



Advanced Psychotherapeutics & Center for Neuroplastic Research

Neurofeedback

What is Neurofeedback?

Neurofeedback, also referred to as EEG, biofeedback or neurotherapy is a state-of-the-art therapeutic training tool that can be used to improve a variety of health conditions or increase personal potential. An electroencephalogram, EEG, is used to monitor brainwave activity and feedback information to the brain about its activity. During this process, certain brainwave frequencies are targeted and trained for optimal performance. A neurofeedback professional provides the necessary instruction and interpretation to encourage the brain to function within a more appropriate pattern level. This involves increasing and decreasing certain brainwave frequency activities at certain locations. Through neurofeedback, the brain learns to function with greater control and stability through self-regulation. EEG neurofeedback has received a lot of media attention in recent years. Newspaper and magazine articles as well as television reports have cited cases where EEG neurofeedback has helped people with serious and debilitating neurological problems when no other therapies seemed to work.

How Does Neurofeedback Work?

Sensors are applied to specific areas on the scalp and the ears using a special conductive paste. These sensors transmit brainwave activity from the scalp to an EEG that measures and records the frequencies being used to perform a particular task. These frequencies are divided into bands that are displayed on a computer screen which appear to the trainee in the form of a video game or other video display. During neurofeedback, the trainee effectively plays the video game with his or her brain to reach the mental state in which a desired brainwave is achieved. When the desired brainwave is reached, the brain is rewarded and learns to direct itself towards a more desirable performance level. The brainwave frequency is targeted specifically to each individual. There are no medications. The procedure is completely painless and noninvasive. As the brain

learns to regulate itself, you will notice a decrease in symptoms and an increase in positive behaviors.

Is Neurofeedback Treatment Successful/ Permanent?

When the brainwave frequencies move into the desired frequency pattern, symptoms may be greatly decreased or entirely eliminated. The treatment is then considered complete and the results are permanent. Though it may not be possible to predict how successful training may be for every individual, a reasonable expectation of results can usually be assessed early in the course of training. Some health conditions are severe, and in many cases working in conjunction with your physician, neurofeedback training can offer hope for improvement and be an effective alternative to medications or drugs, often reducing or eliminating the need for them. Research has documented significant improvements in people with learning disorders, seizure disorders, closed head injuries and many others. The outcome achieved through using EEG neurofeedback can be remarkable. The overall success with the EEG neurofeedback training is reported to be more than 85%.

How Many Neurofeedback Sessions Are Required?

The number of training sessions will vary depending on the specific condition being addressed. The treatment periods have been known to range between 20 to 60 sessions (30-45 minutes per session, two to three times per week). Your neurofeedback professional will determine the actual number of sessions required and assist in establishing a schedule that best fits your budget and goals.

Is Neurofeedback Safe?

EEG neurofeedback training only presents information to the brain about how it is performing. The decision to increase or decrease a performance frequency is made solely by the brain. EEG neurofeedback training is increasing in popularity because it is safe, drug free, and the results are remarkable.

Clinical Applications of Neurofeedback?

Conditions that may benefit from EEG neurofeedback training include:

- ADHD
- Autism
- Anxiety
- Depression
- Seizure Disorder
- Traumatic Brain Injury
- Headaches
- PTSD
- Addictions

EEG neurofeedback can be equally effective when used to improve personal performance such as developing memory skills, focusing abilities, increasing concentration and much more.

What Change Happen In The First Neurofeedback Session?

The first neurofeedback session will include a thorough interview to gather information about your symptoms, health status, and family health history. A battery of assessments may be conducted including a brain map, nutrition intake, family functioning, sleep patterns, neurological, and cognitive assessments are typically used. Assessment will determine whether the brain is doing its job well and where it needs help.

Who Can Administer Neurofeedback Training?

It is important that neurofeedback training be administered by a professional with the knowledge and skill required to provide the best possible care. Before beginning any treatment make sure that your practitioner is licensed and has received the proper training by a recognized health organization or institute that specializes in neurofeedback.

Dr. Barclay is a clinically trained provider and has been using neurofeedback since 2004. Brittany Finch and Lorena Landa are also trained neurofeedback therapists.

Brainwave Entrainment

What is Brainwave Entrainment?

Audio-Visual Entrainment (AVE) technology influences your brainwaves and is an extremely effective, non-invasive method of rapidly re-educating your brain's natural 'balance-point'. By flashing lights through an eye set and pulsing tones through headphones, we can gently guide ourselves into various brainwave states. After a short period of time, the brain begins to resonate at (or mirror) the same frequency as the stimuli. This is called Audio-Visual Entrainment or AVE.

