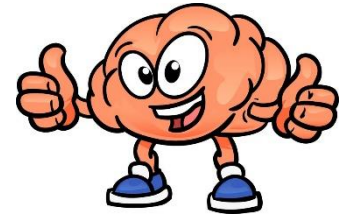


The **Happy Brain** Company"  
**Brevard Brain Training**

1486 Asheville Highway Brevard, NC 28712 (828) 885-7100



**Non-Invasive, Drug-Free Therapies to Help Restore Brain Harmony and Make Life Better**

## **Neurofeedback is Opening New World's for People Who Suffer the Effects of Brain Dysregulation.**

As the clinical director of Brevard Brain Training the top two questions I get asked most often are: "what is neurofeedback and what do we do at Brevard Brain Training?" While the science behind neurofeedback is very complex, the explanation of how it works is quite simple.

In its most basic form, brain training is exercise for the brain. It is a way of teaching the brain how to resynchronize itself by allowing it to see what it is doing wrong and where it is not working efficiently. Neurofeedback is the teaching component of brain training. It works on the "reward" (operant conditioning) system and is effective because it allows the brain to see that something is not functioning correctly and through a feedback system offers and provides a solution.



*Dr. Steve Cagen - Clinical Director*

To understand how brain training works lets first take a peek about how the brain works. Really quick...

The brain is divided into different areas with each area overseeing a different aspect of your physical, mental, or emotional function. Some areas are for movement and some for speech while others control executive functions and creative expression.... One thing is for certain, with everything that the brain must control, if it not communicating or functioning well – you are not functioning well. Some of the more common problems people suffer from when they are experiencing brain dysregulation or a lack of stability in brainwave function are anxiety attacks, depression, PTSD, ADD/ADHD and many other symptoms. We call these symptoms of "brainwave dysregulation; a condition where the brain is producing the wrong brainwave (too much or too little) for the situation or is unable to transition as necessary for daily living - i.e.:

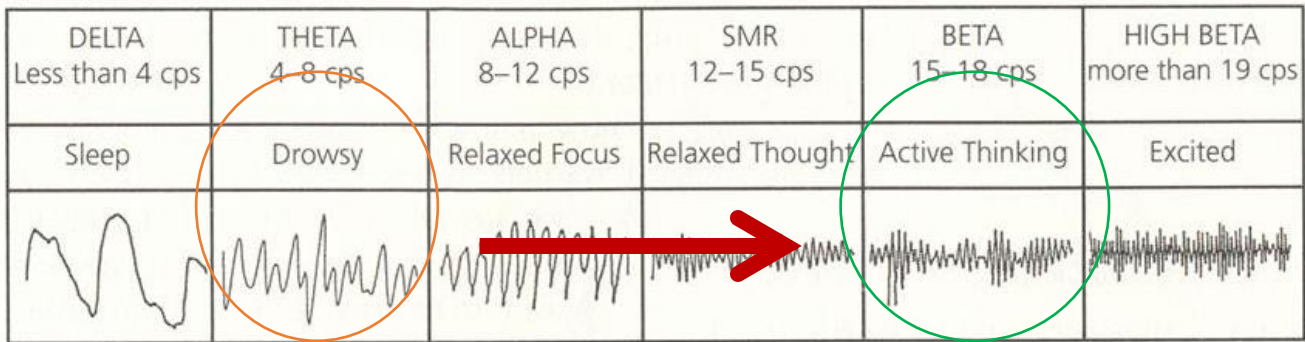
someone whose brain is not able to produce enough Delta waves at night will most likely have trouble falling asleep. Until recently these issues have been treated with medications or talk therapy, however, these same symptoms are now resolving naturally and non-invasively with neurofeedback.

**The chart On the following page will make it easy to understand** - Brainwaves are measured by how fast they are and how powerful they are. When we are awake, our brain should be making fast Beta waves just as when we are ready for bed we should be making slow Theta waves which transition smoothly into Delta (sleep). Making too many fast

waves when we should be making slow waves can result in anxiety symptoms or insomnia just as making too many slow waves when we should be producing fast waves can result in depression or memory loss.

Now consider someone who cannot stabilize their brainwave activity (bi-polar) or how a person with autism may be running in a super excited state all the time. In the example below, the patient is experiencing depression which and a feeling of “not being with it.” Using a brain map we see that they are producing too much Theta when they should be producing Beta waves (the waves we use when we are awake and active).

cps = cycles per second, or Hertz



The goal of neurofeedback in this case would be to train their brain to produce more Beta waves while reducing the amount of Theta they are creating. That sounds reasonable and like a good goal for that patient. In fact, it makes perfect sense. When slower brainwaves are dominant we can feel tired, slow, sluggish, or dreamy. The higher frequencies are dominant when we feel wired, or hyper-alert.

**Over-arousal in certain brain** areas is linked with: anxiety disorders, sleep problems, nightmares, hyper-vigilance, impulsive behavior, anger/aggression, agitated depression, chronic nerve pain and spasticity.

