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Transporting a research-based adolescent drug treatment into practice

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Abstract

This article describes the key ingredients and processes in transporting an empirically supported, research-developed family therapy for adolescent drug abusers, Multidimensional Family Therapy (MDFT), into an intensive day treatment program. Using the same systems change principles that guide this treatment approach, the technology transfer process has been, from its inception, a collaborative, multidimensional, systemic intervention aimed at changing organizational structures, and attitudinal and behavioral patterns with multiple staff members at several levels of the program. This article describes: (1) the conceptual and empirical basis for these technology transfer efforts; (2) the technology being adapted and transferred; and (3) the critical events and processes that have shaped the transfer of MDFT into this program. We discuss this process and the outcomes thus far through the lens of Simpson's organizational change model and specify the implications of this experience for the expansion of current conceptualization of technology transfer.

Keywords: Adolescents; Drug abuse treatment; Technology transfer; Family-based interventions; Day treatment

1. Introduction

Barriers to the transfer of empirically-based drug abuse treatments into community-based practice settings are well documented (Institute of Medicine, 1998). Although there are more efficacious interventions for at-risk and drug-involved patients than ever before, there is remarkably little adoption of these practices in nonresearch clinical settings (Backer, 2000; Morgenstern, 2000). There is virtually no evidence of the feasibility, acceptability, or effectiveness of these treatments as performed by front-line providers (Tims, Inciardi, Fletcher & Horton, 1997).

Most of the progress in drug abuse treatment comes from experience-derived guidelines that suggest the favorable ingredients and circumstances for successful treatment adoption efforts (e.g., Sobell, 1996). Several factors facilitate technology transfer, including direct personal contact and collaboration between researchers and clinicians, and shared beliefs about basic principles of change and the value of integrating the treatment model within an existing service program (Backer, David, & Soucy, 1995). Other guideline developers have emphasized the need to adapt the agency's infrastructure and resources to support the integration of the new technology (Institute of Medicine, 1998). Finally, technology transfer is best conceptualized as a process, rather than an event, to be approached with a coherent framework linking treatment process to patient outcomes (Simpson, 2002).

We have learned that the model must be appealing and credible to clinicians, and intervention developers must motivate clinicians to develop a ''readiness to change'' their practice patterns for the new technology (Rogers, 1995). Family-based interventions, because of their ecological perspective on adolescent problems and the intuitive appeal of this perspective (Liddle, 1995), their efficacy evidence (Stanton & Shadish, 1997), and their systemic approach to creating change, offer promise for transfer into community settings (Ozechowski & Liddle, 2000). One of the empirically supported therapies for substance abusing teens is Multidimensional Family Therapy (MDFT) (National Insti-

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tute on Drug Abuse, 1999). Several characteristics of MDFT (Liddle, 2002) make it a viable candidate for transportation into community treatment settings. Primary among these is MDFT's promising efficacy in comparison to alternative treatments in four controlled trials (Dennis et al., in press; Hogue, Liddle, Becker, & Johnson-Leckrone, 2002; Liddle et al., 2001; Liddle, Dakof, Turner, & Tejeda, in press). The clinical outcomes achieved in these randomized studies, including a multisite study and a prevention trial, indicate MDFT is effective in comparison to state-of-the-art treatments (individual cognitive-behavioral treatment, peer group treatment, and family education models) in significantly reducing substance use up to 1 year following treatment completion. The cost of this treatment relative to estimates of standard community treatment favors MDFT (French et al., in press). The approach is manualized (Liddle, 2002), training materials have been developed, and we have demonstrated the treatment can be taught to nonresearch, clinic therapists.

In addition, MDFT has demonstrated a capacity to adapt over time. We have revised the approach systematically to meet the unique clinical needs of different populations, such as females, ethnic minorities, early adolescents, and comorbid youth, demonstrating sufficient flexibility to accommodate effectively to different clinical settings and patient populations (the MDFT research program is summarized in Liddle & Hogue, 2001). Although the treatment model was originally delivered as a standard, once-a-week, clinic-based intervention, new versions of the approach are home-based and sufficiently intensive to treat severely impaired comorbid substance abusing youth on an outpatient basis (Rowe, Liddle, McClintic, & Quille, in press). A defining feature of the model is an appreciation, evident in the assessment and intervention domains, of the multiple interacting systemic influences operating in the adolescent's life that maintain a current trajectory of negative outcomes. As a therapy of multiple, interconnected systems, this treatment approach is consistent with technology transfer models focused on systems-level changes (Goodman, 2000).

The MDFT intervention strategy targets and simultaneously works to change the many systemic influences establishing and maintaining problem behaviors. Sequentially linked interventions are designed to facilitate adaptive processes in several domains of the teen's and family's life. Small steps create a foundation for more difficult therapeutic work. MDFT assesses and intervenes in five domains (see Liddle, 2002, for more details about the approach): interventions with the adolescent, parent, parent-adolescent relationship, other family members, and with systems external to the family. The same principles that define this clinical approach serve as the foundation of the technology transfer process. Technology transfer is an intervention. We conceive of the work of moving our treatment model into a social system in the same way we approach a clinical case. This includes a comprehensive assessment of all system levels, a phasic model of change that can read intervention outcomes and tailor the next interventions or overall strategy on the basis of this feedback, and the use of coordinated multidimensional interventions orchestrated at different system levels with different members.

This article presents the details of this technology transfer process in the context of our first attempt to experimentally test the integration of MDFT into an existing community-based adolescent drug abuse program. The study described here, a collaborative project between adolescent substance abuse treatment researchers at the University of Miami School of Medicine and adolescent substance abuse treatment providers at the University of Miami/Jackson Memorial Hospital, was designed to adapt and transport MDFT interventions into a day treatment program for substance abusing youth, the Adolescent Day Treatment Program (ADTP). The study evolved from previous collaborative work between members of the two teams, and was inspired by the mutual goal of improving patient outcomes by incorporating empirically-grounded family-based interventions into the program. The program director and medical director of the ADTP, recognizing the need for greater family participation in treatment and help in improving adolescent engagement, retention, and outcomes, invited MDFT team members to collaborate in improving the program. MDFT researchers, interested in the potential adaptability of the model and the process of transporting MDFT interventions into this type of setting, were eager for the opportunity to work with program administrators and clinicians to improve patient outcomes. The purpose of this article is to describe this process, its challenges, and evidence of initial success in adapting and implementing key MDFT interventions for use in the ADTP. The following sections present an overview of the study design, measures, and interventions, details of the technology transfer process, preliminary evidence for its success, and a discussion of the implications of this experience for technology transfer.