Our brains produce four basic brainwave states: beta, alpha, theta and delta. A healthy brain will produce the appropriate brainwaves for a given situation. For example, when reading, a healthy brain will be producing beta brainwaves. Due to stress, chemical imbalances, genetics, etc, people may produce improper brainwaves for certain activities.

For example people with ADHD produce excessive theta brainwaves while reading, instead of beta brainwaves, which are necessary for reading. Because people with ADHD suppress beta brainwaves, they need to increase their beta brainwaves, which is why true cases of ADHD respond to a stimulant like Ritalin. AVE is an alternative to these drugs. Another example of inappropriate brainwave production is depression. People who are suffering from depression are not making enough alpha brainwaves, which we need for a more balanced and happy life.

Research has shown that AVE is an effective non-drug approach to reduce the symptoms of many disorders that are caused by improper brainwave production. AVE is being successfully used by thousands of people for autism, ADHD, insomnia, chronic pain, post-traumatic stress disorder, fibromyalgia, stress management, seasonal affective disorder (SAD), hypertension (high blood pressure), PMS and general well-being and relaxation. It also improves self-esteem, cognition (mental agility) and performance in sports and business.

Audio Visual Entrainment (AVE) devices use flashing lights and pulsing sound via goggles and headphones to get the human brain into altered states of consciousness. Lights flashing in the eyes and/or tones pulsing in the ears at different frequencies from 1 to 25 Hz have an influence on brainwave activity.

Why would you want to alter your brain frequencies?

AVE (Audio Visual Entrainment) helps in the following areas:

Beta - 14Hz (cycles per second) and upwards

Beta is the alert, working, concentrating state. This is where we spend most of our daytime. In normal day-to-day awake state, we are at about 16-30 Hz frequency. When we are under stress or under pressure the brain frequency goes way up to 40Hz or as high as 100 Hz. That is why, when we are stressed we are not able to think clearly, and we don't perform at our peak. It is very important to get stress out of our lives. Doctors all over the world agree that in over 80% of dis-

ease is caused by stress. When we do get sick, the doctors send us to bed to relax, so that healing can take place.

Children diagnosed with Attention Deficit Disorder (ADD and ADIID) are spending most of their day-to-day time in Alpha and Theta state. They struggle to reach the Beta state which would enable them to concentrate and express themselves properly. This is the main reason why they don't do well in school.

Audio Visual Entrainment devices can stimulate your brain to reach the Beta state. Research has shown that it can be used to help with ADIID. It's completely safe and you could stop needing a coffee to get your body energized and awake.

Alpha - 8 to 13.9 Hz

Men and women have different dominant sides of the brain, that's why in general, women are more creative, emotional and intuitive (right brain dominancy) and men are more analytical (left brain dominancy). In an Alpha state, we slow down the brain cycles and become very relaxed. That is when you are letting go of your ego, letting your body relax truly. The Alpha state is the desired state of most meditators and it could take you 6-12 months to achieve with everyday training.

The tricky part is to get yourself to Alpha while having your brain hemispheres balanced. When they are balanced in Alpha state, your brain releases Endorphins (natural pain control hormone) and Serotonin (the feel good hormone - natural anti depressant) which enables you to come out of depression and to let stress fade away without the use of any medication.

When in an Alpha state we use our whole mind instead of only the dominant side. This enables us to think much better; to be creative, improve memory and problem solving ability is at its peak. A half hour spent in Alpha results in you feeling relaxed, stress free and literally smarter. There are also numerous positive health effects like rapid recovery, healing, enhancing your immune system, better sleeping, peaceful feelings, warm hands and feet, a sense of well-being, improved academic performance, increased productivity in the workplace, reduced anxiety, etc.

Theta-4 to 7.9Hz

We are all familiar with the Theta state. That is when you wake up in the morning but still not fully awake. This is that elusive state when you just want to sleep in. To reach a Theta state with meditation, it takes about 10-15 years of everyday training.

The Theta brain suppresses the production of Cortisol, which is an important factor for aging, stress, and our immune system. In contrast, the brain produces catecholamines which are vital for learning and memory retention. A Theta state is commonly referred to as the dream or "twilight" state. Memory development is enhanced in this state as is access to unconscious material, potential change in behavior, intuition, sudden insight and creative ideas are increased.

Theta is where a psychologist takes you when dealing with repressed memories. It also improves your sleeping patterns. It's a mysterious, elusive state of mind that comes with many mental and emotional health benefits.

