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Evidence-based practices for substance use disorders

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People with substance use disorders are heterogeneous, with wide variations across groups in terms of substances used, comorbid disorders, and their strengths and resources. Specialized therapies have been developed to target specific types of substance use disorders: alcohol, opiates, cocaine, and marijuana. Treatment services have been developed to address not only the substance use, but also the range of other problems that often predate, co-occur with, and are caused by substance use disorders. These issues can include family or social relationships, legal matters, job or vocational concerns, medical conditions, and co-occurring psychiatric disorders.

Several large federal agencies oversee treatment services and research on alcohol problems (the National Institute on Alcohol Abuse and Alcoholism), drug problems (the National Institute on Drug Abuse), or both drug and alcohol problems (SAMHSA Center for Substance Abuse Treatment).

In determining and evaluating the effectiveness of various treatment approaches, the primary focus is, in most cases, abstinence, or at least a clinically meaningful reduction in substance use. Other important outcomes usually assessed include treatment retention and associated problems, such as psychiatric severity, medical problems, legal concerns, family/social relations, and job/vocational functioning. Although there is some variability in how these criteria are measured, there is consensus among most researchers about these indicators and standard assessment procedures [1]. Methods of intervention for substance use disorders vary from pharmacological to behavioral or psychosocial, and from singular or specific therapies to a broad array of services within a program. The scientific focus again can differ by these dimensions.

In spite of all the complexities inherent in evaluating the effectiveness of treatment for substance use disorders, many treatments clearly have unambiguous efficacy and cost effectiveness [2–5]. Treatment is beneficial in reducing substance use, in alleviating associated psychiatric, legal, job, family/social, and medical problems, and in reducing the use other services and the cost burden to other systems. Positive outcomes are found to correlate with treatment retention and duration of treatment [6]. Finally, from a chronic disease model perspective, outcomes of treatment for substance use problems are

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comparable to outcomes from diseases such as hypertension, type 2 diabetes mellitus, and asthma [2].

Scope of review

This article reviews current methods used to evaluate strength of the empirical evidence supporting the efficacy of specific therapies. These methods are drawn from the medical, psychological and substance use disorder treatment research fields. Next, the authors provide a very brief description and overview of specific pharmacological and behavioral therapies for alcohol and drug use disorders that have a documented evidence basis. For a review of practices for tobacco and nicotine dependence, other sources are recommended [7]. An array of treatment services also has been the subject of scientific inquiry and will be described within the hierarchy of evidence model. Next, because several of the evidence-based treatments seem to yield equivalent outcomes, the current status of efforts to specify common principles of effective treatments are summarized. Finally, the substance use disorder treatment and research community is wrestling with the translation and implementation of evidence-based practices (EBPs) into routine community settings. Thus, the authors review efforts to disseminate research findings in the clinical community and discuss some factors that promote the adoption and sustainability of EBPs.

Evaluating practices using hierarchy of evidence models

Evidence is ubiquitous, inherently biased, and complicated to evaluate. Clinicians sit with patients who present with specific complaints, a range of symptoms, and a historical narrative. Influenced by education, training, supervision, the setting within which the clinician works, intuition, economics, and experience. Within that constellation, clinicians conduct assessments and make diagnoses and treatment decisions about particular patients. This reflects clinical experience and scientific evidence, derived from the clinician's experience with similar patients.

Patients want to get better and seek help. Patients may want to know that the assessment and diagnosis they receive will guide the treatment offered. Patients hope, perhaps even expect, that this treatment has been studied carefully for safety and has been found to work with substance users with similar characteristics. Finally, patients wish to be confident that the person treating them has long track record of success with this intervention. Patients also may have evidence-based expectations, based on their previous history and experiences in the offices of health care practitioners. Patients may wish to hear about treatment alternatives and be partners in clinical decision making.

Treatment research scientists may develop, implement, and test interventions for groups of patients with similar complaints, symptoms, and histories. These efforts can be guided by rigorous scientific and experimental methods to enhance the validity of inferences about the intervention, and to assist members of the research, academic, and clinical policy communities to determine if the intervention merits further support. This kind of evidence, by virtue of the use of rigorous empirical standards, is arguably less subjectively biased and more objective and systematic in its acquisition. Even within the increased objectivity of clinical research, however, there may be considerable variability in the quality of experimental design, research methods, assessments, subject inclusion/exclusion criteria, statistical procedures, and significance of findings across studies [8]. Apart from scientific quality, a clinical research-developed evidence-based intervention may also be practically irrelevant or unfeasible by virtue of its being too complicated, too expensive, or too narrowly focused on certain types of patients. For example, results based on studies treating college-educated employed Caucasian males with a single diagnosis of alcohol dependence may not apply to other populations.

Guyatt et al [9] note that although clinical research observations may be more systematic and sound than those garnered by the insights and experiences of individual clinicians and patients, these same individual clinicians and patients do have their own valid experience and evidence. Clinical research may only inform this dyad if the scientific information is not only sound, but also compelling, relevant, and doable by the individuals in this context. To the extent it is not, the research-to-practice gap prevails. As shown in Table 1, in evidence-based medicine, Guyatt and Rennie [10] offer practitioners a guide for making clinical research-based decisions along a hierarchy of the strength of evidence. This ranges from: (1) a practitioner conducted N of 1 randomized controlled trial with the specific patient (A B A B design) to (7) unsystematic clinical observations. The points between are: (2) systematic reviews of controlled trials, (3) a single randomized trial, (4) systematic review of observational studies addressing patient-important outcomes, (5) a single observational study addressing patient-important outcomes, and (6) physiologic studies. This model for evaluating the evidence may be particularly useful for clinician-as-scientist, but the sine qua non N of 1 randomized controlled trial (ABAB design) is probably impossible for psychosocial treatments [11].

Although designed specifically for behavioral and psychosocial treatments, framework developed by the Division 12 Task Force (Clinical Psychology Division) of the American Psychological Association is particularly useful for evaluating many substance abuse treatments. This model seeks to identify interventions supported by empirical research to guide clinicians and to influence training in clinical psychology [12]. This review categorized interventions either as empirically validated, probably efficacious, or neither. To be considered empirically validated, it is necessary that a given treatment: demonstrate efficacy in at least two randomized controlled trials (RCTs) or a large series (> 9) of single case experiments demonstrating efficacy, and those studies should be methodologically sound and include such features as treatment manuals and clearly defined samples. Moreover, a treatment ’s efficacy should be confirmed by at least two independent investigation teams. To be considered probably efficacious, a treatment’s efficacy must be confirmed by at least two positive randomized clinical trials with waiting list control group, or a small series of single case experiments, or one or more experiments meeting criteria for empirically validated but not by independent teams. This framework has generated considerable controversy. The capability of the scientific method to capture the nuance, subtlety, and relational dimensions were argued, as were the limitations of manual-guided treatments, RCTs, and longer term, nonresearch developed therapies. Nonetheless, this model articulated a standard by which interventions could be measured, and the evidence each has accumulated could be compared.

