

EVIDENCE-BASED CARE IN SUBSTANCE ABUSE TREATMENT:  
COMPARING THE PUBLIC AND PRIVATE SECTORS

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ABSTRACT

Substantial recent efforts have been made at the Federal, state and local levels to facilitate the transfer of evidence-based addiction treatment technologies from the research arena to everyday clinical practice. The substance abuse treatment field has historically been fairly isomorphic in terms of its core treatment technology, relying heavily on 12-step approaches and with relatively little emphasis on pharmacotherapies. With several new developments in the field, however, the diffusion of new technologies to the field bears watching. This paper describes the rate and correlates of adoption of nine evidence-based approaches to substance abuse treatment, including four medications (naltrexone, disulfiram, buprenorphine, and selective serotonin reuptake inhibitors) and five psychosocial counseling techniques (motivational enhancement therapy, contingency management, cognitive-behavioral therapy, dual-focus schema therapy, and the Matrix model). Data from national samples of public- and private-sector treatment facilities gathered between 2002-2004 provide evidence of measurable levels of adoption of these techniques, with significant differences across sectors and organizational forms.

# EVIDENCE-BASED CARE IN SUBSTANCE ABUSE TREATMENT: COMPARING THE PUBLIC AND PRIVATE SECTORS

## INTRODUCTION

Substance abuse is a significant public health problem in the US. The substance abuse treatment system plays a critical role in improving the lives of addicted individuals, their families, and their communities. There is a large literature that documents how treatment can reduce the broader social costs of addiction by preparing individuals for social participation and productivity that might not otherwise be possible.

Substance abuse treatment has grown and developed upon a base of psychosocial interventions, particularly 12-step programs and varying forms of group and residential-based therapies (White, 1998; Roman, Johnson & Blum, 2000). In order to improve the efficiency and efficacy of treatment as well as to mainstream substance abuse treatment into the broader realm of health care, the past several decades have seen substantial support for the discovery, development and study of new methods of treatment (Midanik, 2004; Lamb, Greenlick & McCarty, 1998). These data have in the past decade become linked with a broader institutional trend toward emphasis on “evidence-based treatment” (Timmermans & Berg, 2003). Throughout medicine, there are concerns that the individual and social costs of both acute and chronic illnesses could be further reduced through the use of more effective treatment practices, drawing upon the substantial knowledge base that has accumulated from biomedical and psychosocial research.

There are few data available regarding the extent to which substance abuse treatment organizations in the public and private sectors have adopted evidence-based treatment practices (EBPs). Even less is known about which types of organizations are more likely to use these

EBPs. Using data from nationally representative samples of 362 publicly funded and 401 privately funded community-based treatment centers, this research considers the rates of adoption of EBPs, differences in adoption between the public and private sectors, and organizational correlates associated with the use of EBPs.

*The American Substance Abuse Treatment System: Historical Context*

While the formal treatment of substance abuse in the US has a history extending back into the 19<sup>th</sup> century, the 1970s were a watershed period with the establishment of both the National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) (Olson, 2003; Wiener, 1980; Beauchamp, 1980). Other efforts by the Federal government predated these organizations, but their emergence was a notable step toward the “institutional legitimacy” of using treatment rather than punishment in addressing drug dependency and addiction.

With substantial initial support from NIDA and NIAAA until 1981, the American substance abuse treatment system developed into a diverse range of organizations. A substantial portion of these organizations are embedded in systems that serve specific constituents and target populations, such as the Veteran’s Health Administration, the Indian Health Service, and the multi-layered criminal justice and correctional system. A specialized component of treatment that is in large part a stand-alone subsystem is the opioid treatment system, consisting of highly regulated programs that primarily dispense methadone but which may be transformed with the diffusion of buprenorphine and other pharmacotherapies.

Within this context, the largest, and probably the best-known and most accessible part of the system comprises community-based treatment organizations. While many of these

organizations are described as “drug-free facilities” in order to differentiate them from opioid treatment programs (OTPs), there is a great deal of diversity within this organizational population. Thus, compared to the other subsystems mentioned, community treatment programs as a collectivity probably least resemble a coordinated “system” of care. A major source of this diversity is the variation in ownership of community-based treatment organizations, with such ownership distributed across governmental entities, privately owned by non-profit agencies, and for-profit ventures.

White’s (1998) history of the substance abuse treatment field describes the emergence of a national system in the 1970s that included this diverse range of organizations. This system includes the delivery of substance abuse treatment services in government-owned facilities, such as state psychiatric hospitals and county-owned general hospitals. In addition, a large number of community-based non-profit organizations began delivering treatment services; many of these non-profit centers, while privately owned, were heavily reliant on federal and state funds (Dayhoff, Pope, and Huber 1994). At the same time, a private treatment system began to emerge once insurance companies provided reimbursement for alcohol and drug abuse treatment services, with such coverage resulting from intense lobbying by constituent individuals and organizations descended from social movements in the 1940s to medicalize alcoholism treatment and mainstream it into the healthcare system, a movement that later came to include promotion of drug abuse treatment. Some of these private sector programs were located within non-profit hospital settings while others were largely free-standing and founded by entrepreneurs seeking profit on their investments (Yahr 1986). These variations in “organizational homes” add more differences to the patterns of organized service delivery.