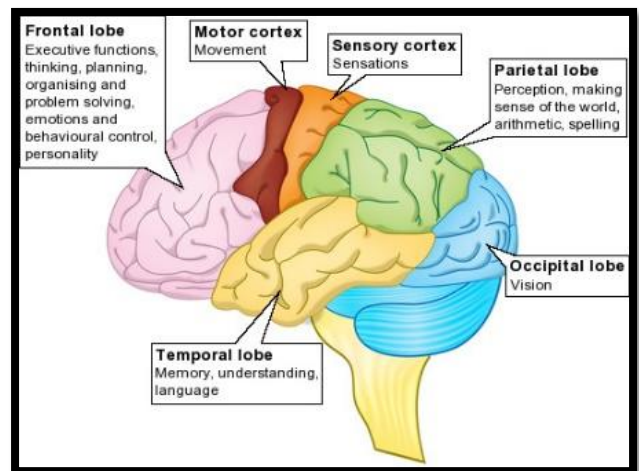
**Under-arousal in certain brain** areas leads to some types of: depression, attention deficit, chronic pain, and insomnia. A combination of under-arousal and over-arousal is seen in cases of anxiety, depression, and ADHD.

**Instabilities in brain rhythms** correlate with: tics, obsessive-compulsive disorder, aggressive behavior, rage, bruxism, panic attacks, bipolar disorder, migraines, narcolepsy, epilepsy, sleep apnea, vertigo, tinnitus, anorexia/bulimia, PMT, diabetes, hypoglycemia, and explosive behavior.

Looking at the picture to the right we are clearly able to see how the brain is divided into different section.

Each section is the storage unit for various functions, senses, and emotions. The location(s) of the symptom(s) provided by the client will aid the neurotechnician in creating a proper protocol and training location.

Training the brain to run smoother and more efficiently helps reduce or eliminate the stresses and symptoms. Many clients are also able to greatly cut back or totally eliminate their need for medications during and after a course of treatment with neurofeedback.





*Dr. Nancy Cagen (mom), with Allie, Bodhi and Atlas*

## We Discovered Neurofeedback Because Allie Needed Us To...

Both my wife and I were practicing chiropractors for many years when our then seventeen-year-old daughter suffered a severe traumatic brain injury in an automobile accident. Her injuries were extensive and she was not expected to live the night. Miraculously she did and after spending two weeks in a coma and three months in a Rehab Center Allie needed to relearn everything all over; how to walk, talk, write, and even feed herself. Not liking the options, the medical community presented my wife Dr. Nancy Cagen and I went on a personal quest to help our child recover and lead the most fulfilling life possible. We set a high criterion for what we were looking for. We

were looking for a non-invasive, drug-free ways to help her. We needed something outside the box. Our research led to neurofeedback which not only met our criteria, but surprisingly had four decades of university-level research supporting its efficacy.

Since then, I have studied and practiced neurofeedback and holistic brain therapies on our daughter and private clients. We credit neurofeedback with giving Allie a quality of life far surpassing medical expectations. Today neurofeedback is becoming more mainstream with neurofeedback units in some VA hospitals and even on some Olympic Teams. While my initial focus years ago, was traumatic brain injuries and seizures in children, I find that today many of my clients are adults who come in for help with a broad range of symptoms that respond well to a better regulated and better functioning brain.

## What is Neurofeedback & How Does It Work?

**Neurofeedback is a non-invasive, drug-free approach to helping clients reshape their brainwaves to a more desirable state; one more reflective of a Happy Brain.**

The most popular form of neurofeedback is also known as brain biofeedback, EEG biofeedback, or more simply -- brain training. It's based on the scientific finding that we can all learn to change our brain's functioning through feedback about brain wave activity.

Neurofeedback is a holistic, pain free approach to creating positive, lifelong changes for those who may be suffering from **anxiety, stress reactions, depression, sleep problems, headaches and migraines, chronic pain, compulsive behavior, mood swings, stroke, traumatic brain injury, seizures, autism, attention deficits and many other dysfunctional states** that affect physical and emotional well-being. If you change these areas, you also tend to find broader changes in the way you think and feel.







*The person is effectively playing the video game or watching the movie with his or her brain. Eventually the brainwave activity is "shaped" toward a more desirable, more regulated performance.*

Neurofeedback is also used as a tool for personal evolution and spiritual growth, even when people don't have any particular "problems" they want to "fix".

Understand, neurofeedback is not a specific treatment for any particular disorder. It's a tool for working directly with your brain to enhance its functioning and to give you a brain that works as efficiently and effectively as possible. It may reduce or even eliminate the need for medications. Always review any changes with your involved health professionals.

