The Addiction Severity Index (ASI) was first developed in 1980 by A. Thomas McLellan, the well-known addictionologist and his colleagues (1980, 1985, 1994, 1997). The ASI was designed as a structured clinical interview focusing on many key aspects of a substance abuser’s life. Although the ASI assesses addiction problems, it also includes sections pertaining to medical problems, legal status, employment issues, family and social relationships, and psychiatric issues.

At the time that McLellan developed the ASI, clinical care for addictions was plagued by a myopic perspective that substance abusers in treatment should and could only deal with their drug or alcohol problems. Focusing on anything else was considered treatment resistance. Clinicians were taught never to trust substance abusers. Moreover, clinicians learned to be alert to abuser’s denial or their ability to fool others and themselves by “changing the topic” from their real problems of drug or alcohol abuse. Furthermore, nothing could change unless or until the substance problem was addressed. Although it is clear that substance abusers may directly or indirectly obfuscate their addiction problems, McLellan perceived of the substance abuser with the respectful attitude that he or she is a
“whole person” and that effective drug and alcohol treatment entails examining many aspects of the person’s functioning.

The ASI was designed to provide a broad set of metrics regarding a client’s functioning in many areas of life commonly associated with substance abuse problems. The ASI can also be administered on more than one occasion to measure outcomes in an individual client, or many clients’ data can be aggregated and used to learn about the population of clients being seen at a given clinic, in a given region, and so on.

Since its initial development, it has been used worldwide and translated into 14 languages including Spanish and Chinese. Many state and county systems in the United States use the ASI and the Federal Department of Veterans Affairs uses it as well. At present, it is the most widely used, standard measure for examining problem severity within and across substance abusers in treatment. It is also a very effective treatment-planning tool since McLellan and his colleagues (1994, 1997) demonstrated that if ASI severity scores are used to inform treatment interventions, clients stay in treatment longer, have more positive attitudes about treatment, and have better outcomes.

Because of the nature of the interview, McLellan has also maintained that the ASI needs to remain an interview rather than a paper and pencil self-report. Many questions included in the ASI are very personal and pertain to sensitive issues such as illegal activities and socially unacceptable behaviors. Therefore, the interview progresses from basic questions to more delicate and sensitive topics as the client’s level of comfort with the interviewer increases. Because many individuals interviewed using the ASI have literacy problems or are functionally illiterate, they cannot be expected to read through a lengthy, complex interview and accurately rate their selections.

Our computerized version of the ASI, called the Addiction Severity Index Multimedia Version (ASI-MV®) will be the focus of this chapter. We have written previously about dissemination strategies for the ASI-MV® (Budman et al., 2003), but this presentation is the most broad-based, comprehensive elucidation regarding this powerful clinical tool.

PROBLEMS WITH THE ADDICTION SEVERITY INDEX

Although the ASI is very useful in a variety of ways, it is plagued by a number of important problems. Most of the issues associated with the ASI pertain to the fact that it is a lengthy, structured interview that requires extensive and repeated interviewer training to achieve and maintain reliability. To administer the ASI

properly, a clinician requires many hours of preparation to achieve proficiency. There is also the problem of “rater drift,” which means that human raters, after training on any standardized rating system, tend to drift away from the norm to which they were trained. These problems are further exacerbated by the fact that staff turnover at substance abuse treatment facilities is extremely high and job satisfaction is often very low. Substance abuse treatment facilities have employee turnover rates that average 50% per year (Carise et al., 2003). The ASI is also costly to administer; the administration of one ASI, even by an entry-level clinician costs at least $25, with fringe benefits (including scoring and report writing). For the most part, clinicians do not enjoy administering the ASI and view it as a hoop to jump through before “really getting down to treatment.” Administering the ASI is even used as a “punishment” or remedy for bad clinicians in some settings. (Presumably, the structured interview helps mitigate the potential for damage.)

The ASI also requires the interviewer to contribute a number of subjective judgments that are intended to be rationalized through the training process. However, when the ASI is used for treatment placement and reimbursement decisions, the likelihood of biases influencing the process appears to be substantial. For example, if a certain threshold ASI severity score warrants a higher level of reimbursement, consciously or unconsciously, interviewers may tend to score clients as more severe.

THE ADDICTION SEVERITY INDEX-MULTIMEDIA VERSION

With these ASI problems in mind, the research and development team at Inflexxion began to work on a technological solution in the mid-1990s. With support from National Institute on Drug Abuse (NIDA), the Inflexxion team developed a computerized, client self-administered version of the ASI, with audio and video, entitled the Addiction Severity Index-Multimedia Version (ASI-MV®). Because minimal staff time (completion of a basic information screen) is necessary to administer the program, the ASI-MV® can be used for a fraction of the cost of a face-to-face ASI interview. Additionally, staff can focus on developing effective treatment plans rather than administering the ASI.

The ASI-MV® is offered in English, Spanish, and now Chinese (Mandarin and Cantonese). It is currently used in over 800 sites in the United States, Canada, and Australia. An online version, ASI-MV® Connect, was launched in the spring of 2007 and an adolescent version will be released in mid 2008. Although the online version actually resides on the user’s desktop, it (like antivirus software) can be updated from the Internet on a regular basis and, in turn, can upload relevant information to the Internet automatically, in full compliance with HIPAA security and confidentiality requirements.
The ASI-MV® uses the metaphor of a virtual city to take users through the ASI questions. At the beginning of the program, the user is greeted by two "guides," George and Angela, who introduce the ASI-MV® (see screen shot above) and then "escort" the user to different offices within the city. The user "meets" on screen video interviewers at the offices representing various sections of the ASI (e.g., Medical, Legal, Family). For example, in the Medical section, the user meets a physician who asks medical-related questions. In the Legal section questions are asked by an attorney. Between sections, George or Angela return and escort the user to his or her next interview and offer encouragement, such as "You're halfway through." Interviewers in the program read the questions to users, but if an individual can read well and does not wish to wait for material to be read to them, he or she can navigate more quickly. The interviewee responds to questions by clicking the appropriate buttons that are highlighted as that response is read. Like a human interviewer, the ASI-MV® uses prior question responses to skip those items that are irrelevant to a particular interviewee. Thus, an individual who does not use heroin will not be asked any further questions about his or her heroin use.

The ASI-MV® screens are designed for use by clients with no prior computer experience. The large screen buttons are easy targets for the mouse (there is no fine scrolling, menu selection, or skillful manipulation of the mouse required). Users with no computer experience learn quickly to operate the mouse and
appear to enjoy the experience as well. McLellan and his colleagues at Treatment Research Institute (TRI), conducted a small independent pilot study in November 2001, examining clients' responses to the ASI-MV® compared with the clinician-administered ASI. They found that 96% of the clients reported the ASI-MV® was “very” to “extremely” easy to use and clients preferred the ASI-MV® over the original ASI, 12 to 1 (Gurel & Carise, 2001). Additionally, the researchers found that clients with no computer experience said it was user-friendly, those with reading difficulty preferred the audio component of the ASI-MV®, and many clients reported feeling more comfortable and less threatened taking ASI-MV® by themselves. Also, Marsh Mathews, Program Manager for Mental Health Services—Options for Recovery in Vista, CA, reported that “Clients with no computer experience have no problem completing the ASI-MV®. They were more honest than with the interviewer and even counselors who were initially resistant to using the program, now like it.” Clients quickly master the ASI-MV® regardless of education level, reading ability, and computer experience.

Because the original ASI provides the interview format but not necessarily the precise wording of questions, we needed to derive the exact wording for the ASI-MV® by observing experienced interviewers. The question format within the ASI-MV® was developed by working closely with expert ASI interviewers from TRI in Philadelphia. During observation we took note how interviewers asked particular questions, and responded to interviewee misunderstandings, etc. The current ASI-MV® wording was developed through an intense, iterative process.

Developing a computer-generated formula for the ASI Severity Ratings was even more difficult than wording the questions correctly. Because the Severity Ratings are derived from the interviewer’s clinical judgment of interviewee severity based on responses to all questions within a section and not by an arithmetic formula, this was a significant challenge. Our initial approach to this challenge was to develop an algorithm (Butler et al., 1998) using data from over 1000 expert interviewer-administered ASIs. Repeated resampling of the dataset permitted derivation of stable regression equations predicting the Severity Ratings for each ASI domain from clients’ answers to preselected interview items. This algorithm, dubbed the Predicted Severity Ratings (PSR), when tested with a new dataset proved a very accurate representation of expert interviewer Severity Ratings. Since the ASI-MV® was first developed, we have continued to refine the PSR algorithms and have sharpened them even further with new data.

**OUTCOME DATA**

In modifying the ASI for computer administration, it was most important that the scale not lose reliability and validity. For all the reasons described above, it is unlikely that the ASI “in the wild” is nearly as valid or reliable as when it is administered by experts in the carefully controlled and rarified environment of a research project. However, our goal was to develop the ASI-MV® into the
"world’s best" ASI interviewer, maintaining reliability and validity without being subject to the inconsistencies that occur with human interviewers. The research that we have conducted on the ASI-MV® strongly supports this contention.

A comprehensive psychometric test of the ASI-MV® established strong evidence of reliability and validity. A NIDA-funded study by Butler and colleagues (2001) found that the ASI-MV® was acceptable to client volunteers, required about the same amount of client time to administer (a mean of 43 minutes compared with 45–60 minutes for the interview), and minimal staff time. Once completed, the program automatically calculates Composite Scores as well as the mathematical prediction of the Interviewer Severity Rating (Butler et al., 1998). Test–retest reliability was tested over a 3-day period based on reasoning by McLellan and colleagues (1985) that this is a long enough interval to reduce likelihood of simply repeating answers from memory, but short enough to reduce the possibility of real changes in patients’ situations. Furthermore, the IntraClass Correlation statistic was used to evaluate test–retest reliability. The intrarater correlation coefficient (ICC) is recommended when the variables to be correlated belong to a common class, meaning that the variables share both their metric and variance (McGraw & Wong, 1996), as opposed to the Pearson r, which is used when measures have different scales (e.g., weight and height). Thus, the ICC is commonly used for examining reliability. Traditionally, interpretations of the magnitude of ICCs assume that values >0.80 represent “perfect” agreement; 0.61–0.80 is substantial; 0.41–0.60 is moderate; and 0.21–0.40 is fair reliability (McGraw & Wong, 1996). On the basis of these principles, the ASI-MV® was found to have excellent test–retest reliability (ICCs, between 0.81 and 0.97 for Composite Scores/0.76 to 0.90 for Severity Ratings).

Validity was examined in two ways. First, it was important to establish that the scores generated by the ASI-MV® are similar to some “gold standard.” This is referred to as criterion validity. In this instance, the “gold standard” was considered to be to the traditional interviewer-administered ASI. Thus, we calculated agreement of the ASI-MV® assessment with an interviewer-administered ASI at a time 3 days before or after (in counterbalanced order) from the ASI-MV® assessment. In this context, the ASI-MV® yielded good criterion validity for the Composite Scores (ICCs between 0.54 and 0.95). Agreement with interviewers’ judgments for Severity Ratings, however, was problematic, ranging from ICCs of −0.12 to 0.64. Exploration revealed considerable variability for each of the interviewers. That is, for each domain, some interviewers appeared to agree with the ASI-MV®, and some appeared to disagree. There were no domains for which all interviewers disagreed with the ASI-MV®. This state of affairs suggested a lack of interrater reliability among the interviewers. This could not be ruled out, because standard ASI training does not involve establishing interrater reliability of Severity Ratings. To further explore this situation, the PSR equations were applied to the interview data. This analysis yielded IntraClass correlations of acceptable levels (Medical 0.76; Employment 0.64; Alcohol 0.69; Drug 0.49; Legal 0.84; Family/Social 0.74; and Psychiatric 0.81). Thus, the data
given to the interviewers by clients were not so different from the data the clients were reporting to the ASI-MV®; certainly not different enough to account for the disagreement in the Severity Ratings. Rather, the disagreement on Severity Ratings may be due to inconsistencies in the interviewers’ judgments.  

Finally, convergent/discriminant validity was evaluated comparing the ASI-MV® scores on each domain with comparison measures for each of the domains. Convergent/ discriminant validity, a conservative assessment of validity, requires three conditions be met (Campbell & Fiske, 1959). First, each ASI-MV® domain score (Composite Score or Severity Rating) should be correlated in the appropriate direction with its designated comparison test. Second, each domain score should be more highly correlated with its designated comparison than with any of the other tests. Finally, a comparison test should be more highly correlated with its paired ASI domain score than with any of the other ASI domain scores. Correlations among all the ASI-MV® domain scores and their comparison measures are arranged as a matrix with the ASI-MV® scores on the rows and comparison measures across the columns. In this analysis, correlations on the diagonal represent convergent validity (correlation between a domain score and its comparison). Off-diagonal correlations reflect discriminant validity (correlations with a domain score and the comparison measures for the other domains). For the Composite Scores, the average on-diagonal correlation ($r = 0.37$) was significantly higher than the average off-diagonal correlation ($r = 0.17$) for the ASI-MV® ($t = 3.92; df = 47, p < 0.001$). Interestingly, the convergent/discriminant validity of the Composite Scores for the interviewer-administered ASI was less in evidence. The average on-diagonal correlation ($r = 0.28$) for the interviewer version was not significantly different from the average off-diagonal correlation ($r = 0.17; t = 1.82; df = 47$, NS), although the basic pattern of relationships was similar for the interviewer and ASI-MV® administered version (i.e., on-diagonal correlations tended to be larger than off-diagonal correlations). It should be noted that discriminant validity results reported by McLellan and colleagues (1985), conducted with the interviewers who helped to create the original ASI, did find significantly greater on-diagonal correlations than off-diagonal ones.

