FROM THE EDITOR

Double Special Issue on: 1) Coding, Billing and Reimbursement, and 2) Nursing Research in Psychoneuroimmunology

Donald Moss, PhD

This Winter 2003 issue of Biofeedback offers a “double header.” First, Sebastian Striefel, Robert Whitehouse, and Ronald Rosenthal present a series of articles on billing procedures, the coding of biofeedback services, and reimbursement issues. Managed Care has changed the world of health care dramatically, and the area of billing now presents serious potential problems for the health care professional. The authors present guidelines designed to serve the patient’s needs, optimize reimbursement, while protecting the provider from potential liability for fraud. This special section originated as a symposium at AAPB’s annual meeting in March 2003.

Next, a special section highlights the extensive research of nurse scientists in psychoneuroimmunology (PNI). Sharon Lewis overviews the field of PNI, which she defines as the “multidisciplinary field of inquiry about how the mind influences the neuroendocrine and immune systems.” She reviews the relevance of PNI principles for clinical research and practice. Five short articles then feature the work of nurse scientists, pursuing research into breast cancer, HIV, Alzheimers’ caregivers, and maternal-infant interactions.

Feature Articles. Jeffrey Leonards presents a second article in a series on Sport Psychophysiology, reviewing today’s common applications of biofeedback and biological monitoring to sports performance. David Siever continues his special series on audio-visual entrainment (AVE).

In a special editorial, Jeffrey Leonards presents a tribute to the inspirational determination of Lance Armstrong, the cyclist and five time winner of the Tour de France, who stands as a symbol of the pursuit of human potential which biofeedback also stands for. Armstrong has pushed past illness and adversity to consistently reach heroic levels of achievement in sport. The editorial section also includes an article from Celeste DeBease on important changes in BCIA certification requirements.

AAPB News and Events Section. Finally, AAPB President Lynda Kirk, President-Elect Steve Baskin, and Executive Director Francine Butler offer their current perspectives on events shaping professional research and practice today.


Watch for your AAPB Ballot in early January.
Abstract: The author introduces a special section of articles on billing, coding and reimbursement issues in clinical practice. The author examines the impact of managed care on billing, and coding practices. Ethical practice places priority on the needs of the client, above those of the provider, and regardless of reimbursement.

Managed Care (MC) has changed the world of healthcare dramatically and many providers would say that the overall impact has been negative. The courts seem to agree because Managed Care Organizations are slowly being held more accountable for the decisions that they make. Yet, there are two sides to every issue. Durfee (1997) has argued that the old “fee for service” approach to reimbursement was subject to over-utilization because there was no incentive to quickly improve the health care status of patients. Of course, others argue that capitation and other MC approaches result in underutilization of services and even harm patients. The arguments go on and on. Durfee (1997) also stated that “good” physicians, and one could add “good” providers, function well regardless of the system of reimbursement and “bad” providers do poorly regardless of the reimbursement mode. Suffice it to say, that “first and foremost are the best interests of the patient” and that does not depend on the method or reimbursement (Durfee, 1997; Barnhill, 1998; Striefel, 1995). The needs of the client should guide providers in everything they do or don’t do in their practice activities. In the conflicts created by the MC environment, the needs of the client should take precedence over those of providers (Barnhill, 1998).

This issue of Biofeedback includes a number of articles that discuss various issues and perspectives related to billing, coding, and reimbursement. The articles were part of a symposium presented at the 34th Annual Association for Applied Psychophysiology and Biofeedback Conference in Jacksonville, Florida, March 28, 2003. The symposium was organized by Robert Whitehouse and Sebastian Striefel served as the chair and discussant for the session. Many attendees requested that the information presented be made available in written form. As such, the articles in a slightly modified form are being presented herein.

The intent of this series of articles is to clarify various issues related to billing, coding, and reimbursement and hopefully that will help readers be more effective and efficient in coding and billing and in being reimbursed for the services that they provide.

References


Billing, Coding, and Reimbursement Issues

Sebastian “Seb” Striefel, PhD, and Bob Whitehouse, EdD

Abstract: Considerable confusion seems to exist concerning how to go about correctly and ethically billing, coding, and getting reimbursed for biofeedback and related services. This article discusses some of the commonly used billing codes and the limitations thereof. Practitioners need to establish good working relationships with third-party payer personnel so that they can learn the rules and regulations of each payer concerning coding, billing, and reimbursement. Failure to know and abide by state and federal laws, and the rules and regulations of third-party payers can result in severe penalties in the form of fines and/or jail time, damage to the practitioner’s reputation, loss of referrals, and distrust by patients. Learn to code, bill, and seek reimbursement within legal and ethical guidelines.

Introduction

Considerable confusion seems to exist among practitioners about how, within an ethical and legal framework, to correctly code and bill for biofeedback and related services to maximize the probability of being reimbursed. This seems to be particularly true in areas like EEG biofeedback, surface EMG (sEMG), and sometimes also with incontinence work. One intent of this series of papers is to help provide some useful information on what is working for at least some practitioners.

Some other related but complex issues follow: 1) What is the “down coding?”  2) What are relative values determined and how can they be changed?  3) How do providers avoid engaging in fraudulent behavior?  4) What is “down coding?”  5) How are relative values determined and how can they be changed?  6) How does a provider go about dealing with Medicare?  7) How can providers avoid engaging in fraudulent behavior?  8) What are the rules about using or not using multiple codes within a session?  9) Who can use the new Health and Behavior Assessment/Intervention codes, 96150-96155?  10) When is it appropriate to use a biofeedback versus a psychotherapy code?  11) How can providers go about influencing insurance companies to reimburse for biofeedback and related services?  12) How do certification and licensure influence what is happening or not happening?  13) What kind of research support is needed currently to enhance the status and recognition of biofeedback and applied psychophysiology? Clearly each of these issues is important, but it will not be possible to address all of them in this paper or even in this series of papers. For more information see Striefel, Whitehouse, and Schwartz (2003) and the specific rules and regulations of the various third-party payers.

AAPB is conducting a survey on coding, billing, and reimbursement issues. The survey is available online. If you have not filled out a survey contact the AAPB at aapb@resourcecenter.com for a copy. The survey will help collect the kind of information needed so that AAPB can provide appropriate input to the American Medical Association’s (AMA) coding committee. This is accomplished by sharing information with a representative of the American Psychological Association who represents us on the AMA’s coding committee. At present that person is Antonio Puente, PhD.

Diversity Adds to Confusion

The membership of AAPB is very diverse and represents individuals from at least 19 disciplines. This diversity is both a strength and a challenge in dealing with insurance companies and in terms of who can do what. Biofeedback practitioners have an identity or recognition problem that adds to the coding, billing, and reimbursement confusion. Insurance companies often think that everyone who does relaxation training, including biofeedback for that purpose, is or should be a psychologist, and they often do not know who else, when, or if to reimburse. The public often does not know what biofeedback is and often confuses biofeedback with “biorhythms” or meditation, or see it as “just relaxation.”. Others are confused about whether biofeedback is a profession or a modality, and whether it is part of “mainstream health care” or falls under Complimentary and Alternative Medicine (CAM). In any case, they want to see the outcome research data. In addition, there are certain Current Procedure Treatment (CPT) codes that are very useful and appropriate when used by members of some disciplines, but which are inappropriate for use by other disciplines. In part, the appropriateness of using particular CPT codes is governed by the rules and regula-
tions of specific third-party payers, and in part, it is governed by the licensing laws of individual states. For example, some states have licensing laws that define the practice of specific disciplines to include procedures and interventions like biofeedback and psychotherapy, and include all assessments of and treatment of mental and emotional problems. In such states the specified interventions are the domain of practitioners licensed in those specific disciplines, those exempted by the law (e.g., clergy), or those supervised by such licensed professionals. Utah’s psychology licensing law has such provisions and makes exceptions for other licensed professionals whose own licensing law allows them to provide such services as psychotherapy or biofeedback. Other individuals are prohibited from providing such interventions. Texas law goes so far as to prohibit licensed professionals from even supervising unlicensed practitioners in the provision of certain services, with of course some exceptions. For more information on this topic see Striefel (2003, 2001). The bottom line is that it is very important to establish and maintain a good working relationship with third-party payers so that one can learn what and how to work effectively and efficiently with each provider within their coding, billing, and reimbursement structure.

CPT Codes

The CPT codes were originally developed for obtaining reimbursement from Medicaid and Medicare. Later, other insurance companies started to use the codes, but they do not have to, and they do not all use them in the same way so this also adds to practitioner confusion. The AMA’s coding committee may have added to the confusion with codes 90875/90876 and 90901 because they seem to create a mind-body split. The 90875/90876 codes include biofeedback and psychotherapy and are appropriately used by those who can legally provide psychological or mental health services within the state in which they practice. Using these codes when not legally allowed to do psychotherapy or when psychotherapy is not an appropriate part of a client’s treatment is illegal and unethical. Of course these codes also imply that biofeedback is also a part of the client’s treatment. Generally, 90901 was created for all those others who can legally provide biofeedback, but where psychotherapy is not provided (a mind-body split).

It is important for practitioners to remember that the CPT codes do not make any distinction about whether the provider of services must be licensed or not. The decision about who can legally provide service is decided initially by individual state licensing laws. Further restrictions depend on the policies of third-party payers. For example, a state may allow an unlicensed provider to provide biofeedback services, but Medicare rules in that state may restrict such treatment payments to licensed personnel. For a licensed or unlicensed provider to bill Medicare for services provided by an unlicensed provider in such a state would be fraud. Likewise, when a state restricts the provision of biofeedback services to someone licensed in specific health care disciplines; as such it would be illegal for someone to provide such services if not licensed appropriately even though a third-party payer might pay for services provided by unlicensed personnel.

Practitioners should know the laws of their individual state in reference to who is and who is not legally allowed to provide biofeedback, psychotherapy, and other health care related services. Laws in some states restrict the provision of some health care services such as biofeedback and psychotherapy to members of specific disciplines and some do, and some do not, allow licensed practitioners to supervise unlicensed personnel in the provision of these restricted services. What do the relevant laws in your state say governing the provision of biofeedback, psychotherapy, and related services? It is critical that you know what the provisions of your state laws are. Colorado has licensing laws governing the practice of specific disciplines like psychology, social work, nursing, and physical therapy, but it allows unlicensed practitioners to register themselves as unlicensed psychologists and to provide such services as biofeedback.

AAPB has had some successes or victories in the CPT code arena. John Perry, PhD working with AAPB’s legislative and insurance committees helped in getting Medicare to pay for incontinence biofeedback. In addition, Antonio Puente, PhD, was instrumental in helping to create the new CPT Health and Behavior codes (96150-96155). It does take advocacy on the part of practitioners in order to change CPT codes and get reimbursement for biofeedback and related services. Are you doing your share of advocacy work? Bob Whitehouse is the current chair of the insurance committee and can be reached in the following ways:

Bob Whitehouse, EdD
1526 Spruce, Suite 302
Boulder, CO 80302
Telephone: 303-417-0293
Fax: 303-666-7160
Email: BobWhiteho@aol.com
(Note: telephone and fax preferred.)

The co-chair of the insurance committee is Ronald Rosenthal, Ph.D., of Florida, and he can be reached best via e-mail at: RRosent710@aol.com

The AMA’s coding committee gives this definition of biofeedback:

Biofeedback is the process of detecting information about a patient’s biological functions, e.g., heart rate, breathing rate, skin temperature, and amount of muscle tension, picked up by surface electrodes (sensors) and electronically amplified to provide feedback, usually in the form of an audio-tone and/or visual read-out to the patient. Biofeedback training uses the information that has been monitored from the sensors attached to a muscle on the skin’s surface, or to the skin only for thermal or other readings. With the help of a trained clinician, the patient can learn how to make voluntary changes in those biological functions and bring them under control.

The definition includes all kinds of biological functions and the feeding back or training of individuals using monitors, i.e., doing biofeedback the way it would be done in a clinical setting.
CPT Codes

The CPT codes concerning biofeedback and their codes in the CPT Manual are:

Biofeedback

90901 This code applies to biofeedback training using any modality.
90911 This code applies to biofeedback training of the perineal muscles and the/or the anorectal or urethral sphincter. It includes EMG biofeedback, and/or manometry.

Other Psychiatric Services or Procedures

90875 This code applies to individual psychophysiological therapy that incorporates biofeedback training by any modality with psychotherapy (e.g., insight oriented, behavior modifying or supportive psychotherapy). It must be face-to-face with the patient and session length is approximately 20-30 minutes.
90876 The definition for this code is the same as for 90875, but the session length is approximately 45-50 minutes in duration.

Other Codes That Are Potentially Useable

Some other codes that might be used if approved by the third-party payer follow:

94010 This code applies to spirometry and includes a graphic record, total timed vital capacity, and expiratory flow rate measurement(s), with or without maximal voluntary ventilation.
94400 This code applies to the breathing response to CO2 (includes the CO2 response curve).
96002 This code applies to dynamic surface electromyography during walking or other functional activities for 1-12 muscles.

Biofeedback

This code applies to digital analysis of the electroencephalogram (EEG) (e.g., for epileptic spike analysis. (Some practitioners are using this code for QEEGs because it consists of a digital analysis of the EEG).

90806 This is the code for individual psychotherapy, insight oriented, behavior modifying and/or supportive psychotherapy in an office or outpatient facility for sessions lasting approximately 45-50 minutes, face-to-face with the patient. (Note: some insurance companies will allow biofeedback to be used as a psychological modality if part of a psychotherapy treatment and provided by a licensed mental health provider, but not if provided by an unlicensed provider. Do not try to deceive the insurance company about what you are doing by using this code when only biofeedback services are provided. Doing so would be fraud).

Other Codes

There are some new Complimentary and Alternative Medicine (CAM) codes that use five letters of the alphabet instead of numbers. The code CDAAP applies to biofeedback, counseling, mental health services and practice specialties, e.g., assisting the client to modify body functions using feedback from biofeedback instruments. The codes were developed by Alternative Link for over 4000 procedures that describe the patient encounter with nursing, CAM, and indigenous medical services. Laws governing providers of such services differ by state and are available at 877-621-LINK or www.alternativelink.com. At present it is not clear what role these codes will play in the coding, billing, and reimbursement of services to clients.

An IDC-9-CM code was developed by the World Health Organization (WHO) for treating the psychogenic aspects of a medical disorder using biofeedback. It is 94.39 - other individual psychotherapy (biofeedback).

It should be remembered that managed care considers insurors to be customers and it uses a business code of ethics that empha-
sizing making money. This focus often appears to be totally opposite that of health care practitioners, such as those providing biofeedback, where the focus is on meeting the specific current needs of the client/patient.

**Billing Choices**

Remaining current on coding, billing, and reimbursement is an ongoing learning process that requires practitioners to make many choices as previously discussed. It is important to know what the correct CPT code is for the services that are provided, but it is just as important, if not more important to know what the third-party payer’s rules and regulations are that govern coding, billing, and reimbursement based on the specific insurance coverage of a client. Failure to know and abide by the rules can have dire consequences. It is easier to call for the third party information.

In Utah, a psychologist was working with both the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS, the insurance coverage for military personnel and their families) and Medicaid. He hired several unlicensed individuals with degrees in social work and psychology to provide clients with treatment/therapy. He was charged with 66 counts of mail fraud and related offenses, in what was described in the newspaper, as an alleged billing scheme to defraud government subsidized health-care programs. In at least Utah, CHAMPUS and Medicaid will reimburse only for therapy provided by a licensed mental health professional. He was convicted and sentenced to a prison term for violating Medicare’s billing and reimbursement rules. This focus often appears to be totally opposite that of health care practitioners, such as those providing biofeedback, where the focus is on meeting the specific current needs of the client/patient.

**Whitehouse’s Seven Rules of Thumb for Billing And Coding**

Bob Whitehouse’s seven rules of thumb for billing and coding follow:

1. Decide who is responsible for obtaining the information about the client’s insurance coverage. Practitioners often assume that the client is responsible for obtaining the insurance information and for dealing with the third-party payer. In recent years there have been successful lawsuits against practitioners that have made clear that during the informed consent process the practitioner should clarify for the client what the limitations are that are imposed by his or her insurance coverage, e.g., what services are or are not covered, number of sessions, etc. It is important for practitioners to reconsider what they do or don’t do during the informed consent process about insurance imposed limitations.

2. Decide who is responsible for the bill at the onset of services. Have an agreement with the client about this issue.

3. Determine what the appropriate CPT code is for use in billing based on the client’s diagnosis and the services provided. Determine the appropriate rate of reimbursement, co-pay, and provider requirements. Do not make uninformed assumptions. Instead, form a working relationship with the appropriate third-party payer personnel to be sure you have the information needed to comply with their rules and regulations.

