



What is Neurofeedback?



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Neurofeedback, often referred to as EEG biofeedback or brain wave training, is a type of biofeedback in which individuals are trained to improve their brain function. Extensive research demonstrates its efficacy for specific conditions, such as ADHD and epilepsy, with scientific studies also showing it to be promising for autistic spectrum disorders, anxiety, depression, insomnia, chronic pain, addictions, and traumatic brain injury. Neurofeedback (NFB) has its foundation in basic and applied neuroscience, as well as evidence-based clinical practice.

Like other forms of biofeedback, neurofeedback uses sensors to detect physical changes of the body. Neurofeedback therefore involves placing small sensors on the scalp to see changes in a person's brainwave activity. Precisely detecting brainwave activity allows it to be immediately analyzed by a computer that then presents sound and video information based on the brain's performance. Using this feedback, the individual learns to regulate or control his or her own brain states. This is helpful because the state of the brain has a strong influence on how the person thinks, acts, and feels, emotionally and physically.

Neurofeedback integrates clinical expertise with the best available research to address behavioral, cognitive, and subjective functions related to brain activity, and therefore meets the American Psychological Association's definition of an evidence-based intervention.

Neurofeedback is non-invasive, does not involve surgery or medication, is neither painful nor embarrassing, and has long-lasting effects.

Which conditions are effectively treated with neurofeedback?

Research demonstrates that neurofeedback is an effective intervention for ADHD and epilepsy. For example, an evaluation of 15 well-designed studies involving 1,194 children with ADHD concluded that neurofeedback is effective for reducing symptoms of inattention, impulsivity, and hyperactivity. Specifically, studies show that neurofeedback:

- Improves attentiveness and impulse control
- Decreases hyperactivity
- Raises intelligence scores
- Improves academic performance

Promising ongoing research shows the effectiveness of neurofeedback for disorders such as autism, insomnia, anxiety, depression, substance abuse, traumatic brain injury (TBI), and chronic pain.

Neurofeedback training is also used to assist athletes and performing artists to remove obstacles to peak performance. Peak performance applications of neurofeedback have demonstrated:

- Improved concentration and memory
 - Enhanced creativity and problem-solving
 - Reduction of performance anxiety
 - Reduced extraneous movement
 - Increased self-confidence
 - Better performance
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Neurofeedback has also been used to enhance learning and cognitive function in normal clients. Results show improved attention in college students and adults, and increased thinking speed and executive self-control in the elderly.

How is neurofeedback training conducted?

Neurofeedback is based on an objective assessment of brain activity and psychological functioning. Assessment may include a quantitative EEG (qEEG) which records the brain's electrical activity at multiple sites on the surface of the scalp and compares it to a database of healthy normal individuals the same age as the client. Once assessment has been completed, the practitioner develops a treatment protocol that specifies sites on the scalp and brain wave elements to be trained.

During training, sensors are placed on the scalp and then connected to a computer and sensitive equipment that detects, amplifies, and monitors specific brain activity. Brain activity measured this way is then used to play sound and visual information through the computer's speakers and

monitor so that the client almost immediately sees whether or not their brain is performing within a desired range. Based on this feedback of sound and visual information, and on practitioner guidance, the client gradually learns to produce changes in their brain patterns to improve their ability to think, feel, function physically, and act in ways they want.

Typically, NFB involves:

- Two or more sessions per week
- Twenty to forty-five minutes of feedback per session
- Sound and visual feedback rewards for achieving training goals within sessions

Are there side effects?

When provided by a qualified professional, neurofeedback training produces few, if any, negative side effects. Clients usually find neurofeedback to be an interesting and engaging experience.

How long will training take?

As with most forms of treatment, neurofeedback results may vary with each individual. Neurofeedback training may require 20–40 sessions or more, depending upon the age of the client and the severity of his or her condition.

Where/how can I find a practitioner?

To find a qualified neurofeedback provider, view the professional profiles of practitioners located in your geographic area who are listed on the ISNR website www.isnr.org. Since ISNR is the primary professional society for the specialty of neurotherapy, its membership includes health care professionals from a variety of specialties, university researchers and educators, and other individuals who work with neurofeedback (for example, to develop peak performance). ISNR is not a credentialing organization and cannot make claims for the nature or appropriateness of the services offered by its members, or whether they are professionally licensed as a health care provider.

Other indications of a practitioner's level of qualification include: (1) their listing as Board Certified in Neurofeedback (BCN) by the Biofeedback Certification International Alliance (www.BCIA.org); and, (2) licensure as a health care provider by your state or region.

Additional information and research:

- isnr.org/adhd-toolkit
- isnr.org/recommended-reading
- isnr.org/resources

The information provided in this Brochure does not represent medical treatment or give medical advice. You should contact a licensed health care professional for medical treatment and medical advice. ISNR is not responsible for the medical treatment or medical advice provided by its members.

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