Similar results were obtained for the Severity Ratings. Again, there was support for the discriminant validity of the ASI-MV® Severity Ratings, with the

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2 It is interesting to note that the research interviewers who administered the interview ASI in this study were trained using standard ASI training procedures, which do not require establishing interrater reliability. On the basis of our experience in this study, a subsequent study examining the psychometric properties of a Spanish language ASI-MV®, considerable effort was made to establish interrater reliability among the interviewers. In this study (Butler et al., 2007a, MS in preparation), the range of ICCs for the Severity Ratings between the computerized version and the interviewers was −0.12 to 0.64 when interviewers were not trained to be reliable and 0.64–0.78 when they were. This finding further supports our contention that the relationship between interviewers’ judgments and the ASI-MV® Severity Ratings were adversely affected by the lack of interviewer training. Implications seem clear for the clinical setting, where such intensive training and supervision are not present.
average on-diagonal correlation \((r = 0.44)\) significantly higher than the average off-diagonal correlation \((r = 0.18; \ t = 5.85; \ df = 47, \ p < 0.001)\). And again, the average correlations for the interviewer-generated Severity Ratings were not significantly different (on-diagonal mean \(r = 0.24\); off-diagonal mean \(r = 0.15, \ t = 1.78; \ df = 47, \ NS\)). This was particularly true for the Severity Ratings. In every case where agreement with interviewers' judgments was poor, the ASI-MV\(^\circledR\) demonstrated superior convergent/discriminant validity.

These psychometric results suggest that part of what the ASI-MV\(^\circledR\) brings to an ASI assessment is consistency. The careful construction of the ASI-MV\(^\circledR\) has led to a system that has been shown to be reliable and valid. When discrepancies are found with human interviewers, the ASI-MV\(^\circledR\) appears to perform in a manner that is more consistent. Indeed, a direct comparison of Severity Ratings generated by the ASI-MV\(^\circledR\) and by expert ASI interviewers (Butler et al., 1998) revealed correlations above 0.84 for five of the seven domains, with legal at 0.66 and family/social at 0.75. Given the importance of training and consistency in achieving reliable and valid ASI assessments, the expense of training and recalibrating clinical interviewers, and the frequent turnover of counseling staff at treatment centers (Carise et al., 2003), the relevance of an automated tool like the ASI-MV\(^\circledR\) is evident for settings where training and maintaining expert ASI interviewers is impractical or impossible. Furthermore, such consistency makes results directly comparable across treatment and research settings.

In addition to these psychometric advantages, clients are unanimously enthusiastic about using the program. After several thousand research and commercial administrations, we have encountered (or heard about) only one client who could not complete the program after a brief, initial introduction. This user had severe multiple sclerosis, who became fatigued easily and had extremely poor eye/hand coordination and muscle control. Spontaneous comments by clients in both research and commercial settings suggest that they consider the ASI-MV\(^\circledR\) interesting, attractive, and engaging. Moreover, the time required for completing the ASI-MV\(^\circledR\) is comparable to the amount of time estimated for the ASI interview. Client experiences using a computer mouse with the ASI-MV\(^\circledR\) for the first time have been quite satisfactory as well. Inexperienced users have quickly learned how to use the mouse.

**HOW COST-EFFECTIVE IS THE ADDICTION SEVERITY INDEX-MULTIMEDIA VERSION**

The ASI-MV\(^\circledR\) has proven to be both a cost-effective and a time-saving tool for commercial customers of Inflexxion. The average cost to administer, score, and generate a full narrative report of ASI-MV\(^\circledR\) is about $7. As stated earlier, the cost to have a staff person administer the ASI, including the scoring and write-up, is at least $25, with fringe benefits. Utilization of the ASI-MV\(^\circledR\) represents a potential 72% savings in assessment costs.
Within the first year of ASI-MV® implementation among 30 provider groups, contracted with a large regional coordinating agency in Michigan, the coordinating agency’s management reported that providers were saving about $45 per assessment. They also reported average staff assessment time decreased from 2 to 1 hour. Annually, this is saving the region about $225,000 and, as a result, they have increased the number of counseling sessions initially authorized from 10 to 11.

Many ASI-MV® sites report similar major savings and reallocation of resources accordingly.

WHERE CAN THE ASI-MV® BE USED?

There are currently about 80,000 administrations of the ASI-MV® per year, and this number is expected to accelerate dramatically once the ASI-MV® Connect is widely adopted. ASI-MV® Connect is a clinical and research tool with an impressive range of application in settings such as substance abuse, mental health, behavioral healthcare, dual diagnosis, and methadone maintenance programs; drug courts; probation departments; correctional facilities; Treatment Accountability for Safer Communities (TASC) organizations; driving under the influence (DUI) programs; and welfare (TANF) organizations.

The Oklahoma Department of Mental Health and Substance Abuse Services (ODMHSAS) has approved the use of the ASI-MV®, and it is being used in its substance abuse settings, drug courts, and DUI assessments. In 2004, at the request of the ODMHSAS, we were able to add an electronically generated report to the ASI-MV® program that extracted 20 of the ASI questions that the state uses as a screen for victims of domestic violence and sexual assault. A positive screen results in a referral for a full assessment. Also, the City of Oklahoma City Municipal Courts’ Probation Department established an on-site testing and assessment center where the ASI-MV® helped improve the efficiency of their Probation Officers. According to Lashawn Thompson, Chief Probation Officer

“the ASI-MV has tremendously enhanced our program. The ASI-MV allows the probation officer to focus on the defendant and their current issues rather than spending an enormous amount of time on paperwork, thereby, increasing productivity and services. Prior to establishing an on-site testing and assessment center, only two assessments per officer could be completed daily. Probation Services can now complete eight assessments daily. This testing center only requires the supervision of one office.”

The New Mexico Department of Health, Behavioral Health Services Division, has approved the statewide use of the ASI-MV® and made it available to contracted substance abuse providers. In 2005, Inflexxion helped New Mexico analyze their ASI and ASI-MV® data to measure outcome, as defined by change in Composite Scores, and to better understand their population in treatment.
Now, through Value Options New Mexico, they have "real-time" access to their aggregate data on the new Web-based ASI-MV® Connect Data Center.

Louisiana's Office of Addictive Disorders (OAD) and the Department of Social Services are using the ASI-MV® statewide to screen their TANF(welfare) population. Although the ASI-MV® is generally not used as a screening tool, the OAD realized that the information generated in the seven ASI domains would assist them in better understanding their population's needs, improving services delivered, and in helping TANF recipients overcome barriers to finding work. According to Quinetta Rowley, TANF Liaison for the OAD in Baton Rouge, LA, "I think the ASI-MV is an excellent guide for the clinicians that have trouble administering a thorough assessment. I like the different domains it addresses and it addresses the whole person." And, Angel D. Lechtenberg, a Social Services Counselor for the OAD in Lake Charles, LA, found that

"Comparing previous monthly reports of clients referred, the number of clients referred for substance abuse issues has increased. The assessment is ready to be shared with client's substance abuse counselor. Also, other opportunity areas in client's life are identified and services can be recommended and/or provided for client, including mental health, family counseling, smoking cessation, anger management, etc."

The ASI-MV® also has great utility for the average clinician who sees substance abuse clients. It is an ideal way to look at standardized data and have that data organized in a report (which can be used for documentation and insurance purposes). The data and the report also have direct implications for good treatment planning. One solo practitioner in Texas, Julie West, has dramatically increased her practice doing drug and alcohol evaluations using the ASI-MV® as a core component of those evaluations. Her practice increased so greatly that she needed to bring on more clinicians.

ROLE IN A COMPREHENSIVE TREATMENT PROGRAM

In a study of inpatient and outpatient/day treatment programs, McLellan et al. (1994) investigated the effects of matching services to three functional areas of concern for chemically dependent clients: Employment, family/social, and psychiatric problems. A randomized clinical trial examined outcomes for clients who received services that were matched to their problem areas versus control clients who received unmatched services. In the targeted areas, the matched clients achieved better outcomes than unmatched controls, with employment and psychiatric improvements achieving statistical significance. This research suggests that significant therapeutic gains can be obtained by matching the client's needs to the services that he or she receives. These findings support the importance of substance abuse programs to address ancillary areas, which are known to be major predictors of outcome (McLellan et al., 1994). An effort by McLellan and colleagues (1997) to follow-up on this work in a more practical, nonresearch setting found that the effects were difficult to implement across
programs. However, they concluded that within a program, it is possible to match treatment to problems and that such matching increases the effectiveness of substance abuse treatment systems.

RESEARCH AGENDA

The Inflexxion team has been working on the ASI-MV® and now the ASI-MV® Connect in a comprehensive set of studies since 1996. Much of this NIDA-funded research has involved extending the ASI-MV® to other languages, especially Spanish and Chinese (Mandarin and Cantonese), using state-of-the-art procedures for adapting psychological measures to other languages and cultures (e.g., Geisinger, 1994; Rogler, 1999). These procedures reflect attempts to deal with the effects of cultural misunderstandings on content validity of adapted psychological assessments. The primary focus of these concerns is that satisfactory content validity of a measure cannot be assumed to transfer to another language and culture. Although translations of the ASI exist, according to bilingual counselors, some are not adequate for use with substance abuse populations in the US. For instance, the existing Spanish translation is done in formal Castilian Spanish. Counselors who work with Spanish-speaking clients reported that they usually translated the English version themselves "on the fly" as they worked with a client. Our efforts involved adapting the ASI-MV® wording with bilingual counselors from Mexican-American, Cuban-American, and Puerto Rican backgrounds. These efforts resulted in a Spanish language ASI-MV® with the same advantages of the English version. Indeed, recently collected psychometric data with clients in substance abuse treatment from the three predominant Spanish-speaking cultures in the US are excellent (Butler et al., 2007a ms in preparation). For example, 3-day, test–retest correlations range from 0.60 to 0.93 for the Composite Scores and from 0.69 to 0.89 for Severity Ratings. Criterion validity (comparison with an interviewer) achieved ICCs between 0.81 and 0.93 for Composite Scores and between 0.64 and 0.78 for Severity Ratings, which are in the range of "substantial" to "perfect" agreement (McGraw & Wong, 1996). Using the same procedures described above for the English version, discriminant validity was demonstrated. For composite scores, the average on-diagonal correlation for the Spanish ASI-MV® domains was $r = 0.50$ and was significantly greater than the average off-diagonal correlation of $r = 0.17$ ($t = 6.80, df = 47, p < 0.001$). Similarly, the Severity Ratings of the Spanish ASI-MV® yielded a significant difference between the on- and off-diagonal correlations (average on-diagonal $r = 0.52$; average off-diagonal $r = 0.20$; $t = 5.70, df = 47, p < 0.001$). This compares well with the same correlations obtained for the interview version. That is, for composite scores from the interview, the average on-diagonal correlation was $r = 0.43$, and the average off-diagonal $r$ was 0.16 ($t = 5.13, df = 47, p < 0.001$). For the Severity Ratings, the figures for interviewers were for the on-diagonal $r = 0.27$ and for the off-diagonal $r = 0.14$, which was not a
significant difference. Finally, there was good evidence for structural invariance between the Spanish adaptation of the ASI-MV® and the English ASI. A similar approach was used to adapt the ASI-MV® to two Chinese languages, Mandarin and Cantonese. Psychometric data have been collected on this adaptation and the analyses are currently underway. In both the Spanish and the Chinese projects, special attention was given to achieving a culturally and linguistically appropriate adaptation that results in a reliable and valid assessment.

Another interesting project that was completed in early 2007 is called the ASI-MV® Connect Data Center (originally titled Addiction Resources.com). This project, also funded by NIDA, is an enhancement of the ASI-MV® that provides clinic administrators access to a robust online data-reporting portal. The purpose of this website is to increase efficiency for the “typical” clinic administrator to begin use of actual ASI data in clinical practice. After uploading aggregate, deidentified ASI-MV® data from a clinical setting, administrators can use the portal to easily manipulate data and create tables and graphs. Straightforward tools allow even novice users to construct simple descriptive analyses with various demographic breakdowns. The commands to manipulate data are in English and require no previous statistical knowledge; the tables and graphs can even be copied into word processors for report creation. Designed for people with little or no statistical background, the portal also includes a brief online tutorial about basic statistical principles and use of the reporting features.

A field trial of the website prototype (Butler et al., 2007b ms in preparation). Examined the effect of the training program on the acquisition of statistical knowledge by clinic administrators exposed to the ASI-MV® Connect Data Center online training program as compared with clinic administrators exposed only to written materials or no training at all. Results suggest that the clinic administrators exposed to the training program performed significantly better on a statistics knowledge test than individuals exposed only to written materials or no training at all. In addition, those exposed to the training were significantly more confident than controls in their ability to use clinical data. Finally, satisfaction ratings on the entire program were extraordinarily positive. Respondents indicated “good” or “very good” satisfaction on the overall concept of the program (96%) and the potential usefulness of the program to impact quality (92%). Comments about the website were similar to this: “I liked being able to flip the variables, the color graphics, and easy to understand directions. [It] even helped to simplify stats (with which I ALWAYS had some trouble.)” Given these findings, we believe that ASI-MV® Connect Data Center will help clinical administrators develop the skills they need to use clinical data and improve the quality of substance abuse treatment. ASI-MV® Connect Data Center along with the ASI-MV® line of assessments are all consistent with Inflexxion’s ultimate goal: Enhance substance abuse assessment and treatment by integrating systematic and data-driven processes into ongoing, real-world treatment settings.

A note is warranted here regarding the ASI-MV® and ASI-MV® Connect as an Internet-based application. In 2004, the American Psychological Association
(APA) published the results of a task force on issues related to psychological testing and assessment on the Internet (Naglieri et al., 2004). It is important to remember, however, that ASI-MV® Connect, while connected to an Internet database, is not, strictly speaking, Internet-based testing. This means that individuals surfing the web will never encounter and take the ASI-MV® on their own. Rather, with ASI-MV® Connect, the client is administered the assessment only in a controlled clinical setting. The person’s clinician must be a customer of Inflexxion and sign onto the site before the client sits down at the computer. In actuality, the ASI-MV® program is resident on the clinician’s computer, and only data exchanges, updates of special-interest items, and aggregate analysis reporting (i.e., ASI-MV® Connect Data Center) comprise ASI-MV® Connect. Hence, many concerns addressed by Naglieri’s task force (e.g., concerns about who is “really” taking the test, under what conditions, and who is interpreting the results to the test-taker) do not really apply. The other issues remarked on by the task force reflect concerns that any assessment needs to consider, such as establishing appropriate psychometric properties of an assessment, empirically demonstrating equivalence of a computerized version of an assessment with its traditional version, and ensuring appropriate consideration of culturally and linguistically diverse groups, are all well accounted for and documented for the ASI-MV®.