4. Be sure that your clients are informed about your “no show and late cancellation policies.” Do not violate any contract you have with a third-party payer that prohibits you from billing for “no shows” or other violations of your policies. Know what is in any agreement that you sign with a third-party payer before you sign to be sure you can and are willing to abide by the agreement. The courts have repeatedly ruled that you are responsible for abiding by the contracts that you sign, but you are also responsible for meeting your professional responsibilities to clients.

5. Keep both your clients and the third-party payer informed concerning your legal and ethical obligations, your fee structure, and your responsibilities, including your ethical responsibility to advocate for your clients if you disagree with a third-party payer decision concerning number of sessions, etc. Carefully document all of your advocacy efforts on behalf of a client in their file and be sure to keep them informed about your efforts.

6. Do your best to make sure that the diagnosis you assign to a client’s problem is accurate, that the billing code used is accurate and appropriate, and do include the amount of time spent and the fee charged for services in your billing statement. Be sure you are in compliance with the Health Insurance Portability and Accountability Act requirements.

7. Avoid engaging in any fraudulent behavior such as over or under diagnosing, providing one service but using a different code because the insurance company will pay for that code, inappropriately using dual billing codes, etc.

**References**


Billable, Coding, and Reimbursement Issues in Clinical Practice

Ethics in Billing, Coding, and Reimbursement

Sebastian “Seb” Striefel, PhD

Abstract: Billing, coding, and reimbursement raise a number of ethical and related issues, including: duty of care; best interests of the client; honesty and accuracy in assessment, diagnosis, treatment planning, billing, and coding; competence, compliance with the Health Insurance Portability and Accountability Act (HIPAA); confidentiality and record keeping; informed consent; conflict of interest; and termination and abandonment. Providers are consistently faced with dilemmas that pit their own economic and professional survival against the best interests of the client and the rules and regulations of managed care. Yet, providers are expected to remain and enhance their areas of competence including the ability to provide services that meet all existing ethical and legal guidelines.

Introduction

The ethical and legal “duties of care” of providers remain even if third-party payers won’t pay or authorize additional services (Murphy, 1998). See Striefel, 1997b; 1998; & 2003a; for more extensive information on duty of care. As providers we need to know what our duties of care are, ethically and legally, and let them guide our practice activities. Most important is the duty of “do no harm.” It often takes precedence over other duties of care. For every duty that a practitioner has, there is a concomitant right that the client has (Striefel, 1997a). Providers must be aware of and protect those rights (Striefel, 1997a; 2003b). Cummings (1998) in discussing the patient’s bill of rights (by the way, the new Health Insurance Portability and Accountability Act (HIPAA) gives patients many new rights) said that the “patient is entitled to relief from pain, anxiety, and depression in the shortest possible time and with the least intrusive intervention” (p. 58). Pratt, Berman, and Hurt (1998) agree with him. Do you? Cummings (1998) goes on to make the point that short-term treatments are a part of the MC environment and will be with us for a long time so we best learn how to work in and with MC and to do it effectively and efficiently using short-term treatments.

In addition to duties of care, this article discusses other topics related to coding, billing, reimbursement and MC in general. They are: 1. Assessment, diagnosis, and treatment; 2. Confidentiality and record keeping; 3. Informed consent; 4. Conflict of interest; 5. Termination and abandonment; and 6. “Incident to” care.

Assessment, Diagnosis, and Treatment

Honesty, trust, non-malfeasance, beneficence, justice, autonomy, and other fundamental moral and ethical principles are put to the test daily in MC environments. It is important not to lose sight of these important ethical principles and to get onto that “slippery slope” that leads to serious ethical and legal violations. It is easy to rationalize that “I’ll just fudge this diagnosis a little and then my patient can be reimbursed because his/her insurance will pay for that diagnosis.” Doing so can rapidly lead to an erosion of a provider’s moral and ethical values.

Barnhill (1998) stressed the importance of doing an honest and accurate diagnosis and being competent in doing so. Evidently many providers are on the slippery slope. He surveyed 92 clinicians and only 10% reported that they never modified a diagnosis or CPT code to help a client get reimbursed. Those surveyed reported over diagnosing, under diagnosing, or modifying a diagnosis or CPT code to something for which the third-party payer would reimburse. Only 12% said they never modified a diagnosis or CPT code to protect client confidentiality, or future employment or insurance prospects for clients.

One could argue that providers are faced with the ethical dilemma of deciding between doing what appears to be in the best interest of the client and being dishonest and engaging in fraud by falsifying a diagnosis or CPT code. Of course, it is never ethically or legally acceptable to engage in fraud so no dilemma should exist between those two issues. It is also possible that providers are changing the diagnosis or CPT code because doing so increases the probability that they will be reimbursed (even though many of them would deny that as their motivation). These percentages for changing a diagnosis or CPT code are scary. It is even more frightening to think that the changes are being made purely to maximize the probability of being reimbursed. Engaging in fraudulent behavior is never acceptable ethically or legally. If one engages in fraud the penalties are very severe for the individual, the reputation of the profession and similar providers, and it can destroy client trust and encourages the need for more accountability. Millions of dollars are being spent to detect fraudulent behavior, e.g., Managed Care Organizations
(MCOs) now keep provider profiles to detect over and under diagnoses, length of treatment for specific conditions, procedure codes, etc. (Cummings, 1998). Profiles for hundreds of thousands of clients and providers are being compared and the number of providers being penalized is increasing. It appears important to make the following explicit statement, "Don't engage in fraudulent behavior!"

The conflict between helping the patient and following the ethical, legal, and MC rules is always there. We need to follow the rules while striving to legislatively change those with which we disagree because they have the potential of harming patients.

Cummings (1998) reported that over diagnosis is mushrooming because more serious diagnoses results in more treatment sessions being approved. This process can harm the client/patient and is not fair to the patient because the diagnosis is not honest or accurate and it goes into his or her file and there is no guarantee that the MCO will keep the information confidential. It is also fraud to use a procedure code that is reimbursable and then to provide a different service, e.g., to use the psychotherapy procedure code and provide only biofeedback services (Murphy, 1998).

By the way, Pollack (1998) reports that licensed professionals who serve as utilization reviewers (URs) for MCOs report that they are very concerned about the competence of some providers in being able to conduct appropriate assessments, make the correct diagnosis, and develop treatment plans. It is important to practice only in those areas where you have demonstrable competence based on education, training, and experience, unless appropriately supervised (AABP, 2003; Striefel et al., 1999). It is important to continue one's education and training and to get additional supervision and consultation to maintain and expand one's areas of competence.

The most commonly missed diagnosis is chemical dependency (Cummings, 1998). Providers need to ask about chemical use as part of the intake procedure. If a client is injured because a provider missed a condition in the diagnostic process, he or she could be found negligent. For example, if a provider does not involve a physician when physical problems exist, it would be possible to miss a progressive disease like a thyroid disorder, diabetes, cancer, or a tumor, and this could result in harm to a client and problems for the provider (Nagy, 1998).

According to Cummings (1998) the five most common over diagnoses based on the records of hundreds of thousands of records are: 1. Multiple personality disorder (now called dissociative identity disorder), 2. Attention Deficit Hyperactivity Disorder, 3. Post Traumatic Stress Disorder, 4. Survival of incest, and 5. Depression. Can you accurately diagnose these conditions and or know when to refer a client with one of these potential problems to someone who can?

Confidentiality

If you haven't completely done so yet, pay careful attention to the requirements of the HIPAA of 1996. It lays out a wide range of expectations for confidentiality or what therein is called "protected health information" (PHI). The provisions regarding PHI must be fully implemented by April 14, 2003. We are now past that date.

HIPAA, even though it might technically not be binding on some providers (e.g., individual practitioners who do no electronic billing). Practically HIPAA will impact most if not all providers. A provider will not know if HIPAA is binding for him or her unless he or she is familiar with its provisions. HIPAA requires providers to have written policies and procedures for how they will protect clients' PHI. They must also implement and monitor these policies and procedures, take action if a breach of confidentiality is detected and must document everything.

It is important to compare your policies and procedures for PHI against those of HIPAA, ethical expectations, and state law. If state law is more stringent it takes precedent. Take HIPAA very seriously since the penalties for violations can be very severe; besides you have an ethical obligation to do everything you can to protect confidential information.

Some other suggestions concerning confidentiality follow:

1. Know the requirements in MC agreements/contracts before signing them. If you sign the agreement, even if you disagree with some of the provisions therein, the courts often expect you to abide by those provisions; but they also expect you to meet your duties of care. For example, try to provide only a summary of treatment rather than complete contact notes, unless of course, required by the written agreement (Murphy, 1998). Pollack (1998) reported that providers often submitted more information than was required for purposes of URs. Murphy (1998) and Pollack (1998) report that providing more information than what is needed or required for the review process is a violation of confidentiality. HIPAA requirements expect providers to share PHI only to the degree necessary for the specific purpose at hand, although it appears that some of those requirements may already be changing.

2. Always get a specific signed release of information from a client before sharing information with a MCO (Murphy, 1998), i.e., getting the client's informed consent to share information. The insurance billing form is often considered legally insufficient for sharing confidential information because of its lack of specificity on what information is needed for what purpose (Murphy, 1998). Cummings (1998) argues that those who pay the bill are entitled to the information needed to determine if everything is accurate, meets professional standards, and is within the scope contracted with the provider. He says that providers often use confidentiality as a red herring to hide incompetence in assessment, diagnosis, and treatment planning and implementation. Regardless of what the law requires or does not require, biofeedback providers are expected to maintain client confidentiality (AABP, 2003; Striefel et al., 1999). Crosby reported that "because something is legal does not mean it's ethical, and because something isn't illegal doesn't mean it's ethical" (Smith, 2003, p. 18).

3. Know the limits of confidentiality based on the laws of the state in which you practice so you can obtain the client's informed consent (Nagy, 1998). They often include:
a) when a client is a danger to self or others,
b) when you suspect abuse or neglect,
c) when the patient sues the provider,
d) when the client is court ordered into treatment,
e) when there is litigation where the client uses the condition they were treated for as part of his/her defense (e.g., workers compensation),
f) when a patient dies and her/his heirs think the provider has information needed to contest a will,
g) other, e.g., reporting of infectious diseases.

Protect client records from unauthorized access. This includes faxes, Emails, phone calls, etc. For example, HIPAA requires providers to verify that the fax is going to the right person and that the receiver be notified that the information is to be treated as PHI. All computerized PHI needs to be protected. One can use passwords and change them when staff leave the organization. One can lock up removable hard disc drives, encrypt files, make files “read only” to prevent unauthorized copying, store backup files in an appropriate external storage site, backup files regularly, etc.

**Informed Consent**

Clients are entitled to all of the information that a reasonable person would want in making decisions about treatment; prioritizing treatment goals; fees, billing, and collections; limits of confidentiality, insurance coverage and limitations, etc. The requirements for informed consent have expanded over time. Calfee (1998) reports that providers must inform clients about the limits of their insurance coverage so clients can make informed choices, e.g., if MC will only authorize six sessions and the client knows that, he or she can decide, in consultation with the provider, which symptom or problem to have treated. Nagy (1998) believes that clients should know what is covered, the number of sessions that are likely to be approved, the options that exist if the number of pre approved sessions have been used up, confidentiality issues, and the utilization review and case management process. Providers have been sued (usually MDs) when patients have not been informed about the range and limits of treatment covered by their insurance and the patient claims that he or she would have made different choices had he/she known (Nagy, 1998).

For example, do you inform clients about the risks associated with information that goes to a third-party payer? Do you tell clients about the risks to confidentiality associated with the use of technology, like computerized information, faxes, phones, etc., and how you try to protect client confidentiality (PHI)? HIPAA requires that you how you deal with PHI to be given to clients in writing.

You need to advocate for clients, e.g., if you believe a patient needs more sessions of treatment you need to try to get the MCO to approve them. Failure to do so can lead to charges of abandonment. In this process it is important to have a paper trail of the efforts made, the responses received, and for the client to be aware of the efforts made. A good faith effort to get the needed treatment is needed to meet the expected duty of care. Meeting the duty of care may also mean providing treatment without getting paid for it, helping a client in need gain access from another less costly provider, and informing the client as to his/her options so that he/she can make informed choices.

Informed consent should be an ongoing process so a client knows and agrees to changes in treatment or the treatment approach, homework, including others in treatment (e.g., a spouse), and the risks associated with doing so, e.g., a temporary increase in anxiety or depression (Nagy, 1998).

**Conflicts of Interest**

It is important to disclose all conflict of interest issues that might impact clients or others and to make reasonable efforts to resolve them (Harding, 1997). For example, a client needs to be informed if a provider receives any financial incentives for limiting care so that the client can make reasonable choices. Advocating for a client in need when the pre approved sessions are used up can put a provider at risk of being not receiving future referrals from that MCO (Nagy, 1998; Pollack, 1998). Yet, the provider is ethically bound to advocate (Murphy, 1998). Failing to advocate could result in services falling below the minimal expected standard of care and/or in charges of abandonment. Learn how the MC system works, how to appeal decisions, have a good rationale and treatment plan to support your appeal for more sessions, ask a utilization reviewer to go to his or her supervisor to get more sessions approved, document it all, and keep the client informed (Nagy, 1998; Pollack, 1998). Try to balance client and payer need by keeping both informed and by maintaining a good working relationship with both.

**Abandonment and Termination**

Meeting a client’s current needs and giving all the treatment that might benefit a client are often two different things. Learn to meet the current need. The client can return for more service in the future to meet other needs.

An inadequate assessment or diagnosis at the outset can lead to the wrong focus during treatment and thus to inadequate treatment because the pre approved sessions run out. When clients are terminated early without having been involved in the choices along the way, they may be anxious or angry at the provider and file charges of abandonment. Do not abandon clients. Instead do the following:

1. Do an accurate assessment and diagnosis and develop an appropriate treatment plan;
2. Keep the client informed along the way via informed consent;
3. Try to ensure that the client does not perceive you as abandoning him/her (this is one reason for advocating for more sessions);
4. Meet the client’s current need; and
5. Formalize your termination process:
   a) Discuss termination with the client early and consider the client’s needs and views;
   b) Provide the client with appropriate pre-termination counseling, including exploration of options for the future;
c) Explore the alternative options and make appropriate recommendations; and
d) Take reasonable steps to get the client immediate additional help if she/he needs it via referral or direct services from you (Nagy, 1998).

Sweeney, Stutman, and Martin (1998) provide four options open to a provider if a MC organization refuses the clinical recommendations of a provider, e.g., for more sessions. The provider can:
1. Continue treatment based on the provider's own clinical judgment (even if the MCO won't pay);
2. Continue treatment while appealing to ensure no harm to the client;
3. Can terminate treatment and take the associated ethical and legal risks; and
4. Can help the client get services elsewhere.

It is best to err on the side of good judgment and to minimize risk.

Incident to Care

In Medicare, "Incident to" care includes services provided by non-physicians that are performed incident to a physician's care and which can thus be reimbursed at the physician's rate. Non-physician providers include nurses, physician assistants, psychologists, social workers, biofeedback technicians, etc. Learning the rules for this process can result in very reliable reimbursement at higher rates. Gosfeld (2002) provides a good overview, including, but not limited to:

• The physician must see the patient first and establish a patient-physician relationship.
• The physician does not have to be present or see the patient during each session, but a physician supervisor who sees patients must be on site when the patient is seen. The physician needs to see the patient periodically. Some local Medicare Providers require this to be every third session. Learn the rules and follow them.
• Treatment must be incident to services provided by the physician (assessment, diagnosis, or treatment) and must be recommended by him/her.
• Medicare does not require any special credentials by non-physician providers; however state law may require licensure and that the service be within the scope of practice for that discipline.
• Incident to care services cannot be billed for hospital care, but can be billed for in-office care, nursing home care, in-home care, etc.
• Certain non-physician providers can bill Medicare directly for services using their own provider number, e.g., in the hospital, but they will be reimbursed at only 85% of the physician fee schedule. These providers can also be reimbursed for incident to care services for other services provided in accordance with the requirements for reimbursement, e.g., services provided in an office location where a physician is also providing services to clients/patients.
• To bill for incident to care the non-physician must either be employed by or in a contract with the physician so that he/she can terminate that non-physicians services to his/her patients and so that the billing is done under his/her direction and number.
• Incident to care rules differ for other third-party payers.
• Incident to services must be face-to-face, it cannot include consultations where the patient is absent.

References


Abstract: Billing and coding concerns are unavoidable for most clinicians. Biofeedback codes have evolved over the years and options are available for services typically provided by biofeedback practitioners. The most appropriate code may not be covered by a client's insurance company leading to the use of less specific codes in the search for reimbursement. The risks of this creative coding are discussed and short and long-term strategies to deal with these issues are presented.

