

Recovery is Possible

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The belief that recovery is possible is the underlying tenet that drives the focus of activities at the Crossroads Center of NJ. It is a goal we hold for each client we work with and it requires a shift from therapy provider to care manager. Connecting with each child is paramount in this endeavor, for to be the most that we can be, a loving human connection must underlie the work that is entailed. It provides the basis of the partnership that we create with parents and caregivers, so that all aspects that affect recovery are proactively considered and pursued. These include:

- Diet and proper nutrition
- Targeted biomedical support
- Healthy living environments
- Healthy family relationships
- Neurocognitive support
- Neurophysiological development
- Energetic therapies

Instead of performing a service, we are contemplating impact. Our decision tree and what is offered is driven from this alternative focus. Ultimately, we are tasked to provide the best of the best, as our goals have set the bar very high for each and every client.

A typical client session at Crossroads incorporates 30 minutes of neurofeedback followed by an additional 30 minutes of somatic therapy. A combined session spans 75 minutes with setup, cleanup, and transitions. We strive to improve brain regulation first, and then follow this with therapies that enhance the child's neurophysiological development, which, when received by a more open neurological system, can go deeper and hold better.

In June of 2010, I was privileged to trial the BrainMaster DC Amplifier-based

protocol developed by Mark Llewellyn Smith, that today is known as Infra-Slow Fluctuation (ISF) training. As is customary, I first utilized it on myself and found its regulation capabilities very deep and lasting. As a person recovering from a toxic mold exposure and Lyme disease, its benefits were paramount. So, without much ado, I started trialing it with the children.

What is most important about ISF is to establish an appropriate frequency for each individual. At that time, the software provided for three decimal place settings. For most of my children, this was sufficient, however for a few, we needed more specificity, which Tom Collura delivered later that year. What was significant about this protocol was what happened after a session. My colleague Sandy Beltramini, who sees the children immediately after their neurofeedback session, asked the question, "What do you have over there, a magic wand?" The children were so present and open for the neurodevelopmental therapies that the sessions flew by, and the resultant changes were fast and furious. One 12-year-old child required an updated Individual Education Plan (IEP) every two months, as he was knocking off his new educational goals that quickly. He left his self-contained classroom and now attends a school for children with learning disabilities, where he is quickly advancing with his academics.

ISF took front seat as the neurofeedback modality of choice, even proving itself over time for other rehabilitation requirements. The following stories provide a window into how ISF has affected some of our clients:

Autism/Developmental Delay

R came for his preliminary intake at the end of December, 2011. He was 11 years

old, and was diagnosed as developmentally delayed. In our center, he spoke very little. R had already received the standard OT/PT/SLP therapies since he was two years old, as well as a year of traditional neurofeedback with minimal results, right before coming to see us. His mother reported that he was often angry and would throw and break things (iPad/phones/etc.) and she said he was reticent to participate in the family activity of swimming at the Y. His qEEG indicated elevated power in hi-beta and significant hypercoherence in both the beta and hi-beta bands, the latter is often found in children on the spectrum (Figure 1).

R participates in the Option Institute SonRise program, a home program that is exquisitely designed to draw the child out through a very conscious engagement process. His SonRise program includes academics and replaces school attendance. When he started with us, he was at SonRise Level 2, partway through the level. Through the SonRise weekly

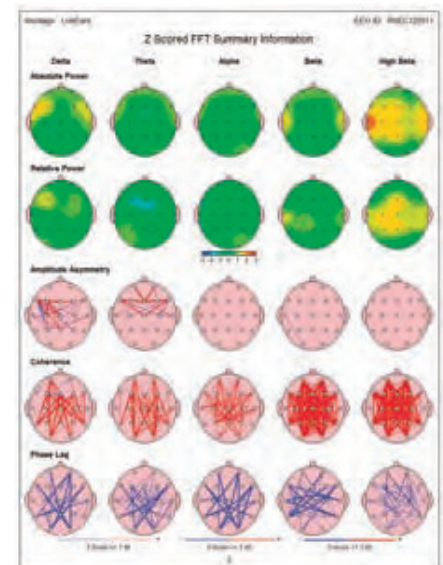


Figure 1: Pre-treatment qEEG, 11-year-old developmentally delayed child

program reporting, his primary SonRise therapist documents his progress and shares observations about team member interactions with R

