



## WHAT IS NEUROFEEDBACK?

*Neurofeedback helps to strengthen, calm and stabilize the brain.  
It is pain-free and completely safe.*

**By Mary R. Vernon, MS, LPC; Bill Bush, MA, LMFT; Kathy Stevenson, MS, LPC**

The overall goal of neurofeedback is to improve neurological flexibility. The brain is supposed to shift easily between states, from sleep, to relaxation, to calm alert, to high alert when needed. Once your brain is “trained”, it can then shift on its own (as opposed to being “stuck” in a state of anxiety, anger, etc.)

Dr. Daniel Amen, a well-known psychiatrist recently seen on PBS, has written many books on the brain. He specializes in brain scans and recommends neurofeedback as a treatment option. Amen says that “a healthy brain tends to be: focused, happy, relaxed, loving and effective while an unhealthy brain tends to be distracted, sad, anxious, angry and not as effective.” We all want the healthy brain!

### **Conditions that neurofeedback can help.**

Neurofeedback addresses many mental, emotional, and physical problems of brain dysregulation. A better functioning brain can improve **sleep**. When you sleep more efficiently, you are more alert during the day. It can be helpful in managing **attention** – how well you (or your child) can attend to a boring task.

Emotions may feel like the real you, but your brain has a lot to do with emotions. If you think about emotions in the light of **depression or anxiety disorders**, our emotions are greatly affected by our brain function. Current research has proven that neurofeedback is a viable option for treating depression and anxiety.

We have not seen anything as effective for decreasing **anger and rage**, as neurofeedback. Sometimes clients struggle with **ADHD**, with a **bipolar (manic depressive)** disorder, or are simply are “wired” toward anger genetically. For years we sent clients to anger management courses which essentially helped them learn to “keep a lid” on their anger. It just didn’t work.

**Sensory integration** is a negative sensitivity to tags in clothes, ears being touched, loud noises, smells or odors, certain textures of fabric, certain textures of food, and much more. This inability to filter can contribute to distractibility, frustration, etc. We put sensors on the back of the head for 15-20 sessions and most of these symptoms are significantly reduced if not completely gone.

Some of the most debilitating symptoms we see are in people who suffer with chronic **lack of energy, migraines, headaches, and/or low motivation**. These are often seen as psychiatric issues, when they are often physiological. After assessment, if appropriate, we try neurofeedback. We have seen improvements that tend to hold and often medications can be reduced.

**Autism, aspergers and reactive attachment disorder** are the fastest growing areas of neurofeedback. Although this population usually needs 75-100 sessions, the calming effect of neurotherapy produces noticeable results quickly in these severely anxious and often over stimulated children.

### **A brief history.**

In 1968, Dr. Barry Sterman, a neuroscientist at UCLA medical school, proved that cats in his lab could be trained to make more EEG activity at 12-15 Hz frequencies (SMR). Sterman used the same cats for a NASA contract to investigate whether rocket fuel could cause seizure activity. The cats were exposed to a volatile fuel called hydrazine. Half the cats seized in a predictable dose response curve. The other half of the cats (those who had increased SMR brainwaves in the last experiment) had a dramatic reduction in seizures compared to the normal cats. It was an unexpected outcome.

After additional research, neurofeedback was tried on a woman working in Sterman's lab, who suffered from uncontrolled seizures. She was trained at 12-15 Hz along the sensory motor strip. The training had the same inhibitory effect that it did on the cats and the woman subsequently qualified for a California driver's license. These events launched the field of neurofeedback.

### **What neurofeedback is not.**

Neurofeedback is **not electricity** to the brain. Much like a stethoscope allows the user to hear the heart beating and measure the heart rate, the sensors allow the software to measure the brain activity and convert these brainwave patterns onto a computer monitor.

Neurofeedback is **not traditional biofeedback**. Biofeedback works on the conscious brain, concentrating on learning to relax, to reduce blood pressure, etc. Neurofeedback works on the brain itself, opening up neuropathways so the brain can do, what the brain is supposed to do.

### **How does it work?**

We take a comprehensive assessment of reported symptoms. These are used to choose treatment protocols.

A special EEG monitor and software are installed on two computers – one for the client, and one for your neurotherapist. One or two sensors are placed on the head according to the assessment. The client relaxes and watches a simple game on the computer screen (like a boring video game). Auditory (beeps) and video feedback reward the client.

One advantage of neurotherapy is that the client doesn't have to want to be there. This can be great for adolescents who are not interested in counseling. Neurofeedback can be very successful with these kids.

