A Case of Psychogenic Seizures
Cynthia Kerson, PhD, BCIAC, BCIAEEG

This case, who I'll call Thomas, was referred to me by his naturopathic physician. He is 18 years old and completed high school during our time in treatment. He had been seen by neurologists, sleep specialists, chiropractors and other practitioners for his seizures. He exhibits mild catatonia as often as 4 times an hour. The stiffness is predominantly on the left side, where his leg is raised and his arm freezes. He remains coherent and can even forewarn when the seizures are coming.

Thomas was in the special education class at his public high school. He has few friends and is very close to his family. His parents are open-minded and educated. His medical history indicated no organic brain seizure activity and he observably is cognitively and emotionally impaired. In fact, during the QEEG, when I instructed him to read a short story and at the end tell me what it was about, he went into seizure. Once he relaxed and composed himself, he continued with the task. I found this provoking and suggested to his mother that the seizures are stress induced or psychogenic. As can be seen in the brain maps below, there is very little difference between the eyes closed and “seizure” maps (figures 1 and 2 respectively), keeping in mind the artifacts apparent while he is becoming rigid and opening and closing his eyes repeatedly. He noted a seizure coming on, so I was aware of the precise time it began and ended. The record was interpreted using the SKIL software and database. In this software, I found pathology in magnitude and comodulation measures. I found the best analysis to be with the Hjorth statistical formulation.

While hoping to rule out any organic etiology of the seizures, it seemed the family was not willing to consider that the seizures were strictly from stress alone. All other measures indicated no organic basis, including PET scan, MRI and Spect scan. I gingerly advised my findings also indicated no organic basis and planned the treatment based upon it. He was motivated. Having graduated from high school, he was concerned about how he would be considered if he were to seizure often in the “real world.” His mother also shared her concern that he may not be successful in academia. I guided the treatment so Thomas believed we were training to reduce the seizures, but was always thinking of how I could also improve...
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Mind Media BV (Netherlands) is proud to introduce the NeXus-10. The NeXus-10 is a 10 channel Physiological Monitoring and Feedback platform that utilizes BlueTooth Wireless Communication and Flash Memory Technologies. NeXus-10 offers data acquisition at up to 2048 samples per second. The advanced technology pre-emptively enjoy independent 24 bit A-D converters per channel with DC coupled amplifiers allowing for DC to 512Hz (Oe8) recording including raw EEG, ECG, EMG, EOG, true DC and other Slow Cortical Potentials. Because this system uses carbon cables with active shielding, movement and noise levels are very low by design.

Specifications:

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<td>128 Samples/sec</td>
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A wide range of additional sensors is available:

- Sensors: EEG, EMG, ECG, EOG and SCP (slow cortical potentials)
- Sensors: RSP, BVP, SC/EDR, Temperature. (need other sensors? contact us!)
- Sensors: Nonin SpO2 Oximetry, Pulse and EVENT synchronization (1024PS)

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<th>Sensor</th>
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<td>RSP sensor (respiration)</td>
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<td>2 Channel SCP sensor cable</td>
<td>NX-SCP1A</td>
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BioTrace+ software
Optimal software support for the new NeXus-10 technology. Runs on your PC with Microsoft Windows 2000 and XP.

Our new BioTrace+ Pro Software provides new dimensions of flexibility in physiological monitoring and biofeedback capabilities. It offers the optimal support for our new NeXus-10 hardware platform with its fast sample rate, flash memory support & 24 bit ADC resolution. Special support for Slow cortical potentials and SpO2 modalities.

Short Summary of Key Features:

* Easy to learn intuitive point and click interface.
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* Switch on the fly between 1 to 12 active screens, instantly change feedback parameters and digital filter settings. True dual monitor support.
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* Integrated, fully functional protocol and screen building editor: build your own screens and protocols with a few mouse clicks.
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The Stens Corporation www.stens-biofeddback.com 800-257-8367 Fax: 415-455-0333
FROM THE PRESIDENT

Welcome to 2008... a year where our reality meets the bold promise of our field’s shining future.

Believe me, however the future of BSC turns out, it is YOUR fault! That’s right, you heard me.... For better or worst, it is all YOUR fault. Right about now you may be asking yourself: “WHAT is my fault?” ... My answer to you is: “Everything” is your fault... the success of 2007, as well as BSC’s future... these are ALL placed right squarely in your lap!!

You might say to yourself "What the '%$*&' did I do to deserve this strange New Year’s greeting??"... The answer is self-evident... look at what you have done for your field and the society. Congratulations on your past efforts if you have served on the Board, or maintained your membership, or attended a BSC meeting...

Many of you and your fellow professionals have put a shoulder to the proverbial wheel these recent years, and have moved the field forward... look at the yeoman’s work done by the BSC workman’s comp group under the direction of Chris Sharp... his group has compiled, authored and edited... and re-edited the most complete documentation for this area ever created... it is being sold to professionals through BSC, as well as AAFPB.

