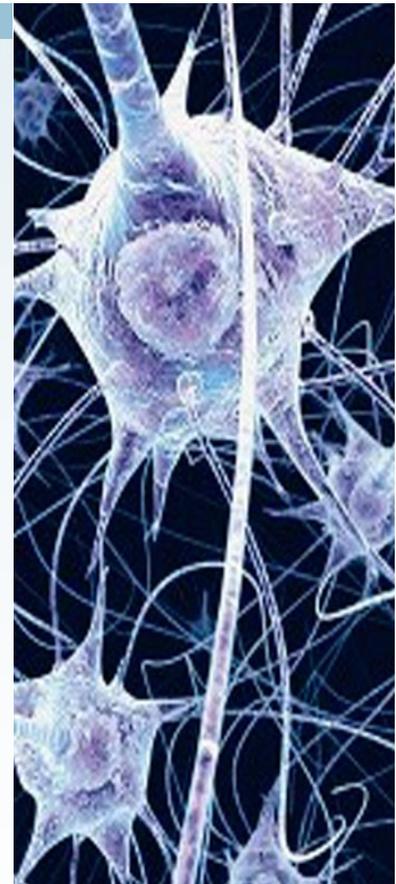


# the **Neuroconnection** News

According to the National Institute of Mental Illness, approximately 1 in 5 adults in the U.S. live with a mental illness (AMI) like depression or anxiety. An even higher prevalence was found among adolescents, with estimates that nearly 50% of individuals ages 13-18 experience a mental health disorder. While more than half of the reported cases of AMI are left untreated, those who do seek care are offered limited or ineffective options to address this growing problem.

For the past 18 years, The Neuroconnection has been a dedicated advocate for the individuals and families affected by a variety of mental health concerns. With the use of Connectivity Neurofeedback, we have been working to fill the treatment void by providing effective, non-invasive options that address the source of the problem: the brain.

We have seen dramatic improvements in symptoms associated with anxiety and depression, and many people who train at TNC are able to reduce or completely eliminate their need for medications aimed at controlling mental health symptoms. In this issue of The Neuroconnection News, we're sharing the most up to date stats and research related to mental health as well as the impressive changes we've seen in those who train with Connectivity Neurofeedback.



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## Special points of interest

- 1 in 5 adults experience mental illness in a given year. Learn how TNC is aiming to change that statistic.
- 73% of those who train with CNFB reduce or eliminate their need for medication
- Mental health involves the whole body



## What is Connectivity Neurofeedback?

Connectivity Neurofeedback (CNFB) is an advanced form of Neurofeedback (NFB) that allows the brain to make changes in brain wave patterns across cortical regions in order to develop more functional neuropathways. CNFB is more accurate than traditional NFB because it measures the neuronal network activity in three dimensions across regions. This is in contrast to traditional NFB which only trains specific sites. CNFB allows for improved communication within the brain and in turn decreases neurologically rooted symptoms.

Learning disabilities, ADHD, Autism, and other problems impacting school success have specific connectivity patterns. These patterns are identified via a QEEG brain map, and they are found to improve with CNFB training. Typical functional improvements include: improved focus, attention, and cognitive abilities, improved mood and behavior, increased learning capacity and academic performance, and better sleep regulation. Because CNFB creates new neural pathways, changes in the brain are lasting and involve none of the adverse side effects that may be experienced with medications.

*“Because CNFB creates new neural pathways, changes in the brain are lasting and involve none of the adverse side effects that may be experienced with medication”*

### It’s a Collaborative Effort

The professionals at The Neuroconnection understand that neuropsychological conditions, if left untreated, can adversely affect an individual’s quality of life.

Our Mission at The Neuroconnection is to provide quality, personalized care using the most up-to-date and researched neurofeedback methods to empower adults and children to reach their optimum potential.

We understand the value and importance of coordinating care with other health, educational and mental health providers, and we are committed to integrating neurofeedback with other treatments and services to produce the best outcome for our clients.

