Special Issue:

Pediatric Integrative Medicine
FROM THE EDITOR

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Pediatric Integrative Medicine

Donald Moss, PhD

This special issue of Biofeedback is devoted to Pediatric Integrative Medicine. I am grateful to Timothy Culbert, Rebecca Kajander, and Judson Reaney, who have assembled a rich collection of articles showing the current state of the art in pediatrics, with an emphasis on integrating biofeedback into a comprehensive integrative treatment, including both mainstream therapies and complementary and alternative therapies. The initial article by Dr. Culbert elaborates the orientation of this special issue, which emphasizes complementary/alternative medicine and integrative therapies (CAMIT).

AAPB owes an enormous debt of gratitude to Tim Culbert, Jud Reaney, and Rebecca Kajander. This team has exerted leadership from the beginning in AAPB’s Pediatrics Section, and has presented countless symposia and workshops at AAPB’s annual meetings. This is their second special issue on pediatrics. Anyone who loves children will appreciate the creative and innovative approach taken to the problems of children in these pages.

We also include here an article on children’s rights by Sebastian Striefel. I also thank each of our authors and the AAPB production staff headed by Publications Manager Michael Thompson.

The Association News and Events Section includes messages from AAPB’s President Paul Lehrer, President-Elect Lynda Kirk, as well as other Association news.

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**OVERVIEW**

Integrative Approaches in Pediatrics: Biofeedback in the Context of Complementary/Alternative Medicine

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"In a sense, medicine is burning, as old ideas and methods are fading on every hand. But medicine’s fires are purifying: New life is emerging from the ashes as it always does. The reinventors are stepping forward, and health care remains a shared challenge."

(Dossey, 1999, p. 265)

"There cannot be two kinds of medicine –conventional and alternative. There is only medicine that has been adequately tested and medicine that works and medicine that may or may not work.”

(Angell & Kassir, 1998, p. 841)

"There is little doubt that CAM therapies represent an ‘invisible mainstream’ within our healthcare delivery system. Whether and how these therapies and approaches are to be productively included within the delivery of health care remains a shared challenge."

(Eisenberg, 2000, p. 3)

**Abstract:** This article reviews current issues, definitions, and usage trends in Complementary/Alternative Medicine (CAM) and integrative approaches specific to pediatrics. The article also discusses biofeedback and self-regulation skills training for children within the context of the mind/body domain of complementary/alternative medicine.

**Introduction**

These quotations reflect the passion, urgency and confusion being experienced by western, conventionally trained health care professionals as our patients and their families increasingly embrace a wide variety of therapeutic options that are often unknown, untested and unfamiliar to many in mainstream pediatric medicine. Health care professionals are finding that their pediatric patients, just like the adult population, are utilizing complementary/alternative medicine and integrative therapies (CAMIT) with increasing frequency (Ernst, 1999). Within the context of CAMIT as applied to pediatric populations, biofeedback and related mind/body approaches are situated firmly in a group of strategies that are well accepted by pediatricians and for which excellent literature support exists (Culbert & Banez, 2003; Oliness & Kohen, 1996). Biofeedback, applied psychophysiology and self-regulation skills training, are approaches that are categorized within the mind/body domain of CAMIT.

The purpose of this article is threefold:

1. to provide brief background information on the evolution of CAMIT and their relevance to pediatric health care,
2. to discuss the area of biofeedback and applied psychophysiology with children and adolescents in the context of CAMIT,
3. to discuss future directions for this area within pediatric healthcare.

**Defining the Scope of Complementary/Alternative Medicine and Integrative Therapies**

Early definitions of CAMIT described them as therapies that are:

1. generally not taught in US medical schools,
2. generally not provided at US hospitals,
3. lacking evidence of effectiveness,
4. generally not reimbursable by third party payers (Eisenberg, 1993).

This perspective is problematic for a number of reasons. First, there are multiple definitions of what constitute complementary and alternative therapies (Kemper, et al., 1999). Secondly, many US hospitals are offering CAMIT services more routinely (Pelletier, et al., 1999). Many US medical schools are now offering coursework in CAMIT (Wetzel, et al, 1998). Evidence for efficacy is increasing rapidly (Moher, et al, 2002). Finally, third party payers are including CAMIT in health plans more than ever (Spencer & Jacobs, 1999, pp. 371-390).

The Cochrane Collaboration defines CAMIT as a “broad domain of healing resources that encompass all health systems modalities and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant systems of a particular society or culture in a given historical period” (Zollman & Vickers, 1999, p. 394). This definition highlights the fact that many practices viewed by modern Americans as complementary, alternative or “unorthodox” are perfectly mainstream and orthodox in other parts of the world (e.g. Naturopathy, Traditional Chinese Medicine, Ayurvedic Medicine) (Oumeish, 1998). The term “allopathic medicine is increasingly used to describe the dominant US model (Gundling, 1998), although this may not be advantageous. Terminology becomes confusing in that many healing traditions such as Traditional Chinese Medicine, Naturopathy and Homeopathy involve inclusive, complete systems and have their own training schools and certification within the US and abroad. Many CAMIT practices are considered legitimate replacements on their own to Western, allopathic medicine, hence the term “alternative.” Others are seen as primarily being utilized adjunctively with a
“conventional” therapy, and it is recognized that both can be effective, appropriate and are not mutually exclusive (“complementary” therapies).

Many leaders in the field prefer the term “Integrative Medicine” or “Holistic Pediatrics” which are terms that the authors believe are more in keeping with the philosophy of a multimodal, collaborative approach. One working definition of integrative medicine, utilized by the University of Arizona, states that: “Integrative Medicine is a healing-oriented medicine that draws upon all therapeutic systems to form a comprehensive approach to the art and science of medicine. It seeks to combine the best ideas and practices of conventional and alternative medicine into cost-effective treatments that will be in the best interests of the patient and that aim to stimulate the body’s natural healing potential. It neither rejects conventional medicine nor embraces alternative practices uncritically” (Gaudet, 1998).

Pediatrician and researcher Kathi Kemper suggests the term “Holistic Pediatrics” as a desirable designation for the practice of medicine in a way that reflects “caring for the whole child in the context of that child’s values, their family beliefs, their family system, … and considering a range of therapies based on the evidence of their benefits and cost” (2000, p. 414). This approach might very well include a range of conventional, alternative, and complementary therapies.

The other important feature of Integrative Medicine involves a focus on the value of the therapeutic relationship. In this emerging culture, caregiver and patient work together with patients and families taking responsibility for their own health and wellness. One role for the therapist in this model is that of coach-supporting and fostering each individuals innate healing ability, promoting active participation, sharing directed positive energy, and keeping a broad focus on the holistic consideration of the nature of health and wellness (Rakel, 2002). Patients find CAMIT more consistent with their own philosophical orientations toward health (Astin, 1998).

In this article, for the purpose of abbreviation, the terms Complementary/Alternative Medicine and Integrative Therapies will be abbreviated as CAMIT, and will refer to the broad range of therapies commonly identified as falling into this category. One organizational schema, used by the National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health, is described below. NCCAM describes five major categories of CAMIT (NCCAM, 2000):

I Mind Body Medicine—This category refers to behavioral, psychological and spiritual approaches to health and also includes lifestyle and disease prevention strategies. e.g. yoga, tai chi, hypnosis, biofeedback, art and music therapies, religion and spirituality, support groups, community based approaches, lifestyle interventions.

II Alternative Medical Systems—This category involves complete systems of theory and practice that have been developed outside of the western medical approach. e.g. traditional Chinese medicine and acupuncture, Ayurvedic medicine, Native American medicine and other traditional indigenous systems, Homeopathy, and Naturopathy.

III Biologically-Based Therapies—This category involves biologically-based practices, interventions and products. e.g. herbs, botanicals, nutraceuticals, phytopharmaceuticals, vitamins, supplements, specialized diet therapies, orthomolecular medicine, aromatherapy and essential oils, other pharmacological interventions.

IV Manipulative and Body-Based Systems—This category refers to systems that are based on manipulation and/or movement of the body. e.g. chiropractic, massage and body work, osteopathic manipulation, and cranial sacral techniques.

V Energy Medicine—This category involves systems that use subtle energy fields in and around the body for medical purposes and also includes electromagnetic therapies. e.g. therapeutic touch, healing touch, Reiki, Acupuncture, homeopathic remedies, and magnets.

### Background: CAMIT in Pediatrics

Evidence is mounting that increasing numbers of American parents are considering or utilizing complementary or alternative therapies for their children for a wide variety of medical, developmental, and behavioral problems. A recent article in Archives of Pediatric and Adolescent Medicine reported that 83% of pediatricians surveyed believed that their patients were using CAMIT, while 50% said they would refer a pediatric patient for CAMIT (Sikand, 1998). When questioned about what specific alternative therapies they would be comfortable referring pediatric patients, biofeedback was at the top of the list! Are US pediatricians adequately informed about CAMIT practices? Is there a reliable base of literature examining CAMIT therapies in children and adolescents and are the studies of sufficient quality to help physicians and families make informed choices about a particular modality? The answer to the first question is not really known, but likely is a resounding “no.” The answer to the second question regarding, about the literature base is that such a literature base is evolving but far from convincing for most CAMIT modalities as applied to pediatric populations.

Recently a few pediatric CAMIT articles are finding their way into more mainstream journals on topics such as CAMIT in ADHD (Baumgartel, 1999), asthma (Kemper & Lester, 1999), herbal/botanical therapies (Gardiner & Kemper, 2000), cancer (Kemper et al. 1999), pain management (Rusy & Weisman, 2000), and insomnia (Gardiner & Kemper, 2002).

Kathi Kemper, published her groundbreaking book, The Holistic Pediatrician, in 1996 (with the 2nd edition to be released in October of 2002) and helped to start pediatric medicine on its journey to the expanding world of CAMIT. In addition to her book, other new books on pediatric CAMIT by physicians include Whole Child, Healthy Child by Ditchek and Greenfield, and Pediatric Acupuncture by May Loo. Kemper has published several pioneering research studies in this area and points out that there is still relatively little pediatric specific literature, training and/or integrated
clinical service in CAMIT in mainstream pediatric medicine in the USA. However, it is definitely growing, as evidenced by pediatric clinical programs with CAMIT being offered in New York City, Minneapolis, Los Angeles, San Diego, North Carolina and Tucson, Arizona to name a few. Most CAMIT training opportunities are primarily targeted for practitioners of adult medicine, but there are many of these all over the country seen with increasing frequency and scope of coverage including formal fellowship training programs in CAMIT at the University of Arizona and also at Beth Israel Deaconess in Boston. One of the premier conferences in this area, directed by David Eisenberg and sponsored by Harvard Medical School, is now in its 8th year. However most of these conferences include minimal, if any information on pediatric applications of CAM.

In 1997, the University of Arizona received a landmark grant from the NCCAM to create the first research center in pediatric CAMIT. In addition to various research projects that are occurring there, the Center has established a two-year pediatric CAMIT research fellowship. They are also collaborating closely with Dr. Andrew Weil’s Program in Integrative Medicine, also at the University of Arizona. Research projects include a study of herbal remedies and chiropractic osteopathic manipulation as alternative options for children with recurrent OM, and testing the use of relaxation/mental imagery for children with recurrent abdominal pain. Faculty are also looking at the use of self-hypnosis for facilitating relaxation in children with cerebral palsy.

The American Academy of Pediatrics established a task force on Complementary and Alternative Medicine in June, 2000. Goals/Objectives for the task force include the following:

• Develop a technical report detailing CAMIT services, current utilization and expenditure and associated legal and ethical issues,
• Use data from forthcoming periodic survey on pediatrician’s knowledge of CAMIT to identify additional needs for professional education.

At Children’s Hospitals and Clinics in Minneapolis/St. Paul we have established what we believe to be the only full-service Integrative Medicine outpatient and inpatient consultation service based at a Children’s Hospital. The focus has been on working with children and adolescents with chronic illness (asthma, cystic fibrosis, cancer, irritable bowel syndrome) and chronic pain issues (migraine and tension-type headache, recurrent abdominal pain, fibromyalgia, back pain). The Integrative Medicine team includes professionals with expertise in biofeedback, hypnosis, stress management, health psychology, academic therapy, clinical aromatherapy, therapeutic massage, healing touch, acupuncture, exercise physiology, nutrition, spiritual aspects of health, and also Integrative Cancer Care. Our own internal survey revealed that on average, 52% of our pediatric patients are using CAMIT. We also have two funded research projects and staff members participate in a variety of educational activities locally and nationally.

Epidemiological Data

There are critics to be sure, but this area is undeniably burgeoning in terms of consumer interest, professional training opportunities and quality research being done. Mainstream medicine is becoming quite interested; for example, in November of 1998, the Journal of the American Medical Association and the AMA specialty journals published more than eighty articles involving CAMIT. There are literally dozens, if not hundreds of national conferences on adult CAMIT every year, with established medical institutions like Harvard and Stanford leading the way. There are now several textbooks and journals devoted entirely to CAM/Integrative medicine. However, these are largely, if not completely geared toward the practice of adult medicine. The pediatric community has been relatively quiet in its response to what is clearly an area of explosive growth. In 2000 and 2001, the University of Arizona and University of Minnesota along with several other groups, sponsored national workshops and conferences on pediatric aspects of CAMIT.

There is evidence that parents are as interested in pursuing CAMIT therapies for their children as they are for themselves. The benchmark studies in 1993 and 1998 by Eisenberg and colleagues indicate that CAMI use has increased in the adult population from 33.8% to 42.1% respectively. CAMI use by specific clinical populations, such as adults with physical disabilities is estimated to be even higher at 57% (Krauss, 1998). The total visits to CAMIT providers in 1997 exceeded total visits to all primary care physicians. In addition, from a financial standpoint, the numbers are staggering. Total out of pocket expenses for CAMIT were conservatively estimated at 27.0 billion dollars in 1997. This is comparable to out of pocket expenditures for all US physician services! Up to 50% of monies spent on CAMIT are likely going toward self-care.

In terms of pediatric epidemiological studies of CAM use, Spigelblatt, Laine-Ammara, Pless, and Guyver (1994) reported in Pediatrics that 11% of children in large population sample drawn from a Canadian primary care clinic utilized some form of CAMIT for their children. Other recent studies indicate an increase in the use of CAMIT by pediatric primary care patients up to the range of 20% (Ottolini, 1999). Children with chronic illness are apparently even more likely to utilize CAM, with 25%-73% using some form of a CAM service, depending on access to services and geographic locale (Grootenhuis, 1998; Friedman et al, 1998; Stern et al, 1992; Southwood, et al, 1990; Ernst, 1999) Youth that are at risk, such as the homeless, may be the most likely to utilize CAMIT, with one survey indicating that 70 % of homeless youth between the ages of 14-21 in a Seattle sample acknowledging using some form of CAMIT (Breuner et al, 1998). In the same survey, 81 % stated that they utilized allopathic care systems as well. Pacter et al (1998) noted that home-based remedies for the common-cold, including CAMIT and folk remedies, have been used...
for many years with similar frequency across a range of ethnic groups.

Looking at CAMIT that parents are choosing for their children, research indicates that there is a preference for modalities including chiropractic, homeopathy, naturopathy, acupuncture and osteopathy (Spigelblatt, et al., 1994). Prayer is also commonly cited as a strategy by many parents and children (Barnes et al., 2000). Herballs/Botanicals may also be high on the list but were not always singled out in the survey data available.

As mentioned above, pediatricians are not averse to considering referral for CAM therapies. Fully 50% of pediatricians in one survey stated they would refer patients for CAMI therapies. The therapies that they were most comfortable with in terms of referral were biofeedback, self-help groups, relaxation therapy, hypnosis, massage therapy, and acupuncture, and osteopathic manipulation in that order of preference. They were mostly likely to refer chronic medical problems such as headache and seizure disorders and often only after traditional therapy had failed. This may indicate that these therapies are still often thought of as a “last-resort” alternative to mainstream allopathic therapies as opposed to legitimate first-line or least adjunctive therapies considered at the time of diagnosis and initial treatment. One finding of particular interest in this study was that more than half (55.2%) of the MDs stated that they would consider CAMIT use for themselves (Sikand, 1998).

**Biofeedback and CAMIT**

Mind/body approaches including biofeedback and relaxation/mental imagery with children seem generally quite well accepted and at this point should not really be considered as “complementary/alternative”, particularly for mainstream applications like headache (Culbert et al, 1996). These approaches are attractive and congruent within the Integrative Medicine philosophy as defined above in that they are non-pharmacologic, relatively non-invasive, promote self-regulation abilities, and can be learned quickly by pediatric patients. Additionally, most practitioners would support the notion that children and adolescents learning psychophysiological control strategies must be fully participating in such an approach to receive optimal benefit. Health care professionals that teach self-regulation are also generally aware of the benefits of a positive, warm, trusting client-therapist relationship and use positive expectancy as a directed therapeutic tool rather than considering it a “placebo” effect.

Biofeedback is easily blended together with CAMIT strategies. For example, we commonly encourage headache patients to schedule therapeutic massage and clinical aromatherapy consultation along with their multimodal biofeedback training sessions. For kids with irritable bowel syndrome that is exacerbated by stress, we commonly recommend exercise and nutrition consultation along with thermal or heart rate variability training. For children with nausea, we might recommend biofeedback-based diaphragmatic breathing coupled with stimulation of the nausea acupoints (P5 and P6).

Often, biofeedback, imagery and related psychophysiological approaches offer a safe entry point for skeptical kids and families into the realm of CAMIT. We are never pushy or unrealistically optimistic about the benefits of CAMIT but for many children/adolescents these approaches offer excellent, minimally invasive benefits. Above all, we do strive to balance evidence-based approaches with safety and cost- efficacy concerns in offering options that also consider family cultural and health belief preferences.

**Summary/Conclusions/ Looking Ahead**

Biofeedback and the mind/body therapies have the best chance of being among the first CAMIT therapies to become mainstream and in fact it is arguable that this is already happening. The benefits of biofeedback and its acceptability to pediatric populations have been described by this and other authors. Biofeedback is culturally syntonic with today’s youth, well accepted, and offers precision relative to other relaxation strategies in reproducible protocols. Additionally, kids demonstrate good proficiency at psychophysiological control and this approach is relatively time and cost effective (Culbert et al, 1996).

When searching the medical literature for CAMIT studies, it is important to search a variety of databases beyond just MEDLINE and including other databases such as MANTIS, EMBASE, and CINAHL (Allais, 2000). Increasingly, evidence is mounting in support of the efficacy of a variety of CAMIT therapies in pediatrics including (Ditchek & Greenfield, 2001; Kemper, 2002; Rakel, 2002; Loo, 1999):

- **Biofeedback**: Asthma, recurrent abdominal pain, migraine, tension-type headache, bedwetting
- **Acupuncture**: Migraine, nausea
- **Hypnosis/Mental Imagery**: Migraine, acute procedural pain, immune system modulation
- **Homeopathy**: Diarrhea
- **Therapeutic Massage**: Low birth weight (premature) infants
- **Probiotics**: Antibiotic associated diarrhea
- **Dietary Intervention**: Constipation
- **Exercise**: Cystic fibrosis patients, Type II diabetes mellitus

The time is long past to ignore or simply criticize this area, with CAMIT clinical services being increasingly sought out by health care consumers. Like it or not, it is incumbent on pediatric healthcare professionals to continue our role as leading child advocates and help families to understand what we can about this range of confusing but potentially useful therapies. The call for an organized national research agenda in pediatric CAMIT has been made quite articulately in a recent issue of the *Journal of the Ambulatory Pediatrics Association* (Kemper et al, 1999). This group of authors identified priorities related to research in CAMIT therapies that include

1) Those CAMIT therapies that already in widespread use by children and families.
2) Promising therapies that have already been researched to some extent in animal models and adults.
3) Therapies that have a potentially significant risk, substantial costs or side effects.

The authors point out that research on nutritional supplements, vitamins, and herbal remedies are one such area where important questions about safety and toxicity in pediatric populations remain. They
also sound the call for outcomes research that looks at patient, family and community outcomes associated with the use of CAMIT approaches.

Since many children already are seeing CAM practitioners such as homeopaths, chiropractors, naturopaths and acupuncturists, conventionally trained pediatric health care professionals in the community needs to open a dialogue with these providers to discuss significant topics such as immunizations, recognition of serious illness, etc. National conference opportunities are one forum within which professionals can gather and begin this dialogue, but this also needs to begin in each community.

A national group of academic CAMIT program leaders were invited to meet at conferences sponsored by the Fetzer Foundation to discuss a way to begin planning curriculum guidelines for health professional training in CAMIT therapies and systems. It is also encouraging to note that several US medical schools now offer CAM courses. One key component of training in CAMIT for health professionals would be courses in mind/body approaches to illness, health and wellness including biofeedback as an important tool.