**DISSEMINATION AGENDA**

Regardless of the quality of an innovation, it may still be difficult to get that innovation adopted (Budman et al., 2003). Currently, the ASI-MV® is used in over 800 sites among 49 states, in addition to Puerto Rico, Canada, and Australia. With the introduction of the Internet-based program, the ASI-MV® Connect, and a focused internal sales and marketing staff, we anticipate increased sales and a rapid increase in use of this program. To date, the ASI-MV® has achieved broad dissemination through promotion at conferences, online advertising, and word of mouth. In considering how to enable new technologies (such as the ASI-MV® and ASI-MV® Connect) to achieve widespread use, we draw heavily from Everett Rogers’ (1995) Diffusion of Innovations theory. Rogers maintains that there are ten important elements that help to determine whether an innovation will achieve widespread adoption and how quickly such adoption occurs. These include issues such as Relative Advantage compared with other approaches to the same problem; Trialability, whether the innovation can be tested before making a major commitment to the new approach; and Observability of the innovation, meaning the degree to which the innovation leads to observable impact for the user and/or other users.

Berwick (2003), in an important article applying this work to healthcare, has taken Rogers’ concepts and consolidated them into three major “clusters of
influence” that contribute to diffusion. These are (1) perceptions of the inno-
vation; (2) characteristics of those who adopt the innovation or fail to do so; (3) and contextual factors such as management and organizational elements.

PERCEPTIONS OF THE INNOVATION

How users perceive an innovation and its potential benefits is pivotal in determin-
ing whether the innovation is adopted. Benefit, however, is a complex concept. The benefit that a user derives is generally weighed against what he or she is risking by making the change in question. Most people are risk averse and more comfortable with the “tried and true.” Furthermore, they may be fearful that an innovation may put extra demands on them, require them to do something new, or give up the familiar. When we first began to sell the ASI-MV® to substance abuse treatment centers in the late 1990s, some clinicians were so uncomfortable with the data they received from the computerized interview that they repeated the entire ASI interview again verbally. Clinicians wanted to see whether their clients were “really being honest” with the computer and believed that this would not be the case. Certainly, treatment center managers were not pleased to have the ASI being done twice on each client; the clients were not pleased either. With time, these perceptions changed particularly as clinicians and administrators saw that data from the ASI-MV® appeared to “make sense” clinically.

Furthermore, there is reason to believe that clients may be more self-disclosing to computer-administered assessments than to live interviewers. Several recent studies have sought to compare the relative accuracy of a computer-assisted ASI assessment modality with a human-facilitated version (Flynn et al., 2005). Research teams have also observed that substance abusers tend to have more honest responses with a computer-prompted assessment aid (Turner et al., 2005). Our own work (e.g., Butler & Villapiano, 2007c) supports the contention that substance abuse clients entering treatment respond with equal or greater honesty to a computer-based interview than with a human interviewer. For example, we compared client responses on the ASI-MV® with responses of the same clients during an ASI interview approximately 3 days apart (order of administration counterbalanced). Although the self-report responses given to the ASI-MV® were in good agreement with responses given to a live interviewer, the question examined was whether some kind of response bias (e.g., denial) would result in clients reporting less severity or otherwise minimizing their problems. In fact, comparisons of the Composite Scores revealed that five of the seven ASI domain Composite Scores (Medical, Drug, Legal, Family and Social, and Psychiatric) were significantly higher (indicating greater problem severity) on the ASI-MV® than when administered by a human interviewer. Composite Scores for the Employment and Alcohol domains were not significantly different. Item by item comparisons revealed the same pattern, namely that there was either no difference between the computer and interviewer-administered ASI responses
or, when there was a difference, the computer administration generally reported
greater problem severity, not less. Taken together, these findings argue against
the hypothesis that a response bias such as denial adversely affects the results
of computer-administered assessments.

A second element of perceptions that contributes or detracts from diffusion of
an innovation is its compatibility with the "values, beliefs and past history and
current needs of the individuals" (Berwick, 2003, p. 1971). If a counselor believes
that he or she "must get a feel for every incoming client" by administering the
intake and ASI personally, it is unlikely that that individual will allow the ASI
component to be automated. However, if he or she feels that ASI and other
structured aspects of the intake are impediments that prevent the clinician from
getting down to the "the real business of treatment," the ASI-MV® may be
viewed as highly facilitative. In most cases, clinicians have viewed the ASI-MV®
as simplifying their work and eliminating a burdensome task.

Third is the complexity of the innovation. The more complicated and dif-
ficult the innovation, the more unlikely rapid adoption becomes. Fortunately,
the ASI-MV® from the clinician's perspective is quite easy to implement and
requires little actual work once the software has been properly installed. Two
other important aspects of perception of the innovation that contribute to rapid
dissemination are trialability and observability. Trialability pertains to whether
an individual who is trying out the innovation can do so with minimal cost and
disruption to what they are currently doing. Observability is the ability of inter-
ested potential users to watch and learn from others who are already using the
innovation. At present, ASI-MV® trialability is achieved by allowing interested
individuals to actually try out the program for free without having to commit to
its long-term use. This trial period can occur without making any major changes
in other processes and/or systems. Observability comes from our satisfied cus-
tomers who can provide examples and testimonials about how they are using the
program and how it impacts their facility.

INDIVIDUAL CHARACTERISTICS

A second cluster of factors relevant to the speed of dissemination are the char-
acteristics of individuals who may adopt the change. According to Rogers, there
is an "S" curve of adoption with progressively more of the target population
adopting an innovation over time.

Characteristically, the "S" curve has different types of individuals adopting an
innovation at different points after its introduction. The first population to adopt
an innovation is called "Innovators". These individuals tend to be less concerned
about risk, knowledgeable about innovations, and are more adventurous than
their counterparts who adopt at a later point. Berwick (2003) describes Innovators
in healthcare as "mavericks" who may be somewhat disconnected from their
more cautious colleagues. The next segment to adopt an innovation is called
"Early Adopters." These individuals are better positioned than the Innovators
because they are generally well-connected opinion leaders in the healthcare community. They routinely experiment with new innovations and share their experiences with others. Although Early Adopters tend to have broad and/or national connections, the Early Majority describes a more locally based group. Members of the Early Majority are more risk averse than Early Adopters but will try new things based on input from their local colleagues. The next group, the "Late Majority," will adopt innovations based on input from the Early Adopters. They are highly risk averse and cautious. The final segment is the "Laggards." This segment is most likely to be very traditional and very cautious about adopting a technology. They are reluctant to move away from an approach they have used for many years.

In general, we have encountered many of these types of individuals in our attempt to disseminate the ASI-MV®. From the clinicians who viewed ASI-MV® as a key innovation in the late 1990s, to the regional advocates who have helped champion the ASI-MV® in a number of states, to those who indicate that they will never use computerized programs in their clinical practices, we have seen all the characteristic groups that Rogers identified. Because a few influential early users have proven to be crucial advocates in many states, we have plans to foster "user groups" and utilize peer marketing approaches, which appear to be highly effective.
CONTEXTUAL CHARACTERISTICS

Refers to the fact that innovation is harder to come by within some organizations than others. This often relates to the organizational climate and leadership issues. Some organizations are typified by low tolerance of innovation and a desire to remain the same or a contrasting situation with a dogmatic and autocratic style of introducing innovation, which does not accept processes that move people to innovate. On the other hand, some organizations encourage and bless innovation and can tolerate the frustrations and growing pains that often accompany new approaches. In any situation or change, agents introducing innovation must be prepared to examine the context into which the innovation is being introduced. Without such contextual awareness, innovation can fail.

It has been our experience that innovation-friendly leadership at a high level of administration is almost always essential for the ASI-MV® to be implemented. We work with several large organizations that have been using the ASI-MV® for 5 or more years. These organizations have had strong leadership advocates for ASI-MV®. Such support has been essential to sustaining the use of the program even when unexpected problems arose.

DIFFUSION OF INNOVATION AND THE ASI-MV®: LESSONS LEARNED

We make no claims that our dissemination of the ASI-MV® has been as rapid or effective as we would like. Our efforts in this area remain a work in progress. However, there are several important lessons that we have learned. (1) Build a product that serves a significant need. The ASI is required in many places and the availability of the ASI-MV® makes clinical practice and administration of substance abuse treatment programs easier than it would be without this program; (2) Get the word out and keep the word out. We put a great deal of time, effort, and money into letting potential users know about the program, how it works, and what it can do for them; (3) Understand the motivation to use your product. If you are not meeting customer needs in very specific ways that are useful to them, they will not use your product. Our original ASI-MV® had a minimal clinical report associated with it. Customers told us that the report was enormously important to them and without a good reporting mechanism, the program would not meet their needs. We have spent years building and modifying different types of reports that can be placed in the clients' charts. Without these reports, treatment centers would not be getting what they need to make a purchase worthwhile; (4) Continue to benefit your customers. Frequently add useful features that speak directly to customer needs. For example, the Spanish version of our program was developed in response to customer feedback, and we are currently engaged in working on an adolescent version of the ASI-MV®. “Listening to the voice of the customer” is critical to remaining at the forefront of innovation and keeping our product visible and fresh.

We believe that our overall approach to computerized assessment in substance abuse treatment can help to significantly improve the quality of drug and alcohol
treatment in this country. We also have begun to consider a next generation of computerized programs that can gather clinical data, make treatment recommendations, and “learn” about which of those recommendations work best through the process of neural networking and case-based reasoning. The ultimate goal of such programs would be to provide clinicians with outstanding computerized tools that scientifically improve treatment. We believe that the clinician will remain essential to treatment, however, the clinicians’ traditional role will change in the future. By combining their clinical acumen with advancements in science and technology they will have numerous resources available that will become integral parts of good behavioral care.

REFERENCES


INTRODUCTION

In the changing healthcare delivery and reimbursement environment, cost-effective, short-term, and self-help therapies are being strongly encouraged. To this end, adjunct treatments have become increasingly important. According to the US Department of Health and Human Services (2002), over $84 million is spent annually on chronic diseases that can be prevented or considerably improved through increased physical activity. Exercise is one example of a safe and cost-effective, therapeutic adjunct in the treatment of a variety of behavioral health concerns. When used in combination with empirically validated treatments such as cognitive-behavioral therapy (CBT), exercise has been found to improve pain and functional capacity in patients with chronic pain conditions such as fibromyalgia (Redondo et al., 2004), increased health-related behavior, including smoking cessation (Albrecht et al., 1998; Faulkner et al., 2007), obesity (Epstein et al. 2006), body image disturbance (McAulay et al., 2002), alcohol dependence (Ermalinski et al., 1997), and improving quality of life in HIV/AIDS treatment (Ciccolo et al., 2004). Exercise has also been found to help remediate depression (Craft & Perna, 2004), particularly in older adult populations (Palmer 2004). In this chapter, we highlight the benefits of exercise as a safe, low-cost, and effective adjunctive intervention for the treatment of (1) health behavior change; (2) depression; and (3) fibromyalgia.
DOSAGE

Before we review the extant literature, it is important to operationalize "exercise." Current physiologic guidelines support that 20–60 minutes of cardiovascular activity, 3–5 days per week, at 60–80% of the age-adjusted maximal heart rate (or a weekly caloric cost of 2000 kcal), represents an effective dose with minimal medical risk (Haskell et al., 2007). However, not only do therapeutic dosages vary considerably across studies, it remains unclear whether a physiological, metabolic, or endocrine response is necessary for psychological outcomes to occur.

HEALTH BEHAVIOR CHANGE

Obesity, smoking, alcohol addiction, and unsafe behaviors leading to HIV and AIDS all are characterized by a pattern of behaviors that contribute to (or cause) an undesired physical condition. Behavior change is required to eliminate or reduce the primary problem in each case and often remediate the physiological sequelae. Physical activity has been used successfully as an adjunctive treatment and sometimes as a primary treatment for a variety of conditions associated with health behavior change. In the following section, we will briefly review the data supporting exercise as an effective adjunctive treatment in health behavior change. Because physical activity has been so widely studied in association with weight management, various behavioral strategies will first be discussed in detail. Following this review, we will briefly present the empirical literature supporting exercise as an adjunctive treatment for smoking, alcohol use, and chronic conditions including HIV/AIDS.

OBESITY

Physical activity and exercise are sometimes used adjunctively to other treatments, such as medical procedures or cognitive-behavioral techniques for weight loss and obesity management or prevention. However, exercise is often the primary treatment for these conditions. Behavioral science has supplied a foundation for understanding physical activity and has been used to establish conceptual and empirical groundwork for designing and implementing physical activity programs. Several reviews of the literature spanning nearly 30 years agree that the majority of effective interventions have used a combination of cognitive-behavioral and behavioral strategies (Baranowski et al., 1998; Brawley et al., 2000; Dishman, 1991; Leith & Taylor, 1992; Robinson & Rogers, 1994; van der Bij et al., 2002). Behavioral science models are characterized by a focus on analysis that allows some predictive quality and principle-based procedures that promote behavior change (Baranowski et al., 1998).
Several behavioral strategies have over time accumulated considerable empirical support. Reinforcement (i.e., feedback), prompting, stimulus control, self-monitoring, and contracting are all behavioral techniques that have been extensively studied as applied to areas of complex behavior change including physical activity. In some studies, one behavioral strategy is used in isolation, but more commonly, two or more behavioral techniques are used together in a behavioral treatment package, possibly along with cognitive-behavioral or other nonbehavioral techniques. Although treatment packages are the norm, the combinations of components in different packages vary greatly. Most studies use behavioral treatment strategies as components in a broader treatment package (Martin et al., 1984).

