

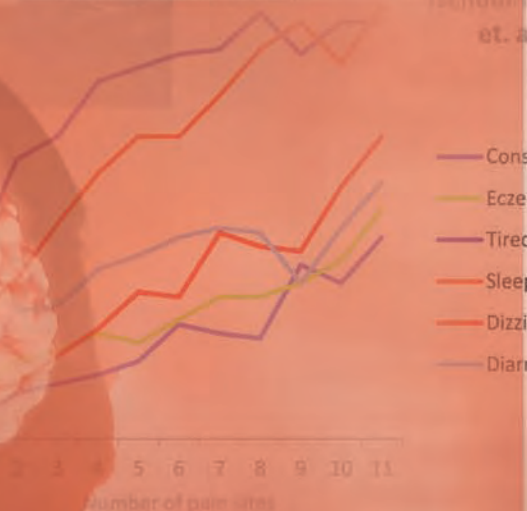
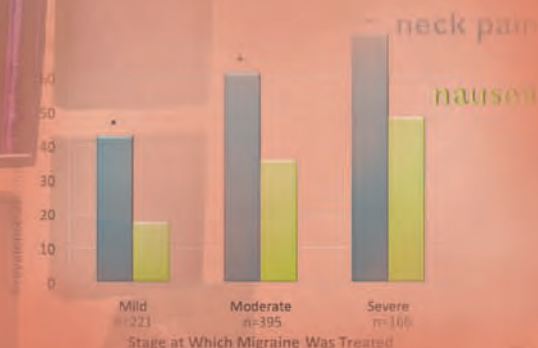
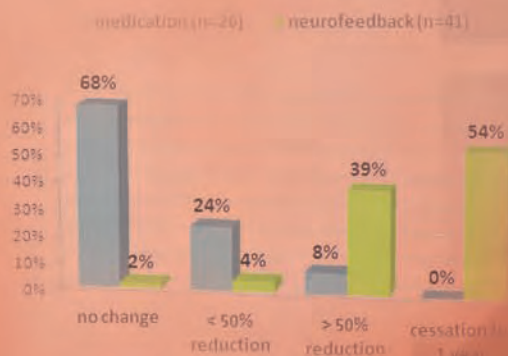
NEURO CONNECTIONS



Summer 2014 *Newsletter*



A joint newsletter from the *International Society for Neurofeedback & Research* and the *Association for Applied Psychophysiology & Biofeedback, Neurofeedback Section*



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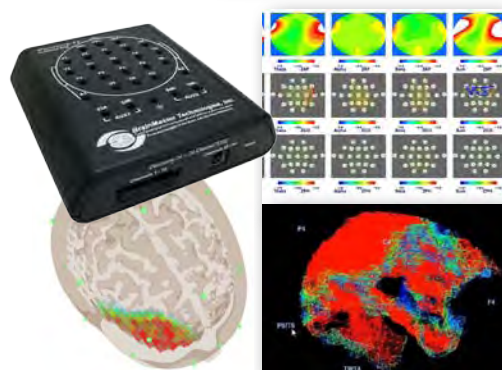
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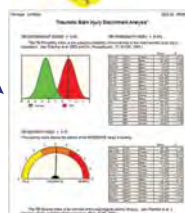
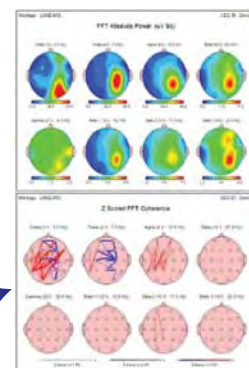
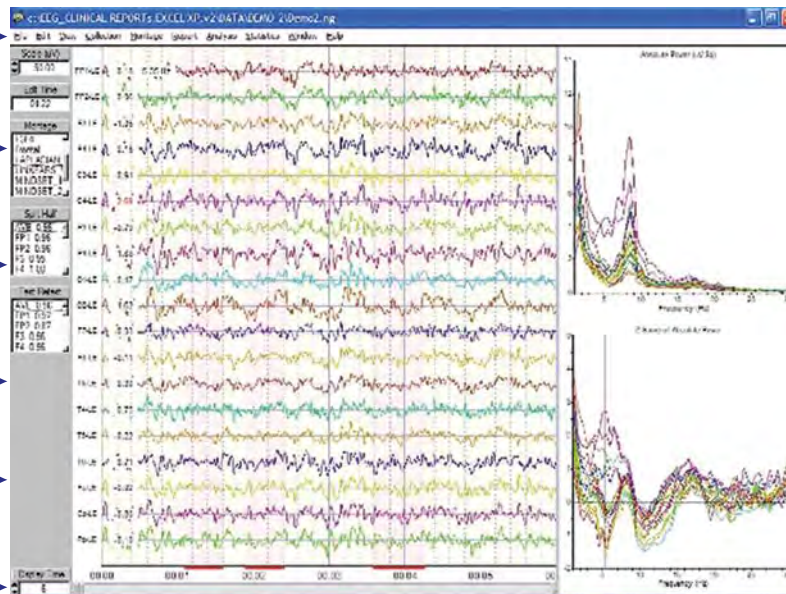
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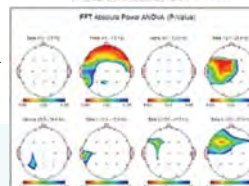
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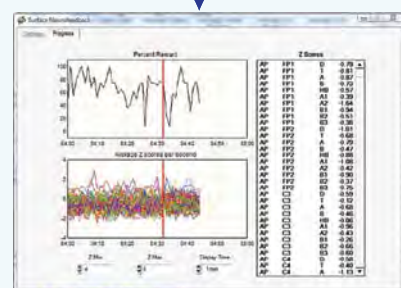
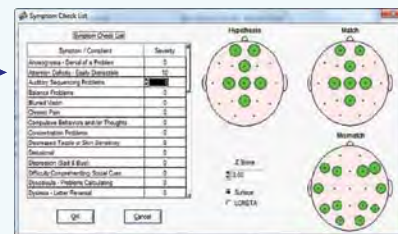
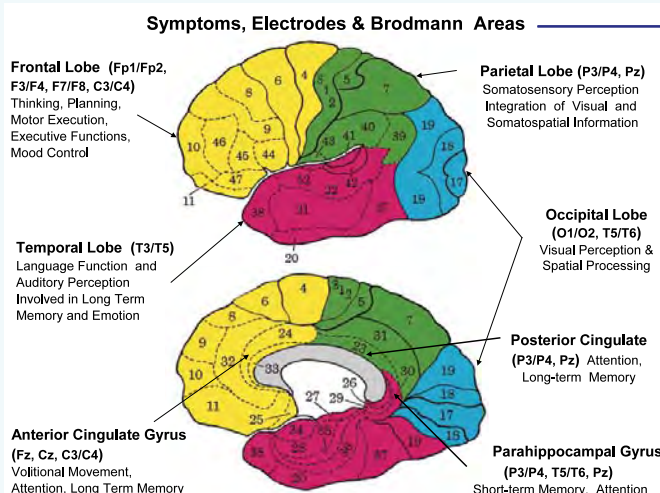
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NEURO CONNECTIONS

A joint newsletter from the  ISNR
& the  AAPB Neurofeedback Section

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NeuroConnections is the official publication of the International Society for Neurofeedback and Research (ISNR) and the Association for Applied Psychophysiology and Biofeedback, Neurofeedback Section (AAPB-NFB). Opinions expressed herein are those of the respective authors and do not necessarily reflect the official view of ISNR or AAPB-NFB. ISNR and AAPB-NFB are not responsible for the products or programs of private companies advertised herein.

Letter from the ISNR President



Greetings ISNR members. There are numerous items to update the membership. It is with great pleasure that we completed our inaugural issue of *Neuroregulation* (Neuroregulation.org). We have been utilizing our social networking tools to promote the new journal across disciplines. We are encouraging our clinicians and researchers to submit case studies, clinical group, and research studies for publication. Gratitude to Adam Clarke and all that worked diligently to make this happen! As you may have noticed, *NeuroConnections* is online as well. We will be working to reinforce the scientific merit of this member benefit magazine and make it available across social networking sites for public and professional exposure to our science.

ISNR-University (ISNR-U) has presented numerous webinars in past months with moderately good success. This is a very exciting vision for ISNR—and fulfills the mission of providing education resources to its members and the public free of commercial interests. The 2014 conference will have a rather large offering of ISNR-U sponsored workshops and trainings. The board of directors (BOD) is excited to develop methods for ISNR to be a fully self-supporting organization, independent of the yearly conference or other sources of such income. The BOD is in place to serve its members, and to maintain our scientific rigor in public and professional arenas. This is a subtle hint that the BOD needs members for our future. Consider what you have to offer and choose to participate in the advancement of *YOUR* society!

A note of encouragement: A PubMed search of the term neurofeedback returns 287 results. This does not include other terms such as EEG biofeedback, neurotherapy and so forth. There has been a general increase in neurofeedback over the past

Continued on page 10

ISNR Mission Statement

To promote excellence in clinical practice, educational applications, and research in applied neuroscience in order to better understand and enhance brain function. Our objectives are:

- Improve lives through neurofeedback and other brain regulation modalities.
- Encourage understanding of brain physiology and its impact on behavior.
- Promote scientific research and peer-reviewed publications.
- Provide information resources for the public and professionals.
- Develop clinical and ethical guidelines for the practice of applied neuroscience.

AAPB Neurofeedback Section Mission Statement

To improve human welfare through the pursuit of its goals. The specific goals are:

- The encouragement and improvement of scientific research and clinical applications of EEG technology and neurofeedback.
- The promotion of high standards of professional practice, peer review, ethics, and education in neurofeedback.
- The promotion of neurofeedback and the dissemination of information to the public about neurofeedback.
- The section is organized for the purpose of carrying on educational and scientific objectives and is not to be operated for profit.

Letter from the

AAPB Neurofeedback Section President



About the Newbies

I conduct a fair amount of workshops every year for neurofeedback providers. I also mentor and train a large number of clinicians entering the field of neurofeedback and I have begun to see a disconcerting pattern. Once we become fully engaged with this fascinating field, I am not sure many of us give much thought to these bewildered souls as they courageously enter this field knowing how little regard it receives from other established health professions. They struggle to find the large studies that will demonstrate its efficacy while they pursue in vain to find the perfect piece of equipment for all of their needs forever going forward. They wrestle with the tidal wave of new lingo and concepts that are overwhelming in order to integrate the mountain of interdisciplinary knowledge that senior members spout effortlessly and impressively at professional meetings. And then there are the contentious prophets of NFB salvation promising the quickest most efficacious road to recovery from all that ails with their wondrous equipment that of course far transcends anything their pathetic competitors can muster. The newbies themselves seem to enter into this carnival of cacophonous claims expecting to conquer it all in a few weeks and intending to set up their neurofeedback practice overnight in order to make their fortune and save thousands of souls in the bargain. They have seen the light that we all saw, of course, and it is a powerful call. They sense in a blink from the thin slice of contact the potential here and they all have the "vision."

I notice how few in this crowd are young people; they are mostly older experienced clinicians. Some are gearing up for retirement and hope to continue working for the good of mankind and some spare change to get by now that Uncle Sam's money jar is getting low. They ask a lot of difficult questions. "Why aren't my clients getting better in 15 sessions like they promised?" "I was thinking of getting a caliper to make sure I locate C3 correctly." "I rubbed F3 with Nuprep until there was blood and I still didn't get below 10k on my connection?" "I have been looking at these brain maps for a month and they still don't make complete sense?" "I trained someone with Parkinson's and they seem to be backsliding, what did I do wrong?" "Should I buy better equipment because the last two kids with ADHD got minimal results even though they had a Coke and fries every day to make sure they weren't too hungry and burned out from school and basketball practice?" "I have a background in biology, do you think BCIA will accept me?" "I spent \$16,000 on equipment and I took

the workshop, but I still don't understand how it works, can you help me because I started a new practice and I have 20 brain maps signed up for next week."

Yes, some of this is their fault. If you are a techno-phobe why did you decide to enter a field that is based on computers, amplifiers, and signal processing software? On the other hand, the vendor puffery is often overwhelming as well. The vendors do a workshop or two and the newcomers expect to get it at the first pass. It turns out that it is like drinking from the fire hose and then getting dropped off in the woods somewhere. Some of the newbies say it feels like a bad date. I have spoken with many frustrated clinicians who said "Oh yeah I have that expensive equipment on the shelf; couldn't figure it out so I thought I would buy something simpler and see if I could find a better teacher." It's a little like selling a 16 year-old a plane, providing a couple of lessons, and then sending him or her on their way.

