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Family-based treatment for adolescent substance abuse: controlled trials and new horizons in services research

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This article provides an overview of controlled trials research on treatment processes and outcomes in family-based approaches for adolescent substance abuse. Outcome research on engagement and retention in therapy, clinical impacts in multiple domains of adolescent and family functioning, and durability and moderators of treatment effects is reviewed. Treatment process research on therapeutic alliance, treatment fidelity and core family therapy techniques, and change in family processes is described. Several important research issues are presented for the next generation of family-based treatment studies focusing on delivery of evidence-based treatments in routine practice settings.

Family-based treatment (FBT) is the most thoroughly studied behavioural treatment modality for adolescent substance abuse (ASA) (Becker and Curry, 2008). The extensive empirical support for FBT has been described in comprehensive literature reviews (Deas and Thomas, 2001; Williams *et al.*, 2000), meta-analyses of controlled outcome studies (Stanton and Shadish, 1997; Vaughn and Howard, 2004; Waldron and Turner, 2008), and quality of evidence analyses (Becker and Curry, 2008; Vaughn and Howard, 2004). In addition, basic research on developmental psychopathology has emphasized the central role played by family environments in the development of adolescent alcohol and drug problems (Repetti *et al.*, 2002). As a result, clinical practice guidelines put forth by federal agencies (Center for Substance Abuse Treatment, 1999), national associations (American Academy of Child and Adolescent Psychiatry, 1997) and influential policy-making groups (Drug Strategies, 2003, 2005) all underscore the importance of involving caregivers and other family members in the treatment of adolescent drug users.

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This article provides an overview of the extant research literature on treatment processes and outcomes in family-based approaches for ASA. First, we review outcome research on engagement and retention in therapy, clinical impacts in multiple domains of adolescent and family functioning, and durability and moderators of treatment effects. Second, we describe treatment process research on therapeutic alliance, treatment fidelity and core family therapy techniques, and change in family processes. Finally, we present several important research issues for the next generation of FBT studies focusing on delivery of evidence-based treatments in routine practice settings.

Treatment outcome research on family-based treatment for ASA

The first wave of controlled studies testing clinical outcomes and treatment engagement strategies in FBT for ASA were conducted during the 1980s (Friedman, 1989; Joanning *et al.*, 1992; Lewis *et al.*, 1990; Szapocznik *et al.*, 1983, 1986, 1988). These studies exemplified cutting-edge research according to prevailing standards: well-defined treatment and comparison conditions, availability of documented treatment procedures or treatment manuals, ongoing clinical supervision of therapists implementing the treatments, and standardized assessments of drug use and related outcomes. Research during this period established family therapy as a safe, acceptable, viable and promising approach for adolescent drug problems (Liddle and Dakof, 1995). However, these studies were also limited by relatively small samples, shorter follow-up assessment windows, and limited data on treatment implementation and fidelity.

The scientific quality of family-based adolescent drug treatment research continues to progress (Becker and Curry, 2008) and has garnered considerable and broad-based federally funded research support (Rowe and Liddle, 2006). A host of randomized, well-controlled, long-term studies have been reported in the scientific literature. Table 1 presents a summary of controlled trials of behavioural treatments for adolescent substance use. Studies were included in the table if they met the following selection criteria: a family-based model was a credible study condition either as a stand-alone treatment or featured component of a multi-component model; there was at least one comparative treatment to which participants were randomly or near-randomly assigned; all study conditions were outpatient treatment models; the study sample was drawn from a clinical population for which ASA was a primary referral problem;

TABLE 1 Summary of randomized controlled trials of family-based treatments for adolescent substance use that report follow-up outcome data