2. Materials and methods

2.1. Design

The objectives of this ongoing dissemination project are to evaluate the feasibility and durability of integrating MDFT interventions into a day drug treatment program for teens, the ADTP. Our first goal is to evaluate the impact and durability of disseminating MDFT on clinical practices and therapeutic/organizational climate at the ADTP. We are interested in the extent to which providers integrate the MDFT treatment techniques into the existing program, and whether the use of MDFT interventions will improve organizational factors such as staff communication, coherence, and organization. The second goal is to evaluate the effects of these changes on clinical outcomes of youth in the ADTP. To achieve these goals, we designed a four-phase

study. During a 12-month Baseline/Pre-Exposure phase (Phase I), we observed and assessed multiple aspects of the day treatment program and patient outcomes, including potential challenges to the implementation of the transferred approach, and prepared for training. Phase II (Training/Exposure) involved 6 months of intensive training by MDFT clinicians with day treatment program staff and administrators. This project is still in process. We are currently 3 months into the 12-month Implementation phase (Phase III), which involves regular supervision of ADTP staff by MDFT clinicians, ongoing coordination with ADTP administrators, and evaluation of program and patient outcomes. In the final 12-month Durability/Practice phase (Phase IV), the technology transfer will be complete and regular supervision by the MDFT team will be withdrawn.

Throughout the 4-year study, data are collected on clinicians' practices, parents' and adolescents' participation in therapeutic activities, staff and patient perceptions of the treatment environment, and adolescent functioning. Interviews with staff to measure their perceptions of the treatment environment are conducted at the midpoint of the Baseline/Pre-Exposure, Implementation, and Durability/Practice phases. Each individual case is tracked by weekly chart reviews and therapist ratings to measure clinicians' utilization of the family intervention and the extent of adolescents' and parents' participation and progress in treatment. Videotaped therapy sessions are coded for the extent of adherence to the prescribed MDFT techniques. Each adolescent's functioning is assessed using adolescent and parent reports of a range of variables at intake to treatment, 1 month after intake, discharge from treatment, and 9 months after intake.

2.2. Participants

ADTP staff, patients, and the patients' parents comprise the study sample. Staff participants include an ethnically diverse, multidisciplinary group including the masters-level program director, the medical director, two masters-level social workers, two bachelors-level mental health technicians (MHTs), and the registered nurse (RN) ($n = 7$). Staff turnover is low, with only two staff members replaced in the program's 4-year history.

Patient participants will include 150 male and female adolescent patients at ADTP (50 consecutive admissions during each of the three study phases: Baseline/Pre-Exposure, Implementation, and Durability/Practice). This article describes preliminary results on data from the 50 adolescents and their parents who participated in the Baseline/Pre-Exposure phase of the study, as well as the seven staff members interviewed during the Baseline/Pre-Exposure phase.

All adolescents who are admitted to the ADTP are eligible for the study. Patient admission criteria to the ADTP include the following: (1) Ages 13 and 17; (2) Meet *DSM-IV* criteria for substance abuse or dependence; (3) Either at high risk for residential treatment as a result of drug use, or transitioning from residential treatment back into the community; and (4) Parent or guardian is willing to be involved in treatment. Exclusion criteria include mental retardation or current suicidality. Research staff interview all adolescents and their parents upon admission to the ADTP to explain the details of the study and to obtain written informed consent to participate. All procedures, forms, and measures were approved by the University of Miami School of Medicine Institutional Review Board.

A total of 50 adolescents participated in the Baseline phase of the study. Approximately three-quarters (74%) of the patients were male. The mean age of the sample was 15 years. The average family income was $20,750. The sample is 68% Hispanic, 18% African American, 4% Caucasian, non-Hispanic, and 10% "other." Ninety-four percent of the adolescents met criteria for a diagnosis of substance dependence and 6% met criteria for substance abuse. A total of 64% had received previous substance abuse outpatient or residential treatment before being admitted to the ADTP. Eighty percent were diagnosed at intake to treatment with an additional comorbid diagnosis, the most common being conduct disorder (64%), major depression (16%), attention-deficit hyperactivity disorder (14%), and bipolar disorder (10%).

2.3. The ADTP

Representative of standard day treatment for substance abusing youth, the ADTP is classified as an "intensive outpatient treatment." It provides full-time services 6 hours each day for 5 days per week. An interdisciplinary staff provides the comprehensive intervention program. The ADTP is based on a social learning approach that emphasizes positive reinforcement for appropriate coping behavior and social skills. A "levels system" allocates privileges and responsibilities according to the individual's behavioral performance. The program was designed to provide each patient with 1 hour of individual counseling, 5 hours of group counseling, 5 hours of recreational/occupational therapy, 5 hours of morning "community" meetings, and 20 hours of school each week, as well as biweekly family counseling. The program takes 6 months to complete. The overarching program goal is to transition the adolescent back into the community and public school, with aftercare services recommended for patients needing continued treatment upon completing the program.

The ADTP exists within the much larger institutional context of the University of Miami Medical School/Jackson Memorial Hospital, the public hospital for Miami-Dade County, FL, with 1600 beds serving more than 2 million people. The creation of the ADTP established the only within-agency/institution continuum of care in Miami-Dade County, from crisis stabilization and evaluation to residential drug treatment. The ADTP administrators and staff are widely respected throughout the community by judges,

treatment providers, and school authorities. The program is funded largely through Medicaid reimbursement.

2.4. Guiding principles of change in MDFT technology transfer

The following principles undergird the MDFT interventions as well as create a foundation for the MDFT technology transfer process.

2.4.1. Multisystemic approach to assessment and intervention

The target of the technology transfer is the program treatment system. Conceptualized as a "multibodied organism" (Minuchin, 1974), this system is assessed in terms of its rules, norms, practices, expectations for staff, policy procedures and mission, and history. Many aspects of the targeted system's functioning, including characteristics and processes that can hinder or facilitate change, cannot be identified until interveners enter the system and make change requests.