- Autism, Aspergers
- ADD and ADHO
- TMJ
- Depression
- Trauma
- Insomnia
- SAD
- Hypertension
- Post Tramatic Stress Disorders
- Biofeedback
- **PMS**
- Chronic Fatigue
- Fibromalgia
- Improve Academic and Athletic performance

Delta- 0.1 to 3.9Hz

Delta is the dreamless sleep state. Usually kids sleep in very deep delta, and adults in a very light delta state. When in a deep Delta state, the brain produces Human Growth Hormone, which builds bone, muscle, tissue, hair, gives us energy, and slows down the ageing process. One of the sessions specifically developed for Fibromyalgia gets us down to just below 1 Hz. In this deep delta state, the brain floods the body with endorphins which relieve pain without the need for pain killers and you can be pain-free for up to a few days.

Audio Visual Entrainment can stimulate your brain to reach states that Tibetan monks and Zen meditators take 10 to 15 years of training to achieve.

Light and Sound Brain Machine now helping those with Autism Spectrum Disorders

For many years it has been known that sound therapy utilizing strictly sound training, which desensitizes the person with sensory issues, has been helpful for many on the autism spectrum. By stimulating the auditory system, and through it, by stimulating the brain, methods such as the Tomatis Method has been able to reduce the autistic symptoms to varying degrees. Each autistic person is different and may respond differently to this program. In some cases, results are seen within a few weeks. There are still good days and bad days but the trend is often upward, especially when you look back over a period of a few months. In many cases improvement has been noted in the following areas, decreased hypersensitivity to sound, reduced tactile defensiveness, improved language skills, improved appreciation for food and less picky in food preferences, better self-image, improved social skills, and better eye contact and less aggressive behaviors.

Combining auditory training with the visual aspect of flashing lights also seems to have a very strong impact on the minds of those with autism spectrum disorders. This is much like what happens during a similar process called neurofeedback and biofeedback, which helps the patient concentrate to relax their minds. The results are even verified by tracking brain wave patterns

through a clinically administered EEG. The mix of the two sensory tools gently bring the mind to a relaxed calm alpha state.

Summary

The benefits of using Audio Visual Entrainment devices include: deep relaxation, strengthened immune system, accelerated learning, peak mental performance, increased energy, focus and concentration, enhanced creativity, problem solving and intuition, expanded perception, whole brain function (by balancing the two hemispheres of the brain), improved confidence and motivation. For more information about AVE and to see if it can work for you, call Advanced Psychotherapeutics.

Cranial Electrotherapy Stimulation (CES)

A Better You

If you suffer from depression or anxiety, you know it's not just you who suffers. It's your relationships, your career, your family, and everything around you that suffers with you. You deserve a better you, they deserve a better you, and Cranial Electrotherapy Stimulation (CES) may be able to help. If you have had little success with your current depression treatment, or do not wish to risk the harmful side effects caused by traditional medication therapy, CES may be an option for you.

How Cranial Electrotherapy Stimulation (CES) Works

How does cranial electrotherapy stimulation (CES) technology work? Based on previous and ongoing studies, it appears that the Alpha-Stirn® microcurrent waveform activates particular groups of nerve cells that are located at the brainstem. These groups of nerve cells produce the chemicals serotonin and acetylcholine which can affect the chemical activity of nerve cells that are both nearby and at more distant sites in the nervous system.

By changing the electrical and chemical activity of certain nerve cells in the brainstem, CES appears to amplify activity in some neurological systems, and diminish activity in others. This neurological 'fine tuning' is called modulation, and occurs either *as* a result of, or together with the production of a certain type of electrical activity pattern in the brain known *as* an alpha state which can be measured on brain wave recordings called electro-encephalograms (EEG). Such alpha rhythms are accompanied by feelings of calmness, relaxation and increased mental focus. The neurological mechanisms that are occurring during the alpha state appear to decrease stress-effects, reduce agitation and stabilize mood, and regulate both sensations and perceptions of particular types of pain. These effects can be produced after a single treatment, and repeated treatments have been shown to increase the relative strength and duration of these effects. In some cases, effects have been stable and permanent, suggesting that the electrical and chemical changes evoked by CES have led to a durable re-tuning back to normal function. With the side effects and safety issues of psychotropic drugs, it's a wonder that their use has become so prevalent in our society. CES simultaneously treats anxiety, depression and insomnia and allows the patient to focus on other therapies such as relaxation, biofeedback or cognitive behavioral therapies (CBT). Notice the results below comparing CES to current medications.