Introduction

For most clinicians, billing and coding is a necessary evil. Some providers are able to make a living on a fee for service basis, but most often insurance companies and other third party payers are a major source of reimbursement. In order to bill insurance companies we must use a CPT code (Current Procedural Terminology) that accurately reflects what we have done, as well as a diagnostic code from ICD-10. Prior to 1997 there were several coding options available for biofeedback clinicians but currently there are only two specific codes for biofeedback, 90901 and 90911. The 90911 code is used for bladder and bowel work while 90901 is a generic biofeedback code for all other applications. There are also two codes, 90875 and 90876, which are used for a combination of psychotherapy/counseling and biofeedback—90875 for 20-30 minute sessions and 90876 for 45-60 minute sessions.

Individual third-party payers do not all pay for all of the CPT codes and they are not obligated to do so. Each third-party company or agency determines its own rules. In a time of increasing health care costs, many insurance companies have restricted or eliminated coverage for biofeedback services. The companies also decide how much they will pay for each code and biofeedback codes are often reimbursed at a low rate.

Medicare

Medicare is a major player in the billing world because many insurance companies base their payments upon Medicare's rate of reimbursement. The Medicare rules regarding biofeedback are also unusual. Following is a verbatim section from the Local Medicare Review Policy (LMRP) in Florida (Medicare Publications Department of First Coast Service Options, Inc., 2001).

"Biofeedback training is covered under Medicare when it is reasonable and necessary for:
1) Muscle reeducation of specific muscle groups; or
2) Treatment of pathological (disease based) muscle abnormalities of spasticity; or
3) Incapacitating muscle spasm or weakness and more conventional treatments (e.g. heat, cold, massage, exercise, support) have not been successful."

This is a very restrictive interpretation of biofeedback. It runs counter to the definition of biofeedback provided by Medicare that mentions training to improve control of autonomic functions (op. cit., p. 66). Medicare also covers some incontinence training but specifically notes that, "Biofeedback therapy is not covered for the treatment of ordinary muscle tension states or for psychosomatic disorders," and psychiatric disorders are also excluded (op. cit., p. 67). Medicare does not cover the more common applications of biofeedback for relaxation training and to lower arousal. The only applications of biofeedback eligible under these requirements are specialized programs working to improve motor function for neurological (brain injured and stroke) and orthopedic patients.

The situation is even bleaker when the rest of the LMRP is reviewed. The Florida LMRP is confusing in that it blends the 90901 and 90911 codes together. The LMRP requires the continuous presence of a physician or qualified non-physician practitioner. It also states that evaluation and treatment should be completed within two to three sessions.

Relative Value Units

Medicare's payments are based upon a schedule of Relative Value Units (RVU) that assign a weighting to each of the codes in the CPT. The 90901 code has a RVU of .41 and the 90911 code has a RVU of .89. The allowance for 90901 is $50.45 (in South Florida) and will vary by region. The 90901 code has no time restrictions and the pay is the same for 20 minutes of biofeedback or for 3 hours.

Claims and Reviews

When the 90901 code was first introduced in 1997, Medicare decided to suspend the automatic payment of biofeedback claims. Most Medicare claims are processed by computerized systems and payment is virtually automatic if all the provided information is correct. Claims with the 90901 code were separated and manually reviewed. The clinician was required to provide a history and physical, treatment plan and office
notes to demonstrate that the biofeedback training was medically necessary. Unfortunately, many of the local carriers were not prepared to make the reviews properly. Office staff were pressed into service with little or no training, but were still responsible for making the determination of eligibility for payment. In my own experience, claims were processed erratically and denials were frequent. In some cases a voucher was provided for four or five consecutive sessions of biofeedback with the same patient. The supporting documentation for each date was identical with the only difference being the office notes for the given session. Many times some of the sessions were covered while others were denied for lack of medical necessity.

I have previously written in this magazine about this problem and the options available when faced with a denial of coverage by Medicare. Additional reviews and hearings are available to the stubborn provider unwilling to take no for an answer. In my own case, I wrote so many letters to Medicare that they eventually tried to silence me completely by stating that I was practicing outside of my scope of practice as a psychologist by providing biofeedback for movement disorders. I was told that if I continued to submit biofeedback claims to Medicare I would be liable for prosecution. Fortunately, I was able to get a declaratory statement from the Florida Board of Psychology affirming my right to provide all forms of biofeedback under Florida statutes. When I sent this statement to the Florida Medicare Carrier they were at first unwilling to rescind their initial letter until I insisted that I wanted in writing permission to continue billing Medicare for biofeedback training.

Under the most recent LMRP (op cit., pps. 67-68), Medicare is no longer requiring supporting documentation and automatic payment has been reinstated for most claims. The Medicare rules also permit a provider to request additional payment by using a modifier code (22). The provider must submit supporting documentation to prove that the case is more complex than standard applications and that additional time and effort is required. When using this modifier, the voucher is pulled for manual review and invariably denied because of lack of medical necessity. After a long conversation with senior officials in the Florida office, I realized that the additional payment option is a sham. These requests are routinely denied while payment will be made for clinicians willing to provide biofeedback for an allowance of about $50 per session—regardless of time spent.

**Recent Medicare Developments**

In late June 2003 I received a letter from the Florida Medicare carrier that a revision of the LMRP for biofeedback had been drafted. The Florida Medicare B Update is no longer readily available in hard copy but the revised policy was posted at their website (www.floridamedicare.com). The draft LMRP includes one major change; a brief list of required diagnoses for the 90901 code was added. This list included major paralytic disorders (quadriplegia, paraplegia and hemiplegia) and one condition relating to incapacitating back spasms.

Under the current system, the Medicare carrier is not able to insure that biofeedback codes are submitted appropriately. Without a system of manual review, providers could bill Medicare for biofeedback for non-covered conditions and payment would be made regardless of the diagnosis provided. In one case, I mistakenly submitted a biofeedback voucher to Medicare for a psychotherapy client and Medicare paid for the biofeedback linked to a psychiatric diagnosis. (I returned the payment with a corrected voucher). While there is little incentive to abuse the biofeedback code because of low reimbursement, Medicare would like to ensure that all biofeedback claims are medically necessary within their guidelines. However, the list of acceptable diagnoses excludes many conditions that are currently acceptable including all orthopedic disorders and motor problems due to peripheral nerve dysfunction. The insurance committee of AAPB helped organize a response to these proposed revisions but no final decision was made at the time this article was written.

The situation regarding Medicare and biofeedback has also been affected by the recent adoption of a cap on outpatient rehabilitation services (Medicare Publications Department of First Coast Service Options, Inc., 2003). This limitation has been floating around for several years; Congress originally passed the cap on outpatient rehabilitation funding as part of the Balanced Budget Act of 1997. However, there was a strong outcry from the physical and occupational therapy professional groups and the cap was delayed twice by moratoriums that expired at the end of 2002. Biofeedback is included in the list of services affected by the outpatient cap and Medicare will pay $1590 per year for outpatient physical therapy and speech therapy and another $1590 per year for occupational therapy. The only exception is for outpatient services provided by a hospital or under arrangement with a hospital.

**Creative Coding**

Faced with a confusing array of exclusions and restrictions combined with poor reimbursement for biofeedback, many practitioners have reluctantly turned to the practice of *creative coding*. This refers to the use of alternative CPT codes that are related to the reason for the biofeedback training but are less specific. Alternative codes include neuromuscular retraining (97112), cognitive retraining (97532), gait training (97116) and even the psychotherapy codes (90806 and 90804), and the newly developed health and behavior codes (96152).

The use of creative coding creates a dilemma on many fronts. There are legal, financial, practical and ethical issues involved in every coding decision. The basic rule for coding is that *the most specific code available that describes the services provided should be used*. However, if a provider uses one code, he or she may not be paid while an alternative code that is a near fit may be reimbursed. This is a slippery slope and if a provider knowingly submits an inappropriate code, he can be subject to prosecution or required to return payments.

The situation becomes even more confusing when the insurance companies tell us to use a less specific code. In Florida, the workers compensation system and other state agencies have been willing to accept the use of the 90876 code for biofeedback training. When calling private insurance companies seeking prior authorization for...
Abstract: Psychoneuroimmunology (PNI) is a multidisciplinary field of inquiry about how the mind influences the neuroendocrine and immune systems and ultimately how interactions among these systems impact health and well-being. Psychological stressors result in central nervous system (CNS) modulation of the immune system. The central nervous system and immune system can communicate via neural and hormonal pathways. A dramatic consequence of these pathways is that activation of the central nervous system by stressful experiences can result in altered immune function. Stress and other behavioral and psychological factors may be linked to disease susceptibility and progression through either direct CNS-immune system links or CNS-endocrine-immune system pathways.

Introduction

The nervous system, the endocrine system, and the immune system are interrelated, and thus the ultimate response of the person to stress reflects the integration of the nervous, endocrine, and immune systems (Figure 1). Furthermore, stress activation of these systems affects other body systems, such as cardiovascular, respiratory, gastrointestinal, renal, and reproductive systems. As a result, an individual’s response to stress has the potential to lead to disorders and diseases of adaptation in any body system (Table 1).

Because it is now known that the brain is connected to the immune system via neuroanatomical and neuroendocrine pathways, stressors have the potential to lead to alterations in immune function. Nerve fibers extend from the autonomic nervous system and synapse on cells and tissues (i.e., spleen, lymph nodes) of the immune system (Webster & T onelli, 2002). In turn, the cells of the immune system are equipped with receptors for many neuropeptides and hormones, which permit them to respond.

Figure 1 Neurochemical links among the nervous, endocrine, and immune systems. The communication among these three systems is bidirectional.

Table 1 Examples of Disorders and Diseases of Adaptation to Stress

- Angina
- Asthma
- Carpal tunnel syndrome
- Depression
- Dyspepsia
- Eating disorders
- Fibromyalgia
- Fatigue
- Headaches
- Hypertension
- Impotence
- Insomnia
- Irritable bowel syndrome
- Low back pain
- Myocardial infarction
- Peptic ulcer disease
- Rheumatoid arthritis
- Sexual dysfunction
to nervous and neuroendocrine signals. As a result, the mediation of stress by the central nervous system leads to corresponding changes in immune system activity. Multiple studies have shown that both acute and chronic stress can affect immune function. Most of these studies have shown that stress induces immunosuppression (Garssen & Goodkin, 1999; Kiecolt-Glaser & Glaser, 2002; Kiecolt-Glaser, McGuire, Robles & Glaser, 2002a; Kiecolt-Glaser, McGuire, Robles & Glaser, 2002b; Kiecolt-Glaser, Robles, Heffner, Loving, & Glaser, 2002).

The network that links the brain and immune system is bidirectional. Signals from these systems travel back and forth. This allows for reciprocal communication between these systems. Consequently, not only do emotions modify the immune response but products of immune cells send signals back to the brain and alter its activity. Just as the brain and immune system share mutual communication pathways, so do the endocrine and immune systems. As a result, the immune system also affects the endocrine system, while hormones of the endocrine system feedback upon the immune system, altering its function.

Because of the multiple links between areas of the brain concerned with stress-mediation and emotions, there is the possibility that stress may play a role in immune-based illness (Sternberg, 2000). It is hypothesized that stress-induced immunosuppression may increase the risk of progression of immune-based diseases such as multiple sclerosis, asthma, rheumatoid arthritis, and cancer. The stress of inadequately treated postoperative pain has been shown to impair the immune system’s surveillance of tumor cells. It is believed that surgical manipulation of tumors may lead to dissemination of tumor cells in the body and increase the risk for postoperative tumor spread. Therefore, adequate reduction of postoperative pain and stress is important for cancer control (see author feature on Gayle Page).

Stress may also alter immune function in such a manner that an individual is more susceptible to infection. For example, psychologic stress may increase risk for developing the common cold (Cohen, Doyle, & Skoner, 1999). The link between stress and susceptibility to infectious disease has also been demonstrated in a study of elderly individuals caring for a spouse with Alzheimer’s disease. The chronic stress of caregiver burden in these individuals was associated with an impaired immune response to influenza vaccine. The results of this study suggest that chronic stress may increase an elderly person’s vulnerability to influenza (Kiecolt-Glaser et al., 2002).

Biobehavioral interventions can enhance immunocompetence. These strategies include relaxation and imagery techniques, biofeedback-assisted relaxation strategies, humor, exercise, mindfulness-based meditation, and social support (Kemeny & Gruenewald, 1999; Sephton, Terr, & Stites, 1998).

A better understanding of health and disease states will occur when the interactions between the mind and body are better understood. Nurse scientists are involved in many different areas of research related to PNI. Some of these nurses and their work are featured in brief summaries following this article.

References
Asthma, Breast Cancer, Genetics, and Immune Response

Duck-Hee Kang, RN, PhD, Birmingham, Alabama

Dr. Duck-Hee Kang started her nursing career in Seoul, Korea. She received a PhD in a joint program of nursing and psychology at the University of Wisconsin - Madison. Her focus on physiological psychology gave her a solid foundation to investigate mind and body interactions.

Her research initially focused on asthma. Because psychological stress is thought to exacerbate asthma symptoms, it is important to understand how stress actually affects asthma and what immune mechanisms influence the relationship between psychological stress and asthma.

She is currently examining the effects of an 8-week intervention on immune responses, psychosocial well-being, and clinical symptom management in newly diagnosed breast cancer patients. The intervention is designed to be comprehensive to include three components to support the mind and the body simultaneously: stress management, social support, and exercise training. After the intervention, patients are encouraged to continue their practice that they learned in the intervention. When they are followed for a year, patients in the intervention group show less psychological distress, less fatigue, and better quality of life.

Her next research study will incorporate genetics to look at the genetic-environment interactions on health outcomes. One initial approach is to examine the effects of psychological stress and nutritional pattern (high fat and low antioxidant intake) on oxidative stress, which, in turn, can cause increased DNA damage. This process may lead to more frequent mutations in tumor suppressor genes and ultimately the expression of cancer, particularly in those individuals at high risk for developing breast cancer. The findings of this study can lead to developing additional strategies to improve health and potentially to delay the expression of cancer.

Maternal-Infant Interactions and Immunology

Maureen Groer, RN, PhD, FAAN, Knoxville, Tennessee

Dr. Maureen Groer is a nurse-physiologist whose research career has been devoted to psychophysiological research analyzing stress-immune-endocrine-cardiovascular links in children and adults. Her most recent interests revolve around behavioral immunology in women during the perinatal period. The focus of this interest has been on maternal stress-immune links which potentially might influence interactions between the mother and infant.

Her current National Institutes of Health funded study is examining the relationships between stress and immunity in postpartum mothers. Maternal stress may produce deleterious stress responses in the infant. Such stress states have the potential for producing immunological consequences in both the mother and the infant. Maternal stress and infectious illness also appear to be related both in mother and infant. The goal of this research is to determine if lactation provides mothers with particular health benefits such as better immune function, fewer infections, and less stress reactivity.

Other projects currently being carried out by Dr. Groer’s doctoral students and other colleagues include a study of postoperative massage on wound drainage cytokines after open heart surgery, a study of the influence of milk melatonin on infant sleep-wake cycles, a study examining the effect of maternal insecticide exposure on human milk and infant development, and a study examining the psychoneuroimmunologic effects of rape.
SPECIAL TOPICS:
NURSING RESEARCH IN
PSYCHONEUROIMMUNOLOGY

Stress-Busting Program for Caregivers of Patients with Alzheimer’s Disease

Sharon Lewis RN, PhD, FAAN, San Antonio, Texas

Dr. Sharon Lewis has a PhD in immunology from the University of New Mexico. She is an experienced researcher in the area of biobehavior and immunology. Her strong research training and experience in basic science provides a base for investigating biological, immunological, and physiological outcomes. Her background as a nurse with research training in basic science has led to her success in bridging clinical and basic science research.

She focused on the study of host defense in renal dialysis patients from 1983 through the mid 1990s and has now shifted focus to the newly emerging field of psychoneuroimmunology (PNI). For the past eight years she has been working on a NIH-funded research project to determine the effectiveness of relaxation therapy for caregivers of patients with Alzheimer’s disease. This longitudinal study involves working individually with caregivers and monitoring the effectiveness of the intervention using biofeedback measures, immunological parameters, and self-report measurements. Findings from this study indicate that over the course of study caregivers had improvements in immune function and mental health scores and decreases in emotional distress variables.

She has recently begun to investigate the effectiveness of structured educational support groups for caregivers of patients with Alzheimer’s disease. Outcome measures include biofeedback measures, immune parameters, and emotional distress variables.

Stress Management Interventions for Patients with HIV Disease

Nancy McCain, RN, DSN, FAAN, Richmond, Virginia

For over twenty years Dr. Nancy McCain has studied the relationship between stress and coping in people with chronic illness. She did a postdoctoral fellowship in psychoneuroimmunology in HIV disease at Rush University in Chicago.