- January: Increased calmness, more spontaneous and complex sentences.
- February: Started swimming the same number of laps as his dad (30-32), up from 4.
- March: Great interactivity on Florida vacation, high levels of eye contact and socially appropriate.
- April: Completed Stage 1 & 2 Interactive Skills (SonRise) and on his way to acquiring Stage 3 & 4.
- May: Approaching Stage 4 Flexibility (SonRise).
- June: Anger management skills have improved.
- July: Handwriting improvements, writing slower and more age appropriately.
- August: Improved verbal responses, more immediate and natural.
- September: More chatty, longer sentences with advanced structure.
- October: Started using the dictionary during the rhyming game.
- November: More flexibility in symbolic play.
- December: Spontaneous talking has improved.
- January: Expressing regret and taking initiative in doing workbooks.

Presently R is actively tackling academics and advancing quickly. While R still has more distance to travel in his recovery journey, his qEEGs and history demonstrate how far he has come in his first 12 months utilizing ISF neurofeedback (Figure 2). During this period, R has also experienced Craniosacral Fascial Therapy (CFT), Quantum Reflex Integration (QRI), has had constitutional homeopathics recommended, and modified his diet to be gluten free. CFT is a somatic therapy whose goal is to identify and release fascia strain, as fascia strain

has been found to affect everything from posture to organ function (see Gillespie-Approach.com for more information). QRI is a somatic therapy that uses low-level laser therapy (LLLT) on specific points and neurological pathways to enhance the integration of primitive and postural reflexes. Primitive reflexes have been found to affect emotional regulation, memory, and learning (see Reflex-Integration.net for more information).

Stroke

A 41-year-old female referral from a physical therapist colleague had suffered a stroke at age 29. Unfortunately misdiagnosed as a heart attack, her care had been a series of unfortunate events, resulting in an emergency hemicraniectomy (skull bone removal) that eventually required replacement with hipbone and screws. She presented with right-side atrophy, very limited mobility in her leg and arm, with a fully clenched hand. Her communication consisted of one to two word exchanges. I later learned she had only 25% visual field function and no sensation on the right side of her body. She was also dramatically affected by changes in barometric pressure.

Her qEEG was deemed significantly

affected by the metal screws anchoring the top of her cranium, providing little guidance for specific therapeutic approach.

Over her ten sessions of treatment, utilizing ISF inter-hemispherically, working on the homunculus brought the most dramatic changes. Her hand unclenched, her arm moved more freely, and both hot and cold sensation returned to her face and arm. Her leg demonstrated the least response. Her verbal capacity increased to 8–10 words, she reported being able to think and type on her iPad simultaneously (new gain), and her visual field increased to 50%. Her weather-related effects diminished in severity. This case is a true testament to the neuroplasticity of the brain, which had incurred the damage 12 years prior.

Heart Attack/Anoxia

A 62-year-old male referral from a speech language pathologist had suffered a heart attack and had been revived after more than ten minutes of cardiac arrest. He presented with great physical stiffness, in a depressed state with poor memory, low energy, and no motivation.

His qEEG indicated global low power, initially leading me to utilize other modalities, in hopes of enhancing his energy. While that equipment was out being upgraded, I opted to do an ISF session with him, and finally the game started changing. Suddenly, he was making witty quips, like his old self. Little by little more of him returned, despite the significant impact of an ejection fracture rate of 10-20% (poor circulation due to heart damage). Ultimately, he handled social situations with interactive vigor, however his overall physical stamina remained low, as did his depressed mood.

