

# *the* **Neuroconnection** **News**

January-February 2015

Edition 1, Volume 5

## **Happy New Year!**

### **From The Neuroconnection**

Most New Year's traditions include attending parties, eating special New Year's foods, watching firework shows, and even tuning in to the dropping of a giant ball in New York City's Times Square at the turn of midnight. Yet, the common tradition that our staff at The Neuroconnection would like to take the time to highlight is making resolutions for the New Year. Defined, a resolution is the act of finding an answer or solution to a conflict, problem, etc. Living in today's ever-changing society, we are constantly forced to adapt to change. However, through making resolutions, we are establishing changes that we are in control of, rather than trying to tackle changes that are presented to us unwillingly. The professionals at The Neuroconnection are confident that through consistently setting goals for our practice, we have the power to better our services in the field of Neurofeedback to our clients for the 2015 year and beyond.

Upon reflecting on the 2014 year, we are pleased to share that this month marks our one year anniversary with utilizing new 4-Channel Connectivity Guided Neurofeedback (CGNFB) with our clients to improve symptoms and create results that are positive and lasting. Our mission 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. The experts at The Neuroconnection are committed to working diligently to set our own resolutions and goals for the 2015 year, in order to stay true to our ultimate mission and be able to better serve our clients.

With goal setting comes reflection and as we reflect on the research-based advances made thus far at The Neuroconnection, we would like to share with you in this month's newsletter more information on what "Connectivity Guided Neurofeedback" is, the advantages to our most up-to-date 4-Channel CGNFB training, evidence-based research reporting on the effectiveness of CGNFB in clinical studies, and how our @ Home Training option provides a solution to those outside of our area or with conflicting schedules.



#### **In This Issue:**

- 1 A Look at What's New
- 2 Connectivity Guided Neurofeedback
- 3 4-Channel CGNFB Training
- 4 Evidence-Based Research
- 4 @ Home Training
- 5 About the Director



**Bring on the New Year with  
Connectivity Guided  
Neurofeedback  
Financing Available with  
Low Monthly Payments**

## How is Connectivity Guided Neurofeedback State of the Art Neurofeedback Training?

Until recent years, the maps that were used in the field of neurofeedback only allowed us to look at the brain as if it were flat and did not account for the distance between the sites that we were evaluating. Of critical concern within the practice of neurofeedback is the use of pairwise coherence connectivities estimates that assume a flat, 2-dimensional space when the space is actually 3-dimensional. Only NeuroRep, a multivariate coherence measurement, developed by Dr. William Hudspeth, correctly assesses the 3-dimensional waveforms in the brain and produces the statistical computations that show how the brain is communicating with itself. This specific tool provides a quantitative metric for EEG and measures regions of the brain for connectivity. These tools take into account the geography and structure of the brain and an understanding of the pathways in the brain that allow information to flow back and forth. By using the proper measurements with NeuroRep and doing neurofeedback training based off of these measurements, the neuronal messenger delivery system is enhanced to improve overall cognitive, social, behavioral, and language functioning. It is only with these tools that trained clinicians accurately know where and how to do the correct type of Neurofeedback training.

State-of-the-art brain mapping today enables us to evaluate regions of the brain, looking at areas that are too loosely or too tightly connected and aims to make changes to these abnormalities in functioning. Ultimately, CGNFB improves symptoms by improving undeveloped neuronal pathways and the ability of the brain to relay messages. Furthermore, NeuroRep QEEG maps allow for pre and post comparisons and reveal improved outcomes of corrected 3-dimensional coherence.