Despite the wide range of organizational forms involved in delivering substance abuse

treatment services, there was remarkable homogeneity in the approach to treatment. Great confidence was placed in the “Minnesota Model” (Cook, 1988) which may be viewed as an ideological compromise stemming from the history of the field since the invention in 1935 of what came to be known as Alcoholics Anonymous (AA). Perhaps because of the uniqueness of its indirect claims to sobriety among a substantial proportion of its affiliates, as well as its clear internal logic, AA was widely lauded and rather uncritically accepted through the 1940s and 1950s as an effective approach combining spirituality, self-control, and an implicit biological model of causation. AA assiduously avoided any promotional involvement or organizational aggrandizement, but another vehicle developed to become the core of a small-scale social movement. The National Council on Alcoholism emerged as what might be called a political arm of AA, engaging persons who had successfully affiliated with AA in activities to promote the social acceptance of the disease concept of alcoholism and the mainstreaming of alcoholism treatment into the healthcare system.

The Minnesota Model was developed in the 1950s as a treatment model that combined the sobriety/abstinence goals of AA with hospital-based inpatient treatment. Organized around a 28-day timeframe, the Model involves initial detoxification, group therapy, introduction and participation in AA, individual counseling, and education about the scientific dimensions of alcoholism (Cook, 1988). The inpatient dimension of the treatment allows for the clients’ full attention to the recovery process, and family members are rarely included until the later part of the treatment regimen. It is expected that clients will be prepared for full affiliation and participation in AA upon departure from treatment, and frequently the client’s engagement with an AA sponsor occurs before treatment is completed.

It is evident that the Model rather elegantly combines the principles of AA with the

ecology of medical care. Its inpatient nature and diversity of activities makes it definitively “treatment” and not just a 28-day dosage of AA attendance. The technology required is simple and does not require a large investment, other than accommodating residential dining and sleeping arrangements as well as appropriate 24 hour staffing.

In the early 1980s, initial challenges to the 28-day model first arose with the publication of research indicating that there were no significant differences in outcome for alcoholic patients experiencing 28-day inpatient treatment versus those receiving outpatient care (Saxe et al., 1983). This challenge to the relative costs of inpatient care both fueled and was fueled by the nascent managed care industry, which found substance abuse treatment a straightforward candidate within which to fulfill part of their promises to reduce employers’ health care costs. During the same period, there was substantial growth in the scientific community studying treatment and the impact of alternative models, this being facilitated by research funding from NIDA and NIAAA which had been forced to cease their community programming activities in 1981. Researchers were also attracted to medication development. The persistently high relapse rate among treatment seeking individuals was an added impetus for clinical research endeavors that sought to improve client outcomes through innovative approaches to treatment.

*The “Research to Practice Gap”: Understanding the Adoption of Treatment Innovations*

As mentioned, NIDA and NIAAA have provided substantial support for research investigating the effectiveness of treatment interventions, beginning in the early 1970s. Moving beyond comparisons of inpatient and outpatient treatment, emphasis clearly shifted in the past 15 years toward evaluating specific interventions, including medications and manualized psycho-social treatment techniques. This research has yielded tangible products, including an expanded

range of pharmacological approaches approved by the FDA, namely naltrexone for the treatment of alcohol dependence in 1994, buprenorphine for opiate detoxification and treatment in 2002, and acamprosate for treating alcohol dependence in 2004.

Treatment effectiveness research has also explored the merits of specific behavioral interventions that move beyond the conventional 12-step model. Given the high rates of attrition during the early stages of treatment, researchers have developed interventions to enhance client engagement in treatment and motivation for recovery, such as motivational enhancement therapy and motivational interviewing. These interventions, theoretically grounded in a “stages-of-change” perspective (DiClemente & Prochaska 1998; DiClemente, Schlundt & Gemmell 2004), attempt to build a client’s self-efficacy through non-confrontational, empathetic interactions. Other interventions, such as cognitive behavioral therapy (CBT), emphasize learning and skill development through clients actively participating in the treatment process. During CBT interventions, clients often practice specific skills, such as coping with craving, avoiding situations where the risk of substance use is high, and problem-solving skills (Marlatt & Gordon, 1985; Carroll, Rounsaville & Keller, 1991). Other approaches, such as motivational incentives (also referred to as contingency management or voucher programs), utilize tangible, positive reinforcements to reward clients as they progress towards their treatment goals (e.g., Iguchi et al., 1997; Petry et al., 2000).

In 1998, the Institute of Medicine released a seminal report that documented a “research to practice gap” in substance abuse treatment, meaning that certain treatment practices, although demonstrated to be effective in clinical research, had failed to penetrate the treatment system (Lamb, Greenlick & McCarty, 1988). The IOM panel argued that greater adoption of evidence-based practices was likely to yield substantial improvements in the quality of care delivered and

improve client outcomes. They noted that this gap is evident for both pharmacological approaches to treatment as well as behavioral interventions.