When they contact me for advice, I tell them to start simple, based on your background and resources and work up to the complex. Know that you will probably end up buying several pieces of equipment in the future because only one may not meet your client needs. Take your time and train yourself and a couple of clients and get certified. Spend a year doing it and studying the literature before expecting to get a grasp on the field. Eventually take several workshops from different vendors, but spread them out over time. Develop a good neurofeedback tool box. Those of us who have spent a decade or more in the field easily lose sight of how much there is to absorb and how many more equipment options there are available today.

Next meeting or if you get a call, consider extending a helping hand to one of these unfortunates, as they are the future of our field. Once upon a time you were like them, only it has gotten harder. I personally thought I had entered on the "ground floor" in this field only to find they were still just laying the foundation. There was a lot less to absorb at first back then. I think now we may have finally made it to ground floor and these may be the folks who build the rest of the house. We need their help and we need competent practitioners, which is why I mentor quite a few people. If we don't do it properly then they will do it themselves, maybe in ways that result in unnecessarily repeating problems or creating new ones that only hurt the image of our field in the long run. And remember, in this vastly complex field of neuroscience we are all still students of the brain and newbies in many ways.

Richard Soutar, PhD, BCN

Letter from the ISNR Editor



Dear All,

Welcome to the summer edition of NeuroConnections. Hopefully, more and more people will be aware that they can download the full edition to their computer. Some clinicians have noted that they liked the paper published one so they could have them in the waiting room for clients and potential clients. We are trying out the digital and decisions as to publishing a hard copy will be made by the end of the year.

Okay, this edition started out as a migraine/headache edition and we have the master himself, Jeff Carmen, PhD, giving us the ins and outs of HEG training. If you have never used this device, try it out at the next conference Jeff is showing it or have a colleague who has one give you a couple of sessions. It is amazing how quickly the migraines disappear and how quickly the frontal lobe comes on line. I use it extensively and usually as the first Neurofeedback experience. Then we have Martin Brink, PhD, with his Migraine Revolution book and this article that provides us with even more information to help our clients. We also need to be aware that Z-score training; LENS training; Neurofield training all have over the years stopped migraines and headaches cold. Hopefully, in future editions of NC, clinicians using those devices with enough clients will write up their experiences so we can increase our knowledge base.

Erik Peper has provided us with two articles called Affluenza: Transforming Wisdom into Alzheimer's Disease with Affluent Malnutrition and Immobility and the second called Medication can Reduce Functional Health in Schizophrenia: We Must do Long Term Follow Up. Erik is one of the experts on what we can do with easy training of the blood flow, muscle activities, and sweat gland issues. Do attend his workshops, they are informative and fun. You will not sit for an hour or so and not walk away with more techniques and knowledge. Besides, Eric doesn't let you sit for more than 20 minutes at a time. He then gets you up and jumping or any number of physical activities. A way of training that would be useful if adopted by all presenters as far as I am concerned.

Jamie Moore has given us an article about the clinicians' environment and what we need to think about as we set up our practices. The photos accompanying the article will make you want to go there immediately.

The column Around the World with Neurofeedback covers South America, Canada and Spain. Check it out to see what's happening with neurofeedback in our neigh-

boring countries—and beyond!

We have also included two press releases from the FDA about the approval for marketing of the first device as a preventative treatment for migraine headaches and the first medical device based on brain function to help assess attention-deficit/hyperactivity disorder (ADHD) in children and adolescents. Although the second release came out quite some time ago, we wanted to ensure that our readers were informed.

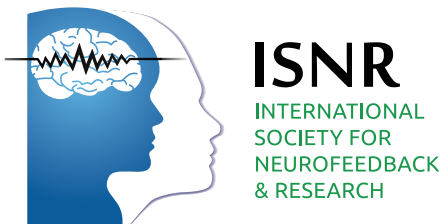
Hope you are having a wonderful summer and see you at the ISNR 22nd Annual Conference this October in San Diego.

*Merlyn Hurd PhD, QEEGD, BCB,
BCN Senior Fellow*

ISNR President continued from page 6

three years, and this will continue in very rapid fashion. I believe this paradigm shift will progress in a dramatic linear fashion, as exposure and results continue to be presented. I am not sure the original founders of ISNR perceived such potential and a rather short burst in the mainstream of psychology and medicine. But here we are, and here we will stay! Change is difficult at times, yet as we evolve so does our need for rigor, congeniality and supporting one another. Individually, we are great scientist-practitioners, collectively—We are ISNR!!—and shall keep moving in the desired direction, learning.

Rex Cannon, PhD



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How to Treat Migraine Headaches with pIR HEG

Jeffrey A. Carmen, PhD



If you are looking for a scholarly article, this isn't it. I will be discussing the “nuts & bolts” of clinical issues using pIR HEG (Passive Infrared Hemoencephalography) to treat migraine headaches. The primary sources of information for diagnosis, instrumentation, and procedures are from me.

For scholarly information, world-class headache research, and a free subscription to Cephalalgia, I strongly recommend that you join the International Headache Society. The International Headache Society (www.ihs-headache.org) is regarded as the ultimate authority for classification of headaches and their subtypes. You can download their classification system without charge. It is currently in the third (beta) revision, but the second revision is the current worldwide standard. This is “the” handbook for people who treat headaches.

In 2004, the Journal of Neurotherapy published my article summarizing the treatment of 100 migraine patients using Passive Infrared Hemoencephalography (pIR HEG). The results were surprisingly impressive. 10 years later, the data still holds, although it is actually better. As the equipment and procedures have evolved the response rate has become faster and in some cases better able to handle more difficult cases. At the same time, side effects have been reduced.

The System:

Disclosure: I designed and manufactured the original headset and all the iterations since then. The headset interfaces with my complete system called the EZPIR system, and it also interfaces with BrainMaster and Pocket Neurobics hardware. I am biased in favor of the hardware, software, and techniques used in my system. As you read this, take that into consideration. There has been evolution of the headset over the years. See the original in figure 1 and the new one in figure 2



Figure 1: original headset



Figure 2: current headset

Both headsets monitor infrared output between 7 and 14 microns. This is identical to the frequency bandpass of long wave infrared cameras. The use of

such a camera has allowed me to monitor prefrontal brain activity before and after training, and as baseline changes over time. The 7 to 14 micron bandpass represents a range of wavelengths that are much longer than visible light. Because of that, visible light in the room has no influence on the signal. Since the signal monitored is photon based not electron based, eye blinks and muscle contractions do not affect the signal. The headset acts just like an infrared camera, but produces an electrical signal rather than an image.

The field of view of the current headset is a rectangle roughly 1.5 inches high by 2 inches wide (3 square inches). The original headset had a center weighted circular field of view of 1.26 inches (1.25 square inches). The current headset has an increase in field of view by a factor of 2.4. The field of view of the current headset is extremely uniform, so that small changes anywhere in the field of view are all given equal weight. The original headset gave higher weighting to the center area, making the effective field of view even less. The original was also larger, heavier, and uncomfortable.

Current users, including myself, report faster and stronger effects with the newer hardware. While this sounds good, with the newer system came software improvements and technique improvements, making it a little difficult to tell where the added benefits come from.

This is all you need to know to run a session (almost): Center the headset on the forehead, just above the eyebrows.

1. Instructions: Let yourself get drawn into the movie. Don't analyze the movie or the software, just let go and enjoy the movie.
2. Click start. The movie will play.
3. After 5 minutes, switch the software from continuous mode to auto threshold mode.
4. At the end of the session, click stop.

Diagnosis:

We need to have some common ground for diagnosing and categorizing migraine headaches. The IHS classification system helps. However it is still not unusual for a patient to present with an inaccurate diagnosis, especially if the diagnosis was made during a short office visit to the primary care physician. Even headache specialists have conflicting orientations. It is not unusual for someone to accumulate multiple, incompatible diagnoses



Figure 3: This is what the screen looks like.

as multiple headache specialists are consulted.

Data Collection to Help with Migraine Diagnosis and Treatment:

Although you should always refer to the IHS handbook, the following guidelines will allow you to develop a working diagnostic hypothesis relatively quickly, until classification can be refined.

- Have the person keep a diary. This is helpful in terms of establishing a baseline that will also serve as a way to evaluate treatment progress. It will also be helpful in establishing the diagnosis. A caveat here is that it is surprisingly difficult to get people to actually keep a diary. Perhaps less surprisingly, diary recordings are not very accurate. Still, you need some sort of baseline, and data from a headache diary is better than no data at all. The diary should at a minimum include the following, although for very complicated headaches you may want to include other variables unique to individual.
- Day, date and time of onset. Except for some chronic headaches, individual headaches tend to have a repeating pattern. The pattern may be deceptive. Time of day may reflect rise and fall of physical or psychological distress patterns, but it may also reflect the length of time since the person last took medication. The date is important because you can go back and review variables such as weather patterns, illness, and menstrual cycle.
- Duration. This can be measured in minutes. If the person is less fortunate, it may be measured in hours, days, weeks, or even months. Migraine headaches may become chronic. Cluster headaches sometimes only last for seconds, which can be a clue for differential diagnosis. This is an important differential diagnosis as the mechanisms are entirely different.
- Day, date, and time that the headache ends (chronic headaches may vary in intensity but may not end). Clue: migraine headaches will sometimes end when the person becomes engaged in a relaxed but single pointed focus, which is the essence of the pIR HEG mechanism. A headache that goes away while a person is playing chess is suspicious for migraine, perhaps less suspicious for tension-type headache, and much less likely to be from physical pathological conditions.
- Pain levels before, during, and after the headache. Although the 11-point pain scale (0 to 10) is too finely graduated to precisely discriminate pain, people are generally comfortable with that scale and it is commonly employed. It makes intuitive sense to most people. A smaller number of points on a pain scale increases reliability and validity, but loses sensitivity. It is a trade-off. Sometimes the nature of the pain scale needs to be adjusted to the ability of the patient to comprehend the scaling task. Smiley/Frowning faces work well with young

children. The simplest scale has only 2 points: “Do you have a headache right now?”

Pain itself is very subjective. It can be more accurate to evaluate the degree to which the headache interferes with activities, although it will usually be different for activities the person likes as opposed to dislikes. Pain measurement is further complicated by an automatic recalibration of the pain scale. For example, as migraine management improves, the headaches hurt less. There is a natural tendency for the person to recalibrate the pain levels. What used to rank as 5 out of 10 may be moved up to 8 out of 10. This is when it is necessary to ask about how much it interferes with activities.

- Mechanisms the patient uses for headache relief. It is possible that the single most common headache is a kind of drug withdrawal from the drug(s) used to relieve the headache in the first place. I call these “contaminated” headaches. They used to be cleaner diagnostically, but once medications become involved on a regular basis, diagnosis becomes less precise. Acetaminophen, ibuprofen, and other OTC painkillers are major offenders. Since they are available without a prescription, many people don’t consider them drugs. In addition, these medications are used for many other conditions. The brain cannot tell why the medication is being used. It may produce rebound headaches from medication withdrawal, even when the medication is used for some other symptom or condition.
- Prescription medications, OTC medications, herbal remedies, vitamins, minerals, other supplements, food, and drink all need to be tracked for response patterns.

Some Questions to Ask a New Migraine Patient:

1. What year did the headaches begin?
2. How old were you when they started?
3. Did they relate in time with any physical event such as start of menstruation?
4. Did they relate in time with any psychological trauma?
5. What do you do to make them go away?
6. Do you have genetically-related relatives who have been diagnosed with migraines? Note: although there is a high familial incidence for most migraines, the connection with Familial Hemiplegic Migraines is very strong. Multiple genes for this specific disorder have been isolated.
7. How old were the relatives when their migraines began?
8. How old were the relatives when their migraines became less troublesome?

Clarifying the migraine diagnosis: clinical insights

Why do people have migraines? There have been many speculations. My own theory is that migraines represented an evolutionary survival benefit as a storm warning system. Most people with migraines can sense a large storm approaching. In a primitive society this could be very useful. Now, they are inconvenient. From this evolutionary perspective, some people have inherited this beneficial trait, and their brains “think” it is important to generate high quality migraine headaches. What appears to happen with pIR HEG sessions is that it becomes more difficult for the brain to generate high quality migraines. They don’t last as long or hurt as much.

Migraine headaches represent a paroxysmal neurological event. They involve a complex inter-relationship between the trigeminal nerve, the brainstem, the cerebrovascular system, and psychological stress responses. Also involved in the process are complex responses to external variables, such as barometric pressure, and internal variables, such as changing hormone states.

There is one variable that is clearly diagnostic of migraine. That variable involves the relatively rapid reduction in psychological stress. If a headache hits at the end of a long hard day or the end of a long hard week, it is almost certainly migraine. People often wrongly self diagnose these as a tension headache. This may also apply to headaches that hit hard the morning after a stressful day or week, or the first day of a vacation. When this pattern presents itself, it is a good sign because it means the mechanism is likely migraine and that it is relatively uncontaminated with medication effects. Caveat: a headache that comes at the end of the day may also be a withdrawal from a morning medication. If that is the case, the headache will typically appear at the same time on weekends, assuming the medication is also taken on weekends. ADHD stimulants very commonly produce this response.

