Neurosocial Engineering:
Frontal Lobe Reorganization
William J. Hudspeth, Ph.D., qEEG-HD Neuropsychometrix

Neurofeedback practitioners are involved in engineering tasks by which operant conditioning procedures are used to alter brain processes to moderate behavioral functions that have critical social consequences. In this regard, frontal lobe integrity appears to be an essential condition for the development of affective, intellectual and moral regulatory skills that are needed to navigate a lifetime of social engagement. When frontal lobe functions do not develop or are otherwise impaired, affected individuals often have difficulties in regulating various aspects of their lives.

The principal difficulties in regulatory skills appear during adolescence and they call for an inquiry into the details of psychological development. The qualitative characteristics of emotional, intellectual and moral development are described in the works of Piaget and Inhelder (1966), Kohlberg (1969) and Riegel (1973). The final stages of maturation (i.e., formal and post-formal operations) coincide with adolescence and appear to be most closely related to frontal lobe functions, i.e., the ability to subordinate emotions, thoughts and moral judgments to rules based on their priority, practicality and propriety.

Hudspeth and Pribram (Hudspeth, 1985; Hudspeth and Pribram, 1990, 1992) computed maturation curves for normative EEG spectra, using data presented by Matousek and Petersen (1973). These findings show that regional EEG spectral maturation exhibits cycles that are coordinate with the stages of emotional, cognitive and moral development presented by the Piaget-Kohlberg-Riegel model. Figure 1A presents compressed spectral arrays for the developing EEG spectra that are decomposed into infant, transitional and adult spectral profile components, within 4 different brain regions. (See Figure 1 on page 12.)

The EEG spectral arrays in Fig. 1A show that maturational changes progress from posterior to anterior, as depicted in columns PO, TT, CC and FT, respectively. These changes show that early maturation deals with sensory skills (PO, TT), then with organization of sensorimotor skills (CC) and, finally, with frontal lobe integration of posterior systems for experience and action to assure they can be subordinated within plans and strategies for behavior according to their priority, practicality and propriety. Hudspeth and Pribram (Hudspeth, 1985; Hudspeth and Pribram, 1990, 1992) computed maturation curves for normative EEG spectra, using data presented by Matousek and Petersen (1973). These findings show that regional EEG spectral maturation exhibits cycles that are coordinate with the stages of emotional, cognitive and moral development presented by the Piaget-Kohlberg-Riegel model. Figure 1A presents compressed spectral arrays for the developing EEG spectra that are decomposed into infant, transitional and adult spectral profile components, within 4 different brain regions. (See Figure 1 on page 12.)

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The foregoing discussions show that the neurobiology of frontal lobe
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Summer is on its way and so are our annual regional meetings, both Northern California and Southern California. Your Board of Directors has been meeting frequently to bring a great variety of experience for your sampling at these meetings.

For our Society to continue to thrive and bring you the programs you enjoy, I am suggesting that each of you ask friends, colleagues, and businesses you know to contribute to the BSC. We are a non-profit educational organization and donations are tax deductible. We can use this money to pay for speakers who deserve compensation for bringing us greater understanding and professional skills.

It seems that money is always the primary concern of whoever is the president of any society or association. It is the heartbeat that provides life and health to the membership through educational programs. I urge each of you to become more involved with your Society. Please remember that when you bring 2 new members to BSC, you will get free CEUs.

Biofeedback is receiving more notice due to a burst of energy being created by discoveries in cognitive neuroscience. There is a union among academic disciplines that is really making the entire field of neuroscience a very fertile ground in which to plant the seeds of progress in all areas of healthcare. This puts biofeedback and neurofeedback in a position of prominence.

At this summer’s regional meetings and even more at this November’s conference in Irvine, you will have a chance to hear some of these wonders spanning many different professional areas of interest.

I look forward to meeting and greeting each one of you.

James E. de Jarnette, M.A., Ph.D., President, BSC

From the Editor

I hope everyone is enjoying the warming season and the increase of sunlight. We are seeing an expansion in the field of biofeedback as well, with ever more innovations with using neurofeedback applications. In this issue, we bring you a fascinating article by Bill Hudspeth that examines the correspondence between the maturation of EEG spectra during adolescence and the stages of emotional, cognitive and moral development.