**Neurofeedback is used to teach children with ADHD how to calm and concentrate, and is rated level 1 'best practice' intervention for ADHD by Practicewise**

(the research body of the American Pediatric Association). NASA uses neurofeedback to train astronauts. The US military use it to train their Special Forces, and have adopted neurofeedback as a new intervention for PTSD and traumatic brain injury (TBI).

**The goal of neurofeedback is to help a client reshape their brainwave activity to a more desirable "normal" state.**

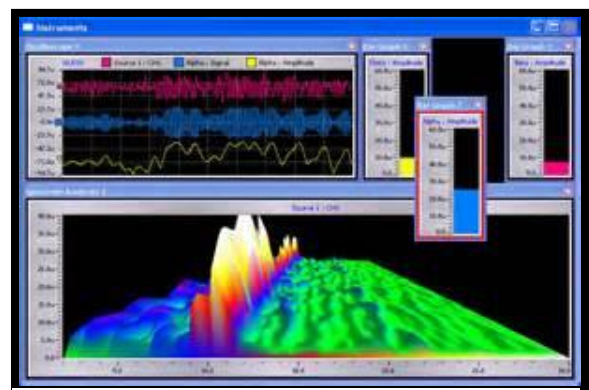
With neurofeedback, clients learn how to quiet brainwaves associated with low performance and increase brainwaves associated with optimal brain function. Much like physical exercises, strengthens and develops specific muscles, the more your brain is exercised into reaching a new more comfortable, more efficient position, the better and stronger it gets at it. Like any new skill, it simply requires feedback and practice.

## How Exactly is it Training My Brain?

Using the results of a brain map or symptoms described by our clients, electrodes are placed on the appropriate area of the brain where the target issues are located. The electrodes capture and transmit the client's brainwave activity in those areas to an amplifier which magnifies them enough to be run through special software. During a typical training session, a client will watch a movie or play a game which is being run solely by their brain. Neurofeedback is a form of operant conditioning, a learning process generated by the client, which is self-rewarding.

**Neurofeedback works by training the brain to better self-regulate or balance its own arousal level.**

To understand how brain training works only requires a few simple understand with the first being that the brain is a self-healing organ which is capable of learning. If presented with the



*As activity in a desired frequency band increases, the brain is provided with a reward signal, and the client learns to produce more of that frequency.*

opportunity to see how it is performing and a method to create positive change – the brain will always move towards that positive change.

If a brain map has been performed the computer will generate a report which provides the neuro-trainer with site locations and procedure codes for the areas determined to be needing the most stabilization. The procedure codes tell the computer which frequency to run on and sets the goal ranges for that patient. This is where the training begins. The computer is now programed with the specific frequencies this client needs to train on.

Neurofeedback software is designed to provide the brain with the feedback it needs to begin reshaping a client’s brainwaves to a more normal, stable state of function.

## Training with neurofeedback is easy because your brain does all the work!

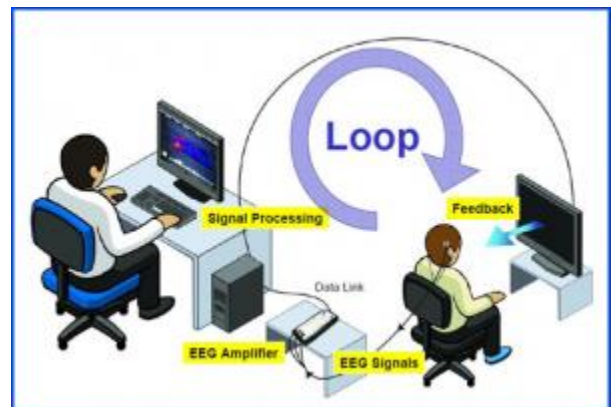
As the neuro-tech watches the clients wave activity on their computer screen, the client watches a movie or plays a video game on a large television monitor. What could be better than that?

Using this feedback the brain quietly sets about reshaping and healing itself without the client ever having to do anything! The clients will not feel any physical changes but... because of the feedback cues, they will see and hear it happening.

## The Feedback Loop

When training with neurofeedback, the brain is provided direct, immediate information as to how it is performing at that very moment.

After establishing a training protocol and site locations for a client a “reward” frequency is determined. We will use this frequency as our “goal settings.” These setting inform the computer of which wave forms we would like to inhibit and ones we would like to promote. For example, if you experience depression we would most likely inhibit Delta wave and promote Beta waves and visa versa; if you experienced anxiety symptoms we would inhibit Beta and promote Theta.



*When goals are met, the client get good feedback. When they are met long enough they become habits and a new way of life.*

## The Feedback

**The most important part of brain training is the feedback.** Feedback allows the brain to see how it is performing. When the brain is functioning at or above the reward level set for that client, the television monitor is filled with a big bright picture, the volume will sound at a normal level and our special teddy bear will buzz. In this way, we are providing the brain with visual, auditory, and kinesthetic feedback. The more senses we can get involved - the better the training will be and the sooner the brain will begin to make changes.