There are only three ways to prove that CES using Alpha Stirn technology works: research, surveys, and testimonials. Alpha-Stirn technology has all three in abundance. In fact, with 55 completed studies and many more underway, there is more research supporting Alpha-Stirn technology than there is for most drugs. The chart below shows the effectiveness of CES over medication.

Cost-Effectiveness

Forbes Magazine reported annual cost figures for the most popular drugs used to treat various conditions including anxiety and depression, chronic pain and insomnia ("Just Say No!", November 29, 2004, pages 102-112).

For the customary pharmaceutical treatment of depression or anxiety using the popular drug Zoloft, the annual cost per patient is \$850. However, it is well known that Zoloft may cause insomnia, and Alpha-Stirn CES is also FDA cleared to treat insomnia. Therefore, patients who use Alpha-Stirn CES to treat anxiety are simultaneously receiving an effective treatment for insomnia and depression. According to Forbes, the sum of the annual costs for the drug treatment of anxiety and insomnia is \$1,770

per patient. A patient suffering from chronic pain, anxiety and insomnia, spending \$3,100 annually for Oxycontin, Ambien, and Zoloft would begin seeing a cost savings by using CES at 1.91 or 3.46 months. Put another way, against the combined costs of Oxycontin, Ambien, and Zoloft, Alpha- Stirn CES breaks even at about 2 to 3 1/2 months.

Treatment

Depending on the severity of your condition, the usual protocol consists of 6 weeks of treatment. It begins with daily treatments from 45-60 mins. for the first 21 days. After the initial 21 days, treatment is usually drops to 2-3 times per week. According to research, treatment has a cumulative effect, making each treatment last longer than those preceding it. You will usually notice a difference after the first treatment and its effects may last several hours. After the 6 week period, improvement has been shown to last indefinitely.

Frequently Asked Questions

1. Is it safe?- Yes. Electricity is perfectly safe at the level that CES delivers. Remember, we all have electrical currents flowing throughout our brain and body at all times. CES treatment uses tiny currents close to the amount that flows naturally in our systems.
2. Is it like shock therapy or something?- No, not at all. Shock therapy uses a current that is 1000 times greater than CES treatment. We use current close to your body's own naturally occurring electrical current. To many patients the feeling is subsensational. CES is an extremely safe treatment, that unlike shock therapy, has no major adverse effects ever reported.
3. Will I feel better after the first use?- Maybe. Many patients that use CES report benefit after the first use. Keep in mind that it may take one to 3 weeks however for some people to feel benefit. It will depend on how your body reacts to the input.
4. What are the long term effects?- The amount of electricity used does not cause any known cell damage at all. Out of the estimated 15 million patients that have used this form of treatment, none have reported any long term negative effects.

To find out more about how CES can work for you, contact Advanced Psychotherapeutics. Dr. Barclay is a Licensed Clinical Psychologist and trained provider of CES treatment. He is also an

active researcher in the use of CES. View his current article http://www.stress.org/wp-content/uploads/CES_Research/JAD.pdf

Transcranial Direct Current Stimulation (tDCS)

Transcranial direct current stimulation or tDCS is a non-invasive neurophysiologic technique that involves the application of weak electrical currents to the scalp. During a treatment session, the tDCS machine uses a small electric current that uses the energy of a 9-volt battery to stimulate your brain. (For the sake of comparison, a 9-volt battery is typically used for home fire alarms). Electrodes (sponges soaked in saline) are placed over certain parts of the head. The electrode positions change based upon the area of the brain that we are targeting. The electrodes are held in place using a rubber headband. The current will flow through the electrodes, penetrate your scalp, and create a flow of electrical current in your brain. Usually patients feel a slight itching or tingling on their scalp. As the current moves through the scalp there is "shunting" or the current, meaning some of the current does not make it into the brain. The current that does pass through the brain is very small, but is sufficient to influence the brain's levels of activity by stimulating neuronal activity.

Off-Label Use

The Food and Drug Administration (FDA) has not approved the use of tDCS for treatments of any conditions. While tDCS is not FDA approved for any indication, the FDA has cleared some tDCS devices as Non-Significant Risk (NSR) devices and has been used to successfully treat symptoms of depression, anxiety, and ADHD. There is also research showing positive outcomes for autism. Dr. Barclay has been trained on the clinical and research applications of tDCS from Harvard Medical School and the Bernsen-Allen Center for Non-invasive Brain Stimulation in Boston, MA.

