My Journey from Bionenergetics to Bioenergetics

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Connecting Isomorphic Dots

My journey began in my psychotherapy consulting room one day when a man with whom I'd been working in psychotherapy for five years told me how he was doing. He noted that he was enjoying life more, and his sense of himself was deeper, and his ability to express himself more satisfying and authentic. Then he reached up and tapped his index fingers to his temples and said, "but you know sometimes things just don't click". I always made a point of having people frame their nonverbal gestures into statements, and he responded, "well it's like, sometimes I have to read things several times before I can really understand what I'm reading and sometimes the letters seem like they're moving around on the page, it's annoying and frustrating really." Then I, in a moment of countertransferential interpretive judgmentalism blurted out, "what, you got hit in the head?" He replied, "you mean like a car accident? No, never". I'm now suddenly feeling a bit queasy and like I've just stumbled inside myself and am reorienting in a new space. I responded more pointedly, "that's not what I asked you…I meant, did you ever get hit in the head? He then nonchalantly starts recounting early traumatic incidents, e.g., falling down basement steps, hit in the head with a baseball bat playing with his friend and riding his bicycle into a brick wall. I'm now staring at him as if I'm meeting him for the first time and said, "you're not neurotic, your brain is injured, what do I do now?

This situation came very much out of left field as it was not covered in my body-centered psychodynamic psychotherapy training where behaviors were the result of intrapsychic conflicts and emotional and other forms of trauma. The 'trauma' was framed in terms of its emotional consequences not the frank destruction of brain functionality due to direct organ damage, or as I'd come to understand dysregulated electrophysiological connectivity. This interaction forever altered my clinical orientation as a psychologist and certified Bioenergetic therapist (CBT) since 1983. Starting with what was now my third intake interview question, 'tell me about hitting your head with or without loss consciousness?" Parenthetically, when I checked the history of my current caseload, over 70% had one or more traumatic brain injuries, including auto accidents, sports injuries, general anesthesia, febrile seizures, and loss of consciousness from drug and alcohol overdose.

As luck would have it, I'd become friends with Len Ochs who had moved to Philadelphia and knew he was into biofeedback, and that he'd developed some way of helping people with brain functioning using a form of biofeedback. I got in touch with Len and purchased one of the earliest versions of what now is called Low Energy Neurotherapy System (LENS). I brought the Windows 95 tower and J&J I330C2 and Photosonics glasses and electrodes back to my office and tried to imagine how this would all work. I did about 10 sessions of the EEG-driven neurotherapy with both the original patient and also with a woman with generalized anxiety who also struggled with being able to initiate actions on her own behalf and had a TBI history. They both noted improvement in their symptoms within 10 sessions and so we terminated at that point, and I put the unit away thinking it was now a tool I would use when needed by those psychotherapy patients who also had head trauma in their history.

About 6 weeks after we terminated treatment, both people came in stating that their allergists had either reduced or stopped having them use medication for asthma, indicating that their symptoms had significantly diminished or ceased entirely. They'd both done nothing else, so it was clear that something had happened from the treatments that went well beyond the remission of their TBI symptoms. This left me really scratching my head. I now had to explore further and see what more neurotherapy had to

offer and how the mind-body connection could be better understood by including brain electrical activity.

While I watched the dominant frequency (DF) display on the EEG-Driven Stimulation Biofeedback (EDS) system, I noticed patterns in the DF moving average as it moved up and down within the 0-30Hz histogram display. What I noticed was a noticeable limitation in both the range and variability of the frequencies being displayed. The pattern of restricted dominant frequency activity was the functional expression of neuronal dysregulation, or, in my psychodynamic framework, a manifestation of character defenses. The implication being that dominant frequency behavior was a way of operationally defining characterological defenses or armor as described first by Wilhelm Reich (1933) and then Alexander Lowen (1956). They were describing the evolution of compensatory patterns of chronic muscular contraction that served to bind intense and potentially overwhelming emotional experiences. This was a central organizing construct for understanding the relationship between intrapsychic conflict and physical and interpersonal behavior, ie., personality or character structure.