These visual and auditory cues trigger the brain to jump into action. When the brain loses or drifts away from the reward status, the picture on the screen will get smaller, dimmer and the volume will go down (feedback that we are off course). As if by magic the brain will quickly begin filtering though itself until the television picture gets big

and bright again. This is an “ah-ha” moment. Your brain (without any help from you) just found the reward frequency for the first time. The picture got bigger and the brain got happier! Everyone loves a reward and your brain is no different - from here on out it will continue to get stronger.



It's brain exercise - lose the signal – find the signal, lose the signal – find the signal. Can you see how we are reshaping the brainwaves? With consistent training, the brain will soon grow stronger and work more efficiently thus reducing the stress it is currently under. Soon, living in the new state will have become a habit and way of life.

### Review:

During a typical training session, the client will either watch a movie or play a game – with their brain only.

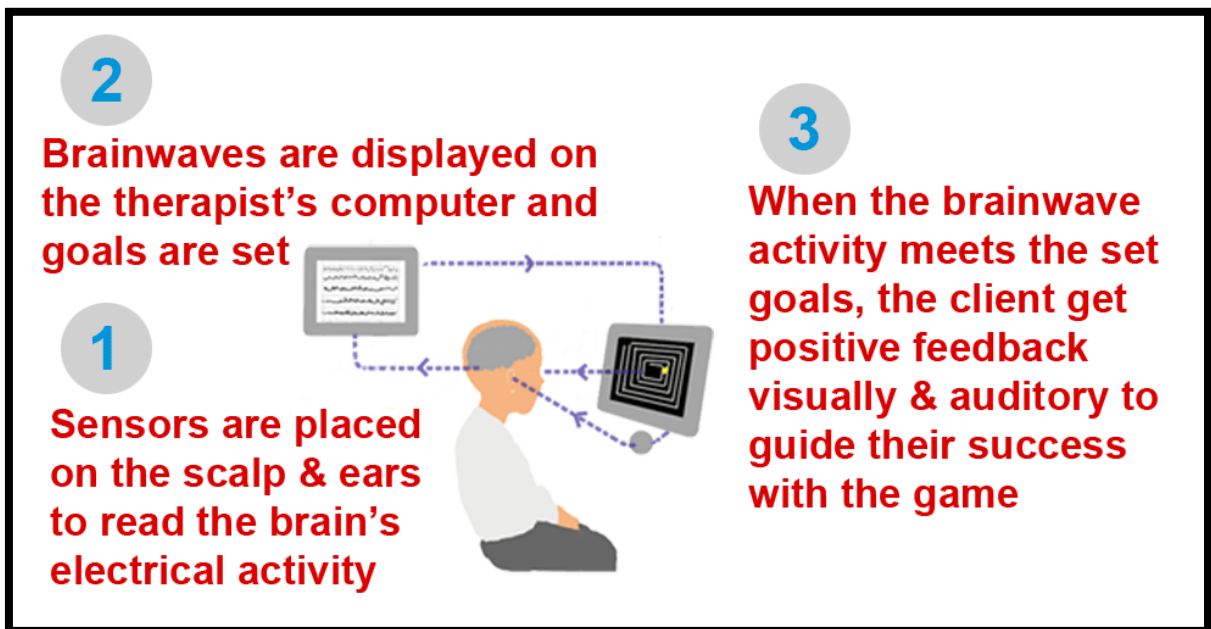
As the game or movie progress the brain is gradually given clues as to how well it is functioning.

The brain “passively” responds to these clues and “learning” of a new brainwave rhythm takes place.

The new pattern is one which is closer to what is normally observed in individuals without such disabilities.

By making information available to how the brain is functioning, the brain can learn to regulate or “reset” itself and continue to make adjustments after the training is over. This process produces physiological changes and teaches the client control over their nervous system.

Once the brain learns this balance and flexibility, it applies this skill to its overall functioning and continues to process information in an efficient manner, improving, or eliminating all symptoms, resulting in increased energy and function, physiological balance, and optimal performance.



# The

## History and Development of NF

Neurofeedback began in the late 1950's and early '60's through the work of both Dr Joe Kamiya at the University of Chicago and Dr Barry Sterman at UCLA.

Dr. Kamiya was studying consciousness, and discovered that by using a simple reward system, people could learn to alter their brain activity. This was the first ever EEG neurofeedback training.

Along similar lines, Dr. Sterman ran an experiment to see if cats could increase their sensory motor rhythm (SMR). A simple machine gave them a food pellet every time they 'got it right', and they quickly learned to control their brainwaves to get the treat.

Several years later he was doing an experiment for NASA, again using the cats from his lab. This time, he was testing the effects of exposure to lunar lander fuel. For most of the cats, as the levels of toxic fumes increased there was a linear progression of brain instability; first drowsiness, then headaches, followed by hallucinations, seizures, and finally death.