Another framework, specific to behavioral therapies research, has been developed recently. Known as the stage model of behavioral therapies development [13], this model describes a sequence of research on new treatments from the point where they are merely good ideas to the point where they are capable of being disseminated in the clinical field as validated, effective, well-defined treatments with guidelines for choosing the patients, providers, and settings most associated with optimal outcomes [14]. Stage 1 consists of pilot/feasibility testing, manual writing, training program development, and adherence/competence measure development for novel and untested treatments. Stage II consists principally of controlled clinical trials to evaluate the efficacy of approaches that have shown promise in earlier pilot studies. Stage III consists of studies to evaluate the transportability of treatments (eg, efficacy in diverse populations, means of training therapists, and cost-effectiveness). This model can serve as a goal-oriented and systematic approach to the development, testing, and dissemination of therapies.

The stage model is based upon the most widely established procedure for evaluating the status of pharmacotherapeutic and biological interventions from the United States Food and Drug Administration (FDA) Center for Evaluation and Research [15,16]. The FDA system articulates an orderly process of drug development and testing, with multiple studies and independent sites. It is guided by experimental design and public safety. It offers four well-articulated phases:

1. Testing for feasibility and safety (usually with 10 to 100 normal or healthy persons)
2. Efficacy testing by RCT (including active control and bioequivalence, involving several hundred people)
3. Effectiveness testing 0 the intervention in routine conditions using RCT (using typical patients, clinicians, settings, a broad range of outcomes, geography, populations, and practices)
4. Postapproval marketing and surveillance study (ongoing voluntary examination of evidence for adverse reactions, long-term impacts, comparisons with new products, and applications to new populations). The FDA model delineates guidelines for drug chemistry, properties, manufacturing, controls, and dosage developments. Rigorous experimental designs and protocol adherence, including double-blind RCTs, are essential features. This evidentiary method is appropriate for medications, may not be implemented without modification, and may be unsuitable for evaluating behavioral therapies [17,18]. As defined in Table 1, these four models define a hierarchy within which to evaluate the evidence for a treatment for substance use disorders. The next section reviews pharmacological and behavioral therapies for substance use disorders that have been evaluated by these experimental clinical research standards. The limited scope of this review does not permit evaluation of the quality of the research conducted with any intervention, nor the range of the potential applications or limitations for these treatments regarding diverse groups of patients, settings, or therapists.

Evidence-based practices for substance use disorders

This article focuses on treatments with a documented clinical evidence-base. The authors acknowledge that other treatments, including inpatient or residential programs, prevention programs, and self-help programs such as Alcoholics Anonymous (AA) do have some evidence for effectiveness. Again, because many of these approaches have not been tested widely using the criteria below, a discussion of the merit and evidence for these and other approaches is beyond the possible scope of this article. Lack of scientific evidence for efficacy is not tantamount to lack of efficacy. Furthermore, the authors' approach will not address therapies and EBPs for acute withdrawal symptoms; rather the authors will focus on treatments for adult substance users [19].

Table 2 categorizes each intervention reviewed in terms of these evidence models. The pharmacological approaches are not scored on the Division 12 or Stage Model for Behavioral Therapies, and the behavioral/psychosocial treatments are not scored on the FDA/CDES model. The authors categorized these interventions based upon information available at the time of writing and therefore offer it as a preliminary examination of the evidentiary base of each intervention. The authors offer this categorization more so as an observational and evaluative exercise in how practices can be compared and evaluated on a hierarchy of evidence basis.

Pharmacological therapies

Over the past decade there have been many scientific advances in neuroscience, neurobiology, and in technologies to map and study brain structures and processes. Psychiatry is on the threshold of many significant advances, and these remarkable developments promise to influence the understanding of the short- and long-term effects of drug and alcohol use. More detailed reviews of promising and validated pharmacotherapies are available [20–25].

Pharmacotherapies for alcohol use disorders

Disulfiram. Disulfiram inhibits aldehyde dehydrogenase, and results in an aversive metabolic response to alcohol. In systematic reviews of controlled trials [26,27], the outcomes for disulfiram were ascertained to be inconclusive, including in a double-blind placebo treatment study of 605 subjects. Type of administration (direct observation), psychological deterrent factors, and physician and patient choice account for the continued positive use of disulfiram [25].

Naltrexone—A major development in the treatment of alcohol dependence was the FDA's recent approval of naltrexone. The application of naltrexone, an opioid antagonist, to the treatment of alcoholism derives from findings indicating that naltrexone reduces alcohol consumption in animals and alcohol craving and use in people [28]. In randomized clinical trials, naltrexone has been shown to be more effective than placebo in reducing alcohol use and craving, time to first relapse, and the severity of relapse [29–31].

Acamprosate—Acamprosate has been found to be associated with reduced craving and consumption of alcohol through agonist activity at (gamma)-aminobutyric acid (GABA) receptors and inhibitory activity at N-methyl-d-aspartate receptors [25]. In two trials, patients who received acamprosate had higher abstinence rates at follow-up versus controls; another study found no differences. Acamprosate, alone and in combination with naltrexone is in the FDA Investigational New Drug (IN V) status, but it has been used widely in Europe.

New developments for alcohol use disorders also appear to be in the near future, including calcium carbimide (an aversive agent) [23] and γ-hydroxybutyric acid (a GABA metabolite that could reduce cravings) [32]. Mood stabilizers (lithium), anticonvulsants (carbamazepine), clozaril, and serotonergic drugs are also under investigation. None of these has demonstrated efficacy consistently.

Pharmacotherapies for opioid use disorders

Methadone—Methadone treatment for heroin users dates back to the 1960s [33], and it was approved by the FDA in 1973. It has been used for short- and long-term maintenance, and has demonstrated many public health outcomes: decreases in illicit drug use, psychiatric symptoms, family problems, and crime, and increases in employment [19]. Methadone is a long-acting opiate agonist that prevents withdrawal and reduces the effects and cravings for other opiates. Recent estimates suggest 179,000 Americans are on methadone maintenance primarily in licensed clinics funded by federal block grants [34].

Levo-alpha acetylmethadol—Levo-alpha acetylmethadol (LAAM) is an opioid agonist analog, which approved for the long-term maintenance of opiate dependence disorders by the FDA in 1993 [23]. Like methadone, LAAM has demonstrated effects to prevent opiate withdrawal and block the effects of heroin use. LAAM has low abuse potential, but its use is

rare because of some findings of potential adverse effects on the cardiovascular system, regulatory and insurance issues, and clinic acceptance [24].

Buprenorphine—Buprenorphine hydrochloride is a partial agonist, semi-synthetic opioid analgesic. It recently has been made available to trained and certified physicians and pharmacies. It has been shown to have a high affinity for the mu opioid receptor. It is safe, long acting, and has a mild dependence potential. In three trials it has been shown to reduce heroin use. The combination of naloxone (which reverses the effects of opioids and is used to treat acute opioid-related states) and buprenorphine also is available. Naloxone has been shown to reduce the abuse potential of buprenorphine. Buprenorphine and buprenorphine-naloxone were approved by the FDA in 2002 [24,25,35].