Writing about the future of CAMIT, experts Freshley and Carlson (2000) point out that:

- This already rapidly growing movement will gain momentum as baby boomers grow older,
- Individuals with health insurance will insist that CAMIT benefits be included and expanded,
- Payors will respond by offering more comprehensive coverage for CAM services,
- Research on the safety and efficacy of CAM will increase,
- CAMIT will become more mainstream and the line between conventional medical therapies and CAMIT will blur,
- The internet and other information vehicles will fuel growth in the use of CAMIT,
- A new profession will emerge for persons to serve as intermediaries or “health coaches” between individuals and a complex but integrated health system.

As the tide of complementary/alternative medicine and Integrative therapies sweeps forward to transform healthcare, it seems that biofeedback and self-regulation skills training are well positioned as front-line options for children and adolescents with a variety of health and wellness concerns.

“Doing everything for everyone is neither tenable nor desirable. What is done should be inspired by compassion, guided by science and not merely reflect what the market will bear.”

(Grimes, 1998, p. 3033)

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Children’s Rights: Legal and Ethical Issues

Sebastian “Seb” Striefel, PhD, Logan, UT

Abstract: Serving children can be difficult and requires some competencies that are different from those needed in serving adults. Children’s rights from a legal perspective are confusing because of the lack of consistency in laws, rules, and regulations within and across states. As children get older the legal perspective shifts from a nurturance to a self-determination orientation which is consistent with the philosophy of self-regulation which is inherent in biofeedback. Children have the same ethical rights that adults have, but the rights must be tempered by factors such as the law, age, and cognitive abilities.

Introduction

Did you know that public health personnel long ago identified ethnicity and race, family income and family structure, and the presence of one versus two parents in the home as important risk factors for whether teenagers engage in risky health related behaviors such as smoking, drinking, sexual intercourse, violent behavior, and suicide (Carpenter, 2001)? However, school performance, use of free time, friendships, and family relationships are just as important (Carpenter, 2001). The message is, don’t leave children or teenagers on their own.

Long before 9/11 children and adolescents were being exposed to school and community level violence, a rapidly changing world of technology, and the lack of appropriate health care services. Each of these factors can be extremely stressful. Since 9/11 children and adolescents have had increased levels of exposure to terrorism and war. Losing a family member in the 9/11 attacks, fearing such a loss in a future attack, being discriminated against because one is a member of an identifiable minority group (especially as a member of a Middle East culture), having a parent (mother or father) called up by the military to serve elsewhere, and fear for one’s own life have become a reality. Increasing numbers of children and adolescents need help in coping with such stressors. La Greca developed a widely acclaimed workbook for parents to use in helping their children cope with terrorist attacks and other major stressors like hurricanes (De Angelis, 2002). Could you do something similar to promote and advertise your practice?

Hoagwood said that “mental health is an essential part of children’s health” (DeAngelis, 2001, p. 52). Even the U.S. Surgeon General has made a commitment to improve children’s mental health. Davies (2003) suggested that primary care practitioners could perform an important health care service by lobbying for physiological self-regulation services to be introduced at the preschool level and then adding more sophisticated knowledge and skills as the children grow older and advance through the education system. Can you imagine a world in which children know as much about the impact of different life styles, diets, exercise, relaxation, stress management, and mind-body connections as they do about reading, writing, and arithmetic? Could your practice promote such knowledge profitably?

Applied psychophysiology and biofeedback have much to offer in the treatment of children via the training of self-regulation skills (Culbert & Reaney, 1998). For example, O’Conner (2001) pointed out that far too many children are receiving drug treatment for Attention Deficit Hyperactivity Disorders (ADHD) in comparison to available prevalence figures. EEG and other behavioral approaches are alternative treatment approaches for dealing with hyperactivity, impulsivity, and inattention. So how do you ethically and legally provide services to children and adolescents?

Competencies

Children and adolescents are dependent, vulnerable, often unable to protect themselves, and cannot advocate for themselves with policy makers. For example, few children or adolescents seek treatment for emotional or medical problems. In fact, the greatest fear adolescents have is disclosure of confidential information to their parents (Feldman-Winters & McAbee, 2002) so they often seek help only when it has become an emergency. As such, practitioners who do, or who plan to provide services to children and adolescents, need to have a broad range of competencies that are different in many ways from those useful in working successfully with adults. The American Psychological Association’s (APA, 1998, 1994) “Guidelines for psychological evaluation in child protection matters” and “Guidelines for child custody evaluation in divorce proceedings” both point out the importance of various competencies, including but not limited to, knowing about and understanding: normal and deviant child and family development, appropriate methods for evaluating potential child problems (both physical and mental), psychopathology in children, nature of abuse and neglect, the role of human differences, and cultural variations. Practitioners should undertake a reasonable course of education and training before working with children to ensure that they are competent in the skills needed to do “what is in the best interests of the child.” APA (Crawford, 2002) has available a publication for helping professionals of various health care disciplines to understand adolescents. It is called,
“Developing adolescents: A reference for professionals.” For more information on the publication go to www.apa.org/pubs/j or send an email to publicinterest@apa.org.

Parents and school personnel often bring or refer children and adolescents for treatment of behaviors that the child/adolescent himself or herself does not see as a problem. Should you treat the child just because he or she was referred for treatment? Our university clinic once received over 30 referrals from one teacher in a year because she believed that all of them had ADHD. In fact, only one of them came close to meeting the diagnostic criteria for ADHD. The teacher was later diagnosed as suffering from Alzheimer's Disease. The needs of children and parents also often compete and one cannot always count on the parent(s) to do what is in the best interests of the child (Striefel, 1998a).

**Children’s Legal Rights**

Are you aware of children’s legal rights? Nothing seems more confusing than the issue of children’s legal rights. For example, the age of majority in most states is 18 years of age, yet the legal drinking age in all states is 21. In health care, some states permit minors to seek and consent to treatment for screening and treatment of sexually transmitted diseases, substance abuse treatment, counseling for and prescription of contraceptives, treatment following sexual assault, prenatal care, and sometimes help with mental health problems (Feldman-Winters & McAbee, 2002). Yet the rules vary greatly from topic-to-topic and state-to-state. Do you know what children and adolescent’s legal rights are in your state?

From a legal perspective there seem to be two major views on children’s rights (Wrightsman, Nietzel, & Fortune, 1998). First is the nurturance orientation in which what is good or desirable for children is determined not by the children themselves but by society or the adults around them (Wrightsman, Nietzel, & Fortune, 1998). It is a paternalistic orientation of “I know what is best for you better than you do.” As such it is one of the legal bases for why the parent or legal guardian must generally give informed consent for treatment (exceptions exist for mature minors and for emancipated minors). For example, in most states (38) a teenager cannot get an abortion without either parental notification or a judicial review (Wrightsman, Nietzel, & Fortune, 1998). Yet, the US Supreme Court has ruled that parents do not have the right to veto their daughter’s decision about obtaining an abortion (Sales & Shuman, 1996). Confusing isn’t it?

Second is the self-determination orientation which fits philosophically very well with the biofeedback and other self-regulation approaches to treatment. The self-determination orientation stresses rights that would allow children, or at least adolescents, to exercise control over their own health care, to make decisions for themselves about what they want, decisions that are binding, and to have autonomous control over various facets of their own lives (Wrightsman, Nietzel, & Fortune, 1998). Of course not all children or adolescents have the capacity to make such decisions.

So legally the confusion is between giving children what is good for them (nurture) and letting them have the right to decide for themselves (self-determination). As children grow older, legally, there seems to be a shift from a nurturance orientation to a self-determination orientation. So what is ethically appropriate in terms of children’s rights? You need to know your state laws to answer this question.

**Children’s Ethical Rights**

Clearly practitioners need to be in compliance with relevant state and federal laws, rules, and regulations. Considerable leeway still exists ethically and therein lies some potential confusion. Take as an example the issue of confidentiality. We know that for many teenagers the disclosure of confidential information to their parents is something that they fear (Feldman-Winters & McAbee, 2002) and that they often will not actively participate in treatment if sensitive information will be shared with others. But what about confidentiality with younger children?

**Confidentiality**

It is important for practitioners to consider several factors in deciding what the level of confidentiality will be in working with children and adolescents, e.g., age and cognitive abilities (Kitchener, 2000), relevant laws, presenting problems, desires of the child or adolescent client concerning confidentiality, and those of the parents. The choices are between total disclosure, partial disclosure, and no disclosure.

Total disclosure would rule out being able to work with many children and adolescents, especially those that are older and those that have good cognitive abilities because of the likelihood of their being unwilling to participate in treatment if all confidences will be shared. In addition, case law and common practice make clear that a promise of no disclosure (total confidentiality) in not an option when working with children or adolescents for several reasons. State laws (although varying from state-to-state) give parents certain rights and responsibilities concerning the health care of their children. Parents may well expect or demand certain information. As such, there are limits on the confidentiality that can be promised to child/adolescent clients. At minimum these limits (partial disclosure) include when the child/adolescent is a danger to self or others (suicidal, engaging in risky behavior such as sharing drug needles, or making serious threats about harming others), suspected or actual abuse or neglect, court ordered treatment, child custody evaluations, and proceedings for involuntary hospitalization. (Remember that the term privileged communication applies to confidential information in court proceedings.) Even within these limits practitioners struggle with decisions, e.g., when is the behavior of a child/adolescent client “risky enough” to require disclosure of confidential information to a parent and/or others? Failure to disclose risky behavior that later results in injury to the client or others can and has resulted in lawsuits against practitioners for negligence.

Generally the older a child or adolescent is, the more important confidentiality becomes in terms of establishing and maintaining a good working relationship with active involvement of the client in the treatment program. Often practitioners ask parents and adolescents to accept the practitioner’s judgment in determining what information, if any, will be shared (partial disclosure), when, and how (Kitchener, 2000). When information is going to be shared with a parent, it is important (if a life and death situation does not exist) to inform the child/adolescent
client that information is going to be shared with the parent, what information is going to be shared, why it will be shared, and to allow the client to voice his or her objections, if any (Kitchener, 2000). In such a situation the child/adolescent client is informed, but his or her consent in not necessarily being sought, i.e., the practitioner may have decided that it is critical to share certain information with the parent even though the client objects (e.g., suicide plan). Whether trust is destroyed by such disclosure depends in part on how well the limits of confidentiality were explained and understood by the child/adolescent client at the outset of treatment. It can be useful to write out the limits of confidentiality that will exist in your practice for child/adolescent clients and have them reviewed by in-state colleagues to maximize the probability that they comply with state laws, ethical boundaries and principles, and that they are practical in terms of working with clients.

**Informed Consent**

Adolescents often resent having to enter any form of mental health related treatment, partially because they become the "identified client/patient" and thus, the treatment focus is on changing them or their behavior when they believe the problem belongs to someone else, e.g., their parent (Corey, Corey, & Callanan, 2000). Adolescents are also often very sensitive to the stigma associated with mental health treatment. As such, informed consent from parents is not sufficient. Practitioners must try to establish a good working relationship with child/adolescent clients. Getting informed consent or least assent to treatment can be useful in establishing trust and a good working relationship (Striefel, 1998a & b).

Informed consent implies at minimum, that the individual giving consent understands the risks and benefits of the proposed treatment or refusal of treatment and has the mental capacity needed to make the necessary decisions. By age 15 most adolescents can understand these things if explained carefully. Children at younger ages can often also understand the basics if they are simplified. Assent requires the individual to acknowledge his or her problem (e.g., a mental illness), its treatment, and express a willingness to participate in the treatment program. Some authorities believe that ethical assent is the most appropriate ethical approach to all decisions about health care that involves adolescents (Feldman-Winters & Mcabee, 2002). Informed consent and assent certainly fit the philosophy of self-regulation (principle of autonomy) inherent in biofeedback. Involving child/adolescent clients according to their abilities in determining treatment goals, limits of confidentiality, and informed consent or assent, shows respect for the client and stresses the importance of client autonomy. This does not mean ignoring the presenting problem(s), rather it means making the best out of what could easily become an adversarial situation. For example, a teenager might well testify on his or her own behalf in a hearing concerned with involuntarily committing him or her to a mental health institution, whereas a younger child would not likely be so involved.

For more information on working with child/adolescent clients in terms of informed consent, assent, parent's rights, identifying the best interests of the minor, balancing interests, right to receive or refuse treatment, confidentiality, and privileged communication, see Striefel (1998a & b). Generally, the ethical treatment of child/adolescent clients requires practitioners to apply the same foundational ethical principles that would be applied in working with adults. These include: non-maleficence (do no harm), respecting autonomy, beneficence (do good), being just, fidelity, according dignity, treating others with care and compassion, pursuing excellence, and accepting accountability for one's actions. Some adjustments in applying these principles need to be made based on the client's age, cognitive abilities, and existing laws. For more information on the foundational ethical principles see Striefel, 2000, 2003, in press).

**References**


*The booklet, 'Helping Children Prepare for and Cope With Natural Disasters,' can be obtained by sending a written request to Annette LaGreca, PhD, Box 249229, University of Miami, Coral Gables, FL 33124.*
Abstract: This article provides an overview of integrative therapies that have been proven effective in the treatment of anxiety and stress-related disorders in children. Anxiety disorders are among the most common type of psychological disorders found in children. Further, stress and anxiety often play a mediating role for many pediatric psychophysiological disorders (i.e., chronic headaches, stomachaches, and sleep disorders). Clinical and empirical evidence is reviewed to support an Integrative Medicine Approach for the treatment of anxiety and stress-related disorders.

Introduction
Stress, anxiety and fears are common in children, and activate the familiar “fight-or-flight” response. Normal stressors that children experience include taking an exam, playing basketball in a close game, attending a new school, and dealing with illness. When children are stressed their hearts beat faster, respiration rate increases, muscles tense up, and hands may get cold and sweaty.

Some children are more vulnerable to stress and anxiety secondary to heightened physiological reactivity, certain temperament qualities and personality characteristics, and heritability factors (Bauer et al., 2002; Jemerin & Boyce, 1990; Gunnar et al., 1997; Boyce et al., 2001; Compas et al., 2001). Further in today’s society many children are in a chronic state of overstimulation and physiological stress (Ditchek & Greenfield, 2001). This state of prolonged and excessive cardiovascular, electrocortical and hormonal activation, called “allostatic load” (McEwen, 1998), is associated with suppressed immune function, health and behavior problems, and may lead to chronic conditions.

Many studies have documented the mediating role of stress for many pediatric psychophysiological disorders, such as chronic headaches, stomachaches, and sleep disorders. It is estimated that up to 20% of children will experience significant psychophysiological symptoms at some point in their development (Haggerty et al., 1993). Children need help to develop coping skills which allow them to change the way they perceive and react to stress.

Anxiety disorders are among the most common type of psychological disorders found in children and adolescents. Prevalence rates of anxiety symptoms in nonreferred children have between reported to be between 10 and 30% (Bernstein et al., 1996). Manifestations of anxiety in children include anxiety associated with medical procedures, separation anxiety, school avoidance, social and performance anxiety, specific phobias, somatic complaints, post-traumatic stress disorder, generalized anxiety disorder, panic disorder and obsessive-compulsive symptoms.

When deciding if a child’s anxieties, worries or fears meet diagnostic criteria for an anxiety disorder, health professionals consider the intensity, frequency, duration and manner in which symptoms are expressed. Clinical treatment is warranted when the anxiety causes significant distress and/or functional impairment for the child. Parents of anxious children often set low limits for autonomy, increase their control over activities, and underestimate their child’s coping skills. This article will provide an overview of integrative therapies that have been combined with the empirically-supported cognitive/behavioral approach for the treatment of stress and anxiety in children.

Integrative Medicine Approach
The fields of pediatric medicine and child mental health are changing in response to consumer driven interest in more holistic models of assessment and treatment. Today’s consumers want additional choices, less invasive and more natural treatment options as well as a culturally sensitive approach to health care for themselves and their children. An integrative medicine approach provides a more comprehensive model for pediatric health care that recognizes the importance of the physical, emotional, intellectual and spiritual domains. It emphasizes each child’s autonomy, responsibility and participation in their own health and wellness. For a complete discussion of the definition of complementary/alternative medicine and integrative therapies (“CAMIT”) the reader is referred to Dr. Culbert’s article in this issue entitled “Integrative Approaches in Pediatrics: Biofeedback in the Context of Complementary/Alternative Medicine.”
Integrative therapies that we have used for treatment of stress and anxiety problems are listed in Figure 1.

**Integrative Therapies for Anxiety and Stress-Related Disorders:**

*Self-regulation skills training:*
- biofeedback
- breath control training
- self-hypnosis
- autogenic training
- progressive muscle relaxation

*Cognitive/Behavioral Therapy*
- Meditation
- Clinical Aromatherapy
- Massage Therapy
- Exercise Consultation
- Bibliotherapy

**Figure 1**

**Self-Regulation Skills Training**

Research has shown that parents are increasingly interested in mind-body techniques for their children and are seeking out non-pharmacological treatment options (Spigelblatt, et al., 1994). Self-regulation skills training suggest that the child can learn to “be the boss of his body” and regulate emotional, cognitive, behavioral and physical reactions to stress. Self-regulation skills training helps anxious children modulate these processes in desired directions and develop a sense of self-efficacy, i.e., feelings of mastery and control.

We have found that the most effective method for teaching children self-regulation skills is with biofeedback techniques. Biofeedback, with its computerized, video game-like quality, is culturally syntonic with today’s youth and well accepted in mainstream pediatrics. Multimodal biofeedback training can play a powerful role in mind-body education for children with anxiety by illustrating that a change in your thinking causes a change in your body in a very immediate and concrete fashion (Culbert, Kajander, & Reaney, 1996).

Psychophysiological stress profiling is a helpful tool to identify the child’s individual stress response and demonstrate mind-body linkage. Learning self-regulation skills empowers children with anxiety to focus their mind in a way that positively affects their body. Biofeedback modalities including electrodermal activity (EDA), heart rate variability (HRV), peripheral temperature and diaphragmatic breathing (pneumography or capnography) have been proven to be effective treatments for children with anxiety and stress-related symptoms.

David Mars (1998) and Donald Moss (2002) have outlined mind-body treatment protocols for individuals with anxiety disorders, including panic attacks, performance anxiety, generalized anxiety disorder, and specific phobias. Children with anxiety disorders, especially panic disorder, often have respiratory patterns that include very shallow breaths, breath-holding and hyperventilation, thus driving their CO2 values down. This lowered level of CO2 (hypocapnia) induces cerebral vasoconstriction and hypoxia and increases sympathetic nervous system arousal. By teaching diaphragmatic breathing skills and training children to exhale to a normal level of end-tidal CO2 (38-42 Torr), children with panic symptoms are able to restore proper physiologic balance. In this state, they are able to think more coherently and utilize cognitive/behavioral coping skills for managing their anxiety.

Diaphragmatic breathing (or “belly breathing”) is easy to teach to most children. Kajander and Peper (1998) provide helpful clinical tips for teaching diaphragmatic breathing skills to children. Breath work can be used to relieve stress, anxiety and fear. It can also enhance a child’s self-awareness of what is going on in his/her body. Diaphragmatic breathing is thought to have a positive effect on every system in the body. It slows the heart rate and restores respiratory sinus arrhythmia (RSA), stimulates the immune system, and increases peripheral warming (Schwartz, 1995; Gevirtz, 1999; von Scheele, 1988).

Children tend to like breathing exercises best, and find they can apply it to many aspects of their lives.

Hypnosis is also an effective treatment for children who have anxiety problems (Griffen, 1999, Olness & Kohen, 1996, Schultz, 1991). Hypnosis is defined as a state, which is often, but not necessarily, associated with relaxation in which the child is able to focus attention on the accomplishment of specific behavioral or physiologic changes (Olness & Kohen, 1996). Depending on the child’s individual situation, hypnotherapy can be used as a complement to psychotherapy or as a primary treatment. Hypnosis and biofeedback share several common characteristics and work well together in an integrative approach (Culbert, Reaney, & Kohen, 1993). Hypnotic interventions for the treatment of phobias, social anxiety and performance anxiety rely heavily on desensitization. Children are taught self-hypnosis and they experience feelings of safety and mastery while confronting feared stimulus via imagery. Post-hypnotic suggestions are given for the child to experience the same feelings of mastery and control in real world situations.