However, some of the cats seemed to be immune. Sterman noticed that the cats who were immune were the same cats he had used in the SMR brain training experiment a couple of years before. The SMR training had given those cats ultra-stable brains. Sterman moved on to train SMR in humans to control their epilepsy; 60% of his subjects reduced their seizure level by 20-100%, and the results lasted.

As a result, NASA trained their lunar Astronauts to control their brain's SMR rhythms. Fifty years later, neurofeedback is still part of the Astronaut training program.

In the mid 1970's, neurofeedback caught the attention of meditators as an aid in spiritual development, and so wandered into the no-man's land between science and religion. Conferences were attended by two people in orange robes for each one in a white lab coat. Soon neurofeedback gained a dubious reputation as a meditation or spiritual tool, which considering the extreme biases of the time made it an unpopular choice for career minded researchers.

Neurofeedback didn't fit the (now defunct) medical view of how the brain functioned. Though the empirical data proved that neurofeedback worked, it couldn't possibly work under the scientific beliefs of the time. This kept neurofeedback regarded as 'spooky' medicine.

Out on the fringes of science, work continued. By the late 80's neurofeedback was being applied to attention deficit disorders, and through the 90's to a wide variety of psychological and central nervous system based conditions.

Over the last decade, the medical view of the brain has changed completely and the principles of neuroplasticity are universally accepted. Neuroscience has come to accept the interrelation between the central nervous system, the autoimmune system, emotional, physical, and mental health. It has conceded that indeed, the brain can change at any age, and that we create new neurons throughout life. The natural mechanisms underlying neurofeedback are now becoming clear.

To most medical practitioners, neurofeedback is still foreign. Many hold a view based on its old reputation, and have had no exposure to the research. Old views die hard, particularly regarding competing methods that lie outside of their expertise.

Brainwave monitoring is no longer 'experimental'. It is common practice in scientific studies to assess how people's brains are functioning under various conditions of illness, stress, and mental difficulties. Patterns in the EEG reflect emotional and cognitive states and predict whether people are paying attention, or even what their mood is likely to be. Today, to describe a condition properly, you must describe its effect within the brain. This research allows neurotherapists to target a wide range of conditions.

With the advances computer software and brainwave monitoring equipment, neurofeedback practitioners now have affordable precision tools. **With 50 years of independent development behind it, the methods have become highly sophisticated, and highly effective. In the realm of brainwave training, neurofeedback has a half century head-start on conventional medicine.**

Today neurofeedback is used for peak performance by professional sports teams, Olympic athletes, and business people. It is commonly used as a non-drug solution for ADHD, post-traumatic stress, and emotional conditions of all sorts.

## Neurofeedback Provides Great Relief for People with Disorders of Brain Dysregulation.

As the brain governs your emotional health, psychological health, and every system in your body, training it into better function has far reaching benefits. **Not only is neurofeedback non-invasive and drug-free, it has a very high success rate in helping most all issues associated with brainwave dysregulation including:**

Anxiety	Depression	Chronic Fatigue
Chronic Pain Issues	Addiction	OCD / Tics
Insomnia	Migraines	PTSD
Fibromyalgia	Tension Headaches	Headaches
Hyperactivity	Memory Loss	Autism Spectrum
Concentration	Post-Stroke Recovery	Traumatic Brain Injury
Focus Issues	Anxiety Disorders	Attention Deficit Disorders
Anger Issues	Panic Attacks	Seizures

Interestingly, it is not always a problem which brings clients to us. While most clients have had some sort of physical, chemical, or emotional trauma, many neurofeedback clients are peak performers; athletes and business executives who are looking to improve their performance and gain a competitive edge.

The people I work with most often are willing to explore new strategies and are actively seeking assistance to get beyond current blocks. They generally fall into one or both groups:



**Health Focused Clients** are exploring resolution of a health issue to regain or acquire a state of physical, cognitive, or emotional health that permits them to move to their next stage of personal development. "Brain Training improves brain function, reflex and efficiency making it beneficial for everyone."

**Personal Evolution clients** are exploring spiritual development/personal growth strategies that will help them make a difference to their world and to enhance their own self-development and evolution of consciousness. See Alpha-Theta Training at the end of this booklet.

## Can Neurofeedback Help You?

To see if Neurofeedback is proper for a client we begin with a preliminary 19 point QEEG. This is done in our office and is a completely non-invasive test. A Quantitative Electroencephalography (QEEG) is a technique of taking EEG data and producing a visual map of the type and location of rhythms in a brain. The QEEG provides an analysis of brainwave function. We compare and cross-reference your readings to a normative database of 450,000 other readings taken over the last 40 years. This is the largest database in the world. It is how we can determine if your brain waves are regulated or dysregulated. This simple process takes only an hour but produces some of the most important information a person can have about themselves; how their brain is functioning.