We are honored to include a truly amazing article by one of our well-beloved pioneers, Joe Kamiya. He discusses the need for increased public awareness of the uses of biofeedback, and how biofeedback can be utilized with “normal” populations. The most intriguing part of his article for me was his description of the role biofeedback could play in conflict resolution situations, or simply as a self-exploration tool in a group setting. Be sure to share this issue with any psychotherapist friends who aren’t in the BSC!

And finally, Doug Drucker presents a case study of a worker’s compensation client, in which biofeedback is one modality in a comprehensive treatment approach including EMDR, vocational counseling and psychotherapy for codependency issues.

We offer to the community a space called the “Clinician’s Corner”, where we can share interesting and/or unusual clinical anecdotes with each other. Perhaps you may be inspired to write about a particularly meaningful insight into yourself as a clinician, or what makes it all worthwhile to you, etc. Please do not hesitate to
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Helping Clinical Biofeedback with Non-Clinical Applications

Joe Kamiya, Ph.D.

Currently, biofeedback is used almost exclusively as a clinical tool and is primarily thought of as such by members of its professional organizations. This is hardly surprising. Its utility for helping clients recover from a variety of disorders is well established, and with continued improvements in physiological knowledge and in monitoring technology there is good reason to expect that biofeedback of many functions will eventually become established as a standard component of professional health care practice.

However, this acceptance and use of the technology by the public and the established professions has been slower than might have been expected. To correct this, a multi-pronged effort of several kinds is needed, from increasing the evidence of the efficacy of various clinical biofeedback applications, to educating policy making and funding agencies at federal, state and local levels. Those who are currently working on these fronts are to be commended and encouraged to continue. Here I advocate an additional effort to accelerate the acceptance of biofeedback: Increase its public visibility by using current or new biofeedback applications for the much larger population of persons who do not suffer disorders requiring clinical treatment. The more the public sees biofeedback of any kind in action, the more it will be talked about. This should help achieve a most important requirement, which is the public’s awareness of biofeedback’s basic principle -- that all persons can be taught to gain self-control of a broad range of their physiological functions, with the aid of skilled trainers and instruments.

Persons who understand the principle of biofeedback, in contrast to those who do not, will be more likely to regard biofeedback as a credible treatment for a disorder they or their acquaintances may have. Consequently, seeking the help of a clinical biofeedback practitioner would become more likely.

Fortunately, we are already increasing the visibility of biofeedback to some degree by the use of the home training unit. The reduced size of today’s biofeedback equipment as well as the ease of storing training protocols on removable computer disks now makes the take home unit practical. As Cindy Kerson has discussed in the last issue of this Newsletter, the result is increased availability and reduced cost of biofeedback for the client, thus paving the way for much wider usage. The presence of biofeedback equipment in homes and workplaces increases the chances the client will show it to friends, family, coworkers and health practitioners, and discuss its principle of operation and its utility for treatment. This would also add credibility to clinical biofeedback and increase the demand for its use.

The non-clinical uses proposed below could also increase public awareness and acceptance of the conceptual base of biofeedback as a learning tool. The following are only a few examples of the wide variety of ways biofeedback can be used outside the therapeutic setting:

1. Enhancing cognitive functions for the general public. The use of EEG and HEG protocols currently being used for the treatment of ADHD, learning disabilities and autistic spectrum disorders can easily be tried, with or without modification, for persons who do not have such disorders. The goal would be significant improvement of all cognitive measures. Especially worthy would be trying out such protocols with normal school children for improving school performance. Private communications with clinical practitioners indicate that formal studies using similar protocols with the cognitively non-handicapped should show significant improvement in cognitive performance tests and school performance. If the studies do result in showing substantial improvement in cognitive functions, I would imagine a large increase in demand for the use of the method, especially by parents anxious to improve performance of their children in school.

2. Interpersonal conflict resolution: The electronic referee. One method proposed here could be attempted with two persons who wish to resolve some conflict between them. They would be seated in two separate rooms, each participant in a seemingly conventional biofeedback session, with each person provided a computer-controlled display of one or more measures of his or her autonomic activity. However, also in each room is a video/audio communication system, which permits each person to see and hear the face and voice of the person in the other room. The task given the two would be to use this communication system to discuss their differences.