Progressive muscle relaxation (PMR) exercises help children discover where tension is being held in their bodies and teaches them to recognize and control the feeling of muscle tension. PMR reduces blood pressure, respiration rates, and anxiety, and is a fun way for children to relax all of their muscles in an organized fashion. Electromyograph (EMG) biofeedback can be combined with PMR training to help children discern where tension is being held in their bodies.

Autogenic training (AT) is another approach for managing stress and anxiety. Autogenic phrases are organized into exercises that are physiologically oriented. There are six standard exercises, during which the individual performs mental repetitions of specific body sensations. This self-regulation technique offers a helpful way to become more aware of how your body feels. Thermal biofeedback can be combined with autogenic training to demonstrate whether using this technique has produced lowered sympathetic nervous system arousal.

**Cognitive/Behavioral Therapy**

Cognitive/behavioral therapy (CBT) is the conventional treatment modality for anxiety disorders. This empirically supported treatment approach involves an integration of cognitive, behavioral, affective and social strategies for change based on learning principles (Kendall et al., 1992). It addresses the role of distorted thoughts in the onset and maintenance of anxiety disorders. Common errors made by anxious children include: overestimating probability...
(i.e., “mom is late, she was in a car accident”) and overestimating consequences (i.e., “my mistake will be the end of the world.”). CBT includes exposure-based interventions such as systematic desensitization with a fear hierarchy and gradual or intense exposure. Within the self-regulation skills training framework, we have used cognitive techniques including self-monitoring, symptom diary, positive self-talk, refuting irrational beliefs, problem-solving, self-reinforcement, contingency management, and modeling.

**Meditation**

Like other mind/body therapies, meditation can bring deep states of relaxation, decrease anxiety and improve physical symptoms. Meditation is a self-directed practice for relaxing the body and calming the mind. Joan Borysenko (1988) defines meditation simply as any activity that keeps the attention anchored in the present moment. There are three basic kinds of meditation: concentrative, awareness, and expressive. Research has supported the efficacy of a mindfulness-based group meditation program for adults with generalized anxiety disorder or panic disorder (Kabat-Zinn et al., 1992, Miller et al., 1995).

**Clinical Aromatherapy**

Clinical aromatherapy is the therapeutic use of essential oils, which are aromatic compounds derived from plants, for the treatment of a variety of problems including nausea, pain, insomnia and anxiety (Battaglia, 1995, Price & Price, 1999). Essential oils can be directly applied to the skin, inhaled or ingested. They are believed to work at the psychological, spiritual, physical and cellular levels (Bucke, 2002). Research in aromatherapy is just emerging, but in our clinical experience, children with stress and anxiety have benefited from aromatherapy as an adjunctive therapy. Over 50% of children seen for aromatherapy in our clinic have chosen sweet orange for reducing anxiety. Children have also found lavender, mandarin, frankincense, bergamot and ylang-ylang helpful for stress and anxiety problems.

**Massage Therapy**

Therapeutic massage is the gentle manipulation of the body’s soft tissues. Its purpose is to promote circulation of blood and lymphatic drainage, relax muscles, relieve pain, reduce anxiety and enhance overall health. From extensive studies, Tiffany Field and colleagues at the Touch Institute report that massage is effective in reducing stress hormone levels and anxiety in children with chronic illness (Field et al., 1998, 1997), post traumatic stress disorder (Field et al., 1996) and psychiatric illness (Field et al., 1992).

**Exercise Consultation**

Researchers have found that exercise can decrease anxiety and depression, improve an individual’s self-image and buffer against stress (Sacks, 1993). More children are becoming interested in yoga as a tool to manage stress. Yoga has been proven to enhance fitness, flexibility and mood through the use of meditative awareness, breathing exercises and physical postures.

**Bibliotherapy**

The use of books and articles to be read during or between sessions can be a useful adjunct to other integrative approaches. Please refer to the suggested resource list at the end of this article. Materials include stories about body functioning, stress and anxiety, such as Your Insides (Cole, 1992); Stress Can Really Get on Your Nerves (Romain & Verdick, 2000); and Let’s Talk about Feeling Afraid (Berry, 1995). Workbooks on similar topics can be effective for teenagers, such as Masters of Your Anxiety and Panic (Bourne, 2000) and Fighting Invisible Tigers: A Stress Management Guide for Teens (Hipp, 1995). Books on specific clinical issues (i.e., obsessive-compulsive disorder) are also available. Self-help books for parents are also available, such as Helping your Anxious Child (Raaper et al., 2000) and Stress-proofing your child: Mind-Body Exercises to Enhance your Child’s Health (Lewis & Lewis, 1996).

**Treatment Planning Model**

The Discern-Control-Generalize model (Stroebel, 1977; Culbert & Banez, in press) offers a useful paradigm for treatment planning. In the discern phase, children with anxiety learn how to identify stressors and are taught about mind/body links. They record stressful events, thoughts, feelings, and physical reactions. Self-monitoring of symptoms is encouraged and positive expectations are established. Biofeedback training focuses on discriminating differences between relaxation and anxiety. In the control phase, children learn to modulate anxiety and associated sympathetic nervous system (SNS) arousal. Children are coached to master specific skills (belly breathing, self-hypnosis, RSA, autogenics, PMR). They establish certain preferences and home practice is reinforced. Cognitive-behavioral therapy focuses on changing attributions and refuting irrational ideas. In the generalize phase, children learn how to apply their self-regulation skills in real-life situations. Desensitization exposure is planned, allowing children’s feelings of mastery and control to increase.

**Our Experiences**

In their 1998 article in Biofeedback, Timothy Culbert and Judson Reaney asked the question: “What if every child and adolescent received ‘stress inoculation’ training and developed awareness of mind/body bidirectional influences and their ability to control these factors at each stage of development?”

The Integrative Medicine Clinic at Children’s Hospitals & Clinics in Minneapolis, Minnesota provides this type of training for our pediatric patients. The clinic opened in July, 2001. The professional staff includes Timothy Culbert, MD, Medical Director and Lynda Richtsmeier Cyr, PhD, Pediatric Psychologist and Program Manager. Our program provides inpatient and outpatient clinical services. Staff members place a priority on safety and scientific evidence in identifying complementary/alternative therapies that can be blended with conventional approaches into effective, affordable treatment plans. The majority of patients seen at our clinic have chronic illness (asthma, cystic fibrosis, cancer, irritable bowel syndrome), chronic pain issues (migraine and tension-type headache, recurrent abdominal pain, fibromyalgia, and back pain), and related symptoms of stress and anxiety.

Our clinic offers children and families a variety of assessment, treatment and consultative services. Clinical services include holistic assessment by an individual provider or an interdisciplinary team, per-
sonalized information/resource consultation and a broad range of individual or multi-modality treatment approaches. These include self-regulation skills training, biofeedback, relaxation/mental imagery, mind-body skills group therapy, exercise/fitness program consultation, nutritional consultation, spiritual guidance, academic therapy, massage therapy, aromatherapy, acupuncture, healing touch and herbal/ botanical consultation. Our own internal survey revealed that, on average, 52% of our pediatric patients are using complementary and alternative medicine and integrative therapies.

Our treatment protocol for stress and anxiety includes assessment, intervention and follow-up activities (see Figure 2). Clinical assessment is needed to determine appropriate treatment modalities. During assessment, the clinician also has the opportunity to re-frame the problem and educate the child on mind/body linkages. Assessment of all dimensions of anxiety disorders (physiologic, behavioral, psychological, and cognitive) is needed within a developmental framework. Eliciting the child’s experiences with the problem and description of symptoms is also important for treatment planning. Multimodal interventions are utilized and self-regulation skills training follows the Discern-Control-Generalize model. Finally, planning follow-up activities is important and will prevent relapse at times of increased stress.

The Anxiety, Stress, and Health Clinic at a Stanford-affiliated child mental health agency was developed in 1995 by Pamela Kaiser, Director. Comprehensive assessments were standard, including understanding self-regulation, psychological, academic, family, and peer dynamics. An individualized treatment plan was developed in collaboration with the parents, child, referring primary care provider and/or subspecialist, classroom teacher, and other needed interdisciplinary experts. The following case example reflects such a plan.

**Case Example**

The following case example illustrates the importance of comprehensive assessment. It demonstrates that self-regulation and cognitive-behavioral techniques can often be applied to concurrent disorders and difficulties, even when anxiety treatment goals are prioritized.

Kathy was a 12 year old who was referred by her pediatrician for treatment of an extreme fear of shots and blood. In addition to Kathy’s (and both parents’) severe needle/injection/blood phobia, the clinical assessment revealed that she was a gifted and highly creative child struggling with symptoms that met criteria for Bipolar Disorder, OCD, ADHD, and Math Learning Disability. Further, marital discord, parental anxiety, and enmeshed parent-child interactions further reinforced Kathy’s panic episodes, inability to sleep alone, and dramatic oscillations between helplessness and oppositionality.

Due to school district pressures, Kathy and her parents agreed that working on the needle phobia was the initial priority. She quickly grasped the visual displays about the mind-body connection, panic response, and feeling thermometer. Her parents agreed to regular collateral counseling sessions focused on parenting changes that fostered Kathy’s self-confidence that she was competent to manage anxiety provoking situations. Resources for marital therapy were given.

Self-regulation skills were taught to facilitate modulation of psychophysiological reactivity, mood, impulsivity, as well as her anxiety related to needles, math performance, and bedtime. Her vivid imagination prompted strong responsibility to learning self-hypnosis and diaphragmatic breathing (“blowing the worries far in to the stratosphere”). She embellished the 0-10 scale of emotional control with elaborate drawings for her bulletin board. Her impatience and low frustration threshold demanded rather easily attained biofeedback parameters and frequent changes in visual displays. Progressive muscle relaxation was rejected. When Kathy began to relate specific instances using self-regulation strategies in her every day life, her parents were invited to join a session so that she could explain and demonstrate the skills.

Cognitive-behavioral approaches were then introduced. A fear hierarchy was established, followed by exposure response prevention (ERP) and other cognitive “tricks”. Bibliotherapy provided two-dimensional exposure of a picture story of young children getting immunized at the doctor’s office. Next, three-dimensional exposure of the medical equipment for injections began with small, cloth play materials followed by a plastic toy medical kit. Nonfunctional play with real syringes, tourniquets, alcohol swabs and Band-Aids utilized all senses and elicited humor in order to further decrease the association with fear, including water syringe fights, dabbing alcohol as perfume, tourniquets bracelets, and arm and face decoration of multiple Band-Aids.

Collaboration with the injection nurse followed, in order to accurately simulate exposure to the upcoming procedure as well as to maximize a supportive, calm milieu for Kathy at the pediatrician’s office. ERP

<table>
<thead>
<tr>
<th>Treatment Protocol for Stress and Anxiety:</th>
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<tbody>
<tr>
<td><strong>Assessment</strong></td>
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<tr>
<td>- evaluate experience with the problems</td>
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<tr>
<td>- obtain descriptions of the symptoms</td>
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<tr>
<td>- consider developmental issues</td>
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<tr>
<td>- re-frame the problem, mind/body education</td>
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<tr>
<td>- rule out medical conditions</td>
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<tr>
<td>- assess motivation, positive expectancy</td>
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<tr>
<td><strong>Multimodal Intervention</strong></td>
</tr>
<tr>
<td>a. Cognitive-Behavioral Training and other psychotherapies</td>
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<tr>
<td>b. Self-regulation skills training</td>
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<tr>
<td>- self-monitoring</td>
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<tr>
<td>- mind/body education</td>
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<tr>
<td>- psychophysilogic stress profiling</td>
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<tr>
<td>- biofeedback, PMR, self-hypnosis, breath work, RSA training</td>
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<tr>
<td>- home practice program established</td>
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<tr>
<td>c. School consultation</td>
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<tr>
<td>d. Pharmacotherapy</td>
</tr>
<tr>
<td><strong>Follow-up activities</strong></td>
</tr>
<tr>
<td>- reinforce feelings of mastery and control</td>
</tr>
<tr>
<td>- reinforcement for practice and success</td>
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<tr>
<td>- schedule follow-up appointments</td>
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**Figure 2**
Suggested Resources


References


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**Integrative Approaches in Pediatrics: Biofeedback in the Context of Complementary/Alternative Medicine**

continued from Page 8


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i *Authors Note: The term Complementary and Alternative Medicine or “CAM” is well recognized in the scientific literature but is problematic for a number of reasons as explained later on in this article. For the sake of inclusiveness and to reflect the authors’ explicit preference for terminology that reflects a more collaborative, holistic approach, we have chosen to use the phrase “complementary/alternative medicine and integrative therapies” — abbreviated “CAMAIt.” This retains the familiar stem of CAM but suggests moving beyond an “either/or” model to a paradigm that includes integration of the best of all available therapies for children and families in a way that respects cultural, spiritual and personal beliefs and preferences.

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**Author Correction:**

An error has been identified in part one of the article, *Active sEMG Training Strategies for Chronic Musculoskeletal Pain*, by Randy Neblett, which appeared in the summer 2002 issue of Biofeedback (Volume 30, number 2). A “web” placement was described, in which one active electrode is placed on the web of the hand and one electrode is placed on the forearm. The supraspinatus muscle, which is a muscle of the shoulder, was incorrectly identified! The correct muscle is the brachioradialus, which is on top of the forearm, just below the elbow.
Abstract: The purpose of this article is to review the basic medical and psychosocial assessment of children with recurrent headaches and to discuss non-pharmacologic interventions. Recurrent headaches, including migraine and tension headaches, are a significant health problem for many children. When inadequately treated, the child or adolescent can experience significant functional impairment in school, social activities and home life. Comprehensive assessment, including medical, psychological and social issues, is essential in determining appropriate intervention. Pharmacotherapy may be one aspect of treatment, but does not teach children the skills of self-regulation. Biofeedback, relaxation, and self-hypnosis are evidence-based interventions for recurrent headaches. Other non-pharmacologic, complementary/integrative interventions are also used without data of efficacy or safety.

Introduction
How often have you heard a child say adamantly, “I CAN’T go to school, I have headaches,” or despairingly “I can’t go to SCHOOL, my headaches are so bad.” Recurrent headaches can be a major problem for children and adolescents. The pain and suffering children experience can have a significant impact on every aspect of their daily lives (Bandell-Hoekstra, Abu-Saadmi, Passchier, & Knipschild, 2000). Evaluation can take months and be very costly, causing concern and frustration for parents. Diagnosis and treatment of recurrent headaches is often a perplexing challenge for health care professionals. The child may be referred from primary care providers to a multitude of specialists including allergists, neurologists, rheumatologists, psychologists, and behavioral specialists. A wide array of blood tests, x-rays, brain scans and medications may be ordered with limited success in making a diagnosis much less alleviating the pain.

The purpose of this article is to review the basic medical and psychosocial assessment of children with recurrent headaches and to discuss nonpharmacologic interventions. While headaches may have many causes, this article will be limited to migraine and tension headaches.

The incidence of recurrent headaches in children varies depending on the type of headache and the research method. Evidence supports an increase in prevalence of headaches over the past 25 years. In 1962, Bille reported that 40% of children had experienced headache by age seven. In a more recent Canadian study, 85% of children 5 to 7 years of age had experienced headaches (McGrath & Hillier, 2001). Migraine headache, the most studied form of headache, is estimated to affect 3 to 10% of children. Tension-type headaches account for the greatest percentage of all headaches, perhaps being three times more common than migraine headaches.

Other causes of recurrent headache may include sinusitis, allergies, visual deficits, exposure to chemicals, head injuries, viral or bacterial infections, poor nutrition, insufficient sleep, postural abnormalities, temporomandibular joint misalignment, pressure from braces, stress and brain tumor.

Definitions
In 1988, the International Headache Society developed definitions for migraine and tension type headaches for adults. Because children and adolescents present with a wide variety of symptoms, the criteria have not been specific or sensitive to them. Numerous modifications have been suggested. Migraine headache is typically defined as an intermittent, paroxysmal headache, separated by symptom-free intervals with nausea or vomiting, and a positive family history of migraine” (Rothner, 1995). The frequency of migraines is approximately 3 to 5 episodes monthly lasting 1 to 72 hours. Migraine without aura (or formerly called common migraine) is the most frequent form accounting for 60 to 85% of all migraines (Rothner, 1995). It is often characterized by prodromal symptoms including mood changes such as irritability, food cravings and withdrawal. The onset is short and symptoms escalate quickly. The quality of the pain is described as...
pounding, pulsing or throbbing. Autonomic symptoms differentiate migraine from other headaches. Nausea, vomiting, anorexia, pallor, photophobia, phonophobia, and abdominal pain, and desire to sleep are all common. Migraine with aura presents with visual disturbances prior to or at the time of headache. The aura often lasts just a few minutes. It can be helpful in recognizing when to initiate treatment and abort the progression of migraine. Children can also experience migraine variants such as complex migraine, hemiplegic migraine, ophthalmologic migraine, and abdominal migraine (McGrath & Hillier, p. 66).

Tension-type headaches are also called nonmigranious, chronic nonprogressive headache, muscle-contraction headache or psychogenic headache. Tension headaches can vary widely in frequency, duration, functional impairment and response to treatment.

The incidence of tension headaches is approximately 15% in adolescents (Rothner, 1995; McGrath & Hillier, 2001). Females experience a greater prevalence for tension headaches than do males. The clinical features of tension headaches are distinct from migraines. There is no aura. The location of the pain is bilateral, frontal, temporal or holocephalic. The pain is described as dull or like a tight band around the head. The duration of the pain may be constant or variable throughout the day. Associated symptoms may include fatigue, insomnia, blurred vision and difficulty concentrating.

In addition to migraine and tension headaches, another form of headache, chronic daily headache, has been recently identified. It is a combination of periodic migraine and chronic daily headache, also called mixed headache disorder. The presenting feature is the presence of daily or near daily headache that varies in duration, intensity and accompanying features. Four types of chronic daily headache have been identified: transformed migraine, chronic tension-type headache, new daily persistent headache and hemicrania continua (Gladstein & Holden, 1996). The chronic daily headache may be the most resistant to treatment.

Contributing Factors

Cognitive, behavioral and emotional factors all contribute to the etiology of recurrent headaches. Children and adolescents with recurrent headaches may be more sensitive to pain, have more somatic complaints and have more fears than children who are headache free. A recent study found that adolescents were most likely to have migraine attacks on Mondays and least likely on Saturday (PRNewswire, 2000). High-achieving students who place excessive pressure on themselves or fear failure are often subject to tension headaches. As one neurologist tells his adolescent girls, “‘C’ students don’t get these headaches.” Naturally, what is stressful to one person may not be to another. Major life changes such as moves, parental divorce, learning challenges, and poor social skills are common precipitating factors. McGrath and Hillier (2001) present an interesting theory suggesting that it may not be the stressor that triggers headaches, but the adolescent’s inability to resolve the stress and concomitant anxiety that lead to the chronic headache.

A genetic predisposition exists in migraine and tension headaches. A positive family history is a diagnostic factor in migraines. The concordance rate for migraines in twins is 50% (McGrath & Hillier, 2001). Recurrent headaches in children are also thought to be a precursor in recurrent headaches in adults (Holden, Levy, Deichmann, & Gladstein, 1998). In a 30-year follow up study of Swedish pediatric migraineurs, one third of the children continued to suffer from migraine throughout the 40-year period (Bille, 1997).

Recurrent headaches can result in great functional impairment in all areas of a child’s life. It has been estimated that several hundred thousand school days are missed each month because of pediatric migraine alone (Holden et al., 1998). Children with headaches withdraw from social and family activities, view themselves as sickly and may cause their parents to miss many days of work. Depression and anxiety are common comorbid conditions that further impact daily functioning. A parent’s view of headache and reaction to the pain can impact the resolution process.

Assessment

Successful intervention for recurrent pediatric headache demands correct diagnosis. While this usually begins in the office of the primary care provider, it may progress to evaluation by many specialists. These may include psychologists, neurologists, ophthalmologists, and behavioral medicine specialists, just to name a few. The medical model guides this initial assessment, so the procedures typically involve a comprehensive history, physical and neurological examination. A careful and thorough history is crucial. The history needs to address family history of headaches, the child’s physical and emotional status, specific questions about the headache, and questions about any changes in neurological status. The medical differential must be considered to determine the type or etiology of the headache. Laboratory tests are often unnecessary at the primary care level, but should be based on the presenting history and differential diagnosis. The EEG is not indicated for diagnosis of tension or migraine headache. It is appropriate when the child presents with focal or nonfocal neurological symptoms such as loss of consciousness, aphasia, or abnormal movements (Rothner, 1995). Neuroimaging should be used initially when the history is suggestive of an acute trauma or infectious process. If the child has a normal physical and neurological examination with no symptoms of progressive neurological dysfunction or increased intracranial pressure, then neuroimaging is not necessary.