Certain aspects of our Brain Mapping Report that no other system of analysis is doing involves the correlation of which exact area of the brain is dysregulated to the results from functional MRI studies that have been done over the past 10 years to produce a probability chart of what a person is experiencing. This correlation is then related to the actual self-reported questionnaire. Items such as memory, anxiety, depression, attention, hyperactivity, anger, rumination and many other feelings and tendencies are tracked and evaluated as a person travels through the sessions and, you get to see how this is changing throughout the process. It's uncanny how you can watch the probability patterns change as a person's brain waves become more regulated. Now we have both, subjective and objective findings to reference for each patient, and we can track what makes sense to track.

If your brain map shows dysregulation, the next step would be to consider a course of Neurofeedback.

**Neurofeedback is the learning component** which gives your brain the opportunity to see how it is functioning while at the same time giving it the feedback it needs to begin making changes.

The frequencies we target, and the specific locations on the scalp where we listen in on the brain, are specific to the conditions we are trying to address, and specific to the individual. The results become real and lasting. Neurofeedback has become great news for sufferers of many types of neurological conditions including brain injuries.



*Figure 1 Brevard Brain Training is one of a small number of offices in North Carolina capable of doing a 19 Point QEEG Brain Map.*

## What is Alpha-Theta Training?

Alpha-Theta training is actually part of our method, but we call it out separately here because the method is so distinctive with respect to everything else that has been listed. The objective of all the techniques so far cited is the remediation of brain-based dysfunction, or more grandly the normalization or enhancement of brain function. **The objective of alpha-theta training is to open the door to a certain kind of experience.** The training facilitates an inward journey, amounting ultimately to a profound encounter with the self.

For many, this is really where healing lies. The symptoms we contend with are often signposts of a deeper wound to the self, and we cannot obtain lasting resolution until the person confronts.

Located just below our conscious mind is a center of creativity that is tapped when Alpha waves are dominant. It brings our most inspired thoughts and ideas to the foreground. Similarly, Theta waves are meditative in nature. You may experience images like that of dreams or recall memories that had long been dormant. The contemplative state that one experiences with Theta waves can produce a feeling of floating on air. Deep meditation is a person's ability to control Theta waves. Tapping into these brainwaves allows us to be apt problem solvers.



Alpha-Theta Neurofeedback was designed with two purposes in mind. The first is to literally calm your brain by training you to use your Alpha and Theta waves. By doing this, you can make yourself react differently to stressors and anxiety. People who are considered high Alpha-Theta are typically less hostile, less angry, less unhappy, less depressed. They can also be friendlier, more vigorous, more motivated, and more clear thinking. You are more easily able to return to a place of mental peace. In addition to this, Alpha-Theta Neurofeedback can also be used in a way that's similar to hypnosis. One is able to dive deeply into his or her unconscious and more easily cope with and resolve psychological

issues. The effects of Alpha-Theta Neurofeedback can be long-lasting. After this neurofeedback training, one's brain becomes more steady, robust, and adaptable.

In addition to the psychological benefits that can be achieved through Alpha-Theta Neurofeedback, it can also be used to treat other afflictions, including alcoholism and post-traumatic stress disorder (PTSD). This is the result of being able to get to the deep-seated reasons that perpetrated the condition, even when the person experiencing it may not consciously know them. In Alpha-Theta Neurofeedback sessions, one can decide what he or she would like to focus on. It can be dedicated to something specific, like working through a fear. It can also be more general, like the desire to be more motivated or be self-disciplined. In this way, it's similar to hypnosis.

**However, the point of these exercises and of neurofeedback, is to train your brain to reach these states on your own so that you don't need the aid of a practitioner to get to a healthier mental place.**

## It's Easy to Get Started?

If your interest has been peaked or, if my message resonates with you then the next step would be to schedule an initial brain map. During this time, we will consult, go over your history, get to know each other and perform the brain map.

On the second visit, we go over your findings and share the results of the brain mapping evaluation to determine if you are a candidate for Neurofeedback.

If you decide that neurofeedback is the right option for you we will take care of some paperwork, schedule your training times, and get started.

## Frequently Asked Questions:

### Does Brain Training Hurt?

The answer is no...nothing is ever put into your body in terms of shock or electricity. The EEG instrument simply reads the brainwaves that are already there and feeds it into a computer so that the brain can observe itself in real-time, with both auditory and visual feedback allowing it to see how balanced it is in that very moment. This self-observation over time is what creates new connections and new pathways in the brain. The result is that the brainwaves become more ordered and the brain begins to function better in that area, exactly where it needs it most.

### What do you do that is different from psychologists? (There are a couple of differences I would highlight)

1) **Neurofeedback is a "training technique."** It is not a specific treatment for any particular disorder or set of symptoms. Treatment implies diagnosis of a specific condition and an intervention that is different depending on the diagnosis. Neurofeedback doesn't require this kind of "medical" diagnosis. So, while I am providing training using information from your brain, I am not providing "treatment" for any one specific condition.

2) **I don't do "therapy" with you.** See above. I am not a psychologist.