### How do you know where to place the sensors?

Very simply, the left side of the brain mostly controls underarousal (e.g. depression), and the right side in general controls overarousal (e.g., anxiety). The area of the brain behind the forehead (known as the frontal lobe) helps regulate motivation, organization, impulsivity, learning from previous behavior, etc. The back part of the brain helps regulate sensory integration (handwriting, eye-hand coordination, etc.). After a thorough assessment, we place the electrodes on the part of the head that correlates with the brain function being treated.

### How does neurotherapy differ from a psychiatric diagnosis?

Dr. Jack Golden ([www.DrJgolden.com](http://www.DrJgolden.com)) arranged the following chart. “Below are some of the conditions people experience that can be effectively treated with neurotherapy. The typical medical model addresses these conditions from an individual diagnosis perspective. The significance of neurotherapy is that we can train one or more of twenty sites and regulate the exact area that needs regulating. Many conditions where people are taking stimulant medication (Ritalin for example) also stimulate other areas of the brain that do not need the stimulation.”

### Symptoms and brain arousal states.

	<b>Under Arousal</b>	<b>Over Arousal</b>	<b>Unstable Arousal</b>
Poor Sustained Attention	<b>X</b>		
Impulsive		<b>X</b>	
Easily Distracted		<b>X</b>	
Anxiety		<b>X</b>	
Depression	<b>X</b>		
Agitated Depression		<b>X</b>	
Anger		<b>X</b>	
Impatient		<b>X</b>	
Manic-Depressive Cycles			<b>X</b>
Panic Attacks			<b>X</b>
Sleep-Difficulty waking in A.M.	<b>X</b>		
Frequent Waking During Night	<b>X</b>		
Difficulty Falling Asleep		<b>X</b>	
Restless Sleep		<b>X</b>	
Nightmares		<b>X</b>	
Poor Reading Comprehension	<b>X</b>		
Migraine			<b>X</b>
Sensory Integration			<b>X</b>

### **How long do the effects last?**

In general, clients report that results are permanent. If the client has done enough training and the right type of training, results seem to stick. Should there be a head injury, extreme stress, a serious disease, etc., sometimes an additional 5-10 sessions are needed.

### **Can neurotherapy be done while on medication?**

Yes, we start many clients while on medications. After a number of sessions, a reduction is not unusual (under the supervision of your physician). An example: A 42-year-old mom had been on four medications for years to treat depression. After 40 neurofeedback sessions, she was only using one medication at a reduced dose.

### **What are the costs and time commitments?**

Training requires at least two sessions per week during the early stages. Then we taper to weekly, then to every other week then monthly. Each session lasts 45 minutes (with 30 minutes of actual training). The cost is comparable to counseling: \$140 per session. It is also available in a block of 10 sessions prepaid at \$120 per session (\$1,200). Most clients need between 35-40 sessions to complete treatment.

### **What do the experts say?**

“In my 38 years of practice, I have never seen any treatment that comes close to producing the results that neurofeedback offers... I have seen results achieved in days and weeks that previously took months and years to achieve, using the best methods available to us.” **Jack Woodward, MD, Psychiatrist, North Carolina**

“It is wonderful to see children learning to... regulate their brainwaves using neurofeedback. This is the most exciting thing I have done in my career as a psychologist. Neurofeedback empowers people to make changes and achieve things that were just not possible for them before.” **Lynda Thompson, PhD, *The A.D.D. Book*, Canada**

“The (research) literature, which lacks any negative study of substance, suggests that EEG biofeedback therapy should play a major therapeutic role in many difficult areas. In my opinion, if any medication had demonstrated such a wide spectrum of efficacy, it would be universally accepted and widely used. It is a field to be taken seriously by all.” **Frank Duffy, MD, Harvard Neurologist**

### What do Crossroads' clients say?

“Neurofeedback has saved my marriage. I was so angry that I couldn’t see my part in our arguments. We were considering divorce. We are now doing great.” (35-year-old male, anxiety, depression)

“Neurofeedback has given me back my life. I was so depressed and lethargic that I spent most of my days on the sofa. Now, I am up, busy and raising my daughter with a smile.” (30-year-old female, depression and ADD)

“I was on so many drugs (probably 10-15 including Ritalin, Adderall, Concerta, Straterra, Wellbutrin, Clonidine, Risperdal, Trileptal). I had no friends and always got in trouble in school. In the 7<sup>th</sup> grade, I spent 6 weeks in an alternative school. I hated it and I hated my life. Now it is better. I have friends, and am doing good at school.” (13-year-old female, bipolar, off of all meds)

This 7-year-old boy came to our office in 2007 struggling with ADHD, behavior problems and dysgraphia. Below are reduced copies of his 8½" x 11" drawings.



