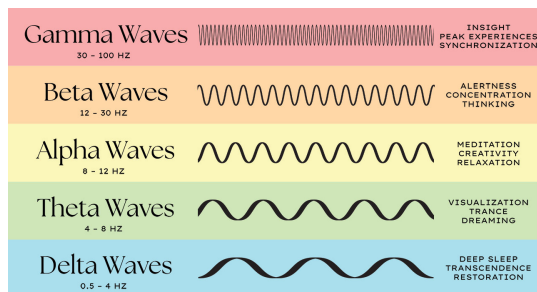


Neuro EP and Brain Mapping at Expertise Health / Nashville Neurosurgery

What is Neuro EP (ElectroPhysiology)?

Your brain generates electrical activity when neurons fire, which can be measured with sensors. This electrical activity at specific brain regions helps create most brain functions and brain problems. We can analyze your brain activity using a "qEEG Brain Map," determine which parts need help, then we can train/improve this activity using Neuro EP treatments. For simplicity here, we will discuss a few frequencies of activity where your brain can tune:

- Delta (slow): deep sleep, brain repair, problem solving
- Theta (med slow): drowsiness, dreaming, insight
- Alpha (medium): alertness, readiness, poised, calm
- Beta (fast): high alert, focus, attention, concentration



Different combinations of brain waves involving speed (frequency), strength (power), connections (coherence), and other EP signals, can result in too much brain activity or too little. Both extremes can cause severe symptoms. A brain with too much activity in certain areas may result in migraines, insomnia, chronic pain, anxiety, or panic attacks. A brain with too little activity in certain areas may result in depression, brain fog, poor attention, poor memory, etc.

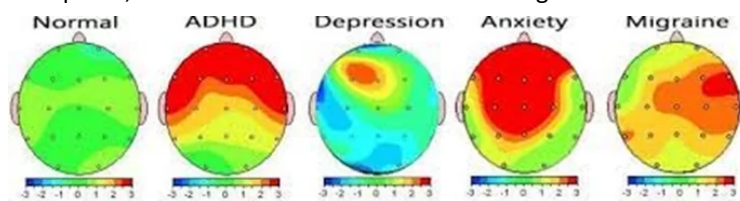
We use many types of Neuro EP treatments to train your brain to improve itself. Some of the Neuro EP treatments we use are: Neurofeedback, HRV training, sEMG biofeedback, ISF cross-coupling, NIR photobiomodulation, etc. All of these can improve your brain activity and improve your symptoms.

For example, if you struggle with chronic pain, migraines, brain fog, anxiety, depression, previous stroke, concussions, or other brain problems, Neuro EP treatments like Neurofeedback can improve or resolve your symptoms. Over time, the Neuro EP training can turn off the pain, reduce anxiety, overcome depression, improve focus, and improve your brain's optimal functioning and performance. Your brain literally learns improved neural pathways through practice during Neuro EP sessions. Over time, these improved pathways will strengthen so you experience these improvements in your daily life. Neuroscientists call this brain improvement process *Neuroplasticity*.

Brain Mapping

A qEEG (quantitative ElectroEncephaloGraphy) Brain Map is a picture of your brain's electrical activity that shows us how your brain is functioning. We know what a "normal," healthy brain looks like (the Neuro EP signals at each specific part of your brain). This knowledge allows us to measure your brain functioning and determine if there are parts that could be improved to help your symptoms.

Brain Mapping uses 20 sensors to simultaneously record the electrical activity at each part of your brain. If you have too much or too little brain activity in a specific part of your brain that controls any symptom that you want to improve, then Neuro EP treatments have a high success rate.

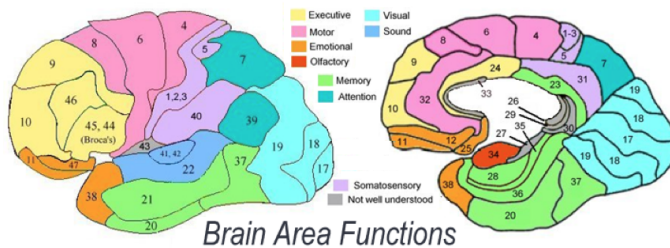


We will process your recorded brain activity from each specific part of your brain on your brain map. We will then discuss your brain map results with you and use the results to plan your tailored treatment approach.

What is Neurofeedback?

Electrode sensors are placed on your head overlying the brain areas with abnormal activity that you want to improve. The sensors measure your brain activity in these specific locations in real time. A computer program is set up to read your brain activity and to 'reward' your brain when your Neuro EP signals move to an improved range. For example, an individual struggling with pain, anxiety, insomnia, or racing thoughts may have a brain that is running too fast in some areas. To combat this, a reward is provided every time your brain slows down in the target areas. The rewards can be a movie that fades in and out, a reward tone, or accomplishing a goal in a video game. As sessions progress, your brain will learn how to improve further and attain your treatment goals.

We will evaluate your progress periodically to be sure you are progressing in the best manner possible. If appropriate, your treatment plan can be modified to maximize your goals.



Neurofeedback is a partnership

Neurofeedback is a partnership. We can provide the tools and teach you how to improve your brain activity, but you have to do your part. Consistent training, avoiding or weaning certain drugs/meds, quality sleep, and a stable environment can improve brain function and learning. Like all forms of treatment, these daily habits, and others, can speed up or slow down your progress during neurofeedback and other Neuro EP treatments.

Neuro EP Assessment and Treatment Process

We offer multiple types of assessment and treatment at Expertise Health/Nashville Neurosurgery. We generally start with a medical interview, history, and exam in our Nashville Neurosurgery office (or over video telemedicine). After discussing pros and cons, if you are a good candidate, we recommend a brain map. All of this information is then used to develop the best treatment plan (which combination of Neuro EP treatment options may be best for you).

Where does Neurofeedback take place?

Neurofeedback is typically completed in a special room in our clinic, where the best results are generally attained. However, we have also had excellent results with remote training at your home. This requires rental of our equipment and video telemedicine appointments with our team to get you set up and assess your progress.

Who can Neuro EP treatments/Neurofeedback help?

Extensive research evidence and extensive clinical experience both demonstrate significant improvements for:

- Chronic Pain (face, neck, back, extremities, etc)
- Migraines / Chronic Headaches
- Post-Stroke Recovery
- Traumatic Brain Injury (TBI) Recovery
- High Stress, Anxiety, Panic Attacks
- Peak Performance/Optimal Functioning
- Sleep Disorders/Insomnia
- Memory and Cognitive Skills
- Depression
- Post-Traumatic Stress Disorder (PTSD)
- Poor Attention/ADHD

Are the Improvements permanent?

Yes, there is typically a permanent benefit. Neuro EP treatments represent a learning process (the brain learns how to function with improved patterns), and learning is generally retained once it has been repeated enough times to consolidate into new patterns of function.

Research

Please refer to the websites below for extensive research on neurofeedback and other Neuro EP outcomes for multiple problems.

Neurofeedback is a rapidly growing field. The information provided at the linked sites attempts to keep pace with new research and findings.

1. **International Society for Neurofeedback and Research**
<http://www.isnr.org/resources/comprehensive-bibliography.cfm>
2. **The Association for Applied Psychophysiology and Biofeedback**
www.aapb.org/i4a/pages/index.cfm?pageid