Defining “evidence-based practices” (EBPs) is a difficult task. In this research, we rely on three approaches in selecting EBPs. First, we measure the use of three medications that had received FDA approval for the treatment of substance abuse as of 2004: disulfiram (approved for treating alcohol dependence), naltrexone (approved for alcohol and opiate treatment), and buprenorphine (approved for opiate treatment). Second, we also consider the adoption of selective serotonin reuptake inhibitors (SSRIs), because of the high rate of co-occurrence between substance abuse and mood disorders and the growing evidence that programs that address both disorders in the same organizational settings produce superior clinical outcomes. For behavioral interventions, we focus on psycho-social approaches outlined in NIDA’s (1999) *Principles of Drug Addiction Treatment: A Research-Based Guide* and approaches that have been evaluated in large-scale clinical trials, such as Project MATCH. Specifically, we measure the adoption of five behavioral interventions: motivational enhancement therapy (Miller 1996), contingency management through the use of motivational incentives, dual-focus schema therapy (Ball 1998), cognitive behavioral therapy (CBT), and the Matrix Model (Huber et al., 1997; Rawson et al., 1995).

Although the IOM report suggests that the “research to practice gap” is substantial, there are few national datasets available to measure its magnitude. For example, most studies of the diffusion of pharmacotherapies in addiction treatment are based on small or nonrepresentative samples of treatment providers, or focus on the prescribing behaviors of individual physicians (Mark et al., 2003; Thomas et al., 2003; Fuller et al., 2005). Meanwhile, SAMHSA’s National Survey of Substance Abuse Treatment Services reports on a limited number of

pharmacotherapies (naltrexone, methadone, buprenorphine, and disulfiram), but provides no data with which to assess the organizational correlates of their adoption, nor the extent to which these medications are used in everyday practice. Studies of the adoption of evidence-based psychosocial counseling techniques are even more rare.

In addition to the need to measure the rates of adoption in national treatment system, there is also a need for information about adoption may vary across program types and by organizational characteristics. There have been growing concerns that the American treatment system consists of two-tiers, with clients served by the private sector perhaps have access to higher quality care than those individuals served by the public sector. Although this two-category system is elegant in its simplicity, the empirical reality of the American treatment system suggests the need for a four-category approach. This system consists of a public sector that can be divided into facilities owned by governmental agencies and non-governmental non-profit centers that remain highly reliant on governmental funds, such as federal block grants administered by the state. The private sector can be differentiated from the public sector by a greater reliance on non-governmental funds; primarily the private sector is funded via commercial insurance payments and self-paying clients. However, the private sector can be further differentiated into for-profit entities and non-profit organizations. Organizational theory suggests that these organizational differences, based on ownership, funding, and profit status, are likely to yield differences in organizational strategies, and ultimately, the services delivered to clients. However, there are few analyses that have considered the adoption of EBPs across this spectrum of substance abuse treatment centers.

A critical issue in addressing the research to practice gap is a greater understanding of the characteristics of organizations that have adopted EBPs. Although there is an emergent literature

on this type of innovation adoption, there are numerous limitations implicit in the designs of previous research. In particular, few studies have been national in scope or included both public and private treatment facilities. Furthermore, much of the published research focuses on a single EBP, making it difficult to assess if organizational characteristics are predictive across a range of EBPs, including pharmacotherapies and behavioral approaches.

Thus, this research focuses on three research questions. First, to what extent have community-based substance abuse treatment centers adopted FDA-approved medications and evidence-based psychosocial counseling approaches? Second, are there differences in rates of adoption of these EBPs across government-owned, publicly funded non-profit, privately funded non-profit, and for-profit treatment centers? Finally, are there differences in the adoption of EBPs based on other organizational characteristics, such as program structure, clinical services, program staffing, and client mix?

## METHODS

### *Sample*

Data for these analyses are derived from two nationally representative samples of specialty addiction treatment programs in the public and private sectors. Two separate samples were drawn for public and private treatment programs, respectively, each utilizing a two-stage random sample of treatment programs, stratifying first on geographic location (county) and then sampling treatment facilities within geographic strata. To be eligible for the study, programs in both samples were required to offer treatment for alcohol and drug problems and to provide a level of care at least equivalent to structured outpatient programming as defined by the ASAM patient placement criteria (Mee-Lee, Gartner, Miller, Schulman and Wilford, 1996). Excluded

from the samples were halfway houses, detox-only programs, counselors in private practice, DUI and other alcohol education/prevention programs, and programs offering exclusively methadone maintenance. (Organizations offering methadone along with other non-maintenance modalities were eligible for sampling.) Inclusion criteria also required that programs be community-based and open to the general public; as a result, correctional facilities and Veteran's Healthcare Administration programs were also excluded from the study design.

Unique to this study, the public and private sectors are differentiated by sources of revenue rather than by ownership. The private sector, which includes both for-profit and non-profit programs, is defined to include programs receiving less than 50% of their annual operating revenues from government block grants, other federal/state/local grant funds, and criminal justice system contracts. The average private sector program in this sample receives an average of only 11% of their revenues from such sources. By contrast, programs were eligible for the public sector sample if they received at least 50% of their annual operating revenues from government grants or contracts; centers in the resulting public sample received an average of 84% of their operating revenues from such sources.