REINFORCEMENT AND FEEDBACK (CONSEQUENCE CONTROL)
Reinforcement may be the most easily generalized behavioral principle and is a cornerstone of any effective behavioral change program. The procedure of reinforcement is appropriately regarded as providing praise, or another reward to the participant after a desirable behavior occurs. This procedure is commonly referred to as “feedback” in intervention studies. Feedback in the form of positive reinforcement has most often been administered by delivering statements of praise after reaching a predetermined goal (positive reinforcement). The overt verbal reinforcement may be accompanied by a nonverbal or intrinsic reinforcer that increases its value (i.e., the feeling of accomplishment). In this way, both extrinsic/overt reinforcers and covert/intrinsic reinforcers are likely at work, but only the overt reinforcers are observable direct measures of a treatment component. Feedback and/or reinforcement has been listed as a successful intervention strategy most often used in studies aimed at increasing physical activity for the primary purposes of weight loss and the health benefits associated with weight loss (Gillet et al., 1996; Kau & Fisher, 1974; Taggart et al., 1986; Wallace et al., 1998).

PROMPTING
Prompting can take many forms, including textual prompts, as in written guidelines or leaflets, verbal prompts from interventionists, and within stimulus prompts that are inherently a part of many self-management techniques. Phone calls are one of the most prevalent ways to deliver prompts to research participants (Nicolson, 2000). A prompt is administered after the antecedent for a particular behavioral response has occurred, but before the behavior has occurred with the intended effect of increasing the chances that the behavior will indeed occur as intended (Cooper et al., 1987). Thus, a prompt is a form of assistance for completing a behavioral response that has not occurred at a high rate in the past. Prompting often is used in conjunction with stimulus control, another antecedent technique, and has been listed as an effect component of behavioral
intervention in several studies including Fitterling et al., 1988; King et al., 2000; Kriska et al., 1986; Lombard et al., 1995; Martin et al., 1984; Wallace et al., 1998.

STIMULUS CONTROL

Stimulus control procedures vary widely. In this antecedent procedure, the stimulus that is intended to evoke the desired behavior is manipulated in some way to make it more salient thus increasing the likelihood that the behavior will occur (Cooper et al., 1987). These techniques can include instructions from a therapist, such as cleaning out the fridge to remove unwanted food choices or throwing away any available alcohol or cigarettes. A less direct use of stimulus control can be considered an environmental stimulus control strategy (sometimes conceptualized as a setting event or establishing operation) and involves changing the actual physical environment that was associated with the past undesirable behavior. An example is removing oneself from the environment in which past behaviors have occurred, such as not going to a nightclub associated with past drinking binges. Stimulus control procedures may have a secondary unintended, but beneficial effect as they are likely to become part of a successful participants changing behavioral repertoire. That is, instead of being something that is added and then faded away, like a prompt, the individual learns to incorporate new lifestyle habits into his or her existing behavioral repertoire, thus setting his or her own stimulus cues (having shoes and clothes laid out for a morning walk or facilitating the consumption of healthy meals by shopping in advance and menu planning). This new behavioral pattern becomes an enduring part of a new behavioral repertoire that is supportive of maintaining the new healthy pattern of physical activity.

Studies that have successfully included stimulus control as an intervention component include Brownell et al., 1980; Kau & Fisher, 1974; Martin et al., 1984; Owen et al., 1987.

SELF-MONITORING

Self-monitoring has been shown to have robust behavior change effects. Being aware of one's own behavior is sometimes all that is required for behavior changes. Self-monitoring can be done in many ways: keeping a detailed journal that involves writing down all food consumed, physical activity, or number of cigarettes smoked. Self-monitoring can give information about the behavior itself and how it may most effectively be changed by indicating where and when offending behaviors most often occur. Self-monitoring may be faded over time; however, a simple form of record keeping is a common practice for many adults and can easily become part of one's everyday routine on a permanent basis.

Studies that have successfully included self-monitoring as a component of physical activity intervention include King, et al., 1992; Martin, et al., 1984; Oldridge & Jones, 1983; Owen et al., 1987.
BEHAVIORAL CONTRACTS

Behavioral contracting involves a written document stating goals and the reward or other outcome for meeting (or failing to meet) the stated goals. Usually, guidelines for goal writing include keeping the goal realistic (usually small), measurable, observable (recordable), and on a proposed timeline. The other part of the contract involves rewards for achieving the goals that are agreed upon and sometimes facilitated by another party. A monetary reward or cost is a common consequence in many behavioral contracts for physical activity. Often, the consequence is the loss of money already put forth for this purpose by the participant. Contracts have many benefits to the practitioner in that they have inherent flexibility and can be written to state appropriate goals for any individual. Furthermore, the contract can incorporate a number of health goals with consequences that are individualized to incorporate meaningful outcomes for the unique participant. An additional benefit of contracts is that they can be mediated by a number of people other than a professional, including a significant other or a family member.

Behavioral contracting is one of the more widely used methods for establishing a change in physical activity and has been used successfully in a number of studies including Epstein et al., 1980; Neale et al., 1990; Singleton et al., 1987; Wysocki et al., 1979.

SMOKING

A large body of literature has supported physical activity/exercise as a primary or adjunctive treatment in smoking cessation. Marcus, Albrecht and colleagues have shown repeated favorable results when using exercise as a primary or as an adjunctive treatment for smoking cessation. A 1995 study with 20 previously sedentary female smokers used exercise training as the primary intervention and showed improved short-term quit rates (Marcus et al., 1995). A larger study involving a sample of 281 female smokers randomly assigned to a cognitive-behavioral smoking cessation program with or without vigorous exercise revealed that participating in vigorous exercise facilitates short- and longer-term smoking cessation in women combined with a cognitive-behavioral program (Marcus et al., 1999). Thus, used adjunctively to cognitive-behavioral techniques, Marcus and Albrecht have consistently shown positive effects for the use of physical activity as a treatment for smoking cessation.

In an effort to improve on methodological shortcomings from past research, the same group of researchers developed a large-scale study called the “Commit to Quit” trial evaluated the contribution of exercise to smoking cessation (Marcus et al., 1997). Among the variables examined in this study was the relationship between motivational readiness for exercise adoption and high levels of concerns of weight gain after ceasing smoking. This was a large clinical trial comparing the relative efficacy of cognitive-behavioral smoking cessation programs plus
vigorouss exercise with the same treatment plus a control contact group using
breath monitors to measure physiological levels of nicotine in one's system
(Marcus, et al., 1997). With growing empirical support from large randomized
studies, the use of exercise as an adjunctive treatment for smoking cessation is
growing and becoming more conclusive in its support for choosing to include
exercise in treatment; however, there is much needed work in this particular area
of research.

Ussher et al. examined literature on exercise as an aid to smoking cessation in
a 2000 review. They found eight randomized controlled trials (RCTs) published
between 1980 and 1999 specifically examining the effect of exercise on smoking
cessation. Of the eight trials, only two found a positive effect and the others
showed no effect. They concluded that although there is some evidence for
exercise aiding smoking cessation, there is a need for more rigorously designed
studies. In an effort to address this need, Faulkner and colleagues have published
a recent article addressing some of the limitations of past research and considering
the importance of addressing the issues of effectiveness and practical concerns
has aimed for a “Better Practices” model that may provide a framework for
furthering work in this area (Faulkner et al., 2006).

ALCOHOL

The use of exercise as an adjunctive treatment for alcoholism may be growing
in practice, but, to this point, there is scarce empirical evidence for the use of
exercise as a treatment. The vast majority of available research, when consider-
ing the interaction between exercise and alcohol, examines how exercise alters
the effects of alcohol on various metabolic and physiological mechanisms in the
human body. Although the research on how exercise may be used as an effec-
tive treatment for alcoholism is limited, initial studies show promising results.
Ermaliski and colleagues (1997) investigated the effects of a physical fitness
program as an adjunct to the typical treatment program for a group of alcoholic
patients. Those who participated in the exercise program showed significantly
less craving for alcohol than members in the standard treatment group. Addition-
ally, the group treated with physical activity saw themselves as having more
internal locus of control (Ermalinski et al., 1997). Including measures such as
report of locus of control offers some insight as to why exercise may be an
effective adjunctive treatment for so many different types of problems.

HIV/AIDS AND CHRONIC CONDITIONS

Another developing area of research is in using exercise as part of a treatment
package for chronic conditions such as HIV and AIDS. A common treatment for
HIV-infected persons is the use of highly active antiretroviral therapy (HAART)
that reduces the mortality of HIV-infected person, but also leaves patients with fatigue, nausea, pain, anxiety, and depression. In a 2004 publication, Ciccolo and colleagues discussed the use of exercise as an adjunctive treatment instead of the more commonly used pharmacological treatments aimed at improving the quality of life for patients undergoing treatment (Ciccolo et al., 2004). They conclude that while results are generally positive, existing studies have utilized small samples with high attrition rates, and many studies were conducted before the use of HAART, now standard, which limits the ability to generalize findings. Data from other chronic conditions and healthy samples suggest that exercise has the potential to be a beneficial treatment across the range of symptoms experienced by HIV-infected individuals (Ciccolo et al., 2004). Support for this position can be found in a 2003 review on patients with chronic diseases and in particular focuses on counteracting protein wasting (Zinna & Yarasheski, 2003). This piece summarizes the findings from studies that have examined the potential benefits of exercise training for the treatment of wasting associated with sarcopenia, cancer, chronic renal insufficiency, rheumatoid arthritis, osteoarthritis, and HIV. These conditions share a fundamental mechanism that causes an imbalance between muscle protein synthetic and proteolytic processes (Zinna & Yarasheski, 2003). Findings from studies have shown that even a modest increase in physical activity can mitigate muscle protein wasting and that participants in an exercise training program can gain muscle protein mass, strength, endurance and in some cases, are more capable of performing daily living activities (Zinna & Yarasheski, 2003).

DEPRESSION

Depression has been ranked as the leading cause of disability in the United States and affects approximately 121 million people worldwide (WHO, 2007). It ranks second only to heart disease in terms of disease burden and is projected to be the leading cause of disease burden by the year 2020 (Apeldorf & Alexopoulous, 2003; Goodwin, 2003). Depression has deleterious effects on health and is associated with increased healthcare costs, worse outcomes after acute medical events, decreased physical functioning, and decreased overall mortality rates (Crystal et al., 2002; Palmer, 2005). In the United States alone, over $44 billion is spent each year on lost work productivity related to depression (Stewart et al., 2003). However, only 25% of those affected have access to effective treatments (WHO, 2007).

Primary care providers are uniquely positioned to promote behavioral approaches, such as exercise. Currently, depressed patients treated in primary care settings receive predominately pharmacotherapy (Craft & Perna, 2004). However, due to adverse side-effect profiles, low response rates (e.g., 50%), even lower remission rates (30–35%), poor adherence, and persistent impairments in functioning, safe, low-cost, and effective treatments for depression are sorely needed in primary care. Treatment can be improved by providing
education regarding safe, well-established, and effective nonpharmacologic treatments such as CBT (Young et al., 2001) and strategies such as exercise (Craft & Perna, 2004). Exercise alone has been shown to alleviate symptoms in both clinical and subclinical depression (Dunn et al., 2001, 2002, 2005; O'Neal et al., 2000) and in some studies, to be as effective as treatment with sertraline or a combination of sertraline and aerobic exercise (Blumenthal et al., 1999). When used adjunctively with other treatments for depression, exercise has received empirical support for use as an augmentation strategy and has been associated with improved quality of life (Dimeo et al., 2001; Veale et al., 1992). Meta-analytic findings suggest that exercise is an effective intervention for the short-term management of depressive symptoms (Lawlor & Hopker, 2001). Together, empirical data suggest that exercise has numerous physical and psychological benefits and is a safe adjunct or alternative treatment to medication for the treatment of depression (Palmer, 2005).

Depression is typically underdiagnosed in at least half of all older adults, oftentimes because of the presence of comorbid medical conditions and a greater reliance on the report of physical symptoms such as lack of sleep or energy and weight loss as opposed to sadness, feelings of guilt, suicidal ideation, or worthlessness (Apeldorf & Alexopoulous, 2003; Dantz et al., 2003; Kaplan et al., 1999). However, the prevalence of depressive symptoms in older adults can be as high as 30% in community populations and as high as 40% in hospitalized and nursing home residents (Leon et al., 2003). Currently, only 30% of adults over 65 years and 12% of those aged 75 years and above engage in regular physical activity (Heath & Stuart, 2002). Exercise is not often prescribed to older adults, despite the vast amount of current research available demonstrating its efficacy (Palmer, 2005).

The relationship between increased physical activity and depression has received the most empirical attention in the treatment of older adults. Many RCTs have demonstrated the effectiveness of exercise as a treatment for depression, with some studies indicating that exercise can be as successful a treatment alternative as medication (Goodwin, 2003; Lawlor & Hopker, 2001). Exercise has been particularly effective in treating depressive symptoms in older adults who respond poorly to traditional treatments alone (Mather et al., 2002). In fact, when older adults were randomized to a 10-week exercise class or health education class, a greater proportion of those who attended the exercise class demonstrated 30% or more reductions in depressive symptoms on the Hamilton Rating Scale for Depression (Mather et al., 2002). Research indicates that exercise significantly decreases depression scores for persons with high and low measured symptomatology, decreases pain and disability (Penninx et al., 2002), improves subjective well-being (Stathi et al., 2002), has a positive effect on meaning in life and self-rated health and functioning (Takkin et al., 2001), increases self-efficacy (McAulay et al., 2002), and is associated with decreased rates of depressive and anxiety disorders (Goodwin, 2003). Some researchers hypothesize that improvements in pain and perceived health status, increased
social connectedness, reductions in stress, distraction from negative thoughts, and increased cognitive functioning may account for the effects of exercise in the prevention and treatment of depression in older adults (Goodwin, 2003). Together, reviews of medical and gerontological studies have found that exercise markedly reduces depressive symptoms and is a safe adjunct or alternative to pharmacotherapy for depression (Palmer, 2005).