2.4.2. Assess and identify each team members' contribution to the process of the technology transfer

Each member of the target system must be attended to individually. This includes identifying how each staff member's expectations are different and unique, and thinking through how each individual might respond to and ultimately come to accept and implement the new intervention.

2.4.3. Prepare individuals for change

The preparation phase begins by communicating clearly the skills to be taught and the steps to learning these techniques, and providing a coherent rationale for the proposed changes. It also involves working with staff to envision what changes are reasonable. A social learning approach (i.e., learn concepts and skills, provide opportunities for practice, give feedback and shape skill development) underpins the technology transfer process.

2.4.4. Epigenetic (i.e., a chain of developmental processes) stage model of change

Trainers outline and facilitate changes in one area (e.g., basic skills), and these changes serve as a platform and point of departure for the next stage of change (e.g., coordination of different interventions). Small successes provide a foundation for requesting the more difficult change attempts to follow.

2.4.5. Establish priorities

Therapists help parents to "pick their battles" with their teens — to help them decide which issues are most important to take on and which ones should be set aside, at least temporarily. In adapting MDFT for transportation, we found this same process helpful. It has involved discussing and differentiating those aspects of the MDFT approach that were most important to teach, and had a reasonable likelihood of remaining a part of the therapist's and treatment system's regular practices after the active phase of the technology transfer ended.

2.4.6. Facilitate positive developmental processes

In MDFT technology transfer efforts, all resources are directed at promoting adaptive functioning and minimizing the impact of negative factors on the system. This requires reading feedback at multiple levels — patient, organization, and staff — and remembering these are pieces of a unified puzzle. As in therapy, technology transfer involves the continuous monitoring of staff reactions and outcomes to assess progress and alter implementation strategies as needed.

2.4.7. Teach and enact the principle: be therapeutic all the time

MDFT therapists are taught to ask themselves throughout each therapy session, "What am I doing here that is therapeutic?" This principle underlies the basic attitude change that MDFT trainers have facilitated on the ADTP. As the project has progressed, MDFT and ADTP team members together have looked for ways to increase their effectiveness. In teaching the "be therapeutic" principle to staff, it was important to link this principle to concrete suggestions for action.

3. Results

3.1. Phases of the MDFT dissemination process

Simpson (2002) outlines the process of change and common obstacles to change in technology transfer in terms of four major stages: exposure (training), adoption (leadership decision), implementation (exploratory use), and practice (routine use). The MDFT dissemination process largely parallels this change model, with the addition of a "Pre-Exposure" phase that prepared both teams for the dissemination intervention. The phases described below follow the epigenetic principle, with success in each stage potentiating the next phase of work. We describe these steps in the sections that follow.

3.1.1. The Baseline/Pre-Exposure phase: setting the stage for change

Technology transfer is a systemic intervention (Simpson, 2002), with careful attention given to all members of the clinical team as well as broader systemic influences on the program. In addition to the multidisciplinary clinical team at the ADTP, it has been important to include other members of the treatment system, such as hospital administrators and influential contacts in the public schools and juvenile courts. The commitment and support of core and all broader system members influences the technology transfer success (Corri-

gan & McCracken, 1995). The Baseline/Pre-Exposure phase involved working with all system members. Our aims were to: (1) understand the overall structure and organization of the program vis-à-vis these many systems of influence and their interconnections, assess baseline functioning; (2) join with each member; (3) prepare for change; and (4) begin discussions that would identify the key MDFT components to implement.

3.1.1.1. Initial assessment of baseline functioning. Assessment in MDFT is a multidimensional and multifaceted process (Rowe et al., in press). Guidelines from the technology transfer literature caution against unidimensional theories of change (Brown, 1987; Backer, 1995). Before attempting to influence behaviors, a realistic picture was needed of the resources available within both ADTP and MDFT teams, the relational factors that might impede implementation, as well as systemic influences that could limit or help these efforts. The assessment process took many forms, including direct observation of clinical activities, informal interviews with each staff member, brainstorming meetings with administrators and staff, collecting self-report standardized measures of the patients' and staff members' perceptions of the program's organizational climate, and evaluating patient outcomes. The information provided in this complex assessment process builds a scaffolding for change. Using an ever-deepening and evolving understanding of the program's complexity, we pinpointed and prioritized change targets, identified specific barriers and motivators to change, and articulated a coordinated, multifaceted intervention plan to begin the technology transfer process.

The initial assessment revealed several problem processes in the program and related systems. At the same time, identification of these challenges also uncovered ADTP team members' readiness to change current practices. First, morale on the unit was low, and the program's organizational structure provided few opportunities for staff support or guidance. Inadequate communication among staff about their roles and responsibilities created confusion and conflict. Social workers reported feeling they had few concrete therapeutic guidelines to follow, and also felt the burden for the patients' recovery was mainly on their shoulders. Their direct supervisor was not the ADTP program director, but rather the head of the social work department, who was not involved in daily ADTP operations. The program director and medical director, who shared responsibility for running the unit, had little time for daily monitoring of the program because of other responsibilities. Yet the RN, who held responsibility for the daily operations of the unit, felt unable to take leadership. Staff felt burdened by the pressures of "policing" the patients and pessimistic about establishing meaningful change in the teens' lives. Staff defined their role in terms of containment (a good day was an absence of "codes," or patient crises, on the unit), rather than in ways that could be proactively therapeutic. Staff did not reach out effectively to the teens' family members and the adolescents' parents were disconnected from the program. Most youth had inconsistent attendance. Further, ADTP staff did not maximize relationships with important contacts in influential systems that could provide leverage with teens, such as the juvenile justice system and schools. The team felt isolated, overworked, disconnected, and powerless to effect change in the lives of the patients.