Naltrexone—Naltrexone directly blocks opiate receptor activity (receptor antagonist) and was approved in the 1990s for the treatment of opiate and later for alcohol use disorders. Naltrexone reduces the pleasurable, positive effects of opiates. In RCTs, it has been found to reduce substance use and the amount of illicit substances used per episode [19,29]. Retention is an issue, with only 15% of patients remaining on naltrexone after a year. For states with regulatory restrictions on methadone, or for groups where diversion may be a concern (for example, physicians), it is used more frequently [23].

Pharmacotherapies for other drug use disorders

No pharmacological agents are approved by the FDA for treating cocaine (or other similarly acting stimulants), cannabis (marijuana, hashish), or benzodiazepine use disorders. There have been many scientific advances in the past 5 years in the identification of multiple cannabinoid receptors, and research is underway to explore reciprocal pharmacological agents [36]. There are over 65 medications in development for cocaine addiction [23]. Much of the focus involves the dopaminergic system, dynorphinergic kappa opioid receptors, and dynorphin. Because people with these disorders often have co-occurring mood or anxiety disorders [37], many of these patients likely receive antidepressant or anxiolytic medications.

Behavioral or psychological therapies

Although the following is not an exhaustive list, it does include most behavioral therapies that generally are acknowledged to have comparatively strong empirical support and which have been specified adequately. Unlike pharmacotherapies, many behavioral therapies can be used across a range of substance use disorders with fairly little adaptation [38].

Behavioral couples therapy

Behavioral couples therapy (BCT), or behavioral marital therapy, is a behavioral treatment for both alcohol and drug use disorders that has been in development since 1985 [39]. It uses behavioral principles and contracting to reinforce abstinence and the appropriate use of medications (eg, naltrexone). It has been found to increase abstinence, improve relationship functioning, and decrease domestic violence in both male and female identified patients [40–44].

Brief interventions

Brief interventions for alcohol use disorders have been developed for use in settings other than addiction treatment programs, such as in primary care practices. These interventions generally consist of screening, assessment, advice, and greater frequency of follow-up visits [45,46]. This relatively minimal clinical effort has been shown to have powerful effects on

patient alcohol use. To date, these approaches have not been evaluated widely among individuals with drug use disorders [47,48].

Brief strategic family therapy

Brief strategic family therapy (BSFT) has been developed for Hispanic adolescents and their families. It has been shown to reduce drug use, enhance treatment compliance, and improve family relationships [49,50]. Although the intervention generally is conducted with families, some evidence supports its utility with a single person [51].

Cognitive–behavioral therapy

Cognitive–behavioral therapy (CBT) is based on principles of cognitive psychology and social learning theory and teaches patients to develop new cognitive and coping skills for substance use behaviors. In addition to a number of specific investigations [52,53], CBT has been studied in major multi-site RCTs, including National Institute on Alcohol Abuse and Alcoholism (NIAAA's) Project MATCH [54] and the National Institute on Drug Abuse (NIDA) Collaborative Cocaine Treatment Study [55]. In both of these projects, CBT was found effective in reducing alcohol and drug use and in supporting improvement in other life domains. Moreover, CBT appears to be associated with durable effects that have been shown to increase after the termination of active treatment [56–58]. Social and coping skills training and relapse prevention are adaptations of CBT [59–62].

Contingency management

Contingency management (CM) is a treatment approach that involves systematically reinforcing abstinence, usually with tangible goods or money in exchange for drug-free urine toxicology or treatment compliance. This intervention has been studied carefully by Higgins et al for people with cocaine use disorders [63–65], and robust positive outcomes implementing modifications of the approach also have been found for combined opiate and cocaine use disorders [66–68], alcohol use disorders [69,70], and marijuana use disorders [71].

Drug counseling (individual and group)

Individual and group drug counseling were manual-guided interventions developed for the NIDA Cocaine Collaborative Study [72,73] and designed to replicate as closely as possible, within a manual-guided format, the treatment approaches most routinely delivered in the community. Within different formats, both interventions focus on a direct problem solving to initiate abstinence, identify triggers and prevent relapse, and facilitate 12-step group involvement [74,75]. Both formats demonstrated positive effects on substance use and associated problems.

Motivational enhancement therapy/motivational interviewing

Miller and Rollnick [76] launched the approach termed motivational interviewing based upon the stages of change model of Prochaska and DiClemente [77]. This approach has been found effective with alcohol use disorders [78], and a four-session version (Motivational Enhancement Therapy, or MET), produced favorable outcomes in the NIAAA Project MATCH Study [79]. Modifications of this approach have been studied and found to yield positive substance use and treatment outcomes, such as with college student drinkers [80], persons with schizophrenia [81], and adolescent cannabis users [82]. Several reviews describe the effectiveness of this approach in a range of populations [8,83–85].

Multi-dimensional family therapy

Multi-dimensional family therapy (MDFT) was developed for adolescents with drug use problems and involves the adolescent, parents, and other social systems [86]. The intervention has been found to have positive effects on substance use, behavioral problems, and family functioning [87]. In addition, it recently has been found effective in a multi-site RCT with adolescent marijuana users [88].

Psychodynamic (supportive–expressive)

Psychodynamic supportive–expressive psychotherapy (SE) as developed by Luborsky et al [89] focuses on substance use within the context of the person and interpersonal relationship difficulties. SE has been found to be an effective intervention for opiate use disorders, especially when delivered by skilled therapists [90] and in controlled settings such as methadone maintenance.

Twelve-step facilitation therapy

Twelve-Step Facilitation Therapy (TSF) is a manual-guided therapy based upon the 12-step model [91] outlined in the Alcoholics Anonymous “Big Book” [92]. The intervention focuses on the patient’s acceptance of his/her alcohol use as a disease, using 12-step tools, and connecting with recovering persons in the fellowship. The manual-guided version was evaluated in comparison with MET and CBT in Project MATCH NIAAA Project MA TCH Study and produced favorable outcomes on abstinence, treatment retention, and other life dimensions [79]. More recently, it also has been shown to be effective with cocaine abusers who are concurrently alcoholic [93,94].

Integrating psychotherapy and pharmacotherapy

Pharmacotherapy and psychotherapy have distinct modes of action, time to effect, target symptoms, durability, and applicability. Each has some limitation when used alone. The combination has been found to enhance outcomes for opiate, alcohol, and cocaine use disorders [93,95,96]. Understanding that many who suffer from substance use disorders have heterogeneous resources, problems and preferences, these methods can be integrated both philosophically and in practice [95,97].

Addiction treatment services

Addiction treatment services research assumes that people with substance use disorders have a range of problems, degrees of severity, resources, and strengths. This is featured in substantial work with alcohol [98] and drug treatment services [99]. As McKay and Weiss report, a distillation of service research findings is complex [100]. Three of the most significant findings are: duration of treatment, problem-service matching, and standardized assessment.

Duration of treatment

Simpson et al [101,102] have documented the importance of duration of treatment, derived empirically at 90 days or more on average, in association with positive outcomes. This finding is consistent with the physiological, psychological, social, and behavioral attachments to the substance of abuse and the time necessary to construct new substance-free physiological processes, social connections, and cognitive skills.