The private sector treatment center sample was originally drawn in 1994, and several waves of data collection have been completed with these programs over time. The most recent wave of data collection occurred over an 18-month interval between late 2002 and early 2004. Over time, sample replacement strategies were employed to compensate for sample attrition due to program closure or refusal to participate; where needed, centers were replaced with randomly selected units within the same geographic strata. The public sector sample was drawn in 2002, and 362 programs were interviewed concurrent with the private sector sample. In all, 87% of the private sector sample, and 80% of the public sector sample, responded to face-to-face interviews

with project staff during the study period. Pooled, unweighted data from both samples (total N=763) are reported here.

Traditionally, analyses describing the US treatment system have differentiated programs based on ownership (e.g., government-owned versus privately-owned programs) or profit status. In so doing, the vast majority of programs are classified as private not-for-profit entities. However, a treatment facility's revenue streams are likely to be associated both with its client base as well as the nature and variety of services offered. Thus, layering funding source onto ownership and profit status may provide a richer description of the patterns of innovation adoption within these organizations. Four groups result from this combination of ownership, profit, and funding attributes: government-owned facilities, nonprofits deriving the majority of their revenues from public grant and contract sources, nonprofits deriving the majority of their revenues from private funds (i.e., commercial insurance and client fees), and private for-profit facilities. Of note, grouping the samples in this way permits an assessment of important differences within the nonprofit sector when funding source is considered. Table 1 shows the distribution of the study sample across these four categories.

[Insert Table 1 about here]

### *Measures*

Face-to-face interviews were conducted with the administrators of all participating treatment programs. The interviews included detailed questions on the treatment center's organizational structure, staffing, clinical services, and caseload characteristics. From these questions, a series of measures were derived to describe the adoption of evidence-based practices in the treatment system, and the organizational correlates of these practices.

### Adoption of Evidence-Based Practices

Administrators were asked whether a number of pharmacological and behavioral therapies were currently used in their program. Three medications approved for the treatment of alcohol or drug dependence were included: disulfiram, naltrexone, and buprenorphine. In addition, use of selective serotonin reuptake inhibitors (SSRIs) is also measured, as this class of pharmacotherapies may be prescribed for clients with co-occurring alcohol and mood/anxiety disorders. The use of five behavioral therapies was also measured: a manualized approach to motivational enhancement therapy (MET), voucher-based contingency management, cognitive behavioral therapy (CBT), dual focus schema therapy (DFST), and the Matrix model. Each of these 9 treatment techniques is coded as a dichotomous variable (1 = in use at the treatment program, 0 = not used). It is important to note that these measures indicate adoption (any use), as distinct from implementation (frequency of use) of each technique.

### Organizational Correlates of Evidence-Based Practices

A number of variables were measured that may be potential correlates of the use of evidence-based clinical practices in specialty addiction treatment programs. First, organizational size may be associated with innovation adoption in that larger programs have available a greater degree of slack resources to devote to the development of new service lines (Pfeffer & Salancik, 1978), and because the need for more efficient and effective treatment technologies should be expected to increase proportionate to the number of clients treated. Thus, two measures of program size were constructed: the number of *full-time equivalent (FTE) employees*, and the total number of *admissions in the past year*. In the analyses that follow, both of these variables

are expressed in percentages in the bivariate analyses, but are log-transformed for use in the logistic regression analyses to account for skewness.

Three other measures of organizational structure are also included in these analyses. Because accreditation is an indicator of program quality, it may be expected to be associated with the use of evidence-based practices. The program's *accreditation status* was obtained for the two major accrediting bodies in the addiction treatment field: JCAHO and CARF (for each, 1 = accredited and 0 = not accredited). *Location in a hospital setting* might be expected to increase the likelihood of EBP adoption, particularly for pharmacotherapies. Centers were coded 1 if they were based in a general or psychiatric hospital, and zero otherwise. Geographic location may also influence innovation adoption, particularly to the degree that new technologies diffuse more quickly within concentrated population areas. A dichotomous measure of *rural location* was coded 1 if the center was located outside a metropolitan area under 2000 US Census Bureau definitions, and zero otherwise.

Because the structure and intensity of a center's clinical programming is likely to influence its adoption of EBPs, variables were constructed to measure the availability of four different levels of care: detoxification, residential services (non-hospital services of greater than 30 days), inpatient programming (medically-monitored services of less than 30 days), and outpatient services. Each variable is coded 1 if the center offered that level of care, and zero otherwise. Two measures regarding the program's approach to addiction treatment were also included. Programs offering integrated care for clients with co-occurring substance abuse and psychiatric conditions were expected to be more likely to have adopted other EBPs; at the same time, programs indicating that their treatment approach was based on a 12-step model may be

less likely to adopt EBPs, particularly pharmacotherapies. These orientations are measured as dichotomous variables.