A formal assessment of the treatment environment was also conducted with ADTP staff and patients using the Community-Oriented Programs Environment Scale (COPES) (Moos, 1974, 1997). We used the COPES to obtain patients' and staff members' perceptions of the program, and to provide a baseline measure with which to monitor the impact of changes to the treatment program's policies, services, and structure over the study (Moos, 1996). A profile of COPES results from the baseline assessment for ADTP staff and patients is given in Fig. 1. Interestingly, as illustrated in the figure, staff and patient perceptions of the treatment environment were very similar. For example, while standardized scores on the system maintenance dimensions of organization and program clarity were about average ($M = 50$, $SD = 10$), high scores were seen for both staff and patients on staff control (patients: $M = 56.72$, $SD = 9.73$; staff: $M = 64.67$, $SD = 5.08$). However, relationship dimensions including staff involvement, support, and spontaneity, were lower. These findings confirmed our observations that staff members were focused on policing the patients and were less attentive to fostering relationships with patients. Not surprisingly, both patients and staff perceived autonomy on the unit to be relatively low (patients: $M = 43.63$, $SD = 7.97$; staff: $M = 38.86$, $SD = 4.18$), indicating patient independence was not encouraged. The results of this assessment provided objective evidence for ways to change the environment. Improvements in staff-adolescent relationships that facilitated patient autonomy, decreased focus on patient control, and increased concrete and helpful therapeutic alternatives were the initial intervention areas.

3.1.1.2. Increasing motivation and identifying resources. MDFT team members held regular meetings with ADTP administrators and staff to identify motivators of and targets for change. Both the ADTP program director and medical director identified areas in which they needed help. One of the program director's concerns was increasing teen and family participation in treatment, outcomes that would maintain the program census at an operational level. At one point early in the Baseline phase, the low daily attendance was noticed by hospital administrators. The program's survival was in jeopardy. MDFT collaborators attended meetings with hospital administrators and the program director to outline the specific steps to be instituted to increase attendance, including assistance from the MDFT outreach coordinator to identify potential refer-

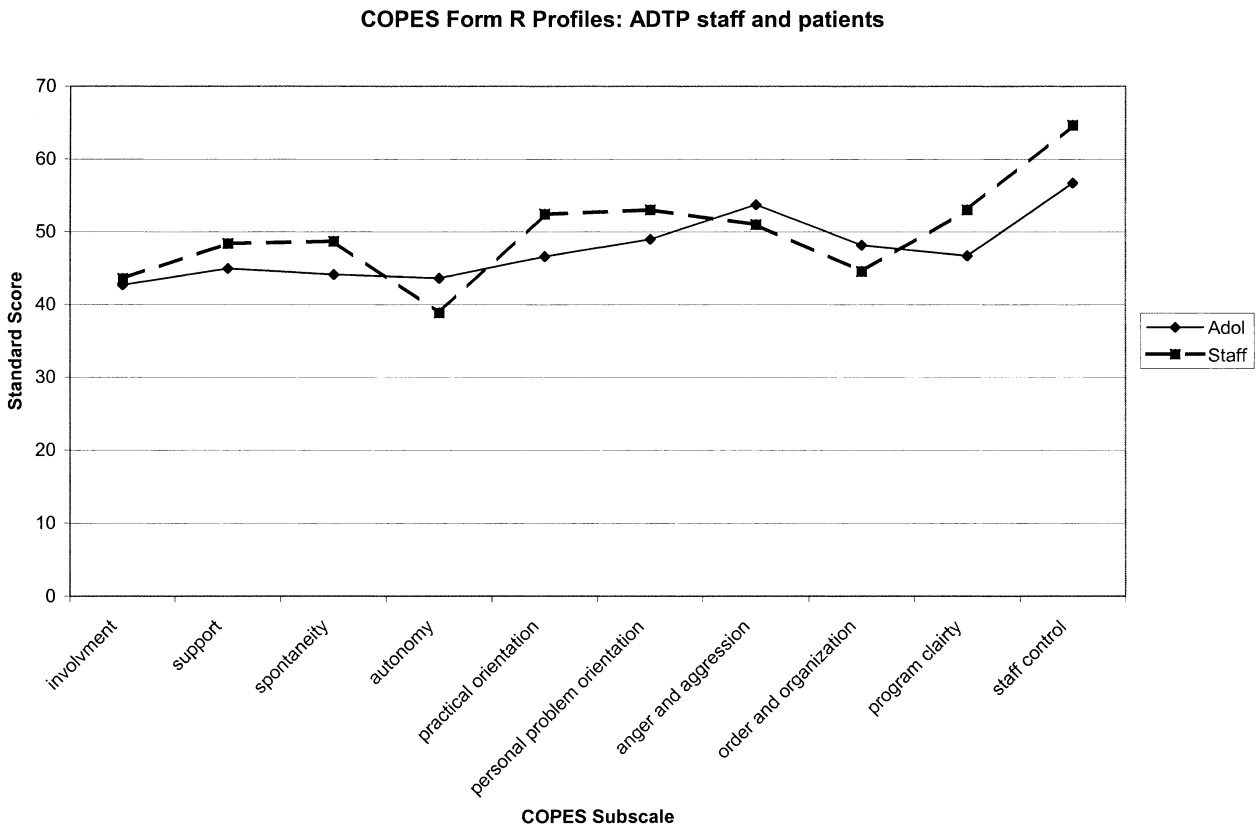

Fig. 1. COPES Form R profiles at Baseline/Pre-Exposure: ADTP patients and staff.

rals. MDFT interventions and the model's empirical support were detailed in order to generate excitement about the potential of the intervention to improve attendance and program outcomes. The program remained open, demonstrating early in the process and in a concrete way that MDFT collaborators were invested and could positively impact the program.

A parallel process occurred with the medical director and other staff members. The medical director voiced frustration about the therapy groups, which frequently became nontherapeutic because of the preoccupation with finding fault and "policing" the teens. In observing the groups, MDFT clinicians noted insufficient structure and a focus on trivial content. The groups were failing to interest or focus the teens. The intervention team brainstormed with the medical director ideas for improving the group treatment component. The idea of theme-based groups on core topics integral to MDFT (e.g., family and peer relationships) was introduced. In addition to suggestions about organizing sessions, the idea of incorporating multimedia materials was introduced, such as popular videos and films that have been successful in MDFT in facilitating discussions with teens. The medical director responded positively to these suggestions. Motivation and resources were also increased through team building meetings that served to identify problem areas and inspire readiness to change.