Prior to neurofeedback



After 22 sessions of neurofeedback

**With a better brain, comes a better life!**

**In closing.**

*“We have been individual, marriage and family therapists for over 20 years, and have looked at many alternative treatments. We found none with results as significant as neurofeedback. Now, because of advances in technology (faster, more efficient computers and more accurate ways to view and understand the brain), neurofeedback is often the treatment of choice for many conditions -- providing better results faster.*

*For some issues such as marital therapy, grief issues, overcoming abuse, etc., talk therapy continues to be the therapy of choice. We will be happy to help you evaluate what is the best treatment for you!”*

*– Mary Vernon, Bill Bush and Kathy Stevenson*

**Mary R. Vernon, MS, LPC.** I enjoy seeing adults, teens and children. I began working with neurofeedback in 2003 and have had great success with depression, anxiety, bipolar disorder, sleep issues, sensory integration and ADD/ADHD. With compassion and a spiritual perspective, I also counsel adults. I was blessed to do an internship under Paul Warren, MD, in 1984, was then on staff at Fellowship Bible Church North and now have been in private practice for 18 years. I am married with a married daughter and a teenage son. EEG Spectrum Affiliate and EEG Associate

**Bill Bush, MA, LMFT.** I have been counseling for over 25 years. I work with families, children, adolescents, and marital issues. I enjoy working with men and their struggles, as well. I have been married for twenty years and we have three children ages 7 through 16. I am active in my church and serve on the Elder Board as well as the School Board at my children’s school. I have been on staff with Young Life and several churches. I am also excited about neurofeedback and all the options it brings to a counseling setting. EEG Spectrum Affiliate and EEG Associate

**Kathy Stevenson, MS, LPC.** I work with individuals, couples and families struggling with depression, anxiety, life stage issues, attention, and conflicts using both counseling and neurofeedback. With a bachelor’s degree in theology, I taught in church and school settings. After receiving my Master’s degree in Marriage and Family Therapy in 1986, I worked as the Family Therapist at Millwood Hospital in the drug and alcohol treatment center. I have been in private practice since the late 1980’s. I am married and have two children and three stepchildren. EEG Spectrum Affiliate

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### **Recommended reading.**

*Getting rid of Ritalin: How Neurofeedback Can Successfully Treat Attention Disorder Without Drugs*, by Eduardo Castro and Robert Hill. (A very easy book to read. Castro and Hill give a great overview which will appeal to everyone, far beyond ADD.)

*ADD: The 20 Hour Solution: Training Minds to Concentrate and Self-regulate Without Medication*, by Mark Steinberg and Siegfried Othmer (great book by two experienced clinicians in the field for parents with ADD children)

*A Symphony in the Brain: The Evolution of the New Brain Wave Biofeedback*, by Jim Robbins (published in 2000, gives a very detailed history of the field, first part very informative, last part bogs down in politics of the field)

### **Research/websites/links on neurofeedback.**

[www.aboutneurofeedback.com](http://www.aboutneurofeedback.com) (great website, clear readable current information including audio excerpts from experts in the field)

[www.eegresearch.com](http://www.eegresearch.com) (click on “articles” or “research” for over 50 publications on many subjects from ADD to Depression to Anxiety)

“Type-Specific EEG Biofeedback Improves Residential Substance Abuse Treatment”, published by UCLA, by Dr. Thomas Brod

[Http://tbrod.bol.ucla.edu/neurofeedback/APA02/apa02\\_poster.html](http://tbrod.bol.ucla.edu/neurofeedback/APA02/apa02_poster.html)

### **Articles on neurofeedback.**

“Neurofeedback Proves Effective in Treating Numerous Disorders”, *San Antonio Business Journal*, Dec 6, 2004, Randall Lyle, PhD.

<http://sanantonio.bizjournals.com/sanantonio/stories/2004/12/06/focus4.html> (Can be downloaded from website.)

“Train your Brain”, *Scientific American Mind*, by Ulrich Kraft, 2006 Feb.

[http://sciammind.com/print\\_version.cfm?articleID+000C075D-4357-13D9-81018341](http://sciammind.com/print_version.cfm?articleID+000C075D-4357-13D9-81018341)