Migraines occur in from one to four major stages. The main one that gets the attention of the migraineur is the headache. Sometimes this is preceded by an aura which can represent a negative or positive symptom involving any brain mechanism. More people have auras than are recorded, because they can represent silent brain functions such as subtle perceptual distortions. Some people only have an aura but don’t get a headache. There can also be a long prodrome stage before the aura and/or headache in which the brain progressively functions less efficiently. It can last weeks. I have found that this can account for “learning disabilities” in children who are actually not learning disabled. It should be considered for children whose learning difficulties get progressively worse up to the day they get a big headache, but improve the day after the headache. This is also sometimes seen as a progressive emotional irritability that ends with the aura or headache. Sometimes, there is also an additional stage after the headache that leaves the person mentally fuzzy.

Inflammatory headaches are related to migraine headaches only because the symptoms are similar. They feel like migraine headaches, in that they are very painful and often described as pounding. However, they are caused by inflammatory diseases. The mechanism is thought to be linked to an inflammation of blood vessels, although alteration of pain sensitivity may also play a role. These headaches are non-responsive to brain-based biofeedback treatments, and do not trigger with sudden stress reduction. People diagnosed with Systemic Lupus Erythematosus often have these headaches. They are common in other inflammatory diseases as well. It is very common for people with inflammatory diseases to have both inflammatory headaches and migraine headaches. The migraines will respond to biofeedback/neurofeedback. The inflammatory headaches will not. This helps with differential diagnosis; pIR HEG can be especially useful in this differential diagnosis.

Sinus pain can also be misinterpreted as migraine, although interestingly, most sinus pain actually is migraine pain rather than sinus. In addition, sinusitis can help generate a migraine headache by irritating the trigeminal nerve.

Tension-type headaches represent mechanisms that are unclear. It was once thought that they were caused by muscle tension. It is now known that muscle tension is not the cause, although there may be some increase in muscle tension in response to the pain. Head pain that rises with psychological distress and fades when the psychological distress fades is likely a tension-type headache. Tension-type headaches tend to rise in pain as a stressful day progresses, then fade at the end of the day.

Cluster headaches can be confused with migraine headaches. These hit very hard for very short durations, affect only one side of the face, and are included in the IHS Trigeminal Autonomic Cephalalgia category. The pain is so intense that cluster headaches actually account for a significant number of suicides. The suicides are not from depression but from pain that is so horrible that death can seem like the only solution. Although migraine sufferers often rank their pain at 10 on a 0-10 point scale, a cluster headache sufferer will often rank the pain at 100 or 1000 on a 0 to 10 point scale. There is no good way to describe the pain intensity during a cluster headache. There are lots of treatments for cluster headaches, but it is difficult to evaluate the efficacy because typically they don't last long and come very infrequently.

Based on time-of-day and psychological variables, if a headache rises slowly throughout the day and subsides at the end of the day, it is likely a tension-type headache. If the head pain doesn't start until the end of the day when the person comes home from work or school, it is likely migraine.

Headaches that rise somewhat and fall somewhat in terms of pain, but never quite

go away may also represent a purely physiological response to an abnormal mechanism such as abnormal cerebrospinal fluid pressure. With these headaches pain tends to be influenced by body position.

Behavioral treatments such as biofeedback (peripheral thermal, EMG, EEG neurofeedback, and HEG neurofeedback) can be effective for migraine headaches. Although conventional wisdom among biofeedback/neurofeedback practitioners suggests that “tension” headaches are easier to treat, that has not been my experience. Tension headaches (more correctly defined as “tension-type” headaches by the IHS classification system), are very complicated. Once they establish themselves as being somewhat constant, they tend to correlate with emotional distress. After a while, it often appears that they become a perceptual representation of the emotional distress. In this respect they may share some mechanisms with phantom limb pain. I have found that people with these headaches need a great deal of psychological intervention.

Caveat: relaxation therapy with or without the assistance of a feedback device has long been an accepted means of treating both migraine and tension-type headaches. I used to use that in my practice but abandoned it because some people unconsciously rely on a level of psychological tension as a defense mechanism. When they become too relaxed it can produce a rebound state of panic. In addition, relaxation therapy does not increase the smooth inhibition seen when the prefrontal cortex is trained for increased dominance.

pIR HEG treatment variables for migraine headache

In this section I will cover highly specific variables associated with pIR HEG. It mostly reflects my own thinking as it has evolved over the last 15 years. The nuances of the changes have been based on thousands of patient contact hours, and the analysis of 30,000 infrared images. The current EZPIR software, which reflects my present thinking, can be utilized with Pocket-Neurobics and BrainMaster systems.

The pIR HEG signal increases with the intensity of concentration. However, in order for the signal to increase, the person must be completely relaxed. It is intuitive to want to train the person to increase the signal during the session. This is consistent with the way most peripheral thermal training and some of EEG training is done. I originally worked in this manner. It is effective; however, it is no longer the way I work with migraines, for the following reasons: Working that way produces rapid frontal fatigue and often, frontal discomfort. Setting that aside, it is not as effective as a different orientation.

What I do now is train for a specific form of signal variability. The system requires watching a movie as a primary aspect of the process. The movie should be selected

to resonate with the emotions of the person being trained. This tends to be specific to each person and is not easy to generalize. The purpose of the movie is not to reinforce a particular mental state. The purpose is to activate the emotions sufficiently to reduce prefrontal activity. The relationship between the prefrontal cortex and the emotions is reciprocal. When one activates, the other quiets down. A strong emotional response quiets down the prefrontal cortex, followed by a pIR signal drop. The time lag is less than 2 seconds. When that happens, the movie pauses. At that point, the person must quiet the emotional response and simultaneously focus on a bar-graph to turn the movie back on.

Once the movie turns back on, the instructions are to “allow yourself to get drawn back into the movie”. This is a passive process. The prefrontal cortex once again starts to quiet down. As the signal drops and gets closer to the threshold, any strong emotion evoked by the movie will cause the movie to pause. Because disturbing emotions trigger a pause very rapidly, the brain is punished for having such a powerful response.

This process produces a series of event cycles represented by the movie pausing and then restarting. From a psychological perspective, the person goes through cycles of passive, strong emotions, followed by active focus with relaxed emotions. It is impossible to precisely know what this does inside the brain, because in reality, none of our measures are that good; however, from a perspective based on what we believe we know about brain function, it does require the brain to alternate between two incompatible brain states, producing a forced increase in flexibility. I now see this as very important, and this function was lacking in the original procedure of trying to maximize session gain. Since many psychological diagnoses are based on inflexible responses to stimuli, this forced flexibility has the potential to improve psychological function beyond migraine. In practice, this is exactly what is seen. The person’s psychological responses become more flexible. In addition, responses characterized by excessive rate and magnitude to relatively benign stimuli tend to normalize. One hypothesis that may make sense is that the process alternately engages the Default Mode Network and the Salience Network. There are currently some folks with access to an fMRI who would like to study this.

Another part of the process involves the mental effort required to turn the movie back on. The amount of effort required is very significant, and measurable. In fact, the measurement of this variable appears to be the single most significant metric in the whole process. Note: one of the least significant metrics is total session signal gain!

The software automatically measures the total elapsed time for the session, and separately measures something I call pause time. The pause time is the cumulative amount of time during the session that the person spends working to turn the movie

back on. This is the most important metric in the entire process.

[Here are some of the ways to view the pause time metric.](#)

1. People who have never used the system, and have been functioning in a non-dominant prefrontal cortical state, may show signs of frontal fatigue within only 2 or 3 minutes of pause time. Fatigue is observed by perceived struggling along with increased time needed to turn the movie back on. When that happens, it is time to stop the session. Exceeding that point will generally create a state of disinhibition. When fatigued, children tend to become more hyperactive and less self-controlled. Migraine patients may get a migraine later that day. After a good night's sleep, functioning is generally better than baseline.

Excessive fatigue during the session will produce an infrared image that has a central spot that may be darker than baseline. The image to the left in



Figure 4: Baseline image (left) after 7 minutes of pause time (right)

figure 4 is an example of somewhat reduced pre-frontal cortical activity. It isn't normal, but it isn't horrible. The image on the right was captured after the session ran with only seven minutes of pause time. I should have stopped the session sooner, be-

cause mild frontal discomfort was being reported, but the person wanted to continue. The darkening of the center of the image captured at the end of the session represents reduced pre-frontal cortical activity, and correlates positively with fatigue.



Figure 5: This is the color code for the infrared camera. Infrared has no color, so the color is injected by the computer. The industry standard term for it is "false color".

2. As sessions progress, the ability to handle increasing amounts of pause time improves. Over time, it will work up towards 20 minutes. Eventually the person may be able to handle even longer times. This increase over time correlates positively with improved symptom control. In migraine terms, it seems like fewer migraines. In fact it is not. The migraines remain at the same frequency and trigger from the same events. However the pain reduces to the point at which they become difficult to identify as migraine, and often difficult to identify at all.

Summary:

pIR HEG is a simple-to-use but very powerful technique for coaxing the prefrontal

cortex into a dominant status. When dominant, smooth, global inhibition of the brain takes place. In this state, responses to stimuli are slower and smoother. It is also more difficult for the brain to generate high quality migraines.

About the author: *Jeffrey A. Carmen, PhD is a licensed psychologist from Manlius, NY. His practice includes biofeedback, behavior therapy, and psychotherapy. He treats clients who suffer from migraines, tension headaches, pain disorders, and impulse control disorders as well as teaching stress management for chronic diseases. Author's note: Below, I have listed some material that makes interesting reading related to this article. Beyond that, I am available for questions on anything covered here.*

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- www.ihs-headache.org (This is the website for the International Headache Society. You can download the IHS diagnostic manual free. For a small membership fee you can also get online versions of Cephalalgia and search back issues.)
- www.stopmymigraine.com (This is my website. It contains a lot of information that frequently changes. All that information can be downloaded from the public section of the site. It is also the support site for users of the EZPIR system for downloading software upgrades. This is can only be accessed by special permission.)
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Comment on Using EEG in Diagnosis of ADHD Guideline

The AAN requests your feedback on the Academy's new draft guideline "Evidence-based Practice Advisory: The Utility of EEG Theta/Beta Power Ratio in the Diagnosis of ADHD" between July 18 and August 18, 2014.

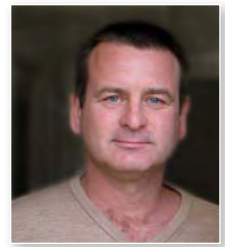
The draft guideline concludes that it is highly likely that EEG theta/beta power ratio and EEG frontal beta power correctly identify patients with ADHD. The advisory recommends that the combination of theta/beta ratio and frontal beta power should not be used in place of a standard clinical evaluation, because of the risks of misdiagnosis of 6 percent to 15 percent of patients when using the theta/beta ratio.

For more information: <https://www.aan.com/Guidelines/Home/PublicComments>

What Neurotherapists Should Know about Migraine:

A Biased, Angled, and Opinionated Overview for Clinicians

Martin Brink, MSc, BCN



Melissa (left photo) was 22 when she decided to kill herself. She had suffered from debilitating migraine attacks since she was 15 and had undergone every medical examination and therapy that she was given by a dozen neurologists, headache experts and pain specialists. At the age of 19, and after another MRI, the doctor at the Mayo Clinic told Melissa, “You have daily chronic migraines, learn to live with it.” After that, she reported, doctors refused to see her, “They had given up on me.” Melissa couldn’t attend college or get a job and instead lived in a dark, quiet room until she couldn’t take it anymore.¹

Samantha, on the right, saw me for her episodic migraines which developed after having her second child six years ago and which rendered her useless for three days about two to three times each month.

After the first session (qEEG and LENS map) Sam didn’t have another attack. After eight sessions of bio- and neurofeedback, we couldn’t find anything to work on anymore. Today, eight months later, she is still completely symptom-free.



Figure 1: Melissa & Samantha

There is one migraine-related detail that both women had in common, Melissa explained, “When I have a migraine, I will throw up around 50 times. I don’t get headaches and I wish more people could understand how bad migraines are...”

The sword of Damocles

The Roman philosopher Cicero summarized Damocles’ disappointing stint on the throne of Syracuse—due to a sword dangling over his head, “Does not Dionysius seem to have made it sufficiently clear that there can be nothing happy for the person over whom some fear always looms?”

Migraineurs’ experience reflects the devastating impact of an uncertain, ever-present threat on overall happiness. And so they complain about:

- Struggling in a life stamped with uncertainty, being in a state of constant

¹ “Still searching to get my life back” forum post by melissadwyer-13 on migraine.com/stories, posted on May 12th, 2011, accessed on Feb 25, 2014

readiness, worrying about the use of medication.