You could also look at the clever work done by last year’s Board; salvaging the BSC fiscally, with the use of creativity and flexibility in the face of our state being inundated by various international societies’ meetings. Our society is doing well, but not by some random chance. Our current success is due to YOUR efforts, whether as a member paying dues, or as a Committee or Board member, or as a vendor or donor at a meeting... even as a presenter or audience for a paper or workshop. YOU have done it your way... like any good Californian!

In 2008 we have our work cut out for us! The Asilomar meeting (November 7-

FROM THE EDITOR

We are pleased to bring you our first of three newsletters in 2008! In this issue, we have expanded our “Clinical Corner” section. Clinical Corner is an excellent forum for clinicians to share their work and allow others to benefit from their experience. BSC board members rallied together to contribute some exceptional clinical case write-ups for this issue. My fellow editor Janette Sperber submitted a wonderful case study on Repetitive Strain Injury. In just six sessions she was able to help her client dramatically reduce his symptoms. Teresa Corrigan writes about a client with a form of cancer and tinnitus who successfully learned self-regulation skills. Cindy Kerson shared her work in regards to assisting her client to reduce seizures. We appreciate the participation of these clinicians and we hope you will benefit from their experiences.

As our new president Jay Gunkelman is saying, the BSC is experiencing renewed levels of participation and is in good shape financially. We are proud to announce that we will start tendering a stipend for newsletter articles of up to $100 in order to build on this momentum. We are looking for case studies, review of emergent technologies, articles and book reviews in order to expand the newsletter’s content and quality. If you have any questions as to what would be appropriate, feel free to contact either Janette Sperber (janette_sperber@yahoo.com) or me at (c.malewicz@yahoo.com). We welcome your contributions and look forward to another year with the BSC.

Christina Malewicz
CoEditor, California Biofeedback
Biofeedback workshops for professionals... by professionals

Earn the most didactic hours for BCIA certification while you learn from our highly experienced instructors and receive hands-on training using the two leading biofeedback systems, Nexus and Infiniti. Advance your career with the finest, most established workshops from Stens, now in our 32nd year and breaking new ground with cutting-edge Nexus wireless technology.

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Call us at 800-257-8367 or register online at www.stens-biofeedback.com

CEs for APA, CNA, BBS. Stens Corp is approved by the APA to offer CE for psychologists and maintains responsibility for the program.

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From the President
Continued from page 3

9, 2008; submission to begin in late January) will be upon us sooner than you may think... and we have a wonderful California venue at Asilomar, with the Pacific Ocean lapping at the door begging for a morning walk along the tide pools, and the night life and restaurants of Monterey to titillate our appetites and palates, and the great science and clinical presentations (not to mention the great networking). Where better to discuss various waveforms than while walking along the ocean with the seabirds and otters there to argue their perspectives?

I would wager that those who attend BSC’s 2008 ASILOMAR MEETING will have FABULOUS memories and develop professional ties that will last a life-time... and those who don’t will have a dark void that they can use to simulate a lump of coal in their 2008 holiday stocking.

I really want to get you to find one other person who is in the field, and get them to attend. The Board is trying to come up with an incentive program to encourage people to bring other professionals or students to the meeting, so please try to find others in the field who may not be members, or who may not attend the annual meeting, and get them excited about the possibilities ahead in 2008.

I welcome you all to attend, and join in the fun... Bring a friend and meet some new friends... present your challenging cases, your outcomes, and your insights at Asilomar... after all, if you are interested in moving the field forward, the BSC is the place to apply your talents.

Bring a friend or two... Join me and all your BSC friends at the beach in Asilomar!

Jay
qeeqjay@bscglobal.com

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Peripheral Biofeedback for Tinnitus and Stress Management

Teresa Corrigan, R.N., M.A.

As many of us feel very isolated in our practices, it would be great to have comments and feedback regarding these cases. There are many ways to do training and I would love to use the Clinical Corner as a resource for references, new ideas and a place to share our expertise. Thanks. (*Eds note: this is a feature we have had in past newsletters, a place where you can write up a case, as simply or comprehensively as you wish, to share interesting or even amusing incidents in your clinical practice.)

Biofeedback Case Study

Diagnosis: RF is a 35 y.o. single male with Waldenstrom macroglobulinemia (WM) and tinnitus. WM is a rare, slow-growing non-Hodgkin lymphoma (cancer that begins in the cells of the immune system). He was referred to me by an Integrative Oncologist at the UCSF Osher Center for Integrative Medicine. He is asymptomatic at this point, but knows that because of the slow growth of his lymphoma, it is only a matter of time until he will need treatment.

He has had tinnitus and hearing impairment since childhood. He wears new bilateral digital hearing aides and reports they have dramatically improved his hearing. He has been able to “include” the tinnitus as part of his life until recently. He thinks the stress of the looming cancer treatment is exacerbating his anxiety and causing the tinnitus to become increasingly loud and harder to tolerate.

Reason for Referral: To learn relaxation, stress management skills and self-hypnosis.

