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Reference Style examples

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Applying an Evidence Based Assessment for Attention Deficit Hyperactivity Disorder

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Abstract

The primary goal of this article is to describe some of the differences currently held between the practices of Evidence-Based Medicine (EBM) and Evidence-Based Assessment (EBA) as related to Mental Health Professions, and to demonstrate the increased effectiveness of merging the best of both concepts with an eye toward increasing efficiency and accuracy in current mental health assessment practices. EBA methods can be adapted to almost any clinical population, and there are a growing number of tools and resources available for the clinician to use in creating a framework to use in conjunction with clinical judgment. The current article summarizes the EBA approach and presents a case example based on the Pediatric Attention Disorders Diagnostic Screener (PADDS). The PADDS system described below is one of the few tools available for ADHD assessment that merges EBM and EBA approaches by design.

Introduction

One of the most commonly diagnosed childhood disorders referred to mental health clinicians is Attention Deficit Hyperactivity Disorder (ADHD). ADHD, a complicated neurodevelopmental psychiatric disorder has an estimated range of occurrence of 2 to 3 percent of the school population and up to 10 percent in other settings. Thus, on average a minimum of at least one child with ADHD and executive functioning disorders is in each classroom in American schools.[1] Children with these disorders are affected behaviorally, socially, and academically both at home, at school, and across the child's many social situations. Rowland, Leswesne, and Abramowitz[2] indicated that prevalence rates for ADHD vary markedly based on presenting symptoms, different assessment approaches used, and the various settings in which the child was evaluated. A lack of a consensus on what constitutes the core set of symptoms for ADHD complicates and confounds the screening and assessment process.[3]

Due to these concerns regarding base rates of ADHD, the American Academy of Pediatrics[4] and the National Institute of Health[5] have, in their consensus statements, resoundingly stressed the need to develop new standardized, evidence-based assessments that have strong psychometric properties easily administered in primary care, schools and other clinical settings. This article addresses the above recommendations by presenting an example of merging the approaches of Evidence-Based Medicine and Evidence-Based Assessment within a newly developed ADHD assessment system referred to as the *Pediatric Attention Disorders Diagnostic Screener* (PADDS). A brief case review is provided for illustrative purposes.

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Evidence-Based Medicine Using Evidence-Based Assessment of ADHD

The practice of Evidence-Based Medicine (EBM) is described as the application of evidence gained from the scientific and research communities to medical/clinical practice.[6,7] In the mental health professions, many sources referring to Evidence-Based Assessment (EBA) recommend that a particular treatment, intervention or assessment has some level of empirical evidence to support its use.

In the medical sense, EBM is more specific to mean that the professionals have evaluated the scientific literature and reviewed the published findings of the statistical relationships between a given condition and an assessment measure, treatment or intervention. This is commonly recorded as the effect size of the relationship. These published effect sizes can be converted to useful metrics, such as sensitivity and specificity, which can then be easily converted into Diagnostic Likelihood Ratios, (DLR)[7]. The benefit of using likelihood ratios is that the clinician can build a predictive index by combining the results from multiple lines of evidence during assessment to better support treatment decisions. A similar approach in psychological assessment is referred to as incremental validity or the use of multiple measures in combination to add greater predictive power to a diagnosis and proposed treatment plan. Frazier & Youngstrom[8] recommended that calculated likelihood ratios and a nomogram be utilized so that each unique data source can be allowed to contribute to (or detract from, as the case may be) the prediction of the diagnosis. A particularly challenging task involved in the establishment of incremental validity is determining the appropriate base rate to use as a starting point for the assessment process. Unfortunately, base rates can change significantly depending on the referral patterns and level of services, among other factors. Uncertainty about the base rate creates a substantial challenge to adopting evidence-based assessment strategies.

Although EBM has emerged as an influential model for the teaching and practice of clinical medicine, this actuarial/statistical approach is still unfamiliar to many mental health clinicians. EBM, however, is not without criticisms. Arguments against the use of EBM approaches are many. Criticisms include the fear that EBM might contrast sharply with more intuitive approaches to interpretation. Some claim that EBM is reductionistic, that it uses a narrow definition of evidence, and that it ignores the legitimacy of clinical judgment or experience. Furthermore, some have argued that EBM approaches may foster an inappropriate reliance on epidemiology and statistical methodology.[9] Despite these potential concerns, the literature produces ample evidence that simple statistical approaches, such as the nomogram method, have consistently outperformed typical clinical judgment.[10, 11, 12] Moreover, these EBA methods can be adapted to almost any clinical population, and there are a growing number of tools and resources available for the clinician to use in creating a framework to use in conjunction with clinical judgment. The PADDS system described below is one of the few tools available for ADHD assessment that merges EBM and EBA approaches by design.

Pediatric Attention Disorders Diagnostic Screener (PADDS)

The *Pediatric Attention Disorders Diagnostic Screener* (PADDS) is a software suite that uses a multi-dimensional, evidence-based approach to ADHD screening. It consists of a computer assisted semi-structured diagnostic interview, *Pediatric Attention Disorders Diagnostic Screener* (PADDS) two brief SNAP-IV parent and teacher behavior rating scales[13], three new objective measures called the Target Tests of Executive Functioning, and a modern, actuarial approach to scoring and reporting using Bayesian

reasoning, Diagnostic Likelihood Ratios and a nomogram to provide incremental validity for these multiple sources of evidence.[14]

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The Computer Administered Diagnostic Interview

The Computer Administered Diagnostic Interview (CADI) is completed by a parent and consists of 113 items separated into seven different sections to screen for possible co-morbid conditions. These areas include: a medical and developmental history, emotional/social functioning, depression and anxiety symptoms, behavioral school history, and attention/hyperactivity symptoms.

Behavioral Ratings

The parent and teacher rating scales included are from the SNAP-IV[13] whose items originate from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Revised[15], for ADHD. Each item is rated on a 4-point Likert scale for severity.

Target Tests Of Executive Functioning

The objective component of the PADDS, named the Target *Tests of Executive Functioning* (TTEF), presents a series of cognitive measures assessing executive functioning and working memory skills. Several areas of interest stimulated the development of the TTEF. Recently, multiple researchers have called for the inclusion of the evaluation of executive functions to improve upon standards aimed at valid ADHD assessment [16; 17; 18, 19; 20]. However, executive functioning is more difficult to assess and utilizes pencil and paper tasks, which are better suited for the assessment of domain specific areas of function (e.g., language, reading & writing skills). The complexity of the neuroanatomical substrates and constructs of attention and executive control suggests that no single measure will address all facets of attention and executive control [21, 22]. Thus, the *Target Tests of Executive Functions* subtests include several differently designed tasks presented via computer aimed at providing objective assessment of a subject's ability to employ various but not all executive processes. Tasks assessed include: **planning, attending, organizing input, storing and retrieving information, modulating emotions and sustaining effort**. These task demands have been consistently identified as areas of difficulty for children known to have ADHD. Below is a brief description of the *Target Tests of Recognition, Sequencing and Tracking.*

Target Recognition shows five large, colored squares with smaller squares inside them. There are five buttons marked one through five. All five colored squares flash on and off at 1.5 second intervals throughout 153 presentations. The child is essentially taught a strategy to count from left to right and count the number of squares with small squares of the same color. The child is then asked to click on the corresponding number that matches.

Target Sequencing presents five colored circles, which have a small square appearing and disappearing in varying sequences across 39 trials. The child must attend only to the circles when the square matches it in color and then remember the sequence of color matches. Thus, not only does the child have to remember which items match but also remember the sequence of the color matches. The child is then asked to click on the circles presented and must match the same order as presented.

Target Tracking shows four colored shapes at the top and bottom of the screen across 20 trials. The top shapes move one at a time to another shape at the bottom

in different sequences at two and three step moves and then resets. The child is asked to click and drag each shape to its position on the lower shapes in the same order.

Psychometric Properties Summary Of the Target Tests of Executive Functioning (TTEF)

In the TTEF study, 725 children (240 females and 485 males) between the ages of 6 and 12 (*M* = 8.66, *SD* = 1.71) were split approximately evenly between those diagnosed with ADHD and age matched non-ADHD peers. Data were collected in seven states in ten ADHD assessment centers. The ethnic breakdown of the sample consisted of 77 percent Caucasians, 16 percent African American, and 17 percent Hispanics. The TTEF demonstrated acceptable reliability and validity based on the PADDS Technical Manual[14], internal reliability (alpha-coefficient) for the three TTEF subtests was 0.86. Six-month retest results showed that 36 of 38 participants remained appropriately classified, resulting in a stability coefficient of .94. Phi and Kappa coefficients were .70 and .69 respectively, all *p*<. 001. Results for a second group of 27 participants at a one-year interval produced a stability coefficient of .85 with PHI and Kappa coefficients of .73 and .70 respectively. There was modest convergent validity with the Test of Variables of Attention (TOVA)[23] , *r* (122) = .38, *p*<0.001). Percentage for diagnostic efficiency and percentage of inter-test agreement was determined with a sample of 38 children that received the TTEF subtests, the Brown Attention Deficit Disorder Parent and Teacher Rating Scales[24], and the Conners' Continuous Performance Test-II (CPT-2)[25]. Results showed 66 percent and 63 percent agreement between the diagnostic classification of the PADDS, the Brown ADD Scales, and the CPT-II respectfully. Overall, there was a 94 percent hit rate on the Target Tests in comparison to 68 percent for the CPT-2 and 66 percent for the Brown ADD Scale. Discriminant validity was assessed with 137 participants (mean age = 8.05, *SD* = 1.50) of whom 64% were male, 67% Caucasian, 30% African American and 3% Hispanic. Interestingly, overall diagnostic classification using the PADDS system was unrelated to Full Scale IQ, Verbal IQ, or Performance IQ as measured by the Wechsler Abbreviated Scale of Intelligence[26]. Also unrelated were visual or verbal memory, and the indices of attention and concentration, as measured by the Children's Memory Scale[27], and the Wide Range Assessment of Memory and Learning II[28] are all *p*s > .05.

Clinical Utility and the Application of Diagnostic Likelihood Ratios (DLRs)

The Receiver Operating Characteristic (ROC) curve is a visual representation of the sensitivity (the percentage of true cases that are correctly classified) of a test versus its specificity (the percentage of cases without ADHD that are correctly classified) at each potential cut point on the test of interest. In other words, the ROC provides a comparison of all possible cut-points for diagnostic utility and therefore assists the test developer in selecting and verifying the most appropriate cut point to use to maximize both sensitivity and specificity. From this information, one can then produce diagnostic likelihood ratios to further improve the diagnostic utility of the test. Table 1 shows results of the ROC analysis of 725 subjects for the three *Target Tests of Executive Functioning*.

Target Tests of Executive Functioning Receiver Operating Characteristics (ROC)

Table 1.

Area Under the Curve					
Target Tests	**Area**	**Std. Error**	**Asymptotic Sig.**	**Asymptotic 95% Confidence Interval**	
				Lower Bound	**Upper Bound**
Recognition	.950	.009	.000	.932	.969
Sequencing	.951	.009	.000	.934	.969
Tracking	.921	.013	.000	.896	.946

(Table from the PADDS Clinical Manual, 2008. Used by permission).