- Feeling besieged by attacks, temporarily incapacitated, and isolated from life.
- Living with the fear of not being believed, of being doubted and marginalized, of being seen as drug-seekers and malingerers, of being brushed off with the phrase, “It’s just a headache.”

Migraine patients would certainly agree with Cicero, as they are led to believe that they are “obliged to endure a life accompanied by an unpredictable and invisible disorder.”² This imposed obligation makes suicide look like a reasonable alternative in severe cases.³

What are patients told about migraine?

The true mastery of sales, marketing, and PR professionals is the manipulation of their customers’ thoughts and behaviors with seemingly innocuous words. It is a stroke of genius to frame the problem of migraine as a mere symptom by calling the so-called “headache phase” of an attack “a migraine.” That way, patients are led to believe that their “migraine headaches” are already the root of the problem; and so the only apparent way to “migraine relief” is the purchase and consumption of “migraine medication.”

To strengthen the aforementioned *obligation*, patients earn the label chronic migraine once they have more days with headaches than without, and chronic means “undoubtedly life-long migraines” to them. How’s that for a customer loyalty program?

Like epilepsy, migraine is the name for a disorder with episodes. In epilepsy, they’re called seizures or fits, in migraine, attacks. The expression “suffering from migraines” is like saying “having epilepsies,” and “a migraine” is like “an epilepsy.” Period.

“A migraine is a kind of headache”

Head pain is a frequent attack symptom (85%), but so are neck pain and nausea.⁴

No single symptom is always present during attacks. In any case, a symptom **is not** a condition or a diagnosis. Imagine if doctors had the audacity to tell patients, “Pneumonia is a kind of cough.” And then prescribe cough syrup only and not treat the lung infection. Unthinkable? Well, that’s what they do with migraine.

“Migraine is genetic” or “inherited”

Patients understand genetic as predetermined and inescapable. The truth is that health conditions usually have certain prerequisites. For example, you could say that women are genetically protected from prostate cancer, whereas men are pre-

2 Rutberg S et al. “Migraine—more than a headache: women’s experiences of living with migraine” *Disabil Rehabil* 2012;34(4):329-36

3 Breslau N et al. “Migraine headaches and suicide attempt” *Headache* 2012 May;52(5):723-31

4 Calhoun AH et al. “The prevalence of neck pain in migraine” *Headache* 2010 Sep;50(8):1273-7

disposed for it. The same holds true for migraine; some people are genetically protected, others have inherited the predisposition or “talent.” From twin studies, it can be estimated that more than half of the people with a talent for migraine, never have an attack in their lives.⁵ The “inheritability” of migraine hovers around 45%. Much more “genetic” is obesity, with an inheritability of 65%; and yet, we are instructed to exercise and watch our diet.

“Migraine headaches are caused by swelling and inflammation of blood vessels in your head”

In 1873, the English doctor Edward Liveing concluded that a migraine attack must be a an electrical storm in the brain, given the enormous variety of possible symptoms:

- unilateral or bilateral or no head pain
- dizziness, vertigo, nausea, vomiting
- polyuria, diarrhea or constipation
- photophobia, phonophobia, osmophobia (intolerance to light, noise, odors)
- neck pain, hyperalgesia, allodynia
- hot or cold flashes, stuffed or runny nose, teary eyes
- problems with speech, word finding and/or language comprehension, mental confusion
- any emotional turmoil up to panic attacks
- clumsiness, but also hemiparesis or cortical blindness

One attack symptom is rarely discussed, but it might be the most common one: The distinct feeling of being ill. It is hard to fathom how all these symptoms could possibly be caused by a blood vessel dilemma. Of course, people’s imagination improves greatly when they’re being paid by Big Pharma.

“The throbbing of the migraine headache is caused by the relentless pulse pounding the walls of the dilated and inflamed blood vessels”

In those who do experience a throbbing headache, heartbeat and pulse didn’t match the thumping.⁶ Instead, variations in Alpha Power corresponded with the clobbering.⁷

“Identify and avoid your migraine triggers!”

In this day and age, it is expected that substantial treatment advice is based on scientific evidence. It is therefore surprising to find that:

- There aren’t any multiple double-blind, randomized, placebo-controlled clinical trials showing the effectiveness of trigger avoidance as adjunctive therapy

5 Mulder E. J. et al. “Genetic and environmental influences on migraine: a twin study across six countries” *Twin Res.* 2003;6(5):422-31

6 Ahn AH “On the temporal relationship between throbbing migraine pain and arterial pulse” *Headache* 2010;50:1507-1510

7 Mo J. et al. “Does throbbing pain have a brain signature?” *Pain* 2013 Jul;154(7):1150-5

for migraine. I'm struggling to imagine an appropriate study design (group 1 blindly avoids placebos?).

- There is no other scientific evidence supporting the usefulness of encouraging avoidance behaviors in patients whose personality already leans towards harm avoidance and obsessiveness.
- There isn't even any evidence that migraine attacks are typically triggered, a term that implies an immediate reaction akin to that of a peanut allergy.
- There is not even a serious hypothesis as to how the various "migraine triggers" are supposed to elicit the complex process of a migraine attack with prodrome, possible aura symptoms, as well as the myriad of symptoms during the headache phase.

Of course, there are surveys as to what migraineurs blame in hindsight, after being told that migraine attacks are caused by triggers.⁸

Astoundingly, even experts accept the absurd idea that menstruation was a frequent migraine trigger, because many women report particularly severe attacks around the time of their period. Yet, many women also suffer from premenstrual mood swings without declaring mood swings to be their period trigger.

Other alleged migraine triggers lose their malicious magic when tested versus placebo in provocation studies: "Placebo produced as severe headache as tyramine and in an even larger number of patients." The interesting question is, why did placebo elicit headaches in migraineurs at all?

Similarly erratic was the result of a study testing real chocolate versus fake chocolate (carob) in pre-selected, highly chocolate-sensitive migraine subjects. After 80 samples were consumed, only 2 out of 15 subjects reported headaches after real, but not after fake chocolate, a bit less than random chance. Please note, they reported headaches, not migraine attacks.

A safe sign for the suspicion that identifying migraine triggers is a bad idea for patients, is the fact that pharma companies distribute free Smartphone apps for it.⁹

"Talk to a Headache Specialist!"

Like all of us, migraine patients find a lot of info on the internet. For migraineurs, a trusted source of knowledge are so-called patient advocates, highly chronic migraine sufferers themselves, who spread their treatment insights and medical beliefs on websites and social media with the help of medical marketing media PR companies.

8 <https://migraine.com/migraine-basics/>, accessed on Feb 26, 2014

9 <https://www.excedrin.com/migraine-center.shtml>, accessed on Feb 26, 2014

As an example, Migraine.com, a so-called unbranded patient education platform—is run by marketing professionals from pharma giant GlaxoSmithKline.¹⁰

On such unbranded patient education platforms,¹¹ in blog posts, articles, podcasts and books, but also in support forums, these patient advocates teach other migraine patients what they need to know in order to live well with migraine disease. The advice often ends with, “Talk to your doctor!” Isn’t that the phrase they use in drug commercials too? I wonder why.

Particularly popular in migraine support groups is the noble cause of raising public awareness that a migraine is not just a headache, which ironically focuses the attention on the headache phase of the migraine cycle. In medical marketing “raising awareness” is code for customer acquisition.

A breeding ground for chronic migraine

It is puzzling and almost unfathomable that despite the intense health education by the pharmaceutical/medical industry, encouraging the intake of sufficient migraine medication, US patients with episodic migraine have a 10-20 times higher risk of progressing to chronic migraine, compared to German sufferers.

In Germany, migraine is seen as a sensory processing disorder, and official medication guidelines at least mention aerobic exercise and cognitive behavioral therapy (CBT) as first line interventions; difficult patients are caught by a nationwide interdisciplinary network and intractable

cases are sent to rehab clinics for multi-modal and multi-disciplinary rehabilitation.¹²

On the other hand, it would be wrong not to acknowledge the success of the migraine industry; market experts predict that within 10 years, migraine drug sales will almost double in industrialized countries.¹³



Figure 3

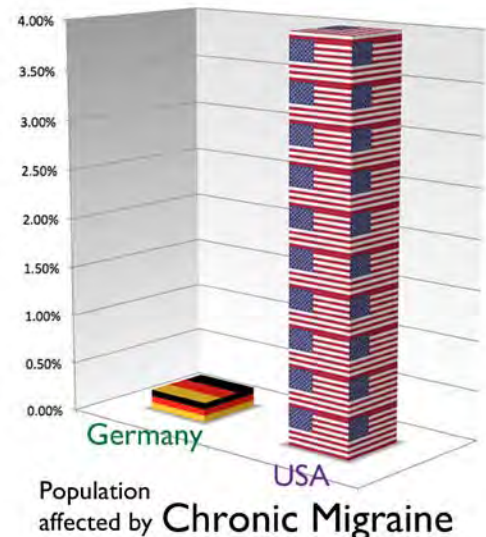


Figure 2: German vs. US population affected by chronic migraine..

10 <http://health-union.com/hu-team.html>, accessed on Feb 26, 2014

11 <http://social.eyeforpharma.com/marketing/how-get-marketing-through-unbranded-websites-right>, accessed on Feb 28, 2014

12 Göbel H. et al. [Development and implementation of integrated health care in pain medicine : the nationwide German headache treatment network] [Article in German]Schmerz 2009 Dec;23(6):653-70

13 REUTERS“The Migraine Drug Market Will Increase from \$3.3 Billion in 2011 to \$5.8 Billion in 2021 in the United States, France, Germany, Italy, Spain, the United Kingdom and Japan” Nov 15, 2012

“Migraine is a real neurological disease, not psychological or all in your head.”

The Cartesian dualism of body and mind is convenient for those health professions who either talk or medicate. It is up to us who apply the wisdom of brain science to finalize the model and turn it into a wholesome trinity:



Figure 4

That might help to reassign the humiliating and stigmatizing label “mental illness” now correctly to greed, racism, intolerance, fascism, fanaticism, arrogance, indifference, and the like.

Migraineurs feel indeed the need to point out that their symptoms are real and not a figment of a sick mind. Therefore, the desire to consult a mental health-professional is understandably low.

On the other hand, when confronted with the label functional brain disorder, a passionate chronic migraineur may still fly off the handle and protest “It’s NOT all in my head! The pain is REAL!”

“There is no cure for migraine”



Figure 5

The seemingly innocent use of medical terminology once again defines the limits for affected patients; “cure” insinuates the successful medical treatment of a disease. Of course, there is no “cure” for migraine, as it is clearly not an infectious disease, but a functional brain disorder—and disorders need a comprehensive rehabilitation of the things that are not in order.

Whilst there are some who believe that the creation of a diagnostic and statistical manual would at least turn “mental disorders” into “medical” conditions, research leaves no doubt that disorders are

first and foremost expressions of the human condition.

This Norwegian study (figure 6) with more than 3000 subjects found a strong and almost linear relationship between the number of painful body sites and the number of other symptoms. That indicates that either or both numbers are essentially expressing an underlying distress, rather than distinctly different illness entities.¹⁴

14 Tschudi-Madsen H. et al. “A strong association between non-musculoskeletal symptoms and musculoskeletal pain symptoms: results from a population study” BMC Musculoskelet Disord 2011;12:285

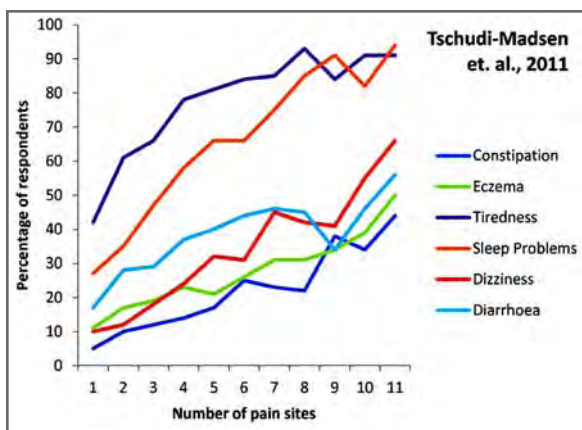


Figure 6

The same principle can be observed in migraine, where countless interictal symptoms with increasing intensity are labeled comorbidities. They reach from problems with mood regulation, memory, and concentration to gastrointestinal troubles, tics, epileptic seizures, and chronic pain to metabolic and cardiovascular disorders. In short, any functional disorder is more likely in migraineurs.

It is a bit as if migraineurs were lacking overall resilience or “fitness for life” which would be consistent with insecure attachment and early life stress.¹⁵ Amongst chronic migraineurs in specialized headache clinics, almost 60% reported some form of childhood maltreatment (emotional or physical neglect or abuse)¹⁶ which is a risk factor for the progression to chronic migraine¹⁷. Understandably, many believe that the world is a hostile place for migraineurs—a maladaptive schema of special vulnerability, reinforced by medical authority figures.¹⁸

Neurofeedback for Recurrent Migraine Headaches

As part of a comprehensive rehabilitation, neurotherapy is an essential modality to achieve the cessation of attacks and a reduction of other functional problems. However, we do not provide treatments for symptoms, but therapy of the underlying dysfunction, dysregulation, or disorder.