Inclusion of psychological, family and social history is as necessary as the medical history. Sufficient time must be dedicated to obtain information on family medical history, family dynamics, school performance, psychosocial stressors, depression and anxiety, recent significant life events, and coping strategies. The primary care provider is the most appropriate person to complete the initial assessment. Unfortunately, this information may be overlooked or investigated only superficially in the context of a busy medical practice.

Further psychological assessment may be required if the child’s headaches are not responsive to medical treatment. Chronic pain can affect every aspect of a child’s life.
Normal patterns of eating, sleeping, and play may change. Impaired concentration, fatigue, fear of becoming sick at school, and falling behind in school work may result in a child avoiding school. Parents may inadvertently reinforce their child’s sense of pain by being overly solicitous of how the child is feeling or providing some secondary gain for the symptoms. Tension headaches by definition have a component of stress in the underlying etiology. Rothner (1995) suggests that the psychological assessment contains three core areas: the pain itself, including antecedent, precipitants, responses, and effects; the patient, including global psychological and social functioning; and the patient’s environment, including physical, familial, and social factors.

Structured interviews and standardized questionnaires are valuable in gathering information. McGrath and Hillier (2001) provide detailed child and parent questionnaires in the appendices of their book, The Child with Headache: Diagnosis and Treatment. Achenbach’s Child Behavior Checklist, The Children’s Depression Inventory, the State-Trait Anxiety Inventory for Children, the Revised Children’s Manifest Anxiety Inventory, the Minnesota Multiphasic Personality Inventory for adolescents, or the children’s Comprehensive Pain Questionnaire are other standardized protocols that are often used in the assessment process. Perhaps more important than the specific instruments used, is the close attention to the child’s state of physical, emotional and social well-being.

Interventions

An in-depth discussion of pharmacological interventions for headaches is not in the scope of this article. This treatment will be reviewed in brief, however. Pharmacological interventions are often the first line approach to the treatment of recurrent headaches. Nonprescription analgesics are helpful in relieving the episodic tension headache. They often are not helpful, and may contribute to rebound headaches, if used excessively in recurrent headaches. SSRIs and Tricyclic antidepressants can be helpful in treating chronic pain, sleep disturbances and comorbid mood disorders associated with tension-type headaches.

Pharmacological treatment of migraine headaches should include immediate pain relief, abortive measures and preventative measures. Additional treatment may need to be used for nausea or vomiting. Analgesics, given at the earliest time of onset, are the most appropriate first step in treating childhood migraine. Midrin, a combination of isometheptene mucate, dichloralphenazone, and acetaminophen, is a common agent to abort migraine headaches because it has a vasoconstrictor, anxiolytic and analgesic component (McGrath & Hillier, 2001). Triptan medications such as Imitrex are rapidly becoming standard treatment of migraine in adults and are being used with increased frequency in children. These medications have not been approved by the FDA for use in children.

Non-Pharmacologic Therapies

There is a wide array of nonpharmacologic therapies available for treating recurrent headaches in children, chief among these being relaxation, biofeedback, cognitive-behavioral therapies, and hypnotherapy. Cognitive therapy is a corner stone in treatment of pediatric headache because it helps children and parents understand the cause and effect of the headache process and teaches strategies for making changes that improve health and minimize disability. Because of the natural developmental drive for mastery, children usually enjoy learning about the mind/body connection, the impact of stress, and how self-regulation skills can be used to help them feel better. Children are often very curious about techniques such as biofeedback and hypnosis. It is also essential that parents learn to respond appropriately to their child’s pain. For example, children who stay home from school should be treated as ill with limits on their activities. Parents should encourage children to participate in normal activities and refrain from repeatedly asking the child how he/she feels. Reinforcement should be given for practice of self-regulation skills (Allen & Shriver, 1998).

Relaxation has long been a treatment for aches and pains, dating back to the pioneering work of Jacobson in the 20’s. Larsson and Andrasik (2002) found over ten investigations of varied forms of relaxation, applied in varied settings, and by varied personnel. Generally, positive effects were obtained, pointing to the robustness of this approach. These treatments have typically involved the below components: discrimination training focusing on identification of tense and relaxed larger muscle groups, differential relaxation, cued relaxation, mini-relaxation focusing on a limited number of muscles in the head, neck, or shoulder, and application of techniques in everyday life.

For biofeedback, thermal biofeedback, autogenic training, and EMG biofeedback have been studied the most extensively for pediatric headache and both efficacy (Holden, Deichmann, & Levy, 1999; McGrath & Hillier, 2001) and meta-analyses (Hermann & Blanchard, 2002; Hermann, Kim, & Blanchard, 1995) confirm their clinical utility and comparative efficacy with regard to certain medications. Use with other modalities (blood volume pulse and EEG) remains in the infancy stage (Andrasik, Larsson, & Grazzi, 2002). Another meta-analysis has shown that these biofeedback treatments lead to greater outcomes when used with children than when applied with adults (Sarafino & Goehring, 2000), supporting the notion that children may be especially good candidates for biofeedback (Attanasio, Andrasik, Burke, Blake, Kabela, & McCarran, 1985). Green (1983) provides a number of very helpful suggestions and verbatim scripts to use when teaching self-regulatory skills to very young children. Training parents in pain behavior management strategies has been shown to add a significant increment to the outcome for biofeedback alone (Allen & Shriver, 1998).

Hypnosis is now included in most contemporary discussions of nonpharmacologic therapies for childhood headaches (McGrath & Hillier, 2001; Martin, 1993; Winner & Rothner, 2001). For the younger child, hypnosis has been described as “an altered state of consciousness or awareness.” (Olness & Kohen, 1996) For the adolescent it may involve a relaxation-based practice that might include the use of imagery, suggestions, and some type of induction (Hall, 1999). Although the exact mechanisms for the pathophysiology of migraines in children or for the efficacy of relaxation-based treatments is still unclear (Olness, Hall, Roznieckl, Schmidt, & Theoharides, 1998), empirical literature has supported...
the usefulness of hypnosis as a nonpharmacologic intervention for recurrent childhood headaches. As concluded by the review by Holden, Deichmann, and Levy (1999): “Sufficient evidence exists from treatment outcome studies to conclude that relaxation/self-hypnosis is a well-established and efficacious treatment for recurrent pediatric migraine and tension headaches” (p. 96). For example, a randomized prospective cross over study of children with juvenile classic migraine headaches between the ages of 6-12 years, found self-hypnosis superior to proparanolol and placebo in terms of migraine prophylaxes (Olness, MacDonald, & Uden, 1987). Children who practiced self-hypnosis had statistically less frequent headaches than the active medication or placebo groups. The severity of the headaches, however, did not differ among the three groups.

Hypnosis is best employed in an integrative manner in the management of recurrent pediatric headaches following appropriate medical and psychological assessment... . The clinical goal is to use hypnosis for the prophylaxes of headaches rather than as a rescue intervention (which can be taught later with pain analgesia suggestions). It can be readily explained to children as a “skill not a pill.” Before hypnotic intervention is begun a careful history is taken with attention to such factors as: sleep hygiene and sleep disorders; medical, psychiatric and medication history; nontraditional treatments; headache and pain history; allergy and sinus complaints; school and learning problems; postural complaints; orthodontic history; dietary triggers, caffeine use; anxiety and depression, substance use, family stressors as well as other clinical factors. After this initial evaluation with appropriate interventions for co-morbid clinical issues, hypnosis as a part of this holistic problem for headache management is explained as a “skill and not a pill.” The children are informed about how stress may increase the chance of them The hypnotic induction approach with children is permissive and non-authoritarian with suggestions such as: “you may wish to imagine being in your favorite place” instead of “I want you to …” (Olness & Kohen, 1996). I have observed that adolescents respond well to the relaxation benefits of hypnosis as well as pain control suggestions, generally in around five sessions (Hall, 1999). An advantage of hypnosis is that it does not necessitate the need for expensive equipment. Thus, hypnosis is an evidence-based procedure that can be included in an integrative approach to pediatric headache management or in some cases hypnosis may serve as primary treatment.

Life-style changes such as nutrition, sleep, exercise, and stress management may be as essential as any other treatment modality. A growing number of Americans are turning to alternative and complementary (CAM) therapies for treating chronic pain conditions. This is certainly true for treatment of recurrent headache in children. There is very little data available on the efficacy of nonpharmaceutical, CAM therapies in children due to research limitations. Additionally doses of herbs and supplementations are established for adults not children. However, CAM therapies are often tried by many parents and children without seeking advice from their medical provider. CAM therapies used in the treatment of recurrent headaches may include aromatherapy, acupuncture, acupressure, massage, herbs, and chiropractic manipulation.

There is one randomized, controlled trial in the use of acupuncture for pediatric headache (Pintov, 1997). Twenty-two children received either true acupuncture or placebo. After 10 weeks of treatment, children in the true acupuncture group had significantly fewer headaches and milder headaches than children in the placebo group. Additionally, there was an increase in the panopioid activity in blood plasma and an increase in B-endorphin levels in those who received true acupuncture. In a study conducted by the pain clinic at Boston Children’s Hospital on the experience of acupuncture for children, 67% reported that acupuncture had been a positive experience and 70% felt that acupuncture had definitely helped their pain (Kemper, 2002).

Dietary and nutritional considerations are important in the management of recurrent headaches. It is important that children eat regularly to avoid hypoglycemia, avoid excessive amounts of caffeine, and other foods that may trigger headaches. The Diamond Headache Clinic recommends that children consider a low tyramine diet (Diamond, 2002). This includes elimination of aged cheeses, nuts, red wines, chocolate, luncheon meats and other preserved foods.

Feverfew is an herb commonly recommended for preventing migraine headaches. It is thought to have an anti-inflammatory effect. Ginger, peppermint and chamomile teas are used for relaxation and calming nausea. Supplemental calcium, magnesium and riboflavin are being studied in the treatment of headaches in adults (Pizzorno & Murray, 1999). There is no data to support the use of herb or mineral supplementation in children with headaches.

Aromatherapy is a form of herbalism in which fragrances are used for healing effects. Aromatherapy works on the olfactory system and skin. Lavender, basil, lemon balm, peppermint, chamomile, rose and sweet marjoram, eucalyptus are often used for headaches (Mass & Mitchell, 1997). The choice of aroma is a personal preference.

Massage, acupressure and chiropractic are therapies that employ manipulation of muscles to prevent or alleviate pain. Massage relaxes muscles, increases circulation and reduces tissue swelling. Acupressure is stimulation of pressure points in the body to relieve pain. It works by stimulation of nerve reflexes and endorphin release, which is a natural painkiller. Chiropractic involves numerous techniques to restore the normal alignment and mobility of vertebrae.

Chiropractic is one of the most common forms of CAM used in pediatrics (Eisenberg, 1998). While these interventions may offer relief, much further research must be done to determine their efficacy and safety.

Summary

Recurrent headaches in children can be a debilitating problem affecting every aspect of their lives. Medical and psychological assessments are essential to determine appropriate treatment. Biofeedback, relaxation and hypnosis are evidence-based interventions that should be part of a comprehensive treatment plan. Other CAM interventions hold promise and need to be further studied for their efficacy and safety in children.
References
Abstract: The purpose of this article is to provide an empirically-informed but clinically oriented overview of conventional and alternative treatments for recurrent abdominal pain (RAP). First, issues related to classification, epidemiology, and conceptual models of RAP are outlined. Second, conventional medical and behavioral interventions for RAP are reviewed. Third, alternative treatment strategies, including biofeedback therapy, are described. Finally, the integration of conventional and alternative treatments for RAP is discussed.

Introduction

Recurrent abdominal pain (RAP) is a primarily functional disorder that affects 10-17% of school-age children and accounts for a large number of referrals to pediatric health care professionals (Feuerstein & Dobkin, 1990). A growing body of literature provides empirical support for conventional medical and behavioral interventions for RAP. At the same time, interest in alternative treatment strategies is expanding. The purpose of this article is to provide an empirically-informed but clinically oriented overview of conventional and alternative treatments for RAP. The literature reviewed for this article was identified by means of both computer (e.g., Medline, PsychInfo, MANTIS) and manual methods.

The term recurrent abdominal pain (RAP) has been used and defined in various ways over time. Almost every paper or presentation on RAP, however, begins with a reference to Apley’s criteria (Apley, 1975; Apley & Hale, 1973; Apley & Naish, 1958). According to Apley, RAP is characterized by three or more episodes of abdominal pain that occur over at least three months and are severe enough to interfere with activities, such as school attendance and performance, social activities, and participation in sports and extracurricular activities. These episodes are characterized by vague abdominal pain that may be dull or crampy, and is poorly localized or periumbilical, and persists for less than one hour (Frazer & Rappaport, 1999). The pain frequently presents with nausea, vomiting, and other signs of autonomic arousal (Apley, 1975). The majority of children with RAP do not have a specific physical disorder or organic disease. Most investigators report that only 5-10% of affected children have an organic cause for their pain (Apley, 1975; Apley & Hale, 1958).

Studies of the prevalence of RAP have found disparate results, with rates ranging from 9% to almost 25% (Apley & Naish, 1958; Oster, 1972; Scharff, 1997; Zuckerman, Stevenson, & Bailey, 1987). In general, population-based studies suggest that RAP is experienced by 10-15% of school-age children (Apley, 1975; Apley & Naish, 1958) and almost 20% of middle school and high school students (Hyams et al., 1996). As children grow older, the incidence of RAP appears to decrease in boys but not girls (Stickler & Murphy, 1979; Apley & Naish, 1958).

Investigations of the prognosis for RAP have yielded conflicting findings. Though many children with RAP have no longer exhibited symptoms at follow-up (as many as 76%), almost one-half of these children have manifested other psychosomatic or physical complaints (Stickler & Murphy, 1979; Apley & Hale, 1973). Long term follow-up of children hospitalized for RAP (as many as 28 to 30 years after) indicates that a smaller number, between 30% and 47%, will have complete resolution of their symptoms (Apley, 1959; Christensen & Mortensen, 1975).

In the four decades since Apley’s seminal research, etiological models of RAP have become increasingly complex. As we enter the 21st century, these models are multivariate and acknowledge the contributions of a variety of biological, psychological, and social factors (e.g., Drossman, 2000; Walker, 1999). For example, a child with abdominal pain but with no psychosocial problems as well as good coping skills and social support is predicted to have a better outcome than the child with pain as well as coexisting emotional difficulties, high life stress, and limited support. The child’s clinical outcome (e.g., daily function and quality of life) is predicted, in turn, to affect the severity of the disorder.

Conventional Medical and Behavioral Treatments

Conventional interventions for RAP include reassurance and general advice, symptom-based pharmacological therapies, and psychological/behavioral treatments. Standard pediatric care typically consists of...
reassurance that there is no serious organic
disease and general advice about learning to
manage or cope with pain. It is important
for the health care practitioner to acknowl-
edge that the pain is real but not life-threat-
ening. This reassurance can end the child's
and family's search for a physical cause for
the pain and allows them to move into the
stage of learning to cope with it. Though
this level of intervention has been associated
with clinically significant improvements in
the functioning of children with RAP (e.g.,
Sanders, Shepherd, Cleghorn, & Woolford,
1994), medication and psychological thera-
pies are often necessary.

In some cases, symptom-based pharmaco-
logical therapies are helpful. For example,
tricyclic antidepressants such as desipramine
(Norpramin) and amitriptyline (Elavil) may
be used to target the child's visceral pain.
Anticholinergic medications such as dicy-
clomine (Bentyl) and hyoscyamine (Levsin)
have been used for their antispasmodic
properties. In those with constipation, tar-
geted therapies (e.g., laxatives, stool soften-
ers) may be a helpful adjunct.

Much of the existing literature on psycho-
logical/behavioral treatments for RAP was
summarized in an excellent article by
Janicke and Finney (1999). They reviewed
the treatment literature available prior to
February 1, 1998, and identified nine stud-
ies examining three distinctive treatment
approaches, including operant procedures
(Miller & Kratochwill, 1979; Sank &
Biglan, 1974), fiber treatments (Christensen,
1986; Edwards, Finney, & Bonner, 1991;
Feldman, McGrath, Hodgson, Ritter, &
Shipman, 1985), and cognitive-behavioral
procedures (Finney et al., 1989; Linton,
1986; Sanders et al., 1989; Sanders et al.,
1994) (refer to Janicke & Finney [1999] for
more detailed information on each of these
studies). Of note, all patients enrolled in
these studies had functional or nonorganic
abdominal pain. The extent of medical eval-
uation that they received was not specified,
nor was their medication status certain.
Guidelines formulated by the Task Force on
Promotion and Dissemination of
Psychological Procedures were used to cate-
gorize treatments as either well-established,
probably efficacious, or promising
(Chambless et al., 1996). According to these
criteria, cognitive-behavioral procedures
emerged as a probably efficacious treatment
for RAP. Fiber treatment for RAP with con-
stipation emerged as a promising inter-
vention. Operant procedures did not meet the
most lenient category of empirically-sup-
ported treatments, and no treatment
approach met the criteria for a well-estab-
lished intervention.

One particularly promising intervention is
the cognitive-behavioral family intervention
designed and evaluated by Sanders and his
colleagues (Sanders et al., 1989; Sanders et
al., 1994). This intervention consists of
three components delivered in six 50-minute
sessions: explanation of RAP and rationale
for pain management procedures, contin-
gency management training for parents (e.g.,
reinforcement of well behavior, ignoring
nonverbal pain behaviors), and self-manage-
ment training for children (e.g., distraction
techniques, progressive muscle relaxation,
coping statements). In their initial study,
Sanders et al. (1989) found that the treat-
ment group improved more quickly and was
more pain free at 3 months than a wait list
control group. In a second study, Sanders et
al. (1994) found that the treatment group
was significantly more pain free at follow-up
and had a lower rate of relapse than children
who received standard pediatric care (reas-
surance and general advice, as above).

**Alternative Treatments**

Despite the growing evidence base for
conventional interventions, interest in alter-
native treatments for RAP is expanding.
The empirical support for these treatments,
however, lags behind the interest level. In
our literature search, we identified papers
on the following alternative intervention
strategies: biofeedback therapy, hypnothera-
py, acupuncture, peppermint oil, and folk
remedies. Some of the studies included
child as well as adult participants. These
studies were not exclusively limited to chil-
dren with pain of a functional nature, with
some including children with organic pain
as well.

Various types of biofeedback therapy have
been used to treat RAP. Electrocardiogram
and pneumograph biofeedback provide the
patient and the practitioner with valuable
information for effective treatment of RAP.
Electrocardiogram (ECG) biofeedback
devices with the capability to separate car-
diac rhythms into separate spectral bands
calculate the patient's vagal tone, an indica-
tor of their autonomic nervous system's
ability to achieve and maintain homeostasis.
By watching the display of moment to
moment physiological activity with the
patient, the practitioner can coach the
patient in resonant frequency training by
instructing him or her to increase activity in
the low frequency range and decrease activi-
ty in the very low and high frequency
ranges. This method of focusing on the
"peak" of activity in the low frequency
range is an efficient method of familiarizing
the patient with his or her own unique
physiological response. The practitioner
and patient can also validate the intervention
by monitoring session to session improvements
and comparing them to changes in the
patient's pain frequency or severity.

Pneumograph (PNG) biofeedback moni-
tors respiratory activity to facilitate training
in abdominal breathing, a particularly help-
ful treatment for RAP. With strain gauges
around both the chest and abdomen, the
patient learns to decrease chest movement
and increase abdominal movement. The
practitioner also explains the effects of shal-
low breathing and demonstrates with a cap-
nometer, when available. With this guidance
the patient learns to breathe fully, slowly,
and evenly, utilizing the diaphragm muscle.

Additionally, electrodensigraph (EDG)
biofeedback consisting of skin conductance/
resistance can be used for training the
patient to reduce worry and anxiety, thermal
biofeedback measuring peripheral skin tem-
perature can be used to vasodilate and
enhance blood flow, and electromyography
(EMG) can be used to train the patient in
muscle relaxation, if indicated. Each of these
types of biofeedback provides immediate
feedback which assists the learning process
as well as the patient's sense of control and
understanding of personal physiology.

In a study examining biofeedback as one
component of a behavioral treatment proto-
col for RAP, Humphreys and Gevirtz
(2000) compared four different treatment
protocols using a pretest-posttest control
group design. Participants in the research
were 64 children and adolescents with RAP.
They were randomly assigned into four
groups: (1) fiber-only comparison group,
(2) fiber and skin temperature biofeedback,
(3) fiber, skin temperature biofeedback, and

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**Biofeedback**

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cognitive-behavioral procedures, and (4) fiber, skin temperature biofeedback, cognitive-behavioral procedures, and contingency management training for parents. The results revealed that all groups showed improvement in self-reported pain. The active treatment groups, however, showed significantly more improvement than the fiber-only comparison group. Because the addition of cognitive-behavioral and parent support components did not seem to increase treatment effectiveness, the authors concluded that increased fiber with biofeedback-assisted low arousal was effective and efficient as a treatment modality for RAP.