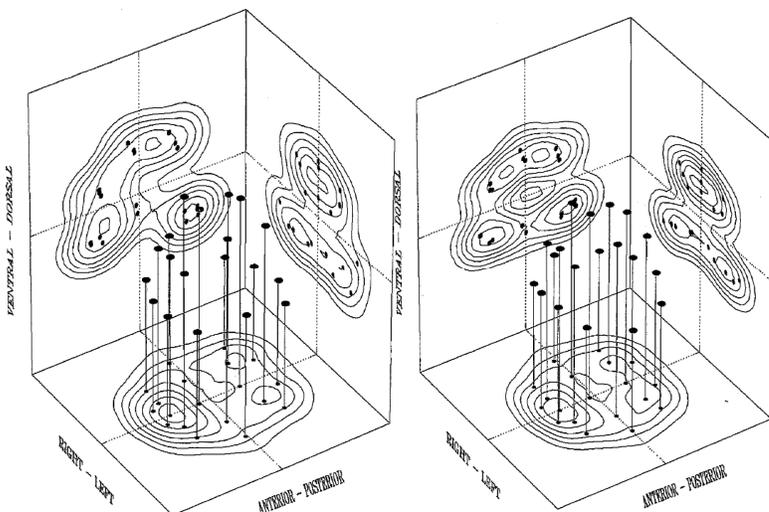
*“In particular, the differences between pair-wise and multichannel...results show unequivocally that in most cases, the pair-wise estimates are incorrect and a complete set of signals involved in a given process has to be used to obtain the correct pattern of EEG flows.”*

Kus, R., Kaminski, M., Blinowska, K.J. (2004) Determination of EEG activity propagation: pair-wise versus multichannel estimate. *IEEE Trans Biomed Eng.* 51(9):1501-10.

Of further importance, the sophisticated CGNFB training offered at The Neuroconnection is particularly effective for clients with autism, as it trains regions of the brain- where neuropathways were supposed to have formed during early development and did not- for better communication and timing. When you have the neuroconnections that allow you to now perform the tasks, improvements are seen more quickly. For instance, speech therapy can be enhanced, children are able to pay more attention and get more out of tutoring, become socially aware and engaged, and often need to join a social skills group to catch up, due to their new awareness and interest in peers. Among other results is the ability to transition without disruption, improved eye contact, increased focus, improvement in social skills and social pragmatics, increased calmness and decreased anxiety, improved verbal communication or expressive language, improved receptive language, fewer repetitive behaviors and improved processing speed.

Since 2001, The Neuroconnection has been successful in reducing neuropsychological symptoms with the use of CGNFB training. it is not uncommon for our clients to be able to come off of stimulant medication, antidepressants, and anti-anxiety medication following training. Best of all, the improvements seen with training are lasting.