Five measures related to the availability and credentials of specific clinical staff within the treatment program. Because access to physicians is a critical element in a program's ability to prescribe medications, the availability of these key staff was coded in three dichotomous variables: no access to physician services, access via contractual relationships only, and employment of a physician on the staff of the treatment program. Counselor credentials have also been associated with the adoption of EBPs, and this may be particularly important for the introduction of new psychosocial counseling techniques. Staff credentials were measured in terms of the percentage of counselors possessing at least a Master's degree, and the percentage of counselors who were certified in additions.

Finally, the nature of treatment services offered within a program may be related to the specific needs of its clients. Clients' primary substance of abuse dictates the appropriateness of certain pharmacotherapies, as well as the applicability of some psychosocial counseling approaches. Thus, the percentage of clients with primary diagnoses of alcohol abuse/dependence, cocaine abuse/dependence, and opiate abuse/dependence are included as predictor variables in these analyses.

### *Analyses*

Two sets of analyses were run to examine patterns in the adoption of evidence-based clinical practices in these samples. First, cross-tabulations show the overall rates of adoption of the medications and behavioral therapies four groups of treatment programs: government-owned, non-profits relying predominantly on public funding, non-profits relying predominantly on

private funding, and for-profit units. Second, a series of bivariate logistic regressions were conducted to examine the association between structural, clinical, staffing, and client characteristics and the evidence-based practices of interest. In order to compare the magnitude of these associations, the unadjusted odds ratios are displayed in the corresponding tables.

## RESULTS

Table 2 shows the distribution of organizational structure, clinical services, staffing, and client characteristics across the four types of programs. In particular, these data suggest that there are considerable differences among non-profit programs when principal funding source is taken into account. Notably, the privately funded non-profits were much more likely to be hospital-based as well as JCAHO-accredited, and admitted significantly more clients in the prior year relative to the publicly-funded nonprofits.

In terms of clinical services, both groups of private-sector programs were more likely to offer detoxification, inpatient, and outpatient services, while residential services were more often available within the public-sector programs. Publicly-funded nonprofits were significantly less likely than the other three groups to offer integrated care for clients with co-occurring substance abuse and psychiatric conditions. Both groups of private-sector facilities were more likely than their public-sector counterparts to describe their program as being based on a 12-step model.

There were no significant differences across the groups of centers in terms of the availability of physicians. However, there was a significant difference among the non-profits in the employment of Master's level counselors; these staff comprised a greater proportion of clinical staff in the privately-funded nonprofits relative to their publicly-funded counterparts. Finally, there were also differences across the sectors in the treatment needs of their clients. Both

groups of privately-funded centers treated significantly more clients with primary alcohol conditions relative to the public sector, while publicly-funded centers saw a relatively greater percentage of clients with primary cocaine abuse/dependence.

[Insert Table 2 about here]

Table 3 shows the distribution of the measured pharmacotherapies and behavioral therapies across the four types of programs. Once again, there are a number of significant differences across groups, with notable differences in the non-profit facilities based on funding source. Generally speaking, privately funded programs, whether for-profit or non-profit, are significantly more likely to use pharmacotherapies than their publicly funded counterparts. Publicly funded non-profits were significantly less likely than the three other program types to have adopted buprenorphine, naltrexone, or SSRIs. By contrast, there were fewer between-group differences in the reported adoption of the five counseling techniques. A notable exception is contingency management (motivational incentives), which was reported significantly more frequently in the public sector. A very high percentage of all program types report using cognitive behavioral therapy (CBT), although private for-profits were significantly less likely than the other groups to report using this approach. The for-profit centers were significantly more likely to report the use of dual-focus schema therapy compared to government-owned facilities. There were no significant between-group differences in the adoption of manualized motivational enhancement therapy (MET) or use of the Matrix model.

[Insert Table 3 about here]

The next set of analyses used a series of bivariate logistic regressions to assess the impact of each of the organizational characteristics on the adoption of each of the medications and behavioral therapies described above. Tables 4 and 5 show the unadjusted odds ratios for each pair of independent and dependent variables. Examining these findings across the columns of each table permits comparison of the relative strength of the associations between a predictor variable and the adoption of each of the EBPs shown.

[Insert Table 4 about here]

As shown in Table 4, there is a significant and positive association between location in a hospital setting and the adoption of each of the four pharmacotherapies. Likewise, JCAHO accreditation is similarly associated with medication adoption. While there is a high correspondence between hospital location and JCAHO accreditation, the sample includes a number of accredited facilities that are not hospital-based; therefore, these measures may tap different organizational features that are predictive of medication adoption. Both of the organizational size measures are also significantly associated with medication adoption, such that programs employing a greater number of FTEs, and those treating proportionately more patients annually, are more likely to have adopted pharmacotherapies. Although there was a tendency for centers in rural areas to be less likely to offer medications, these differences were not statistically significant.

In terms of clinical services, each of the four pharmacotherapies was significantly more likely to have been adopted by programs offering detoxification and/or inpatient services. By

contrast, programs offering long-term residential services are significantly less likely to use disulfiram, buprenorphine or naltrexone. Programs offering outpatient services are significantly more likely to report using disulfiram and naltrexone. Although it is not surprising to find that programs offering integrated services for co-occurring conditions are more likely to have adopted SSRIs, these types of programs are also more likely to use disulfiram and naltrexone. In these bivariate tests, adoption of buprenorphine and naltrexone were significantly more likely among programs based on the 12-step model. This was an unexpected finding, although additional analyses (not shown) suggest that controlling for program type reduces these associations to non-significance.