That works reasonably well, as Dr. Jonathan Walker demonstrated, with qEEG-guided neurofeedback training (excess HiBeta down).

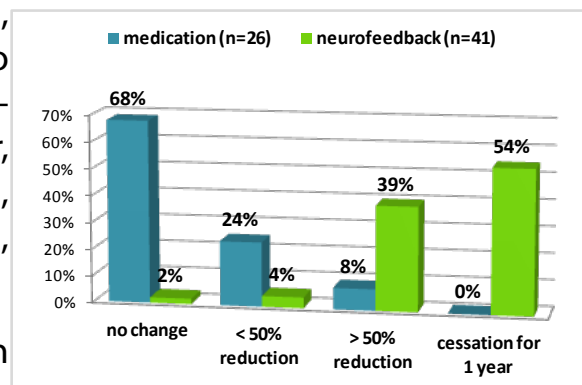


Figure 7

More than 90% of the study group at least halved their attack rate, which beats every medical treatment by a mile and hands down.¹⁹

Also, more than half of Dr. Walker’s patients stopped having attacks altogether; pretty good for an incurable, genetic disease.

15 Post R. M. et al. “Shared mechanisms in affective illness, epilepsy, and migraine” *Neurology* 1994;44(10 Suppl7):S37-47

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However, for 46%, even the 24 sessions (on average) of EEG neurofeedback therapy was not enough to turn them into ex-migraineurs. If you ask me, that says less about the chosen training and more about the medical mind-set of the study design which used neurotherapy like a prescription medication as treatment to eliminate the suspected migraine “bug” (here, excess HiBeta).

Why hot heads are cool, calm and collected

The neurophysiology of migraine is rather complicated,²⁰ and yet, even the most advanced fMRI studies cannot compete with the elegance and face validity of Dr. Jeff Carmen’s thermal images showing underactive areas of the prefrontal cortex (PFC) as ominously dark flecks.²¹

The precise details of the “electrical storm” that we call migraine attack are still under fierce debate. For now, let’s say the PFC seems to lose its inhibitory grip on limbic system and brainstem,²² resulting in:

- Mayhem in the brainstem²³ (keyword migraine generator network) and
- Chaos in the cortex (keyword cortical spreading depression).²⁴

The deceptively simple tool to strengthen the PFC in its daily battle against the whining of the limbic system and the defensiveness of the brainstem is Dr. Carmen’s infrared neurofeedback or passive Infrared Hemoencephalography (pIR HEG).

These thermal images show a 74 year-old lady before session one and before session six, down from 15 severe migraine attacks per month to about one or two. Well, it’s a start.

Carmen reported that 95% of the compliant clients of his famous 100 consecutive cases ended up pretty much migraine free.²⁵

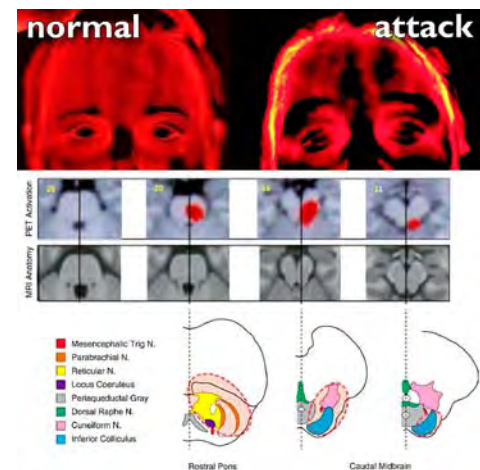


Figure 8



Figure 9

20 de Tommaso M. et al. “Altered processing of sensory stimuli in patients with migraine” *Nat Rev Neurol* 2014 Feb 18

21 Thermal images courtesy of Dr. Jeffrey Carmen, stopmymigraine.com

22 Stankewitz A et al. “Increased limbic and brainstem activity during migraine attacks following olfactory stimulation” *Neurology* 2011;77(5):476-82

23 Borsook D et al. “The enigma of the dorsolateral pons as a migraine generator” *Cephalalgia* 2012 Aug;32(11):803-12 Free PMC article: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3711518/>

24 Eickhoff M. et al. “Spreading depression triggers ictal activity in partially disinhibited neuronal tissues” *Exp Neurol* 2014 Mar;253:1-15

25 Carmen J. “Passive Infrared Hemoencephalography: Four Years and 100 Migraines” *J Neurotherapy* 2004;8(3):23-51

The Rehabilitation of a Chronic Migraineur

Her concerned pharmacist gave Mariette his copy of my book *The Migraine Revolution*. After reading it from cover to cover, she saw me for her chronic migraine (with two attacks per week and daily headaches). Being a nurse, Mariette (age 59) had tried lots of medications over the years. Apparently, it all started after a concussion.

Mariette's QEEG—here eyes open referenced to linked ears—showed Beta excess and many connectivity abnormalities. Her LENS maps almost look volatile, with high dominant frequencies all over.

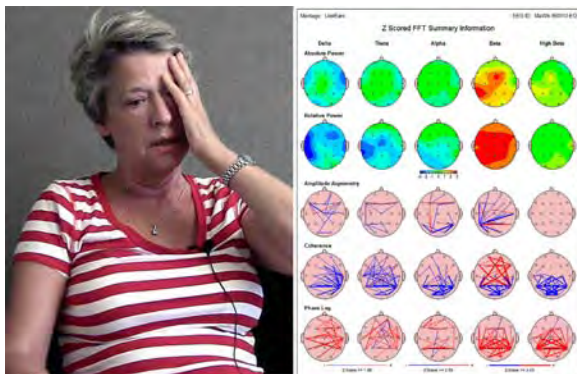


Figure 10: Mariette

Brain:

Mariette saw us for a total of 14 neurotherapy sessions. In 10 of them, I used LENS and pIR HEG; in three sessions I targeted her tinnitus with Cygnet ILF training and one session was used to teach her slow abdominal breathing and a lecture about the role of CO₂.

Body:

Mariette didn't need any treatment for muscular trigger points, but the blood test panel revealed low levels of progesterone. We advised her on bio-identical supplementation with custom-compounded vaginal suppositories which she started after session 13. A hair trace mineral analysis was recommended, yet did not happen.

Mind:

Mariette didn't bring up any topics and didn't ask for any psychological coaching. As a reader of my book, she was aware of her own behavioral traps and could laugh about them.

During the eight weeks of her rehabilitation, her attacks and her daily headache gradually decreased in intensity and frequency and she decided to throw out any migraine-related medication before she went on a sailing trip around Australia.

A video showing Mariette before and after her transformation can be found on the website TheMigraineRevolution.com under "Videos" and is called "How to become an Ex-Migraineur."

Mariette didn't have the time for a post-rehabilitation qEEG. Instead, I'm presenting Edward, who spent 60 of his 71 years with chronic migraine. His chronic daily headache is constant, 24/7, day-and-night since 1982, despite medication.

The picture shows the impact of a single LORETA Z-score session. Edward is again responsive to medication and currently has about five pain-free days per week on meds.

Edward needs more sessions, a hormone panel and a hair trace mineral analysis, but he doesn't regret that he surrendered his gun last year, when he was miserable enough to consider using it on himself.

Epilogue

Three times as many people are affected by migraine as compared to ADD/ADHD. As part of a comprehensive rehabilitation, neurofeedback-based therapy can change or even save lives. However, the neurotherapy community needs to start thinking about public relations and marketing to inform affected patients of this reasonable alternative to the medical migraine madness.

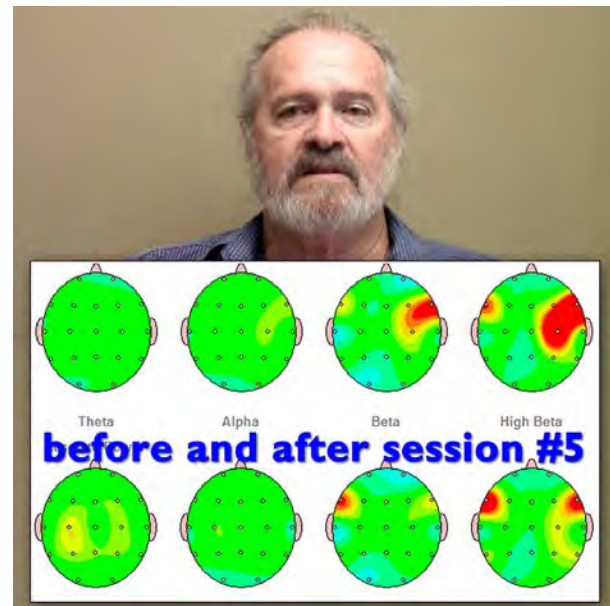


Figure 11: Edward

(How about an unbranded patient education forum where neurotherapists can post their clients' success stories? An attack-free cluster patient would be interesting for patients all over the world.)

Otherwise, we face the risk of being annihilated by Big Pharma and the industry for passive neuromodulation devices.²⁶ Professional modesty, excessive political-correctness, and scientific excellence are blunt weapons in competition with a ruthless industry, which, hypothetically speaking, could probably get away with murder.

About the Author: Martin Brink, MSc, BCN, is the author of *The Migraine Revolution: We Can End the Tyranny!* and the website *TheMigraineRevolution.com*.

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Medication Can Reduce Functional Health continued from page 38

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Affluenza: Transforming Wisdom into Alzheimer's Disease with Affluent Malnutrition and Immobility

Erik Peper, PhD, BCB



Wise elders, grandparents, or statesmen have been the traditional roles for aging adults. Older people are revered as the repository and sources of wisdom in many traditional cultures. Presently, the development of aging into wisdom is being overshadowed by the specter of Alzheimer's disease. Wisdom transforming into Alzheimer's disease does not compute. Why is it that slightly more than a century after it was first described by the neuropathologist [Alois Alzheimer](#), the fear of contracting Alzheimer's disease with the concurrent loss of cognitive and body functions is becoming a possibility? How could this have occurred?

Today more people are living to older ages; however, in traditional cultures some people also lived to very old age (the major increase in present day longevity is due to the elimination of infant and maternal mortality and medical treatment to survive trauma).

Is it possible that the prevention of Alzheimer's will not be found in pharmaceutical treatment but in promoting an organic food diet and movement? The research data is starting to find that our lifestyle patterns are risk factors for Alzheimer's. Changing lifestyle factors is a more promising treatment approach than drugs. A significant risk factor may be the confluence of a sedentary lifestyle and affluent malnutrition. Researchers are even reporting that the buildup of the beta amyloid plaques in the brain of people with Alzheimer's disease is not the result of aging, but the body's attempt to cope with the influx of environmental and dietary poisons or decreases in essential foods or body activities.

Risk: Sedentary Lifestyle—Too Little Exercise

Over the last hundred years—and rapidly accelerated in the last 30 years—we have transformed work into sitting. By sitting in front of a computer screen, we have created a new disease: immobilization syndrome. Lack of exercise is recognized as a major factor in numerous illnesses, such as cardiovascular disease, obesity, and diabetes. Movement in many different forms reduces the risk of illness. Older people who exercise have a significant reduction in the risk of developing Alzheimer's ([Larson, 2006](#); [Radak et al, 2010](#)).

The regular movement lowers the risk. Even though the research is overwhelming

that movement and exercise are required for health, there is a disconnect with the medical and educational system. Insurances will pay for treatment; however, they usually will not pay for preventive exercise. At the same time, physical education in schools is reduced or eliminated to reduce litigation risk (an injured child on the playground may sue the school). Instead of playing and moving outdoors children now spend most of their time in front of a screen while exercising their thumb and index fingers.

Risk: Affluent Malnutrition—Too Much Sugar & Simple Carbohydrates

Affluent malnutrition appears to be another risk factor. The newest understanding suggests that the beta amyloids plaques as the marker for Alzheimer's in the brain is a protective response to the modulating insulin levels triggered by affluent malnutrition and sedentary lifestyle. This disease has been labeled as type 3 diabetes by Associate Professor Suzanne de la Monte at Brown University (Steen et al, 2005). Namely, the disease occurs as the brain tissue becomes resistant to insulin.

Rats that are fed high-fructose corn-syrup-laced water experienced learning and memory problems in less than 6 weeks, and became less responsive to insulin. At the same time, if the animals were given omega 3 fatty acids, they appeared to escape the cognitive decline. In other research, rats developed Alzheimer-like brain changes and became demented when Suzanne de la Monte interfered with how the rats' brains respond to insulin (Trivedi, 2012).