Problem-service matching

Using an instrument designed to measure patient problems and severity on multiple dimensions (the Addiction Severity Index), McLellan et al [103–105] found that when

services are matched to problem areas, both naturalistically and prospectively, outcomes on these dimensions improve. This is consistent with the mental health services research of Drake et al [106], who have demonstrated the importance of integrating services for people with co-occurring substance use disorders and severe mental illness, although this practice has not been explored fully in addiction treatment settings and research.

Standardized assessment

In the early days of addiction treatment, the field suffered from a one size fits all approach, where few treatment alternatives were available, regardless of the patient's individual needs [107]. With the availability of a broader array of treatment alternatives and intensities, reliable and objective assessment increasingly is seen as crucial in guiding rational treatment decision-making [108]. Such an assessment should include: aspects of the substance use and its severity, psychiatric problems and severity, medical conditions, substance withdrawal potential, legal pressures, family/social relationships, motivational factors, recovery and support environment, treatment history and behavior, and cognitive capability [109].

Principles of effective treatments

NIDA recently outlined 13 principles of effective treatment including information on many of the treatments cited previously [110]. Similar outcomes and common themes in the behavioral and psychosocial treatments have led many to speculate about the nonspecific or nontechnical factors in all effective therapies. Factors such as the therapeutic alliance, enhancing positive expectancies, inspiring hope, and conveying a deep understanding have been outlined as nontechnique-based agents of change. A presentation and discussion of this issue are beyond the scope of this article. Undoubtedly, these factors are key ingredients to effective psychosocial treatments of all varieties and the foundation upon which the technical aspects of manual-guided treatments are built. These qualities should be remarkable qualities among those who seek to become therapists, and then cultivated and nurtured in those who enter the field. The differences on these dimensions likely account for the consistently found variations in therapist effectiveness within any given approach [111–113].

Specific to substance use disorders, among the similarities in varying psychosocial interventions, Rounsaville and Carroll [114] identified the following common tasks: addressing motivation, teaching coping skills, changing reinforcement contingencies, fostering management of painful affects, improving interpersonal functioning and enhancing social supports, and fostering compliance and retention in pharmacotherapy. Nathan and McCrady [115] made similar observations of common ingredients to effective addiction treatments: enhancing and maintaining motivation, teaching and learning new coping skills, restructuring the social environment, changing conditioned responses, developing understanding of social norms, and enhancing self-efficacy.

Implementation of evidence-based practices

The research to practice gap is well documented in the field of addiction treatment [116–118]. Currently, an individual or a family member seeking treatment for an addictive disorder is not likely to be offered a treatment drawn from the extensive list of well-studied and empirical evidence-based practices provided previously. How, and whether, an evidence-based intervention is translated and implemented into routine clinical settings may be the final element of evaluating its evidence base. For example, an intervention could not be considered effective in clinical practice if it is found to be too costly to do, ethically untenable, too complicated to implement, not economically supported, not suitable for regular patients, or too complex for most clinicians to learn.

Efforts are now underway to transfer research-developed practices into community settings through the NIDA Clinical Trials Network and numerous bridging the gap meetings and conferences [119]. Dissemination research has become an important field of interest [119,120], beyond the field of addiction to all technology transfer activities [121]. Several EBPs outlined in this article are involved in dissemination research into routine community settings, such as BSFT [122], CBT [123], CM [124,125], MET [126], and a variety of pharmacotherapies [34]. Consensus about conducting an intervention to prescribed levels of adherence and competence is emerging [127], and models of training are being developed and compared [123,128]. Once trained in an EBP, how clinicians implement and sustain the practice is a critical aspect to dissemination research.

Systematic efforts are underway to address the effectiveness of treatments as practiced in the real world. Treatment dissemination research, conducted comparatively early in its development, may ease a new clinical technology's way into clinical practice [129]. This is embodied in research to assess practitioners for their attitudes toward certain practices, including medications [130], manual-guided therapies [131,132], treatments for co-occurring disorders [133], or specific interventions [134]. Backer [135] and Lehman et al [136] have advanced this clinician assessment to include readiness for change for new practice implementation. Implementation researchers such as Drake et al [137] may provide addiction research with more developed measurement, methodologies, and strategies to address barriers and facilitators to practice adoption and sustainability. This more advanced stage of research has particular relevance for problem-service matching and the development of treatment service fidelity scales akin to therapy adherence/competence measures.

Summary

There are inherent complexities in evaluating EBPs for substance use disorders: the heterogeneity of the disorder itself, the variability in people who suffer from them, the range of settings in which services are provided, and multiple lines of research development. This article outlined four models for evaluating the evidence for interventions for substance use disorders, and presented brief descriptions of pharmacological, behavioral/psychosocial, and treatment services that have a clearly defined intervention (chemical agent or manual-guided therapy) and a documented record of objective evaluation. Although substantial work is underway to evaluate effectiveness in the real world, clinicians and individuals with substance use disorders and their families should be cognizant of the burgeoning array of effective treatment alternatives that are available.

References

[1]. Sobell LC, Toneatto T, Sobell Me. Behavioral assessment and treatment planning for alcohol, tobacco, and other drug problems: current status with an emphasis on clinical applications. Behavior Therapy. 1994; 25:533–80.

[2]. McLellan AT, Lewis DC, O'Brien CP, Kleber HD. Drug dependence, a chronic medical illness. Implications for treatment, insurance, and outcomes evaluation. JAMA. 2001; 284:1689–95.

[3]. McLellan, AT.; McKay, JR. The treatment of addiction: what can research offer In? practice. In: Lamb, S.; Greenlick, M.; McCarty, D., editors. Bridging the gap between practice and research: forging partnerships with community based drug and alcohol treatment. National Academy Press; Washington (DC): 1998.

[4]. O'Brien CP. A range of research-based pharmacotherapies for addiction. Science. 1997; 278:66–70. [PubMed: 9311929]

[5]. Rounsaville BJ, Kosten TR. Treatment for opioid dependence: quality and access. JAMA. 2000; 283(10):1337–9. [PubMed: 10714736]

[6]. Simpson DD, Joe GW, Brown BS. Treatment retention and follow-up outcomes in the Drug Abuse Treatment Outcome Study (DATOS). Psychol Addict Behav. 1997; 11:294–307.

[7]. American Psychiatric Association. Practice guidelines for the treatment of patients with nicotine dependence. American Psychiatric Press; Washington (DC): 1996.

[8]. Miller WR, Wilbourne PL. Mesa grande: a methodological analysis of clinical trials of treatments for alcohol use disorders. Addiction. 2002; 97:265–77. [PubMed: 11964100]

[9]. Guyatt, G.; Haynes, B.; Jaeschke, R.; Cook, D.; Greenhalgh, D.; Meade, M., et al. Introduction: the philosophy of evidence-based medicine. In: Guyatt, G.; Rennie, D., editors. A manual for evidence-based clinical practice. American Medical Association; Chicago: 2002. p. 3-12.

[10]. Guyatt, G.; Rennie, D., editors. A manual for evidence-based clinical practice. American Medical Association; Chicago: 2002.