Study	Treatment groups	Sample N: sex, ethnic status	Drug-use status at intake	Main findings
Szapocznik <i>et al.</i> , 1986	a. One-person family therapy b. BSFT	35: 78 per cent male, 100 per cent HA	Presenting clinical problem is drug use	Both groups improved drug use, behaviour problems and observed family functioning
Friedman, 1989	a. FFT+individual b. Parent training group+individual	135: 63 per cent male, 89 per cent EA	Presenting clinical problem is drug use	FFT had higher rates of treatment engagement; both groups improved drug use, behaviour problems and family functioning
Azrin <i>et al.</i> , 2001	a. BFT b. CBT-I	56: 82 per cent male, 79 per cent EA, 16 per cent HA	SUD+ODD/CD	Both groups improved drug use, conduct problems, problem-solving, depression symptoms and family satisfaction
Liddle <i>et al.</i> , 2001	a. MDFT b. CBT-G c. Multi-family education	182: 80 per cent male, 51 per cent EA, 18 per cent AA, 15 per cent HA	Illegal drug use at least three times per week	MDFT had superior engagement; all groups improved, with MDFT showing superior improvement in drug use, family competence and grade point average
Waldron <i>et al.</i> , 2001	a. FFT b. CBT-I c. CBT-G d. IBFT	114: 80 per cent male, 47 per cent HA, 38 per cent EA	SUD	FFT and IBFT were superior to CBT-G at 4 months and to CBT-I at 7 months; no differences in behaviour problems or family conflict
Henggeler <i>et al.</i> , 2002	a. MST b. Usual care	80: 76 per cent male, 60 per cent AA, 40 per cent EA	SUD+Juvenile offence	MST had fewer aggressive criminal acts and reduced drug use; no differences in psychiatric symptoms
Latimer <i>et al.</i> , 2003	a. IFCBT b. Drug psycho-education	159: 72 per cent male, 81 per cent EA	SUD in 85 per cent of sample	IFCBT was superior in reducing alcohol and drug use and improving problem-solving, learning and parenting skills

Dennis <i>et al.</i> , 2004	a. MET/CBT-5 b. MET/CBT-12 c. FSN d. ACRA e. MDFT	600: 83 per cent male, 61 per cent EA, 30 per cent AA	Met ASAM criteria for outpatient treatment	All groups improved similarly on drug use outcomes; ACRA and MET/CBT-5 were most cost- effective
Slesnick and Prestopnik, 2005	a. EBFT b. Usual care	124: 59 per cent female, 42 per cent HA, 37 per cent EA	SUD or 10 days use in past 90 days	Both groups improved on drug use, behavioural and family outcomes; EBFT was superior on drug use
Henggeler <i>et al.</i> , 2006	a. MST+drug court b. MST+CM+drug court c. Drug court d. Family court	161: 83 per cent male, 67 per cent AA, 31 per cent EA	SUD+juvenile offence	cases completing at least 5 sessions The three drug court groups were superior to family court in decreasing criminal behaviour and drug use; the two MST groups were superior to drug court alone in reducing drug use
Smith <i>et al.</i> , 2006	a. SOFT b. 7C	98: 71 per cent male, 76 per cent EA	Recent risky behaviour+ lifetime SUD	Both groups improved in drug use and drug-related symptoms
Robbins <i>et al.</i> , 2008	a. SET b. FAM c. Usual care	190: 78 per cent male, 59 per cent HA, 41 per cent AA		For Hispanics, only SET reduced drug use; for African Americans, there were no reductions in drug use for any group
Liddle <i>et al.</i> , 2008	a. MDFT b. CBT-I	224: 81 per cent male, 72 per cent AA, 18 per cent EA, 10 per cent HA	SUD	Both groups reduced drug use frequency; MDFT was superior in promoting abstinence, reducing drug-related problems, and sustaining gains at 1-year post- treatment

TABLE 1 *Continued*

Study	Treatment groups	Sample N: sex, ethnic status	Drug-use status at intake	Main findings
Liddle <i>et al.</i> , 2009	a. MDFT b. CBT-G	83; 74 per cent male, 42 per cent HA, 38 per cent AA, 11 per cent Haitian or Jamaican	Met ASAM criteria for outpatient treatment	Both groups were effective; MDFT was superior in reducing drug use, delinquency, internalized distress and multi-domain risk factors