The distinctive feature of the communication system is that it is controlled for both persons by the same computer which controls the biofeedback displays, but in the following additional manner: The computer first combines the measures of physiological stress of the two persons into a single index, which then controls the video/audio display. The computer is programmed such that whenever the average of the physiological stress measures of both people is greater than a level set by the trainer, the video/audio communication system automatically turns off. Only when the average of the stress measures of both

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Non-Clinical Applications

Continued from page 5

people is less than that level can the persons see and hear each other, and communicate.

Since each person gets his or her own private biofeedback display, the person contributing more than the other to the interruptions of the communication path will be known to both persons. Under the conditions of this setup, both persons must of course learn to keep their own autonomic functions under control during the communication process. But the dynamics of maintaining communication will be more complex. Each person must learn to communicate in such a way as to minimize stressing the other person, to avoid the consequent autonomic response that would cut off the communication. But, also because the stress might trigger a defensive, possibly hostile communication from the other, leading to an increased stress response by the first person, again increasing the likelihood of loss of communication. All this must occur while the two try to communicate on an issue on which the two disagree. Thus the system may function as a kind of "biofeedback referee" of the interaction.

The proportion of time spent in the session in full, unimpeded communication could be one measure of interaction, as would be the temporal distribution over the session of moments of full communication. Several problems of conducting and assessing the outcome of this experiment will need to be faced, such as normalizing the range of responses for each so that they do not contribute unequally to determining the average because of a difference between them in the range of autonomic stress responses (as determined by baseline pretests). However, the basic concept of this kind of experiment is sufficiently intriguing to merit some exploratory work.

3. Multi Person Games that are competitive and cooperative. Most biofeedback systems now on the market have incorporated some type of game as an option for providing feedback to the individual of progress in achieving self-control. These can be adopted for groups in many instances. They can be arranged to provide competition or cooperation or both.

(a) A competitive Skin Conductance game for two people. This game was developed about 20 or 30 years ago as a commercial product by a biofeedback equipment dealer who stopped sales after only a brief period of time. As far as I know, neither dealer nor manufacturer is known today. The game was played somewhat as an electronic tennis game, as follows: On a display placed between the players, a ball started from the center of the display and moved toward the player who had the higher skin conductance, that this game becomes a high school team sport with tournament competition among schools will be the day to celebrate the birth of our culture’s recognition of the value of psychophysiology and biofeedback.

(c) Single groups of individuals connected in the same chain fashion as above can simply strive cooperatively, without any concern about the performance of other groups, to achieve the lowest collective conductance possible, the aim being to assess the associated subjective experience for the members of the group. One preliminary effort of

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with the rate of movement proportional to the difference in conductance between the two players. If the direction of movement was sustained, the ball would reach the edge of the screen corresponding to the player with the higher conductance, causing a point to be awarded to his opponent. The ball would then return to the center, to start another tussle. The challenging part of the game was that as the person with the lower skin conductance managed to push his or her ball near the opponent, the arousal accompanying the anticipation of winning a point would cause the ball to start reversing itself (unless the opponent was not equally or more aroused by the threat of losing). With today’s laptop computers and with several multimodality-multichannel monitoring systems available commercially, the game could readily be programmed and improved over the original stand-alone system. For example the computer could automatically make the game equally difficult for both initially.

(b) The same game could be played by teams of opponents, with the total conductance of each team becoming the contested point. This can be obtained by having the team players hold hands to form a chain with the member at each end of the chain being connected to the conductance measuring device. (If holding hands is resisted by some, short pieces of pipe could be held as connectors between the members of the team.) The day this kind resulted in increased senses of calmness and group solidarity as the group succeeded in progressing to lower conductance levels.

A note regarding the physiological modality to be used in multi-person biofeedback studies: Skin conductance was the modality chosen for describing the nature of the interaction process in the suggested studies above. However, many other modalities might have served as well to evaluate the stress response levels, and hence to control the feedback signals. Indeed, optimal results might be achieved by using combinations of modalities.