Based on the ROC analysis, age specific referenced cut points were determined, and the following decision rule was applied with all 725 subjects. In order to be considered as a classification "hit", two of the three *Target Tests of Executive Functioning* performances must fall in the correct direction (i.e., at least two clinical scores for ADHD classification and at least two non-clinical scores for classification as non-clinical). Applying the age specific cut scores and decision rule with 725 subjects, the TTEF subtests demonstrated Sensitivity of .88 and Specificity of .89 and Positive Predictive Power of .91 and Negative Predictive Power of .86. Table 2 presents the age specific sensitivity, specificity, diagnostic likelihood ratios for a positive and negative test result, and positive and negative predictive power of the TTEF.

Sensitivity, Specificity, Diagnostic Likelihood Ratios (+and -), Positive Predictive Power (PPP) and Negative Predictive Power (NPP) by Age

Table 2. Target Tests Executive Functioning Results

Age	Sensitivity	Specificity	DLR+	DLR-	Sample Base Rate	PPP	NPP
6 yrs	.89	.84	5.56	0.13	74%	.94	.72
7 yrs	.90	.88	7.50	0.11	71%	.95	.78
8 yrs	.87	.87	6.69	0.15	65%	.92	.79
9 yrs	.91	.92	11.38	0.10	51%	.92	.91
10 yrs	.86	.91	9.56	0.15	36%	.84	.92
11 yrs	.86	.92	10.75	0.15	29%	.83	.94

(Table from the PADDS Clinical Manual, 2008. Used by permission).

Development of Diagnostic Likelihood Ratios (DLRs) and Evidence-Based Application in PADDS

Despite the acceptable classification potential demonstrated by the *Target Tests of Executive Functioning* with known groups, these metrics, when applied against a base rate of 4% (as with ADHD in community samples) will result in markedly lower positive predictive power than achieved in the standardization sample, where the base rate ranged from 29% to 74% across the range of ages. Thus, each potential raw score from the Target Tests of Executive Functioning was analyzed to determine the percentile rank for both the ADHD and Typical groups that corresponded to that given raw score for that age group. This was done to determine the sensitivity (percent of ADHD cases scoring at or above the threshold) and specificity (percent of non-ADHD cases scoring below) for every possible score on each of the three Target Tests. These sensitivities and specificities were used to develop diagnostic likelihood ratios from every potential score for all three subtests. The diagnostic likelihood ratio for a positive test result is the sensitivity divided by the complement of the specificity (i.e., 1 – specificity). The DLR for a negative test is the complement of sensitivity (i.e., 1 – sensitivity) divided by the specificity. These ratios could then be applied incrementally with other data, as judged clinically appropriate, via Bayes Theorem or a graphical nomogram designed to combine probabilities and likelihoods. These incremental inputs develop a predictive index for or against diagnosis in a given case. This transparent process helps the clinician to evaluate the relative weight of all procedures and to consider the combined evidence accumulated for or against a diagnosis in conjunction with clinical judgment. This is the heart of an evidence-based approach and will constitute a standardized process for ADHD assessment that could help clinicians reduce both over and under identification of ADHD by fine tuning their diagnostic approach over time.

Case Example

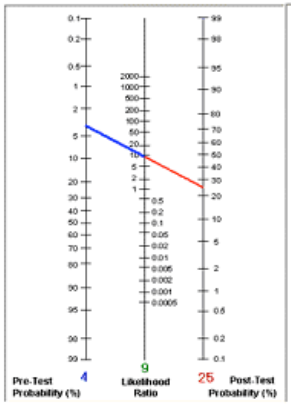
The Pediatric Attention Disorders Diagnostic Screener (PADDS) is used to help evaluate children at risk for ADHD and can assist in treatment by validating improvement across medication trials. An illustrative example follows: Johnny is a 10 year-old fourth grader whose parents and teachers felt he was struggling too much at school and lacked confidence. Too easily discouraged, lethargic, and overwhelmed much of the time, his parents questioned a learning disability and/or an Attention Deficit. His comprehensive psycho-educational evaluation suggested he presents with “a Sluggish Cognitive Tempo” or a subtype of Attention Deficit Disorder with Inattention that involves a number of symptoms dealing with daydreaming, distractibility, slow processing, and weak working memory[29]. Johnny was tested on the PADDS prior to medication and retested five months later while on stimulant medication. His results are as follows:

As seen in diagrams 1 & 2, Johnny’s pre and post testing results, when compared to the non-clinical reference group, are striking and remarkable. For instance, on Target Recognition, highly sensitive to sustained attention and focusing problems, he went from the 4th percentile to the 94th percentile. On the Target Sequencing subtest, he went from the 7th percentile to the 31st percentile, and on Target Tracking a test of divided attention, he went from the 23rd percentile to the 75th percentile.

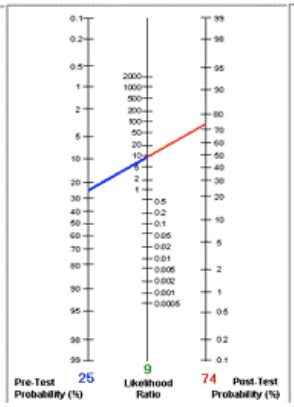
Clearly, he improved substantially. His parents reported that the medication was working exceedingly well, both at home and at school. The teacher confirmed these improvements, noting improved grades and increased on-task behavior. Prior to receiving stimulant medication therapy, his PADDS Predictive Index suggested a diagnosis of ADHD with a 99 percent probability. Subsequent to medication therapy, the

PADDS Predictive Index score went down to 3 percent overall probability, indicating a significant improvement over the prior 99 percent probability. His results on the Conners' Continuous Performance Test-II also showed marked improvement, with a substantial decrease in the hit reaction time by Inter-Stimulus Interval between pre and post medication administrations. In the first administration, the *T* score was outside the normal range at approximately 66, but the decrease in the second administration resulted in performance considered within the average range with a *T* score of 53.9. The TTEF measures clearly agreed with Johnny's attention and executive functioning performance in both pre and post medication administrations.

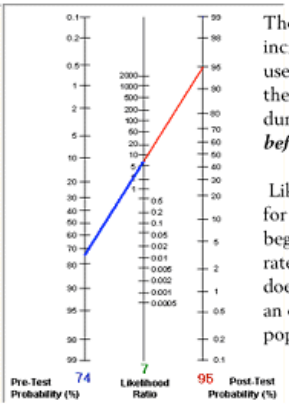
Diagram 1: Initial Assessment before Treatment.



Beginning with 4%, the SNAP-IV Parent calculation is applied, giving a L/R of 9 and a revised probability of 25% for ADHD



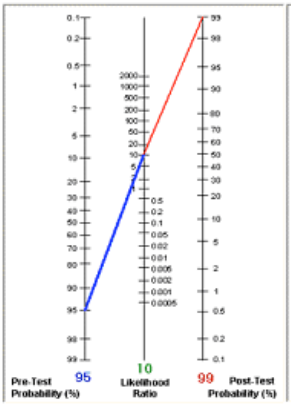
Next we add the SNAP-IV Teacher Rating, the calculation results in a L/R of 9 and a new revised probability of 74% for ADHD



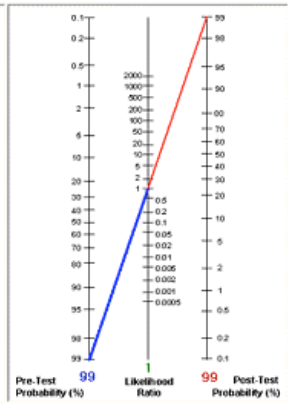
Scoring the Target Recognition subtest results in a calculated L/R of 7 and a new revised probability of 95% for ADHD

These nomograms represent the incremental input of each measure used and the cumulative effect on the overall probability of ADHD during the initial assessment, ***before any medication or therapy.***

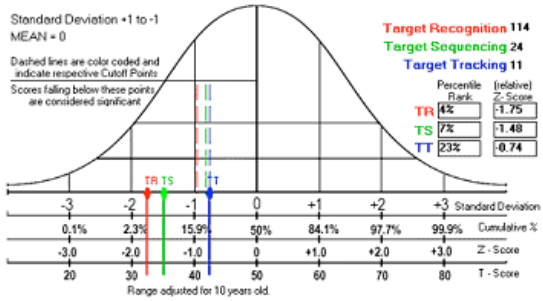
Likelihood Ratios were calculated for each measure and applied, beginning with a conservative base rate of 4%. The PADDS program does this automatically and creates an exportable report in many popular formats.



Scoring the Target Sequencing subtest results in a calculated L/R of 10 and a new revised probability of 99%

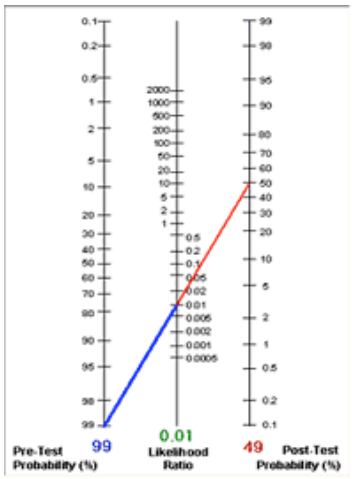


Scoring the Target Tracking subtest results in a calculated L/R of 1 and an unchanged probability of 99%



This graph represents the scores from the 3 objective measures, called the Target Tests of Executive Functions. The scores are presented in a standard format and illustrate the comparison of performance to age adjusted cut off points established by non-clinical subjects of the same age group. They are given in T-score, Z-Score, Percentile Rank, and Standard Deviation.

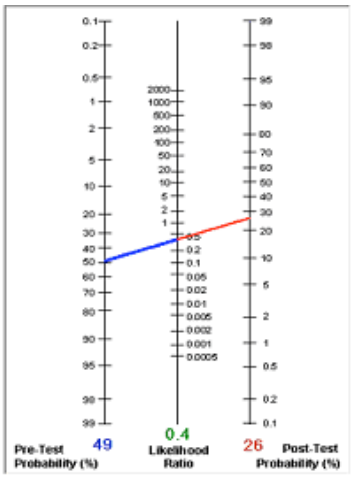
Diagram 2: Second Assessment after Medication Trial.