## Who Can Benefit?

Training the brain with neurofeedback has resulted in dramatic and lasting improvements for the following conditions:

- \*Attention Deficit
- \*Autism Spectrum Disorders
- \*Anxiety
- \*Addictions
- \*Chronic Fatigue
- \*Learning Disabilities
- \*Memory
- \*Mood Disorders
- \*Obsessive Compulsive Disorders
- \*Post Traumatic Stress
- \*Seizure Disorders
- \*Traumatic Brain Injuries

### Notable Areas of Improvement

- Attention
- Shifting attention
- Processing speed
- Executive functioning
- Following directions
- Organization
- Sensory sensitivity
- Mood
- Anxiety
- Behavior
- Obsessive thinking
- Reading comprehension
- Word fluency
- Speech and language ability
- Grammar and writing ability
- Handwriting
- Spelling
- Math ability
- Test performance
- Sleep
- Social skills
- Motor skills
- Phonetics and semantic language

# What is “Mental Health”?

The term “mental health” refers to an individual’s cognitive, behavioral, and emotional wellbeing. In other words, mental health involves one’s capacity to think, feel, and behave. When one or more of these abilities is impaired to an extent that it significantly interferes with or limits an individual’s functioning in daily life, a mental illness may be present.

Mental illnesses include a wide scope of conditions that can vary in severity, ranging from mild to moderate to severe. Such conditions may affect each individual differently, even those with the same diagnosis. Over the years, research has suggested that mental illness is not a result of one event, but rather multiple linking factors including genetics, environment, and lifestyle influences. The most common mental illnesses fall under one of two disorder classifications based on the symptoms an individual is experiencing:

**Anxiety Disorders** — a state of excessive uneasiness and apprehension, often linked to particular situations or objects. Examples of anxiety disorders include:

- ◆ **Panic disorder:** frequent, sudden feelings of terror despite a lack of real danger; often manifests physical symptoms, such as rapid heartbeat
- ◆ **Phobias:** extreme, irrational fear of something that poses little or no threat
- ◆ **Obsessive-compulsive disorder:** unwanted and recurring thoughts, ideas, or sensations (obsessions) that compel repetitive behaviors (compulsions) in order to ease distress
- ◆ **Post-traumatic stress disorder (PTSD):** intense, disturbing thoughts and feelings related to a traumatic experience that is triggered long after the event has ended

**Mood Disorders** — prolonged periods of emotional disturbances including excessive sadness, elation, or both

- ◆ **Major depression:** extended feelings of sadness and loss of interest in activities once enjoyed lasting at least two weeks
- ◆ **Bipolar depression:** frequent mood swings that fluctuate between emotional highs (mania) and lows (depression)
- ◆ **Persistent depressive disorder:** episodes of major depression that present less severely, but last for a minimum of two years
- ◆ **SAD (seasonal affective disorder):** depression onset when there is less natural sunlight, typically during winter months; symptoms tend to lift during spring and summer but return every year

Further Reading

<https://www.medicalnewstoday.com/articles/154543.php>

<https://www.nami.org/Learn-More/Mental-Health-Conditions>

**1 in 5 Adults**  
in the U.S. experience mental illness in a given year.



of adults living with mental illness do not receive treatment

**50%** of all lifetime cases of mental illness begin by the age of 14.



**42 million** are living with anxiety disorders

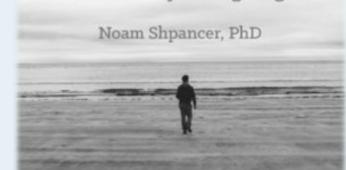
**16 million** are living with major depression

**7.7 million** are affected by post-traumatic stress disorder

**2.2 million** are affected by obsessive compulsive disorder

"Mental health...is not a destination, but a process. It's about how you drive, not where you're going."