### **NeuroRep QEEG Analysis Principle Component Analysis of EEG Waveforms**



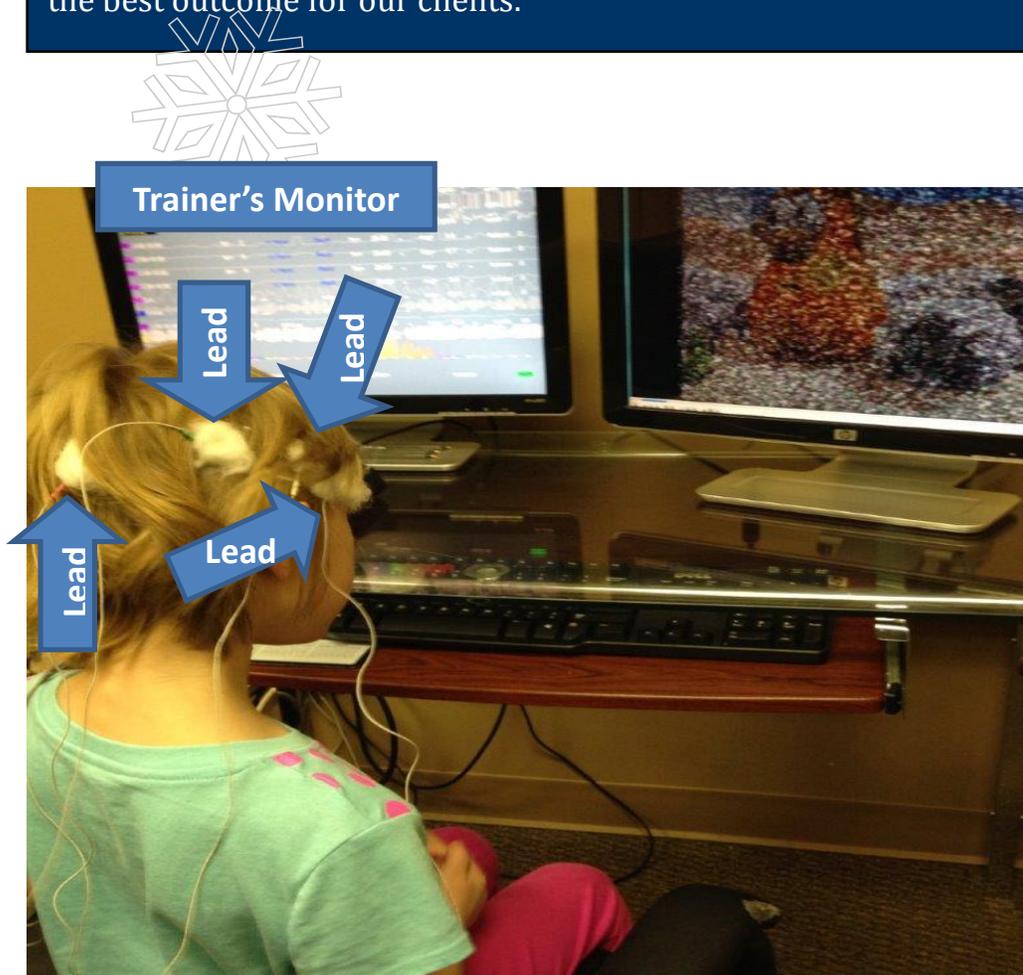
(Hudspeth, 1987, 1990)

## Announcing 4-Channel Connectivity Guided Neurofeedback Training:

Connectivity training up to this point has consisted of 2-Channel training. As promised, The Neuroconnection continuously perseveres in dedicating time and effort towards bringing our clients the latest advancements in neurofeedback. In January of 2014, we began utilizing 4-Channel CGNB training. While 2-Channel training is effective, through research we found that using four channels may be even more powerful and more effective. Thus far, we have seen this to be the case. 4-Channel CGNFB training uses four electrodes on the head instead of two, averaging four channels of EEG data. Ultimately, 4-Channel CGNFB training reduces the number of training sessions needed by 50%.

Below is an example of a child hooked up with 4-Channel CGNFB training equipment at our clinic. The four leads are visible on the right side of her head. There is also a trainer's monitor for the clinician and a training monitor for our client. Operating using a similar format as 2-Channel training, 4-Channel CGNFB training induces change by rewarding the brain with visual images from a movie, which is played when the correct brainwaves are produced. The picture below illustrates the movie fading as a result of our client not producing the correct brainwave activity.

It is vital that 4-Channel CGNFB training be used in an experienced practitioner's hands. The experts at The Neuroconnection continue to strive towards providing our clients with the most up-to-date researched neurofeedback training. We are pleased with the results that this new form of training has to offer and are confident it stands by our mission of producing the best outcome for our clients.



*"A knowledge of brain science will provide one of the major foundations of the new age to come. That knowledge will spawn cures for disease, new machines based on brain function, further insights into our natures and how we know."*

From "The Soul Made Flesh, The Discovery of The Brain and How it Changed the World" by Carl Zimmer, 2004

## Evidence-Based Research:

In 2014, a single case study was examined with a 12 year old girl diagnosed with autism, with findings from MR-DTI, pairwise and coherence and three forms of multivariate coherence analysis. The hypothesis presented was that more advanced statistical approaches to EEG coherence analysis may provide more detailed and accurate information in comparison to pairwise measurements.