As expected, treatment centers with some level of physician availability were significantly more likely to offer each of these medications relative to centers with no access to physicians. Moreover, for each medication, the employment of a physician on the treatment center's staff was associated with significantly greater odds of adoption than having physicians available on a contracted basis. These data also suggest that employing a more professionally trained counseling staff may increase the likelihood of adopting pharmacotherapies. Across all four medications, there was a significant positive relationship with the percentage of master's level counselors. While there was no association between the proportion of addictions-certified counselors and addiction pharmacotherapies, centers that had proportionately more addictions-certified counselors were less likely to have adopted SSRIs. This association may be a function of these centers' relatively greater focus on treating substance abuse rather than dually diagnosed clients.

Caseload characteristics had some impact on the adoption of pharmacotherapies. Disulfiram and naltrexone are both oriented toward the treatment of clients with alcoholism, and

our results show a significant positive relationship between the percentage of clients with a primary diagnosis of alcoholism and the adoption of these medications at the organizational level. None of the selected pharmacotherapies are expressly for the treatment of cocaine addiction, although there is some evidence that disulfiram may be effective for cocaine dependence under some circumstances. Nevertheless, centers treating a greater proportion of clients with primary cocaine dependence were significantly less likely to utilize each of the four medications shown in Table 4. In the case of opiates, the significant relationship between the percentage of clients with a primary diagnosis of opiate dependence and the likelihood of adopting buprenorphine is not unexpected, although the same relationship was not found for naltrexone. The significant relationship between opiate dependent clients and the use of SSRIs and disulfiram was less expected, although there is ample evidence in the literature that opiate-dependent clients often have complex treatment needs, including co-occurring psychiatric conditions and co-occurring alcohol dependence. It may also be that centers that have had more experience treating opiate dependence (principally via methadone and now buprenorphine) may be more receptive to the use of pharmacotherapies for their client populations generally.

Table 5 presents a second set of bivariate logistic regression analyses that examine relationships between the structural, clinical, staffing and client mix variables and the five psychosocial therapies. Relative to the results for pharmacotherapies, significant associations between these variables and the behavioral EBPs are less common. In addition, where significant relationships do exist, the direction of the relationship is more varied across the different EBPs. This may be largely due to the markedly different philosophies underlying the selected practices.

As shown, hospital-based programs are significantly more likely than freestanding programs to report using Dual-focus Schema Therapy, a therapy which emphasizes the

importance of addressing both the addiction and mental health issues of the client, and requires the involvement of trained psychotherapists which are more likely to be available in hospital settings. However, hospital-based centers were significantly less likely to report using contingency management techniques, which may be less applicable to clients being treated in more highly structured inpatient settings. A similar relationship exists between JCAHO accreditation and these two behavioral therapies, which may be at least partially accounted for by the correlation between hospital location and JCAHO accreditation.

[Insert Table 5 about here]

While center size had an influence on the adoption of pharmacotherapies, the association with behavioral EBPs was less compelling. Centers having a greater number of staff were significantly more likely to have adopted MET and contingency management, but were no different in their likelihood of adopting other counseling approaches. The number of annual admissions had no effect on adoption of these EBPs.

In terms of levels of care, programs offering residential services are significantly more likely to use contingency management than other types of programs, while programs offering detoxification and those based on the 12-step model are significantly less likely to use this approach. Not surprisingly, the use of Dual Focus Schema Therapy and Cognitive Behavioral Therapy are more likely in programs offering integrated services for co-occurring conditions. The use of MET is also more likely in these centers.

Program staffing and client mix have little impact on the use of these evidence-based behavioral therapies. There is no relationship between the availability of physician services and

the likelihood of using any of the behavioral therapies. Higher percentages of master's level counselors are associated only with the use of Cognitive Behavioral Therapy. Among the caseload characteristics, the only significant relationship is the inverse association between the percentage of clients with a primary diagnosis of alcohol dependence and contingency management. This may be at least partly an artifact of contingency management's traditional focus on rewarding clients for clean urine tests, which play less of a role in the treatment of alcohol dependence.

## DISCUSSION

These analyses found significant variations across a four-group typology of treatment providers in terms of organizational structure, clinical services, staffing, and clients' diagnostic characteristics. These data suggest that differentiating between treatment centers on the basis of ownership, profit status, and funding source illuminates a number of systematic differences that may impact service delivery within the specialty addiction treatment system. While there were significant differences across government-owned, publicly funded nonprofit, privately funded nonprofit, and for-profit centers in terms of structure, staffing, and clinical services, there were particularly notable differences among the nonprofits when comparing principal funding source. Privately-funded nonprofits were more often hospital-based, accredited, treated more patients, offered more intensive levels of care, and had more highly credentialed staff than nonprofits relying predominantly on block grant and other public funds. These resources – both in terms of revenues and structural variables – likely have a significant influence on centers' capacity to invest in innovative treatment technologies.