Noam Shpancer, PhD

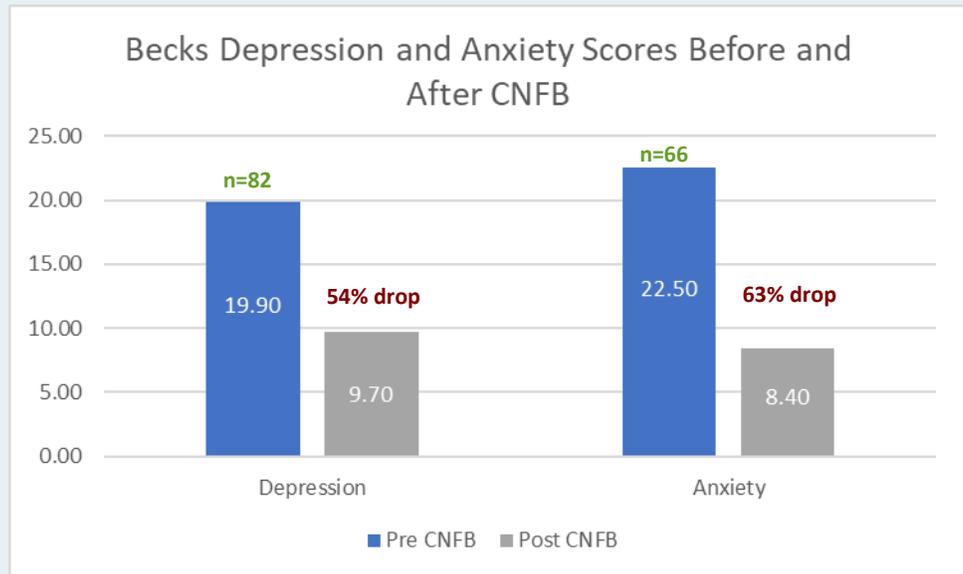


# Depression and Anxiety Symptom Improvement

## Client Progress Summary

Just how effective is Connectivity Neurofeedback in reducing symptoms of anxiety and depression? One way we measure the effectiveness of training is through the Becks Depression and Becks Anxiety Inventories which are filled out at the beginning and end of each set of sessions. This is an important clinical tool to measure an individual's progress, but it also allows us to gauge the overall effectiveness of CNFB in clinical practice.

We've compiled and analyzed five years' worth of data on our clients. While many have experienced the benefits of CNFB over the years, we focused on the clients who came to us with elevated symptoms of anxiety, depression, or both, and whose primary goals for training were to reduce these symptoms. These individuals consistently participated in at least two CNFB sessions per week and completed at least 10 sessions. While the total number of session varies from person to person, the average number of sessions completed was 20.

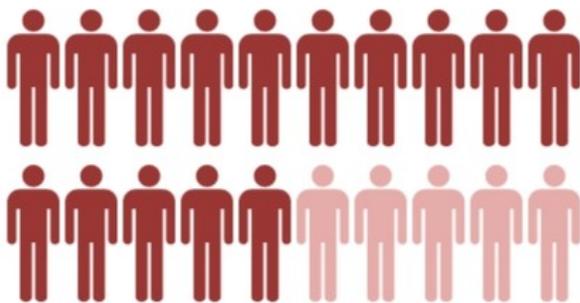


This graph represents 66 people presenting with elevated symptoms of anxiety and 82 presenting with elevated symptoms of depression. These clients completed at least 10 sessions of CNFB (Average number of sessions: 20)

## Neurofeedback and Medication

# 73%

Reduced or eliminated the need for medication



In addition to the dramatic improvements our clients see in their symptoms, many are also able to decrease or discontinue the use of medications that once addressed these symptoms. This graphic represents all clients who were taking medication to address mental health symptoms upon intake and who completed at least one set of CNFB sessions. 73% were able to decrease or even totally discontinue the use of these medications without their symptoms returning.