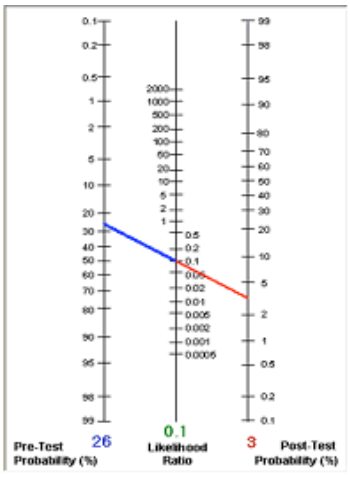
Beginning with the prior probability of 99% and scoring the Target Recognition subtest results in a calculated L/R of .01 and a new revised probability of 49% for ADHD

These nomograms represent the incremental input of each measure used and the cumulative effect on the overall probability of ADHD during the **second assessment, after a medication therapy trial.**

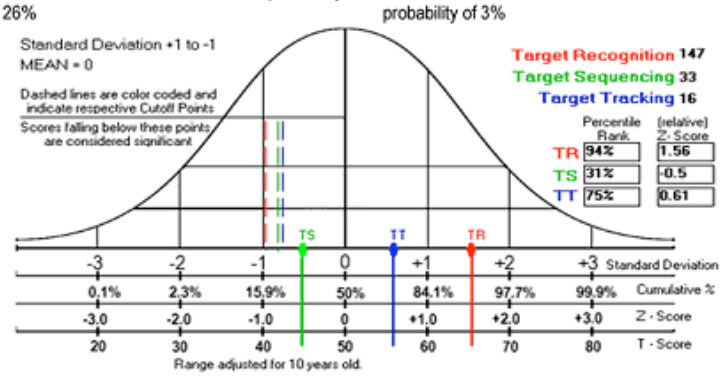
Likelihood Ratios were calculated for each measure and applied, beginning with the prior probability of 99%. The PADDS program does this automatically and creates an exportable report in many popular formats.



Scoring the Target Sequencing subtest results in a calculated L/R of .4 and a new revised probability of 26%



Scoring the Target Tracking subtest results in a calculated L/R of .1 and an revised probability of 3%



This graph represents the scores from the 3 objective measures, called the Target Tests of Executive Functions. The scores are presented in a standard format and illustrate the comparison of performance to age adjusted cut off points established by non-clinical subjects of the same age group. They are given in T-score, Z-Score, Percentile Rank, and Standard Deviation.

Conclusion

For the clinician looking to improve diagnostic accuracy, Evidence-Based Medicine (EBM) approaches can combine an actuarial cross check of their clinical judgment and practices. Although some criticisms of the EBM approach point to valid concerns, mounting research suggests that actuarial models can often prove more accurate than unaided decisions about. EBM as utilized in the PADDS system is not intended to replace but rather to augment and cross validate subjective clinical inputs such as behavioral rating scales. As demonstrated in the case review, the PADDS provides the opportunity to combine clinical and actuarial approaches by using a structured interview, assessment of base rates, teacher and parent behavior rating scales, neurocognitive executive functioning assessments and actuarial scoring and report as well as rendering traditional standard score and cut points. Current psychometric support of the PADDS suggests it is appropriate to use as an adjunct to clinical judgment. As a new measure, the PADDS will need ongoing evaluation to determine the extent of and to cross validate its clinical usefulness. Further external peer review of the PADDS system would be helpful in this area.

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Privacy, Confidentiality, Privilege*

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Abstract: This presentation was designed to meet the State of California Board of Psychology Continuing Education requirement in Ethics and Law. Therefore, the presentation is geared to California law and California psychologists. However, it is highly likely that the laws in most states are quite similar to California's laws, although there are some definite differences and one must know their own state's specific laws and cases.

Introduction

Because California psychologists have been taking Ethics and Law CE courses for several years, this presentation reviews some of the basics of the issues in privacy, confidentiality and privilege with an emphasis on the legal reasoning behind the applicable statutes and case law as well as the application of those to clinical practice.

Fundamental for California psychologists to understand in applying the statutes, regulations and case law to every day practice is that the California legislature required the Board of Psychology to make the Ethics Code of the American Psychological Association (APA) part of California Law. The following is extracted from the Psychology Licensing law:

> **Rules of Ethical Conduct; Posting of Notice**
>
> § 2936. The board shall adopt a program of consumer and professional education in matters relevant to the ethical practice of psychology. The board shall establish as its standards of ethical conduct relating to the practice of psychology, the ''Ethical Principles and Code of Conduct'' published by the American Psychological Association (APA). Those standards shall be applied by the board as the accepted standard of care in all licensing examination development and in all board enforcement policies and disciplinary case evaluations.

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California psychologists are attempting to incorporate the concept of privacy into our practices, we need to keep in the back of our minds the explicit statements in the APA Ethics Code regarding privacy. Beyond the Ethics Code is the legal status of the privacy rights of American citizens. Therefore, we begin with the concept that privacy is a legal right of all citizens, not just of patients participating in psychotherapy.

Privacy

Federal Right to Privacy

You should check to see if your state has incorporated the APA Ethics Code into its law. However, to fully appreciate the legal status of the right to privacy, beyond the APA Ethics Code, California psychologists should be aware of 2 legal cases, one federal, the other a California case.

At the federal level, we have the case of *Griswold v. Connecticut* (which laid the foundation for *Roe v. Wade*). The relevant specifics in *Griswold* were that the Administrator and the Medical Director of a Planned Parenthood center were charged with violating Connecticut's law prohibiting disseminating information and devices regarding contraceptives. The specific case involved a married couple. In *Griswold*, the United States Supreme Court ruled that American citizens have a **constitutional** right to privacy. It is important to be aware that the United States Constitution does not contain the word privacy. However, the US Supreme Court determined that if one examines the Constitution in terms of underlying principles rather than just specifically enumerated rights, that one can discern an underlying principle of privacy (such rights as being free from unreasonable search and seizure, among others). Applied to the specifics of the Griswold case, the Supreme Court declared that the State of Connecticut could not intrude on the privacy of a married couple—the case at hand. However, in determining why the Statute was unconstitutional, the Supreme Court determined that the right to privacy belongs to all citizens not just married couples. As a side note, you can see how a decade later, this reasoning provided a foundation for *Roe v. Wade*.[1]

In this day of disrespect from the managed care industry for our right to privacy regarding our personal experiences and feelings, especially as they are revealed in psychotherapy. We would like to point out here, and again later in this paper, the respect that American law has for the valuing of our most personal experiences, as can be seen in the following extracted from *Griswold*. In his concurring opinion in *Griswold*, Justice Goldberg quoted from an opinion of Justice Brandeis in a previous case in which Justice Brandeis, "… summarized the principles underlying the Constitution's guarantees of privacy." Following is Justice Goldberg's quoting of Justice Brandeis:

"The makers of our Constitution undertook to secure conditions favorable to the pursuit of happiness. They recognized the significance of man's spiritual nature, of his feelings and of his intellect. They knew that only a part of the pain, pleasure and satisfactions of life are to be found in material things. They sought to protect Americans in their beliefs, their thoughts, their emotions and their sensations."

[1] This interpretation of the United States Constitution as bestowing a constitutional right to privacy has been so well established that even Chief Justice Roberts, at his confirmation hearing agreed that he believes the right to privacy is implicit in our Constitution.

Privacy and California Law

In regard to California specifically, psychologists should be aware of a California Supreme Court Case: *In re Lifschutz*. In this case, a school teacher was assaulted by a student. The teacher sued for damages including emotional damages. When it was learned that the teacher had once seen a psychiatrist, Dr. Lifschutz, those records were subpoenaed. When Dr. Lifschutz refused to turn over the records, the Judge found him to be in contempt. The appeal of that ruling made its way to the California Supreme Court. The Court referenced *Griswold* and asserted that Californian's have a constitutional right to privacy – even though the word privacy did not appear in the California Constitution at that time. Since that ruling, the right to privacy is now explicit in the California Constitution.[1]

There are two aspects to the Lifschutz case that are essential for us. First, the California Supreme Court discussed the difference between medical doctor-patient privilege and Psychotherapist Patient Privilege, both of which appear in the California Evidence Code. You should take some pride in the analysis that the California Supreme Court made in Lifschutz between medical doctor-patient privilege and Psychotherapist-Patient Privilege. The Court wrote:

"The psychotherapist-patient privilege, on the other hand, won legislative recognition in the face of legal antipathy toward privileges generally …; the Legislature acknowledged that the unique nature of psychotherapeutic treatment required and justified a greater degree of confidentiality than was legally afforded other medical treatment (see Legislative Committee Com. to Evid. Code, § 1014). Even commentators who concurred in the criticism of the general physician-patient privilege noted that the psychotherapeutic privilege rested on a much sounder basis and supported its adoption …"

Getting back to the specifics of *Lifschutz*, the California Supreme Court ruled that since the teacher had made his mental status (emotional distress) a legal issue, he had waived his right to privilege of privacy.[2] However, the Court stated that information in the psychotherapy record that wasn't relevant to the current legal case remained privileged and was protected from discovery and protected from being brought into the courtroom.

Psychologists need to understand two principles that can be confused and require clarification. When a patient makes their mental status a legal issue, information relevant to that mental status will not be privileged. If the patient believes that there is information in their file that is not relevant to the legal matter at hand, then it is the patient's obligation, through their attorney, to make the case to the Court that there is information in the file that is irrelevant and must be **redacted** from the file. A more complete discussion of the issues involved in this decision and process are beyond the scope of this paper (such as what if the patient is not available to file a proper objection, what if you and the patient disagree as to what is relevant and what is irrelevant, among other possible issues).

[1] The senior author of this article learned about *Griswold* from reading *In re Lifschutz*, he was never taught *Griswold* nor *Lifschutz* in graduate school nor at Ethics and Law CE presentations.
[2] Privilege means the right to keep the information out of the courtroom.

Application of the Legal Right to Privacy to the APA Ethics Code

Whether your state has incorporated the APA Ethics Code of the American Psychological Association (APA) into law or not, people have a (federal) constitutional right to privacy. Therefore, the APA Ethics Code is examined with that perspective in mind.

There are two relevant sections of the APA Ethics Code. One section is the Aspirational Principles, and the other is the Enforceable Standards.

ASPIRATIONAL PRINCIPLE of PRIVACY of the APA Ethics Code

Principle E: Respect for People's Rights and Dignity
Psychologists respect the dignity and worth of all people, and the rights of individuals to privacy, confidentiality, and self-determination.

Enforceable Standard of the APA Ethics Code

4. Privacy And Confidentiality

4.04 Minimizing Intrusions on Privacy
(a) Psychologists include in written and oral reports and consultations, **only information germane** to the purpose for which the communication is made [Emphasis added].

Examples

In an effort to give real life application of Principle E and Enforceable Standard 4.04(a), 2 examples were provided in the CE presentation and are reported here. You may or may not agree that both of these examples are violations of privacy, but it is the contention of the authors that they are.

The first example comes from an ABPP senior exam. It was clear that the examinee was exceptionally qualified for the ABPP. Therefore, in order to find an aspect of the submitted work sample to "critique," it required a very close examination of the submitted psychological evaluation report that the examinee had once written.

Within the history section of the report, there was reference to the fact that the patient being examined had been divorced many years previously. The report then mentioned that some time following the divorce, the patient found out that the ex-spouse was bi-sexual — certainly an interesting piece of data. However, nowhere else in the report was this information used to help us understand the patient's psychological functioning. Because the psychologist being examined for the ABPP was very sophisticated, as this piece of data being in the report was being questioned, the psychologist was able to spontaneously indicate that the data should not have been in the report. Not only does it violate the privacy of the ex-spouse to have that data in the report, it violates the privacy of the patient because it is a private "experience" of his that apparently had no relevance to the report that was being written.