[11]. McCrady BS. Alcohol use disorders and the Division 12 task force of the American Psychological Association. Psychol Addict Behav. 2000; 14:267–76. [PubMed: 10998952]

[12]. Chambless DL, Sanderson WC, Shoham V, Johnson SB, Pope KS, Crits-Christoph P, et al. An update on empirically validated therapies. The Clinical Psycologist. 1996; 49:5–11.

[13]. Onken, LS.; Blaine, JD.; Battjes, RJ. Behavioral therapy research: a conceptualization of a process. In: Henggeler, SW.; Santos, AB., editors. Innovative approaches for difficult-to-treat populations. American Psychiatric Press; Washington (DC): 1997. p. 477-85.

[14]. Rounsaville BJ, Carroll KM, Onken LS. A stage model of behavioral therapies research. Clinical Psychology: Science and Practice. 2001; 8:133–42.

[15]. US Food and Drug Administration. Food and Drug Administration/Center for Drug Evaluation Research guidelines for the format and content of the clinical and statistical sections of the application. DHHS; Washington, DC: 1988.

[16]. US Food and Drug Administration. The CDER Handbook. Washington, DC: 1998. Center for Drug Evaluation Research.

[17]. Kazdin AE. Progression of therapy research and clinical application requires better understanding of the change process. Clinical Psychology: Science and Practice. 2001; 8:143–51.

[18]. Gonzales JJ, Ringeisen HL, Chambers DA. The tangled and thorny path of science to practice. Clinical Psychology: Science and Practice. 2002; 9:204–9.

[19]. O'Brien CP. Recent developments in the pharmacotherapy of substance abuse. J Consult Clin Psychol. 1996; 64:677–86. [PubMed: 8803357]

[20]. Betz C, Hihalic D, Pinto ME, Raffa RB. Could a common biochemical mechanism underlie addictions? J Clin Pharm Ther. 2000; 25:11–20. [PubMed: 10771460]

[21]. Koob GF. Neurobiology of addiction. Ann N Y Acad Sci. 2000; 909:170–85. [PubMed: 10911930]

[22]. Kreek MJ. Opiate and cocaine addiction. Pharmacol Biochem Behav. 1997; 57:551–69. [PubMed: 9218280]

[23]. Kreek MJ, LaForge S, Butelman E. Pharmacotherapy of addictions. Nat Rev Drug Discov. 2002; 1:710–26. [PubMed: 12209151]

[24]. Sindelar JC, Fiellin DA. Innovations in treatment of drug abuse. Ann Rev Public Health. 2001; 22:249–72. [PubMed: 11274521]

[25]. Swift RM. Drug therapy for alcohol dependence. N Engl J Med. 1999; 340:1482–90. [PubMed: 10320388]

[26]. Fuller RK, Branchey L, Brightwell DR. Disulfiram treatment of alcoholics. JAMA. 1986; 256:1449–55. [PubMed: 3528541]

[27]. Hughes JC, Cook CCH. The efficacy of disulfiram: a review of outcome studies. Addiction. 1997; 92:381–95. [PubMed: 9177060]

[28]. Volpicelli JR, Alterman AI, Hayashida M, Obrien CP. Naltrexone in the treatment of alcohol dependence. Arch Gen Psych. 1992; 49:876–80.

[29]. O'Malley SS, Laffe AI, Chang G, Schottenfeld R, Meyer RE, Rounsaville BJ. Naltrexone and coping skills therapy for alcohol dependence: A controlled study. Arch Gen Psychiatry. 1992; 49:881–7. [PubMed: 1444726]

[30]. O'Malley SS, Croop RS, Wroblewski LM, Labriola DF, Volpicelli LR. Naltrexone in the treatment of alcohol dependence. Psychiatr Annals. 1995; 25:681–8.

[31]. O'Malley SS, Laffe AI, Chang G, Rode S, Schottenfeld R, Meyer RE, et al. Six month follow-up of naltrexone and psychotherapy for alcohol dependence. Arch Gen Psychiatry. 1996; 53:217–24. [PubMed: 8611058]

[32]. Addolorato G, Caputo F, Capristo E, Sefanini GF, Gasbarrini G. Gamma-hydroxybutyric acid: efficacy, potential abuse, and dependence in the treatment of alcohol addiction. Alcohol. 2000; 20:217–22. [PubMed: 10869862]

[33]. Dole VP, Nyswander ME, Kreek MI. Narcotic blockade. Arch Intern Med. 1966; 118:304–9. [PubMed: 4162686]

[34]. Kreek MJ, Vocci FJ. History and current status of opioid maintenance treatments. J Subs Abuse Treat. 2002; 23:93–105.

[35]. Raisch DW, Fye CL, Boardman KD, Sather MR. Opioid dependence treatment. Ann Pharmacother. 2002; 36:312–21. [PubMed: 11847954]

[36]. Earlywine, M. Understanding marijuana. Oxford University Press; New York: 2002.

[37]. Cacciola IS, Alterman AI, McKay JR, Rutherford MJ. Psychiatric comorbidity in patients with substance use disorders. Psychiatr Annals. 2001; 31:321–31.

[38]. Carroll KM. Integrating psychotherapy and pharmacotherapy to improve drug abuse outcomes. Psychology of Addictive Behaviors. 1997; 22:233–45.

[39]. O'Farrell TJ, Cutter HSG, Floyd FJ. Evaluating behavioral marital therapy for male alcoholics. Behav Ther. 1985; 15:147–68.

[40]. Fals-Stewart W, O'Farrell TJ, Birchler GR. Behavioral couples therapy for male methadone maintenance patients. Behav Ther. 2001; 32:391–411.

[41]. O'Farrell TJ, Fals-Stewart W. Behavioral couples therapy for alcohol and drug abuse. J Subs Abuse Treat. 2000; 18:51–4.

[42]. O'Farrell TJ, Fals-Stewart W. Behavioral couples and family therapy with substance abusers. Curr Psychiatry Rep. 2002; 4:371–6. [PubMed: 12230966]

[43]. Fals-Stewart W, O'Farrell TJ, Birchler GR. Behavioral couples therapy for male substance abusing patients: a cost outcomes analysis. J Consult Clin Psycho I. 1997; 65:789–802.

[44]. O'Farrell TJ, Cutter HS, Choquette KA, Floyd FJ. Behavioral marital therapy for male alcoholics: marital and drinking adjustment during 2 years after treatment. Behav Ther. 1992; 23:529–49.

[45]. Babor, TF.; Grant, M. A randomized clinical trial of brief interventions in primary health care. World Health Organization; Geneva Switzerland: 1992. Project on identification and management of alcohol-related problems. Report on Phase II.

[46]. Fleming MF, Bouny KL, Manwell LB, Johnson K, London R. Brief physician advice for problem alcohol drinkers: a randomized controlled trial in community based primary care practices. JAMA. 1997; 277:1039–45. [PubMed: 9091691]

[47]. Friedman PDD, McCullough D. Screening and intervention for illicit drug abuse: a national survey of primary care physicians and psychiatrists. Arch Intern Med. 2001; 161:248–51. [PubMed: 11176739]

[48]. Sullivan, E.; Fleming, MF. A guide to substance abuse services for primary care physicians. Center for Substance Abuse Treatment, DHHS; Rockville MD: 1997. Tip #24

[49]. Santisteban DA, Szapocznik J, Perez-Vidal A, Kurtines WM, Murray EJ, Laperriere A. Efficacy of intervention for engaging youth and families into treatment and some variables that may contribute to differential effectiveness. J Fam Psychol. 1996; 10:35–44.