4. Self exploration and exercise: The psychophysiology gym. There is a strong natural curiosity in nearly all persons for glimpses of their physiological systems at work. The means for exploring these, particularly those in which variations over time have conscious correlates, can be made available on an ad lib basis, in schools, homes, community centers, recreation facilities, with helping personnel on hand where needed. Some psychomotor instrumentation would also be helpful. A start for a psychophysiological Gymnasium might include the following: Simple reaction time. Complex reaction time. Weekly TOVA-type tests, Skin temperature, SCL, EEG, EMG, HR, HRV, HEG, Pulse wave velocity (a beat by beat indirect measurement of blood pressure), Blood Volume Pulse, Respiration rate.
Jeff Cram Remembered

With the recent passing of Marjorie Toomin, and now the passing of Jeff Cram, I am moved to reflect upon the fact that we have in such a short time lost two good warriors and gifted spirits in the field of biofeedback and psychophysiology. I knew Jeff for many years. I met him in the late seventies or early eighties, and was always impressed with his dedication and devotion to both biofeedback and optimal performance. I enjoyed reading his many articles and appreciate the fact that he wrote extensively on sEMG. He provided a lively perspective regarding functional EMG and the applications of biofeedback. I also felt he embodied some of the best aspects of what a biofeedback practitioner could be in his dedication to scientific inquiry, functional improvement, and human development. He was a wonderful spirit, with a great sense of playfulness and enthusiasm. He left us too soon, and I will miss his contributions and our conversations.

— Steve Wall, M.A.

Jeff seems to always lead ahead in the travels of space and time...he seems to be steps ahead in the Journey in that he explored meditation, flower essences, prayer, healing and consciousness and breath work and there was the renegade scientist in there too. He won’t be missed by me in the sense that his values can live thru me when needed. I hope he finds his way to the Clear Light where he will be gracefully re-membered!

— Jacques Kelly

It was probably only in the last 10 of my 20 years in biofeedback that I knew Jeff. Although Jeff has always been warm and generous to share professional information, my fondest memory was at the 1998 BSC conference in Valencia when I was President and a group of us went to play golf next door to the hotel. It was a fun night and the goofiness that prevailed on the miniature green golf course, a culmination of the preceding year’s board business anxiety, was a pleasure to share with Jeff. He was always helpful and supportive to me that year and I have always been in awe of his creativity and devotion to biofeedback. If he lived next door, I am sure that I would have enjoyed a deeper friendship. My thoughts are with him and I am happy to know that I can grieve in Austin with other bio-buddies!

— Steve Kassel, M.A.

On March 2, Jeff Cram succumbed to a rapid illness. Jeff was a powerhouse in AAPB, a prolific writer, teacher and clinician. He recently authored a chapter in the new AAPB Home Study series. Shortly before his death, he offered to provide several audio publications to AAPB and we are pleased to continue his legacy. This year, Jeff will receive the AAPB Presidential Recognition Award from President Steve Baskin. Jeff’s wife has made a special request. A grandchild will soon be born into their family. While Jeff may be known to his grandchild through photos, his wife Theodora asks members who knew him to send her any stories, vignettes, or memories of Jeff. You can reach Theodora at truffles@jps.net

A Jeff Cram scholarship is already in the works. AAPB presented a plaque to his widow during the awards ceremony and at the same time announced the scholarship for the student doing the best EMG related paper. Jeff contributed some of his CDs for AAPB to sell to finance the scholarship.

— Rich Sherman, Ph.D.

For more than two decades I always looked forward to attending biofeedback meetings, workshops and conventions because I knew I might have a chance to chat with my dear friend, colleague and mentor, Jeff Cram. We had many opportunities to share some time at the end of a convention day. I always considered our careers remarkably parallel — with two big differences. First, while I was always narrowly focused, Jeff was always looking at the bigger picture. In my imagination I see Jeff as kind of octopus, with a hand in many different and diverse subjects. Hardly anything was outside his range of interest — and research.

The second difference was that — although we never discussed it directly — I always knew in my heart that he was simply a better person than I. “Morally superior” doesn’t convey the right sense; it was never something he claimed. But I could just TELL that I was in the presence of a GOOD MAN. I enjoyed his company and his love of biofeedback. Last June at BSC he introduced me to Theodora, and I was thrilled by the new joy in his eyes.

We worked together on many projects, some of which we never finished, and now we never will. I am deeply saddened by his premature death.