This example was chosen because psychologists commonly put all kinds of historical information in a report that is never used in any way in the report because we are operating under the concept of being complete in reporting the information we have obtained. However, the legal and ethical principles that should be overriding are respect for privacy and only reporting information that is relevant, germane and minimally necessary.

The second example used is possibly a bit more complex. This example comes from a forensic case in which the Plaintiff was being examined by the defense expert in regard to severe physical injuries the Plaintiff had suffered when he was attacked by two German Shepards. During the course of the examination, the Plaintiff informed the psychologist that he had an affair approximately 50 years ago. This affair occurred when the Plaintiff escaped from his country that had recently had a change of government due to a revolution. When the Plaintiff had escaped, he was not able to take his wife with him. The affair happened during the time that the Plaintiff could not get his wife to America. The Plaintiff eventually was able to bring his wife to America, and they have remained married for over 50 years. The information about the affair does not appear anywhere else in the report. In other words, it was not used to explain anything about the Plaintiff's behavior, character, nor personality. It's obvious why this non-complimentary fact from 50 years ago stood naked in this report, but the point here is that since this data was never used in any way in this report, its use was a violation of this person's privacy.

Confidentiality

For years, we used to understand confidentiality as an ethical duty. However, in the last decade the patient's right to confidentiality has clearly been established. Psychologists seem to be pretty clear about this legal, not just ethical right to confidentiality. Thus, at the federal level, we have HIPAA (and various State laws), and everyone knows that the confidential information that patients tell their health care professional cannot legally be shared with anyone without the patient's permission. Well, sort of. We all also know that we have to keep records on our patients and that the "clinical information" is subject to being shared. In general, the issue really is insurance companies, which for purposes of this discussion, we will include Medicare **as though** it is an insurance company. Thus, everyone knows that when a patient utilizes their insurance benefit for payment of health benefits that insurance companies (including Medicare) can access the clinical information to determine that a benefit is payable. Consequently, many mental health professionals keep separate "process" notes distinct from clinical notes.

Here is the relevant wording from the APA Ethics Code:

4.01 Maintaining Confidentiality
Psychologists have a primary obligation and take reasonable precautions to protect confidential information obtained through or stored in any medium, recognizing that the extent and limits of confidentiality may be regulated by law or established by institutional rules or professional or scientific relationship …

For California psychologists, here is the relevant section from the Evidence Code (note that this is not from our Licensing Law. You should check to see where this appears in your State's law):

California Evidence Code (Confidential Communication defined):
1012. As used in this article, "confidential communication between patient and psychotherapist" means information, including information obtained by an examination of the patient, transmitted between a patient and his psychotherapist in the course of that relationship and in confidence by a means which, so far as the patient is aware, discloses the information to no third persons other than those who are present to further the interest of the patient in the consultation, or those to whom disclosure is reasonably necessary for the transmission of the information or the accomplishment of the purpose

for which the psychotherapist is consulted, and includes a diagnosis made and the advice given by the psychotherapist in the course of that relationship."

The message here is simple: it is a complex issue. It will require much litigation before we know absolutely the limits of protection of the notes we keep. Therefore, we must be as careful as ever about what gets into notes, whatever label you put on those notes, keeping privacy rights somewhere in our thinking. Consequently, we all have to keep attending CE presentations and being aware of court cases because this is an evolving area of law, not a settled issue wherein "we" have finally legally protected the information that patients provide to us.

Privilege

This concept of **privilege** is often confusing for psychologists, primarily because it is so specific to legal cases. To review for a moment, we emphasized that **privacy** is a legal right founded in the United States Constitution (as determined by the US Supreme Court in *Griswold*), and in California the Supreme Court also affirmed that privacy is a constitutional right (in *Lifschutz*), and subsequently the California constitution explicitly included privacy as a right. Next we reviewed that **confidentiality** has been transformed from an ethical obligation to be also a legal right (obligation) at both the federal and state level.

However, we know that confidential, private information does come in to courtrooms. The rules related to how confidential information gets in to a courtroom and how it is kept out relates to the concept of **privilege**. To be explicit, what we are saying is that information that patients provide to us that is legally confidential has a special **privilege** in the law. The **privilege** it has is to not be brought in to a courtroom if the patient objects. Well, sort of.

The place in California law where we find this **privilege** is in the Evidence Code:
EVIDENCE CODE SECTION 1010-1027: Psychotherapist-Patient Privilege. The section relevant to psychologists is:
1010. As used in this article, "psychotherapist" means a person who is, or is reasonably believed by the patient to be:

(b) A person licensed as a psychologist under Chapter 6.6 (commencing with Section 2900) of Division 2 of the Business and Professions Code.

For our purposes, it isn't necessary to provide the entire list of persons defined as "psychotherapist" for the purposes of protecting the confidential communications of patients from forced disclosure in a courtroom. Let us add however, that students in practicum and on internship are defined as psychotherapists for purposes of the psychotherapist-patient privilege.

However, there are many exceptions to this **privilege**. It is customary to put some of these in our Informed Consent to Treatment documents. The exceptions that we usually include in our Informed Consent Forms usually cover: danger to self or others; reasonable suspicion of elder, dependent adult, child abuse. If we work in certain settings in California, we would include spousal abuse in the informed consent. The entire list of statutory exceptions is found in the Evidence Code Sections 1016-1027.

For California psychologists, we wonder how many of you tell your patients of this one?:

1022. There is no privilege under this article as to a communication relevant to an issue concerning the validity of a deed of conveyance, will, or other writing, executed by a patient, now deceased, purporting to affect an interest in property.

We leave the reader to ponder how many patients would make it past the informed consent process if every exception were enumerated and discussed in detail with them before any services were delivered. At this point, we reiterate that even when there is an exception, that only the information that is relevant to the legal issue at hand loses its privilege.

Privilege in Federal Court

It is also important for psychologists to understand the meaning of "privilege" in federal court in order to understand to privacy, confidentiality, and privilege. In the discussion above about privilege, we only discussed California's law (Evidence Code), although you should be able to find equivalent protections in your State law. We know that in State courts, patients confidential information is protected (**privileged**) from compelled disclosure (unless one of the exceptions apply), and we see how that is spelled out in the Evidence Code. The equivalent for federal courts is the Federal Rules of Evidence. Oops, the Federal Rules of Evidence do not specify a psychotherapist-patient privilege.

Hopefully, all of you know that due to the US Supreme Court case of *Jaffee v. Redmond*, the Supreme Court ruled that the Federal Rules of Evidence should be interpreted as providing that **privilege**. Thus, mental health professionals (at least psychiatrists, psychologists and licensed clinical social workers) can be assured that their patients' confidential communications are privileged in federal court.

To our awareness, few psychologists have read the *Jaffee* case. While we are all happy with the final decision, and even get pleasure reading the reasoning of the Majority, there is value in also reading the Dissent opinion. Thus, we present excepts of both the Majority Opinion and of the Dissenting Opinion for your reading pleasure.

CONFIDENTIALITY OF COMMUNICATIONS IN PSYCHOTHERAPY: FEDERAL RULES OF EVIDENCE

JAFFEE v. REDMOND

The details of this case are interesting in and of themselves. Redmond was a police officer responding to an emergency call at an apartment complex. It is generally agreed that when she arrived, she saw people fleeing an apartment. She observed one man, Allen, who she said was carrying a knife and apparently chasing another man.

Redmond reports that she ordered Allen to drop the knife, he did not, and when she thought that Allen was about to stab the other man, Redmond shot Allen, who died. Jaffe, the Executor of the estate, sued Redmond. Redmond entered psychotherapy with a Licensed Social Worker. As part of the lawsuit, Jaffe, on behalf of the estate and Allen's family, sought the psychotherapy records from Redmond's psychotherapy sessions. Redmond refused to give permission to the Social worker to release the records. The Social Worker refused to testify.

The Trial Court Judge told the jury that the law permitted them to infer from this refusal that the information would be hurtful to Redmond, although they did not have to come to that conclusion. Thus, a US Supreme Court case developed. The question in the case was whether the Federal Rules of Evidence did or did not grant such a “testimonial privilege” to the psychotherapy records of Redmond.

Quoting from the Decision:

Held:
The conversations between Redmond and her therapist and the notes taken during their counseling sessions are protected from compelled disclosure under Rule 501. Pp. 5-17.

Like the spousal and attorney-client privileges, the psychotherapist-patient privilege is "rooted in the imperative need for confidence and trust." Trammel, 445 U.S., at 51. All agree that a psychotherapist privilege covers confidential communications made to licensed psychiatrists and psychologists. We have no hesitation in concluding in this case that the federal privilege should also extend to confidential communications made to licensed social workers in the course of psychotherapy. The reasons for recognizing a privilege for treatment by psychiatrists and psychologists apply with equal force to treatment by a clinical social worker such as Karen Beyer. 15 Today, social workers provide a significant amount of mental health treatment. See, e.g., U. S. Dept. of Health and Human Services, Center for Mental Health Services, Mental Health, United States, 1994 pp. 85-87, 107-114; Brief for National Association of Social Workers et al. as Amici Curiae 5-7 (citing authorities).

Their clients often include the poor and those of modest means who could not afford the assistance of a psychiatrist or psychologist, … but whose counseling sessions serve the same public goals … Perhaps in recognition of these circumstances, the vast majority of States explicitly extend a testimonial privilege to licensed social workers …

The conversations between Officer Redmond and Karen Beyer and the notes taken during their counseling sessions are protected from compelled disclosure under Rule 501 of the Federal Rules of Evidence. The judgment of the Court of Appeals is affirmed.

It is so ordered.

The following is also quoted from the Decision:

“Justice Scalia, with whom The Chief Justice joins as to Part III, dissenting.

At bottom, the Court's decision to recognize such a privilege is based on its view that "successful [psychotherapeutic] treatment" serves "important private interests" (namely those of patients undergoing psychotherapy) as well as the "public good" of "[t]he mental health of our citizenry." I have no quarrel with these premises. Effective psychotherapy undoubtedly is beneficial to individuals with mental problems, and surely serves some larger social interest in maintaining a mentally stable society.

When is it, one must wonder, that the psychotherapist came to play such an indispensable role in the maintenance of the citizenry's mental health? For most of history, men and women have worked out their difficulties by talking to, *inter alios*, parents, siblings, best friends and bartenders-none of whom was awarded a privilege

against testifying in court. But merely mentioning these values does not answer the critical question: are they of such importance, and is the contribution of psychotherapy to them so distinctive, and is the application of normal evidentiary rules so destructive to psychotherapy, as to justify making our federal courts occasional instruments of injustice?

On that central question I find the Court's analysis insufficiently convincing to satisfy the high standard we have set for rules that "are in derogation of the search for truth." Nixon, 418 U.S., at 710. Ask the average citizen: Would your mental health be more significantly impaired by preventing you from seeing a psychotherapist, or by preventing you from getting advice from your mom? I have little doubt what the answer would be. Yet there is no mother-child privilege.