Alois Alzheimer first described these abnormal protein structures in the brain a little more than a hundred years ago (1906). At that time, the European diet had increased sugar intake as shown in Figure 1. More recently, there has been a significant increase in high fructose corn syrup as shown in Figure 2.

We are now becoming concerned with Alzheimer's disease as

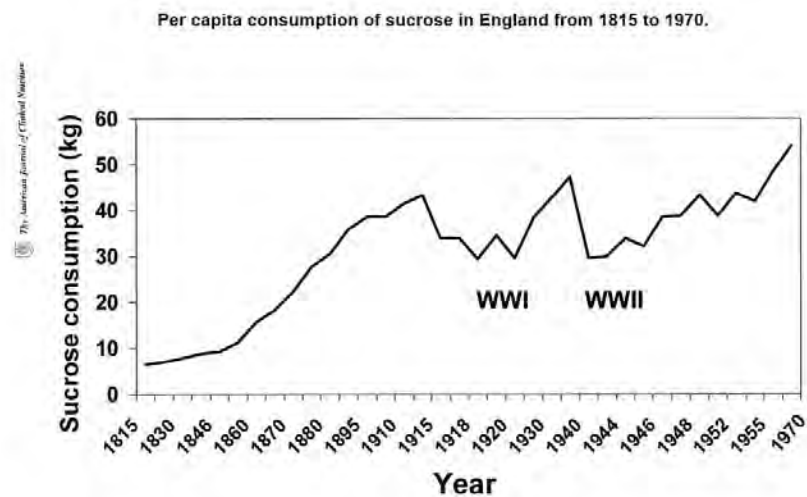


Figure 1: Radical increase in sugar consumption in the last 200 years. From: <http://ajcn.nutrition.org/content/81/2/341.full>

Cordain L. et al. Am J Clin Nutr 2005;81:341-354

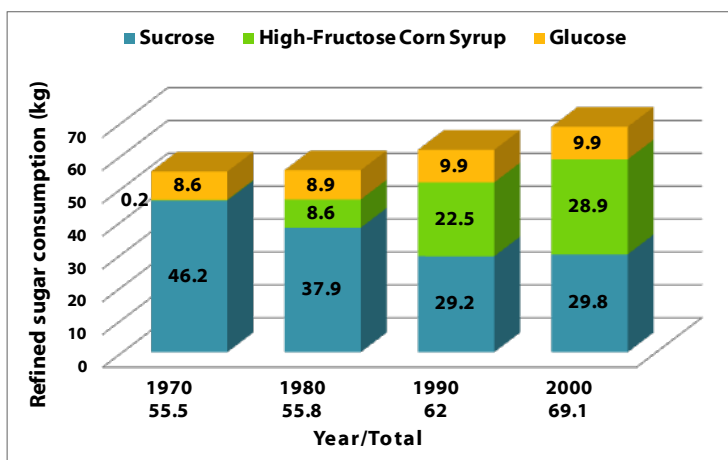


Figure 2: Increase in the type of sugar consumption in the last thirty years. From <http://ajcn.nutrition.org/content/81/2/341.full>:

an upcoming epidemic. It cannot be just sugar, since its consumption has been high since the beginning of the 20th century. A possible contributor could be the high-fructose corn syrup; however, it is most likely the interaction between reduced exercise and sugar.

Sugar set the stage for pathogenesis to occur in the brain and the absence of movement/exercise promotes and supports the patho-

genesis. People continue to decrease movement: from walking or riding horses to sitting in cars or standing on escalators and elevators; from doing physical housework to automated washing machines, driers and dishwashers; from preparing foods from raw materials to prepackaged foods; from filing and typing to computer work; from playing family games to watching TV and searching the net; from face-to-face communication to texting, etc.

We have separated from our biological evolutionary heritage. I am not surprised that Alzheimer's disease, immobility, and sugar are linked. Adopt the precautionary principle and assume that sugar and high-fructose corn syrup in conjunction with reduced movement (immobilization syndrome) is harmful.

As a reader, you will probably have to wait another 20 years before these findings have been scientifically proven against the overt and covert lobbying efforts of agribusiness and the pharmaceutical industry. Remember it took 30 years to demonstrate that smoking was harmful. Begin to move and eat in concert with your evolutionary background (See Part III Self-care in Gorter and Peper, 2011).

Begin now!

Eat food not sugars! Eat the foods our great-grandparents would recognize as food as Michael Pollan (2009) describes in his superb book, *In Defense of Food: An Eater's Manifesto*. Eat foods that have not been processed or adulterated by additives. Take charge by eating brain-supporting foods such as organic vegetables, roots, fruits, nuts, fish, some organ meat, and eliminate all those sugary, fatty, processed, highly-advertised fast foods.

Move and exercise! Get up and move every hour. Walk up the stairs instead of the escalator. Meet new people and move by going hiking, dancing, taking Tai Chi or yoga classes, or volunteer by helping others.

About this Article:

Adapted from the blog, *The Peper Perspective*—ideas on illness, health and well-being from Erik Peper. <http://peperperspective.com/2013/12/14/from-wisdom-to-alzheimers-are-we-poisoning-ourselves-with-affluent-malnutrition-and-sedentary-life-style/>

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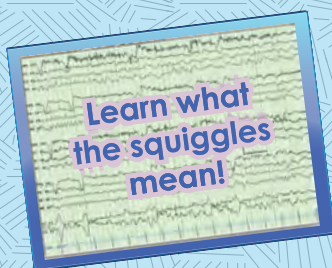
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FDA Allows Marketing of First Medical Device to Prevent Migraine Headaches

March 11, 2014

Today, the U.S. Food and Drug Administration allowed marketing of the first device as a preventative treatment for migraine headaches. This is also the first transcutaneous electrical nerve stimulation (TENS) device specifically authorized for use prior to the onset of pain.

“Cefaly provides an alternative to medication for migraine prevention,” said Christy Foreman, director of the Office of Device Evaluation at the FDA’s Center for Devices and Radiological Health. “This may help patients who cannot tolerate current migraine medications for preventing migraines or treating attacks.”

Migraine headaches are characterized by intense pulsing or throbbing pain in one area of the head, accompanied by nausea or vomiting and sensitivity to light and sound. A migraine can last from four to 72 hours when left untreated. According to the National Institutes of Health, these debilitating headaches affect approximately 10 percent of people worldwide and are three times more common in women than men.

Cefaly is a small, portable, battery-powered, prescription device that resembles a plastic headband worn across the forehead and atop the ears. The user positions the device in the center of the forehead, just above the eyes, using a self-adhesive electrode. The device applies an electric current to the skin and underlying body tissues to stimulate branches of the trigeminal nerve, which has been associated with migraine headaches. The user may feel a tingling or massaging sensation where the electrode is applied. Cefaly is indicated for patients 18 years of age and older and should only be used once per day for 20 minutes.

The FDA reviewed the data for Cefaly through the de novo premarket review pathway, a regulatory pathway for generally low- to moderate-risk medical devices that are not substantially equivalent to an already legally marketed device.

The agency evaluated the safety and effectiveness of the device based on data from a clinical study conducted in Belgium involving 67 individuals who experienced more than two migraine headache attacks a month and who had not taken any medications to prevent migraines for three months prior to using Cefaly, as well as a patient satisfaction study of 2,313 Cefaly users in France and Belgium.

The 67-person study showed that those who used Cefaly experienced significantly fewer days with migraines per month and used less migraine attack medication than

Continued on page 49

Medication Can Reduce Functional Health in Schizophrenia: We Must Do Long Term Follow Up

Erik Peper, PhD, BCB



In the late 19th and early 20th century, numerous people with schizophrenia recovered and lived functional lives without receiving pharmaceutical treatment (Whitaker, 2011). The spontaneous recovery has changed since the advent of barbiturates and the use of antipsychotic medications. With medication, the initial schizophrenic crises can be more easily managed—patients have less disruptive symptoms although they slow down and often live in a mental fog. Now, there is new doubt about the efficacy of long term use of antipsychotic medication as reported by science writer Clare Wilson in her New Scientist article, “Rethinking schizophrenia: taming demons without drugs”. She points out that there have been no long term comparative outcome studies between continued drug treatment and stopping drug treatment, except for observing the increase in serious side effects such as tardive dyskinesia.

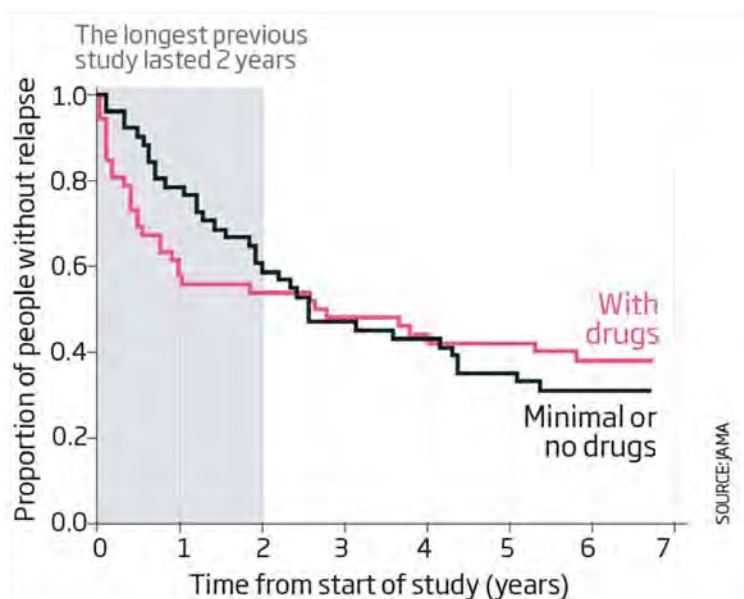


Figure 1: Long term study showing the benefit of minimal or no drugs after the initial schizophrenic episode as compared to continued medication. From: Wilson, C. (2014). Rethinking schizophrenia: taming demons without drugs. *New Scientist*, 221(2955), 32-35.

Psychiatrist Wunderlink and colleagues (2013) in the Netherlands have just published an outstanding controlled study. They showed that when the people were assigned to either a medication or stopped medication group, the stopped medication group did nearly twice as well over the long term. In the short term, the stopped medication group had a higher relapse rate. However, at the end of seven years they showed a significantly lower relapse rate, and double the rate of having functional lives (e.g., holding down a job and looking after themselves) than

the group that continued to take medication (figures 1 & 2).

This study points out the importance of not generalizing from short term benefits

which are so often augmented by active placebo factors. As the Dutch study showed, there is more harm than benefit from long term medication use in the treatment of schizophrenia. Similar results have also been reported in long term use of sleeping medication—it increases mortality risk by 25%. Long term chronic medication may cause different outcomes than for short term crisis use. When medication is taken over an extended period of time, the body will adapt to achieve homeostasis. Namely, it will reduce or increase endogenous neurotransmitters or prune those receptors to compensate for the increased presence of the drug. When the medication is withdrawn, the symptoms are now worse because the neurotransmitters or receptors have been changed and this takes time to regenerate. This process is similar to having a caffeine withdrawal headache. Drinking caffeine induces vasoconstriction; the body compensates by reducing its own vasoconstriction. Then, when caffeine is stopped, the blood vessels dilate too much and a headache results. It usually resolves itself in a few days as the body rebalances.

The reported results that the minimal or no drug group did so much better confirms the observations that significant number of schizophrenics in the late 19th century and early 20th century could regain functional recovery unlike what occurred after the use of antipsychotic medication treatment (for more discussion on this topic see the superb book by Robert Whitaker, *Anatomy of an Epidemic*.



Figure 2: Long term outlook of the ability to hold down a job or look after themselves. Those who were assigned to the minimal or no drug group had a significant improvement in functional recovery. From: Wilson, C. (2014). Rethinking schizophrenia: taming demons without drugs. New Scientist, 221(2955), 32-35.

Finally, this post is a reminder to doubt the benefits of medication for ongoing long term use based upon short term studies.

About this Article:

Adapted from the blog, [The Peper Perspective](#)—ideas on illness, health and well-being from Erik Peper.

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References continued on page 30

FDA Permits Marketing of First Brain Wave Test to Help Assess Children and Teens for ADHD

July 15, 2013

The U.S. Food and Drug Administration has allowed marketing of the first medical device based on brain function to help assess attention-deficit/hyperactivity disorder (ADHD) in children and adolescents 6 to 17 years old. When used as part of a complete medical and psychological examination, the device can help confirm an ADHD diagnosis or a clinician's decision that further diagnostic testing should focus on ADHD or other medical or behavioral conditions that produce symptoms similar to ADHD.

The device, the Neuropsychiatric EEG-Based Assessment Aid (NEBA) System, is based on electroencephalogram (EEG) technology, which records different kinds of electrical impulses (waves) given off by neurons (nerve cells) in the brain and the number of times (frequency) the impulses are given off each second.