[50]. Szapocznik J, Perez-Vidal A, Brickman RL, Foote FH, Santisteban DA, Hervis O, et al. Engaging adolescent drug abusers and their families in treatment: a strategic structural systems approach. J Consult Clin Psychol. 1998; 56:552–7. [PubMed: 3198813]

[51]. Szapocznik L, Kurtines WM, Foote FH, Perez-Vidal A, Hervis O. Conjoint versus one-person family therapy. J Consult Clin Psychol. 1996; 54:395–7. [PubMed: 3722570]

[52]. Carroll, KM. Behavioral and cognitive behavioral treatments. In: McCrady, BS.; Epstein, EE., editors. Addictions: a Comprehensive Guidebook. Oxford University Press; New York: 1999. p. 250-67.EE

[53]. Irvin LE, Bowers CA, Dunn ME, Wong MC. Efficacy of relapse prevention: a meta-analytic review. J Consult Clin Psychol. 1999; 67:563–70. [PubMed: 10450627]

[54]. Project MATCH Research Group. Matching alcohol treatments to client heterogeneity: Project MATCH post-treatment drinking outcomes. J Stud Alcohol. 1997; 58:7–29. [PubMed: 8979210]

[55]. Siqueland L, Crits-Christoph P. Current developments in psychosocial treatments of alcohol and substance abuse. Curr Psychiatry Rep. 1999; 1:179–84. [PubMed: 11122922]

[56]. Carroll KM, Rounsaville BJ, Nich C, Gordon LT, Wirtz PW, Gawin FH. One-year follow-up of psychotherapy and pharmacotherapy for cocaine dependence: delayed emergence of psychotherapy effects. Arch Gen Psychiatry. 1994; 51:989–97. [PubMed: 7979888]

[57]. McKay JR, Alterman AI, Cacciola JS, O'Brien CP, Koppenhaver J, Shepard DS. Continuing care for cocaine dependence: comprehensive 2-year outcomes. J Consult Clin Psychol. 1999; 63:70–8. [PubMed: 7896993]

[58]. Rawson RA, Huber A, McCann MJ, Shoptaw S, Farabee D, Reiber C, et al. A comparison of contingency management and cognitive-behavioral approaches during methadone maintenance for cocaine dependence. Arch Gen Psychiatry. 2002; 59:817–24. [PubMed: 12215081]

[59]. Carroll KM, Rounsaville BJ, Gawin FH. A comparative trial of psychotherapies for ambulatory cocaine abusers. American Journal of Drug and Alcohol Dependence. 1996; 17:229–47.

[60]. Monti PM, Abrams DB, Binkof JA, Zwick WR, Liepman MR, Nirenberg TD, et al. Communication skills training with family and cognitive–behavioral mood management training for alcoholics. J Stud Alcohol. 1990; 51:263–70. [PubMed: 2342366]

[61]. Kadden, R.; Carroll, KM.; Donovan, D.; Cooney, N.; Monti, P.; Abrams, D., et al. Cognitive-behavioral coping skills therapy manual. NIAAA, DHHS; Rockville MD: 1999.

[62]. Marlatt, GA.; Gordon, JR. Relapse prevention: maintenance strategies in the treatment of addictive behaviors. Guilford; New York: 1985.

[63]. Higgins ST, Budney AJ, Bickel WK, Hughes JR, Foerg FE, Badger GJ. Achieving cocaine abstinence with a behavioral approach. Am J Psychiatry. 1993; 150:763–9. [PubMed: 8480823]

[64]. Higgins ST, Budney AJ, Bickel WK, Foerg FE, Donham R, Badger GJ. Incentives improve outcome in outpatient behavioral treatment of cocaine dependence. Arch Gen Psychiatry. 1994; 51:568–76. [PubMed: 8031230]

[65]. Higgins ST, Wong CJ, Badger GJ, Ogden DE, Dantona RL. Contingent reinforcement increases cocaine abstinence during outpatient treatment and 1 year follow-up. J Consult Clin Psychol. 2000; 68:64–72. [PubMed: 10710841]

[66]. Silverman K, Higgins ST, Brooner RK, Montoya ID, Cone EJ, Schuster CR, et al. Sustained cocaine abstinence in methadone maintenance patients through voucher-based reinforcement therapy. Arch Gen Psychiatry. 1996; 53:409–15. [PubMed: 8624184]

[67]. Silverman K, Wong CJ, Higgins ST, Brooner RK, Montoya ID, Contoreggi C, et al. Increasing opiate abstinence through voucher-based reinforcement therapy. Drug Alcohol Depend. 1996; 41:157–65. [PubMed: 8809505]

[68]. Silverman K, Wong CJ, Unbricht-Schneiter A, Montoya ID, Schuster CR, Preston KL. Broad beneficial effects of cocaine abstinence reinforcement among methadone patients. JCCP. 1998; 66:811–24.

[69]. Petry NM, Martin B, Cooney JL, Kranzler HR. Give them prizes, and they will come: contingency management for treatment of alcohol dependence. J Consult Clin Psychol. 2000; 68:250–7. [PubMed: 10780125]

[70]. Petry NM, Martin B. Low-cost contingency management for treating cocaine- and opioid-abusing methadone patients. J Consult Clin Psychol. 2002; 70:398–405. [PubMed: 11952198]

[71]. Budney AJ, Higgins ST, Radonovich KJ, Novy PL. Adding voucher-based incentives to coping skills and motivational enhancement improves outcomes during treatment for marijuana dependence. J Consult Clin Psychol. 2000; 68:1051–61. [PubMed: 11142539]

[72]. Daley, DC.; Mercer, D.; Carpenter, G. Drug counseling for cocaine addiction: the Collaborative Cocaine Treatment Study Model. NIDA; Bethesda MD: 2002.

[73]. Mercer, DE.; Woody, GE. An individual drug counseling approach to treat cocaine Addiction: the Collaborative Cocaine Treatment Study Model. NIDA; Rockville (MD): 1999.

[74]. Woody GE, McLellan AT, Luborsky L, O'Brien CP. Psychotherapy in community-based methadone programs. Am J Psychol. 1995; 152:1302–8.

[75]. Crits-Christoph P, Siqueland L, Blaine J. Psychosocial treatments for cocaine dependence. Arch Gen Psychiatry. 1999; 59:503–12.

[76]. Miller, WR.; Rollnick, S. Motivational interviewing. Guilford; New York: 1991.

[77]. Prochaska, JO.; DiClemente, Cc. Toward a comprehensive model of change. In: Miller, WR.; Heather, N., editors. Treating addictive behaviors. Plenum; New York: 1986. p. 3-27.

[78]. Miller WR, Benefield RG, Tonigan JS. Enhancing motivation for change in problem drinking: a controlled comparison of two therapist styles. J Cons Clin Psych. 1993; 61:455–61.