Even where it is certain that absence of the psychotherapist privilege will inhibit disclosure of the information, it is not clear to me that that is an unacceptable state of affairs. In its consideration of this case, the Court was the beneficiary of no fewer than 14 *amicus* briefs supporting respondents, most of which came from such organizations as the American Psychiatric Association, the American Psychoanalytic Association, the American Association of State Social Work Boards, the Employee Assistance Professionals Association, Inc., the American Counseling Association, and the National Association of Social Workers.

Not a single *amicus* brief was filed in support of petitioner. That is no surprise. There is no self-interested organization out there devoted to pursuit of the truth in the federal courts."

In examining the Dissenting Opinion, we get a better understanding of the Justice's issue with social workers from the next section (hint: they help poor people). The Justice gives some praise to the knowledge base of psychiatrists and psychologists, however, licensed clinical social workers are not particularly esteemed:

"Another critical distinction between psychiatrists and psychologists, on the one hand, and social workers, on the other, is that the former professionals, in their consultations with patients, do nothing but psychotherapy. Social workers, on the other hand, interview people for a multitude of reasons."

The Justice goes on to indicate how applying this privilege will be complicated:

"Thus, in applying the "social worker" variant of the "psychotherapist" privilege, it will be necessary to determine whether the information provided to the social worker was provided to him in his capacity as a psychotherapist, or in his capacity as an administrator of social welfare, a community organizer, etc. Worse still, if the privilege is to have its desired effect (and is not to mislead the client), it will presumably be necessary for the social caseworker to advise, as the conversation with his **welfare client** proceeds, which portions are privileged and which are not." [Emphasis added]

He spells out what social workers do by referring to the Oklahoma statute defining the license of social workers. The social worker's "professional capacity" is expansive, for the "practice of social work" in Oklahoma is defined as:

"[T] he professional activity of helping individuals, groups, or communities enhance or restore their capacity for physical, social and economic functioning… to one or more of the following ends: Helping people obtain tangible services; counseling with individuals families and groups; helping communities or groups provide or improve social and health services; and participating in relevant social action."

The Power Point presentation used at the NAPPP Annual Convention has sound effects, music and animations that do not translate to the written word, as well as a few slides that don't translate well either. The intent has been to give you some further clarification of the legal status and limits of three words: privacy, confidentiality, privilege as they affect or should affect our interactions with our patients, our reports, our notes and our interactions with the broader legal system. Finally, we hope that you have obtained a deeper understanding of some of the legal principles, as well as societal values that underlie our work with our patients.

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State of California Psychology Licensing Law

Neurofeedback: A New Modality For Treating Brain Problems

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Abstract

Neurofeedback is a modality of biofeedback that aims to train the electrophysiology of the patient's brain to become more normal. A basic assumption is that if the brain physiology becomes more normal, the related symptoms of psychological and neurological conditions would improve. Training patients to control their own physiology can result in lower medical costs by empowering patients to regulate their own health. A brief overview of biofeedback is presented along with basic concepts of neurotherapy and neurofeedback. Concepts of the electrophysiology of the brain are provided for a fuller understanding of the research in this area. Research on neurofeedback and neurotherapy for a few disorders are noted, as well as possible directions for the future.

An Overview of Biofeedback

Biofeedback is a method of treatment whereby patients are trained to become aware and learn to control their own physiology in order to improve physical and psychological health. For example, a patient who is trained to control his/her temperature can help diverse disorders such as headaches, hypertension, anxiety, tinnitus, as well as enhance general relaxation.[1] Several modalities of biofeedback treatment are of some interest to treatment for psychological health, which are often used in conjunction with neurotherapy treatment. For example, training a person in heart rate variability can be beneficial for those with cardiac conditions. Temperature training could also benefit patients who need a method of overall relaxation or for disorders mentioned above. Both heart rate variability and temperature training can be prior to neurofeedback as a means of relaxing the patient for the neurofeedback session. In all cases, biofeedback trains people to monitor and control aspects of their own physiology to improve their health. Training the EEG or brain waves is the modality of biofeedback we will consider in this article. First, we need to introduce other aspects of biofeedback since this treatment involves the use of very sophisticated equipment, and demands a substantial amount of training.

In all biofeedback procedures, specialized equipment measures the physiology of various modalities, which in turn are fed back to the patient (usually on a computer) so that the patient knows what is going on with regard to their physiology. For example, in temperature training, the degrees of the body where the sensor is (typically on the finger) can be displayed on the computer screen so that the patient can see if the temperature is raised by specified exercises, such as imagining that the hand is getting warmer. Modern biofeedback instruments are quite sensitive, and in the case of temperature training, the resolution is to the 100th of a degree. Thus, even small changes can be seen on the computer in a graph or other visual display. Biofeedback for heart rate variability measures a detailed and complex spectral frequency of the heart rate over a range of values. Cardiologists are trained to analyze and understand the complexity of this physiological information. Muscle tension is measured in microvolts (millionths of a volt).

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The EEG is also measured in microvolts, and one possible display is to see one's own brain waves in microvolts pass in front of you while learning how to control them.

Substantial training is necessary in order to learn how to use this electronic equipment and specialized biofeedback devices. Several different biofeedback systems are available (e.g., Thought Technology, Nexus, J & J Engineering). Each has detailed and complex software. Some biofeedback systems do all the modalities mentioned above (Thought Technology and Nexus) while others specialize in neurofeedback (e.g., BrainMaster and pirHEG). Still other forms of neurotherapy deal with aspects of treatment that do not deal with feedback *per se*, but train the brain waves in a direct stimulation method (e.g., MindAlive).

Neurotherapy

The term neurotherapy is used here to indicate all forms of training the brain with specialized equipment such as noted above. Neurotherapy can be defined as any method of training the brain to enhance the functioning of the patient. This broad term can include neurofeedback (also known as EEG biofeedback), as well as Hemoencephalography (HEG), and Audio-visual entrainment or stimulation (AVE or AVS), as well as other methods. In all these cases, equipment is used in the treatment.

Neurofeedback

The vast majority of the research in neurotherapy is in the area of neurofeedback. Neurofeedback consists of training the patient to control their brain waves. Ordinarily this means training a patient to become aware of and learn to train their brain waves or electroencephalograph. Neurofeedback is also called *EEG Biofeedback*. It is important to understand some aspects of electrophysiology of the brain to gain an appreciation and understanding what neurofeedback does.

The neurofeedback patient typically obtains a quantitative EEG in order to identify where the brain waves need to be trained, or changed. The electrode is then placed in one or more areas, and the patient is displayed a feedback so that the dysfunctional frequencies are trained down, and the "good" waves are trained up. The display can be the brain waves themselves (good for some patients), or a display generated by the computer. For example, the patient is asked to maintain the displayed animation presented. Then, by operant conditioning the patient trains his/her brain waves to be more normal. Neurofeedback is considerably more complex than most other biofeedback modalities, and it is the newest modality in the field of biofeedback. Nonetheless, there is substantial research regarding its effectiveness.[2,3,4,5] Neurofeedback has been shown to be effective for attention deficit disorder, chronic pain, traumatic brain injury, and other brain disorders.[4] Frank Duffy[5], a well-known neurologist, stated in a special issue of the journal *Clinical Electroencephalography* devoted to neurofeedback that "if any medication had demonstrated such a wide spectrum of efficacy, it would be universally accepted and widely used."

Of importance is that there seem to be actual changes in the brain as a result of neurofeedback. Levesque, Beauregard and Mensour[6] compared pre and post functional MRIs (fMRI) and neuropsychological tests using a neurofeedback treatment group of children with ADD and controls, in a randomized, double blind, placebo controlled study. Both the children and the therapists were blinded to whether they received the treatment or not. The treated children improved in functioning and in neuropsychological test scores, and their brain physiology improved in the predicted areas according to the post

fMRI. Several substantial volumes of research support the effectiveness of neurofeedback with a variety of populations. [5,7,8,9] Cory Hammond[10] frequently updates the research literature iin this important area showing that neurofeedback can change the brain functioning.

Brain Physiology

Everyone has electricity all over their body, and in the brain this electrical activity is measured in terms of its brain waves; the unit of measure is microvolts. Brain waves occur in different frequencies, understood in cycles per second, or in hertz (abbreviated Hz). All frequencies occur in all parts of the brain, but in different conditions of the brain, the distribution of the frequencies can take on specific proportions. The slowest brain wave frequency is Delta, 0.5 to 4Hz, and next is Theta, 4-8Hz. Alpha is often considered 8-12Hz, Beta is from 12-30Hz, and Gamma is from about 30-45Hz. Be aware that different researchers define these bands in different ways. Table 1 provides some benchmarks for clarification.

Table 1.

Brain wave	*Frequency band*	*Characteristic*
Delta	0.5 to 4 Hz	Slow waves, often associated with sleep
Theta	4-8 Hz	Dreamlike or slow processing
Alpha	8-12 Hz	Relaxation, brain idling
Beta	12-30 Hz	Active thinking
Gamma	30-45 Hz	Very active processing

The frequencies of the brain waves are also measured at certain locations or sites. There is a system of location called the “10-20 system” which specifies the sites (19 or 21 sites, depending on the system) where brain waves are measured. For example, Cz is at the top of the head; Fpz is in the middle of the forehead, about an inch up from the mid point between your eyebrows. Frontal sites include Fz, F3, F4, and posterior sites include P3, P4, PZ. You can choose to train some frequencies up (or to be more active), and some frequencies down, or to be inhibited. Thus, one protocol could be to train Fz 12-18Hz up and 4-7Hz down (or “inhibit”) at the same time. This particular protocol is used for many ADD children, because Theta is often too high and Beta is too low at Fz (mid-way between Fpz and Cz). Successful training of these frequencies to be more normal can reduce the typical ADD symptoms.[6] In order to determine precise protocols for doing neurofeedback, it is common to assess the patient’s brain waves with a quantitative EEG (QEEG), sometimes called a “brain map.”

Quantitative EEG (QEEG)

The technology of the electroencephalogram (EEG) has progressed far beyond the original invention of the EEG by Hans Berger[55] in 1929, so that the electrophysiological data is now analyzed in very sophisticated ways. Only a basic presentation can be made here.

To give an idea as to how complex this is, consider that the QEEG method measures all frequencies (Delta, Theta, Alpha, Beta 1, Beta 2, Beta 3, Gamma) at each of the 19 sites, plus all possible pairs of sites in terms the connectivity variables of Coherence,

Asymmetry and Phase, plus the whole right side of the brain and the whole left side. The result is some 2,500 variables. This complex brain wave data is analyzed by a computer program and compared to people the same age, and the result is called a *Quantitative EEG*, or QEEG. These are compared to the normative database that contains the data for all ages. Therefore, the data of the patient in question is compared to those members of the database that are the same age. Of importance are the deviations the patient has compared to the norms with respect to all these variables. What is so fascinating about the complexity of this data is that the QEEG patterns are lawful and describe certain pathologies in a reliable way. Thus, a child with attention deficit disorder (ADD) has a certain number of patterns that are typical, such as a high Theta/Beta ratio in the frontal area of the brain (at Fz). However, there are several specific electrophysiological patterns in children with ADD[11] Dementia, affective disorder, traumatic brain injury, and obsessive-compulsive disorders all have distinctive patterns to their QEEG. As you might imagine, collecting data for a QEEG database is complex and needs to be done in a very careful way since this database will be used in comparing patient brains to see if they correspond to certain kinds of brain dysfunction. Robert Thatcher and Joel Lubar[12] present a detailed history of this process.