Note: Studies are listed in order of publication year, from earliest to most recent.
BSFT = Brief Strategic Family Therapy; FFT = Functional Family Therapy; BFT = Behavioural Family Therapy; CBT-I = Cognitive-behavioural Therapy - Individual; MDFT = Multidimensional Family Therapy; CBT-G = Cognitive-behavioural Therapy-Group; IBFT = Integrated Behavioural and Family Therapy (FFT+CBT-I); MST = Multisystemic Therapy; IFCBT = Integrated Family and Cognitive-behavioural Therapy (Problem-focused Family Therapy+CBT-I); MET/CBT-5/12 = Motivational Enhancement Therapy plus Cognitive-behavioural Therapy - Group (5 or 12 sessions); FSN = Family Support Network; ACRA = Adolescent Community Reinforcement Approach; EBFT = Ecologically Based Family Therapy; SOFT = Strengths-oriented Family Therapy (multifamily groups plus case management); 7C = The Seven Challenges (group and individual journaling and skills building); CM = Contingency Management; SET = Structural Ecosystems Therapy (BSFT+structured extrafamilial interventions); FAM = BSFT with prohibitions on extrafamilial intervention. HA = Hispanic American; EA = European American; AA = African American. SUD = Substance Use Disorder; ODD = Oppositional Defiant Disorder; CD = Conduct Disorder; ASAM = American Society of Addiction Medicine.

drug use was a main outcome variable in the study; at least one follow-up assessment (i.e. beyond immediate post-treatment assessment) was included in analyses; the study was published in an English-language peer-reviewed journal. For projects that yielded more than one publication reporting follow-up results, the most recent publication is included. Reporting of follow-up assessment data was made a selection criterion in order to place emphasis on the durability of treatment effects. In addition, note that multi-family groups (Joanning *et al.*, 1992; Liddle *et al.*, 2001) were considered group-based psychoeducational models rather than family-based interventions *per se*.

Findings from these and other FBT studies are discussed below as they pertain to treatment engagement, outcomes, and durability and moderators of outcomes. A host of manualized family therapy models has been tested over the past three decades, and family therapy is now considered an efficacious treatment approach for adolescent substance abuse (Austin *et al.*, 2005; Waldron and Turner, 2008). Several reviews have rated family therapy as the treatment of choice for ASA (Stanton and Shadish, 1997; Williams *et al.*, 2000). Waldron and Turner (2008) recently presented a meta-analytic synthesis of seventeen studies of outpatient treatments for ASA completed since 1998. Their review analysed forty-six different treatment conditions classified as individual cognitive-behavioral therapy (CBT), group CBT, family therapy or minimal treatment control. Of the three specific models that emerged as 'well-established' interventions (Chambless *et al.*, 1996) – multidimensional family therapy (MDFT), functional family therapy (FFT) and group CBT – two were family-based treatments. Three additional family models – brief strategic family therapy (BSFT), behavioural family therapy (BFT) and multisystemic therapy (MST) – were classified as 'probably efficacious' and, given their ongoing research programmes, moving towards status as well-established treatments (Waldron and Turner, 2008). Another recent, comprehensive review of outpatient ASA treatments was completed by Becker and Curry (2008), who rated thirty-one randomized trials published since 1983 on fourteen indicators of methodological quality. Three approaches showed evidence of treatment superiority in the highest quality studies: ecological family therapy (including MDFT and MST), individual and group CBT, and brief motivational intervention. Finally, Vaughn and Howard (2004) combined meta-analysis and quality of evidence analysis to synthesize ASA treatment research, and determined that MDFT and group CBT generated the strongest

empirical support, with MST and FFT also showing evidence of effectiveness.