As far as hypnotherapy, Anbar (2001) published a case series to demonstrate the utility of self-hypnosis for the treatment of childhood functional abdominal pain. In four of five patients, abdominal pain resolved within 3 weeks of a single session of self-hypnosis instruction. Sokel, Devane, and Bentovim (1991) reported that all six of their RAP patients were able to use self-hypnosis to reduce or remove pain so that they were able to resume normal activities within a mean period of 17.6 days. In another study (Browne, 1997), seven children with RAP were treated with brief hypnotherapy and subsequently rated at follow-up as improved. Though encouraging, these studies are limited by the absence of prospective controlled designs and failure to use objective measures of improvement.

Two acupuncture studies were identified. Yanhua and Sumei (2000) reported on the treatment of 86 cases of epigastric and abdominal pain by scalp acupuncture. Significant improvement resulted from the insertion of just a few needles. Xiaoma (1988) described electroimpulse acupuncture treatment of 110 cases of abdominal pain as a sequel of abdominal surgery. 71 of the 110 cases were clinically cured with disappearance of symptoms and signs. These studies had mixed age samples and, like the hypnotherapy studies, were not prospective controlled investigations. The latter study assessed children with presumably organic pain, and the extent to which its findings can be generalized to functional abdominal pain is uncertain.

In a randomized, double-blind controlled study (Kline, Kline, DiPalma, & Barbero, 2001), 42 children with irritable bowel syndrome (a subtype of RAP) were given pH-dependent, enteric-coated peppermint oil capsules or placebo. After 2 weeks, 75% of those receiving peppermint oil had reduced severity of pain associated with IBS.

Finally, a study of folk remedies for a Hispanic population (Risser & Mazur, 1995) found that tea (chamomile, cinnamon, honey, lemon) was commonly used to treat childhood abdominal pain. Participants were 51 Hispanic caregivers, mostly mothers, attending a primary care facility serving a primarily Hispanic population. The authors failed to specify whether the children's pain was functional or organically caused. No outcome data were reported.

**Integrating Conventional and Alternative Treatments**

To date, the evidence base for conventional interventions for RAP is larger and better than that for alternative treatments. At the same time, not all children with RAP benefit from conventional treatments, and an increasing number are seeking alternative treatments. An integrative approach to treatment of RAP blends the best of conventional and alternative therapies in a personalized plan that best fits each child and family. Clearly, the heterogeneity of RAP warrants individualized as well as holistic treatment. Because the extent research suggests a variety of subtypes of RAP with various psychosocial and physiological etiologies, satisfaction of Apley's diagnostic criteria does not, in itself, suggest a standard and optimal course of treatment for all RAP. It is our experience that optimal treatment of RAP follows from a comprehensive evaluation of all potential psychological and physiological contributors as well as the child and family's values, beliefs, and culture. An understanding of these factors and processes allows the practitioner to develop a treatment plan that best fits the child and family's needs. This plan may blend conventional treatment strategies, such as contingency management training for parents and child self-management training, with electrocardiogram biofeedback and peppermint oil. As empirically-informed practitioners, we believe that it is our first responsibility to identify and recommend strategies like cognitive-behavioral procedures, which have the greatest evidence base. As integrative and holistic practitioners, however, we are open to and encourage blending of alternative therapies for RAP with empirically-supported conventional approaches. When scientific evidence for a particular alternative treatment is limited, we place a priority on its safety and affordability. If safe and affordable, we support its use in conjunction with more established treatment strategies. It is our expectation that as more is learned about the efficacy and safety of certain alternative treatments for RAP, the integration of these strategies and conventional treatments will become increasingly standard and best practice.

**References**


continued on page 29
Self-Regulation in the Treatment of Nocturnal Enuresis, Dysfunctional Voiding, and Bladder Instability

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Abstract: Urinary incontinence in childhood is a troublesome and common problem that can take many forms. These include nighttime or daytime wetting (nocturnal and diurnal enuresis). Two causes of daytime wetting are dysfunctional voiding and bladder instability. This article will discuss the different presentations of these problems in children, consider etiologies and co-morbidities, and present strategies for the evaluation and treatment of incontinence including the uses of self-regulation training and urodynamic biofeedback.

Introduction

Control of urinary continence is a learned developmental skill that is attained in typically developing children by three years of age during the day and by six to seven years of age during sleep with girls typically achieving control earlier than boys. Control of urine is important to the child as it carries with it a sense of mastery over bodily function, and fosters developing self-esteem. Childhood urinary incontinence is one of the most common problems faced by youngsters and can also be a problem into the teen years.

To qualify for a diagnosis of enuresis, a child must have repeated voiding outside of the toilet at least twice a week for a duration of at least three months. However, a child may also qualify for a diagnosis of enuresis if the problem causes significant emotional or functional distress with or without qualification under the frequency and duration criteria.

Enuresis can occur at night (nocturnal enuresis or “bedwetting”) or during the day (diurnal enuresis). Primary nocturnal enuresis, meaning the child has never attained dryness for a substantial period of time, accounts for 90% of all nocturnal enuresis. Secondary nocturnal enuresis occurs most commonly at age five-eight years, after the child has been dry for “an established period”, traditionally three months or more. Often but not always, there is a triggering stressful event for secondary enuresis such as the birth of a sibling, the death of a family member, parental separation, sexual abuse or a school transition or stress. However, there may not be measurable psychologic stress differences between non-enuretic children and those children who do develop secondary enuresis. This lends support to the hypothesis that a child’s genetic predisposition leaves her vulnerable to losing control of urine at night in response to a stressful event or experience.

Estimates of the prevalence of nocturnal enuresis are quite varied but fall into the range of 10% to 15% at the age of five years, decreasing by approximately 15% per year, with the problem more prevalent in boys than girls. By the age of seven years the prevalence is approximately 7%. By the age of eighteen years, nocturnal enuresis is rare in young women and is still a significant issue for 1% of young men. We do know that there is a marked genetic, likely polygenic, predisposition to the development of nocturnal enuresis but not diurnal enuresis. Twin studies show a 68% concordance rate in monozygotic twins and a 36% concordance rate in dizygotic twins. Approximately 75% of children with nocturnal enuresis have a first degree relative who has had the problem. If both parents have a history of enuresis, the child has a 70% likelihood of having enuresis. For a review of nocturnal enuresis, etiologies and treatments, the reader is encouraged to read the review of the literature by Uri S. Alon (1995).

Although there is a genetic predisposition to the development of nocturnal enuresis, many other factors come into play to cause enuresis, nocturnal or diurnal, for each individual child. These include:

- The rate of neurologic/developmental maturity
- Psychosocial stress and family dynamics
- Constipation: The child reaches functional bladder capacity sooner
- Smaller bladder capacity: The child reaches functional bladder capacity sooner
- Not producing expected diurnal variation in ADH: Make larger amounts of dilute urine and so reach functional bladder capacity sooner
- Degree of arousability from sleep

And less commonly:

- Urinary tract infections or urinary anomalies
- Diabetes mellitus
- Sleep disorders, such as sleep apnea
Daytime wetting or diurnal enuresis is more common in girls. A thorough medical evaluation is always indicated to identify the cause of the daytime wetting. Two types of daytime wetting amenable to biofeedback will be discussed here. These include “dysfunctional voiding” and “bladder instability”.

Dysfunctional voiding (also known as Hinman’s Syndrome or “non-neurogenic neurogenic bladder”) occurs when there is dyscoordination in voiding between the bladder smooth muscle contraction and opening of the external urethral sphincter in the absence of neurologic dysfunction or disease. Children with the disorder typically have urinary urgency, wet themselves in the day or night, have increased or decreased frequency, and may sustain recurrent urinary tract infections. Children with dysfunctional voiding may squat, jump, or posture in an effort to contain urine in the face of bladder contractions against a closed urethral sphincter. Constipation and stool soiling (encopresis) are sometimes a part of the picture and children have a difficult time relaxing the urinary sphincter as they struggle to keep their anal sphincter contracted to withstand stool. Therefore, treatment of any underlying constipation is often essential. The disorder is annoying at least, but also can result in bladder changes and disorders of the ureters and kidneys. The bladder contractions against a closed urethral sphincter cause thickening of the bladder wall, and a diminished bladder capacity. This increases the force of the contractions and leads to a vicious cycle of contracting and resisting more and more. In addition to the changes in the bladder wall, there may be ureteral reflux or kidney sequelae as well. Biofeedback may be necessary to teach a child the feeling of relaxing the urinary sphincter at will, in response to bladder contraction while on the toilet. Other treatments include frequent voiding regimens and anticholinergic medications to relax the bladder.

More recently there have been descriptions and reports of bladder instability treated with urodynamic biofeedback. In bladder instability, the bladder is hypersensitive and contracts at relatively low urine volumes. The child experiences increased urinary frequency and often wetting. If the child finds stopping to urinate inconvenient and contracts her sphincter to delay the contractions, dysfunctional voiding may result. Alternatively, there may be coordinated voiding dynamics but very strong and frequent bladder contractions that may lead to wetting. For some children with urinary urgency and frequency (also called “pollakiuria”), there can be a strong behavioral component, often mediated by anxiety. Perineal surface EMG biofeedback and behavioral shaping approaches are often quite successful for this group.

**Evaluation of the Child with Urinary Incontinence**

As with most psychophysiologic disorders, the mainstay of evaluating the problem is establishing rapport and eliciting a detailed history. If the incontinence is associated with symptoms of concern like abdominal pain, neurologic signs or symptoms, weight loss, dysuria, or atypical urinary stream, a more complete medical evaluation is warranted which will not be detailed here. The following is a brief summary of the initial evaluation and information gathering session that will help you prepare for Biofeedback training or other intervention.

1. Establish rapport — get to know the child’s interests and hobbies for use in metaphoric teaching during self-relaxation skill training.
2. Determine the specifics such as “When?, How much?, and How often?”, in order to classify the disorder and understand the pattern of the problem. This can sometimes be done most efficiently in questionnaire form.
   a. Primary or Secondary,
   b. Nocturnal or Diurnal or Mixed,
   c. Associated with Constipation and/or Encopresis or not.
3. Strive to understand the child’s feeling and thoughts about the problem and his or her experience.
   a. Can she tell when the problem is going to happen?
   b. Why does he think the problem occurs?
   c. What does she think when she gets the body signal to urinate? What does he do next?

4. You may wish to ask the child and family, “What happens when ‘it’ happens”?
   a. What do parents do?
   b. What do siblings do? Peers?
   c. What does the child do? What is expected of him? Laundry, changing clothes?
5. In order to understand what might motivate the child, you may wish to ask him, “What will be better for you when you learn to stay dry?”
6. Review previous evaluations, and treatment trials and the child’s and family’s thoughts about what was and was not helpful.
7. Be alert to the familial context, family dynamics, and cultural beliefs that may affect the treatment process.
8. Educate children and families about enuresis, how many other kids have it and what we know about it.
9. Be specific with your language use during the visit, for example avoiding the “W” word (Wet) and instead talking about becoming dry, or having been not quite dry, etc. Teach children to be “the boss of your body!”
10. Communicate positive expectancy for good results with ongoing education and practice.
11. Demystify the genitourinary system with diagram of the child’s anatomy that the child can label. Include arrows indicating brain control of tightening and loosening the “bladder gate” that can occur awake or asleep.
12. Rule-out pathology with a screening urinalysis, a urine culture if indicated, and a physical exam including abdominal exam with possible rectal examination, neurological exam, genitourinary exam and a check for spinal integrity, perineal sensation, and anal wink.

**Treatment of the Child with Urinary Incontinence: Increasing Internal Locus of Control**

The mainstays of treatment of uncomplicated urinary incontinence in children are education, coaching and teaching control and mastery using self-monitoring and self-
regulation techniques. In addition, particularly with dysfunctional voiding or bladder instability, self-regulation practice may include urodynamic biofeedback.

If constipation and/or stool soiling are present, these should be addressed before the child begins a program to address the enuresis. Once constipation has responded to dietary, behavioral and medical interventions as necessary, the enuresis may be addressed more effectively. Treatments include self-monitoring, the use of a conditioning alarm, self-hypnosis, bladder “stretching” exercises, and practice opening and closing the external urethral sphincter with or without the use of urodynamic biofeedback.

**Nocturnal Enuresis**

Conditioning alarm devices are a well-established treatment for nocturnal enuresis (NE) or bedwetting. While other treatments such as behavior modification (timed voiding/fluid moderation) and treatment of coexisting constipation, detrusor instability, vesicoureteral reflux and urinary tract infections were used until consistent relaxation of the pelvic floor occurs during voiding. EMG data, children can learn to coordinate bladder contraction with a relaxed pelvic floor and an open external urinary sphincter until the bladder is empty. At home they practice the relaxation during voiding and listen for the sound of uninterrupted urine flow they heard during therapy sessions. Combs et al. (1998) have described their urodynamic biofeedback technique in detail and the reader is encouraged to read their article. Most children had repeated cycles of bladder filling followed by emptying using a small urinary catheter. Natural filling also was successful but was more time-consuming and afforded less feedback. Weekly sessions were used until consistent relaxation of the pelvic floor occurs during voiding. They found that most of their patients refractory to standard therapies for dysfunctional voiding had a good urodynamic response in somewhat less than four weekly sessions and achieved complete symptom control in about six months. As with other forms of biofeedback with children, it is important to elicit curiosity, interest and enthusiasm for urodynamic biofeedback. Education about how their bodies work gives children a greater sense of control. Imagery about the body and positive outcomes should be utilized to enhance the effectiveness of the biofeedback.

**Biofeedback**

Urodynamic biofeedback for dysfunctional voiding was first proposed in 1979, most prominently by Maizels, King, & Firlit (1979). Since then numerous additional articles have appeared which have documented the usefulness of this procedure. Kjolseth, Knudsen, & Madsen (1993) reported 51.5% of children cured of their problem and 26% profoundly improved. This compares favorably to the 81% of children with an “excellent response” to treatment reported by Combs, Glassberg, Gerdes, and Horowitz (1998). Urodynamic biofeedback is the most appropriate treatment for dysfunctional voiding. Other therapies such as behavior modification (timed voiding/fluid moderation) and treatment of coexisting constipation, detrusor instability, vesicoureteral reflux and urinary tract infection may be indicated as well but are augmentative.

Urodynamics are used to evaluate urinary functions and monitor the flow of urine simultaneously with pelvic floor electromyography (EMG). Like many other technologies originally developed for diagnostics, urodynamics can be used therapeutically to give feedback to children with dysfunctional voiding so that they can correct the abnormal responses. Prior to biofeedback treatment an accurate diagnosis of dysfunctional voiding (video-urodynamics is particularly recommended where available) is crucial. The biofeedback procedure uses the uroflow-EMG equipment available in most pediatric urology settings. Video-urodynamics are available in some practices as well. By observing the uroflow and pelvic EMG data, children can learn to coordinate bladder contraction with a relaxed pelvic floor and an open external urinary sphincter until the bladder is empty. At home they practice the relaxation during voiding and listen for the sound of uninterrupted urine flow they heard during therapy sessions.

Biofeedback is particularly recommended where available is crucial. The biofeedback procedure uses the uroflow-EMG equipment available in most pediatric urology settings. Video-urodynamics are available in some practices as well. By observing the uroflow and pelvic EMG data, children can learn to coordinate bladder contraction with a relaxed pelvic floor and an open external urinary sphincter until the bladder is empty. At home they practice the relaxation during voiding and listen for the sound of uninterrupted urine flow they heard during therapy sessions.

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**Bladder Instability**

Because most children with classic dysfunctional voiding also have symptoms of increased frequency, urgency and wetting, one must be careful before treating this dis-
order to identify and treat the dysfunctional voiding. If this is not addressed, treatment will nearly always be unsuccessful in the long run. Children with bladder instability should be given information about their bladders and told that they will be learning how to relax the bladder and stop the feelings of needing to urinate. Using urodynamics either with natural filling or a small catheter for cyclic filling, children can practice manipulating their pelvic floors to stop unwanted contractions. Progressively larger volumes are used as the child improves her ability to inhibit contractions. The therapist should have a good understanding of the underlying condition and use appropriate imagery with the child.

Conclusions
Urinating and defecating with control are a developmental task that requires a child to master quite a complex coordination of internal and pelvic floor musculature. When children struggle with dyscoordinated voiding, bladder instability, or nighttime enuresis, mastery and control can be achieved with help. Education, coaching, self-regulation training and biofeedback all assist patients who struggle. The benefits for their self-esteem and sense of competence are immeasurable.

References


Recurrent Abdominal Pain in Children and Adolescents: Conventional and Alternative Treatments
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1 Electrocardiogram biofeedback is also commonly called heart rate variability (HRV) biofeedback.
Abstract: Real life experiences in integrating biofeedback and self-regulation skills training with traditional psychological and behavioral strategies are important in creating new treatment paradigms. This article describes the clinical experiences of a group of community clinic-based and school-based therapists suggesting that biofeedback training and related techniques can facilitate emotional control and behavioral change in ways that traditional “talk” therapies may not. This article describes beneficial outcomes with the addition of biofeedback as a therapeutic tool for a group of very challenging, complex children and adolescents for whom “traditional” psychotherapy doesn’t always connect.

Biofeedback has been a popular and successful addition for children and families at the Central Center for Family Resources (CCFR), a sliding fee, non-profit community mental health agency located in Spring Lake Park, a northern suburb of Minneapolis, Minnesota. This article describes the experience of integrating biofeedback and self-regulation training with traditional behavioral and psychotherapy techniques. Agency staff includes four child psychiatrists, one adult psychiatrist, support staff and several part-time and full-time child psychology doctoral and master’s level clinicians at different school and clinical sites. Clientele is quite diverse ethnically and 51% of the families seen are low income. The agency sees over 3,000 families annually.

In 2000, CCFR received a grant from the Bush Foundation to conduct a clinical demonstration project utilizing biofeedback as an adjunct therapy for the treatment of children with serious emotional and behavioral problems. The grant provided funds for training a number of the staff in the use of biofeedback and self-regulation skills training for children with a wide variety of mental health problems as well as paying for initial equipment. A BCIA certified pediatrician was hired as a consultant and provided on-site training and patient consultation for a period of 24 months at regular intervals. Targeted populations were children and adolescents with anger management and impulse control difficulties, and mental health disorders such as generalized anxiety disorder, phobias, panic disorders, obsessive compulsive disorder, intermittent explosive disorder, posttraumatic stress disorder, separation anxiety, oppositional defiant disorder, depression, and attention deficit disorders. Co-morbid disorders in this clinical population included reactive attachment disorder, Asperger’s Syndrome, Tourette’s disorder, bipolar disorder, fetal alcohol effects and learning disabilities. These issues are long term and many of these clients are also seen for medication management by CCFR child psychiatry staff.

The youth we serve with biofeedback and other psychological services range in ages from six to seventeen. The grant allowed for provision of peripheral biofeedback services at four different settings:

- CCFR main clinic
- Bell Center — a school-based, affiliated day treatment program which offers a highly specialized setting for children and adolescents with significant emotional and/or behavioral challenges.
- Centennial Lakes Middle School and High School — specialized program settings within each school for children with emotional and behavioral disorders that has contracted with CCFR to provide groups and support services for youth in those programs.

The programs share 2 biofeedback hardware/software set-ups among the four sites (these include two Biointegrator systems – one laptop and one desk-top, and also the “Freeze-Frame” heart rate variability system (from HeartMath)—each site has the equipment for 2+ days each week. These populations are highly at risk for conduct disordered behaviors and drug and alcohol abuse. Often the children and/or their parents are interested in self regulation for various reasons – i.e. not wanting to take medications, wanting to reduce the need for medications, or simply wanting to learn new skills to manage their symptoms and/or behaviors better.

Biofeedback has been used in this demonstration program adjunctively with approximately 150 children and adolescents. CCFR staff is finding peripheral
biofeedback to be quite a positive tool in treating these children and very empowering as they begin to generalize these skills for personal use at home as well as at school. Modalities most commonly utilized include pneumograph belt, EMG, thermal training, heart rate variability, and EDA training. Generally we begin by teaching various relaxation strategies such as progressive muscle relaxation, visualization, diaphragmatic breathing and autogenic training along with cognitive behavioral strategies.