FUNCTIONAL PAIN SYNDROMES: FIBROMYALGIA

In addition to its role in mood regulation, for at least a subset of the population, exercise has also been found to play a key role in the management of pain and fatigue in response to stress (Glass et al., 2004). Exercise has been investigated as an adjunctive treatment in the care of patients with a wide variety of functional pain conditions including fibromyalgia, chronic fatigue syndrome, and other conditions that are thought to involve a biological stress response. Primary treatment approaches vary by disorder and complexity of presentation, but typically include a combination of symptomatic relief through physiological means (i.e., pharmacotherapy) and CBT (Goldenberg et al., 2004). Given the dearth of well-controlled clinical trials evaluating the efficacy of exercise as an adjunctive treatment across functional pain syndromes, we will briefly summarize the available data supporting exercise in the treatment of fibromyalgia.

Fibromyalgia is a syndrome of unknown etiology characterized by chronic widespread pain, increased tenderness to palpation, and additional symptoms such as disturbed sleep, stiffness, fatigue, and psychological distress (Offenbacher & Stucki, 2000). It is diagnosed based on a patient’s report of widespread pain of 3 months’ duration or longer and identification of 11 of 18 possible tender points (Wolfe et al., 1990). In community-based studies, approximately 2% of adults and 1.2–6.2% of school-age children screened positive for fibromyalgia (Quisel et al., 2004). Persons with fibromyalgia use an average of 2.7 drugs at any one time for related symptoms, make an average of 10 outpatient visits per year, and are hospitalized once every 3 years (Wolfe et al., 1997). Clearly, effective treatments are needed to address morbidity and associated medical utilization.

Despite the specific psychiatric condition targeted, the effects of exercise are most pronounced when they are used as one component in an integrated, multidisciplinary approach to pain management (Henningse n et al., 2007). Redondo and colleagues (2004) investigated the efficacy of a physical exercise-based program and CBT in decreasing the functional impact of fibromyalgia. After 8 weeks of treatment, participants in both groups reported reduced interference because of fibromyalgia and improved coping responses. These findings did not persist at 1-year follow-up, but participants who received the physical exercise intervention maintained significantly greater improvements in functional capacity as compared with CBT controls. These findings are consistent with those of
other studies indicating that regular exercise improves pain, energy, work capacity, and physical and social activities in persons with fibromyalgia (Offenbacher & Stucki, 2000).

A 2003 Cochrane review identified 7 well-controlled clinical investigations of the impact of exercise on fibromyalgia-related pain and morbidity (Busch et al., 2002). Aerobic conditioning was defined as (1) 2 days per week; (2) at 55–90% of predicted maximum heart rate; (3) 20–60 minutes; and (4) for at least 6 weeks. In these studies, exercise resulted in improvements in global well-being, physical function, aerobic fitness, and pain threshold of tender points (2002). When evaluated in a primary care setting, adherence to a regular exercise program has been found to reduce consultations and prescriptions significantly (Peters et al., 2002). Exercise appears to hold considerable promise in reducing unnecessary medical utilization in persons with pain of unexplained etiology.

**AVAILABILITY AND DISSEMINATION**

The most effective strategies for increasing exercise include written exercise prescriptions, patient goal setting, individually tailored physical activity regimens, and scheduled follow-ups (Heath & Stuart, 2002). A number of Internet-based resources for writing exercise prescriptions exist (U.S Preventive Services Task Force, 2003). These include the American Academy of Orthopedic Surgeons (www.aaos.org), the American College of Sports Medicine (www.acsm.org), American Diabetes Association (www.diabetes.org), the American Heart Association (http://www.americanheart.org, 2007), American Physical Therapy Association (www.apta.org), Arthritis Foundation (www.arthritis.org), National Institute on Aging (www.nia.nih.gov), the National Osteoporosis Foundation (www.nof.org), and the National Heart, Lung and Blood Institute (www.nhlbi.nih.gov). Another excellent source of online information and support is the website for the Centers for Disease Control (CDC) (http://www.cdc.gov, 2007). The CDC physical activity page contains a great deal of information that includes education, techniques for getting started, and techniques for continuing a program (http://www.cdc.gov/nccdphp/dnpa/physical/index.htm, 2007). The CDC includes links to research and further information including motivational strategies.

**FUTURE DIRECTIONS**

The benefits of exercise and increased physical activity has vast implication across a number of different problems and conditions. In some areas, such as weight management and obesity treatment, the research is vast and has enjoyed the benefit of numerous replications with different populations and package components. In fields such as smoking cessation, there is moderate to strong support for the use of physical activity programs in conjunction with traditional
treatment programs, and empirical support is continuing to grow in this quickly developing area of research. In other areas, such as alcoholism and chronic disease conditions, evidence is just beginning to mount in support of exercise as an adjunctive treatment, but with promising results thus far. Additional research is warranted to further investigate the clinical implications of using exercise as a preventive and intervention strategy across a wide variety of conditions.

Professionals in a multitude of fields, including mental health professionals, counselors, program directors, psychologists, and, arguably the most influential professionals, physicians, are encouraged to consider the potential benefits of prescribing exercise as an adjunctive treatment. Medical doctors, especially in the early stages of diagnosis and prescription, have a large degree of influence over patient behavior. This influence is particularly important when discussing issues related to health behavior change, including smoking, dietary habits, and exercise. Winslow and colleagues suggest a three-step process when professionals are interacting with patients to encourage behavior change that includes explanation/education, goal setting, and ongoing monitoring (Winslow et al., 1996). Although the directed interaction with patients during routine office visits seems a reasonable endeavor, one recent study concludes that although physicians have the potential to impact health behaviors through simple discussion and routine follow-up, only about half are using this opportunity (Nawaz et al., 2000).

In conclusion, the use of behavioral techniques in promoting health behavior change is well-supported and relatively easy to implement. The established and growing body of research supporting the inclusion of exercise to enhance the treatment effects across numerous areas should encourage health professionals to examine this simple yet powerful adjunctive treatment option.

REFERENCES


DESCRIPTION OF THE INTERVENTIONS

There is clear logic in considering meditation and relaxation together in one chapter. First, both bridge the Cartesian duality and are often described as “mind/body” interventions. Extensive research has shown that meditation and relaxation impact psychological as well as physical well-being (Lehrer & Woolfolk, 1993; Murphy & Donovan, 2006). Second, both are often referred to as “self-regulation” techniques (Shapiro, 1980). As such, they are frequently described as ways that individuals can gain control of their own thoughts, emotions, and bodily processes. Yet another reason for considering meditation and relaxation together is that there is often a blurring of the boundaries between the two. Some, notably Benson (1975), have postulated that there are no fundamental differences among various types of meditation and relaxation techniques. Others have argued that different techniques have specific effects (see Lehrer & Woolfolk, 1993; and Lehrer et al., 1994 for reviews of this debate). Finally, both meditation and relaxation have the potential to be ideal adjuncts to other forms of psychotherapy. Because they typically consist of skills that a client presumably can learn in a brief time and practice on his/her own, these modalities can conveniently be added to other therapeutic interventions.

Although combining meditation and relaxation in a single chapter has a clear rationale, doing so creates some definite challenges. First, they have extensive literatures. The combined number of citations in Medline since 1966 using meditation or relaxation techniques as keywords is close to 5000 articles. Even when one considers that many of the articles are nonempirical in nature—and thus obviously not relevant to evidence-based standards—reviewing the literature can be a challenge. For a busy clinician looking into these techniques as potential adjuncts to psychotherapy, the sheer amount of literature can seem overwhelming.
A second challenge presented by the combined literatures stems from the variety of techniques that have been subsumed under the rubrics of meditation and relaxation. For example, meditative traditions from many religious traditions have been applied to clinical settings, often with great claims of effectiveness. The differences among various meditative traditions may seem subtle. Descriptions of the techniques may be cast in esoteric jargon unclear to clinicians without backgrounds in these traditions. Furthermore, some techniques have been applied to certain clinical problems but not to others. This raises the question of how specific is the therapeutic effectiveness of the various techniques to specific problems. Again, the size of the literature on meditation and relaxation can intimidate the busy clinician wishing to answer these questions in order to make an empirically sound recommendation for a client.

Yet another challenge presented to the clinician—let alone to the reviewer—by the size of the literature is the blurring of the boundaries between meditation and relaxation described above. In performing the literature search for this chapter, we found that the same clinical technique would sometimes have the keyword meditation, sometimes relaxation, and sometimes both. This is not surprising because some of the most researched relaxation techniques are modifications of centuries-old meditation techniques. It was often difficult to decide whether a technique should be referred to as meditation or relaxation.

**MEDITATION**

Most, if not all, religious traditions have some type of meditative discipline. In *The Meditative Mind: The Varieties of Meditative Experience*, Goleman (1988) describes meditative traditions from Hinduism [Bhakti, Transcendental Meditation (TM), Ashtanga Yoga, Kundalini Yoga], Buddhism (Vipassana, Tibetan, Tantra, Zen), Judaism (Kabbalah), Christianity (Hesychasm, the Rosary), and Islam (Sufism). Typically, meditative traditions represent mystical branches of religions and are intended to induce transcendental experiences as defined by the particular religious tradition. As such, they were not intended to be psychotherapies in the Western sense of the word, although religious traditions have all participated in their cultures' healing methods, medical and psychological (Frank, 1973). However, because they are generally recognized as creating positive psychological and physiological states (i.e., a sense of well-being, relaxation), they became of interest to Western psychotherapists.

There have been attempts to arrive at a common definition of meditation that encompasses the variety of meditative techniques. For example, Shapiro and Walsh stated “meditation can be defined as a family of practices that train attention and awareness, usually with the aim of fostering psychological and spiritual well-being and maturity. Meditation does this by training and bringing mental processes under greater voluntary control, and directing them in beneficial ways” (2003). Several typologies of meditation have been attempted. A common one is to divide meditative disciplines into concentrative (focusing
awareness on a single object or movement) or awareness (allowing attention to “move to a variety of objects and investigate them all”) (Shapiro & Walsh, 2003) as well as types that combine both concentration and awareness (Shapiro, 1980). Although there may be many commonalities among the various forms of meditation, there is also tremendous diversity of techniques. As Shapiro pointed out, “some involve sitting quietly and produce a state of quiescence and restfulness. Some involve sitting quietly and produce a state of excitement and arousal. Some ... involve physical movement to a greater or lesser degree. Sometimes these ‘movement meditations’ result in a state of excitement, sometimes a state of relaxation.” (Shapiro, 1982). Thus, although there may be theoretical and empirical reasons to assume that at least some types of meditation may have similar psychological and physiological effects (Benson, 1975), there is equal reason to believe that there may be significant differences among them as well, and physiological differences among different types of meditation have been demonstrated (Lehrer & Woolfolk, 1993). However, Walsh and Shapiro’s recent (2006) caution stands, that Western psychology should avoid “assimilative integration in which much of the richness and uniqueness of meditation and its psychologies and philosophies have been overlooked.”

There have been extensive reviews of the effects of various types of meditation on physiological and psychological parameters, including electrocortical activity, electrodermal activity, respiration, cardiovascular response, metabolism, cerebral blood flow, hemispheric lateralization, and blood pressure (see Shapiro and Walsh, 1984, 2003; Murphy and Donovan, 2006; and Walsh and Shapiro, 2006 for reviews). Recent research has found meditation to influence immune functioning (Davidson et al., 2003; Robinson et al., 2003). There have also been several reviews specifically on the use of meditation in psychotherapy (Bogart, 1991; Delmonte, 1986; La Torre, 2001; Smith, 1975; West, 1987). In spite of the plethora of meditative traditions and techniques, a relatively small subset has been the focus in the empirical psychotherapy literature. These will be discussed below.

HINDU TRADITIONS

YOGA

Westerners probably associate yoga with physical postures and stretching, referred to as asanas in Sanskrit. However, asanas are only one aspect (translated as “limb” from the Sanskrit) of the practice of yoga. The other limbs involve moral precepts and other forms of meditation. There are numerous meditative techniques that come out of the yogic tradition. (Becker, 2000). Many of them, particularly those in the Kundalini Yoga tradition, emphasize breathing, referred

1 Although there is some association between yoga and Buddhist traditions, it is primarily identified with Hinduism and will be discussed in that context accordingly.
to collectively as pranayama, one of the limbs of yoga. Reviews of the literature on Yoga in psychotherapy have been published by Becker (2000), Khalsa (2004), and Patel (1984).

While description of the many types of yoga practices is beyond the scope of this chapter, two in particular have special relevance to research on yoga as psychotherapy. Sudarshan Kriya Yoga (SKY), a form of pranayama, has been applied to the treatment of depression (Brown & Gerbarg, 2005a; Brown & Gerbarg, 2005b). Basic SKY is taught in a 22-hour course. It involves training in four different types of controlled breathing: 3-stage slow breathing (ujjayi), rapid breathing (bhasrika), chanting of “om,” and cyclical breathing (Sudarshan Kriya). Shannahoff-Khalsa (2004b) modified Kundalini meditation techniques specifically for treatment of psychiatric patients.

TRANSCENDENTAL MEDITATION

TM is one of the most well-known and possibly the most popular form of meditation in the West. It was brought to the West by Maharishi Mahesh Yogi, a prolific teacher and writer. The fundamental technique of TM involves meditation on a mantra, a Sanskrit word or sound. A basic tenet of TM is that the selection of the mantra for a particular individual is extremely important. The mantra must be given to a student by a bona fide teacher of TM, and the manner in which mantras are selected is shrouded in considerable secrecy. The actual process of TM involves concentration on the mantra as the meditator repeats it in his/her mind. When the practitioner notices that his/her thoughts have wandered from the mantra, he/she gently refocuses attention on it. Both the concentration on the mantra and the refocusing should be done gently, rather than in a forced manner. In this way, effortless concentration is avoided (Goleman, 1988). No special postures or physical activities are necessary for the basic practice of TM; the student is told to sit comfortably in a chair and breathe naturally.