— John Perry, Ph.D.
This year’s AAPB conference was in Austin, Texas during the first weekend in April. Creating the Next Step: Honoring Tradition and Embracing Science was its title and it was just that. We had the honor of being induced into a relaxed state by the master of relaxation, himself - Dr. Herbert Benson.

We were then introduced to many scientific ideas about the emotion of rejection, seizure disorder, brain plasticity and heart rate variability, to name a few.

However, it was outside the classroom and lecture hall that we enjoyed the company of our colleagues from across the States and shared the fruits of the past year’s labors!
Mark Your Calendar!

Northern California Regional Meeting
June 11th in San Francisco
Jay Gunkleman – From the Pathophysiology of Clinical Disorders to the Mind /Brain Model
Alicia Schaffer – Understanding Repetitive Strain Injury
Peter Litchfield – Are Your Clients Overbreathing?
Kris Sharp – Worker’s Compensation Update
http://www.biofeedbackcalifornia.org/conferences.htm

Southern California Regional Meeting
June 4th in Pasadena
Victoria Ibric – Enhanced Neurofeedback Type of Training
Hershel Toomim – Treatment Efficacy Workshop
Caroline Grierson – Understanding RSD
Steven Kassel – Biofeedback For Stress In The School Setting
Kris Sharp – Worker’s Compensation Update
Siegfried Othmer – Is There a Generalized Theory of Self-Regulation in Our Future?
http://www.biofeedbackcalifornia.org/conferences.htm

2005 Conference
November 4th, 5th and 6th
Irvine, California
Preliminary Line Up:
Wes Sime, Carolyn Yucha, Naras Bhat, Peter Litchfield, and Mark Waller

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Note: this story is “from the vaults” but remains relevant today.

In 1990, I was both a fledgling biofeedback practitioner and a chronic pain patient with severe and persistent posterior neck pain related to a 1988 car accident. I tried many different therapies for the pain, one of which was the Alexander Technique. For those who are not familiar with it, this is a movement therapy approach that was originally designed for actors, to improve vocal quality. Today, Alexander Technique teachers are more focused on head and spine positioning and they work with musicians, actors and people in chronic pain. This approach was especially appropriate for me, since like many patients with neck pain, I had a “forward head” position, where the head is carried forward from the neck.

After a series of Alexander lessons, I noticed a significant improvement in my neck pain, especially right after sessions. I began to wonder if surface EMG could document what was happening in my cervical muscles, which might shed light on the improvements that I experienced.

So, in 1991, I set up a quasi-experimental situation, in which an Alexander Techniques teacher agreed to come to the biofeedback office to help me assess sEMG differences between faulty vs. correct head positions. I chose 3 different bilateral electrode placements: one on the upper cervicals (as high as possible against the hairline, approximately C-4), one on the upper trapezius, and one on the suboccipitals. I used the triangle formation electrodes with the plastic body to monitor the suboccipitals. The 2 active electrodes were placed horizontally across them, with a separate reference electrode on the neck. Electrode gel was applied to the 2 active electrodes and the electrode housing was held in place with a headband (Nowadays I would probably just use EEG paste).

The teacher began to guide me in releasing my cervical musculature, and after about 15 minutes, we both agreed that I had reached the most ideal position. The teacher assessed my posture at that time as “improved” and I felt a relief of tension in my cervical area. When I reviewed the EMG data, there were surprisingly few changes in the cervical and upper trapezius readings, however there were dramatic differences in the suboccipital readings during the faulty (my “normal”) head position compared to the ideal position. The suboccipital readings dropped dramatically in the ideal position, and increased immediately in the forward head position, while the other muscle groups remained basically unchanged.

The implications are that suboccipital monitoring may be required for people who have cervical and/or head pain, and that cervical or trapezius monitoring alone could be insufficient to assess muscular dysfunctions in the neck. I may say, since that time I have seen only a small minority of my clients register elevated cervical sEMG, no matter how much neck pain they have. When I have assessed their suboccipitals, sometimes I find elevations hiding there, sometimes nothing. Usually, the findings in the suboccipital area are the most robust when the client points to that area as the focus of his/her pain. In my experience, a narrow bandwidth reading of less than 3 uV indicates relaxation, while readings of 15 uV and over are common with the forward head position.