Some methods involve collecting the QEEG data under different conditions — eyes closed, eyes open and doing several cognitive tasks. In this way, we can understand how the brain is functioning under different cognitive tasks and then train the brain while doing those tasks in order to correct that cognitive function. Researcher Kirtley Thornton[13] demonstrates that QEEG data collected under different eyes open conditions of cognitive functioning (e.g., memory, reasoning, visual and verbal attention) are different than in the eyes closed condition. This may lead to different kinds of neurotherapy interventions than those described here. For example, one might be able to target the enhancement of memory functioning specifically in relevant disorders (e.g., early stage dementia) with this methodology.

Additional Methods of Neurotherapy

There are some other modalities that have to do with training the brain. As mentioned above, neurofeedback involves giving feedback to the patient, while neurotherapy can be any method of training the brain. *Audio-visual stimulation, audio-visual entrainment and Hemoencephalography* are presented as examples of psychological treatments in the expanding field of neurotherapy.

Audio-visual stimulation (AVS) and audio-visual entrainment (AVE) consists of flickering LED lights embedded in glasses presented to the patient, along with sounds vibrations through earphones. The frequencies can vary according to EEG frequencies (e.g., Delta, Alpha, Beta). Sometimes the AVS device is programmed to vary the frequencies according to what is believed to be optimal for a given purpose. For example, if low Beta (15-18 Hz) is thought to be beneficial for a patient, this frequency might be programmed so that the patient sees lights flicker at 15-18 Hz and hear the 15-18 Hz rhythm in the ear phones. Research has shown that entraining these frequencies can enhance the same frequencies in the brain and its effects can last for a long period of time.[14] Sometimes a variety of frequencies are programmed, so that the flickering lights can go through a range of Delta flickering lights, then ramp up to Alpha and Beta, then go back down to Delta. In a clinical study[15], Budzynski and colleagues did some “Brain Brightening“ AVE sessions with 10 seniors (noted below), and there were improvements on many of the measures from the MicroCog computerized cognitive battery.

Hemoencephalography (HEG) biofeedback trains the patient to control the cerebral blood flow in the frontal lobes. An infrared camera sensor is placed on the forehead that reads the heat emanating from the forehead (a close correlate of the blood flow), and the patient learns to control the heat by the display being watched. In the case of the pir HEG, the display is a movie — any DVD the patient wishes to see. If the frontal lobe blood flow and temperature remains high, the patient can continue to watch the movie. When the temperature drops (believed to be in the anterior cingulate gyrus), the movie stops, and by focusing on a bar graph display, the cortical activity increases such that the movie starts again. The therapist can make the task easier or more difficult; the auto-threshold aspect of this system follows the temperature of the frontal lobe (which naturally fluctuates) so that sooner or later the movie will stop, and the patient needs to focus on a part of the computer

The HEG method of neurofeedback is a new kind of treatment, and there is little research as to its effectiveness, and none to my knowledge with the elderly. This biofeedback system was originally designed for migraine headache treatment, and has shown promising results there. Carmen[16] took 100 migraine patients who had been through many previous treatments, including many trying several medications, with little success. Positive results were usually seen in six HEG sessions, and over 90 percent of the patients reported significantly positive results, according to their own report. I am including this method of neurofeedback because it is specifically designed to train the cerebral blood flow of the frontal lobes to increase. This known to be an important area of brain functioning in the elderly since a typical problem in the elderly is the reduced frontal lobe blood flow. This unique methodology may become an important part of future treatment for elderly cognitive enhancement.

There are a number of disorders that have been shown to respond to neurofeedback. As research grows in this area, it is likely that the number of disorders able to benefit from neurofeedback will increase. At this point, there is a reasonably good evidence that neurofeedback can help those with attention deficit disorder, traumatic brain injury, epilepsy, depression, and stopping the beginnings of cognitive decline in the elderly.[17] HEG biofeedback has also had success in treating migraines.[16,18] Some single case studies have shown that QEEG-guided neurofeedback can also help obsessive-compulsive disorder[19] and anxiety disorders.[20] A Turkish neuropsychiatrist[21] has used QEEG-guided neurofeedback to train schizophrenics, resulting in such a reduction of symptoms so that they score as normal on several well-regarded psychological and neuropsychological measures. Additional developments are discussed below.

Attention Deficit Disorder

A great deal of research has been done with using neurofeedback to help alleviate the symptoms of Attention Deficit Disorder (ADD). A number of studies can be found in review articles.[2,4] The early term of EEG biofeedback has been updated to be called neurofeedback in most publications. A variety of protocols have been used over the last three decades, so it is hard to summarize them in a brief review. The overall trend is to train the patient to lower the slow waves (especially theta) and increase the fast waves (beta) in the frontal regions of the brain, i.e., the frontal lobes.

The earliest studies[21,22] were done by Joel Lubar and his colleagues and showed that in training down the slow activity and training up the beta or faster brain activity, behaviors improved in the ADD children. Lubar followed 52 patients over 10 years, and the gains were maintained over that length of time. This answers the question as to whether the

benefits of neurofeedback training can last over time; but clearly more follow-up studies are needed to demonstrate a permanent effect. In another study, Linden, Habib, and Radojevic[23] found children with attention deficit disorder who received neurofeedback showed better control over their attentiveness and had a Full Scale IQ gain of 10 points, while the children in control groups showed no gains in these areas. Thompson and Thompson[24] have also shown similar IQ and behavioral improvements. In a large study, Kaiser and Othmer[25] found significant improvements on the TOVA continuous performance test, as well as gains of 10 points in Verbal and Performance IQs.

In a randomized, placebo, control group study, Levesque, Beauregard and Mensour[6] found that with neurofeedback training, the experimental group of ADD children improved on neuropsychological measures as well as pre- post- fMRI measures of the anterior cingulate cortex. This finding indicated that functional neuroanatomical changes occur with neurofeedback training. In other words, the areas of the brain involved in training showed actual physiological changes, which corresponded to the improved neuropsychological improvements.

Neurofeedback has also been demonstrated as a treatment model in Asian countries. Zhang, Zhang and Jin[26] randomly assigned ADD children to either a medication group (methylphenidate) or EEG biofeedback. They were rated pre- and post treatment, and at one, three and six month intervals. The EEG group showed substantially improved scores on the Conners Parent Rating Scale and at 6-month follow-up. Zhong-Gui, Hai-Qing, Shu-Hua[27] in their study of children who did EEG biofeedback training demonstrated significant improvements on the TOVA continuous performance test after 40 sessions.

Many more studies of neurofeedback helping ADD patients in improved functioning can be found in other references.[3,4,27,28,29] Additionally, it has been shown that the positive results remain long after treatment has been completed.[3,4,5,27] In Yucha and Montgomery[4], they conclude that the use of neurofeedback is strongly supported in the treatment of ADD. They arrived at this conclusion despite the fact that treatment protocols varied widely. In addition, several studies have shown that these treatment effects last over time.

Traumatic Brain Injury

Traumatic brain injury (TBI) can result in problems of cognition, behavior, emotional sensitivity, and attention. Patients can frequently become much more impulsive, appear to have poor judgment, have memory and word finding problems, and often are not very aware of their problems. Planning and organizing can also be significant deficits.[30] There are some two million brain injuries every year in the USA, and while most appear to recover completely, a substantial number — up to 50 percent — can have enduring symptoms six months or more after the injury.[31]

The vast majority of the 2,000,000 brain injuries per year in the United States are mild cases. By definition, mild TBI means a loss of consciousness of less than 20 minutes, or a post-traumatic amnesia (PTA) of less than 24 hours. Post-traumatic amnesia is defined as the period of time when the accident occurs until there is reliable and consistent memory. Brain injuries with longer durations of these variables are considered moderate or severe brain injuries. It is commonly believed that deficits resulting from moderate or more severe TBI injuries are permanent.

Neurofeedback is the biofeedback modality most commonly used to treat traumatic brain injury. Mild TBI is the level usually seen by the private practitioner; severe cases of brain injury are usually not treated with neurofeedback, although there are exceptions.[32] As professionals in the field of TBI accept neurofeedback, it is possible that positive results might be demonstrated with this population.

Thatcher[32,33] advocates obtaining a quantitative electroencephalograph (QEEG) in order to determine which of the 2500 variables to focus on with respect to neurofeedback with traumatic brain injury. When the problematic sites are determined, these variables become the focus of targeted treatment. The QEEG then can be a means of scientifically noting progress in the TBI patient.

One interesting new form of neurofeedback is called the Low Energy Neurofeedback System, or LENS, which tracks the dominant brain wave frequency of the site where the electrode is placed, and delivers a tiny electromagnetic pulse to the brain at a prescribed difference (or offset) from that dominant frequency.[34,35,36] The brain seems to respond to the tiny stimulus, and the brain physiology appears to move towards a more healthy homeostasis, sometimes with dramatic results.[35]

Neurofeedback Treatment for Substance Abuse

Neurofeedback has a long history in treating substance abuse. The most well known protocol is titled the *Peniston Protocol*, which has had several replications and developments in the last 35 years.[37,38,39] Long term follow-up has shown that benefits are enduring.[40] David Trudeau[41], however, emphasizes that neurofeedback has not been validated as a stand-alone treatment for addictive disorders. Trudeau and his colleagues outline the development of the *Peniston Protocol*. The basic elements of this method of treatment includes first training the patient to control their temperature with the classic temperature training model, and at the same time, having the patient create positive images of not drinking or taking the substance. Then, while doing the neurofeedback of training alpha and theta frequencies to become stronger, the imagery is presented to the patient. This positive imagery, while having the body (and brain) relax, this tends to make the imagery become more absorbed. The results of this treatment appear to be more successful than the usual alcohol and substance abuse rehabilitation methods.

William Scott and David Kaiser[42] have developed the *Peniston Protocol* further. In the Scott-Kaiser variation, beta and SMR training is added to the *Peniston Protocol*, primarily because their treatment group had mixed drug abuse, especially with stimulant medication. This type of neurofeedback training is often given to those with attention deficit disorder (ADD). This variation of neurofeedback training improved treatment outcomes compared to the classic *Peniston Protocol.*

Post-Traumatic Stress Disorder

Post-traumatic Stress Disorders (PTSD) treatments have achieved a new prominence with the veterans returning from the Iraqi and Afghanistan wars. There is some literature that supports the use of neurofeedback and biofeedback with this population. A particular advantage in using biofeedback and neurofeedback with soldiers is that it is not "psychological" in the usual sense. The patient can be brought in to master their temperature training, heart rate variability, brain waves (e.g., for focusing or relaxation), and they can be told — truthfully — that they are learning to control their physiological

aspects of their bodies so they can improve their sleep, concentration or stress management. Thus, the stigma of seeing a "shrink" is removed.