\*All changes in medication are made under the care of the client's prescribing physician

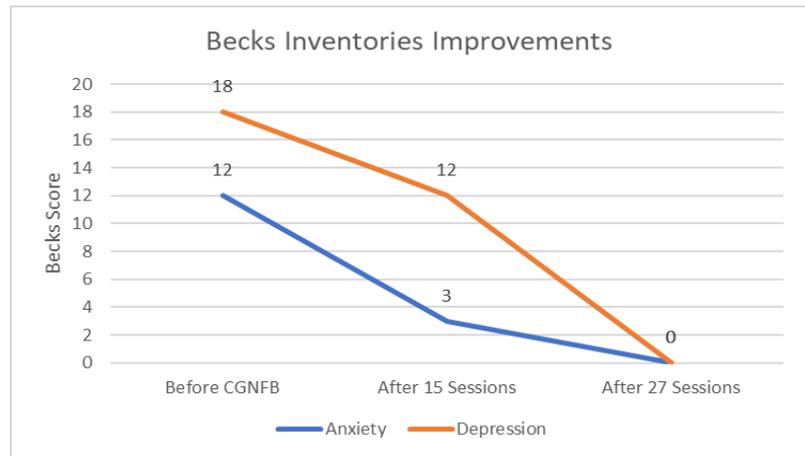
## Case Study: CNFB Reduces Anxiety and Depression Symptoms

While some people come to the Neuroconnection with symptoms of either anxiety or depression, many experience symptoms of both simultaneously. This was the case with Mark, a 47 year old man suffering from symptoms of anxiety and depression. During his initial consultation he shared that he struggled with low moods, lack of motivation, trouble sleeping, lack of enjoyment in activities, low energy, and trouble concentrating since early adulthood. He had been hospitalized more than once for severe depression, and he took several medications to help stabilize his mood. His symptoms were taking a toll on his family and in a last-ditch effort to find help he decided to try neurofeedback. Mark started neurofeedback while on medication and while attending psychotherapy; communication for coordination of care was maintained with other providers through his training at TNC.

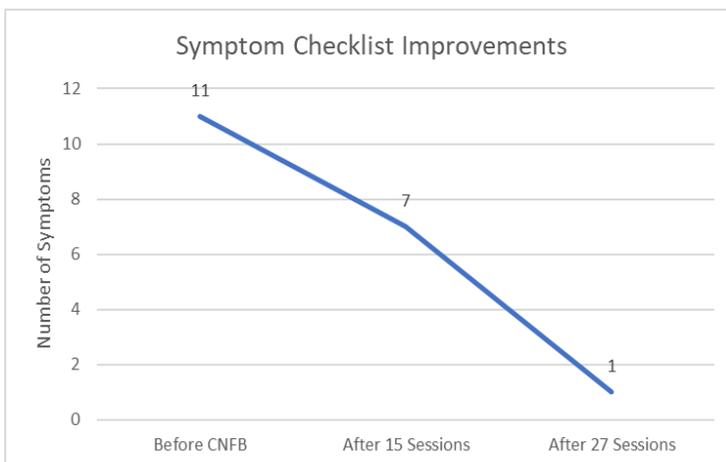
Mark began with a QEEG brain map to assess the power and connectivity abnormalities in his brain. Unlike neurofeedback in the past that simply trained power abnormalities at specific sites, connectivity neurofeedback (CNFB) improves the brain's ability to communicate between different regions of the brain. This is important because symptoms associated with anxiety and depression are caused in part from a deficiency in the neuropathways that connect certain regions of the brain. Mark's QEEG results showed significant underconnection in the neuronal network system and amplitude increases in areas associated with depression and anxiety. The QEEG values were used to create the parameters to train Mark's brain in the areas necessary to reduce his symptoms. He began Connectivity Neurofeedback twice per week.

