity. Slow waves are associated with being daydreamy, tuned out and distracted. Faster waves are indicative of being calm, alert, focused and thinking intensely.

"Can you train people to alter their brain waves? Could you do that? Yes," said Barkley. But the big question, he said, is "does this ability to alter their brain waves translate into everyday life and does it result in the changes in behavior, social function, learning and intelligence that proponents say it does?"

Lynda Thompson, a psychologist who runs the ADD Centre near Toronto, has been offering neurofeedback for six years. "It's kind of surprising to me how harsh the critics are about it," she said.

In an article published last year in *Applied Psychophysiology and Biofeedback*, a peer-reviewed professional journal, Thompson reported on the results of 111 people, most of them children, who went through 40 sessions of neurofeedback at her center. She reported that 30% of the children were taking medications such as Ritalin when they started the program, but that number had dropped to 6% by the end of the sessions.

A comparison of before and after results showed a decrease in slow wave activity, a drop in inattentiveness and impulsivity as measured by an objective test, and a 12-point increase, on average, in IQ score, she said.

"The critics will say it could all be a placebo effect, but when you have effects this large you have to say something is happening," she said.

Before Patrick Steenson, who is now a third-grader at Presentation B.V.M. School in Cheltenham, began his neurofeedback at NeuroDynamix, he underwent an evaluation, including questionnaires of his parents and teacher and an EEG, to confirm a diagnosis of ADHD.

Then he had two one-hour sessions a week for 20 weeks. Each time, an electrode on his head monitored his brain-wave activity.

Patrick's has had his final session. His mother, Dottie Steenson, said she can see changes in her son. NeuroDynamix will follow up with his teacher to see if she notes any changes.

"All of a sudden, there are qualities about him we didn't see before." She said her son has become clued in to what's going on around him, he's more conversant and doesn't get as frustrated when something doesn't go his way.

"There are subtle, little things, but I can see his brain is far more engaged in the learning process," she said.