Currently she has a grant funded by the National Center for Complementary and Alternative Medicine, a relatively new center at the National Institutes of Health. Her research involves three short-term stress management interventions including cognitive-behavioral stress management training, focused Tai Chi training, and spiritual growth groups for patients with HIV disease. Her research compares the effectiveness of these interventions using psychosocial functioning and quality of life measurements, along with immune function parameters. Her goal is to reduce stress and attenuate immune dysfunction for patients with HIV. Additionally, the current study of alternative techniques may expand the options for stress management.

In a previous NINR-funded study, McCain and her team found that although patients who participated in traditional stress management behaviors had higher quality of life and reduced stress, the results dissipated by six months. To counteract this phenomenon, her current research study incorporates booster sessions for participants at four and eight months.

Dr. McCain also is developing applications of the PNI model to persons with impaired immunocompetence due to cancer or its treatments. A novel stress management intervention is planned for women with breast cancer.
Animal Models of Psychoneuroimmunology Research
Gayle G. Page, RN, DNSc, FAAN, Baltimore, Maryland

Dr. Gayle Page’s postdoctoral study was in biobehavioral sciences at the University of California, Los Angeles, CA. She currently uses an animal model of breast cancer to illustrate how painful stress increases susceptibility to the spread of cancer. The animal models use conditions that are similar to conditions of humans in an effort to stimulate biobehavioral processes that occur in humans and to make those processes more accessible for study.

Dr. Page’s program of research is dedicated to providing evidence that unrelieved pain has significant biologic consequences, and has focused on two areas. In the first area, she has shown that undergoing and recovering from surgery is tumor-promoting, and that providing pain relief significantly ameliorates this consequence. Interventions that have been successful in ameliorating the tumor-enhancing effects of surgery have included analgesics. The second area has focused on the development of natural killer cell function in the rat and immune responsiveness to stress in the young animal. Additionally, her studies have considered possible gender differences in immunity and responses to stress.

She recently has begun to explore the impact of early postnatal pain on responses to both painful and non-painful stress in the mature animal. Her early findings indicate that repeated early postnatal pain experiences alter tumor susceptibility responses to non-painful stress in the mature animal.

Biofeedback Billing and Coding Issues
Continued from page 14

biofeedback we often have to perform an elaborate dance to find a suitable code that is permissible within that system. In some cases, the insurance companies will permit only certain types of practitioners to use specific codes.

It is important to remember that our relationship with third party payers if often an adversarial one. Most insurance companies, particularly the managed care companies, are primarily interested in curtailing their costs. If they can get away with denying coverage without breaking any laws they will tend to do so. We need to be up front and honest when dealing with insurance companies, telling them that we are providing biofeedback training because it is in the best interests of the patient. If they deny authorization, ask to speak to a supervisor and request a review of that determination. We also need to mobilize our clients and ask them to insist that biofeedback be a covered modality in their insurance programs.

In the long run, the use of creative coding is detrimental to the field of applied psychophysiology and biofeedback. Reimbursement decisions are often based upon retrospective reviews of submissions. If much of the biofeedback being performed is slipping under the radar with other codes then the companies will continue to restrict or deny coverage based upon lack of utilization. This is, of course, a classic vicious circle. Reimbursement rates will not increase until there is a dramatic increase in the number of biofeedback submissions. However, providers will be reluctant to submit biofeedback claims with little hope of obtaining fair compensation.

Action Needed
All biofeedback practitioners and researchers need to work together to get increased recognition for the value of biofeedback training. The RVU for 90901 (.41) is woefully inadequate and does not reflect the time, effort and expense of providing quality biofeedback training. The RVUs are adjusted on a five-year cycle by a committee from the American Medical Association. These people have no working knowledge of biofeedback. It is a priority of AAPB to present a strong case to the RVU Review Committee in its next session.

References


Sport Psychophysiology: The Current Status of Biofeedback with Athletes (Part II)

Jeffrey T. Leonards, PhD, Farmington, Maine

Abstract: In Part I of this three-part series, the rationale for using biofeedback (BFB) with athletes was explored in terms of the competitive advantages it can bring to a sports training program. Most of these interventions have been designed around improving performance through neuromuscular retraining, optimizing arousal, and/or self-regulation of autonomic functioning. Some of these approaches can assist, for example, shaving seconds, perhaps even milliseconds, off finish times. Others are structured around helping the athlete to maintain focus and control in a competitive environment otherwise filled with performance-inhibiting distractions. Research has shown that the improvements brought forth by these strategies can be substantial, yet even the most subtle modifications could be the difference between winning and losing, gold and silver, or simply qualifying vs. not qualifying for a team. The author contends that BFB-based sports applications represent a distinct specialization within the exercise and sport sciences, one which he refers to as sport psychophysiology (SPP). This article, Part II in the series, provides a comprehensive outline of the more common applications in SPP. In a subsequent article, we will explore the potential for new frontiers in SPP research and practice.

Current Psychophysiological Measures in Sport

BFB can be conceptualized as information fed back to a patient about biological processes, mostly autonomic, that are not typically under voluntary, conscious control. This information underlies the mind-body interplay leading to self-regulation of autonomic tone. BFB is generally immediate which, in a sports context, enables the athlete to continuously adjust work output to achieve or maintain a pre-specified goal (Zaichkowsky & Fuchs, 1989). The most common SPP modalities are discussed below in terms of somewhat limited, though surprisingly favorable, empirical research.

Electrocardiography (EKG)

HR is one of several cardiorespiratory phenomena that can provide an efficient measure of exertional intensity. Applied studies have consistently shown that subjects can learn through feedback to lower their HR even while maintaining a steady workload (Perski, et al, 1985).

Decreased HR corresponds with decreased oxygen consumption, meaning that HR biofeedback can produce improved cardiopulmonary functioning with no apparent cost to working muscles, a fact that can be validated by lactic acid testing (discussed in part III of this series). The recognition that HR BFB can improve exercise economy has led over the past 10 or 15 years to a proliferation of HR monitors in endurance training.

In essence, BFB of HR is designed to improve anaerobic threshold (AT). Correspondingly, it may also benefit both lactate threshold (LT) and ventilatory threshold, other important physiological indices of endurance. AT is the point at which lactate begins to accumulate in the muscles causing a burning sensation and decreased muscular efficiency. The higher one’s AT, the greater their capacity for work output. AT can be indicated by several measures, including maximal oxygen uptake (VO2 max), lactic acid levels, and HR.

Since HR is easiest to measure, a variety of formulas involving percentage of maximum HR (%HR max) have been developed as guides for increasing AT and thereby maximizing aerobic power. For example, studies have suggested that a certain percentage of training exceed 70% HR max (Eston & Parfitt, 1995), that this training fall within the “developmental endurance” (ten-beats-below-threshold) range (Harvey, 2002), or that it be within 10% of one’s AT (Burke, 1992).

While each of these recommendations may have validity, most endurance training is based on “periodization” schedules involving five annual macrocycles (transition, foundation, strength, power, and peaking phases) as well as fluctuating microcycles within each of these phases.

The workloads differ in all of these cycles and are typically calibrated by HR zones ranging from high intensity intervals (85 – 95% HR max) to long, slow distance (LSD) workouts in the 65 - 75% HR max range (Burke & Newton, 1993).

A variation to the HR max model is calculating HR reserve (HRR), which is quantified as the difference between resting and maximal heart rate. Some athletes prefer to tailor their exercise regimens based on a percentage of maximal HRR, so that a cyclist, for example, may train on a given day at 80% HRR max. Some consider this method to be not only reliable, but superior to simply using %HR max because of closer correlation with submaximum %VO2 value, explained in more detail below. Whatever method one employs, HR moni-
tors guide training by beeping when the athlete is no longer in the target range. Once familiar with measuring their own HR, the endurance athlete can begin to accurately estimate it even without the aid of the monitor (House, 1984). Another worthwhile application of HR feedback, particularly with elite athletes, is teaching them to routinely monitor HR upon awakening in order to avoid the perils of overtraining.

Another and more recent adaptation of electrocardiographic BFB involves the measurement of variations in HR rhythm, which is referred to as heart rate variability (HRV). This naturally occurring and quite normal arrhythmia (clinically referred to as respiratory sinus arrhythmia: RSA) has important correlations with cardiovascular conditioning and is therefore of significance to SPP, particularly in our work with endurance athletes. Because BFB of HRV is a newer adaptation in SPP, we have chosen to discuss it in greater detail in Part III.

**Surface Electromyography (SEMG)**

Muscle contractions are actuated by the electrical activity within a motor unit. Electromyography uses surface electrodes contacting the skin above the muscle to measure the electrical activity associated with these contractions. It has been suggested above that SEMG can be useful in arousal reduction and sports rehabilitation. Its greatest promise, however, may be in kinesiology where SEMG is used to target sport-specific muscles for differential training and development.

Nowhere, perhaps, is this better exemplified than in archery, a sport where BFB has been found useful in better understanding the muscular biomechanics of shooting and how to regulate these to optimize performance. In one study (LeRoyer, et al, 1993), the posterior deltoid was sequentially measured throughout the push-pull phases of repeated shots. Two phenomena, tremors and slow oscillations, were found to significantly influence the accuracy of each shot.

Regulating these variables to improve performance was made possible through auditory EMG feedback. Another fairly recent study involving elite archers (Wei-Duo, 1995) used SEMG in measuring postural variables associated with the process moving from drawing the bow to shooting the arrow. Their study suggested that focusing on specific muscles may be less important overall than the consistency of one’s posture from shot to shot. In this instance, SEMG data revealed that archers demonstrating the greatest postural consistency experienced the best overall performance.

Similar applications of SEMG have been reported across a wide variety of sports, including cross-country skiing (Perrey et al, 2000), basketball (Kavussanu et al, 1998), running (Blumenstein et al, 1995a; Hatfield et al, 1992), gymnastics (Wilson & Bird, 1981), rifle shooting (Prapavessis et al, 1992), fencing (Chen et al, 1997), and canoeing/kayaking (Blumenstein & Bar-Eli, 1998).

**Thermal Feedback (TF)**

Mediated by the sympathetic nervous system, digital skin temperature (DST) tends to increase with peripheral vasodilation, which usually occurs with relaxation. DST decreases as a function of vasoconstriction, typically brought about by psychophysiological arousal (Peek, 1987). As with other BFB techniques, TF has been shown to be useful in regulating sympathetic arousal to optimize athletic performance (Kikuchi & Kodama, 1995). In keeping with the Yerkes-Dodson inverted-U theory, Kamimura & Kodama (1995) reported bi-directional use of TF in which athletes learned to modulate DST to both decrease arousal where it had become excessive, and to increase it as a method of “psyching-up” for enhanced performance.

In practice, TF may have more limitations than other SPP interventions due to potential confounds. One such problem is that clinical results can be skewed by ambient air temperature, especially cold. This may not always hold true, though, as Kappes and Chapman (1985) found in studying whether athletes exposed to extreme cold could retain the ability to increase DST as a means of decreasing arousal. It was discovered that not only were trained subjects able to accurately estimate and reliably increase their DST in the cold, but that those whose TF training actually occurred outdoors could raise DST significantly higher, even in the cold, than those trained indoors. This potential confound, then, seems surmountable.

Another possible difficulty with TF is that the relationship between skin temperature (ST) and performance may be somewhat more complicated than simply interpreting it as a direct function of autonomic arousal. To illustrate, ST will fluctuate according to the volume of blood flowing to muscles, a condition which changes depending upon level of exertion. Under intense training, blood flow to the muscles is said to quadruple, producing significant increases in ST as the body directs heat away from its core (Sime, 1985). Buckwalter (1997), on the other hand, discusses how exercise can promote sympathetic vasoconstriction in working muscles, which would seem to lower ST. The point here is that the relationships between arousal, exertion, and performance are complex and need to be fully sorted out to avoid misinterpretation of outcomes.

It is also interesting to note that higher ST is not always most desirable in competitive or pre-competitive settings. A study of rhythmic gymnasts, for example, during the 1984 Olympics (Schmid & Peper, 1987) found that athletes with higher DST prior to performance actually performed worse than counterparts with lower DST. As with many other studies, this suggests that while some sports (or individual athletes) might benefit from arousal reduction techniques, others may require activation strategies to improve their results. Although the current literature shows TF to have some utility in motor skills training, it also reflects a need for additional research to tease out some of the variance in sport-specific outcomes.

**Respiratory Feedback (RF)**

RF, also called pneumography, involves the use of pressure-sensitive strain gauges applied abdominally and/or thoracically to measure quality and quantity of respirations. Controlled breathing is considered by some to be “perhaps the most important arousal reduction technique” (Zaichkowsky & Takenaka, 1993). When performed correctly, diaphragmatic breathing can enhance the bio-availability of oxygen to working muscles, which can thereby improve athletic performance. Shooters, for example, quickly
learn the importance of breath holds for the few moments prior to, during, and following a shot in order to improve accuracy (Landers, 1985).

There are suggestions in the literature that athletes as a whole tend to breathe incorrectly and that significant performance increments could accrue simply from mastery of proper breathing mechanics. While controlled (or abdominal) breathing has traditionally been used as a means of reducing arousal (Schwartz, 1987), hypoaroused athletes can also be trained to modify breathing rhythm in order to become energized. This can be achieved through slow, abdominal breathing, in the first instance, or hyperventilation in the second. This one medium, therefore, i.e., respiration, can be used to influence arousal in either of two directions (Gould & Udry, 1994).

Breathing patterns have also been found to fluctuate simply with imagery involving athletic performance. As athletes imagine themselves in various stages of their event, changes can occur in respiration rate, tone, and oxygen consumption (VO2), all of which can measurably impact performance. Because autonomic functioning is dependent on breathing, Blumenstein et al (1995b) recommend that respiration indices be an integral part of SPP assessments.

**Electrodermal Feedback (EDF)**

Through what is referred to as galvanic skin response (GSR), EDF enables inferences to be made about sympathetic arousal based upon eccrine sweat gland activity. GSR is a function of the increased sweat stimulated by psychophysiological arousal. It is measured subdermally through the skin’s conductance of electricity (Peck, 1987).

There has been some interesting research showing inverted-U relationships between athletic performance and GSR levels. Landers (1985), for example, mentions rifle shooters who were found to register greatest accuracy when GSR was 15-30% above resting levels, yet least accuracy when GSR was either <15% or >300% of preshooting levels. Empirical correlations such as this have suggested that EDF can aid in the mental skills training that is a key part of successful athletic competition.

Most of the recent literature involving EDF incorporates it as part of a multimodal intervention aimed at teaching autonomic regulation and/or reducing arousal. To illustrate, Blumenstein et al (1997) exposed athletes to self-regulation training involving multiple BFB measures (including EDF) as part of their “five-step” approach to mentally preparing for competition. In other instances, GSR has been used as a gauge of treatment efficacy when the actual BFB modality was EMG (Blumenstein et al, 1995a). Finally, EDF has also been paired with HR and frontalis EMG in examining the sensitivity of respiration as a measure of relaxation and imagery techniques in athletes (Blumenstein et al, 1995b).

**Neurofeedback (NF)**

It has only been within the past 10 years or so that there has been significant growth in NF research, much of this occurring in the areas of ADHD and chemical dependencies. Until recently, very few studies were conducted involving NF and athletes. To put this in perspective, Sandweiss & Wolf (1985), in their classic book, *Biofeedback in Sports Sciences*, devote only a few pages to what they called “electroencephalographic (EEG) feedback,” now known generically as NF. Although to date there remains comparatively little work involving EEG in the sports sciences, this is presaged to change—perhaps rapidly. Heralded under the banner of “peak performance training,” there is a growing recognition of significant potential in this field, with NF being widely regarded as very much in its infancy.

Basically, NF employs EEG to facilitate changes in the electrical rhythms of the brain. Applied to motor skills development, this approach is theoretically poised to train athletes to replicate brain wave patterns that will be shown to correlate with optimal performance in their particular sport. Though perhaps a long way from developing sport-specific EEG profiles, there has already been rudimentary progress in this direction (Wilson and Gunkelman, 2001). It is certainly clear, for instance, that the attentional exigencies of a sport like golf may involve different forms of neural entraining than we might expect in alpine skiing or marksmanship.

Sports applications of NF essentially focus on arousal reduction and improvements in attentional control. A study by Landers et al (1991) showed NF benefiting archers, while Sime et al (2001) report on studies in which NF has led to enhanced performance in such diverse activities as golf, diving, and even equestrian sports. Csikszentmihalyi (1991) coined the term “flow” to describe a mental state associated with optimal athletic performance through highly focused attention and total absorption in a particular task. Although “flow” is frequently experienced as an unbidden psychic state with nevertheless profound and salutary, psychomotor implications, NF seems to show strong potential in helping athletes to evoke the state at will.