After just 6 sessions of CNFB, Mark reported some improvement in his depression and anxiety symptoms. After 15 sessions he noticed even greater improvements in his mood, energy level, and motivation, and he was able to work with his psychiatrist to reduce his medication. He was experiencing more enjoyment in activities, and he said everyone around him noticed the changes. A follow-up QEEG was administered and it showed improvements in both amplitude and connectivity abnormalities.

Mark continued CNFB sessions twice a week for 12 more sessions. By the end of this second set of sessions he reported that his symptoms of anxiety and depression were gone, his motivation and energy levels were increased, and his memory had improved. His scores on the Becks inventories were significantly improved (See Figure 1), as were his symptom checklist scores which track the presence or absence of problematic symptoms (See Figure 2).



**Figure 1:** Mark's scores on the Becks Anxiety and Depression Inventories before, during, and after 27 sessions of CNFB



**Figure 2:** Number of problematic symptoms reported by Mark before, during, and after 27 sessions of CNFB

Coordination with other providers including Mark's psychiatrist and psychotherapist was maintained throughout Mark's training. Medication dosages were decreased without any negative response as Mark trained. Other providers noted improve functioning and his ability to make use of new coping skills introduced in psychotherapy as a result of his training.

The change in his demeanor was obvious to everyone around him. Toward the end of his second set of sessions Mark came into the office with a bright affect and joking with the staff. He was more involved with his family. His anger diminished. At a follow up several months later, his spouse reported much less conflict at home and better engagements with their children.

# Treating Mental Health

Aside from options like psychotherapy, today’s standard of care for depression or anxiety leans heavily on pharmaceuticals. The range of potential side effects and responses in tolerance to the antidepressants or anxiolytics available, however, have proven to wane in efficacy and may even pose more harm to a patient than no treatment at all. In fact, a recent study demonstrated that in children and teenagers with major depression (MDD), 13 out of 14 antidepressant drugs were ineffective to relieve MDD symptoms and could increase suicide risk in teenagers (Le Noury et al., 2015). Through efforts to address this apparent need for efficient mental health care, professionals in the field have taken a further look into the function and validity of neurofeedback (NFB) training as an accessible, non-invasive treatment option.



*The brain has no knowledge until connections are made between neurons. All that we know, all that we are, comes from the way our neurons are connected.*

## Evidence-Based Research: Neurofeedback training for Depression & Anxiety

Preliminary studies have shown that EEG biofeedback (neurofeedback, or NFB) has been proven effective in modifying brain function and producing significant improvements in clinical symptoms (Hammond 2005). Through operant conditioning, NFB works to inhibit inappropriate brain wave activity and reinforce healthy activity, thereby normalizing abnormal or deficient brain function. Due to the large body of research available on the abnormal neurological patterns associated with mental health disorders like depression and anxiety, NFB training has been able to target specific regions and frequencies of brain activity correlating to the symptoms of a patient and successfully improve their mental health. Testaments to this method of treatment have been provided by thorough research on the implementations and results of various NFB objectives. -training (Mennella et al, 2017).

**Table 2**  
ANOVA on positive and negative affect, anxiety and depression scores from pre- to post-training in asymmetry group and Active control.