The recognition of constraints in dominant frequency activity was the requisite analogue to what Bioenergetics and Orgonomy referred to as character armor in the musculoskeletal system thus completing my functional understanding for observing the neurophysiological manifestation of character defenses. I was invited to write a paper on this which I titled, 'The Unarmored Brain' for a special issue on trauma and recovery. (Berman, 1998) with a focus on how a trauma's psychic impact can be assessed, and the effectiveness of treatments empirically measured.

Founding Quietmind Foundation & Associates

Using the EDS and subsequent versions of photic-driven stimulation neurotherapy that now includes Corey Snook's High-Performance Neurofeedback (HPN), allowed me to gain an appreciation for electrophysiology and brain wave biofeedback's depth, breadth, and therapeutic potential. I now see it's potential as linchpin technology toward integrating applied clinical psychology, neurology, neuropsychiatry, functional and integrative personalized medicine in revisioning mental health service delivery. When looking at the clinical literature on neurofeedback at the time it was clear that it was having nowhere near the impact on mainstream healthcare service delivery due to the low amount and quality of studies published in the peer-reviewed literature. I founded the Quietmind Foundation (QMF) to provide a platform for conducting and publishing the required theoretical and outcome research and political advocacy to bring neurofeedback into the mental health service delivery system.

QMF was incorporated in 2000 as a nonprofit charity in Pennsylvania with the mission of integrating noninvasive and non-drug therapies into public healthcare and education. Our applied clinical research was initially directed at promoting research on EEG-driven stimulation neurofeedback (EDS) which was the precursor to the Low-Energy Neurotherapy System (LENS) but quickly expanded to supporting all forms of neurotherapy that were non-drug and noninvasive. Our political mission was to influence the PA Department of Health to modify Medicaid reimbursement guidelines to include the current procedural terminology (CPT) for the combining of psychotherapy and biofeedback (90876). We wanted to have neurofeedback recognized as a reimbursable form of outpatient psychological treatment at the same level of existing forms of psychotherapy, e.g., psychodynamic, and cognitive behavioral therapy. Our plan was to demonstrate that neurofeedback training should be considered a form of applied behavior therapy that could enhance clinical efficacy in the treatment of ADHD in children and adults.

The then chairman of Thomas Jefferson's Dept of Psychiatry asked me to join the volunteer faculty to train and supervise 4th and 5th year psychiatry residents about neurofeedback and its integration with body-centered psychotherapy. This was an opportunity to address our secondary goal of developing

graduate level clinical training curricula in digital neurotherapeutics and led to a research project funded by QMF on the use of neurofeedback as a treatment for anxiety among participants in a methadone maintenance program. The study sought to see if neurofeedback training could reduce patient's seeking of anxiolytic medication in addition to their methadone. The study was conducted by Mark Berman, Psy.D. and clinical staff at Thomas Jefferson's outpatient methadone clinic where subjects received 30 sessions of alpha-theta neurofeedback training over 8 weeks. There were marked reductions in both trait and state anxiety in the members who completed the full program (n=8). The study's pilot data was used unsuccessfully to obtain an NIDA grant to expand the neurofeedback in outpatient methadone maintenance; however, it helped bring attention to the value of neurofeedback within the addiction treatment community and specifically, the Philadelphia Office of Mental Health and Mental Retardation (OMHMR).

We also proposed a pilot program of treatment for children (8-14) with co-occurring conduct/oppositional defiant disorder and ADHD who were receiving intensive outpatient therapy afterschool, 2-3x/week at the Northwest Center, a community mental health center and Carson Valley School, a nearby residential treatment center. We received OMH-MR funding to work with a group of 15 children in the outpatient clinic and about the same number in the residential program, over the course of 4 months. Participants were seen at a frequency of between 3 to 5, 30-minute sessions a week respectively for a total of 40 sessions. Notable results included reduction in incidents of aggressive behavior, improved academic performance and reduced use of psychotropic medications. However, the report was given minimal attention by the incoming head of the department as this program had been originally authorized by the previous administration.