3.1.1.3. Building multiple alliances and establishing collaboration. All assessment activities served the dual purpose of helping ADTP and MDFT team members to identify areas of needed change as well as facilitating a gradual joining of these two systems. The aim was to establish collaboration and guard against the frequently cited perception that expert clinicians enter programs to impose external regulations on staff operations (Beutler, Williams, & Wakefield, 1993). In a series of individual and group meetings, each ADTP team member was asked to specify the program's strengths and weaknesses and his or her ideas about how to improve patients' outcomes. Critically, MDFT team members spent time on the unit more regularly and were welcomed to observe and participate in all activities. MDFT team members communicated consistently that they were acting in the best interests of the program. The basic message that "We're here to help make the program more effective, and to help facilitate you all to be more effective too" was emphasized. The study project coordinator was particularly important in this stage, serving as a link between the MDFT and ADTP teams.

At the same time, staff members had reservations about the trustworthiness and motivations of MDFT personnel. The program director and medical director's overt support of the MDFT project and team was essential, but was not sufficient in facilitating full acceptance of the MDFT team

by staff. In therapy, each therapist earns their *"stripes" of credibility* with every new teen and family they see. The MDFT intervention team had to earn their own *technology transfer stripes* in much the same way. The interpersonal and systemic skills of the technology transfer team, in conjunction with the notion of having a good "product" (one that can enhance the work of the recipients of the technology), were core ingredients in this formula.

3.1.1.4. Identifying the critical targets of change. We used expert consultation, incorporation of advice from the literature (e.g., Brown, 1998), and ADTP and MDFT team members' perceptions of the existing program to define how it would be necessary to fine-tune MDFT to adapt to the realities of the ADTP. This was an organic process. Technology transfer involves responsiveness to existing needs rather than the unidirectional transfer or movement of expertise from one group to another. The adaptation process began with the identified priorities of the ADTP team members and involved deciding what the essential ingredients of the MDFT intervention might be in the context of the existing program, staff, and institution.

Particulars such as treatment dosage, length of the program, who to include in treatment, and a timeframe for moving through the phases of treatment were developed to maximize the potency of the MDFT interventions in the ADTP. The MDFT team and ADTP administrators agreed that the following treatment parameters were optimal: (1) weekly individual sessions with each adolescent patient; (2) weekly family sessions during the first 8 weeks of treatment and biweekly family sessions for the remaining 16 weeks of treatment; (3) familiarity and consistent contact with key members of the adolescent's extrafamilial domain (e.g., probation officers, school officials); (4) adherence to the 3-phase model of treatment (engagement, requesting change, sealing changes); and (5) generating an aftercare plan prior to discharge with a realistic academic or vocational placement, a follow-up treatment plan when needed, and opportunities to participate in prosocial activities.

3.1.2. The Exposure phase: providing formal training in MDFT

Although the MDFT team has had extensive experience in training and supervising family therapists (Liddle, Becker & Diamond, 1997), this study represented our first attempt to train a multidisciplinary clinical team with a range of clinical training and experience to incorporate aspects of MDFT into an existing program and evaluate these outcomes. Many of the techniques used successfully and refined over the years in clinical trials had to be adapted to train a diverse group with little family therapy background. The training was aimed at increasing an overall appreciation for and attention to family and systemic factors maintaining patients' symptoms, shifting the staff's focus on patient-blaming to a broader view of their problems. A core training goal was to help each staff member identify therapeutic behaviors that would be part of their everyday job, making the program therapeutic for each part of the patient's day. MDFT was the raw material from which those therapeutic strategies would be crafted.

3.1.2.1. Parameters of the Exposure/Training phase. MDFT team members provided formal training over a 6-month period with ADTP personnel at all levels. Training began with group didactic sessions in adolescent development, families, drug addiction, the recovery process, and other core MDFT topics. The social workers, MHT's, and teachers were trained separately to address their specific roles on the unit and to format MDFT materials for their training levels. MHT's received basic information about MDFT interventions, with most emphasis on therapeutic principles and the corresponding techniques. The teachers received basic information about teen drug abuse, guidelines for dealing with behavior problems in the classroom, and therapeutic classroom activities. A total of 13 hours during the Exposure/Training phase was spent with the MHT's and RN, 11 hours with the teachers, and 60 hours with the social workers. The social workers received the most training in quantity (hours) and depth of MDFT principles. This included MDFT trainers conducting 11 individual cotherapy sessions and seven family sessions with the social workers to provide live supervision and modeling of MDFT techniques and skills. Regular meetings between MDFT trainers and the program director and medical director were also held.

The MHT's, who were responsible for much of the daily contact with patients, had clearly communicated their role was to police and manage the patients' behavior. The MDFT team focused their efforts on helping the MHT's to be more relationship-focused with the patients. As we do in training MDFT clinicians (Liddle et al., 2000), we used the adolescent development knowledge base to underscore the effectiveness of an "authoritative" (vs. authoritarian) parenting style, with aspects of both warmth and control. MHT personnel were also expected to become a more integral part of the treatment team, given their valuable day-to-day knowledge of each patient's progress, as well as their need to be fully informed about patients' histories, problems, and treatment goals to intervene effectively.

The RN's role on the unit had traditionally been medication management. She had been disengaged from the therapeutic milieu and not included in case history presentation or treatment planning. With input from the RN, the MDFT intervention team and ADTP program director together reconceptualized her role to include more day-to-day involvement with the adolescents. Specifically, the RN was expected to give individual attention to patients as needed. In addition, she was expected to serve "therapist assistant" functions, helping the social workers contact families to improve engagement, and performing case management activities.

Training with the social workers involved many different activities that have proven effective in previous MDFT

therapist training. Trainers described interventions outlined in the MDFT manual, reviewed exemplar therapy videotapes, and asked the social workers to relate aspects of ongoing cases in which they could apply the new techniques. Training with the program director and medical director was limited by time constraints in their schedules and the program director's maternity leave. They reviewed materials being discussed with the staff in the context of signing on to the approach and gaining a basic understanding of MDFT. As noted below, much more time with both was needed to facilitate the adoption process.