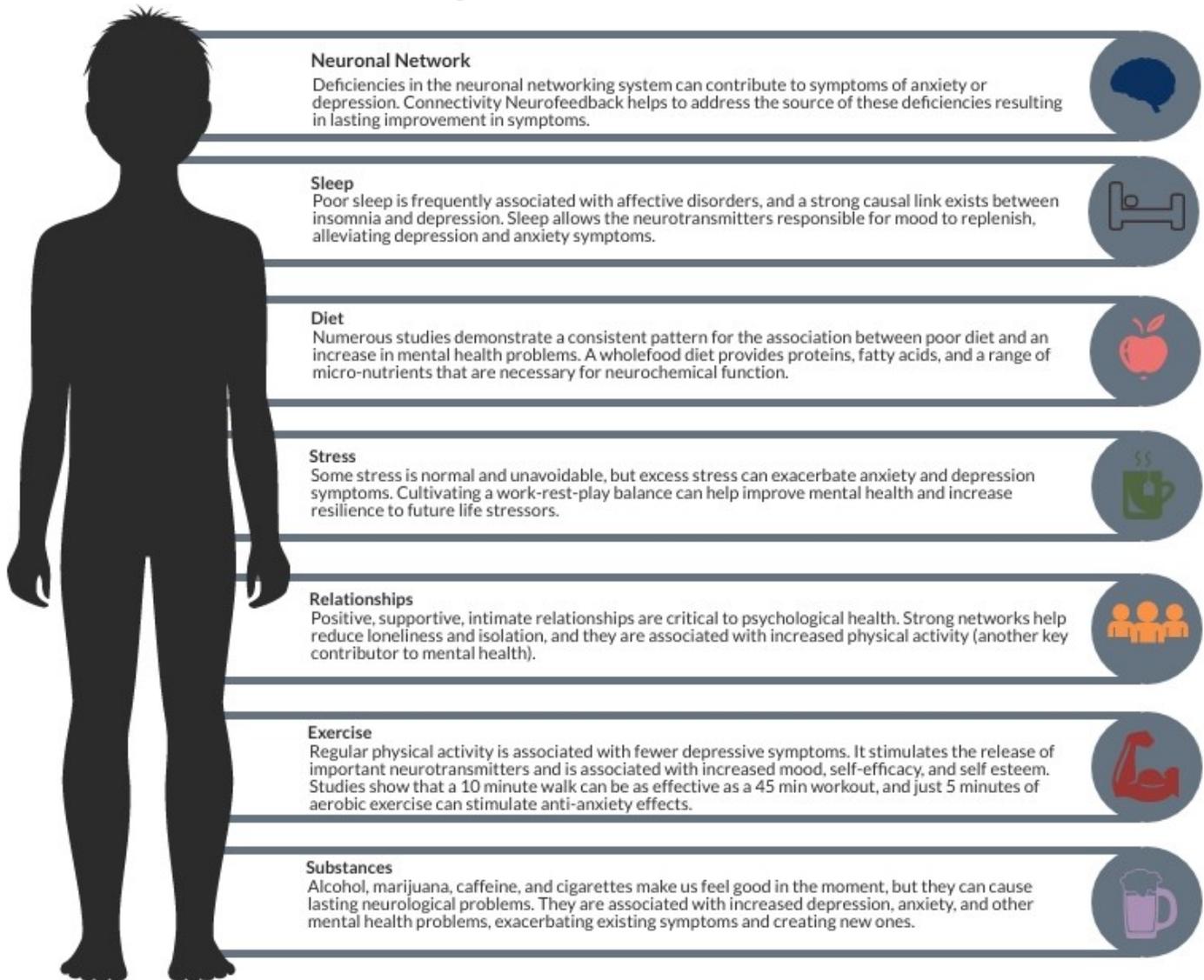
Variables	Pre-training	Post-training	p	$\eta^2_p$
<b>PANAS Positive Affect Score</b>			0.73 <sup>a</sup>	0.004 <sup>a</sup>
Asymmetry Group	27.56 (10.35)	29.19 (6.53)		
Active Control	29.94 (8.87)	30.75 (10.20)		
<b>PANAS Negative Affect Score</b>			0.05 <sup>a</sup>	0.12 <sup>a</sup>
Asymmetry Group	19.25 (9.03)	14.69 (6.46)	<0.01 <sup>b</sup>	
Active Control	18.44 (6.64)	17.88 (8.58)	0.69 <sup>b</sup>	
<b>BAI</b>			<0.05 <sup>a</sup>	0.16 <sup>a</sup>
Asymmetry Group	11.38 (9.56)	6.00 (5.56)	<0.001 <sup>b</sup>	
Active Control	10.19 (9.39)	9.13 (8.00)	0.42 <sup>b</sup>	
<b>BDI-II</b>			0.19 <sup>a</sup>	0.06 <sup>a</sup>
Asymmetry Group	9.75 (12.38)	6.00 (7.90)		
Active Control	8.13 (7.30)	7.19 (9.59)		