Indeed, these data also indicate significant variations across program types in terms of EBP adoption. It is notable that, with few exceptions, programs in the private sector are significantly more likely to have adopted pharmacotherapies than those in the public sector. In particular, stark contrast are the medication adoption rates seen in privately-funded nonprofit programs compared to nonprofits that rely primarily on block grants and other public sources of revenues. Across the board, privately-funded nonprofits were between 2 and 5 times more likely to have adopted the pharmacotherapies examined in these analyses.

By contrast, the patterns of adoption of psychosocial EBPs was less distinct. Public sector programs were more likely to have adopted contingency management, while private for-profit centers were more likely to use DFST. There was a relatively high rate of adoption of CBT across the board, while the adoption of MET and the Matrix Model were relatively low in all centers. On balance, then, while it would be unfair to claim that one sector is “more innovative” than the other, it is clear that the nature of the practices being adopted in each sector is quite distinct. Moreover, studies that treat all privately-owned nonprofits as a homogeneous group underestimate the influence of funding on service adoption in the specialty addiction treatment system.

These findings also suggest that innovation is at least partially a function of the structure and staffing of these treatment organizations. Adoption of pharmacotherapies is significantly greater in treatment centers that operate consistent with a medical model of addiction, as evidenced by location in a hospital setting, provision of integrated care, delivery of more intensive treatment modalities, employment of physicians, and hiring of credentialed counseling staff. However, the adoption of evidence-based behavioral therapies shows less obvious patterns

across organizational characteristics. Such patterns may become evident in multivariate models where the impacts of funding type and center structure can be parceled out.

These analyses have several limitations. First, the data are cross-sectional, limiting our ability to infer causality between the organizational variables and the adoption of EBP. However, because the collection of these data is continuing under the study's longitudinal design, additional analyses will be available in the future that can associate programs' structural characteristics in 2004 with their adoption behavior in subsequent years. Second, the findings reported here are limited to gross measures of adoption of these practices – that is, centers are coded as “adopters” if the medication is ever prescribed or the service is ever delivered in the context of the center's clinical practice. Implementation rates – i.e., the proportion of clients eligible for the service who actually receive it – should also be examined to identify the extent to which these practices are becoming routinized within the centers that have adopted them. Third, the analyses shown here are limited to bivariate associations; some of the apparent correlates of innovation adoption may be attenuated in multivariate models. Other papers in this series will examine these “second order” issues by modeling the adoption of innovative treatment practices as a function of multiple structure, service, staffing, and client characteristics.

While these analyses are useful for describing the adoption of EBPs across various segments of the treatment system, they also provide a useful benchmark for monitoring future trends in these areas. For example, SSRIs, naltrexone, and disulfiram are relatively well-established treatment technologies which may have reached their maximum level of penetration in the field, while buprenorphine and acamprosate are relatively new options for treatment providers. Future analyses should examine not only the rate of adoption of these new pharmacotherapies, but whether the organizational correlates of their adoption are consistent

with those predicting the adoption of other established medications. Likewise, as information about MET and contingency management is disseminated to the field through such forums as NIDA's Clinical Trials Network, we might expect to see the pace of their adoption quicken relative to therapeutic approaches such as DSFT and the Matrix Model that, while evidence-based, are less often the subject of current dissemination efforts. Finally, understanding which EBPs quickly gain traction in the treatment field will not only inform the dissemination process, but should also open new avenues of research to examine the effectiveness, implementation, and reinvention of these technologies in everyday clinical practice.

**Table 1: Distribution of programs in sample**

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Government-owned	13.1%
Publicly-funded not for profit	33.9%
Privately-funded not for profit	37.0%
Private for profit	15.8%

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**Table 2: Sample Characteristics by Program Type**

	Total Sample	Government owned	Public nonprofit	Private nonprofit	Private for profit
<i>Organizational Structure</i>					
Hospital-based**	25.8%	15.0%	4.7%	51.6%	22.0%
Size (FTEs)	35.3	34.8	30.1	39.7	38.9
Past year Admissions*	1069	999.3	808.8	1415.4	987.3
Rural county	11.2%	9.0%	10.0%	14.1%	9.0%
JCAHO accreditation**	38.1%	17.0%	14.3%	66.4%	45.0%
CARF accreditation	13.8%	14.0%	16.1%	13.3%	10.0%
<i>Clinical Services</i>					
Offers Detox**	35.3%	24.0%	17.1%	52.7%	45.3%
Offers Residential**	29.7%	30.3%	43.0%	20.7%	19.5%
Offers Inpatient**	34.3%	31.0%	15.5%	48.2%	47.9%
Offers Outpatient**	83.4%	76.0%	78.6%	88.1%	89.8%
Integrated Care**	58.3%	61.9%	46.6%	66.7%	60.7%
12-Step model**	68.1%	57.1%	60.3%	75.2%	77.0%
<i>Staff Characteristics</i>					
Physician Services**					
None available	28.6%	25.8%	37.8%	21.0%	29.5%
Contract basis only	30.5%	29.9%	37.4%	26.5%	22.3%