[79]. Project MATCH Research Group. Matching alcoholism treatments to client heterogeneity: Project MATCH 3-year drinking outcomes. Alcohol Clin Exp Res. 1998; 22:1300–11. [PubMed: 9756046]

[80]. Marlatt GA, Baer JS, Kivlahan DR, Dimeff LA, Larimer ME, Quigley LA, et al. Screening and brief intervention for high-risk college student drinkers: results from a 2-year follow-up assessment. J Consult Clin Psychol. 1998; 66:604–15. [PubMed: 9735576]

[81]. Karey KB, Purnine DM, Maisto SA, Karey MP. Enhancing readiness-to-change substance abuse in persons with schizophrenia. Behav Modif. 2001; 25:331–84. [PubMed: 11428245]

[82]. Sampl, S.; Kadden, R. Motivational enhancement therapy and cognitive behavioral therapy (MET-CBT-5) for adolescent cannabis users. Center for Substance Abuse Treatment, DHHS; Rockville MD: 2001.

[83]. Dunn C, Deroo I, Rivara FP. The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review. Addiction. 2001; 96:1725–42. [PubMed: 11784466]

[84]. Miller, WR.; Brown, JM.; Simpson, TL.; Handmaker, NS.; Bien, TH.; Luckie, LF., et al. What works? A methodological analysis of the alcohol treatment literature. In: Hester, RK.; Miller, WR., editors. Handbook of alcoholism treatment approaches: effective alternatives. Allyn & Bacon; Boston: 1995. p. 12-44.

[85]. Wilk AI, Jensen NM, Havighurst TC. Meta-analysis of randomized controlled trials addressing brief interventions in heavy alcohol drinkers. J Gen Intern Med. 1997; 12:274–83. [PubMed: 9159696]

[86]. Liddle HA. Theory development in a family-based therapy for adolescent drug abuse. Clinical Child Psychology and Psychiatry. 1999; 28:521–32.

[87]. Liddle HA, Dakof GA, Parker K, Diamond GS, Barrett KA, Tejeda M. Multidimensional family therapy for adolescent drug abuse: results of a randomized clinical trial. American Journal of Drug and Alcohol Dependence. 2001; 27:651–87.

[88]. Diamond G, Godley SH, Liddle HA, Sampl S, Webb S, Tims FM, et al. Five outpatient treatment models for adolescent marijuana use. Addiction. 2002; 97:70–83. [PubMed: 12460130]

[89]. Luborsky, L. Principles of psychoanalytic psychotherapy: a manual for supportive–expressive psychotherapy. Basic Books; New York: 1984.

[90]. Woody GE, Luborsky L, McLellan AT. Psychotherapy for opiate addicts: does it help? Arch Gen Psychiatry. 1983; 40:639–45. [PubMed: 6847332]

[91]. Nowinski, J.; Baker, S.; Carroll, KM. Twelve-step facilitation therapy manual. NIAAA, DHHS; Rockville (MD): 1999.

[92]. Anonymous, Alcoholics. Alcoholics anonymous. 3rd edition. Alcoholics Anonymous World Services, Inc.; New York: 1976.

[93]. Carroll KM, Nich C, Ball SA, McCance E, Rounsaville BJ. Treatment of cocaine and alcohol dependence with psychotherapy and disulfiram. Addiction. 1998; 93:13–27.

[94]. Carroll KM, Nich C, Ball SA, McCance-Katz EF, Frankforter TF, Rounsaville BJ. One year follow-up of disulfiram and psychotherapy for cocaine-alcohol abusers. Addiction. 2000; 95:1335–49. [PubMed: 11048353]

[95]. Carroll KM. Integrating psychotherapy with pharmacotherapy to improve drug abuse outcomes. Addict Behav. 1997; 22:233–45. [PubMed: 9113217]

[96]. Miller NS, Smith DE. The integration of pharmacotherapy and nonpharmacotherapy. J Addict Dis. 1997; 16:51–64. [PubMed: 9328809]

[97]. Boyarsky BK, McCance-Katz EF. Improving the quality of substance dependency treatment with pharmacotherapy. Subst Use Misuse. 2000; 35:2095–125. [PubMed: 11138718]

[98]. Moos, RH.; Finney, JW.; Cronkite, RC. Alcoholism treatment: context, process and outcome. Oxford University Press; New York: 1990.

[99]. Simpson, DD.; Sells, SB. Opioid addiction and treatment: a 12-year follow-up. Krieger; Malabar (FL): 1990.

[100]. McKay JR, Weiss RV. A review of temporal effects and outcome predictors in substance abuse treatment studies with long-term follow-ups. Eva1 Rev. 2001; 25:113–61.

[101]. Simpson DD. Treatment for drug abuse. Arch Gen Psychiatry. 1981; 38:875–80. [PubMed: 7259424]

[102]. Simpson DD, Joe GW, Bracy SA. Six-year follow-up of opioid addicts after admission to treatment. Arch Gen Psychiatry. 1982; 39:1318–23. [PubMed: 6982696]

[103]. McLellan AT, Grissom GR, Brill P, Durell J, Metzger DS, O'Brien CP. Private substance abuse treatment: are some programs more effective than others? J Subst Abuse Treat. 1993; 10:243–54. [PubMed: 8391086]

[104]. McLellan AT, Grissom GR, Randall M, Brill P, O'Brien CP. Problem–service matching in addiction treatment. Arch Gen Psychiatry. 1997; 54:730–5. [PubMed: 9283508]

[105]. McLellan AT, Hagan TA, Levine M, Gould F, Meyers K, Bencivengo M, et al. Supplemental social services improve outcomes in public addiction treatment. Addiction. 1998; 93:1489–99. [PubMed: 9926553]

[106]. Drake RE, Essock SM, Shaner A, Carey KB, Minkoff K, Kola L, et al. Implementing dual diagnosis services for clients with severe mental illness. Psychiatr Serv. 2001; 52:469–76. [PubMed: 11274491]

[107]. McGovern MP, Angres DR, Leon S. Differential therapeutics and the impaired physician. J Addict Dis. 1998; 17:93–107. [PubMed: 9567228]

[108]. Carroll KM. Implications of recent research for program quality in cocaine dependence treatment. Subst Use Misuse. 2000; 35:2011–30. [PubMed: 11138715]

[109]. American Society of Addiction Medicine. American Society of Addiction Medicine patient placement criteria for the treatment of substance-related disorders. 2nd edition. American Society of Addiction Medicine; Chevy Chase (MD): 2001.

[110]. National Institute on Drug Abuse. Principles of drug addiction treatment. NIDA, DHHS; Rockville (MD): 2000.

[111]. Najavits LM, Weiss RD. Variations in therapist effectiveness in the treatment of patients with substance use disorders: an empirical review. Addiction. 1994; 89:679–88. [PubMed: 8069169]

[112]. Project MATCH Research Group. Therapist effects. Psychotherapy Research. 1998; 8:455–74.