Although I will check in with you each session on your wish list" items and track other changes you may be noticing, I do not spend a lot of time discussing the history of these concerns or making suggestions for how to handle them between sessions.

### What is Neuroplasticity?

Our brains are constantly being shaped by experience. Most of us have very different behaviors and thoughts today than we did 20 years ago. This shift is neuroplasticity in action; changes in brain structure and organization as we experience, learn, and adapt.

With every repetition of a thought or emotion, we reinforce a neural pathway – and with each new thought, we begin to create a new way of being. These small changes, frequently enough repeated, lead to changes in how our brains work.

**Neuroplasticity is the 'muscle building' part of the brain;** the things we do often we become stronger better at, what we don't use fades away. That is the physical basis of why making a thought or action over and over again increases its power. Over time, it becomes automatic; a part of us. We literally become what we think and do.

Neuroplasticity is at work throughout life. Connections within the brain are constantly becoming stronger or weaker, depending on what is being used. Younger people change easily; their brains are very plastic. As we age change doesn't come as easily; the brain loses some of its plasticity and we become more fixed in how we think, learn, and perceive.

Since the brain is pivotal to all we think and do, by harnessing neuroplasticity we can improve everything we do and think. Neurofeedback works with these fundamental principles of neuroplasticity to help you take control of your mind.

### **Are there side effects or could I get worse?**

Side effects are rarely described in the literature or among neurofeedback practitioners. I personally have never worked with anyone who has gotten "worse" in any area on their "wish list" or other areas of functioning.

### **Do I need a physician's referral?**

No, you can contact me directly for an appointment.

If you have a health condition or use medications that require medical monitoring (e.g., seizures, heart problems), of course I will want you to remain in contact with the physician(s) you are already working with.

### **Is it covered by Health Insurance Plan?**

No. Neurofeedback is not a medical procedure.

### **How many sessions will I need?**

This is the toughest question. There is no good way to predict how quickly your brain will respond or how far you could go. The current protocol is 30 sessions as it is scientifically shown and accepted that neuroplastic changes occur after approximately 25 visits; that means the gains you have achieved become permanent!

Some clients may require more visits or possible home-training depending upon the person, their condition and length of time they have had it. Other factors may include but not be limited to food sensitivities, heavy metal toxicities, medications or whether the condition is organic such as Parkinson's.

### **How long do the effects or brain training last?**

- As long as you take care of your brain, the effects of brain biofeedback should be relatively permanent.
- That means that you could get some "slippage" if you:
  - drink a lot of alcohol (which is a toxin - a poison - for the brain)
  - skip a lot of sleep
  - malnourish your brain with a chronically poor diet
  - have a condition in which the health of the brain is deteriorating (e.g., a dementia)
  - experience a long period of high stress or an extremely stressful event

Does this mean it won't work for you in these conditions? No - this just means you may need more "tune-ups" or more ongoing support.

### Do You Only Do Neurofeedback?

No, quite often we are confronted with very difficult clinical challenges in which the issues go beyond mere dysregulation of cerebral function. We may also encounter tough cases where the dysregulation goes beyond what present neurofeedback techniques can readily address. It has served us well to cultivate a large, integrated perspective on the conditions that challenge us. Neurofeedback promotes an integrative perspective, but we need to take this even farther. We have found several modalities helpful in complementing what we do in the office and in home training with EEG training. The technologies below are listed roughly in the order of their importance to our clients.

## Professional Services, Tests & Products

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In addition to neurofeedback, Brevard Brain Training offers additional services and products to our clients to help them meet their wellness goals. These products are what we use in our personal life and are from companies we have researched and trust.

### Cortical Electrical Stimulation (Alpha-Stim)



The simple expedient of passing a very low current from one ear to the other may have a profound effect on agitation, anxiety, sleep onset difficulties, and chronic pain. The original technology goes back to a Russian invention, where it was known as Electro-Sleep. Here in the US we use the Alpha-Stim, by the company that pioneered the technology domestically. Clients try the method in the office, and if it is helpful, the unit is rented on a trial basis for a couple of weeks. If the device continues to be helpful, it can be purchased by the client.

### Audio Visual Entrainment



Audio-Visual Entrainment (AVE) is a technique that utilizes pulses of light and sound at specific frequencies to gently and safely guide the brain into various brain wave patterns. By manipulating your brain wave frequencies, you have the ability to boost your mood, improve sleep patterns, sharpen your mind and increase your level of relaxation, all with the simple push of a button!

AVE is capable of producing situationally appropriate brain wave frequencies through the process of entrainment (the tendency of physiological processes to mirror environmental stimuli). AVE also increases cerebral blood flow (blood flow in the brain) and increases the metabolization of glucose in the brain for improved functioning of the neurons. The combined outcome of these processes is improved mental performance. It is an effective, inexpensive alternative therapy for many disorders such as anxiety, Attention Deficit Disorder (ADD), Seasonal Affective Disorder (SAD), PTSD, Fibromyalgia and chronic pain. Our AVE devices are also used successfully to boost physical performance for athletes, academic performance for students and cognitive performance for seniors.