3.1.2.2. Obstacles in training. Challenges to training were identified at all levels of the system. This included organizational factors such as system/hierarchy disorganization and limited staff time for training activities, as well as individual challenges such as lack of access to the program director during her maternity leave, low overall level of staff experience, and low motivation from staff to work harder. ADTP staff initially characterized the MDFT training team as "ivory tower," granting MDFT little credibility. Staff attributions of this nature are frequently encountered barriers to implementation success (Brown, 1987). The social workers voiced powerlessness to effect changes within the system, and doubted the MDFT interventions could be successfully integrated given the demands on their time and the lack of support they generally felt. The MDFT team reframed these barriers as opportunities to understand the blocks to change, and, from this position, to define ways to motivate new behaviors.

3.1.2.3. Interventions to increase motivation/readiness. Formal training's first foci (and an ongoing focus for that matter), as in any therapy case, included motivation and engagement building activities. Building on similar efforts during the Baseline/Pre-Exposure phase, trainers worked with each ADTP team member collaboratively to identify something each individual wanted to change — to show them how the MDFT technology could address some of the very things for which they sought help. The social workers wanted to make the weekly treatment team meetings more solution-focused and change the behavioral levels system to be more effective. One of the MHT's voiced the desire for more influence in the system and more opportunities to be therapeutic. The medical director asked for help from MDFT supervisors during treatment team meetings to respond to questions about how to intervene proactively. Trainers focused on helping members of the system to generate alternatives that had not been explored, and a positive, optimistic attitude to trying out new behaviors.

3.1.3. The Implementation phase: making requests for change

The 12-month Implementation phase followed the 6 months of training. During this phase, ADTP team members were expected to begin "exploratory use" of the model (Simpson, 2002), with regular supervision, cotherapy sessions, and booster training meetings with MDFT supervisors. Although formal "training" was complete, the Implementation phase naturally involved requesting change, reading feedback about staff members' ability to implement new interventions, and adapting training and supervision accordingly. As of this writing, 3 months of the Implementation phase have passed. A total of 20 hours have been spent in training and supervision activities with the social workers. Five hours have been spent in regular meetings including the MDFT trainers and program director. Team "implementation" meetings with the MDFT trainers and the entire ADTP staff have been held weekly.

The requests for change involved a continual focus on and recalibration to the behavioral objectives and the day-to-day outcomes of each teen. ADTP team members gradually began to see positive results of their new behaviors and increased efforts. Yet, as Bridges (1991) discusses, the "neutral zone," or the period between letting go of old behaviors and adopting new ones, is a difficult one because of unreasonable expectations. "They expect to be able to move from the old to the new, but this isn't a trip from one side of the street to the other. It's a journey from one identity to the other, and that takes time" (Bridges, 1991, p. 37).

3.1.3.1. Challenges in implementation. As is typically the case in all human change efforts, many obstacles to the technology transfer intervention became apparent when ADTP staff members were asked to implement the new protocols and techniques. Very early in the Implementation phase, MDFT supervisors recognized insufficient time had been spent during the Pre-Exposure and Exposure phases with the program director and the social workers' direct supervisor (who was supervisor for the hospital's entire social work department in the mental health division, had no presence on the ADTP unit, and thus was not initially considered accessible or a critical target of intervention). This oversight led to an important lesson. As ADTP team members were asked to implement new techniques and confronted obstacles, MDFT trainers were not in a position to enforce adherence to the protocols. Staff resistance and lack of resources were things the program director and the social workers' supervisor needed to address. The critical endorsement of adoption by program leaders, which must take place before implementation can be successful (Simpson, 2002), had been addressed, but not with sufficient comprehensiveness during the previous phases of the study. Thus, MDFT trainers reevaluated their focus and intervened accordingly, as noted below.

3.1.3.2. Interventions to change organizational structure. Several new components of the dissemination intervention were added to address the obstacles to implementation. It is important to note these changes were not determined a priori but were arrived at during the course of the technology transfer effort, just as therapists routinely recalibrate inter-

ventions throughout the course of therapy. First, a regular weekly ''implementation'' meeting was instituted to address issues of organizational climate impeding the MDFT technology transfer, including the program director, social workers, RN, MHT's, and MDFT trainers. Although the social work supervisor was not able to attend regularly, his participation in several meetings early on significantly impacted the social workers' attitudes and performance. The ultimate goal of these meetings was to instill a clear sense of ownership and commitment from the program director, and to enlist her in the leadership process of implementing the program changes being requested. In these meetings, specific issues were addressed such as the revision of the point system to focus more on positive behaviors and less on punishment. New program protocols were created, such as a parent contract for participation and a list of home behaviors to be considered when assigning ''levels'' and privileges at the end of each week. Further, staff relationship and organizational issues were dealt with, as the team clarified each team member's responsibilities and the chain of command. The meetings succeeded in demonstrating the support and leadership of the program director, and in providing a context to address and solve implementation obstacles.

3.1.3.3. Interventions to increase staff clinical skill, competence, and accountability. Formal training with the social workers and the MHT's achieved a basic level of understanding about MDFT. As expected, however, intensive work within each subsystem was needed to develop staff competency with the interventions. Mini-retreats were designed to help fine tune the use of the MDFT interventions in the social workers' daily work. MDFT supervisors spent increased time modeling how MDFT is done, conducting therapy sessions with the social workers and helping them to make phone calls. Modeling these interventions gave the supervisors credibility in the eyes of the staff and reduced pessimism and negativity (e.g., ''I can't get the kid to talk about those things''). Finally, videotape session reviews shaped their understanding of therapeutic concepts and enhanced clinical skills.

One of the most important interventions in facilitating implementation was the development of weekly behavioral checks on core activities. These ''scorecards'' documented information on each patient's progress, including days attended, results of urine screens, program level achieved, as well as the number of phone contacts and sessions conducted. The scorecard, developed by the MDFT team to track adherence to the parameters of the MDFT intervention, served as both a reminder of tasks to be carried out for each adolescent on a weekly basis, as well as an accountability instrument. These scorecards were copied for the social work supervisor and the program director, and were reviewed with each social worker in supervision meetings with MDFT trainers. Early in this phase, the scorecards revealed little adherence to the MDFT protocols, very few family contacts or sessions being conducted, and continued poor attendance and progress in treatment on the part of the patients. Discouraged by slow progress, the social work supervisor and the program director held meetings with each social worker individually to address their difficulties in following the new MDFT protocols. They discussed the social workers' concerns about their limited time. The administrators stood firm, however, stating that in order to remain on the ADTP unit, the staff would need to perform according to the new program guidelines. Further, during supervision with the MDFT supervisors, the scorecard was reviewed and MDFT supervisors assisted in problem solving ways to facilitate sessions. Both social workers responded with increased adherence to MDFT protocols.