... a narrow bandwidth reading of less than 3 uV indicates relaxation, while readings of 15 uV and over are common with the forward head position.

Janette Sperber, MS

Clinical Corner

Cervical sEMG Activity & the Alexander Technique

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Neurosocial Engineering

Continued from page 1

maturation is coordinate with behavioral accounts of childhood and adolescent judgment, i.e., the Piaget – Kohlberg - Riegel model. This correlation establishes some of the necessary conditions for a neurosocial engineering agenda that is familiar to most clinicians. On the average, knowledge of frontal lobe developmental status should convey an actuarial prediction about an individual’s judgment skills and, conversely, deviations in judgment skill should lead to predictions about frontal lobe maturation. Some key strategies in this agenda are currently in place.

The American and Missouri Psychological Associations use neurobiological studies of frontal lobe maturation in their amicus curiae brief (2004) to the U.S. Supreme Court to argue that the death penalty for juvenile (i.e., < 18 years) offenders constitutes cruel and unusual punishment that is inconsistent with intentions of the Constitution. They observe that, “Adolescence is a period in which character is forming and often involves heightened risk-taking and even criminal conduct which are moderated or eliminated by the individual in adulthood”. Neurotherapists often work with clients who have problems with impulsive judgment and aggression. There is very little doubt that such problems are likely to occur when a client’s frontal lobes are undeveloped or delayed in maturation as is indicated by excessive slow-wave (delta and theta) activities that can be suppressed with neurofeedback training (Monastra, et.al., 1999).

There is every reason to look into future developments because excessive slow-waves are probably not a causal factor, but rather an outcome that arises when, for example, a brain region is disconnected from control pathways, such as the frontal lobes (Barlow, 1993). Niedermeyer and Naidu (1997) have suggested that ADHD arises when the sensorimotor system is disconnected from frontal control pathways. These papers outline necessary engineering tasks for assessing neuronal control pathways in a manner that supports congruence between neurofeedback practices and neuroanatomical facts.

References


Figure 1:

A. Four-band (δ, θ, α, β) relative power EEG spectra in 4 different brain regions (PO, TT, CC FT) that are each divided into a raw and 3 independent spectral feature arrays: original data, mature, transitional and immature (top, 2nd from top, 2nd from bottom, bottom, respectively). The sum of the 3 spectral feature arrays is identical (i.e. 99.4%) to the original EEG data arrays. Each array shows the progressive changes in relative power spectra from 1 (bottom) to 21 (top) years of age.

B. Incremental growth (%) in the frontotemporal (FT) region between 1 and 21 years of age. Growth curves are based on direct increments the raw data (D) or on increments in Varimax factor loadings (V) which are less likely to contain sources of error. These data show relatively uneventful growth increments until 17 years of age, at which time, there is a major growth spurt that appears to continue beyond the last observations at 21 years of age.

Complete details are in: Hudspeth and Pribram, 1992.
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**Author’s preface**

In conversations with many colleagues, I have heard numerous reports of a reduction of worker’s compensation referrals for biofeedback over the last year due to the changes in state legislation, and the temporary adoption of the ACOEM Guidelines for California practitioners. However, I have not seen a reduction in referrals. This may be due to the fact that I integrate biofeedback as part of a health psychology practice, am a licensed practitioner, and I have maintained a good network with doctors, nurse case managers, and claims adjustors. I offer this vignette as a possible approach to integrating biofeedback into a more general systems approach. In doing so, I am not advocating that biofeedback needs to be integrated in such a way that it is not recognized as a valuable stand-alone treatment, (I want no part in that old debate!). However I believe we all recognize the need for acceptance of our methodology within the professional community, especially within the changing, fragmented, and often chaotic world of insurance practice.

**Delia’s Story**

Delia is a forty-two year old female pain patient referred by her primary care physician, a psychiatrist, for evaluation for behavioral pain management and treatment of depression and probable posttraumatic stress disorder. She presented with headaches, head pain, depression and anxiety. Delia was pulled by her hair into a beading machine, at a roof cap factory, which cut deeply into her scalp, requiring two surgical procedures at the time of the incident, and a follow up plastic surgery to reduce the amount of visible scarring.