Symptoms: He describes the tinnitus as a constant fast whirring generator sound. He feels the constant fast whirring sound keeps him “revved-up” all the time. Recently the sound has changed to 2 levels; whirring in the foreground and buzzing in the background. He thinks his new hearing aides may partially be responsible for the increased in volume and the bi-level sounds, but he is unclear at this point. He’s working closely with his audiologist to find the most appropriate settings and discover his new hearing capacity.

History: He has been practicing Vipassana (Mindfulness) meditation for many years and meditates approximately 1 hr./day. He feels the calming effects of the meditation usually for most of the day until he has to face a stressful situation and “go outside”. He is bothered by outside noise and the person upstairs who walks with heels on the hardwood floor. When he takes his hearing aides out, he basically hears almost nothing besides the tinnitus. He denies any history of TMJ or facial tenderness. He lives in San Francisco with a roommate.

His history revealed that his diet is nutritionally lacking and his fluid intake low. He doesn’t want to drink as he’s concerned about his need to urinate too frequently (WM cancer can express itself with high levels of IgM and lead to blood hyperviscosity syndrome). He was encouraged to start increasing his daily fluid intake to at least 3-4 glasses/day and more if possible. He felt this was a realistic goal and he would consider gradually increasing his fluids. As he is currently seeing an integrative oncologist, I asked him to review his urinary frequency, diet and supplement recommendations with his doctor for a more complete treatment plan.

Biofeedback Equipment: Biointegrator made by the Bio Research Institute.

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Important Notice about CEUs

Continuing Education Units (CEUs) are no longer required for BSC Certification. The Board has suspended the certification process, recommending BCIA Certification instead (www.bcia.org). For those already certified, BSC can update your last certificate. Please contact the Executive Director for details at (415) 405-1945.

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Continued on page 7
The BSC 34th Annual Conference

November 7-9, 2008
Asilomar Conference Grounds
Monterey, California

Submissions begin February 1, 2008

Northern California Regional Meeting
Eric Peper, Eleanor Criswell & Servaas Mes
Somatics
San Francisco State University
Saturday, May 10, 2008

Check your email and the Web site for updates.

These meetings will be under review by Amedco for CMEs (annual conference only) for MDs and CEUs for BBS, BRN, APA and BCIA.

www.biofeedbackcalifornia.org
(415) 485-1345
Biofeedback Society of California * 1925 Francisco Blvd. E. #12 * San Rafael, CA 94901
Peripheral Biofeedback
Continued from page 5

Biofeedback Assessment and Training Modalities:
- Bilateral sEMG from L & R Temporals;
- Abdominal Respiration belt, Skin Temp, GSR (using the BSR mode) and Heart Rate.

Findings from Initial Evaluation:
- Elevated L & R temporals readings, bilaterally, 15 mv
- Skin temp: R index finger, 90.5° F
- BSR: 2250-2400 ohms
- Breathing: 12 breaths/min. (He is an experienced meditator and was breathing diaphragmatically without instruction)
- Heart rate: 70-75 bpm
- CRS (cardio-respiratory synchrony); eyes closed breathing shifted to 6 breaths/min. and almost perfect phase angle synchronization of breathing and heart rate without instruction!

As my approved biofeedback sessions were limited to 4 visits, training focused on:
- Decreasing bilateral temporals EMG activation
- Passive relaxation self-hypnosis training-breathing techniques (Breathing strategies were a primary focus, building on his advanced meditation skills and ability to spontaneously produce cardio-respiratory synchrony)
- Eyes open CRS
- Exploring white noise background, masking and relaxation coupling possibilities
- Reframing tinnitus

Training:

1. Visual, no audio, sEMG graphs with L & R temporals (both EMG’s displayed on the same graph as well as histograms to enhance bilateral awareness). Visual biofeedback: decreased activation from 12-14 uv to 4 uv bilaterally.

Initially he couldn’t connect with his face and it was hard for him to translate the biofeedback visual to his face and an awareness of relaxation. Over time this transformed, or at least he learned the mechanics of facial relaxation.

2. Breath Training
A breathing technique called Ujjayi Pranayama (pronounced OOOO-jah-yeeyee) was taught in the slow and soft meditative style. Ujjayi breathing creates a sound in the back of the throat on exhale. It is often called a “gentle snore”, “ocean sound” or the kids call it the “Darth Vader” breath. Besides for the calming and relaxing effects of the breathing technique, it also has the advantage of an audible sound that we used as self-made “white noise”.

He began practicing the Ujjayi breathing twice a day (more if possible and as needed):
- 10 Ujjayi breaths
- 10 slow diaphragmatic breaths
- 10 Ujjayi breaths

He was encouraged to use the breathing whenever he needs an instant way to relax and take himself away from the “outside noise and stress”.

He can easily produce eyes open CRS @ 6 breaths/min and we used it as a reinforcement for the benefits of his practice.

3. Passive Relaxation/Self-Hypnosis and Ocean Wave CD
Using the Ujjayi breathing, we focused on gently coaxing the muscles to relax in a head-to-toe-fashion. We also used a CD of ocean waves to reinforce and couple the relaxation with the sound. We used the CD during our sessions and he also took it home for practice.

4. Reframing:
While using the breathing he reframed the whirring sound as a reminder of his power to keep himself strong and vital. Instead of hating the sound, he now thinks of it as a reminder of his strength and aliveness.