**Conclusions**

This literature review makes it clear that BFB has already been used widely and effectively in the sport sciences. This apparent success, however, is not entirely without problems. As we will see in Part III of this series, meta-analytic studies have identified consistent methodological problems in SPP research over the past 20 years. Be this as it may, our contention is that not only are such problems surmountable, as in any of the behavioral sciences, but there seem to be additional frontiers for actually expanding the scope of SPP. It will be shown that some of the newer technologies in exercise physiology suggest opportunities for designing BFB instrumentation around such seemingly esoteric variables as cortisol, catecholamines, blood lactate, oxygen consumption, ventilatory capacity, heart rate variability, and others. In short, the author will cite literature supporting an entirely optimistic view of SPP as a credible and specialized discipline within the exercise sciences.

**References**


Chapel Hill: Performance.

Don't forget that you can earn CE hours by reading articles and completing the exam for each article. See instructions and the exams for past issues of Biofeedback magazine on the AAPB web site www.AAPB.org
Applying Audio-visual Entrainment Technology for Attention and Learning – Part III

David Siever¹, Edmonton, Alberta, Canada

Abstract: Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD) are unique attentional disorders which primarily involve slowed frontal brain wave activity and hypo-perfusion of cerebral blood flow in the frontal regions, particularly during tasks such as reading. A variety of disorders, such as anxiety, depression and Oppositional Defiant Disorder (ODD), are often co-morbid with ADD, thus creating a plethora of complications in treatment procedures. Audio-Visual Entrainment (AVE) lends itself well for the treatment of ADD/ADHD. AVE exerts a major wide-spread influence over the cortex in terms of dominant frequency. AVE has also been shown to produce dramatic increases in cerebral blood flow. Several studies involving the use of AVE in the treatment of ADD/ADHD and its related disorders have been completed. AVE as a treatment modality for ADD/ADHD has produced wide-spread improvements including secondary improvements in IQ, behaviour, attention, impulsiveness, hyperactivity, anxiety, depression, ODD and reading level. In particular, AVE has proven itself to be an effective and affordable treatment of special-needs children within a school setting.

Introduction

All mental functioning involves an element of arousal, that is, the awakened or alertness of the brain. The degree of the brain’s (cortical) arousal dramatically affects how well a particular function can be performed. For instance, it is almost impossible to pay attention if the brain is producing an abundance of alpha or theta (Oken & Salinsky, 1992), just as it’s difficult to fall asleep with excess beta and low alpha activity in an eyes closed condition.

People with attentional problems such as Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD) have particular difficulty shifting their pre-frontal lobes into gear (suppressing alpha and/or theta) during cognitive tasks, particularly passive, spatial tasks such as reading (Lubar, et.al., 1985, Tansey, 1985). However, high levels of stimulation (which AVE provides in abundance) have been shown to improve attention and reduce hyperactivity (Cohen & Douglas, 1971; Leuba, 1955; Zentall, 1975; Zentall & Zentall, 1976), and the presence of rock music has also been shown to reduce hyperactivity (Cripe, 1986). This may explain why those with ADD do so well with video games and action sports. Unless the activity is exciting (pushing up arousal), the pre-frontal and frontal lobes quickly lose their attentiveness and activation. Theta and/or alpha increases dramatically and the person “fogs out.”

ADHD rarely occurs in isolation and is often combined with other conditions including depression, oppositional defiant disorder, conduct disorder, obsessive compulsive disorder, learning disabilities, anxiety disorders, and other significant psychological, psychiatric, and neurological problems (Lubar, 1999; Hunt, 1994; Barkley, 1989).

Quantitative EEG (QEEG) Analysis of Brain Function

QEEGs have proven reliable methods for assessing brain function (Sterman, 1999; Sterman & Kaiser, 2001; John, et.al., 1977; Thatcher, 1998; Chabot & Serfontein, 1996) as shown in Figure 1, a qeeg of a teenager with ADD. One subgroup (Lubar, 1999; Gurnee, 2000) of ADD typically shows higher than average alpha, more prominent on the right frontal side (left image). During a reading task, the alpha activity increases fron tally (instead of suppressing) with larger increases on the right side (center image). This increase in alpha during a cognitive task is known as inversion, in that higher alpha or theta levels occur during task (in this case reading) than during a simple eyes-open (EO) condition. This inversion is experienced as mental “fog” while reading. Following one session (right image) on the DAVID Paradise XL, alpha normalizes and reading speed and comprehension are improved.

Glucose Uptake

Characteristics of ADD

Considering that alpha is basically an “idling” rhythm, it would be logical to assume that both cerebral blood flow (CBF) and glucose metabolism would fall during periods of increased alpha activity. ADD children show hypo-perfusion of blood (as measured with functional magnetic resonance imaging) in the striatum (putamen), and this directly correlates with hyperactivity (Teicher, et.al., 2000). When the same children are treated with methylphenidate, the relative increase in blood flow through the putamen directly correlates with reductions in hyperactivity.

Single Photon Emission Computerized Tomography (SPECT) is a process where a small amount of radioactive tracer is put into the blood stream through an artery. The parts of the brain that receive the most blood flow also absorb the most tracer.
through metabolism which shows up as a bright area on the image. Areas that don’t absorb any radioactive tracer appear as black. Figure 2 shows the pre-frontal blood flow and metabolism in a person diagnosed with ADD (Amen, 1998, p. 123). Notice that the pre-frontal lobes do not function well at the best of times. During concentration the pre-frontal lobes shut down quite completely, making it very difficult for this person to pay attention and process what is being read. After an application of Adderal, pre-frontal lobe function improves considerably, improving attention and reducing hyperactivity. Notice the similarities between the black “holes” in Amen’s spect (centre image) and the alpha inversion shown on the brain map (centre image) during the task conditions. Both Adderall and AVE increase cerebral blood flow. Notice the “smoothing” of brain function in Amen’s third image and the alpha “smoothing” following AVE on the DAVID Paradise.

**The Educational Challenge of ADD**
(excerpted from Michael Joyce – New Vision School, Minneapolis, MN)

Traditionally, educators have viewed conditions such as ADD, ADHD, and Obsessive Compulsive Disorder (OCD) as primarily medical conditions and therefore outside the realm of education. Typically, children with such conditions are referred to the medical world to identify an appropriate medication to ameliorate the problem behavior.

Children with ADHD are often disruptive in the classroom, require frequent teacher input, do not generally keep up with their peers in academic pursuits, and often require additional services due to their significant difficulty with all aspects of learning. Additionally, many children are misdiagnosed and actually have conditions of depression and anxiety. Medicating such children with stimulant medications in these cases is contraindicated and may make their conditions significantly worse. More recently, schools have become involved to a much greater degree, and now provide screening tests to identify students with attentional disorders.

This scenario suggests that a training program that results in more or less permanent resolution of ADHD symptoms would be preferred over the traditional medication management approach. NeuroTechnology (NT) is such an approach. NT, comprising neurofeedback and AVE, has been studied extensively in clinical and research settings for the past twenty years. Because intervention with NT is a training process and not a clinical intervention, it is more appropriately applied in the educational setting rather than in the clinical setting. It is also clear that this intervention will not be available through medical channels to the vast majority of children who need it due to the medical profession’s reliance on medication management, rather than educational approaches for such problems. Additionally, the evidence that medication compliance is significantly lower in low-income families suggests that applying NT in inner city and rural schools in low-income areas would be a more effective method of addressing such impediments to learning. Further, low-income students often cannot afford such training from a physician or psychologist and so do not have access to such an alternative approach for the remedy of their disability, even if it is available in their area.

**Studies of Attentional Disorders Using AVE as the Treatment Modality**

Throughout the 1980s there were a variety of case reports of improved attention and school grades when applying AVE to treat autism and ADD, but larger studies did not yet exist. Finally, in 1990, the first group study took place of the effects of AVE on 26 eight to twelve-year-old learning disabled boys from a private and public school (Carter & Russell, 1993).

In this study, fourteen children (from a private school) received two minutes of 10 Hz stimulation, 1 minute of no stimulation, and 2 minutes of 18 Hz for 5 cycles over a 25-minute period. The students received AVE once a day, five days per week for eight weeks, totalling 40 sessions. They also listened to a tape of binaural beats (recorded from the AVE sessions) for 40 sessions at home. The public school children (n=12) received three treatments per week for six weeks totalling 18 treatments. All children could see out of their eyesets, and were encouraged to play checkers and hand-held electronic games during the treatment.

The results of the first group were considerably better. They received 22 more AVE treatments than the public school children.
Unfortunately this large difference in AVE treatment had confounded the study, making it unclear as to whether or not the binaural beats on cassette tape had any influence. Figures 3 and 4 show the pre-post results of IQ measures and the Burks Teachers’ behavior index for the private school children. Referring to Figure 4, which class of students would you want to teach?

**AVE Program as a Treatment for Behavior Disorders in a School Setting**

In 1997, Michael Joyce began using a unique dual frequency AVE session using the TruVu™ eyesets (independent field stimulation used with the DAVID Paradise units) to treat ADD and reading challenged students in two Minnesota primary schools (Joyce & Siever, 2000). He measured the children for changes in inattention, impulsiveness, reaction time, and variability as measured with the TOVA computerized continuous performance test (CPT) (Greenberg & Waldman, 1993). Figure 5 shows the children’s improvements after an average of 33 sessions (over a ten week treatment period). A normal score is 100. A score of 85 represents one standard deviation away from the norm and is considered aberrant. These results clearly show improvements in all TOVA measures.

Michael also evaluated reading ability in students from the SPALDING reading program within the school. The children were tested on the STAR (Standardized Test for the Assessment of Reading). Figure 6 shows their comparative improvements as compared with the controls’ performance. The grade equivalent (GE) ranges from grade 0 to 13 and represents a child’s actual grade reading level. For instance, if a child is assessed with a GE of 4.7, then the child is reading at the level a typical child in the seventh month of grade 4. Figure 6 shows the differences in performance between the treatment (AVE) group and the control group. The percentile rank (PR), ranging from 1 to 99, shows a student’s performance compared to his/her peers nationally. For instance, if a child has a PR of 78, then the student is performing at a level that equals or exceeds that of 78% of the children in the same grade, based on the national average. This measure shows that the control group performance decreased slightly while the AVE group improved considerably.

**The Brain Blood-Flow Connection**

Cerebral Blood Flow (CBF) has been examined in other disciplines concerned with cognition. For instance, vinpocetine, an extract from the periwinkle plant has been shown to increase CBF (Gold, et. al., 2003). In studies of seniors with memory problems or dementia-related disease, the application of vinpocetine produced...
improvements in attention, concentration and memory.

Hershel Toomim, a long-time pioneer in the field of neurofeedback (NF), has examined the role of cerebral blood flow in brain regulation and attentional disorders (Toomim & Toomim, 1999). He has been using a technique called hemo-encephalography (HEG), which measures the perfusion of cerebral blood flow, and has observed decreases in frontal blood flow in ADD children during reading. By translating the HEG measures into auditory biofeedback, Toomim has been able to train such children to increase CBF. He reports results greater than those of traditional NF. Because of the cerebral blood connection between HEG and AVE, Toomim (2001) analyzed six well respected NF studies (studies with ADD children) and found that the Joyce study, while treating ten children simultaneously, showed better overall improvement on the TOVA than had NF, conducted one child at a time (Figure 7).

Several studies have been completed showing the comparison between peak alpha frequency and intelligence. In 1996, Anoukhin and Vogel observed 101 healthy males ranging from 20 - 45 years of age. They discovered that those who scored well on the Raven’s IQ tests had a scant 1 Hz faster alpha rhythm than did the poor performers. In 1971, Oloffson reported that healthy human alpha production was in the range of 9.3 - 11.1 Hz. A 1990 study by Markand showed that a dominant alpha frequency of 8.5 Hz or lower reflected a state of mental dysfunction. Other studies by various research teams; Vogt, Klimesh and Doppelmayer (1998), Jausovec (1996), Giannitrapini (1969) showed a distinctive relationship between mental performance and peak alpha frequency. Roughly speaking, peak alpha production of less than approximately 10 Hz can be associated with poorer than average academic performance while dominant alpha production higher than 10 Hz is associated with better than average academic performance.

The above findings prompted Budzynski and Tang (1998) to conduct a “peak alpha” experiment with AVE. Fifteen minutes of photic stimulation at 14 Hz was given to 14 people. Peak alpha frequency was found to increase following the cessation of photic stimulation. The pre-stimulation dominant alpha average frequency was 9.78 Hz., which continually increased to 10.38 Hz., 20 minutes post stimulation (the latest measure taken).

Budzynski Study Using AVE to Improve Cognition and Academic Performance in College Students

Tom Budzynski and colleagues (1999) further divided the typical alpha band (8 - 13 Hz) into three separate bands. Band "A1" represented 7-9 Hz, "A2", 9-11 Hz, and "A3", 11-13 Hz. They then examined the A3/A1 ratio. If, for example, there was 15 uv of A3 activity and 12 uv of A1 activity, the ratio would be A3/A1= 1.25. Based on previous findings, a ratio exceeding “1” was considered to equate with better than average mental performance, while a score below “1” equated with poorer than average mental performance.

A group of struggling college students (n=8), defined as those receiving tutoring, attending the Western Washington University, were chosen for the study. EEgs were collected and the A1/A3 ratios were calculated while the students were attending to a variety of mental tasks. As shown in Figure 8, average alpha slowing (as indicated by the negative ratio) was apparent across all measures and in particular alpha slowing was most apparent during the Digit Span task. This task requires remembering progressively longer strings of numbers until they can no longer be remembered. Following 30 sessions of repeating cycles of 14 and 22 Hz AVE, mean alpha frequency (positive ratio) increased. The positive alpha ratio continued across all tasks, indicating heightened mental performance (a reversal of the control group).

The 30 AVE sessions were completed in the Fall of 1997 and the students’ marks from their spring exams were recorded and compared against a control group (Figure 9). Notice the AVE group showed improvement in grade-point average (GPA) over the course of the year while the controls showed a decrease in PGA. This study demonstrates that the carry-over effect following the cessation of AVE treatment continued for at least five months.
Comparing AVE with Psycho-stimulants in the Treatment of ADHD in Children

This study by Lawrence Micheletti is unique in that it compares outcomes of an AVE group with a Ritalin/Adderall group, and with an AVE and stimulant combined group (total N = 99). A control group was also included in the study. The demographics are as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>31</td>
</tr>
<tr>
<td>Stimulant (Ritalin &amp; Adderall) Group</td>
<td>20</td>
</tr>
<tr>
<td>AVE Group</td>
<td>21</td>
</tr>
<tr>
<td>Combined AVE &amp; Stimulant Group</td>
<td>27</td>
</tr>
</tbody>
</table>

Testing was done just prior to treatment (pre), immediately following (post) and after four weeks (post-post). I.Q. was tested on the Wide Range Achievement Test (WRAT), Peabody Picture Vocabulary Test (PPVP) and Raven's Progressive Matrices (Raven). The children received a 20 minute session, five days a week for a total of 40 sessions. The first training session was administered by the researcher while the remaining 39 sessions were completed at home and were supervised and recorded by a parent or legal guardian.

The AVE unit was programmed to begin with both auditory and visual stimulation at 10 Hz for two minutes and at that time visual stimulation would cease and only auditory stimulation would continue for one minute. After the auditory only stimulation, the AVE unit would switch to both auditory and visual stimulation at 18 Hz for two minutes. The children experienced four complete cycles (five minutes per cycle) for the completion of a 20-minute training session. Absolute measures were taken, but for the purpose of this article, only the comparative data between the controls, the Ritalin Group, the AVE Group and the Combined AVE & Stimulant Group are shown (Figure 10).

New Visions School Neurotechnology Replication Project

In 2001, Michael Joyce, at the New Visions School (A Chance To Grow), a charter school in Minneapolis, specializing in special needs children (attentional and behavioral) completed the largest AVE study to date. This study substantiated previous work in schools in Minneapolis and Perham, MN, and in Yonkers, NY. The study illustrated that the public school setting is an ideal environment for conducting AVE training, particularly for low-income inner city and rural families who typically do not have access to such training. This study involved the efforts of seven Minnesota public schools (five elementary, one middle, and one K-12) with the majority of elementary age. This study employed AVE to address the inattention, impulsiveness and behavioral challenges in school-age children, thus reducing the need for medication management of these children and reducing the educational resources that are devoted to responding to their disabilities.

Students selected had a history of learning and reading challenges, impulsiveness, and a propensity to be distracted and to distract others. The students were selected by an ongoing, dynamic evaluation process based upon referrals from classroom teachers, parents, special education staff, and/or other concerned people in the student’s life. Parents and teachers completed a behavior rating scale, while the students completed a standardized reading inventory.

Apparatus

The AVE device used was the DAVID Paradise XL (manufactured by Mind Alive Inc, Edmonton, Alberta, Canada). The eyesets used in the study were field independent, in that they are able to independently stimulate the individual left and right visual fields of each eye thus producing a different frequency in each hemisphere of the brain.