[113]. Siqueland L, Crits-Christoph P, Barber J, Butler SF, Thase M, Najavits LM, et al. The role of therapist characteristics on training effects. J Psychother Pract Res. 2000; 9:123–30. [PubMed: 10896736]

[114]. Rounsaville, BJ.; Carroll, KM. Individual psychotherapy for drug abusers. In: Lowinsohn, JH.; Ruiz, P.; Miller, RB., editors. Comprehensive textbook of substance abuse. Williams & Wilkins; New York: 1997. p. 430-9.

[115]. Nathan, PE.; McCrady, BS. What makes treatment effective: treatment factors. Presented at the 110th Annual Conference of the American Psychological Association; Chicago. August 23, 2002;

[116]. Lamb, S.; Greenlick, MR.; McCarty, D. Bridging the gap between practice and research. National Academy Press; Washington (DC): 1998.

[117]. McLellan AT. Technology transfer in the treatment of addiction. J Subst Abuse Treat. 2002; 22:169–70. [PubMed: 12072161]

[118]. Hansen GR, Leshner AI, Tai B. Putting drug abuse research to use in real-life settings. J Subst Abuse Treat. 2002; 23:69–70. [PubMed: 12220602]

[119]. Simpson DD. A conceptual framework for transferring research to practice. J Subst Abuse Treat. 2002; 22:171–82. [PubMed: 12072162]

[120]. Roman PM, Johnson JA. Adoption and implementation of new technologies in substance abuse treatment. J Subst Abuse Treat. 2002; 22:211–8. [PubMed: 12072165]

[121]. Klein KJ, Sorra JS. The challenge of implementation. Acad Manage Rev. 1996; 21:1055–80.

[122]. Robbins MS, Bachrach K, Szapocznik J. Bridging the research-practice gap in adolescent substance abuse treatment. J Subst Abuse Treat. 2002; 23:123–32. [PubMed: 12220610]

[123]. Morgenstern J, Morgan TS, McCrady BS, Keller DS, Carroll KM. Manual-guided cognitive behavioral therapy training: a promising method for disseminating empirically supported substance abuse treatments into practice into the community. Psychol Addict Behav. 2001; 15:83–8. [PubMed: 11419234]

[124]. Andrezejewski ME, Kirby KC, Morral AR, Iguchi MY. Technology transfer through performance management. Drug Ale Dep. 2001; 63:179–86.

[125]. Petry NM, Simic F. Recent advances in the dissemination of contingency management techniques. J Subs Abuse Treat. 2002; 23:81–6.

[126]. Carroll KM, Farentinos C, Ball SA, Crits-Christoph P, Libby B, Morgenstern J, et al. MET meets the real world. J Subs Abuse Treat. 2002; 23:73–80.

[127]. Carroll KM, Nich C, Sifry RL, Nuro KF, Frankforter TL, Ball SA, et al. A general system for evaluating therapist adherence and competence in psychotherapy. Drug Alcohol Depend. 2000; 57:225–38. [PubMed: 10661673]

[128]. Miller WR, Mount KA. A small study of training in motivational interviewing: Does one workshop change clinician and client behavior? Behavioral and Cognitive Psychotherapy. 2001; 29:457–71.

[129]. Carroll KM, Rounsaville BJ. Bridging the gap between research and practice in substance abuse treatment. Psychiatr Serv. 2003; 54:333–9. [PubMed: 12610240]

[130]. Forman RF, Bovasso G, Woody GE. Staff beliefs about addiction treatment. J Subst Abuse Treat. 2001; 21:1–9. [PubMed: 11516921]

[131]. Ball SA, Bachrach K, DeCarlo J, Farentinos C, Keen M, McSherry T, et al. Characteristics, beliefs, and practices of community clinicians trained to provide manual-guided therapy for substance abusers. J Subst Abuse Treat. 2002; 23:309–18. [PubMed: 12495792]

[132]. Godley SH, White WL, Diamond G, Passetti L, Titus Jc. Therapist reactions to manual-guided therapies in the treatment of adolescent marijuana users. Clinical Psychology: Science and Practice. 2001; 8:405–17.

[133]. Carey KB, Purnine OM, Maisto SA, Carey MP, Simons JS. Treating substance abuse in the context of severe and persistent mental illness: clinicians' perspectives. J Subst Abuse Treat. 2000; 19:189–98. [PubMed: 10963931]

[134]. Fals-Stewart W, Birchler GR. A national survey of the use of couples therapy in substance abuse treatment. J Subst Abuse Treat. 2001; 20:277–83. [PubMed: 11672643]

[135]. Backer, TE. Assessing and enhancing readiness for change: implications for technology transfer. In: Backer, TE.; Soucy, G., editors. Reviewing the behavioral science knowledge base on technology transfer. NIDA, DHHS; Rockville (MD): 1995. p. 21-41.

[136]. Lehman WEK, Greener JM, Simpson DD. Assessing organizational readiness for change. J Subst Abuse Treat. 2002; 22:197–209. [PubMed: 12072164]

[137]. Drake RE, Goldman HH, Leff HS, Lehman AF, Dixon L, Mueser KT, et al. Implementing evidence-based practices in routine mental health service settings. Psychiatr Serv. 2001; 52:179–82. [PubMed: 11157115]

Table 1

Models for evaluating the hierarchy of evidence

Evidence-based medicine model (Guyatt and Rennie, 2002)
1 – Practitioner conducted N = 1 randomized controlled trial
2 – Systematic reviews of controlled trials
3 – Single randomized controlled trial
4 – Systematic review of observational studies w/outcomes
5 – Single observational study
6 – Physiologic studies
7 – Unsystematic clinical observations
Division 12. Clinical Psychology Division, American Psychological Association (Chambless et al, 1996)
1 – Empirically validated
2 – Probably efficacious
US Food and Drug Administration Center for Evaluation and Research (FDA, 1988; FDA/CDER, 1998)
1 – Testing for feasibility and safety
2 – Efficacy testing by RCT
3 – Effectiveness testing of intervention in routine conditions by RCT
4 – Post approval marketing and surveillance study
Stage model for behavioral therapy research (Onken et al, 1997)
1 – Therapy development
2 – Efficacy testing by RCT
3 – Effectiveness testing of intervention in routine conditions by RCT

Table 2

Evidence-based practices for substance use disorders by hierarchy of evidence model

Practice	Evidence-based medicine model	Division 12 model	FDAjCDER drug approval	Stage model for therapy and research
Pharmacological				
Acamprosate	2	–	2	–
Buprenorphine	2	–	4	–
Disulfiram	4	–	4	–
LAAM	2	–	4	–
Methadone	2	–	4	–
Naltrexone	2	–	4	–
Behavioral				
Behavioral couples	2	1	3	–
Brief interventions	2	2	–	3
Brief strategic family	2	2	–	3
Cognitive–behavioral	2	1	–	3
Contingency management	2	1	–	3
Drug counseling individual and group	3	2	–	2
Motivational enhancement therapy	2	1	–	3
Multi-dimensional family therapy	2	2	–	3
Psychodynamic Supportive–expressive	2	2	–	2
Relapse prevention	2	1	–	3
12-step facilitation	3	2	–	2
Treatment services				
Duration	4	2	–	1
Problem–service match	3	2	–	2
Assessment	4	–	–	–