It is noted that when considering autism as a disorder of neural connectivity, there is increasing evidence that supports head enlargement as a result of brain overgrowth early in life (first 1-2 years), as a result of enhancements in frontal white matter and minicolumn pathology (Coben et al., 2014). This ultimately leads to frontal over-connectivity, interfering with the normal developmental trajectory; which in turn halts the natural progression of anterior to posterior synchronization and specialization of functions (Coben et al., 2014). This pattern reflects frontal hypercoherence and bilateral temporal hypocoherece. As a result of such findings, this study suggested that more advanced statistical approaches to EEG coherence may provide more detailed and accurate information.

This study found that a pairwise coherence analysis of this case had very few significant coherence anomalies. It is cited that, "The ones that are present include frontal hypocoherece and bilateral occipital-temporal hypocohereces." (Coben et al., 2014). On the other hand, the multivariate analyses showed the opposite. "All forms of multivariate analysis shown have suggested a combination of local hypercoherence and long distance hypocoherece across right frontal to posterior temporo limbic regions. This, in this case, clearly shows a difference between pairwise and multivariate estimates." (Coben et al., 2014).

For more information pertaining to this study, please review the reference below.

Reference: Coben, R., Mohammad-Rezazadeh, I., & Cannon, R. L. (2014). Using quantitative and analytic EEG methods in the understanding of connectivity in autism spectrum disorders: a theory of mixed over- and under connectivity. *Frontiers in Human Neuroscience*, 8, 45. doi:10.3389/fnhum.2014.00045

## @ Home Training through The Neuroconnection

Upon seeing such excellent results in the past 7 years with Connectivity Guided Neurofeedback (CGNFB), we wanted to find a solution to provide the training to those outside of our area or with schedule inflexibility. As a result, The Neuroconnection provides an @ Home Training program to conduct CGNFB sessions in the convenience of your home. For the past 3 years, we have been providing our expertise and therapeutic treatment to families all around the world. The option of training daily at home has been proven successful with our clients expanding as far as Russia and India.

The @ Home Training program first starts off with an initial intake, along with a QEEG or "brain map" in the office. A custom protocol is then made for the specific needs of the client. At this time, an extended training session is set up within the office to instruct you on how to run a session. We provide you will all the necessary tools and equipment including the neurofeedback system in addition to a laptop which is pre-loaded with all the software and protocols required to conduct training sessions at home. We also provide an Atlantis amplifier, electrodes, head cap to show correct placements, and an @ Home Training manual.

Following the training, we monitor you at home via Skype to verify that you are receiving CGNFB training correctly. Once you feel conformable training with the software, you may then begin to run sessions on your own with The Neuroconnection monitoring your progress. One protocol consists of 20 sessions, with at least two sessions ran each week until completion of the set protocol. Once finished with the first protocol, you would then return to our office for a QEEG remap to allow for pre and post comparisons.



## Learn more about The Neuroconnection's director:

Ann L. Rigby, MSW, LCSW, BCN has over 25 years of experience in the mental health field. She has specialized training and extensive experience in the areas of Autism, Attention Deficit Hyperactivity, Anxiety, and Mood Disorders. 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 Guided Neurofeedback.

Ms. Rigby is the President of the board of the Autism Society of Illinois and is a field placement instructor for graduate students from Benedictine University. She holds memberships with the International Society for Neurofeedback and Research (ISNR), the Association of Applied Psychophysiology and Biofeedback (AAPB), 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 Guided Neurofeedback. In the past year, Ms. Rigby spoke at the following conferences: The 45<sup>th</sup> Autism Society of America National Conference, The Special Needs Expo, The Family Time Magazine Autism and Special Needs Seminar, and the Autism Society of Illinois 10<sup>th</sup> Annual Parent and Professional Networking Conference.

To learn more about up and coming speaking engagements, go to our website [www.theneuroconnection.com](http://www.theneuroconnection.com) and visit our Resources tab.



***Financing available  
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