MD on Staff	40.8%	44.3%	24.9%	52.6%	48.2%
% Masters Counselors**	44.6	40.0%	35.3%	53.8%	48.2%
% Certified Counselors	57.9	58.7%	55.4%	59.4%	58.2%
<i>Caseload Characteristics</i>					
% Primary Alcohol**	44.7%	40.2%	38.7%	49.6%	52.0%
% Primary Cocaine**	21.8%	22.0%	26.4%	18.8%	17.5%
% Primary Opiate	16.2%	14.8%	14.1%	18.5%	16.4%

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Significant differences across program types: \*p<.05, \*\*p<.01

**Table 3: Adoption of Selected EBPs by Program Type**

	Total Sample	Government owned	Public nonprofit	Private nonprofit	Private for profit
<i>Pharmacotherapies</i>					
SSRIs**	48.7%	51.5%	31.0%	65.4%	51.7%
Disulfiram**	23.5%	27.3%	11.5%	30.7%	31.9%
Buprenorphine**	7.3%	2.0%	2.8%	11.8%	11.2%
Naltrexone	21.2%	13.1%	7.5%	32.5%	32.8%
<i>Behavioral Therapies</i>					
Motivational Enhancement Therapy (manualized)	15.9%	15.2%	18.7%	15.3%	12.9%
Contingency Management**	24.7%	30.6%	34.8%	19.6%	12.2%
Dual Focus Schema Therapy*	13.6%	5.1%	13.7%	14.5%	20.0%
Cognitive Behavioral Therapy**	86.0%	91.4%	84.4%	92.4%	75.5%
Matrix Model	12.3%	11.2%	14.8%	11.5%	8.7%

Significant differences across program types: \*p<.05, \*\*p<.01

**Table 4: Bivariate Associations between Pharmacological EBPs and Structural, Clinical, Staffing and Client Mix Variables (Unadjusted Odds Ratios)**

	SSRIs	Disulfiram	Buprenorphine	Naltrexone
<i>Organizational Structure</i>				
Hospital-based	3.33***	2.59***	3.28***	3.55***
Size (FTEs [log])	1.61***	1.18*	1.45**	1.36***
Past Year Admissions (log)	1.54***	1.35***	1.59***	1.46***
Rural	.86	.92	.61	.70
JCAHO accredited	4.86***	2.49***	6.11***	4.48***
CARF accredited	1.05	.84	1.08	.74
<i>Clinical Services</i>				
Offers Detox	4.75***	3.79***	8.77***	6.35***
Offers Residential	.77	.50***	.45*	.65*
Offers Inpatient	3.66***	2.01***	4.21***	3.03***
Offers Outpatient	1.12	2.19**	1.39	2.66***
Integrated Care	6.01***	2.83***	1.79	3.89***
12-step model	.92	.82	2.24*	1.56*
<i>Staff Characteristics</i>				
No Physician Services	---	---	---	---
Physician on Contract	2.67***	1.67*	4.23*	2.33**
Physician on Staff	7.57***	2.99***	9.84***	4.54***
% Masters Counselors	1.02***	1.01***	1.01*	1.01***
% Certified Counselors	.99***	1.00	1.00	1.00
<i>Caseload Characteristics</i>				
% Primary Alcohol	1.00	1.01*	1.00	1.01**
% Primary Cocaine	.99**	.97***	.98*	.98**
% Primary Opiate	1.02***	1.01*	1.02***	1.01

\*p<.05, \*\*p<.01, \*\*\*p<.001

**Table 5: Structural, Clinical, Staffing and Client Mix Correlates with Selected Behavioral EBPs (Unadjusted Odds Ratios)**

	MET	Contingency Management	DFST	CBT	Matrix Model
<i>Organizational Structure</i>					
Hospital-based	1.07	.47***	1.87**	.82	.77
Size (FTEs [log])	1.28**	1.16*	1.12	.92	1.05
Past Year Admissions (log)	1.14	.97	.97	.89	.95
Rural	1.07	.62	1.39	1.24	1.18
JCAHO accredited	1.39	.46***	1.69**	.80	.92
CARF accredited	.89	1.27	.36*	1.64	.48
<i>Clinical Services</i>					
Offers Detox	1.32	.60**	1.37	.76	.89
Offers Residential	.82	1.44*	.88	1.02	1.16
Offers Inpatient	1.21	.78	1.69*	.88	.80
Offers Outpatient	1.62	.90	.86	1.65	1.54
Integrated Care	1.59*	.98	1.64*	1.92**	.77
12-step model	.76	.51***	1.03	.74	1.48
<i>Staff Characteristics</i>					
No Physician Services	---	---	---	---	---
Physician on Contract	1.00	.90	1.37	.94	1.42
Physician on Staff	1.47	1.16	1.37	1.11	1.08
% Masters Counselors	1.00	1.00	1.00	1.01**	1.00

% Certified Counselors	1.00	1.00	1.00	1.00	1.00
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*Caseload Characteristics*

% Primary Alcohol	.99	.98***	.99	1.00	.99
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% Primary Cocaine	1.00	1.01	1.01	1.00	1.01
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% Primary Opiate	1.01	1.01	1.01	.99	1.00
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\*p<.05, \*\*p<.01, \*\*\*p<.001

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