BUDDHIST TRADITIONS

VIPASSANA (INSIGHT) MEDITATION

Vipassana (Insight) and mindfulness often are used interchangeably. Insight has been defined in the context of Buddhism as “a clear awareness of exactly what is happening as it happens” (Gunaratana, 1991). Historically, mindfulness is a precursor to insight, when one can maintain mindfulness continuously (Goleman, 1988). Vipassana is associated with one of the oldest Buddhist traditions still in existence: Theraveda, which is primarily practiced in Sri Lanka and Southeast Asia.² The practice of mindfulness meditation involves observing one’s thoughts

² “Mindfulness” is also associated with some later Buddhist traditions, including some forms of Zen.
and bodily sensations in a nonjudgmental, nonreactive manner. Typically, the practitioner begins a session of meditation by focusing awareness on his or her breath. The meditator does not try to control the breath; rather, he or she just observes the sensations of breathing. However, as the person relaxes, the breaths naturally get longer.

ZEN

The basis of Zen is meditative practice known as zazen, which literally means “seated Zen” in Japanese. Like mindfulness meditation, it is traditionally practiced in seated cross-legged positions; however, alternative postures can be used. There are two major traditions of Zen still in existence: The Rinzai Sect and the Soto Sect, which differ somewhat in the practice of zazen. Soto Zen bears similarity to mindfulness meditation in that the practitioner is taught to observe his or her thoughts and bodily sensations. Similarly, the breath is observed but not controlled. Zazen in the Rinzai tradition emphasizes concentration rather than mindfulness. Beginning practitioners are given the task of counting their breaths (typically exhalations only, from 1–10).³ If the meditator reaches 10, he or she starts again with 1. If he or she notices that he or she has lost track of the count, the instruction is to start again at 1. Rather than observing the breath, the Rinzai practitioner explicitly regulates it through the use of a technique known as tendon or hara breathing (Kushner, 2000; Lehrer et al., 1999; Von Durckheim, 1977), which involves the use of purposefully slow, deep respirations using the muscles of the lower abdomen (hara, in Japanese). With practice students learn that tendon breathing fosters concentration and that proper posture is necessary for proper breathing.

RELAXATION

Progressive Relaxation

The development of modern clinical methods commonly referred to as “relaxation training techniques” is usually identified with Edmond Jacobson (Bernstein & Borkevec, 1973; Jacobson, 1929; Lehrer, 1982), who developed a technique to directly decrease muscular tension by alternatively tensing and relaxing different muscle groups. The original technique, called “progressive relaxation” (PR), was quite lengthy and involved as many as 50 or more sessions over a period of months to years (Bernstein & Borkevec, 1973). Over the years, abbreviated variations of Jacobson’s procedures have been introduced (Bernstein & Given, 1984; Wolpe, 1969). Some believe that the shortened versions should be viewed as distinct from Jacobson’s (Lehrer & Woolfolk, 1984), and perhaps less effective (Lehrer, 1982). However, these all utilize similar procedures of tensing and relaxing various muscle groups. Other procedures have

³ Some Soto instructors also use breath counting, at least in the beginning.
added techniques to enable the subject to develop a relaxed state on cue in a very short time. A well-researched example of this is “Applied Relaxation” (AR) (Ost, 1987). After learning an abbreviated version of PR, the subject is taught to associate the sensation of relaxation induced by PR to the cue to taking a breath and subvocalizing “relax.” With practice, subjects can learn to relax in 20–30 seconds.

A component that appears in both relaxation and meditation techniques is that of breathing, either as an outcome or as a primary technique. Although beyond the scope of this review, breathing training and regulation techniques appear in current treatment protocols for panic disorder (Meuret & Wilhelm, 2003), and current reviews (Gilbert, 2003; Ley, 1999) have provided evidence for breathing training having a beneficial effect on panic, anxiety, and physiological disorders.

THE RELAXATION RESPONSE

The technique commonly referred to as the “relaxation response” is a modification of TM. It was developed by Benson with the explicit purpose of “decultivating” the meditative experience and of applying it to clinical situations without the religious trappings of TM or other spirituality-based meditation techniques (1975). Benson originally used the term “relaxation response” to refer to what he viewed as a constellation of physiological effects induced by all forms of meditation. The actual technique he developed to induce the relaxation response is sometimes referred to as the “respiratory one method” (Carrington, 1993). However, the term relaxation response is commonly used to describe Benson’s method. According to the technique, the subject uses the word “one” or other word or sound of his or her choice as one would use a mantra in TM. Similar mantra-based clinical techniques have also been report by Carrington (1993) and Murphy et al. (1986).

CONTEMPORARY MULTIMODAL THERAPY PROGRAMS BASED ON MEDITATION

Mindfulness-based Stress Reduction

Mindfulness-based stress reduction (MBSR) was developed by Kabat-Zinn at the University of Massachusetts. The development and structure of the program are thoroughly described in his book, *Full Catastrophe Living* (Kabat-Zinn, 1990). MBSR, as the name implies, incorporates mindfulness meditation as a central component. The original program involved eight consecutive weekly group sessions involving instruction and practice in Mindfulness meditation as well as Hatha yoga, and lectures and discussions about Mindfulness and the role of stress in health and illness. Participants are expected to practice both meditation and yoga asanas for 45 minutes a day, 6 days a week, and to record the results of awareness exercises in a book for 15 minutes a day. Participants are also required to attend a daylong silent retreat on a weekend toward the end of the program. This “Day of Mindfulness” consists of prolonged practice of
MEDITATION AND RELAXATION

Meditation and yoga. MBSR was originally developed for medical patients with maladaptive health behaviors, stress-related conditions, and/or chronic pain. As originally practiced by Kabat-Zinn, the groups were diverse in terms of the types of patient problems. Programs modeled after Kabat-Zinn's have proliferated both nationally and internationally.

Mindfulness-based Cognitive Therapy
Mindfulness-based cognitive therapy (MBCT) can be viewed as a variation of MBSR. The evolution of the program is thoroughly discussed by its originators who are cognitive-behavioral therapists (Segal et al., 2002) and developed it as a way to prevent relapses of major depressive episodes. They came to believe that mindfulness meditation may be a particularly effective way for patients to recognize, through dispassionate observation of their thoughts, feelings, and bodily sensations, the early stages of relapse. After observing Kabat-Zinn and colleagues in action, they developed an eight-session group program that includes elements of MBSR, such as the practice of mindfulness meditation with other exercises and didactic content more specifically relevant to cognition and depression.

Dialectical and “Third Wave” Behavioral Therapy
The term “third wave behavioral therapy” has been used to refer collectively to a number of therapies that grew out of behavioral analysis. Often, they employ mindfulness as a way of teaching acceptance (Hayes et al., 2004). Dialectical Behavioral Therapy (DBT) is perhaps the best known representative of these therapies. It was developed by Linehan et al. (1991) to treat patients with borderline personality disorder (BPD). Mindfulness is one of four core skills emphasized in the program. The others are interpersonal skills, emotion regulation skills, and distress tolerance skills. Linehan describes mindfulness skills as “psychological and behavioral versions of meditation skills usually taught in Eastern spiritual practices” and drew heavily on her own experiences as a Zen student in including them in her program. The original version of DBT involves both weekly individual therapy and a skills training group. Typically, the treatment lasts 1 year.

OUTCOME DATA
In this section, we will discuss the outcome data on meditation and relaxation, with a particular eye toward their uses as adjuncts to psychotherapy. It should be clear from what we have written above that the size of the literature and the diversity of interventions subsumed makes this a challenging task. To make it manageable within the restrictions of one chapter, we will focus on the highest standard of clinical evidence: Randomized controlled trials (RCTs) with clinical populations. We feel that this focus will address the most basic question posed by
the practicing clinician: What do we know about the efficacy of these methods with the types of clients most likely to seek help from a psychotherapist?

In reviewing the literature for this chapter, we adopted the following strategy. First, we searched the Medline, Cochrane, DARE, and PsychInfo databases for the following keywords: Meditation, mindfulness, TM, Zen, relaxation, relaxation techniques, and stress management. We then culled the results and extracted those that included randomized clinical trials (either by keyword or by perusal of the methodologies) or randomized trials with subjects who met interview or psychometric criteria of pathology (i.e., subjects recruited in the media who scored in clinical ranges of depression inventories). We then excluded studies of patients with primarily physical problems (i.e., interventions on pain in cancer patients). When relevant, we included studies referenced in articles that did not appear in our computer searches as long as they met the other inclusion requirements. This left us with a set of RCTs on patients or subjects primarily with DSM axis 1 diagnoses.

The fact that we are interested in meditation and relaxation as adjuncts to psychotherapy also posed some methodological issues. The basic research paradigm for study of an adjunctive measure is additive in nature, evaluating outcomes of a type of therapy, i.e., short-term psychodynamic therapy, with and without an adjunctive intervention, i.e., a form of meditation. Such research should also control for attention and time effects, i.e., a placebo control condition. Thus, there would be, at a minimum, a 2-group design: Psychodynamic therapy plus meditation versus psychodynamic therapy plus placebo. Few studies reviewed met this basic standard. For that reason, we will primarily review randomized controlled studies that considered meditation and relaxation as treatments in themselves, rather than as adjuncts to other forms of psychotherapy. When relevant, we will discuss a few less-controlled studies that we feel have particular usefulness. Our efforts were devoted primarily to the subset of meditation and relaxation interventions that have been relatively well-defined, replicated, and investigated as stand-alone interventions. Other reviews, i.e., Jorm et al. (2004), have looked at evidence pertaining to highly diverse relaxation or meditation techniques applied to a range of similar disorders, leaving the clinician unsure as to the evidence for a specific procedure for relaxation or meditation practice.

STUDIES OF MULTIPLE DIAGNOSTIC CATEGORIES

Kutz et al. (1985), in an uncontrolled study, used a multimodal relaxation program (relaxation response, mindfulness meditation, body awareness exercises, and mindfulness exercises) with 20 patients in psychodynamic therapy. They found substantial improvement on therapist and patient self-report measures of well-being. Weiss et al. (2005), in a nonrandomized and marginally controlled study, offered a variation of MBSR to patients in individual therapy with the senior author. The patients who opted into the adjunctive program had DSM-IV diagnoses of depression and anxiety. They found the MBSR patients roughly
equivalent to patients who remained in individual therapy alone on measures of psychological distress. However, the MBSR patients terminated individual therapy at a significantly greater rate.

ANXIETY DISORDERS

Combined Groups of Anxiety Disorders
In an uncontrolled study, Kabat-Zinn et al. (1990) found that MBSR reduced therapist and self-ratings of anxiety for combined groups of patients with generalized anxiety disorder and/or panic disorder with or without agoraphobia. Analysis of a subset of subjects indicated that therapeutic gains were maintained after 3 years (Miller et al., 1995).

Generalized Anxiety Disorder
Benson et al. (1978) compared the Relaxation Response to self-hypnosis on a sample of patients diagnosed with “anxiety neurosis.” They found substantial improvement in both groups. Remarkably, the instructions for both interventions were given in only one session; the subjects were then left on their own to practice it at home. Another study found TM, PR, and PR plus EMG biofeedback to all result in improvement in DSM-II anxiety neurotics. There were no differences among the various treatments (Raskin et al., 1980b).

Several studies involved trials of AR and cognitive therapy. Fisher and Durham (1999) reanalyzed four of them from the standpoint of clinically significant changes on the State-Trait Anxiety Inventory. They found essentially parity between AR and cognitive therapy, with recovery rates at 6-month follow-up between 50 and 60%. Both fared better than other treatments in other randomized clinical trials reviewed by Fisher and Durham. Ost and Breitholtz (2000) and Arntz (2003) also found equivalence between AR and cognitive therapy in the treatment of generalized anxiety.

Panic Disorder and Agoraphobia
Three studies compared PR to other treatments for panic disorder. Michelson et al. (1983) contrasted PR to other treatments commonly used in the cognitive-behavioral treatment of panic disorder: Graduated exposure and paradoxical intention. Although all three treatments produced significant improvements, both relaxation and exposure tended to lead to faster improvement. There were no differences between PR and graduated exposure. Barlow et al. (1989) compared four conditions: PR alone; exposure to somatic cues plus cognitive therapy; PR plus both exposure and cognitive therapy; and a wait-list control. Subjects in all three treatment conditions improved more than those in the control group. Both treatments with exposure had significantly more subjects who were panic free at the end of the study that those who had PR alone. Beck et al. (1994) compared PR to cognitive therapy without exposure and a minimal contact control for patients with panic disorder. Both treatments yielded significant improvements
compared with the control. There was slightly more improvement in subjects given cognitive therapy compared to those given PR.

Five studies examined the use of AR in panic disorder. Significant improvement in symptomatology was found in all of them. Two of them (Ost, 1988; Ost et al., 1993) compared AR to more traditional PR. Both found slight advantages for AR. Two studies contrasted AR and cognitive therapy. Clark et al. (1994) found better outcomes for cognitive therapy than for either AR or treatment with imipramine. Arntz and Van Den Hout (1996) found cognitive therapy to be superior to AR in reducing panic frequency. In contrast, Ost et al. (1993) found no outcome differences between AR and cognitive behavioral therapy (CBT).

Other Phobias

Jorm et al. (2004) reviewed complementary and self-help treatments for anxiety disorders, including a number of studies involving relaxation techniques for a variety of phobias. They concluded that the family of relaxation techniques is effective for dental phobia and test anxiety. They did not differentiate among different types of relaxation techniques. When we reviewed the studies they cited pertaining to test anxiety, we found they overwhelmingly involved nonclinical samples or used diverse or poorly defined relaxation interventions. Ost and colleagues conducted a series of studies of the impact of AR or modifications of AR on a number of simple phobias. They found AR and active behavioral interventions to be effective treatments; they did not find differences in effectiveness between AR and the other interventions. These comparisons included AR and social skills training for social anxiety (Jerremalm et al., 1986a; Ost et al., 1981), self-instruction training for dental phobia (Jerremalm et al., 1986b), exposure for blood (Ost et al., 1984, 1989), and for claustrophobia (Ost et al., 1982).

Obsessive-Compulsive Disorder

Fals-Stewart et al. (1993) utilized PR as a control group for a study comparing individual versus group behavioral therapy. They found both behavioral treatments to be superior to relaxation at the conclusion of treatment. In one of the few studies that compared different types of meditation in a randomized clinical trial, Shannahoff-Khalsa et al. (1997) and Shannahoff-Khalsa (2003) found greater improvement for obsessive-compulsive disorder (OCD)-spectrum patients treated with a set of Kundalini Yoga exercises than for patients treated with a combination of Relaxation Response and mindfulness meditation.