5. Continue Meditating:
I encouraged him to continue his daily meditation practice as it was evident that it was making a profound impact on his physiology and would help him throughout his life.

Summary:

After 4 sessions he states he feels more tolerant of his tinnitus and encouraged that he has readily available tools to help him manage his stress. He says he feels more confident, even with the bi-level sounds, and is starting to go outside more. He’s started drinking about 6 glasses of fluid/day. Although he’s still a little disconnected from his face and neck, he understands the mechanics of relaxation and states he can see the graphs in his mind. Reframing the tinnitus as a reminder of his strength and aliveness was helpful in “making peace with it again.”

I encouraged him to come back for more biofeedback especially when/if he needs to begin cancer treatment. Possibly his ability to deal with his stress may help keep his immune system functioning well and keep his cancer growing slowly for a long time!

Teressa Corrigan R.N. M.A., is a nurse at the UCSF Osher Center for Integrative Medicine, San Francisco, CA

Another Perk for BSC Members!

Are you hosting a workshop? For a minimal fee, the BSC will administer the CE process so you can award your attendees with continuing education credits. Many prospective attendees will require education hours to complete their licensing requirements. This benefit is available for attendees licensed or certified under the following agencies:

- Board of Behavioral Sciences (BBS)
- Board of Registered Nurses (BRN)
- APA
- BCIA.

Contact Executive Director Cynthia Kerson at bsc@biofeedbackcalifornia.org for instructions and guidelines.
Review of Relax to Sleep
A CD by William Barton, Ph.D.
DeLee Lantz, Ph.D.

Like most biofeedback therapists, I'm always on the lookout for recordings of guided relaxation for clients to use at home to reinforce and deepen what they learn in their sessions. There are many such recordings out there, and while many of them are adequate, not many are ones I find truly excellent. It's hard to find ones that have the combination of a good script, a good delivery, and good recording quality. Some voices appeal to some people; few appeal to most of my clients.

Several years ago, William Barton, Ph.D., put out "Relax to Sleep" in an audio cassette format. (Bill is a psychologist, a long-time biofeedback provider in San Francisco and a past president of BSC.) It immediately became my new favorite and has stayed one of my favorites. Almost all clients responded positively to it. I gave it not just for sleep, but for general relaxation and stress reduction training. Now, several years later, many clients don't have audio cassette players. CDs are the favored format. I have been on Bill's waiting list for the CD version for some time. Happily, it is now available. It has been remastered with only slight revisions.

The combination of Bill's voice, the guided imagery used, the inclusion of breathing phrases, and the music background that comprise Track 1 are ideal for me. In addition to Bill's script, Relax to Sleep has a background of beautiful guitar music by Teja Bell. Bell is a Zen priest whose "New Age" back-ground music on this CD creates a meditative, deeply calming effect that supports the script very well. Track 2 is the sound of ocean waves and an occasional sea bird, without voice or music.

Track 1 of "Relax to Sleep" begins with what I believe is the single most important thing for people with problems in sleeping to learn to do: focusing on the moment and letting go of other concerns. Bill guides this by first directing attention to restful breathing and to releasing all tensions on the exhalation. Then a suggestion of an image of a metal box with a heavy lid
So Many Choices

Only One Software...

CONNECTIVITY TRAINING

Thatcher's Z-score Biofeedback
Uses the feedback power of BioGraph to train from norms on-the-fly, or for pre- and post-session assessment.

Industry-Standard Coherence, phase and amplitude asymmetry computations.

Dual Threshold Instruments to allow clients to train within a pre-defined range.

ADVANCED EEG

JTFA - Gabor and Adaptive Spectrograms permit training specific bands using JTFA frequency separation: faster and more accurate than filtering or FFT frequency separation.

SCP - Slow Cortical Potentials
Train SCP in DC or slow AC modes using our new EEG-Z3 sensor. Assess SCP using dual-stimuli Go/No-Go evoked potential protocols.

EP/ERP - Evoked and Event-Related Potentials
Record and train audio or visual evoked potentials, including P300 individual responses or multi-trial averages. User-programmable protocols can be any combination of mixed-mode (audio, visual or both), single or dual-stimuli, Go/No-Go, and motor response.

Reaction Time Measurement for assessment of attention, and focus using our AV-Sync interface and software with millisecond accuracy. Report on errors of omission, errors of commission, success rate and failure rate, on-the-fly or post-session.
The Physiology Suite contains a complete set of standard biofeedback tools to get a total physiological perspective on your client's sympathetic and parasympathetic processes, including: Temperature, Skin Conductance, Surface EMG, Respiration and Heart rate variability (HRV).

The Physiology suite contains more than 80 screens and over 14 scripts, and provides you with advanced tools for assessment and follow-up:

- Pre/post baseline assessment
- SC verbal Relaxation exercise
- Training scripts (10 x 1 min trials)
- A 7 activity stress assessment script that takes your client through a sequence of stress/relax cycles and generates a report to rapidly identify hyper- or hypo-reactivity in each modality.