The initial method of neurofeedback treatment for PTSD was the Peniston Protocol[39] and this may serve many patients very well. However, recent developments suggest QEEG-based neurofeedback protocols is for those who do not respond well to the initial treatment methods.[43] Although some standard protocols have been shown to be effective, the complexity of any given single patient may warrant a very specific assessment with a QEEG, as well as, the use of other modalities.

John Carmichael[43] has developed an elaborate system of treating PTSD in which neurofeedback in an important component. He spells out his multimodal treatment model in great detail in his book on treating post- traumatic stress disorder. Carmichael includes psychological methods (especially cognitive behavior therapy), nutritional supplements, biofeedback, as well as neurofeedback. He reviews the various treatment methods for PTSD, and his particular focus is providing treatment methods for the military. It is worth keeping in mind that the PTSD veteran may also be suffering from traumatic brain injury, since blast injuries are common in recent wars. An overview of military neuropsychology is published in a new book titled, “Military Neuropsychology”, edited by Carrie Kennedy and Jeffrey Moore.[44]

Epilepsy

Barry Sterman[5,44,45], a UCLA physiological psychologist, began working on seizure disorders in the late 1960s, discovered neurofeedback as a treatment for epilepsy. He was asked to determine why fighter pilots sometimes went into seizures while flying their planes, and discovered that a chemical in the jet fuel (hydrazine) triggered the seizures. In working on this project, he tried to induce seizures into some cats he had in his laboratory and found some cats went into seizures but others did not. Sterman learned that the cats that did not go into seizures (when they should have) were ones which had been trained previously to increase certain brain waves in previous experiments. Sterman concluded that the place and frequency he had trained the cats (12-15hz at C4) seemed to be protective of seizures happening, even when provoked with hydrazine. His continued work led to eventually working with people, helping many to eliminate seizures in their life. The scientific details, theory and references of Sterman’s work can also be found in other sources. Neurofeedback continues to be a viable method of treatment for epilepsy.[4,27] Yucha and Montgomery[4,46] claim that neurofeedback is a treatment which can be rated as being *efficacious* or Level 4 according to the criteria of Chambless and Hollon.[46]

Depression

Davidson’s[47,48] neurophysiological research documents that some depressed patients have excess left frontal alpha and that by training this pattern to normal, the symptoms of depression can be lifted. A common pattern in those with endogenous depression is more slowed brainwave activity in the left frontal area. When this part of the brain is more inactive and the right frontal area is more dominant, the patient is predisposed to become depressed more easily, as well as, becoming more anxious. The contributing factors may include a family history of depression, or a mild head injury in the left frontal area that helped create the frontal alpha abnormality.

Elsa Baehr, Peter Rosenfeld and their colleagues discovered that by training the depressed patient to alter the abnormal alpha asymmetry, the relevant symptoms can be

alleviated.[49,50,51,52,53,54,56,57] Other reviews of the literature has shown that neurofeedback can be effective in treating depression.[20,58,59] Another possible pattern of abnormal neurophysiology has included low alpha in the posterior regions. Moreover, positive neurofeedback treatment effects for depression have been found to be maintained for long periods of time.[52]

Brain Brightening: Stopping cognitive decline in the elderly

Thomas[16] describes results that give some hope that early stages of cognitive decline in the elderly can show improvement with neurofeedback. Paula Hartman-Stein and Sanest LaRue.[17] present such information in their recent book entitled Enhancing Cognitive Fitness in Adults, This exciting new area is summarized below.

Brain Changes in the Elderly

The term "brain brightening" refers to doing neurotherapy with the elderly in order to enhance their cognitive abilities. Brain brightening seems to have been coined by Thomas Budzynski[62] in his 1996 paper on this subject. It has, however, been adapted by many to include a number of possible interventions for the same overall purpose — helping the elderly improve cognitive functioning. In this article the term brain brightening refers to the use of neurofeedback and neurotherapy for improving cognitive functioning in the elderly.

Cognitive decline in the elderly may likely be associated with a drop in cerebral blood flow as one ages.[60,61] Alongside this, there is likely an increase in slow waves throughout the brain. With such disorders as mild cognitive impairment (MCI), there is often an excess of slower brain waves (i.e., increases in Delta and Theta) in the frontal region. For those with the beginnings of dementia, the presence of frontal slow waves is even more likely and more pronounced. Therefore, it would appear logical that if one could reduce the amount of slow waves and enhance the more active or "thinking" waves (Beta and high Alpha) in the frontal lobe region, there might be an enhancement of cognition. Likewise, with the drop in frontal cerebral blood flow in the elderly, if there could be a method of enhancing frontal lobe blood flow, it could improve cognition and maybe other functioning as well.

Research on Brain Brightening

There is a limited literature on neurotherapy for the elderly with regards to cognitive enhancement. Budzynski[62] presented a case study in which he employed neurofeedback and audio-visual stimulation (AVS), which helped reduce cognitive and memory symptoms. Budzynski and Budzynski[63] presented another case study of a 76-year-old man who had a history of two cardiac bypass surgeries, a pacemaker implantation, hearing problems and self-reported cognitive problems. The patient was assessed with the MicroCog Battery before and after treatment.[64] After 30 sessions of neurofeedback, primarily suppressing frontal slow waves (2-12 Hz) combined with 14 Hz AVS at the start of each session, improvements almost all of the MicroCog scores were noted. He also did home training with the AVS each day for 20 minutes. The post training assessment also revealed a reduction in slow wave activity in the frontal area (i.e., one to seven Hz), an increase in 7-9 Hz, and an improvement in hearing.

Budzynski, Budzynski and Tang[15] administered neurofeedback and audio-visual entrainment (AVE) to two elderly volunteers as part of the Ponce de Leon Project. One of

these volunteers, an 80 year old woman, was tracked carefully. After 20 neurofeedback sessions, which also utilized AVS, her *Wechsler Memory Scale-Revised* scores showed significant improvement after treatment and at follow-up on the General, Visual and Delayed Recall scales.

In another study reported in Budzynski[15], 31 volunteers ages 53 to 87 received audio-visual stimulation (AVS) three days per week over three months. The AVS EEG frequencies were randomly presented between 9 and 22 Hz, and session were 20 minutes each. Pre- and post- measures consisted of MicroCog and the Buschke Remembering test.[65] Improvement was seen on the Buschke measure and seven of the nine MicroCog measures for the AVS group. Other interesting results were reported. However, some participants experienced a period of confusion for 15 to 30 minutes following the AVS session.

Jon Frederick and Marvin Berman[66] did a study with 26 subjects who had frontal-temporal lobe dementia, 15 of which were assigned to neurofeedback treatment, and 11 to the control condition. Those in the neurofeedback group received 30 or more sessions, with video, audio and tactile reinforcers. Pre and post measures of neuropsychological tests as well as QEEG were done. Improvements in the treatment groups were found in visual and verbal memory, and self- ratings by and their significant others in executive functioning. The authors concluded that neurofeedback would be more likely to be effective in cases of very early dementia.

The above noted research and case studies represent beginning efforts in the possible value of using neurotherapy to treat cognitive decline in the elderly. There are significant limitations in the above papers, but there is enough evidence to consider developing more extensive research proposals to see if neurotherapy can contribute to the prevention of dementia if caught early enough in the disease process. It is worth noting that in most of the Budzynski articles, neurofeedback sessions are begun with audio-visual stimulation or entrainment. A likely reason is that AVS/AVE seems to increase frontal cerebral blood flow. The present author now includes the HEG method of neurofeedback, because HEG specifically trains the patient to increase frontal blood flow. But there are some limitations to what we can expect from neurotherapy with dementia. Frederick and Berman[66] concluded from their work that if the pathological process in dementia has progressed too far, there is little likelihood that neurotherapy will be helpful, although neurofeedback can be useful in the very earliest stages of cognitive decline.

Some Clinical Thoughts for Integrating Neurotherapy into Healthcare

A final aspect of neurotherapy is worth mentioning. In dealing with patients learning to control their brain functioning, being psychologically minded is not necessary. Indeed, neurofeedback training does not require having any psychological insights. For some patients, this could be very attractive, and could be especially important in treating those with limited language abilities with respect to the therapist, or those who are not comfortable with the usual psychological treatment situation. This could apply, for example, the war veterans who do not want to go to a “shrink,” but might go to someone to improve their attention or memory abilities. In addition, training one’s own brain physiology by watching movies is another attractive feature of doing neurotherapy.

The effectiveness of neurotherapy will probably result in lowering overall medical costs for those with brain problems. Research on attention deficit disorder may be able to

reduce or eliminate their medication. Patients with traumatic brain injury might be able to improve their functioning, thereby need less support from society. People suffering from depression might become more functional and lead more fulfilling lives. People with seizure disorders have a good chance of reducing their seizures as well as lessening the probability of neurosurgical interventions. Some dementias may be stopped, while other cases may have a more benign course. Future studies examining treatment paths are likely to demonstrate that neurotherapy and biofeedback are cost-effective and humane treatment modalities. This will necessitate that professionals master this technology and acquire the specific knowledge of the medical conditions under question. It is hoped that psychologists and other mental health professionals will attain these skills in the coming years.

Concluding remarks

Given the above applications of neurofeedback in the treatment of various brain and psychological disorders. it is believed that well-designed studies will be conducted and show this modality can help people with these difficult disorders. While there are methodological weaknesses in the some studies and case reports, there is evidence that neurofeedback treatments can be beneficial. This treatment benefit would be measured by improved health, less use of medication and lower medical care costs.

Appendix : Resources

A. Major manufacturers of Biofeedback Equipment. Below are listed those who manufacture biofeedback equipment; in all cases, these systems can do neurofeedback or neurotherapy. In most cases, this kind of equipment can be sold only to licensed health professionals. These companies also provide training in the use of the equipment.

1. Thought Technology: www.thoughtechology.com, (800) 361-3651. The largest biofeedback equipment maker in the world; their systems are multi-modality.
2. J & J Engineering: www.jjengineering.com, (888) 550-8300; systems are multi-modality.
3. Nexus: www.stens-biofeedback.com, (800) 257-8367; systems are multi-modality
4. Brain Master: www.BrainMaster.com, specializes in neurofeedback, and supports several of the most popular systems. (440) 232-6000.
5. MindAlive makes audio-visual stimulation and entrainment systems. www.MindAlive.com, 1-800-661-MIND or (6463).
6. PirHEG (Hemoencephalography): Dr. Jeffrey Carmen, www.stopmymigaine.com, 315-682-5272.

B. Biofeedback and Neurofeedback Organizations

1. The Biofeedback Certification Institute of America (303-420-2902, BCIA@resourcenter.com) organization certifies practitioners on biofeedback (Board Certified in Biofeedback, or BCB) and neurofeedback (BCN). They also publish some training materials and books.
2. The Association for Applied Psychophysiology and Biofeedback (AAPB) is the principle professional organization for biofeedback. 10200 W 44th Ave, #304, Wheat Ridge, CO 80033. www.aapb.org, 303-422-8436, aapb@resourcenter.com
3. International Society for Neurofeedback and Research, www.isnr.org. This is the main professional organization for neurofeedback. They have an annual

conference in the Fall; the website has a list of professionals offering neurofeedback, as well as articles.