At two schools, the DAVID Paradise XL was attached to a multi-user amplifier, which enabled up to ten students to receive treatment simultaneously (Figure 13). Each student had his/her own station, which consisted of a set of headphones and an eyeset. The students could control both the audio volume and the light intensity. The students preferred brighter intensities, between approximately 400 and 600 lux (full spectrum) measured approximately 0.3 inches from the eye set screen (approximating their average eye distance from the screen).

Students participated in two or three AVE sessions (20-30 minute) per week, averaging nearly 30 sessions over a period of three months. Some students with severe impairments underwent...
daily sessions. The training was part of the student’s regular curriculum, scheduled around other activities. Training was accomplished using protocols established by the foremost clinicians and researchers in the field, modified to reflect New Visions’ experience working within the school environment.

Results

Pre- and post-intervention data was obtained using direct assessment and behavior rating scales completed by both parents and teachers. Behavioral and personality ratings were obtained via the BDS, both the home and school versions and normed to a value of “10” (Figure 11). Oral reading proficiency was assessed with the Slosson-R reading test. Students showed reductions in anxiousness, depression, hyperactivity and inattention. On average, students gained eight months (p<.001) in grade-equivalent oral reading scores (Figure 12).

Shown below in Figure 13 is Michael Joyce’s storage box containing the AVE Multiple System. Michael’s box has an audio-mixer that “mixes” a microphone and CD player into the multiple system for the children to hear. These storage systems, which are used throughout several schools are on wheels so that they may be easily transported throughout the schools for use in different classrooms.

Conclusion

Several studies show that AVE is a useful tool for treating attentional disorders. The frequencies used in its operation are similar to those frequencies used with common NF techniques. As added bonuses, the ability to have pre-programmed sessions makes AVE useable by people not skilled in NF, such as teachers and parents. A single clinician may also treat several children at one time, thus drastically cutting costs. The results include many behavioral improvements in addition to the primary attentional concerns.

References

A Story of Inspiration: Lance Armstrong

Jeffrey T. Leonards, PhD

Editor’s Introduction: Optimal performance is not just one application area for biofeedback. Rather, it is an essential theme in all of biofeedback research and practice. Since the early pioneering work of Barbara Brown and Neal Miller, biofeedback professionals have tested the envelope of human potential.

Can human beings control muscle function? Can human beings learn to redirect visceral organs? Can human beings tap higher levels of brain potential for creativity and learning? In this editorial, Jeffrey Leonards gives a tribute to the inspirational determination of Lance Armstrong to push past illness and adversity to reach heroic levels of achievement in sport.

[Donald Moss, Ed.]

The summer is almost over, and so too is what for many was a long-awaited Tour de France (TDF). On July 27th, the three-week bicycling odyssey came to a smashing conclusion in Paris as Lance Armstrong edged-out his nearest rival by a scant 61 seconds. This 100th anniversary of le Tour was nothing short of epic, and not just in the annals of bike-racing nor even sport in general. It was one of those events that for spectators occurs maybe once or twice in a lifetime. This event saw a cancer survivor, an American no less, vying for a record that only once before had ever been achieved — winning the Tour five years in a row. A streak like that has been likened to Gretzky’s 51-game scoring streak, DiMaggio’s 56-game hitting streak, Hershiser’s pitching 59 consecutive scoreless innings, Marciano’s 49-bout winning streak, and Bjorn Borg’s five straight Wimbledon titles.

But the 2003 Tour would be remembered for more than just a streak. In any year, this race is among the most grueling feats to which a human body can be subjected. Riding well over 2000 miles in just three weeks, the course is comprised of 20 stages, each day’s stage consisting of approximately 125 miles of winding, mountainous roads and scorching heat. With mountainous grades often exceeding 10%, the ascents can be tortuous, the descents hair-raising with speeds sometimes approaching 70 mph.

Picture 200 bicyclists all jockeying for position, where one crash can promote a massive chain-reaction, and you can begin to appreciate that without courage and agility, stamina alone will never get one to Paris.

This Tour, though, was unique for it showcased a combination of utter determination mixed with human frailty and, in the end a real person, not some machine, stood alone on the podium. And his struggle bespoke a message. Many have talked of Armstrong’s almost superhuman qualities. Physiologically, his capacity for consuming oxygen and distributing it economically to working muscles puts him in a class of his own. He also seems to generate lactic acid less quickly than his competitors, enabling him to continue cranking when others have been dropped by muscles screaming for mercy. Armstrong, though, notwithstanding his name, is very much a mortal. If this was not demonstrated in 1997 by his near-death speculation about a lingering back injury from at least one of the earlier spills. And if this was not enough, there then came a rather nasty intestinal flu just a week before race-time. Things had to get better.

Unfortunately they didn’t. The prologue began with Armstrong finishing 7th in the opening time-trial, far from the commanding win that many expected. In Stage 2, only moments from the finish-line, he became involved, along with scores of other riders, in a crash that he would later admit made it difficult that evening to simply walk. Regrettably, Stage 8 found Lance virtually unable to get out of his own way on an exhausting climb up Alpe d’Huez, the fabled stage where in previous Tours he had mercilessly hunted down and destroyed his opponents. This year’s toll would show on his face, gaunt and hollow, hardly the countenance of years past. Hearts sank as commentators bawled, “The yellow jersey is up for grabs.”

What more could go wrong? The answer would come in stage 9 when Armstrong, close on his arch-rival’s wheel in a 50 mph descent, narrowly avoided disaster as Joseba Beloki crashed, fracturing his femur, elbow, and wrist. Armstrong’s evasive tactics, while keeping him in the race, lost him precious time in a harrowing, off-track ride down a short ravine. Stage 12 may have been even more dire, if that’s possible. Armstrong, who has always preferred cold, damp conditions, was suffering unmercifully from searing temperatures in Europe’s worst-ever heat wave. The 37 mile time-trial alone would leave him severely dehydrated, 15
pounds lighter, and needing hours of IV fluids prior to the next day’s race. His bid for a record-tying 5th TDF win was clearly slipping away.

And Stage 15 would unfold yet another disaster, one so profound that Armstrong himself, the unflappable optimist, began thinking his Tour was over. Having been challenged relentlessly on the Tourmalet climb by historical rival Jan Ullrich, Armstrong, known as a master tactician, waited until the final ascent of Luz Ardiden to launch his desperate attack. Only moments into this virtually do-or-die situation, fate inexplicably entangled a spectator in his handlebars, flipping Lance head-over-heels onto the pavement. Bruised and battered, he attempted to catch the lead group when horrendously his cleat slipped out of the pedal, wish-boning him on his top tube and again losing him invaluable seconds.

Then it happened. With adrenalin now flowing like a burst water main, Armstrong was for the first time in two weeks really out of his saddle, that trademark look of utter determination defining his face. Call it what you will, anger, desperation, whatever it was, Lance Armstrong was powering his bike up that infernal mountain with the panache of a warrior leading a cavalry charge. For many fans, this was the moment for tears and celebration, as it was suddenly apparent that the champion of four previous Tours, a man who for days had looked truly vanquished, was not only back, but was going to win this pivotal stage, and with it perhaps the Tour itself. History will record Stage 15 as one of the more unsurpassed dramas in sport, certainly in TDF history. Armstrong took the stage with gallantry, slowing momentarily to pat the shoulder of the last overtaken cyclist just minutes before the finish line.

For years, race afficionados have mourned the passing of the padrone, a recognition of leadership paid by the peloton to a truly exceptional bicyclist, one who commands as much respect for character as for athleticism. Such deference bestowed by otherwise cutthroat riders is quite rare these days, yet Armstrong’s demeanor has earned this affection. In 1929, then-President Coolidge intoned that “nothing in the world can take the place of persistence and determination.” Charles Swindoll would later write, “life is 10% what happens to me and 90% how I react to it.” Armstrong’s gritty comeback in this year’s Tour personified both these truths, wherein lies the true magic of this year’s race. When Armstrong got out of his saddle, sweat pouring off his chin, eyes fixed on the horizon, the outcome of the race no longer really mattered. It was enough that the yellow jersey was up, staring down defeat, saying in essence “it ain’t over til it’s over.” The miracle that we witnessed in Stage 15 was “not about the bike.” It was about resolve and determination, to keep fighting no matter how apparent the outcome.

The pages of sports history are filled with heroes like Armstrong. So too are the cancer wards, where valiant combatants all-too-frequently slip tragically away, and with far less fanfare.

Severely ravaged at one time himself by cancer and chemotherapy, Armstrong wants to be remembered more as a survivor than as the biking champion he is. He is inspired by the hope he brings to cancer patients. We, on the other hand, are inspired by his fierce will to survive and to fight for everything that is meaningful.

The message is clear. We can all be Lance Armstrong. Whether it’s a bike race, a career challenge, a failing marriage, a personal loss, or even a hideous disease like cancer, the outcome is never a certainty. We have the capacity to persist, to keep struggling with every available ounce of energy, sometimes against all odds. In the end, we can’t always be victorious, as Lance himself will eventually experience. But in truth, it’s not the outcome that gives meaning anyway; it’s the struggle itself, the will to fight.

For Armstrong, there will, of course, be a sixth attempt at the maillot jaune. Whether he succeeds, though, is somewhat immaterial, for what he has given us already is far more than any could have ever asked for.
From Supervision to Mentoring: BCIA Change in Policy

Celeste De Bease, PhD, Philadelphia, Pennsylvania

Abstract: The wide diversity of biofeedback settings has expanded beyond the medical model. Biofeedback practitioners can be found working with athletes, students, test pilots, CEOs and soldiers. BCIA has responded by moving from a supervision model to a mentoring model as a means of training those individuals seeking biofeedback certification.

Introduction

As biofeedback continues to expand, we are seeing applications of the biofeedback techniques in a wide variety of fields. Biofeedback training is being used in the schools, in athletic arenas, in performance training facilities, and in health care centers. As many of you know, we at BCIA have been working to improve the certification process so that it reflects these rapid changes.

Recently, BCIA revised the recertification policies to reflect the broader context in which biofeedback services are being provided and recognized that there may be situations in which the independent practice of biofeedback requires neither a license nor supervision under a licensed practitioner, depending on applicable law and ethical guidelines.

So too, in the area of supervision, we recognize that there is a fundamental difference between supervision for professional licensure and supervision for BCIA certification. We have had a supervision policy in the past that reflected the licensure model. Now, as more and more biofeedback practitioners move outside the “medical model” of treatment, we are adopting the mentoring/consultation model of supervision.

Why This Change Was Warranted

Training for BCIA certification is not and should not be represented as clinical supervision for either professional licensure or insurance reimbursement. These are unique and separate contractual agreements between two professionals. Rather, it is part of the basic training needed to help a new practitioner gain basic competency in the field of biofeedback.

Supervision for licensure has a number of very specific criteria which are not required in the mentoring model. For instance, in many states the supervisor must be employed by or be in contractual status with the professional setting in which the trainee is employed. In these situations, both the trainee and the supervisor share in the responsibility for the client/patient’s welfare although it is the supervisor who has the ultimate responsibility. Typically the supervisor may not accept fees, honoraria, favors or gifts from the supervisee; and often must meet with the supervisee face-to-face for two hours a week. Finally, the supervision-for-licensure model usually states that the supervisor bears the full professional responsibility for the welfare of every client/patient served.

Insurance companies often dictate who may provide reimbursable treatment. A professional must meet both degree and licensure requirements. Each insurance company has its own rules and regulations. For example, Medicare insists that a licensed supervisor be in the immediate vicinity when an assistant or trainee is providing the service. Other insurance companies insist that the supervisor be on the premises. Still other insurance policies simply stipulate that the supervisor oversee the work.

Here are the most pertinent differences:

- The mentor/consultant does not have legal responsibility for clients/patients.
- The candidate does not need to make it known to the patient/client that s/he is working with a mentor/consultant.
- The candidate does not need to make it known to the patient/client that s/he is working with a mentor/consultant.
- The candidate may charge for services. In essence, the candidate is hiring his or her mentor/consultant for the services provided.
- The mentor/consultant need not be a qualified provider in the candidate’s specialty but must be competent in the areas in which mentoring/consultation is provided.

Conclusion

It is our hope at BCIA that more of you will enter into a rewarding and mutually beneficial mentoring experience. We hope these changes will help you in your endeavors.

References


Dr. De Bease is a BCIA board member and is chair of the mentoring committee.
Celeste De Bease, PhD, was trained at the University of Pennsylvania in psychophysiological psychology and is certified in both general and EEG biofeedback. She worked for many years doing EEG research at Temple School of Medicine, EEG lab. She is a past president of the Pennsylvania biofeedback society and is currently on the BCIA Board. Dr. De Bease teaches graduate psychology at both Widener University and Chestnut Hill College and practices at the BioNeurofeedback Treatment Center in the Philadelphia area.

Maureen Groer, RN, PhD, FAAN, is a Professor and Associate Dean for Research and Evaluation, in the College of Nursing at the University of Tennessee, Knoxville, Tennessee. Dr. Groer is a pediatric nurse practitioner, and travels to West Africa every year for two weeks with other faculty and students to provide primary health care in Sekondi, Ghana. Her research is primarily carried out in the laboratory at the college of nursing and she teaches pathophysiology, which is an area in which she has authored 5 textbooks. She loves tennis, skiing, and her Labrador retrievers.

Duck-Hee Kang, RN, PhD, is an Associate Professor in the School of Nursing, University of Alabama, Birmingham, Alabama. After graduating from Yonsei University, Seoul, Korea, she came to the U.S. and has worked in many clinical and academic positions. She received her doctoral training in Nursing and Physiological Psychology from the University of Wisconsin-Madison and continued her postdoctoral training in psychoneuroimmunology. She has been serving as a grant review member at the National Institutes of Health and a reviewer for many professional journals. She plans to spend her sabbatical at Yonsei University College of Nursing in 2004 to advance bio-behavioral research in Korea. She wants to promote strong international collaborations on bio-behavioral research and expand her studies to include nutritional and genetic factors in the future.

Jeff Leonards, PhD, is a licensed psychologist with Evergreen Behavioral Services, a division of the Franklin County Health Network (http://www.fcfn.org/) in Farmington, Maine. Through this network, Dr. Leonards coordinates behavioral medicine services including consultation to Franklin Memorial Hospital, a rural 70-bed facility where he is an affiliate member of the medical staff. Dr. Leonards is an avid athlete, participating regularly in cycling, hockey, weight training, and nordic skiing. He holds a black belt in Tae Kwon Do, is a former ski-patroller, and is current president of the Western Mountains Hockey and Skating Association.

Sharon Lewis, RN, PhD, FAAN, is a Professor of Nursing and Medicine, and the Castella Distinguished Professor at the University of Texas Health Science Center at San Antonio. She is also a Clinical Nurse Scientist at the Geriatric Research, Education, and Clinical Center at the South Texas Veterans Health Care System, San Antonio, Texas. Her research is in the area of biobehavior and immunology. Her background as a nurse with research training in basic science has aided her in bridging clinical and basic science research. Her free time is spent playing tennis, landscaping, and gardening.

Nancy McCain, RN, DSN, FAAN, is a Professor in the School of Nursing, Virginia Commonwealth University, Richmond, Virginia. She has been recognized as a nursing “pathfinder” based upon her scientific breakthroughs in psychobiological health. Supported by three NIH grants, she has developed a program of research that applies a PNI framework to test stress management interventions in persons with HIV disease, beginning with traditional relaxation approaches and now investigating alternative approaches. Her research has yielded findings that will promote psychological and immunological health in HIV disease and advance the scientific basis for HIV/AIDS nursing practice.

Gayle G. Page, RN, D.N.Sc., FAAN, is an Associate Professor and the Independence Foundation Chair in Nursing Education, at the School of Nursing, Johns Hopkins University, Baltimore, Maryland. Her clinical practice caring for infants recovering from open heart surgery has been a driving force in her efforts to demonstrate that the adequate relief of pain is not merely a matter of mercy, but one of physiologic necessity. Her newly evolving work focuses on the possible long-term physiologic consequences of the multiple pain experiences premature babies must endure by investigating the impact of early postnatal pain on immune responses to stress at maturity.

Ronald Rosenthal, PhD, is a psychologist and biofeedback provider in Miami, FL. He received his PhD in experimental psychology from New York University and worked for five years with Neal Miller. After completing a retraining program in clinical psychology, he opened a practice specializing in the rehabilitation of motor dysfunction in 1992. Ron has been active in the Biofeedback Society of Florida and in AAPB; he is currently serving as the co-chair of the AAPB insurance committee.