Notes: Data are M (SD). <sup>a</sup> = p-values and partial eta-squared referred to the Group x Time interaction for the corresponding measure. <sup>b</sup> = p-values associated to post-hoc comparisons in the context of a statistically significant Group x Time interaction (not reported for non-significant interactions). ANOVA = analysis of variance; PANAS = Positive and Negative Affect Schedule; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory II.

In 2016, researchers studied the effects of NFB training among 14 patients with Major Depressive Disorder. Participants were randomly assigned to either receive NFB training (n=7) or controlled pharmacological treatment only (n=7). After completing 6 weeks of training, the NFB group showed significant decrease on depression and anxiety Beck’s inventories, while those in the control group increased or did not change (Wang et al, 2016). A later study evaluated the efficacy of NFB targeting frontal alpha asymmetry on 32 right-handed females presenting anxiety symptoms. In contrast to the 16 participants in the control group, those receiving alpha asymmetry

NFB showed coherent reduction in both negative affect and anxiety symptoms from pre- to post-training. Improvements in Positive and Negative Affect Schedule and Beck’s Depression and Anxiety scores can be found on Table 2(Mennella et al, 2017).

## The Neuroconnection Recognizes that Brain Health Involves the Whole Person



### Kick It



Reduce or eliminate unhealthy habits

- Processed, sugary, nutrient-poor foods and drinks
- Reduce alcohol and cigarette use
- Avoid marijuana completely
- Excessive worrying or rumination
- Stop trying to "go it alone"
- Limit late night caffeine and screen time as these can disrupt your sleep

### Pick It



Make these part of your routine instead

- Eat meals full of fresh fruits, vegetables, whole grains, nuts, and seeds
- Get 7-9 hours of sleep each night
- Be active: Take a walk, sign up for a fitness class, take the stairs, or park farther away from the door
- Call a friend or loved one just to chat
- Consider psychotherapy or neurofeedback to address the root cause of your symptoms



## More on The Neuroconnection

Upon seeing such excellent results in the past 11 years with Connectivity-Neurofeedback (CNFB), our professionals aimed to extend access to training for those outside of our geographic area or inflexible schedules. As a result, The Neuroconnection designed an @ Home Training program to offer CNFB sessions in the

convenience of your home. For eight years, we have been able to provide our expertise and therapeutic treatment to families across the world. The opportunity for daily neurofeedback training at home has brought successful results for clients living as far as Russia and India.

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*Request more information from The Neuroconnection Website!*  
[www.theneuroconnection.com](http://www.theneuroconnection.com)

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## Meet Our Director

Ann L. Rigby, MSW, LCSW, BCN has over 30 years of experience in the mental health field. Ms. Rigby has been providing Neurofeedback services since 2001. She founded “The Neuroconnection”, a Brain Mapping and Neurofeedback clinic that provides an advanced, research-based form of Neurofeedback known as Connectivity Neurofeedback.

Ms. Rigby is a past Board Chair for the Autism Society of Illinois. She is a fellow and Board Certified member of The Biofeedback Certification International Alliance. She is also a field placement instructor for graduate students at Benedictine University and holds memberships with the International Society of Neurofeedback and Research (ISNR), the Biofeedback Certification Institute of America (BCIA), and the National Association of Social Workers (NASW). Ms. Rigby is a frequent speaker and exhibitor at many national and regional conferences throughout the year on topics related to the benefits of Connectivity Neurofeedback.

For more info about upcoming speaking engagements, go to our website [www.theneuroconnection.com](http://www.theneuroconnection.com) and visit our News and Events tab.



**the Neuroconnection**  
Brain Mapping and Neurofeedback

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