C. Important Texts in Biofeedback and Neurofeedback.

Budzynski, T.. Budzynski, H., Evans, J., & Abarbanel, A. (Eds.) Introduction to quantitative EEG and neurofeedback, 2009 Academic Press. This is a dense and technical book on neurofeedback and related modalities. It covers theory, the underlying electrophysiology, and practical applications.

Schwartz, M & Andrasik F. (2003). Biofeedback: a practitioner's guide. 2003, Guilford NY. This is the main text in the field of biofeedback, and contains detailed explanations of the equipment, physiology of the disorders most commonly treated, extensive review of the literature, as well as ethical and office practices for professionals. It is currently under revision with the fourth edition coming out soon.

Thompson M. & Thompson L. The neurofeedback book. 2003 AAPB, Wheat Ridge, CO. This book is the most thorough text on neurofeedback book to date, written by experienced neurofeedback practitioners, a psychologist and psychiatrist, with a detailed background in neuroanatomy and neurophysiology presented.

Yucha C & Montgomery D. Evidence-based practice in biofeedback and neurofeedback. 2008 Wheat Ridge, CO: AAPB. In this short book, disorders in which biofeedback and other behavioral interventions are reviewed and rated according to the Chambless and Hollon (1998) level of efficacy. Ratings by these authors do not necessarily agree with others rating the utility of biofeedback (e.g., Schwartz and Andrasik, 2003, p. 107).

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A Review of A Basic Theory of Neuropsychoanalysis by William M. Bernstein

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A Basic Theory of Neuropsychoanalysis by William Bernstein presents the effervescing cusp of the integration zeitgeist in psychology. This book brings together viewpoints of multiple schools of psychological thought (e.g., psychoanalytic, cognitive and affect regulation) and neuroscience for approaching the mind-body continuum in mental disorders. The inclusion of psychopharmacotherapy in the psychologists' treatment armamentaria is the catalyst for Bernstein's thesis. Psychopharmacotherapy is an important piece that puts this book at the forefront of the effort to define a relatively new dynamic in the process of constant restructuring of the practice of psychology. Bernstein addresses this development in terms of its niche in the multivariate process of psychoanalytic-informed psychotherapy, as well as a heuristic for understanding the mind-body complex or "brain-mind." This book contributes Bernstein's understanding of the medical aspects of treatment, as well as, neuro-physiological concepts, with a predominantly psychoanalytic model of psychological disorders. Dr. Bernstein writes as a licensed prescribing psychologist with a psychologist's eye for and appreciation of higher-order explanatory constructs.

The author's writing style demonstrates empathy for the reader who is being presented with a host of complex ideas in novel juxtaposition. Bernstein first reviews fundamental psychoanalytic concepts, with an emphasis on Freud. The pleasure principle and its complimentary competitor, the repetition compulsion, remain focal points as he explores neuroanatomical structures and neurophysiological processes for the understanding of mental disorders. Bernstein writes: "A simple starting assumption of this book is that parts of the brain and mind are not operating merely on a pleasure principle. Processes in cortical association areas involved with cognition and feeling represent the brain and mind functions most regulated by a pleasure principle. Feeling and thinking are more or less equivalent to sensing and interpreting sensations of pleasure and pain. In contrast to these cortical regions, more primitive areas of the brain such as the amygdyla have more specific functional responsibilities. The amygdyla functions to regulate reflex-like, fear and flight responses. In the absence of gross psychoneuropathology, its functions can come to be regulated by the higher regions of mind and brain. That is, by those brain-mind areas operating under a pleasure principle. In PTSD clearly, and I assume in all other psychopathologies to various degrees, the functioning of cortex and various brain nuclei become disjoined. In other words, the mutual regulatory processes of the brain-mind system are out of order (pp. 3-4)."

Bernstein notes that the pleasures of thinking leading to organizing concepts is greater than other pleasures including sex and aggression. Trauma and other distracting experiences that challenge mental organizational capacities. Thus, anticipatory aspects of the

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pleasure principal motivate repeated efforts (repetition compulsion) to maintain awareness of traumatic experience until a higher-order conceptualization evolves. The interplay between thinking and conceptualization, pleasure principal, repetition compulsion, trauma, mental health and illness can be better understood with deference to their neurophysiological substrates. Bernstein [p. 6] explains:

> "The aim of [the] book is to describe psychoneurological structures and processes that function to promote and inhibit learning. If there is an overarching monotheism here, it is that the desire to learn about reality has the most potential of all desires to generate intense feeling and, of course, thought... Conceptual activity is more pleasurable than merely sensing information." This is because: "The brain's association areas have the greatest density of mu-opiod receptors. In other words, it is the interpretation of visual patterns that leads to the feeling of pleasure (Biederman & Vessel, 2006, p.253)." [2]

Bernstein reviews other schools of thought, including cognitive and affect regulation and their contribution to understanding of mental and psychotherapeutic processes. The author keeps his reviews interesting by his readable style and by discussion of these theories and approaches in relation with neuroscience. With each of the approaches reviewed he details the relative integration — or lack thereof — of neurophysiological processes in the theoretical models, and their associated strengths and weaknesses. For example, cognitive therapy models lack of acknowledgement of motivational and unconscious systems, and the inherent neurobiology of these systems whereas Affect Regulation models have a relatively better accounting of these dynamics.

The important roles of approach-avoidance dynamics and time conceptualization and estimation are given attention in their own chapters. There probably should be a more extensive discussion of the object relations from a temporal perspective. Also, it would be useful to give attention to the role that attachment relationships play in determining the modulation of affective experience in the regulation of physiological needs as suggested by Stern.[3] An individuals' ability to cope with both time and interpersonal relationships probably have a common developmental "ancestory" in early object relations. It is the reviewer's view[4] that, problems with time extension can be understood as internalizations of the temporal component of sequential attachment processes are a component of the object representation.

These various psychological processes are approachable from an emphasis on object relations or an emphasis on drives. Bernstein takes the "drive" approach that is balanced by reference to object relations that is satisfying and contributes to the overall coherency of the book. The less emphasis on the alternative formulations' role of treatments for our special populations leaves open the question of how particular theoretical formulations appeal to us as therapists. In turn, this elicits the question of how these preferences affect how we experience the role of drugs in the treatment of mental disorder from a psychological, relational perspective. Different clinical populations respond differently to different clinical approaches informed by different theoretical emphases. A common practice problem is to decide when an emphasis on drive is more applicable or useful with a particular population. Patients who have the basic ego formation, flexibility and resilience to can better tolerate addressing, directly, libidinal energies emerging in the therapeutic process. Bernstein presents anxious patients and patients with more moderate mood disorders who can reflect on the meaning of conflict and can tolerate insight into their choices. On the other hand an emphasis on object relations may guide

us better with patients, such as more severely ill patients in need of regulation and containment of impulses, e.g., psychotic patients or patients with more severe mood disorders or co-morbid personality disorders.

The differentiation of theoretical perspectives is relevant here in that it pertains to the ways in which psychopharmacotherapy is addressed in the book. Medications introduced into the psychotherapeutic relationship can be understood as having a role in the expression and processing of conflict, experience of libido and other drive related phenomena. Bernstein illustrates this vividly in the cases he articulates in the book. On the other hand, psychotropic medications also have potential as transitional objects in the formation of internalized object-representations probably and this is not thoroughly articulated. More attention to combined treatments of psychotherapy and psycho-pharmacology of more severe disorders would be welcome.

Bernstein builds a solid foundation for his basic theory of neuropsychoanalysis by including each of the component pieces and the neuroscience implicit in each piece. He then Bernstein presents two clinical cases: Mr. K. and Mr. C. These cases illustrate the meaningfulness and utility of applying psychoanalytic theory that combines each of the other elements and that is grounded in neuroscience. While seeking evidence of positive outcome evidence he shares the depth and humanity in his relational experience with and attitude towards his clients. He presents their lives, struggles, efforts, and strengths, as well as, the multiple forms of their presenting problems with poignancy.

Psychological concepts and dynamics are illustrated with meaningful vignettes, dreams, the transference-countertransference, and direct relational experiences with humanity. This elevates the quality of his case presentations above typical case write-ups where close attention is paid to the pharmacotherapy intervention piece making the role of the patient the test tube for changes in symptoms due to drug effects. Bernstein effectively keeps Mr. K. and Mr. C., and his therapeutic relationship with them central even when reflectively addressing the psychopharmacology piece as one component of a network of dynamics involved in the clients' treatment and their response to treatment. Mr. K.'s struggles with Oedipal and fraternal-competitive dynamics around his preoccupation with the theme and characters of the movie, High Noon, is effective and ultimately moving as a literary event as well as a theme of their clinical work together.

Bernstein intersperses sparing but effective moments of wry, empathic humor in his prose. Readers come to know Mr. K. quite well, and become familiar with the particular paradoxes associated with his psychodynamic make-up. Bernstein writes, "Drops in anxiety tend to cause an increase in anxiety in him." He goes on to elaborate the underlying psychodynamic "vicious cycle" that is central to Mr. K.'s problems in living. For Mr. K. there are perceived dangers associated with awareness in acknowledging the underlying his protective anxiety and somatoform problems.

There is a chapter devoted to eye movement desensitization and reprocessing therapy (EMDR) in the midst of the case presentation of Mr. K. Similarly, EMDR training was introduced in the midst of Mr. K.'s treatment that highlights the role of behavioral response interventions in bringing about neurophysiological changes. This effective illustration of EMDR also serves to integrate body and mind in a network of interacting domains in treatments. Treatments are a psycho-educational amalgam of the development of cognition and affect- the nervous system, and relationships. Psychotherapy, medication and conditioning/extinction response training are part of a

larger interacting complex of systems. No one-treatment process can be eliminated from the dynamic equation to affect positively the functioning of the person. None of these processes has absolute hegemony on alleviating pathological processes for each plays its interdependent role with each other in the human meta-system.

This very valuable, timely and well-written work looks at alternative directions that are evoked but not covered as extensively. These directions deepen our understanding of the collaborations among neuroscience in psychoanalysis, as well as, in psychotherapy and psychopharmacotherapy. The strong drive emphasis throughout the book and provides a useful framework for illustrating the role of libido, conflict and gratification in response to medications, and the effect of inserting medication into the treatment strategy. Approaching the same material from an object relations perspective would likely yield additional valuable formulations for understanding the reciprocal interactions between the electrochemical structures of the body and the dynamics of mind and behavior.

Bernstein does an excellent job moving us forward, in the direction of greater awareness of how these paradoxically disparate, yet continuous, aspects of life really interact in psychotherapeutic process. He humanizes variables traditionally handled by the “harder” sciences. Bernstein’s high degree of humanity as a healer using psychological processes and psychopharmacological procedures cannot be mistaken for his being simply a “prescriber” or a misplaced neuroscientist in the consulting room. Bernstein does a wonderful job of demonstrating and reinforcing this expanded role of psychologists.

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