Treatment engagement and retention

Families of clinically referred adolescents can be very difficult to engage in treatment (Armbruster and Kazdin, 1994), and a strong case has been made that clinical engagement of multi-problem families requires an intensive approach that involves youth, caregivers and extra-familial support systems (Cunningham and Henggeler, 1999; Prinz and Miller, 1996). Controlled studies of specialized engagement procedures developed for FBT models treating adolescent drug users (e.g. Donohue *et al.*, 1998; Santisteban *et al.*, 1996; Slesnick and Prestopnik, 2004; Szapocznik *et al.*, 1988) find that well-articulated, intensive, family-based engagement strategies are superior to standard engagement practices (typically one initial phone contact to schedule a first session) in enrolling adolescents and families into outpatient counselling. In addition, retention rates (i.e. completion of a full course of prescribed treatment) in controlled trials of FBT have been uniformly high, typically from 70 per cent to 90 per cent (Liddle, 2004). However, although FBT has outperformed usual care and also some comparison treatments in retaining high-risk teens (Friedman, 1989; Henggeler *et al.*, 1991, 1996; Stanton and Shadish, 1997), there tend to be fewer differences in retention rates when FBT is compared to other well-defined approaches with specialized engagement strategies of their own (e.g. Azrin *et al.*, 1994; Liddle *et al.*, in press b; Waldron *et al.*, 2001).

Treatment outcomes in multiple domains of functioning

As evidenced in Table 1, FBT has demonstrated treatment effects across several domains of adolescent and family functioning. Significant effects for substance use were reported in all fourteen controlled studies. In seven of these studies FBT was found to have superior outcome effects for drug use compared to group CBT (Liddle *et al.*, 2001, in press b; Waldron *et al.*, 2001), individual CBT (Liddle *et al.*, in press a; Waldron *et al.*, 2001), psychoeducational approaches (Latimer *et al.*, 2003; Liddle *et al.*, 2001), drug court (Henggeler *et al.*, 2006) and usual care (Henggeler *et al.*, 2002).

Notably, FBT performed equally well in reducing behaviour problems that are associated with substance use such as delinquency,

externalizing symptoms (e.g. aggressiveness, oppositionality), and internalizing symptoms (e.g. depression, anxiety). Again, FBT conditions in all fourteen studies in Table 1 showed a significant decrease in at least one behavioural problem other than drug use, and three studies reported that FBT outperformed alternative treatments in this area (Henggeler *et al.*, 2002; Liddle *et al.*, 2008, 2009). This is strong evidence that FBT models effectively treat co-occurring behavioural symptoms in substance-using teens (Whitmore and Riggs, 2006). In addition, in all eight studies that reported on family outcomes (e.g. parenting practices, family competence, parent-child interactions), FBT models achieved significant improvements at follow-up. FBT also demonstrated gains in school performance (attendance, grade point average) in both studies reporting on this key developmental outcome (Friedman, 1989; Liddle *et al.*, 2001). These findings highlight the pressing need for additional clinical and research focus on developmental outcomes beyond drug use and behavioural symptomatology (Liddle *et al.*, 2000; Meyers *et al.*, 1999).

Durability of treatment effects

The positive effects of family therapy on adolescent drug use extend beyond treatment termination. Every study listed in Table 1 reported significant treatment impacts at a follow-up assessment point, with nine of the fourteen reporting drug use effects at twelve months or more post-baseline. In the longest reported follow-up period, Henggeler *et al.* (2002) found that MST participants showed significantly higher rates of abstinence from marijuana than usual care participants at four years after treatment.

Moderators of treatment effects

Moderators of treatment effects refer to client, therapist and contextual factors that influence the impact of treatment on specific outcomes (Holmbeck, 1997). By and large, research on treatment moderators for youth psychotherapy models is scarce (Kazdin, 2001), and this is no less true for ASA interventions (Strada *et al.*, 2006). However, FBT research has begun to make inroads in this priority area. Robbins *et al.* (2008) report that structural ecosystems therapy was more effective than control groups in reducing drug use in Hispanic American but not African American adolescents. Waldron and Turner (2008) suggest that FFT may be more efficacious than

CBT for Hispanic American participants, and Rowe *et al.* (2004) report that substance-abusing youths with co-occurring externalizing and internalizing problems at intake initially responded to MDFT but subsequently returned to baseline levels of drug use at one-year follow-up. Findings such as these underscore the value added by moderator research to understanding which treatments work for which families and illuminating how FBT should be tailored for specific subtypes of ASA clients (Ozechowski and Liddle, 2000).