Posttraumatic Stress Disorder

Echeburua et al. (1997) compared cognitive-behavioral therapy (CBT) (self-exposure and cognitive restructuring) to PR in the treatment of female sexual assault victims seeking treatment for posttraumatic stress disorder (PTSD). Most of the patients improved, but the success rates were higher in the CBT group. It should be noted, however, that the CBT patients had almost double the amount of in-therapy time than those receiving PR. Marks et al. (1998) found that
relaxation training, without specific active coping skills and utilized as a placebo control, produced moderate benefit at 3-month follow-up, and that combinations of exposure and restructuring were “usually” better than relaxation alone. Taylor et al. (2003) found that a relaxation intervention for PTSD patients utilizing Marks et al.’s (1998) protocol was equivalent in efficacy and speed to EMDR, but less effective than combined imaginal and in vivo exposure, also based on Marks et al. (1998). Vaughan et al. (1994) compared AR with EMDR and imaginal exposure relative to waiting list control and found all three conditions to be equivalent in their superiority to waiting list control. Intriguing questions remain concerning the role and components of relaxation treatments for PTSD; Taylor et al. (2003) observe that such treatment is “potentially useful but understudied” and that successful relaxation skill acquisition may facilitate spontaneous exposure to trauma-related stimuli. Bradley et al.’s (2005) recent meta-analysis echoes this ambiguity about relaxation interventions for PTSD, finding that relaxation is generally treated as a “supportive control condition” not compared with waiting list control conditions. They observed that relaxation’s and supportive therapy’s roles as control conditions leave neither of them “intended (and presumably perceived by the research therapists conducting them) to succeed” (p. 226).

DEPRESSIVE DISORDERS

Several studies have compared relaxation or meditation to pharmacotherapy. McLean and Hakstian (1979) used an unspecified relaxation program as an attention placebo for a study comparing brief psychodynamic therapy, behavior therapy, and amitriptyline as treatments for unipolar depression. They found behavior therapy superior to both relaxation and amitriptyline, which were equivalent in terms of outcome. Psychodynamic therapy fared the worst. In a subsequent reanalysis of the data, McLean and Taylor (1992) found no relationship between severity of depression and relative efficacy of the various treatment modalities. Murphy et al. (1995) also used relaxation as an attention control. Mild to moderately depressed outpatients were treated with either imipramine, CBT, or PR. They found the outcomes for the two psychological interventions to be equivalent, but both were superior to imipramine. In a remarkable study that also employed a tricyclic antidepressant, Janakiramaiah et al. (2000) used as subjects inpatients diagnosed with melancholic depression. They were treated with either SKY, electroconvulsive therapy (ECT), or pharmacotherapy. Patients improved in all three groups, with most improvement in the ECT group. There were no significant differences in response between the yoga and pharmacotherapy groups.

Reynold and Coats (1986), in one of the few RCTs involving adolescents, compared CBT, PR, and a wait-list control on groups of high school students meeting psychometric criteria for depression. They found CBT and PR to be equivalent and superior to the control group. At the other end of the life cycle, Lynch et al. (2003) found that the addition of DBT skills group plus telephone
case management to psychotropic medication management resulted in greater remission of depression in geriatric patients than medication management alone.

In a particularly well-designed series of studies, Teasdale, Segal, and colleagues have focused on the efficacy of MBCT in preventing relapse/recurrence of major depression. Teasdale et al. (2000) contrasted MBCT and treatment as usual (TAU) for patients in recovery from recurrent major depressive disorder. They found MBCT to be superior for patients with 3 or more previous major depressive episodes. No such advantage was found for patients with 2 or less previous episodes. This result was replicated in a later study (Ma & Teasdale, 2004).

**EATING DISORDERS**

Two studies have investigated the use of DBT in eating disorders. Telch et al. (2001) compared an abbreviated version of DBT adapted to women with binge-eating disorder to a wait-list control. The DBT group had a significant reduction in binge eating and eating pathology. Safer et al. (2001) found a shortened version of DBT resulted in significantly greater decrease in binging/purging behavior compared with a wait-list control for a group of women with bulimia nervosa.

**SUBSTANCE ABUSE DISORDERS**

Gelderloos et al. (1991) reviewed 24 studies that investigated the benefits of the TM program in treating and preventing the "misuse of chemical substances," including alcohol, cigarettes, and recreational drugs on a broad range of subjects. Although most of the studies are nonexperimental and uncontrolled, the authors conclude that "all studies showed positive effects of the TM program." Three of the studies were RCTs. Myers and Eisner (1974) assigned volunteer male college students to either TM, karate training, or a no-treatment control. Subjects in both intervention groups reported less usage of harmful drug use compared with controls. Brautigam (1977) compared the TM program to a wait-list control for young adult drug users recently treated for hepatitis. Reports of drug use decreased for the TM group and increased for the control group. Taub et al. (1994) compared the TM program to standard treatment or one of two relaxation programs for chronic "skid row" alcoholics recently released from detoxification centers. They reported that after 18 months, 65% in the TM group were completely abstinent versus 25% in the standard treatment group.

Murphy et al. (1986) compared a "mantra-based concentrative exercise" to running and a no-treatment control for a sample of "heavy" drinking college students. They found significantly greater reduction in self-reports of alcohol consumption in the running group than in either the meditation or the control groups. However, when they divided the meditators into high and low compliers, based on self-report, they found the high compliers to have reduction rates equivalent to the running group.

Shaffer et al. (1997) compared Hatha Yoga training to the conventional adjunctive treatment of psychodynamically oriented group psychotherapy for
patients on methadone maintenance. They found that both treatments contributed to significantly reduced drug use and criminal activities. There were no differences between the two types of adjunctive treatments.

Several studies have investigated the effectiveness of DBT for excessive drinking in patients with BPD. These will be discussed below.

**BORDERLINE PERSONALITY DISORDER**

Linehan and colleagues, in a very well-designed series of studies, have found DBT to be superior to TAU for women with BPD. Because their TAU groups involved referral of subjects to community mental health practitioners, they thereby controlled for threats to external validity such as time and attention. Specifically, Linehan and colleagues found that DBT resulted in greater reduction in the number and severity of parasuicidal events, fewer hospital days, and greater improvement in interpersonal functioning (Linehan et al., 1991, 1993, 1994). Similar results have been reported more recently in the Netherlands (Verheul et al., 2003). Linehan and colleagues found DBT to be more effective than TAU in reducing substance abuse comorbid with BPD (Linehan et al., 1999) but equivalent to a combined 12-step and comprehensive validation program for a sample of heroin-addicted borderline subjects (Linehan et al., 2002). Van den Bosch et al. (2002) found no differences in effect between DBT and TAU on substance abuse in borderline patients. Double-blind, placebo-controlled studies have found that the addition of fluoxetine did not enhance the effectiveness of an abbreviated version of DBT (Simpson et al., 2004) whereas the addition of olanzapine did (Soler et al., 2005).

**ATTENTION DEFICIT/HYPERACTIVITY DISORDER**

Goldbeck and Schmid (2003) compared autogenic training to a wait-list control for a sample of “mildly disturbed” children, some of whom were diagnosed with attention deficit/hyperactivity disorder (ADHD). They found greater improvement in the intervention group, particularly for “externalizing” children. They did not provide separate analyses for those diagnosed with ADHD. Gonzalez and Sellers (2002) studied the effectiveness of a multimodal stress management program on children diagnosed with ADHD. The program involved PR, imagery, exercise, time management, assertiveness training, and anger management. They found a therapist-led version of the program to be superior to both a parent-led version and a wait-list control.

**SUMMARY OF THE OUTCOME DATA**

Using the criteria for empirically validated treatments delineated by Division 12 of the American Psychological Association on the Psychological Intervention Guidelines (Task Force on Promotion and Dissemination of Psychological
Procedures, 1995), only one of the interventions reviewed meets the criteria for well-established treatments. DBT, as a treatment for BPD, has been demonstrated in more than two well-designed between-group studies utilizing clearly defined subject groups to be superior on a number of outcome measures to traditional treatment. The treatment is thoroughly manualized, and the effects have been demonstrated by two investigatory teams (Linehan et al., 1991; Linehan, 1993a; Verheul et al., 2003). The use of DBT as a treatment of substance abuse comorbid with BPD has not been studied as thoroughly, and currently does not meet the standards of well-established treatments.

A number of treatments reviewed meet the criteria for probably efficacious treatments. A summary of those that meet this standard of evidence is displayed in Table 9.1.

We recognize the designation of “empirically supported treatment” is controversial (see Norcross et al., 2006, for a recent dialogue on the issues) and that establishment of an intervention as “empirically supported” does not necessarily imply its superiority to others. We do believe, however, that the criteria for “probably efficacious” constitute an appropriate minimum standard of evidence. That said, there is no clear evidence supporting any of the interventions reviewed over the others for the disorders in question. Similarly, there is no evidence from the randomized clinical trials of the superiority of relaxation over meditation or vice versa. By and large, such comparative trials have not been conducted, nor have trials that would examine specific adjunctive contributions to outcomes.

Given the proliferation of research on MBSR, it is worthwhile commenting on why we excluded it from our list of probably efficacious treatments. Although recent reviews have referred to MBSR as meeting the criteria for a probably efficacious treatments (Baer, 2003; Walsh & Shapiro, 2006), most of the studies reviewed have involved patients with pain and/or other psychosomatic problems, which are not the focus of our review. Although patients with DSM diagnoses have been included in some studies on MBSR, these have typically been in heterogeneous diagnostic groups. As Baer points out, MBSR was not developed to treat any specific disorder. While we believe that MBSR has tremendous potential as a health-related intervention and as a treatment for a variety of psychological problems, we simply do not feel that studies have been conducted that meet the standards set by Division 12 for probably efficacious treatments for specific traditional DSM psychiatric disorders. More specifically, we could not identify a

* Criteria for Empirically-Supported Treatments (Paraphrased from Task Force on Promotion and Dissemination of Psychological Procedures, 1995)

Well-established: Manualized treatments researched by at least 2 different investigators, using well-specified client samples, with EITHER (A) 2 or more between group studies superiority to placebo or another treatment, and/or equivalence to an established treatment in an adequately-powered study OR (B) a large series of well-designed single case studies demonstrating efficacy compared to another intervention as in 'A' above.

Probably Efficacious: Two studies showing superiority to waiting-list control OR One or more studies meeting criteria for A above but only 1 investigator OR Two or more positive studies but heterogeneous samples OR A small series of well-designed single case studies.
TABLE 9.1 Summary of Treatments Meeting Criteria for Probably Efficacious Treatments

<table>
<thead>
<tr>
<th>Condition</th>
<th>Intervention</th>
<th>Citation for evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generalized anxiety disorder</td>
<td>AR</td>
<td>Borkovec &amp; Costello, 1993; Ost &amp; Breitholtz, 2000</td>
</tr>
<tr>
<td>Panic disorder with or without agoraphobia</td>
<td>AR</td>
<td>Ost, 1988; Ost et al., 1993</td>
</tr>
<tr>
<td>Dental phobia</td>
<td>AR</td>
<td>Jerremalm et al., 1986b; Willumsen et al., 2001</td>
</tr>
<tr>
<td>Depressive disorders: Symptomatic</td>
<td>PR</td>
<td>Murphy et al., 1995; Reynolds &amp; Coats, 1986</td>
</tr>
<tr>
<td>Major depressive disorder: Relapse prevention*</td>
<td>MBCT</td>
<td>Ma &amp; Teasdale, 2004; Teasdale et al., 2000</td>
</tr>
<tr>
<td>Binge-eating disorder, bulimia nervosa</td>
<td>DBT</td>
<td>Safer et al., 2001; Telch et al., 2001</td>
</tr>
<tr>
<td>Alcohol abuse disorder</td>
<td>TM†</td>
<td>Taub et al., 1994</td>
</tr>
<tr>
<td>Substance abuse disorder, comorbid with borderline personality disorder</td>
<td>DBT</td>
<td>Linehan et al., 1999</td>
</tr>
</tbody>
</table>

* For patients with two or less previous major depressive episodes.
† Because of the highly structured nature of the TM program, we determined that it met the requirement for manualization.

AR, applied relaxation; PR, progressive relaxation; MBCT, Mindfulness-based cognitive therapy; TM, Transcendental Meditation; DBT, Dialectical Behavioral Therapy.

single well-controlled study on a clinical population with a homogenous DSM-IV diagnosis. As noted above, we do feel that MBCT, a variation of MBSR, meets the criteria for probably efficacious treatment for the prevention of relapse from depression. We also anticipate that it will soon be established as an empirically validated treatment.

KEY PROCESS VARIABLES

By and large, process variables have not been studied, let alone linked to outcome, in randomized trials of meditation and relaxation in clinical samples. However, some key mediator variables can be discerned from the literature.

DROPOUT RATES

There is considerable variability of attrition rates of subjects (after randomization) in the studies we reviewed. For example, Benson et al. (1978)⁴ reported a 54%

⁴ They state that 37 of 69 subjects "did not complete the protocol;" they do not indicate whether they dropped out after the interventions began.
dropout rate whereas Arntz and Van Den Hout (1996) reported less than 3%. Although intention-to-treat analyses allow one to account for attrition rates when interpreting results, an intervention that many subjects will not complete will have less general utility than one with a lower dropout rate for the same population. On the basis of the literature reviewed, there is no compelling evidence of differential attrition rates among various types of interventions. The intervention that has the best-studied attrition rate to date is MBSR. Kabat-Zinn and Chapman-Waldrop (1988) found that 76% of 784 consecutive patients with a range of medical and psychological problems completed the 8-week program.