The two Suites offer 17 new animations, 15 MP3 (music & ambiance), 20 MIDI songs and many other new multimedia feedback options:

- DVD (4 action control: shrink, zoom, pause & sound)
- Morphing animation sequences, 3 stage puzzles
- Nature sound audio tracks
- MIDI splitter
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ProComp5 Infiniti™ is housed in an ergonomically-designed case and requires only a USB port to connect to any IBM compatible PC. ProComp5 Infiniti™ has the identical inputs as ProComp Infiniti, but omits the last 3 channels. The first two sensor channels provide ultimate signal fidelity (2048 samples per second) for viewing raw EEG, SEMG, EKG and HR/BVP signals, while the remaining 3 channels sample data at 256 samples/second for slower signals such as respiration, temperature, force, etc. Not only can ProComp5 Infiniti™ capture data in real time by connecting directly to the PC via its fiber-optic cable, but it can also store data on a Compact Flash memory card for uploading later to the PC, or use optional long-range compact flash module telemetry anytime it is desirable.

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Lynda Kirk, MA, LPC, BCIA Senior Fellow, BCIA-EEG Fellow, QEEG-Diplomate, ISNR Past President & Fellow, AAPB Past President

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**Foot Switch** allows you to remotely set a time mark or move a script to the next step.

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DEVELOPER TOOLS LEVEL 1

This workshop is targeted at power users of the BioGraph Infiniti environment.

- Provides an overview on the key concepts behind the Screen and Script Editors, opening the door to further learning in this exceptionally powerful development environment.

DEVELOPER TOOLS LEVEL 2

This workshop is targeted at power users of the BioGraph Infiniti environment.

- Provides an overview on the key concepts behind the Channel Editor, opening the door to further learning in this exceptionally powerful development environment.

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COURSE PREREQUISITES:

This course is intended for licensed health professionals and participants are encouraged to seek BCIA accreditation if they are not already accredited. As this online course is a “hands-on” learning experience, you are required to use your equipment online including computer with software, encoder and sensors. Also required are: High speed internet, Skype™ software and user ID, headset and microphone.
is given, into which all concerns can be placed for the night. (When I first read this sentence, I discovered that I’d written “mental” box! I doubt that this unconscious association will be mine alone and makes the phrase even more evocative than I thought.)

After this are autogenic phrases for muscle heaviness and comfort; calm and regular heart beat, warm and relaxed solar plexus, effortless breathing, mind quiet and serene, and whole body relaxed and warm. An image of tension streaming down the body and out the toes is occasionally given. This is always accompanied by a descending glissando of the guitar. A musical vocabulary is thus established. Later, when this glissando occurs without the spoken script, without thinking, we know just what to do. After the autogenic phrases, and about 12 and half minutes into the CD, the words end and the soothing guitar music continues for ten minutes. Then the sound of ocean waves joins the music. By the end, the music fades and only the ocean waves are heard for the final four minutes. In total, the CD is 27 and one half minutes long. Listeners are likely to be sound asleep by this time or at least, deeply relaxed.

There are several things I especially like about this CD in addition to the script itself. First, is the voice. It is calm, steady, reassuring, with just the right pacing and phrasing. Too fast, and listeners have a hard time relaxing. Too slow, and the listener's mind can start to wander. Second, Teja Bell's music is ideal for relaxing, letting go of stress and drifting into sleep. The guitar uses just enough of an echo effect for a sustained flow of the melody that facilitates sustained letting go in the person. Behind the solo guitar is an ongoing background of even more sustained harmonics that blend into one another. This creates a continuous surrounding cocoon for the melody — and the listener — to float on. This “drone” background with its trance-inducing quality is typically used in Indian classical music but much less often in Western music. The listener is almost unaware of it, and it is ideal for a sleep tape.

The only element of the recording that doesn’t work as well for me as all the rest is the ocean surf sound. Track 1 ends with this and Track 2 consists only of this. This is an entirely individual response, I know. For me, the incoming surf “crashes” onto shore and has a stimulating rather than restful effect. Many people will find the surf sounds peaceful and relaxing. Bill is an avid sailor, so of course, this would be one of the most relaxing sounds in all nature for him. The sound isn’t too loud and since I’m usually asleep before this portion begins, it’s not really a problem for me.

Overall, the combination of the voice, the autogenic phrases, the music and the technical quality of the CD, create an excellent program for clients to use for sleep and for general relaxation and stress reduction.

Relax to Sleep is available from Bill Barton, Ph.D., at www.biobill.org or biobill@pacbell.net. It sells for $15 each or $10 each in quantities of 10 or more.