MDFT supervisors also focused more closely during this phase on the content and quality of the therapy. In order to facilitate the development of therapeutic skill necessary to effectively utilize MDFT techniques, MDFT supervisors developed protocols for the social workers to follow. Abridged versions of the MDFT manual, these protocols give simple, single-phrase rationales for the ''when, why, and how'' of various stages in the therapeutic process. Specific phrases to help initiate therapeutic conversations are given as guides for review prior to sessions. These protocols have been instrumental in helping social workers to maintain focus on the new MDFT interventions to be implemented.

3.1.3.4. Interventions to improve the fit between MDFT and the ADTP. Despite the obstacles presented and discussed in these sections, the overall compatibility between MDFT principles and those of the ADTP served as an important platform for instituting change in the program. Yet, interveners needed to be creative and collaborative in fitting MDFT interventions within the ADTP. For example, social workers did not have time during their day to attend to the rigorous demands of the day treatment program and conduct in-person family sessions with each patient. Thus, weekly phone sessions and biweekly in-person family sessions maximized the social workers' time with families. Although MDFT supervisors pushed for more contact with probation officers and other outside systems, they recognized the restraints of the social workers' schedules and looked for ways other team members could help. The RN helped by making phone calls to probation officers and family members. The team worked with teachers on how to use class time therapeutically, including having teens write daily personal journal entries to be used in individual therapy. Team cohesion and effectiveness improved when staff saw success for each patient was determined by how well they worked collaboratively for the benefit of each teen. This entire process was facilitated by reading feedback in outcome measures, working closely with the ADTP team to reassess their priorities, and using this feedback to shape the supervision focus.

3.1.3.5. Preliminary evidence for the success of MDFT dissemination. Preliminary data indicate some encouraging results of the technology transfer effort. The number of family sessions held by social workers were compared for patients discharged from the ADTP during the last 3 months of the Baseline/Pre-Exploration phase and the first 3 months of the Implementation phase. Although the sample size is small ($n = 6$ for Baseline/Pre-Exposure, $n = 9$ for Implementation), *t*-tests conducted on the average number of family sessions per week per case approached significance ($t(13) = -2.11$, $p = .055$). The average number of family sessions conducted per week increased from 0.05 ($SD = 0.08$) at Baseline/Pre-Exposure to 0.18 ($SD = 0.13$). These very preliminary results indicate the rate of family sessions is increasing for the ADTP patients during the Implementation phase.

In addition to the data presented above, indicators of staff satisfaction and acceptance of the new protocols were evident. As the ADTP team saw their patients change, their own morale and motivation to change increased. For example, one of the social workers who was the most resistant to change during the Pre-Exposure/Baseline phase had transformed into a true collaborator and motivated learner, often asking for additional training materials, feedback on therapy, and supervision. The RN, who at the outset of the project expressed her frustration in working with adolescent substance abusers, became more involved, invested, and effective in working with patients. Placing greater therapeutic responsibility and more relationship focus on the MHT's also paid off in increased job satisfaction and decreased use of punitive measures. Taken together, these results suggest preliminary success of the MDFT dissemination at the level of organizational climate, acceptability, and clinical practices. The durability of the intervention will be evaluated in the coming months.

3.1.4. The Practice phase: demonstrating the durability of the dissemination process

The anticipated Durability/Practice phase is still several months away, and we are actively preparing for this ultimate test of the durability of the technology transfer intervention. Regular supervision from MDFT team members will be withdrawn and we will evaluate the extent to which ADTP staff members demonstrate "regular use" (Simpson, 2002), implementing MDFT with minimal input from our team.

3.1.4.1. Anticipated obstacles to practice. Perhaps the primary concern in the Durability/Practice phase is the level of institutional support to continue the MDFT intervention, as well as incentives for staff members to commit to the extra work involved in achieving better outcomes (Liberman & Corrigan, 1994). As noted above, the program director has been identified and targeted as the critical member of the team in this regard, as well as the social workers' supervisor. Other potential obstacles to adoption include decay of the new knowledge and regression back to previous practices and attitudes. Individual level factors such as motivation and commitment to maintain the effort needed for continued success with the intervention require a certain amount of self reinforcement, satisfaction with the results of the work, and support from administrators and staff. These potential barriers to the successful practice of MDFT in the ADTP represent current targets of intervention.

3.1.4.2. Interventions to ensure increased success of adoption. In order for the ADTP staff to adopt the MDFT model and continue to implement the interventions in our absence, the principles and techniques must be internalized and accepted as integral to the ADTP. As has been noted throughout this article, the ultimate success of this endeavor will be reflected in systemic change. Each staff member must ultimately take ownership and commit to continue the intervention. This will happen only if they see evidence of concrete outcomes — that teens and families come in for treatment, stay in the program, the atmosphere on the unit improves, and the adolescents show clear progress. Staff will only use MDFT if they see the selected methods incorporated into the ADTP work for them in terms of increased responsiveness of teens and families, as well as increased self efficacy and empowerment for themselves as clinicians.

4. Discussion

This article summarizes the still in-process journey to transfer and test a multiple-systems focused, family-based outpatient treatment for adolescent substance abuse in a technology transfer study. We detail the technology transfer project's objectives and overall plan, the technology that is being transported to the new setting, and the adaptations that have been a necessary part of the technology transfer process.

While a realization that adaptation will be a necessary part of any technology transfer process is important, this mind set does not necessarily help the technology transfer implementers to know, a priori, exactly which aspects of the intervention will need to be changed, or how they will need to change. The barriers-to-change literature is helpful to guide these system change efforts. But this guidance is only instructive up to a point. The available recommendations were developed in diverse settings in projects with different technology transfer interventions. They can prepare the interveners in a generic sense of where to anticipate problems. But the interveners' attention to their ongoing experience at the local or "ground level" of system entry and technology implementation matters tremendously. There is an unfolding and accumulating experience of getting to know the program, procedures, policies, its staff, and deep structure assumptions about itself and its work. This information provides the most useful map for where and how the changes can occur. Yet, changes are inevitable and some

can only be known after the endeavor begins. Kurt Lewin's maxim, foundational to organizational theory and system change specialties, "If you want truly to understand something, try to change it," is apropos here (see Schein, 1992). The realities of treatment (vs. a treatment plan) involve the interaction of a generic plan, manifest in a manual, with the real life that is presented by an individual or family. Effective therapists know about adaptation. They improvise day to day, session to session, because every case involves application of core principles and methods to the particulars of that case.