An important objective of entrainment is to produce a dissociative state, which is a meditation-like state of deep relaxation. It is the brain/body rehabilitative benefits produced by this deep trance-like state that makes AVE so useful for so many conditions. The dissociative state can be first observed by noticing deep and diaphragmatic breathing. Hands and feet become warmer as arteries dilate. Skin color will become pinker as blood flow increases throughout the face and body. Blood flow will increase in the brain as well. The person will experience feelings of profound relaxation and contentment as beneficial neurotransmitters are released into the brain. When in this deep state, the brain/body's regenerative repair chemicals (parasympathetic hormones) and stabilizing neurotransmitters such as serotonin, endorphins and dopamine are released, which restore good brain function. AVE contributes to this restoration by providing a stress-break, increasing cerebral blood flow and encouraging impaired neuronal firing which allows the brain to return to normal function.

When the body-mind effects from experiencing AVE are fully appreciated, the experience becomes as regular and beneficial as many other life essentials such as quality sleep, good nutrition, pure water and exercise. Sleep is another area where AVE has been shown to be beneficial, contributing to the natural regenerative process of the body and brain.

## **Biofeedback**

In the glare of the fancy new EEG biofeedback the traditional biofeedback modalities have slipped out of the limelight over the years. This is a shame because they are also very effective in the right circumstances. If an anxious person comes in with cold hands, cold feet, and a cold stomach, simple temperature training is a ready remedy, and it is one that is easily doable at home where one is not paying for clinician time.

Similarly, tracking and training galvanic skin response is very helpful in cases of emotional dysregulation and instabilities in brain function. This can also readily be continued at home.

One of the worst diseconomies of our American health care system is that the third-party payers have increasingly forced biofeedback therapists off their reimbursement schedules. This is the grossest of blunders, since so many of our most intractable ills can yield so readily to low-tech solutions that are available to any budget. But this information does not propagate to the public unless there are clinicians involved. Absent reimbursement, it takes about one generation for the wisdom to disappear out of the culture, and that is what has been happening.

## **Heart Rate Variability Training**

A healthy heart has a rhythm that is immediately responsive to a variety of influences. Under benign circumstances, the dominant influence is our breathing rhythm. The heartbeat is in a continuous dance with our breath, tracking the in- and out-breath with some slight delay. This relationship is particularly prominent in our youth, and fades to an extent with age. We can help our heart status considerably by training the heart to maintain its variability. This objective has recently become a lot more popular again with the availability of user-friendly commercial devices for personal use: The EmWave and Stress-Eraser. We use the Heart Math program at our office, and there are a number of others.

Heart Rate Variability training has beneficial consequences for self-regulation in general. It influences the balance of sympathetic and parasympathetic nervous system activity. It is usefully combined with training of the breath. See below.

## Trace Mineral Hair Analysis

Hair tissue mineral analysis (HTMA), is an analytical test which measures the mineral content of the hair. The sampled hair, obtained by cutting the first inch and one-half of growth closest to the scalp at the nape of the neck, is prepared in a licensed clinical laboratory through a series of chemical and high temperature digestive procedures. Testing is then performed using highly sophisticated detection equipment and methods to achieve the most accurate and precise results

In the words of the late author and noted researcher, Dr. Henry Schroeder, trace elements (minerals) are “...more important factors in human nutrition than vitamins. The body can manufacture many vitamins, but it cannot produce necessary trace minerals or get rid of many possible excesses.”

## Essential Oils

Essential oils have been used to promote robust health since time immemorial. Because of the evolutionary development of the human olfactory nerve, it is especially receptive to being stimulated in ways that can trigger deep healing that endures. Essential oils that promote circulation, particularly in brain tissue, can greatly accelerate the healing process of injuries in the head. Not only will the deeply penetrating oils increase circulation, some of them have the right chemical constituents that can assist in the repair of injured brain tissue.

## Chiropractic

Chiropractic care goes hand in hand with neurofeedback and offers clients a way to take their healing one step further. Just as neurofeedback helps regulate and synchronize brainwaves to help the brain function easier and more efficiently, chiropractic help remove interferences in the nerve system allowing the brain to have unobstructed communications with all the body systems; that includes the heart, lungs, and every other organ, gland, and cell in the body. The brain controls all function in the body – chiropractic helps make it easier for the brain to do.

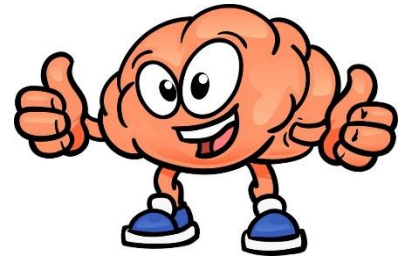
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