The project did attract the attention of the head of a new charter school in Philadelphia who asked Quietmind to conduct a study with their students who were diagnosed as on the autistic spectrum, and several with specific neurological disorders that impaired their communication, mobility, and cognitive processing. Eric Miller, PhD, a gifted music therapist and neurofeedback practitioner, headed up the team at Philadelphia Academy Charter School. They worked in the school's computer laboratory doing mostly QEEG-guided, two-channel amplitude and coherence training with 18 children identified by the school and for whom parental authorization to participate had been obtained. The results of the 40-session protocol were largely positive with notable improvements in academic performance and prosocial behaviors both in school and at home based on parent reports.

Shining New Light on Dementia

QMF's focus shifted from ADHD in children to study of neurodegenerative disorders, specifically Alzheimer's and other forms of dementia in 2007 with the generous support of John & Chara Haas through the Phoebe Haas Charitable Trusts. The focus of this funded study was to see if neurofeedback training targeting amplitude modification of specific frequency bands could improve cognitive and behavioral symptoms in subjects with early to mid-stage dementia. This was based on the substantial literature in Neurology on the changes in slow and fast wave activity as people progressed in dementia. There was broad acceptance that delta and theta band amplitudes increased while beta amplitudes were decreasing as people became more demented.

We were aware, from the neurofeedback literature on seizure disorders, that brainwave amplitudes could be modified using noninvasive operant conditioning techniques (Sterman,2006) and thought it reasonable that subjects with dementia might also be able to renormalize their brainwave activity. The study design involved 27 subjects with mid-stage to moderately severe dementia, who were seen either at the QMF clinic or in their own home delivered by caregivers receiving three sessions a week for three months. The study, funded with the grant, was directed by Jon Frederick, PhD and the results were

presented at the Alzheimer's Association's International Conference in Vienna in 2009. It was accepted and listed in the 'Hot Topic' poster category and was one of only two presentations that year that included QEEG measurement of brain functioning among about 500+ presentations. All others are in some way related to the pharmaceutical treatment of dementia. Our message was of there being a successful non-drug intervention for dementia which was being drowned out by the firehose of drug studies (400+ failed trials) filling the geropsychiatric, gerontology, neurophysiology and molecular biology journals.

Our findings showed that the subjects who improved their cognitive functioning had significantly reduced their slow wave amplitudes and increased fast wave activity compared to those who did not show improvement. Location of training was not a significant factor, supporting our idea that this type of treatment can be delivered remotely by properly trained and remotely supervised caregivers. We also noted that the slope of decline, not the progression of the disease itself, was being affected by the neurofeedback training. We realized, then, that a tissue-level intervention was needed.

The *Daily Mail* Delivers a Surprise

I received an email message one morning from John Haas, who funded our first neurofeedback research program, with the subject line: What's this? , and in the email was a link to the UK tabloid The Daily Mail with their typical blaring headline: *'UK Researchers Reverse Dementia Using Infrared Light'.* Below the headline was a large photo of 3 dour looking men, with two in lab coats flanking a taller fellow in the middle holding what would best be described as half a bowling ball with large metal fan covers. The story was about a recent paper published in the prestigious journal, Neurobiology of Learning and Memory which described an animal study wherein the active treatment mice were exposed to 1072nm infrared light delivered into their cages over the course of 5 months. Brain tissue analysis showed that the active treatment group had significantly less small and medium sized amyloid plaques and dementia-specific biochemical markers after treatment compared to untreated control group mice. The treated group mice's memory performance significantly improved in radial arm memory trials. I concluded from these findings that the light therapy was a good candidate for the tissue level intervention we needed to complement our neurofeedback training to improve impaired neural connectivity.

Dr. Gordon R. Dougal, MD who developed the infrared light stimulation technology came to Philadelphia with his device, and we conducted a single subject trial with a subject struggling with frontotemporal dementia. The treatment took place over 8 weeks wherein the helmet was worn for six minutes twice daily. Neuropsychological and QEEG testing was conducted before and after the trial. Results were very encouraging in terms of improved cognitive functioning, verbal communication, mood stability and affect regulation. QEEG findings showed marked reduction in slow wave amplitudes and improved temporal and prefrontal coherence, or correlation, considered a measure of neural connectivity.