Unhelpful associations accompany the term "technology transfer." First, it fails to convey sufficient interactivity. There is a connotation of unidirectionality that is troubling. If the term is adopted in its most literal form, it can elicit, iatrogenically, the very kind of barriers outlined in technology transfer. The concept "technology transfer" implies a finite and fully defined set of content taken from context A (research) and moved to context B (real world practice). The process discussed here is an evolving, dynamic change process in which principles and intervention methods used in a previous setting are brought forward into a new context. We are less interested in applying these principles and methods wholesale than we are in understanding how to adapt our interventions to fit the new context.

The discovery process that unfolds as the technology transfer progresses is a vital part of the technology's implementation. The discovery process is in part facilitated by reading the target system's and staff's reactions to the level and kind of change that is possible and acceptable. Sensitivity to staff responses is part of engineering a successful transportation process, but the reactions of staff are not the final limit-setting parameter in the story of technology adoption. The transfer team's capacity to help the target staff stretch to new levels of functioning is critical in the organic process of adaptation. It is not possible to determine how much or even which aspects of a "technology" can be adopted beforehand or even once the endeavor has begun. All that exist are probabilities of "success." Interveners should understand change as difficult but not impossible. The strategic plan will reflect the reality that the plan's (inevitable) revision and adaptation does not reflect systemic resistance or poor planning. Adaptation is part of a normative process.

The study and dissemination process described here have limitations. First, the design itself, although representing an important first step in outlining the MDFT dissemination process, is not a randomized design with an alternative site with which to provide a comparison and control for potential confounds. The ADTP essentially operates as its own control, using baseline measures to evaluate the dissemination's impact in comparison to patient, staff, and program functioning during the later phases of the study. The generalizability of the results will ultimately be limited given the fact only one program was targeted for dissemination. We do not know if the technology transfer protocol we used would be applicable or effective in other day treatment settings. We have not conducted any cost or benefit-cost analyses to determine the economic implications of the technology transfer intervention or to determine if shorter training tine might be able to produce the same results.

At this stage of the process, we can specify some guidelines and preliminary lessons learned. On the basis of our experience thus far, we offer this in-process list of do's and don'ts.

4.1. "Do's"

Do think through your own approach in terms of the isomorphic nature of the approach and the technology transfer effort. Our previous experience in articulating a framework of the isomorphic nature of family therapy training/supervision and family therapy was foundational to our technology transfer/system change efforts (Liddle & Saba, 1985). A guiding framework, a well-defined theory of change, and corresponding intervention methods are indispensable allies.

Do consider formal multivariate assessment strategies. This includes psychometrically sound, and technology transfer specific instruments (Simpson, 2002).

Do expect resistance, but work to reframe it. Focusing on the resistant behaviors of members of the technology transfer context creates a negative mind set on the intervener's part. Understand systemic and individual resistance as reasonable reactions to the unknown and to the naturally threatening process of change. It is the technology transfer team's responsibility to understand the fit between the approach to be implemented and the host context. The approach and the context will adapt to each other in an effort to achieve a mutually beneficial and influential fit of the new approach or procedures into the existing context.

Do structure a staff and organizational environment for the technology transfer team that includes regular contact and a feedback system on the project's progress. Meet frequently as an intervention team. We have found it important to keep records (e.g., scorecards) that can check for accountability and outcomes, allowing for intervention changes and adaptations to be made. The ability to adjust one's system change efforts based on the day-to-day functioning and response of all team members is vital to success.

Do keep a log or journal of the vignettes or the studies accompanying the system change efforts. Inside these mini-case studies are important insights and lessons to improve future technology adoption efforts. The vignettes help to articulate the technology transfer process.

Do provide a full and contextual definition of the process you think you need to execute to effect changes. Persistence, commitment, professionalism, and enthusiasm at each stage

of the transportation process are important process ingredients to the change formula. Our intensive involvement in the program fits with our theory of what it takes to effect human change. Considerable human resources and commitment are required.

4.2. "Don'ts"

Do not underestimate staffing needs. Assume more people rather than less will be needed to implement the technology transfer effort. These multiple staff members play different roles, specialize in different interventions, and provide support to each other in the change effort.

Do not underestimate the amount of time it takes to achieve the beginnings of progress. Assuming it will take longer than one thinks to effect even minimal change will help morale and keep the effort focused and consistent. Plan for a "Pre-Exposure" phase to assess baseline functioning, join systems, and prepare both teams for change.

Do not assume the technology to be transported will not need to change. Enter the process looking for ways it does not fit, and think ahead about how to create a context that will address, collaboratively, the adaptation and the adoption process.

Do not assume the pieces of the approach that get selected for transfer will be the most relevant or "active" ones. One has to accept at this stage of the science in this area, the identification of the essential elements of an empirically supported treatment is not possible. Until we do studies that help determine the most influential elements of treatments (e.g., component analysis research), decisions about the most important aspects of treatments to put in place in any given host context will be informed more by good clinical judgment, a careful reading of the transfer context, and previous experience in training therapists.

Do not assume you can always implement your own model. Although the MDFT team was confident in the concrete organizing potential of their conceptual framework for the technology transfer effort, mistakes were made that reflected an inability to follow the approach consistently. Multisystemic interventions require a comprehensive scope and vision of the parts of the system with which one is working. This is where processes like adherence checks, supervision, and consultation enter the picture.

Do not expect perfection. Technology transfer research represents a different logical type of science than many researchers have experienced. Controlled trial research and process research, as examples, are different enterprises than technology transfer. There are parallels and many of the same skills apply, but one is best served by respecting the starkly different research universe represented by technology transfer. Respect for these differences will increase patience, keep expectations realistic, and remind researchers that the new technology transfer research arena is specialized. It is a culture about which one must learn many new things.

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