**Experience in the Community Mental Health Clinic Setting**

One distinct benefit in utilizing biofeedback is that it allows pediatric patients to develop a strong sense of personal responsibility for improvement, facilitating an internal locus of control with regard to behavioral change. One mother reported that although she had not observed her son practicing the biofeedback homework assignments, she believed he must have because his anger outbursts at home and at school became much less frequent. In addition, biofeedback along with conflict resolution strategies helped to decrease power struggles between her and her nine-year-old son.

At CCFR, one thirteen-year-old boy was brought to counseling by his mother after numerous school suspensions. He and his mother were angry that the school was placing him in a high level special education setting due to anger management issues, impulsivity, and oppositional behaviors. He was adamant in his desire to “not talk” and not take medications. Biofeedback was presented as a means for him to be able to change his behaviors without a lot of “talk therapy.” He was also referred for psychological testing which indicated depression and attention deficit hyperactivity disorder. He was prescribed medications but said he didn’t feel like himself when he took the medicine. However, he was quite diligent in his daily practice in the biofeedback regime of thermal training and work with the “Freeze Framer” with heart rate variability. He did transfer to the specialized school setting, but after only a couple months he is now being considered for return to the mainstream setting from which he came due to much improved behaviors. Teachers comment that his behavior was greatly improved and that he was learning to self-control with obvious benefits.

In several instances, parents have requested biofeedback with siblings after seeing success with this technique with another son or daughter. In other scenarios, three children have reported that the relaxation skills they learned with biofeedback have also been helpful in their learning to control their breathing during asthma attacks. An eight-year-old boy diagnosed with bipolar disorder in addition to asthma, used EMG and thermal training to assist with anger management issues. He described a scenario in which he forgot his inhaler at home and had an asthma attack on the playground at school. He said he didn’t know what to do so he started breathing diaphragmatically as he’d been taught in therapy and biofeedback. He told his mother that it had helped so much that he hadn’t needed his inhaler after all—he felt very empowered though his self-regulation skills.

In another scenario, a ten-year-old boy exclaimed to one therapist, “Kathy, this stuff really works!” His mother told the therapist of an incident in which he had an angry altercation with a friend and told his friend “we need some biofeedback.” He then took his peer to his room, demonstrated some of the relaxation techniques he learned with biofeedback, and taught them to his friend as they resolved the conflict.

An adolescent client who did not want to take medications for his depression has reported being better able to regulate his moods and his sleep by using the relaxation skills he learned with biofeedback. His mother writes “after years of my 15 year old son being on medications for treatment of depression and oppositional behavior disorder, we decided to try biofeedback. I have noticed the biofeedback helps my son to become calmer, more compliant and better able to deal with things.”

The clientele at CCFR is often low income. One nine-year old with attention deficit disorder from a challenging family was excited about having biodots sent home with him to use with homework to monitor his hand temperature during the day. (Biodots are tiny stickers that change color with one’s hand temperature. Warm hand temperature is a sign of a relaxed physical state). He started to take the dots and then paused and hesitantly asked, “How much do they cost?” When the therapist said they were free he grinned, gave her the thumbs up sign and exclaimed happily “yes!”

Medication management was offered but the child and parents wanted to try self-regulation first. The school and the therapist coordinated services on a weekly basis to assist this child in better management of anger outbursts and improvement was noted both at home and school.

Staff has found one technique particularly helpful with children and adolescents: use of the stress profile early on in the training sessions. Children are often surprised to see how stress and relaxation affect their bodies so quickly. We allow them to take home printouts of their stress profiles and graphs of the work they did each session. They have been observed explaining the stress response to their amazed parents. We’ve also found it helpful in early sessions with some children to have the parents also come into the session as we explain the stress response and demonstrate various relaxation techniques. The parents are then learning stress management skills vicariously through their children.

**Experience in the School Setting**

Treatment of children and adolescents in the school settings has also been popular as well as successful. Two ten-year-old students at Bell Center with anger management and impulse control problems were treated with biofeedback. Each was taught diaphragmatic breathing techniques prior to formal biofeedback training. They were introduced to biofeedback using the abdominal pneumograph belt. Once they displayed mastery with this technique they were introduced to other kinds of peripheral biofeedback following a physiologic stress profile. They each learned how to relax using muscle relaxation, visualization, and self-talk, and breathing techniques. Each was excited to see his body’s physiology being manipulated on the computer screen. This created more enthusiasm and motivated them to learn.
more about the body’s response to anger. Both reported and were also observed using relaxation strategies learned with biofeedback to successfully control their anger and home and/or at school.

Impressions from Staff and Clinical Challenges

Therapists at our agency have been so impressed with the success of biofeedback that staff members who have not had this training refer their clients to therapists with this expertise. Also, two additional therapists have taken the pediatric biofeedback training and we are now running into scheduling difficulties with the room that houses the biofeedback equipment because it is in such demand. The grant also provided funding for training in neurofeedback and two therapists have completed this training. We are now working on implementing this neurofeedback with select clients.

We have learned that children can be taught the biofeedback skills often in as few as three or four sessions but it usually takes at least four or five additional sessions to insure generalization. Some children drop out before generalization is firmly entrenched, but we still view the use of biofeedback with this clientele as having been a positive experience. These individuals have often endured extreme stressors such as abuse, family disruptions, poverty, family deaths, chemical dependency in the home, multiple moves, homelessness, etc. On occasion, with the completion of even a few biofeedback sessions, some of these young people with extensive emotional and behavioral difficulties have started building a trusting rapport with a therapist in a very non-threatening manner. They are then willing to pursue additional therapy on other life issues.

One of the major concerns we’ve struggled with in using biofeedback with these clients is generalization of skills to home and school. The biofeedback specialists at the middle school and high school have expressed frustration in that a number of adolescents there perform relaxation skills very competently in the biofeedback room but they do not generalize to the world at large where they are having difficulties.

Again, the families we work with often meet poverty guidelines. Transportation can be an issue for them—especially in the cold, snowy Minnesota winters. Their cars can be unpredictable and therapy sessions may conflict with work schedules. Parental education level may often only be that of high school or even 10th or 11th grades. Many are single parents without much support. They may have to move frequently and some may live with extended family or friends due to homelessness. Because of these issues, parents do not always bring in their children as consistently or frequently as we would hope. They may come in requesting biofeedback for their children and then drop out for unknown reasons after only 3 or 4 sessions. In addition, the four sites currently share the equipment, allowing for only 2 to 3 days each week for appointments, complicating scheduling difficulties.

One therapist at Central Center has worked with 58 children and adolescents. Of them, 5 were not brought in consistently enough to make any changes. 6 moved from the area during the course of treatment. 2 have had difficulties learning the skills because the parents do not or cannot schedule more frequently than 3 to 4 weeks apart. 3 dropped out for unknown reasons, 6 dropped out due to lack of motivation in practicing the skills, and 3 were terminated due to oppositional behaviors. 2 children with fetal alcohol effects who were quite motivated and asked for biofeedback were successful in learning the skills but never got to the generalization component. One adolescent was court ordered for therapy and he was able to acquire the skills very successfully and owned that the skills were helpful, but he was quite selective about where he chose to use them, and continued to get into trouble in school.

It’s also been the experience of staff to use biofeedback with children who are being seen in very brief therapy. Teaching them to relax and observing the accompanying bodily sensations has been quite helpful for them even if they could not complete a full 10 to 12 sessions. Also, in some children with very long-term issues, it seems to occasionally take one therapy session to do a “refresher” biofeedback session a couple months after completing a typical ten to twelve session format. This is helpful in reinforcing and solidifying the stress management skills. Parents have generally been quite positive about the effects of biofeedback and we have received no negative feedback from them regarding this demonstration project. We have had only one case in which a parent refused to give consent for biofeedback when it was recommended.

Tracking Outcomes

Early in 2002 we began to give pre and post scales to parents to rate the level of severity of the symptoms and behaviors their children were experiencing. We have too little data at this time to make any conclusions. Anecdotally speaking, however, several parents have observed that they like the feedback because they view it as an alternative to medications whose side effects they view as detrimental. Some have expressed optimism about their children with attention deficit disorder eventually being able to cut back on their medications. The children with whom we work have commented that they like biofeedback in that it makes their self-regulation skills fun to learn and they are reinforced for their daily practice by ever improving skill at the “video games for their bodies” at their biofeedback sessions.

Conclusions

In conclusion, during the course of this clinical demonstration project, the staff found that biofeedback paired with cognitive behavioral strategies can be a useful adjunct instrument in the treatment of high-risk children and adolescents in a variety of settings. Consistency of attendance and generalization of skills are the two major difficulties we’ve encountered. However, biofeedback can make learning self-regulation skills and the process of behavioral change more motivating and interesting for these clients. While biofeedback is not totally successful with every such youth, we’re finding it to be a valuable tool to assist many young clients with various mental health disorders and adding a

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Elizabeth Bigham, MS, is a doctoral candidate in the Health Psychology program at Alliant International University. She is completing her dissertation project investigating a possible mechanism of recurrent abdominal pain in adolescents. Her project used biofeedback monitoring to measure psychophysiological activity, including heart rate variability. She also coordinated the Pediatric Gastroenterology Biofeedback Program at Kaiser Permanente for the past two years. She plans to work as a psychological assistant and adjunct professor in 2003.

Lela Carlson, RN, is the founder and executive director of the Central Center for Family Resources, a United Way funded community mental health agency serving the northern suburbs of Minneapolis, Minnesota for over 20 years. Mrs. Carlson has subspecialty training and certification in psychiatric nursing. She has authored many successful philanthropic grants including the Bush Foundation grant that lead to funding for the unique biofeedback program described in this article.

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Pamela Kaiser, PhD, PNP, is a licensed clinical psychologist and a former director of the Anxiety, Stress, and Health Clinic at a Stanford-affiliated agency. She has advanced training in biofeedback, pediatric hypnosis, and cognitive-behavioral therapy. She specializes in treating children and adolescents with anxiety, stress-related disorders and psychophysiological conditions. Formerly an Associate Clinical Professor, Pediatrics, at University of California, San Francisco, she was a co-investigator of an NICHD-funded project examining individual differences in children’s stress reactivity and health. She has published and presented nationally on behavioral-developmental pediatric topics.

Rebecca Kajander, BSN, MPH, CNP, BCIA-C, is a Pediatric Nurse Practitioner specializing in developmental and behavioral pediatrics. She is the Department Chair of the Alexander Center for Child Development and Behavior and is clinical
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new dimension to their skill set. In addition, we are hopeful that adding neurofeedback to our array of peripheral biofeedback modalities will aid us even further in the treatment of at risk children.

Editors Note: Clinical experiences over a number of years has suggested that biofeedback and related techniques can open up and facilitate psychotherapeutic and behavioral shaping processes in ways that traditional “talk” therapies may not. This article describes beneficial outcomes with the addition of biofeedback as a therapeutic tool for a group of very challenging, complex children and adolescents for whom “traditional” psychotherapy doesn’t always completely connect.

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This is my final chance to address the society as your president. Primarily, I want to convey my thanks to you for giving me this honor. No professional recognition could be more important to me. My identification with our field has been very long and very deep. It is my primary affiliation, among the dozen or more professional societies to whom I contribute dues.

I have had an interest in the training of self-regulatory processes since childhood, when I observed my parents work as music teachers with budding pianists, helping them to avoid and recover from what we now think of as “repetitive motion disorders” due, in large part, to poor instrumental technique. From these early days, I noticed books on relaxation by Edmund Jacobson on the bookshelves. (See some of the fruits of this interest represented in fun and music at our social evening at this year’s annual AAPB meeting.)

It wasn’t until after graduate school that I had a chance to work myself with this great doctor, who, at the age of 86, still commuted monthly between Chicago and New York to treat patients. He used to rent a suite of rooms at the old Commodore Hotel, and go from room to room giving instruction. He was a crusty old fellow. When talking to me about the empirical evidence for progressive relaxation, he once noted that I had missed reading one of his more obscure articles. “Oh, you don’t read, do you,” he said (a little too matter-of-factly). However his diagnostic and treatment abilities still surpassed those of many of his medical colleagues. He easily diagnosed cases of what we now called irritable bowel syndrome (not a well-conceived diagnostic category in the early 1970’s), simply by listening to his patients and palpating the abdomen - cases that were mostly being (ineffectively) treated by various rudimentary tranquilizing and antispasmodic medications, some with considerable side effects. Indeed I still recommend that people read his classic 1938 book, *Progressive Relaxation*. Nowhere have I seen better-documented evidence for the effectiveness of relaxation techniques for this troublesome chronic malady. He had profound distrust for the suggestion of body sensations, as poor substitutes for actual control of physiology. His battles with originators of hypnotic methods, particularly autogenic training, remain some of the most colorful stories in our field.

The particular method he used for conducting relaxation training has often been misinterpreted as overly detailed and too time-consuming, supposedly (as described in his book) taking 20 sessions or more. In fact, it was not the length of his training, but the intensity of it that differentiates it from most practitioners of “progressive relaxation” methods currently in vogue. In an obscure but useful volume, *Modern treatment of tense patients*, (published by Charles C. Thomas), he presented cases patients successfully treated in a single session.

Jacobson approached his relaxation technique the way most biofeedback practitioners treat biofeedback. He was not just concerned that his patients *feel* relaxed, but that they *be* relaxed. Despite his own description of the method as asking patients to tighten their muscles maximally in order to feel muscle sensations, this was not the focus of his teaching. Rather, he advocated a “method of diminishing tensions,” whereby people become progressively aware of smaller amounts of muscle tension. In the end, he taught patients to recognize the very subtle sensations of “residual” tension, that were present even when the patient was *not* deliberately tensing, and seemed to be mostly relaxed - and to neutralize even this minute level of residual tension by becoming totally passive. *Doing*, he said, was the opposite of relaxing. The cornerstone of his

continued on Page 3A
“The Best of Times… the Worst of Times”

Francine Butler, PhD

“It was the best of times…it was the worst of times”. Familiar words written many years ago—but they still capture current sentiment. As applied to the state of biofeedback, the best and the worst are proper descriptors.

AAPB is a year shy of our 35th birthday and a look at our progress is in order. Best and worst are relative terms and it is fair to ask—as defined by whom? For the insurance community, members would judge the state to be “worst.” Despite the passage of time and the continuing collection of research, there have not been major inroads in biofeedback acceptance at a major level. However, we have achieved small successes. The number of reports received from members who have been reimbursed continues to climb. The number of companies reimbursing grows slowly and the awareness of biofeedback to third parties is growing. At AAPB headquarters we receive an average of 5-10 calls per week from an agency or entity requesting information on biofeedback practice or procedures. BCIA regularly receives calls to verify certification of practitioners. We receive 25-30 calls or inquiries per week from the public seeking a practitioner. And this number zooms if there has been an article published in the media recently.

Part of our problem is where Biofeedback fits in the health care menu. Are we considered CAM, established medical treatment, an educational application or non-validated application? Depending on the respondent, there may be a different response.

A 2002 study of CAM services including biofeedback. The highest reported service was pastoral care with 197 hospitals reporting. Half that number, or 100 hospitals (or 20% of respondents) reported using biofeedback. Compared to 40% of respondents using the highest rated CAM practice—we did not fare too badly. Sita Ananth, author of the report is a presenter at the AAPB annual meeting.

Is “Biofeedback” a household word? Not quite. There is a TV program by that name and I eagerly tuned in only to find that it has nothing to do with what we define as biofeedback. Currently, I’m reading a mystery whose heroine, a biofeedback practitioner specializing in treating ADD kids, is an amateur detective. As she tries to glean evidence from a possible suspect she makes a statement about publishing an article in the newsletter of the Association for Applied Psychophysiology and Biofeedback. In the popular press Biofeedback is receiving notoriety. The Discovery channel recently featured a story about an athlete treated with neurofeedback. Our own Vince Monastra’s article on neurofeedback was featured in a national press release distributed by Reuter’s and Web MD. “Ask Dr. Weil” has a section on biofeedback. Take a look at the web site www.webmd.com and search on biofeedback. You’ll be pleased to see the results.

So let’s review the quote—maybe not the best, and maybe not the worst —but how about the betterment of times.

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 (we may be able to publicize your event more than once if you get your calendar to us early enough).

Send Word (.doc) or text files by e-mail to the News and Events Editor: Ted LaVaque, PhD tlavaque@gbonline.com.
This week another new physician showed up at the Austin Biofeedback Center/Optimal Performance Institute to spend the afternoon learning about biofeedback. The University of Texas Medical School sends new residents in Austin through my center as part of their orientation to complementary medicine. The new doctors sit in on our sessions with a variety of patients/clients and then have the experience of being hooked up and trained with peripheral and EEG biofeedback. I have been “selling” biofeedback to doctors in Austin for almost 20 years, and I am excited that new physicians are now routinely coming through the center as part of their complementary medicine rotation.

As is often the case, this new physician admitted outright that she didn’t know anything about biofeedback. When I asked her what she thought it might be, she asked, “Is it something like hypnosis?” “Sometimes,” I replied. “It depends on what the patient or client is coming in for.” She looked puzzled. I explained to her that at our center we refer to people referred by physicians, dentists, and chiropractors as “patients” and to everyone else who comes in as “clients.”

Replying to the doctor’s question about when in the process it would be appropriate to refer a patient to biofeedback, I suggested the following guidelines:

- Patients asking for alternatives other than medication for their symptom(s);
- Patients who are not getting the expected outcome from medication or other treatments;
- Patients who suffer unexpected or undesirable side effects from medication(s);
- Patients who would like to learn psychophysiological self-regulation to address the root cause of their symptoms rather than just treating the symptoms.

I told her that she would see people coming into our center for everything from chronic or intractable “medical” presentations like pain, hypertension, bladder/bowel symptoms, insomnia, headaches, cancer, and TMJ; to “mental health” presentations like anxiety, PTSD, panic disorder, depression, OCD, and ADHD; to “optimal performance” training for artists, musicians, athletes, and musicians.

method was differential relaxation: i.e., relaxing muscles in everyday life, when not needed to perform a particular activity.

Above all, Dr. Jacobson was an empiricist. Not satisfied with his clinical successes, he was determined to measure low levels of muscle tension empirically. In the 1920’s and 30’s this was not yet possible, so he worked alongside scientists from and engineers from Bell Laboratories to invent the “integrating neurovoltmeter,” what we now know as the surface EMG recorder. He was concerned that the device was capable of recording to an accuracy of one microvolt peak-to-peak - a level somewhat below the noise level of most SEMG equipment currently on the market. His device filled up a fairly large room in the loft-like laboratories of his Foundation for Progressive Relaxation - to do roughly what our shirt-pocket sized devices do now. Although he tried SEMG biofeedback in the 1940’s, he rejected it as a treatment technique, because he did not want patients to depend on a machine for feedback. He wanted the feedback to come directly from the muscles.

Jacobson had no patience for the armchair philosophizing currently in vogue among some of his Harvard professors, particularly William James, whom he considered to be an anti-empiricist, and plagued by his own psychosomatic tensions. He claims that James dismissed his own work out of hand, by saying “What does this tell us about human nature?” He had similarly harsh words about Hugo Munsterberg, who, he said, suppressed students’ data that didn’t agree with his theories. He also studied at Cornell with E.B. Titchener, the great introspectionist. He quipped that Titchener was a wonderful tennis player, but “he couldn’t introspect.” Jacobson’s own introspective work started when he was a college student, where he wrote a philosophy paper on the nature of thought, and noted the various body sensations that were part of the thinking experience. In his last book, The Human Mind (also published by Charles C. Thomas), written at age 94, he again speculated whether an intelligent creature with oozing tentacles could possibly have the same type of thought that we
Announcing a New Clinical Psychophysiology PhD Program

The University of Natural Medicine has begun a distance based doctoral program in Clinical Psychophysiology. It is the only doctoral program in clinical psychophysiology in the world at this time. The program is designed to train people to be true professionals in the unique constellation of assessment and interventional techniques that combine to form the profession of clinical psychophysiology. People with prior clinical training will learn to knowledgeably and effectively incorporate the techniques of clinical psychophysiology into their practices.

The doctoral program is designed for two groups of people. First, clinicians who are already independently licensed or certified will learn to use psychophysiological techniques to extend their scopes of practice within their credentials to include new types of patients with a wider variety of disorders by incorporating a wider variety of evaluative and interventional techniques into their current skill sets. Second, people who have completed their bachelor's degrees but do not have a clinical background suitable for state certification or licensure will become professional clinical psychophysiologists capable of using psychophysiological assessment and interventional techniques with a wide variety of patients. People from the second group take three additional courses beyond the core curriculum in basic clinical skills in order to insure that they have the knowledge base needed to work with patients safely and effectively.