The NEBA System is a 15- to 20-minute non-invasive test that calculates the ratio of two standard brain wave frequencies, known as theta and beta waves. The theta/beta ratio has been shown to be higher in children and adolescents with ADHD than in children without it.

"Diagnosing ADHD is a multistep process based on a complete medical and psychiatric exam," said Christy Foreman, director of the Office of Device Evaluation at the FDA's Center for Devices and Radiological Health. "The NEBA System, along with other clinical information, may help health care providers more accurately determine if ADHD is the cause of a behavioral problem."

ADHD is one of the most common neurobehavioral disorders in childhood. According to the American Psychiatric Association, nine percent of U.S. adolescents have ADHD and the average age of diagnosis is 7 years old. Children with ADHD have difficulty with attention, hyperactivity, impulsivity and behavioral problems.

The FDA reviewed the NEBA System through the de novo classification process, a regulatory pathway for some low- to moderate-risk medical devices that are not substantially equivalent to an already legally marketed device.

In support of the de novo petition, the manufacturer submitted data including a clinical study that evaluated 275 children and adolescents ranging from 6 to 17 years old with attention or behavioral concerns. Clinicians evaluated all 275 patients using the NEBA System and using standard diagnostic protocols, including the Diagnostic and Statistical Manual of Mental Disorders IV Text Revision (DSM-IV-TR) criteria,

Continued on page 49

The Neurotherapist's Office: How Environment Affects our Practice

Jamie Moore, RN, BCN and Erica Kube, BS



Making clients feel comfortable in a homelike setting has long been the goal of therapy office décor and design. Previous research has documented potential influences of the physical environment including softness, personalization and order (Devlin & Nasar, 2012). The research has shown that personalization that creates a comfortable environment may enhance clinical effectiveness (Pressly & Heesacker, 2001). A soft and personalized office may evoke positive interpersonal attraction (Chaikin et al., 1976; Gifford, 1988; Miwa & Hanyu, 2006; Sommer, 1974) and enhance credibility, which together may influence client compliance and therapeutic outcome (Amira & Abramowitz, 1979; Strong, 1987; Sue & Zane, 1987).

The therapy environment is the backdrop to the scene in which healing may be facilitated. The physical environment is often the client's first impression and vision into the field of neurotherapy. Therapists often receive little, if any, training on how to set an effective stage for therapy. Using the information gained from previous research regarding the physical environment's affect on client perception is helpful in improving the therapeutic stage. The purpose of this article is to incorporate the important interplay between client, therapist, and environment. This article will address how our office has evolved as a result of the needs of our clients, therapists, and technological advances of our time.

The first vision clients receive into the practice is the front room. The front room is not a waiting room that one might envision in a typical physician's office. Instead, it is designed as a professional, but cozy living room. We feel it to be crucial to be keenly



Figure 1: The front room is a professional and cozy living space designed for client comfort.

aware of the message and mood that is conveyed in this room and to consciously create the room with the intention to provoke positive feelings. The front room is a 13' x 26' area that was designed for the clients and their families. It feels home-like and includes a 42" flat screen television, a full-sized leather couch, two accent chairs, side tables, and a canvas painting of a branching tree that was chosen to sym-

bolize potential, growth, and protection (Figure 1).

Next to the front room, is a separate 12' x 5' refreshments room which is kept stocked full of juices, water, and snacks. At the time of the initial consultation, clients and their families are oriented to the offices. After the first visit, clients and their families feel welcomed to help themselves to the abundance of what the front room and refreshment area have to offer. These front rooms are home-like, personable, non-clinical, and offer a caring atmosphere. Since incorporating this cozy office design, we have experienced an increase in compliance and therapeutic outcomes. Several empirical studies have been conducted that support this finding. The research has associated the importance of a sense of belonging with loyalty and commitment to an organization. The studies suggest that the sense of belonging can be used as an outcome measure of environmental success (Fischer, 1983; Sundstrom & Sundstrom, 1986; Vischer, 2008).

The physical layout of the clinic and each therapy room must be carefully considered. When inspecting layout, it's important to consider both the therapist's and the client's view. To consider each of these vantage points, attention should be given to the layout, ergonomics, style, color, furniture, lighting and décor in relation to each room's function and purpose. When considering these variables it is important to do more than offer another generic office space.

Another very important aspect of neurofeedback office design is the consideration of the technological age in which we are practicing. Neurotherapy is an ever-evolving field that has taken full force to the scientific and technological trends of our time. Today, clinicians around the world have access to an enormous array of tools, equipment, and software. This cutting edge technology allows practitioners to scientifically measure, record and feedback a tremendous wealth of information about the brain and the connected body system.

In order to make use of these advanced tools, incredibly fast and efficient computers and monitors are necessary. Aged laptop computers and small monitors are no longer sufficient to support the technological requirements of the software we are using today. Clients also expect large screens and up-to-date technology. Many clients today enter the therapy office with iPads and other tablets in hand that offer more size and better graphics than archaic monitors.

The computers in the office pictured in Figure 2 were built especially to adequately process the amount of data



Figure 2: High performance computer built with Intel® Core™ i7-3930K CPU, 64 GB memory, and 1080p of HD video.

that current neurofeedback software requires for optimal performance. The computers are built with Intel® Core™ i7-3930K central processing units (CPU). The random access memory (RAM) on each computer is 64 gigabytes (GB) and utilizes a GeForce GTX 660 Ti video card which offers 1080 pixels (p) of high definition (HD) video. All monitors offer a high resolution, high contrast picture which meets or exceeds 1920 x 1080 x 120 hertz.

In addition to the computers in the office, surround sound is another important technological addition that can positively influence the training outcome. During surface and LORETA neurofeedback, the practitioner has the capability to connect visual and sound feedback to the training session. As the client's electroencephalography (EEG) performance matches the training thresholds, the picture or the movie on the screen will appear clear and the volume will remain stable. When the client ventures outside of the training thresholds, the screens' resolution and sound will dampen. NeuroField real time z-score (RTZ) training also connects audio feedback to the training session. During NeuroField RTZ training, a tone will be heard by the client after positive therapy responses. This high quality audio technology is a variable in each session that affects client performance and motivation which ultimately affects clinical outcome.

Allowing the client to experience video and audio feedback and the associated changing brain states and function is extremely important to session outcomes. Offering this 360 degree distraction-free experience allows clients to maximize each and every session to its fullest potential. Clients are often enthralled by the therapy rooms and their technological abilities. Many have even reported that the simple action of entering the training room elicits a positive response.

The neurotherapy training rooms were more challenging to develop than the others. What makes designing neurotherapy rooms challenging is finding a balance between human comfort and technology. Researchers have been reviewing the balance of technological development and human resource needs since before the 1990s. What they have found is that technological innovation must be counterbalanced with human resources in order for new technologies to be accepted (Turnage, 1990). For this reason, each training room offers a one to one client to therapist interaction that was designed to mimic a personalized



Figure 3: Client sits in a reclining chair in front of 42-inch flat screen 1080p HD training monitor, offering a theatre-like experience.

home theatre experience. In each training room, the client sits in a comfortable chair stationed directly in front of a large flat screen training monitor (Figure 3).

The majority of the furniture in the office is leather. Leather furniture was chosen over the cloth alternatives for easy cleaning and hygienic purposes. The field of neurotherapy has quickly evolved into multiple channel training and an increasing number of sessions run today offer 19 or more channels of EEG. Therefore, qEEG capping often occurs before every session and gels are often transferred onto furniture. Leather furnishings allow for quick and easy clean up after each session.

In order to bring personalization into each neurofeedback session, all rooms have been equipped with Wi-Fi and digital movie and music libraries. Digital libraries enhance the video and sound experience of each session. Having access to these enormous libraries of video and music allows each session to be personally tailored toward each client's interests and each day's therapy goals. Allowing the clients choices during their sessions has drastically improved client motivation. Many parents have reported that their children love coming to their sessions and that often their child is telling them when their sessions are each week.

Not only is it important that the office environment is comfortable for the client, it is also important that the therapist is content. Several empirical studies have suggested that a comfortable and open office environment affects work creativity, well-being and overall system performance. (Amabile, 1996; Shalley & Gilson, 2004; Woodman, Sawyer, & Griffin, 1993). The consultation and training rooms were designed with an open, comfortable office setting in mind. When looking for a therapy office, lighting is also very important. Research has indicated that the intensity of illumination influences performance and natural lighting is preferred (Sundstrom, 2001). For this reason, all rooms, except the theatre room, contain oversized windows that



Figure 4: Spacious multifunctional room with nature view, utilized for consultation and training.

provide ample natural lighting. Artificial light sources are rarely used in the training rooms with the exception of the occasional use of soft lit lamps.

The consultation office contains floor to ceiling windows that provide a wealth of natural light, a full-sized leather couch, and throw pillows, to facilitate a relaxing, clean, and open environment for clients and their family members (Figure 4). When

working with young children it is essential for therapists to observe behaviors as the child interacts and explores their environment. For this reason, this room is free of clutter and excess furniture.

The consultation office offers a fine balance of coziness and openness. In this spacious 19 x 13 foot room, children are encouraged to be themselves during the consultation process. Parents are sometimes caught off-guard by this willingness to allow their children to explore the office. Parents are often accustomed to having to restrain their children in many other professional health care facilities. The foundational goal of this room for the consultation purpose is to observe naturally occurring behaviors that may be considered during the development of effective therapy goals and training plans.

This room may also serve as a therapy room; both settings should be considered when creating a multifunctional space. Directly in front of the couch is a desk that displays a 32" therapist monitor and a 42" flat-screen television. The monitors and television can be used to display quantitative electroencephalography (qEEG) reports, serve as a training monitor, and visually display therapy progress data. During the initial sessions, parents are welcomed to stay in the room and watch their child's neurotherapy session from the couch with access to an iPad readily connected to Wi-Fi in-hand (Figure 5).



Figure 5: Mother sits relaxed on the couch observing her child's neurofeedback experience.

The therapist and client sit side by side in straight-back chairs in this room (Figure 6). The room serves well for children with behavioral and attention difficulties, as it has a more serious feel than the other offices and the training tone is more authoritative. This room can be used for reward and punishment purposes, “If you turn in your homework and are good in class, you have your choice of training room today.” The children will typically choose the other offices with larger televisions and reclining chairs that are more flexible and comfortable. Close proximity interaction between client and clinician offers one on one monitoring that is sometimes necessary with certain client populations. This room is designed for consultation, intake, qEEG and NeuroField.



Figure 6: Close proximity interaction between client and clinician offers one-on-one session monitoring.

The second 19' x 13' training room is the same size as the consultation room; however, it has been designed to facilitate a very relaxing, cozy, and nurturing environment. This room is also equipped with floor to ceiling windows that provide ample natural light, in addition to soft lighting capabilities. This room includes a connected therapist and client training station. The therapist is positioned at a large desk at which the therapist can implement and monitor the training session. In the client's station, a leather reclining chair is positioned in front of a desk which holds a 42" flat-screen training monitor (Figure 7). This room is equipped to perform qEEG, NeuroField, LORETA and Brain Surfer training. Adjacent to the client station, another reclining leather chair comfortably seats a parent, or may be easily moved in front of the training monitor, offering the capability of training two clients side by side. This room has been used for couples, parent/child and sibling neurotherapy sessions.



Figure 7: Relaxed in the comfort of a reclining chair, clients enjoy high quality video and sound technology alongside a floor to ceiling nature view.

This room has been used for couples, parent/child and sibling neurotherapy sessions.

The third training room has been named the theatre room. The theatre room is a 12' x 12' room, smaller in size in comparison to the other offices, but has its own functional and unique purpose. The theatre room name was

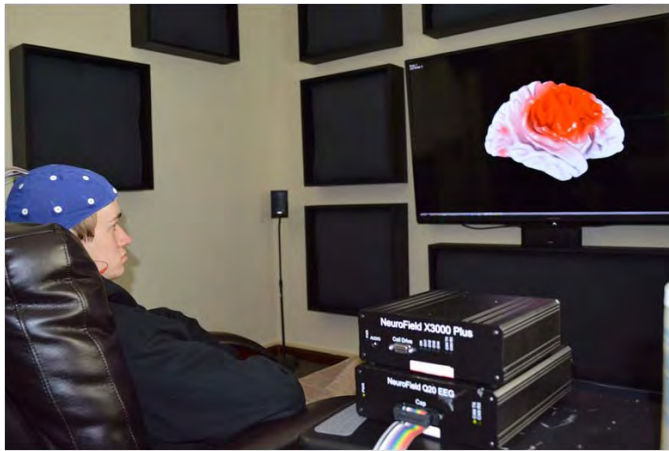


Figure 8: Client sits comfortably in front of 60-inch LED monitor during Brain Surfer training.



Figure 9: Geometrically placed on the walls of the theatre room, sound and frequency absorbing panels are utilized to provide a quiet, distraction free training environment.