The initial interview revealed reoccurring flashbacks, nightmares, and intrusive persistent thoughts related to her work injury. The flashbacks included feeling as if the event was reoccurring. She showed signs of physiologic distress at exposure to cues that resembled or symbolized the event. She showed a marked diminished interest in pleasurable activities. She showed a restricted range of affect. Delia was often irritable, hyper vigilant, and had an exaggerated startle response. Delia also exhibited a sleep disorder. The overall disorder has maintained for longer than a one-month period of time. Those familiar with the diagnosis of PTSD know that I have just “gone down the PTSD list of criteria.” Delia qualified as having Posttraumatic Stress Disorder 309.81 as well as having a pain disorder with both psychological factors and a general medical condition. 307.89.

Testing revealed severe depression, severe anxiety (Beck Depression Inventory and the Beck Anxiety Inventory). The Draw-A-Person Test (the test is simple, a blank sheet of paper is given to the client and they are asked to draw a person, whole body, no stick figures) possibly showed a person who had a good sense of self, was independent, felt diminished by circumstances, had a loss of ego strength, a loss of self worth, had some loss of interpersonal contact, felt pervasively helpless and hopeless, felt isolated and small, had a strong sense of aesthetics/beauty, was identified with her femininity, had a loss of libidinal energy, had a loss of will, was emotionally regressed and felt infantile. (I like the DAP for many reasons, it provides a quick “look” into the client’s internal milieu, it provides body data, and it is easy and quick to work with, the limitations are that the data may not be reliable).

I chose to begin work with EMDR treatment with Delia. She showed heightened arousal, due to her recent trauma. Due to the severity of the traumatic event, it seemed logical to help reduce arousal and the net effect of the trauma before providing coping mechanisms. I have found EMDR to be an effective tool, designed specifically for PTSD by Francine Shapiro, Ph.D. I used the Neuortec device which included two hand held sensors (which generated a set of vibrations into the palms), and a set of earphones (which generate alternating beeps). I believe the EMDR enhanced her nervous system’s ability to process emotionally charged data by moving the data through the corpus collosum, and possibly integrating memory more fully through the two hemispheres. Delia participated in three sessions which quickly reduced anxiety, helped her identify the specific memories that were bothering her, and initiated her process with an experience of effective treatment.

The second step was biofeedback. We initiated a series of sessions designed to help her learn diaphragmatic breathing, establish the RSA pattern, reduce muscular tension, and learn hand warming. The initial sessions focused on breathing, learning about the equipment and understanding her body signals. As Delia was able to establish consistent results with the RSA and breath work, we incorporated sEMG training within the upper quadrant including trapezius and temporalis placements. The final psychophysiological work was done with hand warming using bilateral thermistors. At the end of each session, the patient was instructed to relax and observe EDA (I use a Biointegrator system and love the mandalas for relaxation/BSR work). BSR is a skin conductance system that is more reactive than SCL; I find it more useful as the numbers provided are larger and more expressive than SCL. Delia was able to consistently produce changes in her physiology and reported reduction of depression and anxiety.

The third phase of treatment ordinarily is focusing on return to work, perhaps including vocational rehabilitation. In this case another issue arose during treatment. Delia’s husband, an active alcoholic, generated a series of disruptive events that “grabbed” Delia’s attention. We spent a few sessions helping her look at her codependency issues, finding effective boundaries.
within her marriage and helping her identify a pattern of abusive relationships. In addition to her "unsafe" marriage, her work environment was physically unsafe. She agreed to become proactive in monitoring her relationships and to take proactive steps to ensure her physical and emotional safety.

Phase four of treatment involved Delia achieving the status of permanent and stationary, which is worker’s compensation’s language for having achieved reasonable expectations of medical goals, and focusing on vocational rehabilitation. At the end of treatment, Delia was enrolled in a program to train her to be a medical translator (English and Spanish). She was delighted with her progress and grateful for the help. She was a joy to work with.

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contact me if you have any questions about this!

The BSC wishes to acknowledge Shari St. Martin, who made a generous contribution toward the expenses of publishing this newsletter. We also must acknowledge with sadness the passing of Jeff Cram, whose work has advanced the field of SEMG biofeedback tremendously. Jeff, you will live forever, not only on our bookshelves, newsletter.

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