We then proposed a small pilot study in 2009 which was conducted in 2010-11 with 12 subjects with early to mid-stage dementia. The treatment was conducted using a double blind, waitlist design at the QMF clinic. Subjects were given a single 6-minute treatment every day for 28 days. Their brain blood flow was measured using Herschel Toomim's near infrared spectroscopy before and immediately after the treatments. The technicians delivering the light treatment were not aware of delivering active or placebo treatment as near infrared light is not visible, and the other aspects of the device's performance, e.g., weight, running lights, fan noise were all identical. Subjects completed standardized Alzheimer's Disease Assessment Scale-cognitive subtest (ADAS-cog), self-report surveys of executive functioning (BRIEF-A) and psychological symptoms (SCL-90) as well as pre and post treatment QEEGs. These results suggest the treatment did improve both memory and behavioral functioning based on the

memory testing and the widening of across session total blood flow change which we interpreted as denoting improved cortical perfusion over the course of treatment. This initial exploration needs to be followed up with larger samples and more sophisticated IR spectroscopy measures. The results, however, did support our hypothesis that *photobiomodulation* (PBM), the new term to describe low-level light therapy, might well be a safe, noninvasive, easily deployed, low-cost, tissue-level intervention to slow, stop and even reverse the progression of dementia and Parkinson's disease.

I had the good fortune in 2016 to meet Jason Huang, MD, Neurosurgery Dept. chairman at Baylor Scott & White Medical Center in Temple, TX who expressed an interest in the work we were doing with neurofeedback and infrared photobiomodulation. He and one of his senior residents Damir Nizamudtinov, MD, PhD. conducted a safety study replicating in large measure the previously described trial of intensive daily 6 minute, transcranial and intraocular PBM with subjects diagnosed with early to mid-stage dementia. The subject cohort, (n=12) was unusual in that they were drawn from a population of patients being followed in a regional movement disorders clinic. The study was double blind and placebo controlled with pre- and post-testing with the ADAS-cog, QEEG, and self and caregiver -reported measures of daily living and executive functioning. Subjects used the device at home, twice a day for 30 days. These results were very encouraging, especially since there were no adverse events reported, and there was significant improvement in short and longer-term memory as well as motor functioning when the placebo group data were subtracted from the active treatment subject data. Subjects and their caregivers reported marked improvement in gait, tremor intensity, physical stamina, balance, mood, sleep quality and appetite. Funding and IRB approval has now been granted to expand the study to 100 subjects with similar diagnoses and to be conducted at QMF's offices in Elkins Park, Pennsylvania and at Baylor Scott & White Dept. of Neurosurgery. A mid-2020 completion is anticipated. These data will be used to seek phase III NIH support for a trial to investigate PBM combined with neurofeedback training.

The current neurotherapeutic approach at QMF incorporates transcranial and intraocular PBM body-centered psychotherapy, with 19-channel LORETA z-score NFB training to improve neural network connectivity. We also recognize the need to address the functional (root cause) aspects of health including infections, bacterial, viral, and other sources of inflammation and are affiliated with several functional medical groups to support patients who also require those forms of treatment. This 3-pronged approach allows us to deploy a theoretically and empirically grounded non-drug and noninvasive treatment model. This was where I learned the other use of 'bioenergetics' which means, the biology of energy transformations and energy exchanges (as in photosynthesis) within and between living things and their environments. (Merriam Webster) Neither the lexical irony nor the sense of isomorphic closure was lost on me as I had what Jon Stewart called a 'moment of Zen'.

We may now have a non-drug, noninvasive intervention that could alter the slope of decline, and in some cases reverse and ultimately prevent memory and behavioral symptoms associated with neurodegenerative diseases. Demonstrating neurofeedback training's value as part of a dementia treatment strategy amidst this rapidly expanding, economic and humanitarian crisis affecting over 50 million people by 2020 worldwide (ADI, 2019) would go a long way toward helping neurofeedback receive its rather overdue recognition.

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