COMPLIANCE WITH PRACTICE

Meditation and relaxation are skills that can take considerable practice to master. For that reason, merely participating in a treatment for a set period of time (i.e., completion of study) does not guarantee proficiency in a given technique. Typically, subjects are given training by a professional with instructions to practice on their own. Clearly, the amount of practice theoretically should be related to therapeutic outcome. Yet few studies obtained internal measures of compliance with the instructions to practice and linked them to outcome. All such studies relied on self-reports, which are, of course, of questionable veracity. The best example of how practice can be related to outcome was reported by Murphy et al. (1995) in their study of problem drinkers. They found that, overall, their group of runners had significantly greater reduction of alcohol consumption than did either their meditation or no-treatment control groups. However, when they divided their meditators into high and low compliers, high compliers' outcomes were equivalent to those in the exercise group. Shapiro et al. (2003) found self-reports of practice positively related to outcome among breast cancer patients with insomnia. On the other hand, Davidson et al. (2003) found no relationship between reports of practice and biological or self-report measures of anxiety and affect in healthy normal subjects participating in MBSR in their workplace.

PROFICIENCY WITH TECHNIQUE

Completing a treatment protocol and practicing at home do not in themselves guarantee proficiency in technique. And, as noted above, self-reports of practice are not necessarily reliable. Yet, few of the outcome studies reviewed included internal measures of proficiency with the various therapeutic techniques. Raskin et al. (1980a) followed frontalis EMG changes—muscle tension indicators of decreased anxiety—in patients treated with either TM or PR. They found no association between muscle relaxation and clinical outcome. Recent research and theory about heart rate variability suggests it may be a strong candidate as a measure of proficiency, particularly for meditation or relaxation approaches that aim to alter respiration patterns as a means to achieve a relaxed state (Lehrer et al., 1999, 2000).
To be sure, physiological measures of proficiency may be easier to operationalize than are cognitive measures. However, the MBCT investigators have shown that this is possible. In attempts to determine the mechanisms behind the efficacy of MBCT, Teasdale and colleagues have examined mechanisms by which MBCT reduces relapses of depression. Williams et al. (2000) found that recovered patients given MBCT gave significantly fewer generic memories in response to cue words than did patients receiving TAU. Overly general memories have been associated with depression and other conditions. Teasdale et al. (2002) analyzed metacognitive awareness in patients in remission or recovery from recurrent major depression who had participated in either MBCT or TAU. Metacognitive awareness refers to “a cognitive set in which negative thoughts and feelings are seen as passing events in the mind rather than as inherent in the self or as necessarily valid reflections of reality” (Teasdale, 2002). From the standpoint of CBT, metacognitive awareness would thus give people “distance” from dysfunctional cognitions related to depression. As such, increased metacognitive awareness can be seen as a measure of proficiency with mindfulness. As predicted, patients in the MBCT treatment, in addition to having reduced relapse rates, demonstrated increased metacognitive awareness compared with the TAU group.

COST-EFFECTIVENESS

By definition, the use of meditation and relaxation as adjuncts to psychotherapy implies costs in addition to those of the primary psychotherapeutic treatment. There are several ways in which adjunctive measures can be cost-effective: (1) By shortening overall treatment time; (2) by shortening the length of a more expensive primary treatment; (3) by preventing relapse or comorbid disorders; (4) by preventing utilization of other medical services [as in the so-called “offset” phenomenon (Cummings & VandenBos, 1981)]; (5) by having fees so low that additional costs are not significant. By and large, the issue of cost-effectiveness has not been addressed in the randomized clinical trials of meditation and relaxation. However, there is indirect evidence that some of the interventions may be highly cost-effective.

In the study cited earlier, Benson et al. (1978) found substantial improvement in anxiety neurotics after one individual lesson in the Relaxation Response with instructions to practice at home. Although the study can be faulted for having an apparently large attrition rate, it does show that even minimal instruction in the technique can lead to therapeutic gains. If similar results could be obtained from group instruction, the overall costs of using the Relaxation Response as an adjunct would have been further reduced.

Orme-Johnson (1987) compared 5 years of insurance utilization of 2000 TM practitioners with normative data from the same insurance carrier. They found lower overall health care utilization in the TM group for inpatient mental health services, resulting in a difference of $623,571 per 1000 subscribers over the
5 years. Although Orme-Johnson acknowledges that this was a nonrandomized study and that the results might have reflected preexisting differences in those who chose to practice TM versus those who did not, the study does suggest the possibility of significant cost-offset as a result of the meditative practice.

Cost-effectiveness claims have been made by the team of researchers that developed MBCT. Such claims are based on the program’s relatively large group format (up to 12 participants) and its relationship with prevention of relapse/recurrence of depression in relatively well-controlled studies. Ma (2004) reported that the MBCT program required only 3 hours of therapist time per patient. The potential savings of health care expenses of MBCT is suggested in a study by Scott et al. (2003) that compared clinical management by a psychiatrist to clinical management plus 18 individual sessions of adjunctive cognitive therapy for subjects with partially recovered depression. They found cumulative relapse rates to be significantly lower in the cognitive therapy group. After analyzing total health care expenditures for both groups of patients, the cognitive therapy group, excluding the costs of providing the cognitive therapy, incurred significantly less incremental health care costs. However, when they considered the costs of providing cognitive therapy, the psychiatric management group had significantly lower overall health care costs. Because there is evidence that MBCT is probably efficacious in preventing relapse of depression and that the expenses of providing it are considerably less than that for cognitive therapy, it is reasonable to speculate that it is a cost-effective treatment.

The same issues of the economy of scale of the size of MBCT groups are also relevant to the MBSR program on which it was modeled. MBSR are usually conducted in groups of 15–20 individuals, for eight 2-hour sessions plus a daylong retreat (Beck et al., 1994; Gilbert, 2003; Goleman, 1977, 1988; Kabat-Zinn & Singer, 1981), making it a highly efficient program for the amount of clinical contact. The results of the uncontrolled studies of the effectiveness of the program—including measures of long-term reduction of symptoms—with a sample of patients with a variety of anxiety disorders suggest that the treatment may be cost-effective.

Although Linehan and her colleagues have not conducted cost-benefit analyses per se of DBT, there are data to suggest that the treatment may lead to reduced overall health care expenditures when contrasted with TAU. The reduction both in psychiatric hospital days and in parasuicidal events (which can lead to increased medical attention and emergency services) suggests that costs of DBT may be offset by other health care savings (Linehan et al., 1991, 1993, 1994).

ROLE IN COMPREHENSIVE TREATMENT PLAN OR STEPPED CARE AND COORDINATION ISSUES

Existing data give little empirical evidence of the role of meditation and relaxation in comprehensive treatment planning or in stepped care and coordination issues, and there is little existing evidence of the efficacy of these modalities as
adjuncts to other types of treatment. Suggestions regarding their role in treatment planning must largely be based on extrapolation from the outcome data reviewed above. Nonetheless, we have identified three issues that merit consideration.

**TIMING OF THE ADJUNCTIVE INTERVENTIONS**

With one significant exception, the studies reviewed above introduced meditation and relaxation when the subjects were symptomatic, either acutely or chronically. Thus, whether the target condition was a type of anxiety disorder, eating disorder, or substance abuse disorder, the subjects had to be currently symptomatic (often meeting DSM criteria) to be included in the study. Thus, to the extent that these interventions have been shown to be beneficial, the evidence suggests that they are likely to be efficacious in acute or chronic but symptomatic stages and that they can be conducted simultaneously with primary interventions.

The exception alluded to above is depression. Although several trials demonstrated positive results during symptomatic phases, the best-designed and controlled series of studies—those on MBCT—were conducted on subjects in remission from major depressive disorder. MBCT was developed specifically as an adjunct to other interventions, notably cognitive therapy and/or psychopharmacological management, administered in the acute phase. Thus, although there is reasonable evidence that MBCT is probably efficacious in preventing relapse for patients with 2 or less previous episodes, its efficacy as a treatment in the acute phase has not been studied. Similarly, the efficacy of other forms of meditation and relaxation in preventing relapse of depression or other conditions has not been studied.

**INPATIENT VERSUS OUTPATIENT TREATMENT**

The question of the role of meditation and relaxation in inpatient versus outpatient treatment is closely related to the issue of the timing of the intervention because inpatient stays typically take place during the most acute and symptomatic phases. With one exception, all of the trials reviewed above were conducted on nonhospitalized subjects. Janakiramaiah et al.'s (2000) study showing efficacy of SKY on hospitalized patients with melancholic depression suggests that meditative techniques may have value as an adjunctive measure during hospitalization.

**ADVERSE REACTIONS**

Meditation and relaxation are typically viewed as benign interventions. However, there have been reports of adverse reactions to them (Epstein & Lieff, 1981; Heide & Borkevec, 1983; Otis, 1984). While such reactions seem to be uncommon, they do suggest the advisability of monitoring the effects of the adjunctive interventions and the need for communication between the primary therapist and the individual conducting the adjunctive intervention.
RESEARCH AGENDA

INCREASED USE OF RANDOMIZED CONTROLLED CLINICAL TRIALS

Despite the amount of research on meditation and relaxation, we were surprised at how few randomized controlled studies are published to say nothing of systematic reviews or meta-analyses. Because nonspecific factors can easily confound outcome data in research on any type of psychotherapeutic intervention, the RCT remains the highest standard of evidence. The use of active control groups is especially important in order to account for the effects of expectancy and attention. Linehan’s research on DBT, in which TAU subjects were referred to practitioners, is a model in this regard.

THE USE OF MEDITATION AND RELAXATION AS ADJUNCTS TO OTHER FORMS OF THERAPY

There is little research specific to the use of meditation and relaxation as adjuncts to other types of psychotherapy. This is true despite the growing literature on the integration of Eastern philosophical and meditative traditions with conventional psychotherapy (i.e., Epstein, 1995; Mruk & Hartzell, 2003). Exploring the additive effects of meditation and relaxation when used in conjunction with other therapies should be a high priority for future research, along with identification of the added patient skills that predict improved outcomes.

COMPARISONS OF THE EFFICACY OF VARIOUS TYPES OF INTERVENTIONS FOR SPECIFIC PROBLEMS

The debate as to whether forms of relaxation and meditation are interchangeable or whether they have specific effects is longstanding and has been alluded to earlier in this chapter. Randomized controlled clinical trials comparing different interventions would be important in answering the questions of the relative clinical efficacy of the various forms and types of meditation and relaxation programs for specific problems. Continued research examining profiles of psychophysiological, cognitive, and behavioral responses to diverse meditation and relaxation techniques will be invaluable for the design of interventions and trials (Lehrer et al., 1999).

COST-EFFECTIVENESS STUDIES

The cost-effectiveness of any adjunctive interventions will be of interest to clients, health care plans, and other third-party carriers. There is reason to suspect that at least some of the interventions reviewed may result in overall reductions in health care expenses.
STUDIES LINKING MEDIATOR VARIABLES TO OUTCOME

Mediator variables such as compliance with instructions to practice and proficiency with the techniques taught in an intervention should be related to therapeutic outcome.

STUDIES OF THE RELATIVE CONTRIBUTIONS OF THE COMPONENTS OF COMBINED INTERVENTIONS

Several of the best-studied interventions entail combinations of various therapeutic elements. For example, MBCT combines the practice of mindfulness meditation with cognitive therapy and, presumably, support from group interaction. Thus, one cannot conclude with certainty—especially in the absence of mediator variables—that the therapeutic outcomes are due to the meditative components of the programs.

DISSEMINATION AGENDA

Information on meditation and relaxation is readily available. In fact, the challenge to the clinician is how to sift and winnow through the voluminous material in order to find techniques that are empirically based. For example, searching for books on meditation and relaxation on Amazon.com resulted in over 9000 and 1531 hits, respectively. In this chapter, we have focused on randomized controlled clinical trials in order to examine the highest level of evidence for the use of meditation and relaxation as adjuncts to psychotherapy for common DSM conditions. In so doing, we have identified a set of techniques that are either empirically supported or probably effective for specific problems. We have highlighted, in the Table 9.2, key reviews and, when relevant and available, instructional materials, and additional resources for the techniques.

TABLE 9.2 Dissemination Agenda for Selected Treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Selected reviews</th>
<th>Selected instructional literature</th>
<th>Other resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meditation, general</td>
<td>Delmonte, 1986; La Torre, 2001; Murphy &amp; Donovan, 2006; Walsh &amp; Shapiro, 2006</td>
<td>Dharmenet (<a href="http://www.dharmenet.org">http://www.dharmenet.org</a>) serves as an online clearinghouse for information about meditation and meditation centers</td>
<td>Desikacher, 2006; Mehta &amp; Mehta, 1990; Vaughan et al., 1994</td>
</tr>
<tr>
<td>Yoga</td>
<td>Becker, 2000; Brown &amp; Gerberg, 2005a; Patel, 1984; Shannahoff-Khalsa, 2004a</td>
<td>Desikacher, 2006; Mehta &amp; Mehta, 1990; Vaughan et al., 1994</td>
<td>The Art of Living Foundation (<a href="http://www.artofliving.org">http://www.artofliving.org</a>)</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Treatment</th>
<th>Selected reviews</th>
<th>Selected instructional literature</th>
<th>Other resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxation, general</td>
<td>Lehrer &amp; Woolfolk, 1993</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progressive relaxation</td>
<td>Bernstein &amp; Given, 1984;</td>
<td>Bernstein &amp; Given, 1984</td>
<td></td>
</tr>
<tr>
<td></td>
<td>McGuigan, 1984</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relaxation response</td>
<td>Jacobs, 2001; Mandle et al., 1996</td>
<td>Benson, 1975</td>
<td><a href="http://www.umassmed.edu/cfm/">http://www.umassmed.edu/cfm/</a></td>
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<td>Mindfulness-based stress reduction</td>
<td>Bishop, 2002; Grossman et al., 2004</td>
<td>Kabat-Zinn, 1990</td>
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<tr>
<td>Mindfulness-based cognitive therapy</td>
<td>Bishop, 2002</td>
<td>Segal et al., 2002</td>
<td></td>
</tr>
<tr>
<td>Dialectic behavioral therapy</td>
<td>Rizvi &amp; Linehan, 2001</td>
<td>Hayes et al., 2004; Linehan, 1993a, 1993b</td>
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</tr>
</tbody>
</table>

REFERENCES