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<table>
<thead>
<tr>
<th>Services Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Data analysis</td>
</tr>
<tr>
<td>- Report Generation</td>
</tr>
<tr>
<td>- Medical Report Generation</td>
</tr>
<tr>
<td>- Consulting</td>
</tr>
<tr>
<td>- Clinical Applications</td>
</tr>
<tr>
<td>- Inquire About Affiliates Program</td>
</tr>
</tbody>
</table>

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Use of sEMG, Ergonomics And Body Mechanics Training in a Case of Repetitive Strain Injury
Janette Sperber

My client was a right-handed 23 year old Asian Pacific male with a diagnosis of Repetitive Strain Injury (RSI), referred for 6 sessions of biofeedback through Worker’s Compensation. He was employed by an architectural firm as an interior designer. His primary job duties involved using a stylus and Wacom table as a Computer Assisted Design (CAD) input device. His other work tasks involved some sketching by hand, selection of paints, and typed emails for about 20-30% of his workday.

At the time of referral, his symptoms consisted of R > L wrist, elbow and shoulder pain and burning. His L side symptoms were a result of switching the stylus to the left hand after onset of symptoms in his right side. He rated his R wrist pain at an average of 8/10 and his elbow/shoulder at 6/10. His left side was rated at 4/10. His symptoms began 5 years before, and were off & on depending on workload. However, 3 months before he came to me, his symptoms had worsened dramatically. He had already had a course of physical therapy, which resulted in only modest improvement.

Since he stated that his symptoms were aggravated by mousing, sketching and handwriting, the psychophysiological assessment included monitoring during simulated work activities. All monitoring data were hidden from the client during the assessment process. Several interesting findings were revealed: first, a paradoxical pattern of L > R activation in the upper trapezius/supraspinatus. For example, while typing a simulated email, the L upper trap averaged 6 - 7 mv, while the R was 4 - 5 mv (narrow band). Upper trap readings after the abduction challenge were 9.6 mv L / 6.5 R with no recovery.

The paradoxical sEMG asymmetry persisted in the upper extremities: during typing, the readings from the forearm extensors were as follows: 46 - 49 mv L / 20 - 28 mv R. The readings during stylus use were: forearm extensors at 30 - 40 mv; flexors 12 - 18 mv. This was from the R arm only, since he had gone back to using the CAD right-handed since developing symptoms in his L. The UE’s displayed good recovery post activity.

Dysfunctional posture and movement patterns were observed during keyboard and stylus use. There was constant mild-moderate deviation and dorsiﬂexion in the right wrist during stylus use. The left wrist displayed
mod dorsiflexion during keyboard commands associated with stylus use and during typing. Forward head position, rounded shoulders and posterior pelvic tilt were displayed while using the keyboard and stylus.

Respiration was shallow and thoracic during work simulation: 16 – 18 breaths/min. Hands were warm and dry during assessment and subsequent training.

The assessment concluded with a brief demonstration of the sEMG findings for his upper trapezius. He displayed some ability to control his tension with the biofeedback, but by no means was able to reduce his muscle activity to the target level (< 2 mv).

The treatment plan included the following: 1) correct the asymmetry in the UE/UQ by reducing activation of the L side during work tasks/movements. 2) train for quick recovery of the bil UQ post activity. 3) reduce sEMG levels from the R UE during stylus use through ergonomics, body mechanics training and sEMG feedback. 4) reduce sEMG levels from L UE during typing and keyboard commands through body mechanics training. 5) improve posture. 6) train for slow diaphragmatic breathing during work activities.

The second session took place 10 days later. He came in reporting that his shoulder symptoms had dropped to just 2/10, and in fact never reached over 4/10 again.

Since his R wrist symptoms were the most bothersome, at 5/10, we focused on reducing the wrist stress of his stylus use. I gave him a tubing sleeve that increased the diameter of his stylus, explained the importance of maintaining a neutral wrist, taught the microbreak technique and recommended he stop for a brief UE stretch every 30 mins. By the end of this session, he was using his newly enlarged stylus with 22 – 28 mv from the R FA Ext, and 4 – 5 mv from the RFA Flexors (compared to 30 – 40 / 12 – 18 initially).

By the fourth session, he was reporting lower UE symptoms, for example 3/10 in spite of an intense 10 hour work shift the day before. I recommended alternative ergonomic equipment such as a keyboard tray without a mouse wrist rest (the current mouse rest was interfering with his movement), and also an alternative mouse device for alternation with the stylus. The device I recommended was the Fellowes Micro Trak mouse which is primarily thumb-operated. Since he had no specific thumb symptoms I felt this device was a good candidate to “spread out the work” of mouse use between different muscle groups.

Hist sEMG levels during stylus use approached ideal: R U Trap was 4 – 5 mv, R FA Ext was 12 – 16 mv, R FA Flex was 6 – 7 mv, with excellent recovery during microbreaks.

In the fifth session he reported a maximum weekly symptom rating of 3/10 for his R hand and 1 – 2 for the elbow and shoulder. The session focused on teaching slow diaphragmatic breathing during work tasks. He not only maintained the correct body mechanics taught in previous sessions, but by the end of this session, he managed to breathe 6 – 8 diaphragmatic breaths/ min during stylus use.

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Continued on page 13
The LENS system can dramatically decrease the number of treatments for many of your clients. You may learn more about the Low Energy Neurofeedback (LENS) approach in *The Healing Power of Neurofeedback*, by Stephen Larsen, and issue 10/3-4 of the *Journal of Neurofeedback* devoted entirely to the LENS. Training DVDs are also available for purchase on our website: www.ochslabs.com.