The core doctoral program consists of a combination of distance based lecture courses, laboratory experiences, seminars, and training experiences for a total of 90 credits. Each student will also perform a doctoral dissertation based on a publication quality, original study. A list of the courses follows this article.

The program is designed so the lecture portions of courses are provided on an individual basis through distance education, and the hands-on training is provided at several group sessions per year. The distance based courses are usually provided through audiovisual lectures recorded on CDs and student - teacher interaction via the internet following each lecture. Hands-on training will be conducted several times per year with at least one of the sessions being concurrent with AAPB’s annual meeting. The program will require three to four years for working students to complete and will cost between $18,500 and $21,800 including books etc. but exclusive of travel costs to the hands-on training sessions.

The program was developed and tested through the Behavioral Medicine Research and Training Foundation's courses. Students in the program's initial trial came from counseling, MFT, nursing, physical therapy, and social work. All but four of the courses were taught during the trial and five have been taught by distance education with great success.

Faculty are still being recruited, but it is already clear that many of the top people in psychophysiology will be presenting courses in their areas of expertise as they did during the Foundation's trial. The program is directed by Richard A. Sherman, PhD. In addition to Dr. Sherman, faculty already on board include Jeffrey Kisting, M.Div., MS, Gerry Kozlowski, PhD, Susan Middaugh, PT, PhD, Don Moss, PhD, Wes Sime, PhD, Seb Striefel, PhD, and Eric Willmarth, PhD.

The University of Natural Medicine was established in 1989 with the aims of becoming one of the foremost educational institutions for Natural Medicine, create training programs that integrate healing practices from all disciplines and cultures, and to provide availability and affordability of education in natural medicine for people around the planet. The University now has campuses in many nations and provides education in over ten languages. The non-profit institution is fully licensed by the New Mexico Commission on Higher Education as a Private Postsecondary Institution of Higher Learning. Thus, degrees are granted with the approval of the State of New Mexico. The university is not yet accredited but is in the process of applying to several accreditation bodies. Current degree programs include BS, MS, MA, PhD, NMD, & ND programs.

In order to obtain further information about the Clinical Psychophysiology PhD program, or to register, please contact: Richard Sherman, PhD, at rsherman@nwinet.com or (360) 598 3853.

Required courses for all students

Courses having more than three credits include a lab session. New students must take or test out of courses 1 – 4 before taking any others. All students will begin seminars 20 and 21 as soon as they enter the program. All students are urged to take courses 5 & 6 after completing 1 – 4.

1. Introduction to Psychophysiology – The Biological Basis of Behavior – 3 credits
2. Anatomy and Physiology for Psychologists – 3 credits
3. Psychophysiological Recording and Intervention / General Biofeedback – 4 credits
4. Research and Statistics in Psychophysiology – Credibility Assessment – 4 credits
5. Pain Assessment and Intervention from a Psychophysiological Perspective – 3 credits
6. Overview of Behavioral and Complimentary Medicine – 3 credits
7. Principles and Theories of Stress Management and Relaxation/Imagery training – 4 credits
8. Nervous System Functions in Psychophysiology – 3 credits
9. Recording & Altering the Brain's Activities Through Neurofeedback & Other Techniques – 4 credits
10. Behavioral Assessment and Psychologically Oriented Techniques – 4 credits
11. Behaviorally Oriented Techniques including wellness, conditioning, and meditation – 4 credits
12. Introduction to Clinical Pharmacology - 2 credits
13. Psychophysiological Assessment of Sleep – 4 credits
14. Psychophysiological Applications in the Community, School, Sports, & Workplace – 4 credits
15. Clinical Hypnosis, Self Hypnosis, and Imagery Training – 4 credits
16. Applications of Neuromuscular Reeducation in Biofeedback – 4 credits
17. Ethical, Legal, and Professional Standards Issues – 2 credits
18. Pelvic Floor Disorders and Sexual Dysfunctions – 3 credits
19. Clinical Practicum and field experience – 4 credits
20. Dissertation planning seminars and dissertation preparation – 8 credits
21. Professional Development planning seminars – 2 credits
22. Clinical Case Seminars – 4 credits
23. Dissertation – 10 credits

Courses for students entering the program without clinical credentials

B1. Patient – Therapist Interactions – 5 credits including a one credit lab and a one credit clinical experience
B2. Introduction to Patient Assessment – 5 credits including a one credit lab and a one credit clinical experience
B3. Introduction to Coordination with Other Health Care Providers - 5 credits including a two credit clinical experience

BCIA Explores the Creation of Pelvic Muscle Dysfunction Certification

BCIA is proud to announce that we are current exploring the creation of a separate, entry level, BCIA Certification in Pelvic Muscle Dysfunction (PMD). Pelvic Muscle Dysfunction (PMD) is a specialized biofeedback treatment area, which covers elimination disorders and chronic pelvic pain syndromes. These disorders include: urinary and fecal incontinence, chronic constipation resulting from pelvic floor and bladder sphincter dyssynergia, pelvic floor myalgias, and vulvodynia. As you may be aware, the use of biofeedback for clients identified with these problems is enjoying support from the public and the medical community. Treatment of these disorders using behavioral, applied psychophysiological, and biofeedback modalities is recognized as efficacious and is possibly the most widely supported of all applications in our field.

This issue has been discussed by the board for several years and because of the need to establish standards and credentials in the field, BCIA has put time and effort into this proposal. A multidisciplinary committee of pelvic muscle dysfunction experts came together to formulate academic, professional, didactic, and supervision requirements for a PMD Certification. In recent efforts, BCIA also asked the committee to delineate requirements for the grandfathering of experienced clinicians in the field. The members of this hard-working committee are Eli Alson, PhD, BCIAC; Debbie Callif, OTR; B. J. Czarapapta, RN; Tamara Dickinson, RN; Marilyn Freedman, PT; Howard Glazer, PhD; Holly Herman, PT; Louise Marks, MS, OTR, BCIAC; Elaine Meadows, PT; John Perry, PhD, BCIAC; Beth Shelly, PT; Diane Smith, CRNP; Joey Spauls Smith, RNBC, BCIAC; Kelly Sparks-Evans, RN, BSN, CWO/CN; Elise Stettner, MPS, PT, BCIAC; and Barbara Woolner, RN, BS, BCIAC. Additionally, Gerard A. Banez, PhD; Nanny Christie, MA, BCIAC; Lynda Kirk, MA, LPC; BCIAC; Sarah La Barbara, BA; BCIAC; Rita Steffen, MD; and Rich Sherman, PhD, BCIAC assisted the committee with their tasks.

The Board is supportive of the PMD proposal to date and has authorized proceeding with exploratory steps. At this time, we are assessing the merits and validity of pursuing this specialty certification. BCIA is seeking feedback from all entities who are involved in the treatment of the PMD disorders at any level certified and non-certified clinicians who are doing this work, medical staff who may refer patients, equipment vendors, educators, professional organizations, and anyone else you may feel has something to contribute to this effort. First of course, it would benefit BCIA if you would read our materials and respond to our survey. The next level of involvement would be to help BCIA establish relationships with other professionals and associations to enlist their responses.

The members of the BCIA Board invite AAPB members to visit our website at www.bcia.org and read the proposed certification and grandfathering requirements and Blueprint of Knowledge. Please submit the questionnaire in order to assist BCIA in determining cost-to-benefit factors regarding the PMD certification. Your opinion is vital to our proceeding with this endeavor. You may also choose to contact the BCIA office and have them mail you a hard copy of this information.

A more detailed version of the proposed documents for certification/grandfathering requirements and the full Blueprint of Knowledge in this field is available on our website at www.bcia.org or by contacting the BCIA office at (303) 420-2902 or bcia@resourcecenter.com.

The BCIA Board hopes to revisit the PMD proposal very soon and to make future plans based on your responses and recommendations.

We'll keep you posted on these and other efforts of BCIA on your behalf!

John Carlson, PhD
Chair, BCIA Board of Directors
From the President – Biofeedback and Music

continued from Page 4A

do, because body sensation remains such a
central part of the thinking experience. He
and his student, F.J. McGuigan, demon-
strated in the psychophysiology laboratory
that almost all thought processes necessarily
involved muscle tension, particularly in the
eyes and vocal apparatus.

On the other hand, Jacobson had only
the highest adulation for another Harvard
mentor, the physiologist Walter Cannon.
Cannon's famous volume, The Wisdom of
the Body, should still be on the "must read-
ing" list of anyone entering our field.
Written almost 100 years ago, it still con-
tains some of the best descriptions any-
where of the body's self-regulatory
processes. Our current field of biofeedback
is based on his original insights. I had the
honor to do my graduate study of psychol-
ogy in Walter Cannon's house, located at 5
Divinity Avenue, by then in the middle of
the Harvard Campus, and later renamed
"the Psychological Clinic" by Henry A.
Murray, where he carried out his classic
studies of human personality. Serious study
of Cannon's work, for me, came with the
woodwork. The current field of physiology,
with its almost exclusive focus on the
microcellular level, could learn much from
Cannon's perspective. Perhaps it is primarily
among us psychophysiologists where
Cannon's integrative tradition survives.

The traditions of empiricism and of
mind-body integration are deeply embed-
ded in applied psychophysiology and in
our profession. The program chairman of this
year's AAPB meeting, Richard Sherman,
deeply shares these values, and has put
together an exciting program than reflects
this focus.

During my own graduate training, I had
the chance to study with some of the origi-
nators of our field: David Shapiro, who
never joined AAPB, but was one of the first
to demonstrate voluntary control over auto-
nomic activity, and to apply it in clinically
relevant research over a 40-year career.
David and his collaborator, the pioneering
engineer and psychophysiologist Bernard
Tursky (who essentially invented the mod-
ern polygraph) were my personal links with
the Harvard tradition in psychophysiology:
two honest, truth-seeking, unpretentious
scientists who kept working, quietly, in
their laboratories on a topic that most of
their colleagues considered to be trivial
nonsense. The topic was biofeedback. I
hope that my own attitude toward science
toward fostering the independence and
enthusiasm of my own students can do
honor to their teaching. In my current work
on heart rate voluntary control of heart rate
variability, I draw courage and direction
from their examples. This year David
Shapiro will be presenting a summary of his
life-long research in applied psychophysiol-
ogy at our annual meeting. Regardless of
their own areas of specialization within
applied psychophysiology, I urge all our
members to attend his address to gain a
touch of his influence.

I also should add that aspects of Eastern
philosophy also were a common dinner-
table topic during my childhood. During
college and graduate school, I admired the
early work of Marion Wenger —- climbing
mountains in India with a battery powered
polygraph on his back (pretty heavy in the
1950's!) to measure psychophysiological
profiles among respected yogis and gurus.
During my own more recent studies of Zen
monks in Japan, I fantasized myself as a fol-
lower in his tradition. At that time, I also
learned about the Japanese tradition of
research in applied psychophysiology, influ-
enced both by the Western scientific tradi-
tion and by traditional Zen practice.

Because of language barriers, much of this
work is still unknown in the United States.
Prof. Yuji Sasaki is a leading Japanese con-
tributor to this literature. He has written
widely both about the method of autogenic
training and about East-meets-West influ-
ence in current psychological therapy. Dr.
Sasaki made it possible for me to visit
Japan, generously shared his facilities and
contacts, and was a source of encourage-
ment and help in my own research in
Japan. At this year's meeting, we will have a
chance to hear Dr. Sasaki lecture on his
work.

So, for me, the field of applied psy-
chophysiology has indelible echoes from my
own personal past, and from the intellectual
tradition in which I was trained. I believe
that it is a great tradition, much as are the
traditions of the other great professions and
intellectual disciplines. It draws on the early
psychophysiological tradition at Harvard,
the Pavlovian tradition of Russia (which is
the immediate stimulus of my research on
heart rate variability), and the ancient
Eastern traditions of Yoga, Qi Gong, and
Zen. The modern field of applied psy-
chophysiology has gone on to integrate
these clinical and research traditions, and to
integrate them in an applied discipline
devoted to improving human performance
and relieving suffering. It remains a vibrant
and innovative field.

I have felt proud to be known as an
applied psychophysiologist, and continue to
follow with interest the development of
applied psychophysiology as an independ-
ent profession. As the world's leading and
unifying voice of psychophysiology, I also
salute the good work of AAPB, and urge all
of our members to work together to main-
tain it, help it grow, and continue to be the
arena for the learning and discourse that is
vital for our field's future.
actors, writers, business professionals, students, and sports. I explained how biofeedback was truly mind-body medicine that empowered patients and enhanced their internal locus of control.

Her next question was, “Can biofeedback really help all these things?” I told her that it was our experience that it could, especially if we combined the appropriate biofeedback modalities and tailored a treatment/training program specifically for the presentation in question. She seemed more and more interested as I explained how biofeedback worked and how we had many physicians who referred patients to us for a variety of problems. I told her that AAPB was putting the finishing touches on an Efficacy Book on the various symptoms, conditions, and presentations for which we use biofeedback modalities.

By the end of her visit, she said, “This is amazing stuff. Why haven’t I heard more about it before now? What kinds of things coming through my primary care practice would I send to biofeedback?” It was then that I realized that if we all had more opportunities to disseminate this type of information to doctors all across the United States and abroad, then we could more likely reach one of the goals I identified in my vision for AAPB: We must implement strategies to educate and deliver our services to a public that is hungry for self-regulation.

Getting doctors and other healthcare professionals to refer is a key part of this goal. But doctors aren’t going to refer patients to us if they don’t know what biofeedback is, or how we can deliver our services, or what patients are appropriate to refer. In a word, we must “sell” biofeedback better than we have in the past.

Selling or marketing biofeedback is something that each of us individually and as an AAPB family must do better. Toward that end, AAPB has formed a new Marketing Task Force whose primary goal is to get the word out to professionals as well as the public. We have had two teleconferences to date and will have another before our AAPB Annual Meeting in Jacksonville. We are very excited about ideas generated to date. I promise to keep you informed as we progress.

We are also mobilizing our Membership Committee to attract new members with additional membership perks and programs. And we are actively renewing our connections with State and Regional Biofeedback Societies for mutual collaboration to further the field. We are asking each state and regional biofeedback society to send a delegate to the Council of Chapters meeting at our AAPB Annual Meeting.

Our Insurance Committee is working hard to put together more information regarding insurance issues and questions requested from our members. One of the questions I am always asked by both doctors and patients alike is, “What insurance companies cover biofeedback and for what diagnoses?”

We are looking closely at specific ways that AAPB can be more involved in legislative and advocacy roles. Each and every one of these efforts is part of a choreographed effort to “sell” biofeedback — to educate and deliver our services to a public that is hungry for self-regulation.

Remember that our AAPB family is a volunteer organization. Volunteer organizations need lots of volunteers to help us pull this off. So please be ready with your ideas, your time, and your talent. Getting the word out about biofeedback is a lot like voting — if we don’t vote, we can’t really complain. Email me at lkirk@austinbiofeedback.com with your ideas and suggestions for service to this wonderful organization!
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(480) 424-7200 Fax (480) 424-7800
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Robert L. Gurnee, MSW,
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The Neuropathways EEG Imaging® Neurofeedback system provides the following features:

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- Filters Out Any Specific Frequency for More Effective Feedback
- Visual Graphic Display and Auditory Reinforcement
- Recorded Minute by Minute Statistical Analysis in Real Time
- The Only Instrumentation Where All Artifact is Clamped or Removed From Data in Real Time
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Neuropathways EEG Imaging® features a lightweight notebook computer design. This seven-pound system can go anywhere. No need to plug it in, just use the built in battery. It is ideal for use in a hospital or rehabilitation setting. It is an essential addition for the mobile professional.

Neuropathways EEG Imaging® provides individualized EEG Neurofeedback education for professionals and graduate students. The individualized education focuses on neurophysiology, electrode placement for EEG Neurofeedback and the recognition of EEG patterns and their subtleties. Margaret Ayers, president of Neuropathways EEG Imaging® was first to publish in EEG Neurofeedback for head trauma, stroke, coma, and absence seizures. For more information please visit the website at www.neuropathways.com or write to 427 North Canon Drive, Suite 209, Beverly Hills, California 90210 or call 310-276-9181 or fax 310-275-7894.

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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This workshop will cover the scientific basis of EEG biofeedback training and outline areas in which it is being applied. The main focus is how to use the ProComp+/BioGraph system to do EEG profiles to guide intervention, and to produce both interesting and effective feedback. It includes how to set up 1 and 2 channel EEG biofeedback interventions combined with regular biofeedback (including RSA, peripheral temperature, EMG and skin conductance) and how to combine this with training in metacognition to optimize performance. It will include how to set up screens and feedback for other conditions associated with primary difficulties in focus, concentration, impulsivity, learning and memory. Dr. Thompson will be assisted by her husband, Michael Thompson, a retired physician, past associate professor and author of more than 50 professional publications. He is a former residency training director at the University of Western Ontario.

Lynda Thompson, Ph.D., BCIA-EEG, is a Registered Psychologist with experience in teaching, clinical psychology, school psychology and ownership of learning centers. Since 1993 she has been Executive Director of the ADD Centre, a private service devoted to helping people improve behavior and learning. The clinic also deals with clients who have other disorders associated with poor attention including epilepsy, Asperger’s Syndrome, learning disabilities, Tourette’s syndrome, closed head injury, autism, mood disorders, and anxiety. Her doctoral dissertation (1979) dealt with self-esteem in hyperactive children treated with methylphenidate. She is co-author with pediatrician William Sears of “The ADD Book: New Understandings, New Approaches to Parenting Your Child,” published by Little, Brown & Co. of New York.

Dr. Joel Lubar received his B.S. and Ph.D. from the Division of the Biological Sciences and Department of Biopsychology at the University of Chicago. He has published more than 100 papers, many book chapters and eight books in the areas of Neuroscience and Applied Psychophysiology. He is a Full Professor at the University of Tennessee. He is past President of the EEG Division of the Association for Applied Psychophysiology and Biofeedback, and was President of the organization in 1996-1997. He is currently President Elect of the International Society of Neuronal Regulation (ISNR). Joel Lubar is Co-Director of the Southeastern Biofeedback and Neurobehavioral Institute. His major focus of work involves the use of EEG biofeedback for ADD/HD, depression, seizure disorders, Tourette’s and related tic disorders, and certain specific learning disabilities.

Please Note:
ProComp+™ hardware, BioGraph® software & laptops will not be provided. It is recommended that you bring the complete system with a laptop computer to the course.
Introduction to BioGraph Registration

Louise E. Marks  M.S., O.T.R.
Jan. 24, 2003 - Sacramento, CA
Jan. 9, 2004 - Boulder, CO

Frank DeGregorio
Thought Technology Staff
July 11, 2003 - Toronto, ON
Aug. 15, 2003 - Atlanta, GA

Didier Combatalade, D.C.
Thought Technology Staff
Feb. 28, 2003 - San Antonio, TX
May 9, 2003 - Cincinnati, OH

Cancellations for any reason at any time will receive credit towards a future course less an administration fee of $50. Thought Technology reserves the right to cancel any course with full refund. Deadline for registration is two weeks prior to the course date.

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How did you hear about our workshop?

Do you own the ProComp+™/BioGraph® system? Yes ☐ No ☐

Workshop Fee
Registration is valid only when full payment is received. Course Fee includes all handout materials and light refreshments. Note: In Canada, federal and/or provincial taxes apply.

US $125 ☐ CDN $185 ☐

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Tel: (800) 361-3651 ext. 135
(514) 489-8251
Fax: (514) 489-8255
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Participants will receive a certificate of completion from Thought Technology Ltd.
The Introduction to BioGraph workshop (1 day) will cover the basic operation of BioGraph software and the mechanics of customizing display screens and reports. The Advanced workshop (2 days) will teach participants how to use a variety of modalities: EEG (referential and bipolar), thermal, skin conduction, EMG, heart rate, respiration with a primary focus on the construction of appealing, effective display screens and reports based on specific biofeedback and neurofeedback. Additionally, the rudiments of BioGraph protocol development will be covered. Clinical applications addressed will be tailored to participants composition and there will be ample time allotted for hands on experience.

Louise E. Marks, M.S., O.T.R.

The instrumentation workshop taught by Helena Kerekhazi will help students to optimize their usage of BioGraph software. From basic to more sophisticated operations, students will have extensive hands-on practice, benefiting from her 23 years experience of teaching technology to adults at whatever level they have achieved. It will also provide students with opportunities to design and customize their own screens and reports. She will help you design your own screens, customize them to your patients and discuss the most effective protocols for your most challenging clients. Helena will motivate you to feel proficient and comfortable with your system. She also provides consultation in developing a successful clinical EEG biofeedback practice.