One area of moderator research in which FBT models have excelled is treatment of ethnic minority populations. Of the fourteen studies listed in Table 1, nine recruited samples were at least 50 per cent minority. Hispanic American youth have been a focus of treatment development and outcome research for BSFT (Robbins *et al.*, 2008; Szapocznik *et al.*, 1986; see also Santisteban *et al.*, 2003) and FFT (Waldron *et al.*, 2001), while African American youths are a focus for MDFT (Liddle *et al.*, 2001, in press a, in press b) and MST (Henggeler *et al.*, 2002, 2006). In their comprehensive review of evidence-based treatments for ethnic minority youths, Huey and Polo (2008) designate MDFT as the only probably efficacious treatment for drug-abusing minority youths, and MST as possibly efficacious. They also cite BSFT and MST as two of only three probably efficacious treatments for minority youths with conduct problems. In addition to inclusion of ethnic minorities in clinical research samples, advocates for culturally sensitive treatment (e.g. Hall, 2001; Strada *et al.*, 2006) stress the need for greater articulation of culture-specific accommodations in treatment implementation. Here also, FBT models have made noteworthy progress (e.g. Jackson-Gilfort *et al.*, 2001; Szapocznik *et al.*, 1978).

Process research on family-based treatment for ASA

Treatment process and process-outcome studies play an integral role in FBT treatment development (Diamond and Diamond, 2001), and they have provided essential information about how FBT interventions activate mechanisms of behaviour change (Hogue *et al.*, 1996). Table 2 contains a summary of process outcome studies on FBT for ASA that were conducted on clients participating in controlled trials. Studies were included in Table 2 if they met the following criteria: at least one study condition was a credible FBT model; the study reported analyses on the association between treatment process variables and clinical outcomes; the parent study from which the

TABLE 2 Summary of process-outcome studies derived from controlled trials of family-based treatments for adolescent substance use

Process study	Treatment models	Sample N: sex, ethnic status	Parent study	Main findings
Schmidt <i>et al.</i> , 1996	MDFT	29: 72 per cent male, 55 per cent EA	Liddle <i>et al.</i> , 2001	Observed improvements in parenting practices predicted decreased drug use and behaviour problems
Huey <i>et al.</i> , 2000 ^a	MST	54: 80 per cent male, 54 per cent EA, 46 per cent AA	Henggeler <i>et al.</i> , 2002	Treatment adherence predicted improved family relations and decreased delinquent peer affiliation, which in turn were related to reduced delinquency
Shelef <i>et al.</i> , 2005	MDFT	65: 85 per cent male, 47 per cent EA, 47 per cent AA	Dennis <i>et al.</i> , 2004	Observed parent therapeutic alliance predicted premature termination; observed adolescent alliance predicted drug use, and this relation was moderated by parent alliance
Tetzlaff <i>et al.</i> , 2005	MET/CBT-5 MET/CBT-12 FSN ACRA MDFT	430: 83 per cent male, 61 per cent EA, 30 per cent AA	Dennis <i>et al.</i> , 2004	Adolescent therapeutic alliance predicted decreased drug use at 3 and 6 months post-intake but did not predict longer drug use trajectories; treatment satisfaction did not predict use
Diamond <i>et al.</i> , 2006	MET/CBT-5 MET/CBT-12 FSN ACRA MDFT	400: 81 per cent male, 61 per cent EA, 32 per cent AA	Dennis <i>et al.</i> , 2004	Adolescent-rated, but not therapist-related, early session therapeutic alliance predicted reduced drug use and related problems; neither set of alliance ratings was associated with treatment attendance
Hogue <i>et al.</i> , 2006 ^b	MDFT MDFT CBT-I	100: 81 per cent male, 68 per cent AA, 20 per cent EA, 12 per cent HA	Liddle <i>et al.</i> , 2008	In MDFT, observed early session parent therapeutic alliance predicted reduced drug use and behaviour problems; observed early adolescent alliance was related to change in behaviour problems; in CBT, adolescent alliance did not predict outcome