OchsLabs, Inc. offers a number of trainings throughout the year for both the beginner and the experienced practitioner. The Foundations training is designed to teach assessment, introductory treatment planning, and software operation. The Advanced training is designed to teach advanced assessment, reassessment, and treatment planning.

### 2008 Foundations Trainings

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Registration details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 25-27, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Feb 8-10, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Mar 7-9, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>May 12-14, 2008</td>
<td>West Bloomfield, MI</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>June 20-22, 2008</td>
<td>San Antonio, TX</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Aug 25-27, 2008</td>
<td>San Antonio, TX</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Sept 19-21, 2008</td>
<td>East Coast</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Oct 3-5, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Oct 17-19, 2008</td>
<td>West Bloomfield, MI</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Nov 14-16, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
</tbody>
</table>

### 2008 Advanced Trainings

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Registration details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 15-17, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>Apr 4-6, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
</tr>
<tr>
<td>May 12-14, 2008</td>
<td>Daytona Beach, FL</td>
<td>Registration through <a href="http://www.aapb.org">www.aapb.org</a></td>
</tr>
<tr>
<td>Jul 25-27, 2008</td>
<td>Sebastopol, CA</td>
<td>Registration through <a href="http://www.ochslabs.com">www.ochslabs.com</a> or (707) 823-6225</td>
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<td>Aug 25-27, 2008</td>
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sEMG

Continued from page 11

In the final sixth session, the client reported UE symptoms levels of less than 2/10 and his shoulder at 0/10 (i.e., pain-free). He demonstrated right from the start that he could use the stylus correctly with a respiratory rate of 10 diaphragmatic breaths/min, which dropped to 5-6 breaths/min by the end of the session. Additionally, long-term pain management goals were discussed. Unfortunately, no follow-up was done after termination.

Discussion

This client was unusually quick to pick up and internalize the psychophysiological skills presented to him. In fact, his case illustrates the saying: “He took to it like a duck to water.” The first tip-off came when he came in for his second session with a significant symptoms improvement after having had less than 10 minutes of sEMG biofeedback at the end of his assessment. I believe his advantage came from a personal background of practicing qi gong and meditation. In particular, he was already aware of the advantage to performing any activity with slow, relaxed breathing, as well as having an already well-developed kinesthetic ability.

This case is definitely atypical, in my experience, given the rapidity of his improvement with biofeedback and ergonomics/body mechanic training. Normally I would not expect this dramatic and rapid improvement in someone presenting with relatively high pain levels and a 5 year history of symptoms. Furthermore, when a client continues to engage in full-time work, doing the same activities that injured him/her, this usually constitutes a perpetuating factor that significantly delays recovery.

It would be interesting to attempt to develop a screening tool to identify those patients who would gain the most benefit from biofeedback. I personally have always believed that patients who have a background in doing yoga, meditation, psychotherapy, dance, etc., have a “leg up” on the rest of the patient population when it comes to learning biofeedback skills. This, plus intelligence, a positive, open attitude and a strong motivation may explain this person’s dramatic improvement over 6 weeks of biofeedback.

California Biofeedback Wants to Hear from You

Because we realize that many of you have great things to share with our membership, but are bogged down with patients, clients, running your practice, etc., we have adopted a program which we hope will motivate you, BSC now offers a stipend of up to $100 for your article, review of a book or audio product, case write-up or other accepted piece which we publish. We hope this incentive encourages you to consider us for your next communication venue. Please contact editors Christina Malewicz (c.malewicz@yahoo.com) or Janette Sperber (jbs4@cornell.edu) with your submissions. The deadline for the next issue is May 15, 2008.
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In the PTSD Case Study, follow along as Sue works with Kevin, a 10-year veteran of the conflict in Bosnia. Some of Kevin's symptoms include sleep issues, panic attacks, nightmares, and depression. Watch Sue in action as she determines his optimal reward frequency. See how he changes and how she adjusts her protocols in response. In addition to the awake-state training, Sue’s use of Alpha-Theta continues to yield significant progress and by the end of 24 sessions, he is a self-reported “new man.” He is sleeping through the night without medication, able to go to the grocery store, the movie theater, and out to dinner for the first time in years.

After completing the training, Kevin writes, "My father told me years ago he was certain that someone would help me. You are the ones."
Neurofeedback Used to Assist with Cognitive Decline

Jay Gunkelman, QEEGD

The following is a brief report of a clinical case where Neurofeedback (NF) was used to assist with cognitive decline secondary to a stroke.