David Siever graduated in 1978 as an engineering technologist. He later worked in the Faculty of Dentistry at the University of Alberta designing TMJ Dysfunction related diagnostic equipment and research facilities. He organized research projects, and taught basic physiology and a TMJ diagnostics course. Dave observed anxiety issues in many patients suffering with TMJ dysfunction, prompting him to learn and practice biofeedback and design biofeedback devices. In 1984, Dave designed his first audio-visual entrainment (AVE) device—the DAVID1. Since then he has researched and refined AVE technology, specifically for use in relaxation, and treating anxiety, depression, PMS, ADD, FMS, SAD, hypertension and insomnia. He presents AVE technology applications regularly at conferences and for special interest groups.
Sebastian “Seb” Striefel, PhD, became a Professor Emeritus in the Department of Psychology at Utah State University in September 2000. For twenty six years he taught graduate level courses in ethics and professional conduct, clinical applications of biofeedback, clinical applications of relaxation training and behavior therapy. He was also the Director of the Division of Services at the Center for Persons with Disabilities at Utah State University. In that role he managed a variety of programs, including an outpatient clinic, a biofeedback lab and an early intervention program. He is a past president of the Association of Applied Psychophysiology and Biofeedback (AAPB), past president of the Neurofeedback Division of AAPB, current vice-president of and past secretary/treasurer of the International Section of AAPB, and regularly writes an ongoing ethics column and conducts workshops on ethics, standards, and professional conduct.

Robert Whitehouse, Ed.D., is a licensed psychologist, BCIA Senior Fellow certificant, and former psychology professor, having established one of the nation's first college biofeedback programs. Currently, he is in private practice and consulting in Denver and Boulder, specializing in pain management, driving anxiety, and optimal performance. He is a former AAPB Board member and current co-chair of its Insurance Committee. He is frequently contacted regarding billing and coding issues. He wants to see simple biofeedback self-regulation applications for classrooms in all schools.

**Audio-visual Entrainment Technology – Part III**

Continued from page 29


**Notes**

1Address all correspondence to David Siever at “Mind Alive” (formerly Comptronic Devices Ltd). Toll Free: 1-800-661-MIND (6463), Ph: 780-450-3729, 9008-51 Avenue, Edmonton, Alberta, Canada, T6E 5X4. Web: www.mindalive.ca Email: info@mindalive.ca

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Invest wisely in your practice
- insist on flexibility, ease of use, and affordability!
The experts are gathering in the Colorado Rockies this spring. Come be a part of the rewarding learning experience and share in the fun when AAPB presents its 35th Anniversary Annual Meeting “Launching New Mind-Body Paradigms.” Because it’s our anniversary, the meeting is going to be especially exciting, with special events, a dance and other celebrations.

Gain valuable insight from our Workshops, Short Courses, Keynote Addresses, Special Presentations and Symposia representing the wide range of biofeedback, basic and applied psychophysiology, behavioral medicine, health psychology, and alternative, complementary or integrative medicine. Harness the power behind various self-regulation methods, including EEG biofeedback, QEEG, EMG and SEMG, relaxation training, temperature regulation, and GSR. Plus, get a closer look at the effects of “alternative” or “complementary” approaches such as hypnosis, Eastern and Western energy therapies, and others.

Many of the Sections/Divisions are sponsoring captivating Keynote speakers, such as Richard Davidson, PhD and Luciano Bernardi, MD. Don’t miss out! Seize this opportunity to absorb the dynamic and thought-provoking research and knowledge from professionals in your field.

STUDENTS: We encourage you to apply for the AAPB Foundation Student Scholarship Program, which provides $400 travel and complimentary registration to the Annual Meeting, to those selected. The deadline to apply is December 1, 2003. For complete details, visit http://www.aapb.org/public/articles/details.cfm?id=112.

AAPB also has made available a limited number of free AAPB memberships for qualifying students. To apply, please visit our website at www.aapb.org.
A Buddhist story is told as follows: A young female disciple undertook to develop the meditation on loving-kindness. Every day, sitting in her small room, she would fill her heart with loving-kindness for all beings. Yet each day when she went to the bazaar to buy her food, she would find her loving-kindness sorely tested by one of the shopkeepers, who could not keep his hands to himself and would subject her to unsolicited and unwelcome advances and caresses. One day she could stand it no more, and began to chase the shopkeeper down the road with her upraised umbrella. To her mortification, she passed her Buddhist teacher standing on the side of the road observing the spectacle. Shame-faced, she went to stand before him, expecting to be rebuked for her anger.

“What you should do,” her wise teacher kindly advised her, “is to fill your heart with loving-kindness, and with as much mindfulness as you can muster, hit this unruly fellow soundly over the head with your umbrella.”

I don’t know about you, but sometimes I feel like the young disciple in the Buddhist story. It can become quite confusing when taking a stand, all the while trying to walk my talk and be courteous, respectful, and professional. And, so it would appear according to the parable, sometimes the best defense may be a well-placed umbrella whack.

It is in this spirit that I applaud AAPB’s Vince Monastra for single-handedly taking a stand against Russell Barkley and Sandra Loo. For those of you who haven’t heard the story, a recent issue of the ADHD Report had a major review article by Sandra Loo. Russell Barkley, the editor, concluded with his all too familiar statement that biofeedback is experimental.

Vince fired off a powerful 8 page single-spaced Letter to the Editor, citing many peer-reviewed studies refuting the “experimental” label that Barkley so frequently applies whenever biofeedback is mentioned. To his credit, Russell Barkley agreed to publish Vince’s letter. I have no doubt that the strong case (or “umbrella”) that Vince presented, bolstered by the number of strong peer-reviewed studies he cited made it impossible for Russell Barkley to ignore Vince’s rebuttal. In addition, AAPB’s EEG Division President, Bob Gurnee, and the Division Board and I wrote a statement of support for Vince Monastra’s stand.

These are just the kinds of actions that will help us reach “The Tipping Point” that I wrote about in our last issue of Biofeedback. In that issue, I wrote that all of us need to take every opportunity to promote or defend biofeedback. Every time a TV station runs a story, every time a newspaper, magazine or newsletter prints something relevant to biofeedback, we need to respond, individually and collectively. Post haste!

“If you don’t stand for something, you will fall for anything.”

– Anonymous

We Encourage Submissions
Send chapter meeting announcements, section and division meeting reports, and any non-commercial information regarding meetings, presentations or publications which may be of interest to AAPB members. Articles should generally not exceed 750 words. Remember to send information on dated events well in advance.

Send Word (.doc) or text files by e-mail to the News and Events Editor: Ted LaVaque, PhD, tlavaque@gbonline.com.
I grabbed some reading material for a flight the other evening. I began by reading our president’s wonderful column in the summer edition in *Biofeedback*. Lynda Kirk wrote that the common thread in our applications is self-regulation and that biofeedback technologies help us “guide people from states of dysfunction to function all the way to optimal function.” Biofeedback and other psychophysiolgic therapies can help self regulate our physiology, emotions, and consciousness in many ways that empower our clients. She urged our membership to get the word out to professionals and the public, increasing awareness of our powerful tools.

I then picked up the Science section of the *New York Times* and read about a new study that appeared this week in *JAMA* showing that young adults prone to impatience and hostility are more likely to develop hypertension. An accompanying editorial in *JAMA* noted that stress management techniques have been found to reduce both negative emotions and physiologic changes associated with cardiovascular disease. Unbelievably, the next article described a self-regulation model involving imagery and hypnosis, published in the current issue of the journal *Gut*, that resulted in long term relief (over one year) in approximately 80% of the irritable bowel sufferers in the study. Self-regulation of physiologic processes twice in the *Science Times*!

Why is it so tough to market our science and services? We live in a time urgent short term world. Do you have GERD? Take the purple pill. Sad, irritable, angry there’s an anti-depressant commercial coming your way. Frustrations are everywhere. I’m trying to find out if my flight is delayed on the toll free number of the airline. I push 1 for departure times and then have to state the

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**FROM THE EXECUTIVE DIRECTOR’S DESK**

**In Recognition of the “Other” Pioneers**

*Francine Butler, PhD*

As AAPB approaches its 35th birthday, it is natural to think of the pioneers and their contributions to the field. We have other pioneers, the practitioners who designed and developed biofeedback instrumentation. This column is dedicated to that group of creative and inventive members and partners of AAPB.

You all were there at the beginning when few believed. You were the innovators reaching to face challenges and to try new applications.

At the 1972 meeting in Boston, we had a grand number of seven exhibitors. One individual—John Picchiottino—still has an active company. This column is dedicated to those who were with us in the first twenty years and are still with us today.

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**FROM THE PRESIDENT-ELECT**

**Functioning in a Short Term World**

*Steve Baskin, PhD*

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Continued on page 4A
AAPB to Launch New Mind-Body Paradigms this Spring in Colorado

The Association for Applied Psychophysiology & Biofeedback is traveling to one of the most beautiful spots along the Rocky Mountain front-range to bring you the most rewarding learning experience yet. Don’t miss AAPB’s 35th Anniversary Meeting, Launching New Mind-Body Paradigms, April 2-4, 2004, in Colorado Springs, Colorado. Pre-Conference Workshops will be held March 30 – April 1.

Join us for the special celebratory event that will bring together dynamic workshops, exhibits and educational sessions with many special events, including a gala dance and other surprises. The meeting will feature an array of topics from biofeedback, basic and applied psychophysiology, behavioral medicine, health psychology, and alternative/integrative medicine. Together we will harness the power behind myriad self-regulation methods, such as EEG biofeedback, QEEG, EMG and SEMG, relaxation training, temperature regulation, and GSR. You will also get a unique opportunity to explore the effects of hypnosis, Eastern and Western energy therapies, and more.

AAPB already has a number of dynamic speakers on deck, all eager to share their expertise with you. Nowhere else can you get face-to-face contact with the people shaping the industry.

Keynote speakers include Richard Davidson, PhD, one of the primary authors of Alterations in Brain and Immune Function Produced by Mindfulness Meditation, who was the first to suggest that meditation can produce increases in relative left-sided anterior activation that are associated with reductions in anxiety. Thanks in large part to his research we are now entering a new arena in the practical understanding of long-term changes in baseline brain activity. Make sure you are part of the growing wave of public interest. Dr. Davidson is William James and Vilas Research Professor of Psychology and Psychiatry and Director of the W.M. Keck Laboratory for Functional Brain Imaging and Behavior at the University of Wisconsin-Madison. He received his PhD from Harvard University in Psychology and has been at Wisconsin since 1984. Dr. Davidson is internationally renowned for his research on the neural substrates of emotion and emotional disorders.

The second Keynote speaker is Dr. Bud Craig who has a long and impressive track record in basic neuroscience research, especially in the field of “Interoception”. Based in Phoenix, he heads up a private federally funded neurological research institute. He and the members of his research team have done groundbreaking work on afferent mechanisms involved in homeostasis, including the elucidation of the very important sympathetic nervous system afferents involved in the generation of pain symptoms. He describes pain as a homeostatic emotion. This research has important implications for how we understand symptoms such as pain and fatigue, and has very significant implications for enhancing the sophistication of behavioral medicine and applied psychophysiology approaches to the many patients with functional somatic syndromes, including chronic pain syndromes.

Another invited speaker is Luciano Bernardi, PhD, who will present his latest findings in area of the complexities of cardio-respiratory interactions. Dr Bernardi is an Associate Professor of Medicine at the University of Pavia in Italy and is a respected Cardiologist and Cardiovascular researcher and is the author of many articles in Cardiology journals.

AAPB has also invited Dr. Scott Shannon to share his knowledge of holistic approaches, which he has been perfecting for more than 25 years. Dr. Shannon is a Child Psychiatrist, a charter member of the American Holistic Medical Association and past president of that organization. He serves as Medical Director for the McKee Hospital Center for Holistic Medicine in Ft. Collins, Colorado and continues a private psychiatric practice, which includes acupuncture, herbal medicine, and nutritional approaches for children/adolescents with emotional/behavioral disorders.

Other scheduled speakers include Simon Hanslmayr, Dr. HR Nagendra, Naomi Eisenberger, and Eran Zaidel, PhD.

Come enjoy Colorado Springs, one of the most beautiful regions in the eastern Rocky Mountains. Located in the Pikes Peak region, the area offers more than 50 major attractions, in addition to the stunning beauty of the landscape itself. From the rolling prairies to the east to the towering peaks to the west, Colorado Springs is nestled what has literally been named the “Garden of the Gods.” Beautiful Victorian homes and turn-of-the-century buildings bring the history of the west into this modern mountain destination. The area offers everything from family attractions, such as the Manitou & Pikes Peak Cog Railway, to activities for the nature lovers, including Seven Falls and breath-taking red sandstone pinnacles. You can also visit the U.S. Air Force Academy, the Pro Rodeo Hall of Fame and Museum, and the U.S. Olympic Training Center.
Functioning in a Short Term World

continued from page 2A

airport. Only recorded prompts, no live voice. When I say LaGuardia, it’s interpreted as Los Angeles and of course I have to redial. The next time I decide to get a “live” person and “due to the large volume of calls your wait may be over 10 minutes.” I try the website, seating assignments and arrival/departure information are being redesigned. I call the recorded line again, mistakenly hit the arrival number instead of departure, let out an expletive and hear “your flight arrives in Chicago at...” My thirteen year old observes my fuming and says “Dad, I think you need Paxil or Zoloft.” At least he gave me a choice.

I have to call my mother’s doctor and can’t locate his number. I try directory assistance, “Is Dr. Shapiro a residence or business.” I bite my tongue and state, “a doctor’s office.” “There is no doctor’s office by that name.” I grow impatient and probably hypertensive. “Every city in the US has a Dr. Shapiro.” A long wait. “We are connecting you to...” A man answers, “Shapiro Furs.” “Oh sorry, I was looking for Shapiro the doctor not Shapiro the furrier”. I’m running out of time, I have a plane to catch.

I’m upset because the Marlins beat the Yankees last night in the World Series and my third bit of reading on the plane is the local Florida newspaper from the city that I’ve just visited. I’m reading the sports page which merges into the personal ads, then the large erectile dysfunction and pain management advertisement section. These pain management centers don’t offer relaxation training or biofeedback. They don’t offer cognitive pain management strategies, increasing activity level or exercise. Not even nerve blocks. The Yankees’ loss leads me right to “we give FDA approved narcotics.” A little short term emotional-self regulation to help this old Bronx boy cope.

I’m driving home from the airport and my cell phone rings. I’m talking, driving around the curves on the Merritt Parkway, and my wife asks me to pick up a prescription for her at the pharmacy. “The CVS is right off the Parkway.” I wanted to get to the gym for a bit and wind down from some hectic traveling. There are about 20 people on the prescription line in various stages of illness. A few pneumonias, some large herpetic lesions, and one compulsive, seizing sneezer. I’m being flooded for a germ phobia. The line moves ever so slowly. It’s getting too late to workout. I keep myself from hyperventilating. I finally get to the tech and surprisingly, the prescription hadn’t been filled. “We’re out of that particular antibiotic and the doctor had left for the day. Do you need to pick up another prescription?” “Yeah, some Paxil or Zoloft.”

Every time I give a talk at an educational program (some funded by pharmaceutical companies), I show my AAPB slide encouraging whichever professional group to join our membership, take our courses, present at our meeting. These industry sponsored programs almost always mention stress as an important symptom trigger. In fact, many of the most prescribed drugs are for stress related illnesses. However, medical lore has always been that you can give yourself a lesion but you can’t heal it. “Presenters, other than me, often list self-regulation treatments, often specifically biofeedback. However, the programs are mostly about drugs paid for by drug companies. They have the money, fund research, encourage pilot studies, and advertise to docs and the general public.

Interestingly if I ever do a workshop with hands on biofeedback experience, many participants, regardless of discipline, give that part of the program a very high rating. They truly enjoy it. So what can we do?

I believe that we need advocates in powerful places including government agencies, the NIH, academic centers, and even the big bad pharmaceutical industry. We need to introduce our techniques and technology to the increasingly time urgent short term world, whenever and wherever we can. We need to form partnerships where we don’t just have one small presentation at their meeting but we get many of them to come to our meeting and join our society. I encourage all of our membership to ask one nonmember colleague to join AAPB. Encourage a colleague to attend one of our educational programs or our annual meeting. I will continue to pursue ways to effectively get our message out and investigate partnering opportunities. I’m open to any ideas or suggestions.

### BCIA Events at the AAPB Annual Meeting

**Friday, April 2, 2004**
- **BCIA Certification Examinations**
  6:00pm – 9:00 pm
  Written exams for the certification programs of BCIA will be offered.

**Saturday, April 3, 2004**
- **Certification 101 – Everything You Need to Know About BCIA Certification!**
  12:00 Noon – 12:30 pm
  Becoming a BCIA certified practitioner in either biofeedback, EEG biofeedback, or Pelvic Muscle Dysfunction Biofeedback.
- **Recertification 101 – Everything You Never Knew About Recertification!**
  12:30 pm – 1:00 pm
  Find out about changes in recertification policy that makes it a very user-friendly process.
- **Mentoring Workshop – Moving Away from the Standard Supervision Model**
  1:00pm – 3:00pm

Please join us to learn more about the new mentoring model and how you can fit into the process of training new candidates for certification. The role of the mentor, structure of the mentoring process and ethical issues involved in mentoring certification candidates will be discussed. This workshop is appropriate for all certification candidates or certificants interested in mentoring. Space reserved on first-come-first served basis.