Helena Kerekhazi, M.S. Ed.

Dr. Sideroff integrates the training of the BioGraph system with his unique clinical experience, including the psychological basis for stress management. You will learn how to use the individual modalities such as temperature, EMG, skin conductance, respiration, and heart rate, how to combine them to perform a stress profile, and to set up a treatment plan. You will also learn how to use the system to develop neurofeedback interventions for a wide variety of disorders. Both monopolar and bipolar configurations will be learned. The workshop will show you how to develop clinical screens and the use of animation for best results; and how to look at your results, including trend reports. Use of RSA will also be presented.

Stephen I. Sideroff, Ph.D.

Louise E. Marks, M.S., O.T.R., BCIA-C, is a masters level occupational therapist with 17 years experience in the field of applied psychophysiology and biofeedback. She is BCIA certified in both EEG and general biofeedback. Her experience and special interests include anxiety disorders, chronic pain syndromes, elimination disorders, substance abuse, enhanced awareness and personal growth. She maintained a clinical practice in Boulder, CO, supervises biofeedback trainees, develops software (protocols and training screens) for BioGraph users, and consults with healthcare facilities and providers regarding biofeedback related program development.

Helena Kerekhazi, M.S. Ed. is the founder of BioCare, Inc., a clinical neurofeedback practice in Scarsdale, New York. Here she treats ADD; ADHD; learning disabilities; behavioral problems; Tourette’s Syndrome; closed head injuries; anxiety; pain and stress; panic attacks; addiction; compulsive disorders; autism; eating disorders; epilepsy; cerebral palsy and other bio-behavioral symptoms, as well as trains for overall peak performance.

Dr. Sideroff is an Assistant Professor in the Department of Psychiatry and Biobehavioral Sciences at UCLA’s School of Medicine. He is the founder and former Director of Santa Monica Hospital’s "Stress Strategies" center and author of the popular audiotape programs "Stress Control with Biofeedback" and "Journey into Sleep". He has been involved in neuropsychological and psychophysiological research since 1970. His earlier published research has been in neural control of learning and memory, as well as cardiovascular functioning and conditioned aspects of drug addiction. He has consulted with amateur, collegiate and professional athletes including the US Men’s National Soccer team, the UCLA women’s golf team and the Nike Women’s Beach Volleyball team. He is currently researching the use of neurofeedback in substance abuse, chronic pain, sports, attentional problems, anxiety and depression.
Advanced BioGraph with Health Professionals Registration

Helena Kerekhazi, M.S., Ed.
Mar. 22-23, 2003 - Hartsdale, NY

Louise E. Marks, M.S., O.T.R.
Jan. 25-26, 2003 - Sacramento, CA
Jan. 10-11, 2004 - Boulder, CO

Lynda Thompson, Ph.D.
Michael Thompson, M.D.
Jul. 12-13, 2003 - Toronto, ON
Aug. 16-17, 2003 - Atlanta, GA

Joel F. Lubar, Ph.D.
Mar. 1-2, 2003 - San Antonio, TX
May 10-11, 2003 - Cincinnati, OH

Stephen I. Sideroff, Ph.D.
Nov. 15-16, 2003 - Las Vegas, NV

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Workshop Fee
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AQUATIC BIOFEEDBACK

Ron Fuller, PTA, BA

Please tell us about your work in using Surface Electromyography (SEMG) biofeedback for rehabilitation and how you tied it into aquatics.

I started using SEMG many years ago for land-based orthopedic disabilities and was familiar with its use in the rehabilitation realm. After attending an aquatic seminar and talking with one of the speakers, a question was posed to me, “How can we gather quantitative data from aquatic rehabilitation?” I immediately thought about how I utilized the information from SEMG on land and wondered if I could somehow tie it in to aquatic therapy. After several months of experimenting with different types of bio-occlusive dressings, I finally found a covering that gave me the barrier I needed to utilize SEMG in the water. This technique allowed me the opportunity to treat clients with a multitude of diagnoses from orthopedic to neurological, reconstructions to spinal cord injuries, etc. I can customize my rehab to treat specifics, whether it be facilitation or inhibition of specific muscles or muscle groups. Our clinic has more referrals for aquatic therapy because of our ability to customize and record aquatic rehabilitation using aquatic biofeedback.

In the evolving field of health care, biofeedback, as a treatment and evaluation tool, is playing an increasingly more important role. Biofeedback is used by a diversity of health professionals to treat an ever-lengthening list of conditions. Health professionals such as physical and occupational therapists, psychiatrists, psychologists, nurses and physicians in various specialties have come to use biofeedback either independently or as an adjunctive technique with positive results.

The Expert Series is an on-going series of interviews with leading clinicians in the field of biofeedback lending their insights and techniques they have acquired through their many years of practice.

Thought Technology is very pleased to be part of this educational project. Since 1974, Thought Technology has been committed to making biofeedback more accessible through innovation in technology and educational initiatives.

The Expert Series interviewed Ron Fuller, PTA, BA, a physical therapy assistant, who practices at HealthSouth Rehabilitation Hospital in Concord, New Hampshire. Ron is the aquatic specialist for HealthSouth Corporation (nationally), as well as an adjunct faculty at several colleges where he teaches aquatic therapy and advanced orthopedic conditions to PT and PTA students. He is on the teaching faculty of Aquatic Consultants of Georgia (ACOG), as well as teaching workshops for the Biofeedback Foundation of Europe. He has authored several articles on aquatic rehabilitation and lectures nationally and internationally on aquatic therapy for orthopedic conditions and the use of aquatic biofeedback in the treatment of upper and lower extremity conditions.

Ron Fuller, PTA, BA is the Aquatic Specialist for HealthSouth Corporation. Ron teaches aquatic therapy at several colleges and is a faculty member of the BFE.

Ron Fuller, PTA, BA
Aubrey, MD, showing that the technique of aquatic biofeedback was valid and reproducible. It also showed the therapist could assess their client's progress quantitatively, allowing the client to effectively train while in the pool and ultimately, customize the treatment program to fit the individual needs of the client.

Since that first article I have published several other articles regarding aquatic biofeedback.

Can you tell me about some of the other articles that you have published on aquatic biofeedback?

There are a couple of useful papers in the APTA Aquatic Journal, Volume 9, Number 1 (Fall 2001), *An Aquatic and Land-Based Physical Therapy Intervention to Improve Functional Mobility for an Individual After an Incomplete C6 Spinal Cord Lesion*; Vol. 7, Number 1, (Spring 1999) entitled, "Activity Levels of the VMO Muscle during a Single Leg Mini Squat on Land and at Varied Water Depths".

For general reading on Aquatic Biofeedback Technique I recommend a few articles that were published in Sports Medicine Update magazine (Vol. 15, Number 2, 2001), "Aquatic Biofeedback Treatment of PFPS", ADVANCE for PT’s & PTA’s (Nov. 2nd, 1999), PT/OT TODAY (June 5th, 1999) and "Rehab and Therapy Products in Review" (March/April 1999). Most recently in ADVANCE for Directors of Rehab. (Sept. 2000, Vol. 9, No. 9) there was an article on Aquatic Biofeedback.

Why haven’t we heard of aquatic SEMG until now?

There are two reasons why aquatic SEMG has played a relatively minor role in muscle rehabilitation and re-education. One was the inherent difficulty of the therapist to monitor SEMG activity in a pool environment. The other reason was a lack of clinicians willing to take their land-based SEMG expertise and equipment into the pool area. Although various authors have published articles regarding the use of aquatic SEMG, very few use it on a daily basis in the rehabilitation of their clients.

Aquatic biofeedback utilizes the same techniques and procedures as its land-based cousin. Skin preparation and electrode placement are still important, however the critical step is the application of a waterproof barrier to seal the electrode site. The waterproof barrier is the key to aquatic biofeedback. It enables the therapist the opportunity to specifically direct treatments and to collect quantitative data while the client exercises in
the water. Since the surface EMG unit is hand-held and powered by a 9-volt battery, the threat of electrocution is eliminated and site infiltration by water remains nothing more than a momentary light tingle. The possibility of satirizing an expensive surface electrode however remains a more realistic hazard. The client performs their exercise routine while 'wired-up.' The therapist directs and records specific events of the treatment session.

Is it true that the aquatic biofeedback is hard to do? It used to be true when I started out and had to use the protective wrap method. The idea evolved from my search for an easy-to-use, waterproof seal for the SEMG sensor. Thought Technology and their research team developed an easy-to-use SEMG add-on. AquaSense™ connects to any of their SEMG sensors to adapt their use to the pool environment. This unique design allows the therapist to take advantage of the well-documented benefits of the water environment easily and consistently for their biofeedback-assisted therapy sessions. AquaSense™ can be applied in seconds by attaching the sensor as the therapist normally would.

How do most clients react to aquatic biofeedback? At first, they are somewhat skeptical. However, after they see the benefits derived from just a one-hour session, they are more comfortable wiring up for their pool session. The process of attaching the electrodes and donning the AquaSense™ sock (or glove) takes about three minutes so there is very little set-up time that cuts into your treatment time. AquaSense™ comes in various sizes so you can find the right fit for your clients' arm or leg.

Aquatice therapy allows me the opportunity to start treating my clients sooner by utilizing the physical properties of water. Aquatic biofeedback streamlines my focus, enhances my treatment skills, and gives me quantitative useable data to assist my clients' rehabilitation.


The addition of aquatic therapy in rehabilitation provides an environment in which therapy can be initiated earlier.
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Thought Technology’s AquaSense™ is a watertight enclosure designed specifically for use with our SEMG sensors. With AquaSense™ you can now combine the benefits of aquatic therapy with muscle re-education. AquaSense™ helps you improve the quality of client treatment, opening new therapeutic opportunities.

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<tr>
<th>Location</th>
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<td>Houston, TX</td>
<td>Mar. 29 – April 1, 2003</td>
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<tr>
<td>San Francisco, CA</td>
<td>April 26 - 29, 2003</td>
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<tr>
<td>NJ/NY</td>
<td>May 31 - June 3, 2003</td>
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<td>San Francisco, CA</td>
<td>June 21 - 24, 2003</td>
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<td>Chicago, IL</td>
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<td>San Francisco, CA</td>
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### Professional 4-Day EEG Certificate Program

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<th>Location</th>
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<tr>
<td>San Francisco, CA</td>
<td>May 1 - 4, 2003</td>
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<tr>
<td>NJ/NY</td>
<td>June 5 - 8, 2003</td>
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<td>Chicago, IL</td>
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<td>Austin, TX</td>
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| AAPP03-01-part1 | SC 1 - Clinical Cerebral Blood Flow Workshop | Hershel Toomin, ScD | 1st Tape |
| AAPP03-01-part2 | SC 1 - Clinical Cerebral Blood Flow Workshop | Hershel Toomin, ScD | 2nd Tape |
| AAPP03-02 | SC 2 - Build It & They Will Come: Promoting/Marketing Your Biofeedback Practice From a Spiritual Perspective | Susan Antelis, MPS, BCIAC, Sr. Fellow |
| AAPP03-03 | SC 4 - Hypnosis and Guided Imagery for Chronic Pain | Adam Burke, PhD |
| AAPP03-04 | SC 5 - Psychophysiological Typology & Profiling | Celeste DeBeaux, PhD |
| AAPP03-05-part1 | SC 6 - 4-8Hz Neurofeedback (NF), Heart Rate Variability (HRV) and Changes in Health Data | Thomas Browne, PhD | 1st Tape |
| AAPP03-05-part2 | SC 6 - 4-8Hz Neurofeedback (NF), Heart Rate Variability (HRV) and Changes in Health Data | Thomas Browne, PhD | 2nd Tape |
| AAPP03-06 | SC 7 - Pain Management in Children: ‘On our knees looking backwards trying to crawl forwards’? A tough look at multidisciplinary research, assessment and interventions since 1998 as to what is outdated; what works and what doesn’t; innovations and recommendation for change by 2004 | Elizabeth Stroechel, PhD |
| AAPP03-07 | Keynote Address - Enhancing Neural Plasticity: Beyond the Bounds of Biofeedback | Herta Flor, PhD |
| AAPP03-08 | Special Address - The EEG of Children with Attention Deficit Hyperactive Disorder | Adam Clarke, PhD |
| AAPP03-09 | Symposium 1 - Integrative Approaches in Pediatrics: Biofeedback in the Context of Complementary/Alternative Medicine | Timothy Culver, MD; Lynda Richman-Cry, PhD; Gerard Bames, PhD; Rebecca Lynn Kajander, RN, PNP, MPH |
| AAPP03-10 | Symposium 2 - Advances in Mind-Body Therapies for Medical Disorders | Donald Moss, PhD; Angele McGrawy, PhD; Naras Bhut, MD; Olufar S. Palsson, PsyD; Stuart Donaldson, PhD; Richard Gevitz, PhD |
| AAPP03-11 | Symposium 3 - Billing, Coding, and Reimbursement Issues 2003 Part 1 | Linda Mason Brownback, PhD; Thomas Brownback, PhD; Ronald Rosenberg, PhD; John Perry, PhD; Melit, BCIAC, Dtp, ABS; Sita Ananth, MHA; Alan Strowmayer, PhD; Antonio E. Puetz, PhD; Sch Striegl, PhD |
| AAPP03-12 | Symposium 4 - Billing, Coding, and Reimbursement Issues 2003 Part 2 | Linda Mason Brownback, PhD; Thomas Brownback, PhD; Ronald Rosenberg, PhD; Sita Ananth, MHA; Alan Strowmayer, PhD; Antonio E. Puetz, PhD; Sch Striegl, PhD |
| AAPP03-13 | Symposium 5 - Impact of Mood on Outcome of Biofeedback Assisted Relaxation Therapy | Angele V. McGrawy, PhD; Ronald A. McGimis, MD; Alice Clagg, PsyD; Frank Andrasik, PhD; John G. Aruna, PhD |
| AAPP03-14 | Symposium 6 - Extending the Reach of Biofeedback | Alan T. Pope, PhD; Olufar S. Palsson, PsyD; Kevin B. Stansberry, BS; Thomas Collura, PhD; PE; Joe Kamilly, PhD |
| AAPP03-15 | Special Address - Clinical Research: The Future is Now | Peter Kaufman, PhD |
| AAPP03-16 | Symposium 7 - Applying Story and Narrative approaches to Applied Psychophysiology, Biofeedback and Self Regulation | Rob Kall, Med; Steve Larsen, PhD; Richard Soutar, PhD |
| AAPP03-17 | Clinical Forum 1 - Clarice | Adam Clarke, PhD |
| AAPP03-18 | Symposium 8 - Why Does Neurofeedback Work? The Underlying Physiology | Hershel Toomin, ScD; Jay Gunckleman; M. Barry Searnan, PhD |
| AAPP03-19 | Symposium 9 - Epidemiological and Clinical Psychophysiological Stress Related Issues with Specific Focus on Metabolism | Bo von Scheweel, PhD; Ingrid von Scheweel, BJ; E Noren; Kenneth Frojd; Erik M. G. Olsson; Paul Lehrer, PhD |

**Saturday, March 29, 2003**

| AAPP03-20 | SC 8 - Effects of Drugs on Biofeedback | Barbara Peavey, PhD |
| AAPP03-21 | SC 9 - Executive Profiling Integration of Biofeedback and Neurofeedback into the Corporate World | Vieta Wilson, PhD; Michael Thompson, MD |
| AAPP03-22 | SC 11 - Neurofeedback Added Cognitive-Behavioral Therapy for Sleep Onset Insomnia | Douglas DeGood, PhD |
| AAPP03-24 | SC 13 - Integrating Heart Rate Variability Biofeedback for Cardiac Patients into Clinical Practice | Jessica Del Pozo, PhD |
| AAPP03-25 | Keynote Address - Mind-Body Medicine and the Future of Health Care | James Gordon, MD |
| AAPP03-26 | Symposium 10 - New Psychophysiological Measures and Treatments: Expanding the Boundaries Part 1 | Frank Andrasik, PhD; Richard Sherman, PhD; Stephanie Tiller Nevin, PsyD; Alan T. Pope, PhD |
| AAPP03-27 | Clinical Forum 2 - Middaugh | Susan Middaugh, PhD |
| AAPP03-28 | Symposium 11 - Advances in Heart Rate Variability Research and Training | Donald Moss, PhD; Richard Gevitz, PhD; Larry Hontig, MA; Rollin McCray, PhD; Roland A. Carlsedt, PhD |
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| AAPB03-29 | Special Address - Effects of Mood, Social Stress, and Coping Styles on Blood Pressure in Everyday Life: Implications for Risk and Treatment of Hypertension | David Shapiro, PhD |
| AAPB03-30 | Special Address - Biofeedback and Behavioral Treatment for Bowel, Bladder and Pelvic Floor Disorders: History and Present Challenges | Jeannette Tries, PhD |
| AAPB03-31 | Special Address - The Mind/Muscle Connection: A Search for Psychophysiological Mechanisms of Chronic Muscle Pain | Richard Gevirtz, PhD |
| AAPB03-32 | Special Address - Psychoneuroimmunology - Exploring Mind - Body Interactions | Sharon Lewis, RN, PhD |
| AAPB03-33 | Symposium 12 - The Current Status of Hypnosis in Behavioral Medicine | Eric Wills, PhD; Helen J. Crawford, PhD; Jan M. Burke, PhD |
| AAPB03-34 | Symposium 13 - The Scientific Study of Cross Cultural/Alternative Healing Practices Part 1 | Howard Hall, PhD, PsyD; Kevin W. Chen, PhD, MPH; Sat Bir S. Khalsa, PhD; Paul Lehrer, PhD |
| AAPB03-35 | Clinical Forum 3 - Gevirtz | Richard Gevirtz, PhD |
| AAPB03-36 | Clinical Forum 4 - Tries | Jeannette Tries, PhD |
| AAPB03-37 | Symposium 10 - New Psychophysiological Measures and Treatments: Expanding the Boundaries Part 2 | Frank Andrasik, PhD; Ami Fag, MD; Eric R. Mueh, PhD; Amanda O'Donnell, Ed.; Alan Pope, PhD |
| AAPB03-38 | Symposium 14 - Applied Psychophysiology of Respiratory Diseases | Paul Lehrer, PhD; Bruce D. Miller, MD; Beatrice L. Wood, PhD; Bernhard Dahme, PhD; Nicholas D. Giardino, PhD |
| AAPB03-39 | Symposium 13 - The Scientific Study of Cross Cultural/Alternative Healing Practices Part 2 | Howard Hall, PhD, PsyD; Norman S. Don, PhD |
| AAPB03-40 | Symposium 15 - Does pain have to hurt? Pain management and healing from interdisciplinary and cross-cultural approaches | Erik Peper, PhD; Hirono Matsuura, MD; Naoko Takebayashi, MD; Akio Kajishita; Kenji Kanbara, MD; Mikihiro Funatsug; Yoshihde Nishida; K.K. Deepak, MD, PhD; Vieta Wilson, PhD; Adam Burke, PhD |

Sunday, March 30, 2003

| AAPB03-41 | Presidential Address | Paul Lehrer, PhD |
| AAPB03-42 | Distinguished Scientist - Assessment and Treatment of Motor Vehicle Accident Survivors | Edward Blanchard, PhD |
| AAPB03-43 | Symposium 16 - Bridging the gap between education and clinical intervention: Collaboration between teachers and biofeedback therapists dealing with stress and behavioral problems | Wes Sime, PhD; Ingrid Perker-Binder, Mmag; Elizabeth Stroehle, PhD; Nancy Schwarz, LMHC |
| AAPB03-44 | Special Presentation - Relationships Between Posture, Muscle Tension and Headache: A Three-Way Street | Susan Middaugh, PhD |
| AAPB03-45 | Special Presentation - On Research and Applications of Autogenic Training and the Related Methods in Japan | Yuki Sasaki, PhD |
| AAPB03-46 | Symposium 17 - Advanced Neurotherapy Practice Models | Thomas S. Brownback, MeD; Joel Lubar, PhD; Judith Lubar, MA; Michael Linden, PhD; Linda Mason Brownback, MA |
| AAPB03-47- part1 | SC 15 - Neurofeedback, Meditation, and The Relaxation Response | Richard Soutar, PhD | 1st Tape |
| AAPB03-47- part2 | SC 15 - Neurofeedback, Meditation, and The Relaxation Response | Richard Soutar, PhD | 2nd Tape |
| AAPB03-48 | SC 16 - Biofeedback Training for Children in a Private Practice | Ingrid Perker-Binder, Mmag |

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