

## **WHY NEUROFEEDBACK?**

Neurofeedback is an innovative approach to stress-related difficulties.

Neurofeedback is not talking through problems or learning skills that you have to remember to use in real situations. Neurofeedback has nothing to do with putting any medications in your body to try to fix 'chemical imbalances.'

Advancements in neuroscience show significant evidence of neuroplasticity or the simple idea that the brain continuously changes its function based on new learning. This is exactly what Neurofeedback is designed around. Neurofeedback involves a learning task that enhances the functioning of the prefrontal cortex. After about 4-5 sessions of doing the task, one's ability to pause, observe, and flexibly choose one's responses increases. This can assist with how we respond to stress and result in decreases in anxiety, depression, anger, irritability, and impulsivity. Neurofeedback allows tension and defenses to decrease and openness to our own experience to increase. It helps people observe themselves in the moment and make changes to their automatic habits and become unstuck. These effects seem to come out of the blue, they happen effortlessly. Given these effects, it is an extremely useful tool for enhancing outcomes of 'traditional treatment.'

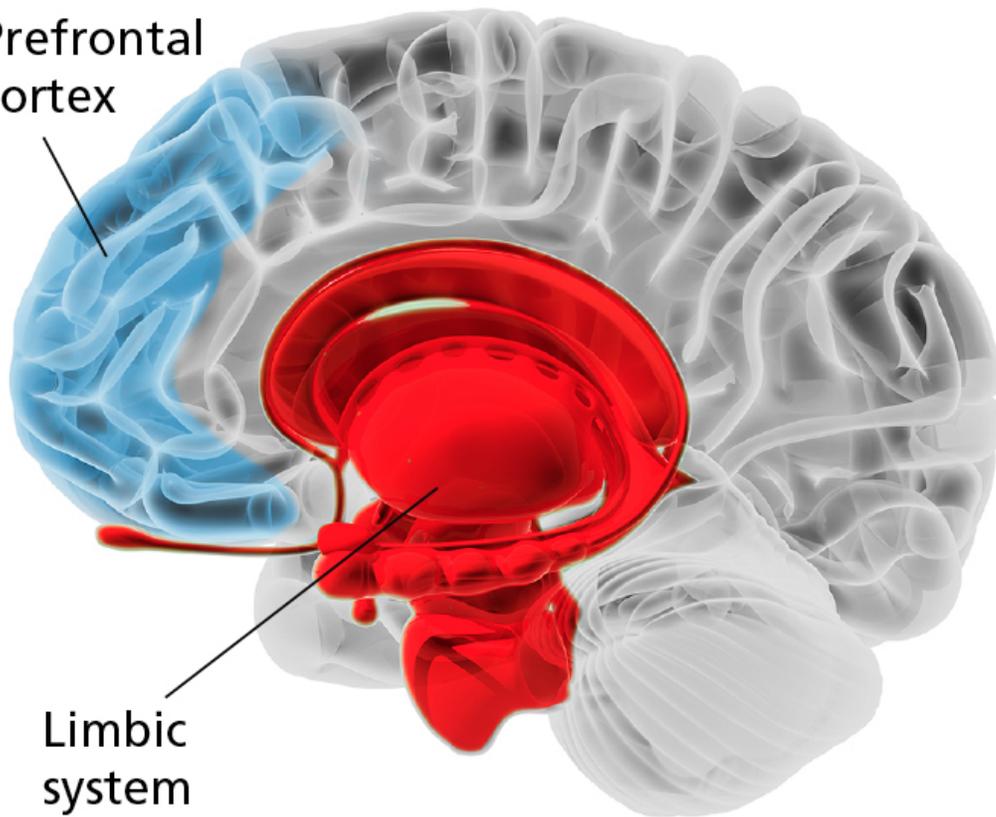
***If you have been in treatment for a stress-related or mental health concern and progress has been slow, Neurofeedback can help you get unstuck. It allows one's brain to start to process things differently and facilitates progress more directly and efficiently than 'talk therapy' alone. Unlike medication, it has no known side effects and Neurofeedback training over 5-20 sessions can result in changes that last for months, even years with no or minimal additional treatment needed.***

Neurofeedback research shows promising effects for treating various types of chronic PTSD, Anxiety disorders, and ADHD. It can also be helpful for people who want to change their approach to relationships.

Dr. Tyrrell Baker and her team are trained in the HEG pIR methodology of neurofeedback developed by Dr. Jeffrey Carmen in Manlius, NY. The method is non-invasive, there are no electrodes and nothing is being done to the brain. The method involves a brain task while watching a movie on a laptop. A simple headband measures heat from your forehead (prefrontal area). The program provides feedback to you on when heat is increasing or decreasing in this area of the brain and through this feedback, the brain learns and changes in function. Clients generally report that they find the task user-friendly and interesting to experience.

### Welcome to your brain

Prefrontal  
cortex



Limbic  
system

**Limbic System**- area of mid-brain that includes Amygdala  
-responsible for emotional reactions  
-responsible for fight/flight

**Prefrontal cortex**- area of brain directly behind forehead, part of Frontal Lobes  
-responsible for inhibiting other brain areas, particularly the amygdala/ limbic system in order to regulate emotions  
-responsible for mental clarity and attention, allows us to use reason, to make plans and follow through on considered action  
-As the brain's executive, it has many, many connections to other brain areas, helps the brain work in a coordinated, efficient manner

In Neurofeedback, we are specifically using a learning task to increase cellular activity in the Prefrontal cortex. When we increase activity in this brain area, the prefrontal cortex becomes stronger and more dominant in our overall functioning.

Activity in the Prefrontal area and the Limbic area are inversely related to each other. When activity in one heats up, it decreases in the other.