ISF Frequency and Protocol Selection

Utilizing the ISF protocol requires following a process for identifying an effective frequency for the client, and learning a set of fundamentals for choosing sensor placements. The optimum frequency

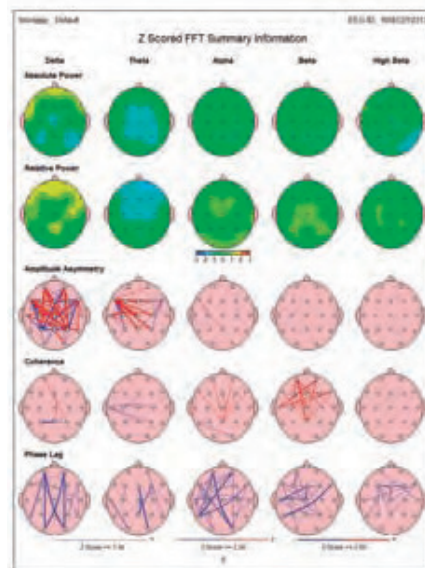


Figure 2: Post-treatment qEEG, 11-year-old developmentally delayed child

is determined through multiple factors, including “in session” feedback from the client, observation of physiological responses (skin tone, pupil dilation and body temperature changes), and 24 hour “post session” reporting. Like other modalities, the most significant issues are tracked to assess frequency effectiveness and sensor placements. Most of my ASD clients cannot self-report during a session, making observation of physiological changes and the 24-hour report a more critical component of care. Sensor placements include T4-P4 for sensory calming, T4-T6 to enhance empathy and facial recognition, T4-F8 to enhance speech production, and T4-FP2 to enhance emotional control.

Summary

Among the many neuromodulation approaches used at the Crossroads Center of NJ, the Infra-Slow Fluctuation approach has taken a prominent role. While I employ qEEG-based neurofeedback and still sporadically utilize Z-score, S-Loreta, LENS, HEG, TDCS, NeuroField, and traditional symptom-based neurofeedback approaches, all my clients receive Infra-Slow Fluctuation neurofeedback. The improvements clients experience are surprisingly fast and positive. It is the modality of choice for children with developmental delays and with people experiencing chronic illness; it has also been highly effective with traumatic brain injuries.

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fluctuations measured in tenths of microvolts with the inclusion of DC.

As our spectral displays improved, the relationship between DC shifts in amplitude, measured in millivolts, and the infra-slow frequencies, measured in microvolts, became illuminated. The rise and fall of the large amplitude of the DC potential shift was observed to be correlated with the smaller energy of the frequency domain measured in microvolts. We see this in spectral displays in our current training screens when both the DC and ISF signal are imaged simultaneously (Figure 1).

It is this interaction between DC shifts and frequencies that directed the name change from Infra-low frequency to Infra-slow fluctuation training. The DC shifts were observed to impact microvolt fluctuations in the slow frequency regime and offer a target for feedback.

Small, recurrent amplitude changes of the ISF signal are the focus of reinforcement, not the return of the slow oscillation itself. We do not reinforce an oscillation that takes scores of seconds or minutes to complete its cycle, a common misconception. During the cycle of a .01 hertz frequency, a frequency that takes 1 minute and 24 seconds to fully oscillate, DC shifts in amplitude much more frequently and induces the ISF signal

to rise and fall in very small amplitude increments. The amplitude change is often a fraction of one microvolt. It is this minute rise and fall in amplitude that ISF training targets.

Reinforcing this slow signal has produced rapid and profound behavioral changes in a multitude of presentations as measured by qEEG and pre/post treatment behavioral scales. Autism, reactive attachment disorder, generalized anxiety disorder, panic disorder, and ADHD are a few of the many presentations treated by clinicians using ISF training over the last six years.

The clinical results presented in this article are typical within the ISF provider network and resonant with the fifty years of research that has been executed involving the frequencies below .1 hertz.

The infra-slow rhythm was first identified by Russian researchers nearly sixty years ago (Aladjalova 1957, Aladjalova 1964). Scientists at the Institute of Biophysics in Moscow implanted electrodes in the brains of rabbits. The infra slow band was observed to increase in amplitude and frequency when animals were subjected to stress producing stimuli. They theorized that the increase in amplitude of the infra slow oscillations reflected the hypothalamus’s reparative, parasympathetic response. Supporting a role for the



Figure 1: ISF signal in the top box with both green (damped ISF signal) and white (Undamped Signal measured in microvolts: .37 uV). DC in bottom box measured in millivolts; white line (here approximately 11 mV). The DC shift amplitude in the bottom panel is more than a thousand times greater than the ISF fluctuation in the top panel. Notice the similarity of the amplitude fluctuations as imaged by the morphology of the white lines.