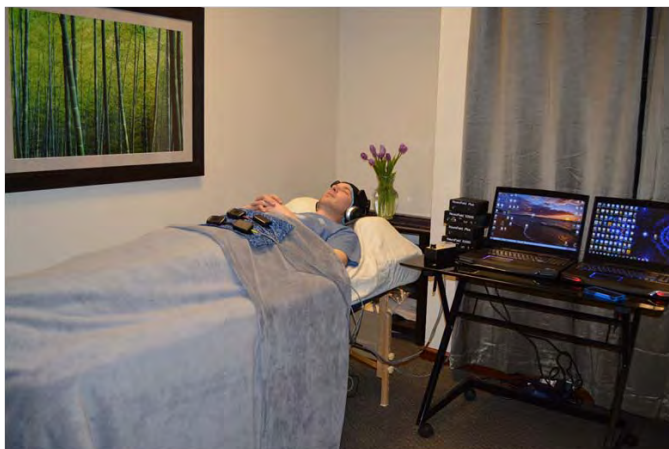


Figure 10: Client lies on 7000 MX professional BioMat in serene room equipped with two NeuroField systems for brain and body biofeedback.

coined for its theatre-like equipment and design. The room contains a 60" LED television for the client, six channels of surround sound multichannel audio, and a 40" monitor for the clinician. This room is equipped for qEEG, NeuroField, LORETA and Brain Surfer training (Figure 8).

Large sound and frequency absorbing panels are geometrically placed on all the walls within the room; they are made from solid wood frames, recycled denim insulation, and bullet proof paint (Figure 9). The panels were created to absorb excess pulsed electromagnetic field (pEMF) scatter from the computers and monitors as well as NeuroField pEMF. The insulated panels not only keep the room clean of pEMF, but they also keep internal and external sound from buffering within the walls, creating a very quiet, distraction-free training environment that maximizes engagement and participation. Clients with attention difficulties have very positive training effects in this room. The extra-large television, surround sound, and sound dampening create an environment that allows the brain little opportunity to disengage from the training session, maximizing outcomes.

The fourth room is a 10' x 12' room which has its own unique set of functions. A 7000 MX professional BioMat lies on top of an extra-long professional massage table. Next to the BioMat are two NeuroField pEMF stimulation-only training devices and a computer desk

holding two laptop computers (Figure 10). Clients relax and enjoy the therapeutic benefits of the BioMat in addition to receiving their NeuroField session addressing brain and body energetic alignments. High quality headphones are provided to the clients to enhance relaxation throughout the session. Clients are able to choose their music from the digital music library or music may be suggested for them. The décor in the office contains a framed photograph of bamboo, soft lamp lighting, light blocking curtains, and hand-crafted wall tapestries made by women in a small isolated community in India. The room feels warm and nurturing with a touch of Zen.

The last room added to the office is the chiropractic office. Chiropractic services have been added to many clients' neurotherapy plans. The role of chiropractic services are to treat the individualized needs of clients whose qEEGs warrant a need to examine circulation and nutrition and their relationship to brain health (Figure 11). The incorporation of chiropractic services has enhanced neurofeedback outcomes for many clients.



Figure 11: . Chiropractor performing an adjustment prior to client's neurofeedback session..

Because so many diverse tools, treatment modalities and technologies can be utilized in the field of neurotherapy, portability of technology is an important factor in optimizing room performance. Today's neurotherapist may often use multiple techniques and modalities in a single neurofeedback session. Therefore, it is particularly important that the clinician has the ability to not only offer multiple treatment modalities to their clients, but to also make the most of each device and its abilities. Having computers, equipment and supplies that can be easily transported from room to room enables practitioners to adapt to each client's unique needs. To accommodate the need for portability within the office, all equipment is stationed on portable laptop carts that can be easily wheeled from room to room on demand. Not only will the client have a room that has been tailored for them individually, but they are also allowed access to the tools that will most optimally enhance their training outcomes.

Our neurotherapy offices are ultimately created to enhance the performance and function of the advanced equipment and other clinical modalities. Maximizing the performance of the equipment, client, and clinician has been essential to the success of our clinic. The cozy, personalized environment of the offices has notably increased both compliance and therapeutic outcomes. As a result, many clients have reported that their brain begins to change as they pull into the parking lot. The in-

corporation of the techniques and tips in this article may help current and future neurofeedback professionals create a healthy, functional office space that may enhance the neurofeedback experience.

About the Authors

Jamie Moore, RN, BCN, has been a Registered Nurse for over 33 years. He graduated from Saint Joseph's School of Nursing in 1979, and has continued to study the brain and Autism Spectrum Disorder ever since. Jamie has studied under Leslie Sherlin, and completed training by John Anderson, a pioneer in the field of neurofeedback. He completed his internship/mentoring under Nicholas Dogris, inventor of the NeuroField system. Jamie plans to continue his education in neurotherapy and nursing, and to carry on practicing from his heart.

Erica Kube, BS, is a graduate from the program of neuroscience and biology at the University of Nebraska, Omaha, where she received recognition for her achievement and outstanding performance. She has authored award-winning work and practices neurotherapy full-time.

Erica has completed extensive training with experts in the field of neurotherapy including John Anderson and Nicholas Dogris. She is currently finishing a Master's of Science in Clinical Counseling. This advanced training and passion for learning the latest approaches have increased the efficiency and effectiveness of neurotherapy, from which her clients achieve maximum health and quality of life.

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Device to Prevent Migraine continued from page 36

those who used a placebo device. The device did not completely prevent migraines and did not reduce the intensity of migraines that did occur.

The patient satisfaction study showed that a little more than 53 percent of patients were satisfied with Cefaly treatment and willing to buy the device for continued use. The most commonly reported complaints were dislike of the feeling and not wanting to continue using the device, sleepiness during the treatment session, and headache after the treatment session.

No serious adverse events occurred during either study.

Cefaly is manufactured by STX-Med in Herstal, Liege, Belgium.

For more information:

FDA: [Medical Devices](#)

NIH: [NINDS Migraine Information Page](#)

Reprinted from the FDA website: <http://www.fda.gov/newsevents/newsroom/pressannouncements/ucm388765.htm>

Brain Wave Test continued from page 39

behavioral questionnaires, behavioral and I.Q. testing, and physical exams to determine if the patient had ADHD. An independent group of ADHD experts reviewed these data and arrived at a consensus diagnosis regarding whether the research subject met clinical criteria for ADHD or another condition. The study results showed that the use of the NEBA System aided clinicians in making a more accurate diagnosis of ADHD when used in conjunction with a clinical assessment for ADHD, compared with doing the clinical assessment alone.

NEBA Health of Augusta, Ga., manufactures the NEBA System.

For more information:

[CDC: Attention-Deficit/Hyperactivity Disorder](#)

Reprinted from the FDA website: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm360811.htm>

Around the World with Neurofeedback



Tanya Morosoli, on Mexico City, Mexico:

The Mexican Society for Bio and Neurofeedback (SMBN) is organizing a second meeting that will be held in the Juriquilla's campus of the UNAM (Universidad Nacional Autónoma de México), the most prestigious public university in Mexico from September the 18th to the 21st 2014. The meeting website can be found at www.congresobioyneurofeedback.com.



The number of neurofeedback practitioners in Mexico has rapidly increased and therefore the Mexican Society for Bio and Neurofeedback has to provide high quality educational opportunities in Spanish through courses and meetings favoring qEEG-based neurofeedback and trying to establish higher standards of practice. Faculty members and students from both private and public universities have a growing interest in bio and neurofeedback research and clinical applications. Therefore, the Society is increasing its presence in universities participating in educational programs, helping developing neurotherapy labs, and providing mentoring that hopefully will lead to meaningful research in the years to come.

Practitioners involved in applied psychophysiology research, clinical practice and teaching throughout Latin America and Spain are planning to found an Iberoamerican Society before the end of the year. Pedro Delgado, ISNR International Member at Large, is also committed to strengthen the collaboration between ISNR and Latin American countries and the foundation of the Society would help to achieve this goal and to increase collaboration within Hispanic countries.

John Davis, on Canada:

The practice of neurofeedback continues to grow in Canada. BCIA certificants here continue to increase in number. Controversy occurs sometimes, as in a recent discussion among my psychologist colleagues about a Toronto neurofeedback practitioner, some of whose former clients report disappointment on learning that he cannot diagnose or treat ADHD and other conditions he labels with those diagnoses because he is not licensed, despite having "a PhD in neuroscience."



A major network presented a good series of programs on the brain, one of which included Norman Doidge, saying encouraging things about neurofeedback before the interviewer spoke with Ed Hamlin and Lynda Thompson.

Continued on page 52

How Does State License Impact Neurofeedback?

Judy Crawford, Executive Director, BCIA



How Does State License Impact Neurofeedback? Certification is a voluntary credential one gains to define and measure professional skills against recognized educational and training requirements.

License is required by the state where you practice, should you wish to be called a specific title or practice a defined profession such as therapist, nurse, psychologist, etc. Laws governing healthcare are not typically modality-specific, but are in place to regulate the independent treatment of disease and disorder.

Each state selects the professions they will regulate through boards that govern them using practice standard guidelines. They may look quite different state to state and profession to profession, and it is imperative that you investigate how to be in compliance.

Some state licensing laws specifically include the terms biofeedback and neurofeedback, but what does that really mean? If a profession lists neurofeedback, does it mean that no other profession can provide that therapy? Great question and one each provider should investigate at the state level.

Unlicensed professionals must work under appropriate supervision when using neurofeedback outside of teaching relaxation and focus. What is appropriate supervision? Read on...

Each licensed professional using these techniques to independently treat a medical or psychological disorder should carefully review their practice standard guidelines to check for the following:

- Is biofeedback or neurofeedback specifically mentioned or excluded?
- Do your practice standard guidelines require you to work only within the area of your expertise? You should do further training prior to expanding your client base to include new diagnoses.
- Is there a stated or implied scope of practice? This question occurs more than you may realize. Just because a dentist learns to use SEMG to appropriately treat TMJ, can he get further training and then legally use those same skills to treat incontinence? In some cases, the diagnosis may not feel clear: is this

within my scope? Be safe—always check with your state licensing board’s guidelines posted on their website.

- What about supervision? To fulfill certification requirements, BCIA only uses the term mentoring, meaning to teach another the application of new skills. Supervision is a legal term meaning to take responsibility for another’s work. BCIA is constantly surprised at the number of people who wish to find or provide supervision without the faintest idea that this could be regulated by state law and they may be out of compliance. Not only do some states clearly outline who can be supervised, some laws even outline how it must be done. For example, in Texas, an LPCS (Licensed Professional Counselor Supervisor) may only provide supervision to a licensed LPC intern. In some states it is clearly delineated that the supervisor must be on site 50% of the time.

No, your state does not specifically regulate neurofeedback. If they did, they would do it through licensing laws. As of the summer of 2014, none of the 50 states offer professional licensing as a neurofeedback therapist or provider. Perhaps that is the future? Until then, state boards may regulate what types of clients or disorders you may treat, if you can be supervised or provide supervision, and how that supervision may look. Stay safe—check it out.

NFB Around the World continued from page 50

Pedro Delgado, on Latin America:

I can inform that In Latin America we have a growing group of neurofeedback practitioners. Mexico, El Salvador, Costa Rica, Panama, Colombia, Peru, Chile, Argentina, and Uruguay as



I know (we are trying to collect information on names and contact info). We have done training in NFB in Spanish in many of those countries. In Venezuela we have more than 20 practitioners, the majority trained by us. Unfortunately, only people from Mexico are members of ISNR because of language barriers and money limitations. We have made contact with the president of the Mexico group that has an association, and are making efforts to create a Central and South American organization that can be linked to ISNR in the form of memberships. No periodical publications in Spanish exist to my knowledge. We find that many professionals are interested in NFB but don’t have access to training in Spanish; we have suggested to ISNR leadership that they should work on an introductory webinar in Spanish sponsored by ISNR.

Save *the* Dates

**46th Annual
AAPB Annual
Scientific
Meeting**

**Renaissance
Austin Hotel**

Austin, Texas



MARCH 11-14, 2015
(during SXSW 2015!)



Austin is proudly weird, proudly Texan (it is the capitol after all). Austin is home to the University of Texas, the state capitol, famed music clubs on Sixth Street, great restaurants and world-class spa retreats, AND the SXSW- South by Southwest Interactive Film & Music Festival which happens to coincide with the AAPB 2015 Meeting. With entertainment and culture, inspiring cuisine and stunning outdoor settings, Austin lets you create a soundtrack all your own. Austin boasts more than 250 music venues and a vibrant arts scene. Make plans to join us for the AAPB 2015 Annual Scientific Meeting: The Many Faces of Biofeedback and put Live Music Capital of the World® on your playlist.