Gordon is a physician in his mid 60’s, having practiced for over 25 years in his specialty. He presented to one of Q-Pro Worldwide’s 12 clinical practice groups in early 2007, after seeking treatments for complications secondary to a thrombotic “stroke” (CVA) which occurred during a surgery three years prior to the intake examination. Gordon’s chief complaint was a poor working memory, seen primarily as delayed recall issues. He couldn’t recall any items after 2 minutes of delay, which made his return to clinical practice as a physician impossible. Using standardized scores, his intake IQ was 96, with an overall verbal ability of 117. His thinking efficiency was 104; cognitive efficiency was 86, working memory was 96, with a visual matching ability of 77; Visual-Auditory-Learning scored at 91 and delayed recall was very poor, at 46.... far below what you would have expected from a physician. The intake EEG and qEEG findings included the slower content in theta anteriorly, more on the right frontally, suggesting a localized disturbance, and with minor slow content bi-temporally, consistent with more generalized vascular changes commonly associated with aging (atherosclerotic changes). The decreased alpha and beta content was noted, with the alpha frequencies trending lower, also consistent with the reported cognitive decline. The frontal-parietal beta training was used to stimulate cortical function generally. Posterior temporal training was added symptomatically for comprehension and memory issues. Centro-parietal SMR type training was used to counteract any overactivation due to the beta training, as well as to help retrieve the thalamo-cortical alpha frequencies. Emphasis was placed on suppression of any slower transients.

Following 25 sessions of treatment over the course of almost 2 months, the client was retested: IQ was now 113, up 19 points, with his over-all verbal ability now achieving a score of 124. Thinking efficiency was now 115, with cognitive efficiency measured at 107 and his working memory now seen at 113, also up 19 points, with his visual matching ability seen at 97 and his Visual-Auditory-Learning now at 99 and delayed recall of 86, up 40 points.

The EEG changes were contingent changes associated with the training, including less slow content, and less temporal delta hyperactivity, suggesting an improvement in brain function, though there remains less faster activity than would be expected, there was also somewhat more alpha power in the follow-up data, with the emergence of a 9 Hz alpha peak, which is considered an improvement. There remained significant room for improvement, though these findings were improved over the prior study.

The improvement in the EEG was contingent to the training, and the associated cognitive changes were in the expected direction for the EEG improvements, with the frontal changes and alpha tuning changes both being associated with improved cognitive functioning. The changes in the EEG are summarized in the graphic taken from the qEEG processing. The doubling of power in alpha at 8-9 Hz and the reduction of the slower content, especially right frontally are noted.

Gordon returned to work full time as a physician now that his delayed recall was no longer a disability, though he continued for 20 more sessions with no real gains or losses in any—or-

Continued on page 16
Psychogenic Seizures  
Continued from page 1

his cognitive processing with the neurofeedback protocols I chose.

The first 5 of 25 sessions included training 9-11 Hz down at P4, as this frequency range amplitude was very high posteriorly. I used the NeXus 10 games as the feedback screens. He reduced the amplitude from the mid- to the low teens. I then trained comodulation up alternating on the BrainMaster and BioIntegrator (synchrony) for 12 sessions between F3 and F4 at 8-10 Hz (see the comodulation maps, Figures 3 and 4). Comodulation is a new feature on the BrainMaster and the client screens are still being perfected. So, interspersing the training with the fun puzzles of the BioIntegrator kept his interest. Comodulation measures increased by approximately 25%. At this point, the daytime seizure incidents were reduced to about half. However, he was having more intense seizures when going to bed which kept him awake.

We then continued the protocol but changed the sensor placement to P4 / T6, continuing with the alternating equipment. We were not as clinically successful in this phase of the treatment, which lasted 4 sessions. However, his seizure patterns continued to improve. The daytime seizures reduced to about once an hour, down from multiple times per hour and were much less severe in intensity. The night time seizures continued.

The remaining 4 sessions, we trained SMR up at C4. I used the BrainMaster as he enjoyed the puzzle feedback. I worked with Thomas from May until November, 2007. We reduced the session frequency from twice weekly, to once a week and then finally to one session every other week. I hoped to train him for a longer period, but his parents decided to enroll him in group therapy to enhance his social skills. Due to limited funds, the family did not opt for another brain map, so I cannot provide post results. However, at recent follow-up, Thomas continues to maintain the lowered incidence and intensity of the daytime seizures and is planning to start at the local college in a few weeks.

![Figure 3](image1)

![Figure 4](image2)

Neurofeedback Assists in Cognitive Decline  
Continued from page 15

orthogonal testing categories other than an additional gain in delayed recall with a score of 90.

Unfortunately, recently the client has had a recurrence of his underlying condition (thrombotic CVA), although this time when he regained awareness he asked for more NF work immediately upon recovery, in addition to the therapy offered by his traditional health plan.

Special thanks to Dr. Curtis Cripe and his entire clinical team at Crossroads Institute and Clinic in Scottsdale for their work with this client.

![Image](image3)

![Image](image4)

Neurofeedbackers: Join this new Clinical Research Consortium!

Neurosynch, a R&D focused company, is interested in organizing a clinical research consortium to collect pre and post data on specific populations receiving neurofeedback treatment. The protocol would include pre and post qEEG, Quality of Life Inventory, Life Stress Inventory, and specific Neuropsych Tests. The data will be independently analyzed with the intent to publish results and provide pilot data for future research grants. Interested clinicians please contact Sandy Ackerman at (760) 436-4896 or email sackerman@neurosynch.com. More info on Neurosynch can be found at www.neurosynch.com.