When we are very stressed over a period of time, our limbic area gets more active and the prefrontal area goes more off line. When we experience stressful events or various types of trauma, the limbic area may get stuck in repetition and reactivity. Our limbic reactions occur over and over. The prefrontal area is not strong enough to inhibit this. It does offline more and more. Because fear/ sympathetic nervous system arousal is dominating the brain, our brain becomes more rigid, less adaptive. We are stuck. Because we cannot inhibit our reactivity, we feel like victims of our experience. We cannot control our symptoms or emotions, we feel incapable, helpless and hopeless at times. We may have symptoms of anxiety, anger, and over-arousal.

Each time you participate in a neurofeedback session, you strengthen the prefrontal cortex. When the prefrontal system is in control we can inhibit our emotions and reactions, choose our responses, see the larger picture, initiate action on our own behalf, accept help, and have compassion for ourselves and others. Neurofeedback essentially reverses the effects of stress on the brain's function.

After Neurofeedback training, the cellular activity in the prefrontal area enhances our capacity to be resilient during stress. Neurofeedback will relieve some symptoms but it does more than that, as it helps the brain heal, stimulates different brain areas to work together smoothly, and promotes reorganization, integration and brain health.

We generally recommend that you do Neurofeedback once a week until you start to see a positive effect. If you need to space out the sessions more, it will be okay and will not take away from the anticipated overall effect of sessions.

### **The Task**

The task completed in the office involves wearing a headband while watching a movie on a laptop.

Watching the movie during Neurofeedback provides a mild stimulus to your emotional system. The headband has two infrared sensors that measure heat (a product of brain activity) from the forehead (the prefrontal area).

When the movie (or an internal event like a thought), triggers emotion, activity increases in amygdala/ limbic area and decreases in Prefrontal area. The headband measures this change.

When this happens the movie stops and a bar graph appears on the screen.

The bar graph moves up and down based on how active the prefrontal area is. This is called biofeedback- your conscious mind is being given feedback on what is happening on the inside of your brain.

The task is to move the bar graph up by increasing the activity/heat in the prefrontal area.

We move the bar graph up by replicating a non-threatened, focused mental state. There are several things that help settle the mind.

- Stable, neutral attention
- Steady natural breathing
- Releasing tension (tightness) in our muscles- shoulders, jaw, hands
- Moving, opening body posture
- Attitude of openness with no judgement or self criticism

Each time we use biofeedback to shift heat/activity to the prefrontal area, the brain learns how to shift and re-regulate. This learning happens rapidly at an unconscious level.

### **Observing Neurofeedback effects**

You are not going to “feel” any effect during neurofeedback. The movie is supposed to provide a relatively mild stimulus to the emotional center. Often the emotional

triggers are so small, there is no felt experience of limbic arousal. The system picks up on very small changes in metabolism in this area of the brain. The limbic area is very sensitive to any emotional and/or evaluative stimulus. This mostly happens outside of awareness. Its sensitivity is natural and necessary for its central role in igniting fight/flight/freeze when we are in danger.

After about 4-5 sessions, the quality of the mind will change in subtle but significant ways. These changes will come out of the blue, one does not need to try to make them happen. They are the accumulation of learning in your brain. Generally they follow from a more dominant prefrontal cortex and better brain connectivity/flexibility between the limbic reactions and prefrontal system.

Sometimes the most significant effects of the reorganization come weeks or even months later. You may notice a different thinking pattern develop. Over time the prefrontal system gets stronger and on-line long enough to help your brain to reorganize resulting in very interesting changes and opportunities for growth.

**Once Neurofeedback begins, it is important to make a consistent effort to interpret new behavior and insight as a result of brain changes.**

When changes occur, most people interpret them as a result of our own thinking, motivational, or emotional processes (I realized..... I decided..... I finally got fed up..... ) and that makes sense because the training is effortlessly creating those kinds of changes. If one examines the timing of these internal changes, one will find that it corresponds to the time frame in which the brain has begun training. In addition, the internal changes will reflect the movement from a fear-based system to a less fear-based, better organized system.

**People report (people report these changes as effortless)**

“Less anxiety, especially in my body”

“ No panic attacks in two weeks”

“I can step back and shift gears”

“Certain things don’t upset me, I take things as they come”

“I realize I don’t have to react that way”

“I feel focused”

“I can do this”

“I notice the urge to avoid or procrastinate but I find myself doing it anyway”

“I have less guilt”

“I am in control”

“My dreams are changing, less scary and I feel less helpless”

“Impulsivity is decreasing”

“Depression is decreasing”

“I am not on high alert as often”

“I decided to take action in a new way”

“I still have some of my negative thoughts/worries but I know they are not true”

**Before Training**

***High arousal-disorganized-rigid***

Reactions, symptoms have high frequency and magnitude

Hypervigilant

Catastrophizing

Anxiety

Anger

Depression

Recklessness

Tension is high, activities to reduce tension

More guilty, self critical

Difficulty making decisions

Emotionally overwhelmed

Hopeless, helpless

On automatic pilot

Ignoring/ Censoring underlying feelings

Self judgment

Narrow problem focused mindset

Inconsistent overall attention

Sense of direction and athletic skill varies

**After Training**

***Lower arousal-organized-flexible***

Lower frequency and magnitude

Less hypervigilant

The context around a fear is clearer allowing for modulation of the fear

Panic attacks, compulsive behaviors decrease

Anger episodes decrease

Outlook and openness changes

Other options are seen as available

Tension is released; Less tension relieving activities are necessary

More aware of own strengths

More decisive, more in control

Sorting it out, knowing what's in my control and what's not

Feeling capable

Can pause and think before acting

Acknowledging feelings

Less persistent self judgement

Can see the whole picture

Mind is clearer and more focused

More neuromuscular control