2 category A accredited hours of continuing education.

- **BCIA Town Hall Meeting**
  3:30 pm – 4:30 pm
  We want to share some important BCIA news with you and we want to hear from you! Meet some of your BCIA Board. Join us for this informal time of sharing information.
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5. Thatcher TBI Discriminant Analysis and Severity Index $60.00
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9. SKIL Topographic Analysis - Sterman/Kaiser Imaging
   Eyes Closed or Open, or Task - Clinical and CoModulation Topographic
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Robert L. Gurnee, MSW,
BCIA: EEG, QEEG Diplomate,
Director
Leslie Sherlin, BA

Scottsdale Neurofeedback Institute (SNI)/ADD CLINIC
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- The Only Instrumentation Where All Artifact is Clamped or Removed From Data in Real Time
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The Neuropathways EEG Imaging® Neurofeedback system is protected under the following United States patents: 4919143,5024236,5571057 and patents in England, Germany and Japan.
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- AVI animations and Fractals
- Physiology with synchronized video
- Powerful trending & reporting features
- Multiple sound feedback options
- A wide variety of immediate or discrete feedback
- Powerful statistics, review and virtual channel options
- Enhanced 3D graphic displays

Take advantage of our ProComp Infiniti User's Group at no additional charge!

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Whether you are a clinician looking for a versatile biofeedback tool or a researcher who needs a powerful data-acquisition system, the BioGraph Infiniti™ platform is designed to offer you the most complete and adaptable software solution.

One of our top design goals was to make BioGraph Infiniti™ the most powerful clinical tool possible. The program's ability to record accurate data, to track a client's learning curve both within and across recording sessions and to generate reliable reports are among its top features.

**Biofeedback and Data Acquisition**

**State-of-the-art multimedia biofeedback:** With its audiovisual capabilities and exciting animations to deliver physiological feedback in many creative ways, the Infiniti Software ensures that you have a multitude of options to choose from when trying to reach a diverse client population.

**Timesaving features allow flexible training routines:** The BioGraph Infiniti™ software allows you to load up to 5 feedback screens during a session and switch between them, on the fly. This, and other timesaving features, lets you rapidly adapt the training task to your client’s needs. It provides an increasingly challenging and diversified feedback environment, without having to stop, load a new screen and restart the session.

**Scripted sessions facilitate standardized assessments and follow-ups:** Time and event-based scripts let you run automatic sessions that guide clients through pre-defined sequences of activities and then generate activity-specific statistics. These powerful scripts help you standardize assessment and follow-up sessions for optimal clinical effectiveness.

---

*EEG linegraph and 3D FFT allow you to analyze a specific temporal event.*

*Some Application Suites include display screens designed for viewing on multiple monitors. This powerful shaping tool allows clinicians to modify the feedback conditions on the fly and teach clients to rapidly adapt to new conditions.*
THE INFINITI

Thought Technology’s BioGraph Infiniti™ software platform has been carefully designed to meet your current and future needs for biofeedback and psychophysiology - with maximum flexibility and ease of use. BioGraph Infiniti’s modular design offers a selection of specialized Application Suites as well as powerful Application Developer Tools, to satisfy beginner and software expert users alike. These options allow you to install additional features, as you need them. Not only will the software adapt itself to your needs, it will also grow with them as new modules become available. New technology like USB, Web Cam Video, Compact Flash, Automatic Impedance Checking and Sensor Recognition are integrated seamlessly.

PLATFORM
**Synchronize psychophysiology with video:** Extend your toolbox for client assessment and training. BioGraph Infiniti™ software allows you to record your client's actions with a Web camera and synchronize the video with the physiological signals.

**Extensive Database Options**

- **Client Database** allows you to store as much or as little client information as required.

- **Client Confidentiality** function gives you the option to hide all sensitive client information from database screens, printed reports and exported data.

- **Inactivity Flag** can warn you and your assistants if a client has not been in for a visit for too long, to help your client management work.

- **Archive, Restore, Export and Import** client functions allow you to manage the client database and share clients between clinics without deleting important client data.

- **Data exporting functions** extend your ability to analyze client physiology by making it available to other data-processing applications.

**Feedback capabilities include playing AVI movies, MIDI songs, MIDI tones, CD Music, MP3 and Wave files. Conduct the orchestra by individually controlling multiple instruments in a MIDI song.**

**Event-counters and discrete feedback options give reinforcing rewards when all conditions are met and held for a given period of time.**

**Selective inhibiting allows multiple animations to be controlled independently.**

**Instantaneous feedback gives immediate indication of success.**

**View the video images, in real-time, with the recorded physiological signals.**

**Review the data and slide the time-line, back and forth, along the physiological signal to see the corresponding video image(s).**
**Session Reviewing and Reporting**

**POWERFUL DATA-PROCESSING FEATURES:** With its robust signal acquisition capabilities, accurate artifact rejection functions and flexible statistical analysis engine, the BioGraph Infiniti™ software allows you to easily normalize recorded data and generate reliable data.

**SPECIALIZED SESSION REPORTS:** Scripted sessions generate sophisticated statistical reports that break down the session's data into meaningful segments and give you appropriate statistics for each segment. This ensures that you get only the most clinically significant information without having to sort through irrelevant data.

**TREND REPORTING ON CLIENT PROGRESS:** BioGraph Infiniti’s powerful trend report capabilities allow you to follow a client’s progress from visit to visit, providing you with guidance regarding the next step to take. Trend reporting lets you easily demonstrate a client’s learning curve, both during a given script session and across script sessions, to enhance case management and to facilitate reimbursement.
Application Developer Tools

The Application Developer Tools include three separate programs: the Channel Editor, the Screen Editor and the Script Editor. The three are required to build complete Application Suites.

The CHANNEL EDITOR allows you to build sophisticated data-processing structures, which are composed of up-to 40 physical channels and up-to 255 virtual channels, for biofeedback or data-acquisition applications. The Channel Editor includes a large library of computation algorithms and an intuitive user-interface to make developing specialized applications a breeze.

The SCREEN EDITOR enables you to design any number of display screens to use in conjunction with a given channel set. Screens are designed by placing graphing and media instruments on a blank screen area. Combine immediate and discrete feedback instruments with timers and event-counters to build the sophisticated feedback paradigms that are required for today's demanding biofeedback environment.

The SCRIPT EDITOR is a powerful programming tool, which allows you to write session scripts for automatic assessment, follow-up and training applications. Scripts expand the power of the Infiniti system by allowing you to break a physiological recording down to the smallest logical component and define precise task-specific statistics. Scripted sessions are the only way to generate reliable trend reports as they allow you to perform standard and repeatable assessment and follow-up recordings.

What our Users say about the Infiniti Software Platform:

“I have been using two ProComp Infinitis with the BioGraph Infiniti™ for my NIH funded research on energy medicine... I find the system's functionality, clinical tools programmability and reporting features very impressive. It will enhance and perhaps transform the practice of psychophysiology as well as biofield science.”
Gary E. Schwartz, Ph.D.

“I am extremely impressed with the Infiniti system in terms of the excellence in the design of the hardware and software. It is extremely versatile, and has outstanding displays and accurate signal processing. It should be applicable for all biofeedback and neurofeedback protocols.”
Joel Lubar

“The EEG-Z, combined EEG and impedance sensor, used with the ProComp Infiniti hardware, is terrific. Checking impedance is quick and easy, plus you know immediately which electrode, if any, has a poor connection. The client gains two ways: faster hook-up and better quality feedback. The Infiniti system worked perfectly at a workshop I just gave... Infiniti will lead the field in combining neurofeedback and other biofeedback modalities.”
L. Thompson, Ph.D.

“You and your staff should be very proud of this achievement... it will advance the practice of biofeedback.”
Fred Shaffer, Ph.D.
Make plans today to join us for the 12th Annual Winter Brain Meeting
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February 4th & 5th Joel & Judith Lubar 2 Day Comprehensive Training & Demonstration Workshop on EEG Evaluation & treatment of ADD/HD, depression, anxiety, addiction, PTSD, closed head injury & other disorders. Approved by BCIA to meet 16 hours of blueprint toward certification ($39 extra charge at meeting if being used for certification)


February 4th & 5th Sue and Sig Othmer Workshop 2 day course on Neurofeedback

www.brainmeeting.com (continues next page)
2004 Winter Brain Meeting
Pre-conference workshops (Continued)

Feb 4th & 5th  Introduction to QEEG  Jay Gunkelman and Richard Soutar
Feb 4th & 5th  Anna Wise 2 Day workshop on Awakening the High Performance Mind
Feb 5th  One Day Multi-Speaker Neurofeedback Foundations Course  teachers include: Joel Lubar, Lynda and Michael Thompson, Sig Othmer, Anna Wise, Valdeane Brown, Paul Swingle, Rob Kall

The 2004 Winter Brain Meeting is packed with workshops, exhibits, and live panel discussions!

To register for the 12th Annual Winter Brain Meeting, visit our website at: www.brainmeeting.com

Special discounts available for students! Details available on our website.

<table>
<thead>
<tr>
<th>Register before:</th>
<th>Jan. 31, 2004</th>
<th>After Jan. 31, 2004</th>
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<tbody>
<tr>
<td>Winter Brain Meeting  Feb. 6 - 10  (includes Optimal Functioning Mtg)</td>
<td>$699.00</td>
<td>$749.00</td>
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<tr>
<td>One Day Intro to EEE Biofeedback pre-conference, Feb. 5th at least 10 teachers including Joel Lubar, Sue and Sig Othmer, Lynda and Michael Thompson, Anna Wise, Paul Swingle, Valdeane Brown and Rob Kall</td>
<td>$189.00</td>
<td>$199.00</td>
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<tr>
<td>Optional 10 hour Workshop package</td>
<td>$225.00</td>
<td>$245.00</td>
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<tr>
<td>Combination Winter Brain 2004 and EEG BF Foundations Course</td>
<td>$749.00</td>
<td>$799.00</td>
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<tr>
<td>Best Deal for First Timers: Package Winter Brain 2004 and one day EEG BF Foundations Course and 10 hour Workshop package</td>
<td>$969.00</td>
<td>$1,039.00</td>
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<tr>
<td>One day registration</td>
<td>$189.00</td>
<td>$199.00</td>
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<tr>
<td>Three day registration</td>
<td>$559.00</td>
<td>$589.00</td>
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<tr>
<td>Optimal Functioning 1 Day Program (included in Winter Brain Meeting fee)</td>
<td>$239.00</td>
<td>$249.00</td>
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</tbody>
</table>

PRE AND POST CONFERENCE WORKSHOPS
Joel & Judith Lubar 2 Day Comprehensive Training and Demonstration Workshop, February 4th and 5th, EEG Evaluation and treatment of ADD/HD, depression, anxiety, addiction, PTSD, closed head injury and other disorders. Approved by BCLA to meet 16 hours of blueprint toward certification ($39 extra charge at meeting if being used for certification) | $449.00 | $449.00 |
| QEEG Foundations Course | $399.00 | $449.00 |
| Anna Wise Workshop | $399.00 | $449.00 |
| Sue and Sig Othmer Workshop | $399.00 | $449.00 |
| Rae Tattenbaum (Feb. 4 - 5) | $399.00 | $449.00 |

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Rob Kall: Brief History of Neurofeedback and biofeedback: Cats, monkeys, jets, Guia, yoga...an overview of the early history of the field of biofeedback and neurofeedback. This went so well that Rob was invited to give an extended version of this talk at the California

Sig Othmer: From Brain Models to Therapies: Neurofeedback started with a focus on brain mechanisms, and first clinical applications were to neurological conditions such as epilepsy. Over time neurofeedback came to be more and more associated with psychological/psychiatric diagnoses, and symptoms drove therapeutic approaches. It is necessary, therefore, to develop a non-specific approach to brain self-regulation applicable to a broad range of disorders as well as to optimum mental fitness training.

Lynda and Michael Thompson: Fundamentals of a Neurofeedback Training Session. In one hour we will demonstrate how to manage a neurofeedback training session. This will cover everything from generating EEG profile to the decision making involved concerning where to put the electrodes, what frequency range to reward and inhibit, right through to the nuts and bolts of how to get a good connection with low impedance readings so that you have valid feedback. As time allows we will discuss how to combine this with a stress assessment and biofeedback when working with adolescents and adults.

Joel Lubar: Understanding The EEG’s Origins, Its Characteristics and Its Application for Neurofeedback - Neurotherapy. Demonstration of a number of EEG pattern characteristics that are important for the basic understanding and for application in the fields of neurofeedback and neurotherapy. Familiarizing the attendees with the basic EEG patterns such as delta, theta, alpha, beta, SMR, beta1, beta2, slow spindles, and other commonly recorded EEG characteristics. This foundations course will discuss in detail the harmonic analysis of EEG, phase and coherence, and their importance in understanding functional linkages within the cerebral cortex and between the cortex and the thalamus; and will also include a discussion of active bandpass filters, analog and digital filters, Fourier analysis, pattern analysis, and combined analog and digital techniques based on several of these approaches used simultaneously.

Anna Wise: Anna’s unique contribution to neurofeedback is the marriage of science and spirituality. Working with both the state and context of consciousness, she uses the Mind Mirror III EEG to identify and train higher states. In this half hour Anna will demonstrate the Mind Mirror and detail her work in training the Awakened Mind.

Judith Lubar: Enhancing and Potentiating Neurofeedback With Other Techniques

John Anderson: Ensuring Success at a Neurofeedback Practitioner

Richard Soutar: Training Toward the Normal Distribution

Barry Sherman: Back to Basics: What are we trying to do, and how should we do it? While there are many interesting and creative models and concepts that abound in the field of neurofeedback, the fundamental and only scientifically documented principle is that the EEG can be voluntarily altered through appropriate operant conditioning and that clinical symptoms can be reduced when EEG normalization is achieved in this manner. The what and how of these objectives will be reviewed.

Nancy White: Alpha Theta Training and the Pennsiston Protocol

Carol Schneider is a past president of both AAPB and ISSEEM and has a very busy clinical practice.

Also featuring Sue Othmer, Tom Budzynski, and Helenna Kerekhazi

Valdeane Brown: Simplifying the Complex: A Comprehensive Approach To Understanding What Fundamentally Changes During Neurofeedback And How We Can Optimaly Influence That Change. Many theories and rationales abound concerning the nature of neurofeedback and how to approach clinical practice. Most approaches are based on monitoring some form of intensity-based measure of the emergent EEG and then selectively decreasing and/or increasing certain segments of this derived signal. This session will give you a simple and comprehensive way to understand all of neurofeedback and will provide a working language for optimizing neurofeedback no matter how you do it.

Hershel Toomin: Hemoencephalography (HEG): A New Form of Neurofeedback With Potential for Enhancing Brain Function in Multiple Conditions Hemoencephalography (HEG) is an innovative method of biofeedback-guided brain exercise, which can enhance brain function through targeted activation of underfunctioning brain areas. The brain recruits its localized blood supply based on moment-to-moment needs. When a specific area of brain is activated, blood flow to that area momentarily increases to meet the demand. As the local brain activation returns to baseline, the local blood flow returns to baseline as well. Patterns of local brain blood flow thus provide an ongoing map of patterns of local brain activation.

Len Ochs: The Low Energy Neurofeedback System (LENS): What It Is and How the EEG Changes with It. The single-channel LENS provides low energy feedback, it is also used to provide topographic brain maps to guide this treatment. This presentation shows sequences of maps made over the course of treatment, showing the physiological basis for the behavioral changes that take place.

Peter Van Deusen: Neurofeedback providers seem to operate at two extremes with regard to assessment and protocol selection issues: One group says that this process is essentially unnecessary and other “one size fits all” in terms of protocols, or they can be selected by trial and error. Another group goes all the way to Quantitative EEG’s with normative database comparisons for all clients, training to “normalize the Q.” There is a middle ground, which involves looking at the client’s subjective (performance) and objective (EEG) patterns and using these to determine a training category. One version of this approach has been developed by Peter Van Deusen, using simple tools for identifying key training issues and selecting the most likely protocols using inexpensive two-channel equipment and comparing the client’s brain against itself.

Paul G. Swingle: Beginners Grand Rounds Following the GRAND ROUNDS format, actual patient records will be scrutinized to provide step-by-step procedures for the neurotherapeutic treatment of a wide variety of disorders. The problem of artifacts that compromise treatment will be examined. Complementary treatments that potentiate neurotherapy will be discussed in detail so that participants can incorporate these procedures in their practices.

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For information contact:
Denise Townsend
dtytownsend@earthlink.net
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