TABLE 2 Continued

Process study	Treatment models	Sample N; sex, ethnic status	Parent study	Main findings
Hogue <i>et al.</i> , 2006a	MDFT	63; 83 per cent male, 71 per cent AA, 19 per cent EA, 10 per cent HA	Liddle <i>et al.</i> , 2008	Observed family-focused treatment techniques predicted improved internalized distress and family cohesion, and also improved behaviour problems and family conflict when adolescent focus was high; observed adolescent-focused techniques predicted improved cohesion and conflict
Robbins <i>et al.</i> , 2006	MDFT (therapeutic alliance)	30 (adolescents and their families): 80 per cent male, 80 per cent AA, 17 per cent EA, 3 per cent HA	MDFT RCT	There is no relationship between therapeutic alliance and treatment response; both adolescent-therapist and mother-therapist alliances discriminated between dropout and completed families
Hogue <i>et al.</i> , 2008	MDFT CBT-I	136; 81 per cent male, 70 per cent AA, 20 per cent EA, 10 per cent HA	Liddle <i>et al.</i> , 2008	In CBT, observed treatment adherence predicted decreased drug use; in CBT and MDFT, adherence predicted reduced behaviour problems (linear effect) and internalized distress (curvilinear effect); observed therapist competence did not predict outcome in either group

Note: Studies are listed in order of publication year, from earliest to most recent. Treatment process variables derived from non-participant observational measures are prefaced with 'observed'.

MDFT = Multidimensional Family Therapy; MST = Multisystemic Therapy; MET/CBT-5/12 = Motivational Enhancement Therapy plus Cognitive-behavioural Therapy-Group (5 or 12 sessions); FSN = Family Support Network; ACRA = Adolescent Community Reinforcement Approach; CBT-I = Cognitive-behavioral Therapy-Individual;

HA = Hispanic American; EA = European American; AA = African American.

^aIn a related study with the same sample, Schoenwald *et al.* (2000) examined the relation between subdimensions of treatment adherence and the mediating variables (family functioning, parental monitoring, peer relations) described in the Huey *et al.* (2000) study.

study sample originated was a controlled trial listed in Table 1, to ensure the methodological rigour of the research context and generalizability of findings to clinical populations; and the study was published in a peer-reviewed journal. Of the eight studies listed in Table 2, four focused on therapeutic alliance with the adolescent and/or caregiver, three on treatment fidelity and techniques, and one on parent/family change during treatment. Findings from these and other FBT process and process outcome studies are discussed below.

Therapeutic alliance

Therapeutic alliance has proven to be a transtheoretical process component associated with treatment outcome across a diverse range of treatment models and clinical subgroups in both adult (Martin *et al.*, 2000) and youth populations (Shirk and Karver, 2003). Most alliance research on adolescent substance users has involved FBT models; much of this work has focused on alliance effects early in treatment. Diamond and colleagues (1999) found that improvements in adolescent alliance over the first three sessions of MDFT were linked to specific alliance-building therapy techniques. Robbins and colleagues (2006) reported that both adolescent alliance and parent alliance in MDFT declined significantly between sessions one and two for dropout cases (attended fewer than eight sessions) but not treatment completers. Flicker and colleagues (2008) found that Hispanic families who dropped out early from FFT had greater discrepancies in parent versus adolescent alliance in the first session than families who completed treatment; this finding was not replicated with European American families.

A few studies involving the MDFT model have linked therapeutic alliance to treatment outcome. Tetzlaff and colleagues (2005) found that client ratings of adolescent alliance predicted reduced drug use across five manualized treatment conditions, including MDFT; alliance effects occurred at six months post-intake but not at longer follow-up. Shelef and colleagues (2005) reported that observer ratings of adolescent alliance in MDFT predicted reductions in substance use and psychological symptoms at up to three-months' follow-up, but only for cases with high parent alliance. Hogue and colleagues (2006b) found that stronger parent alliances in early MDFT sessions predicted declines in adolescent drug use and externalizing symptoms at six-month follow-up; moreover, adolescents with weak early alliances that subsequently improved by mid-treatment showed

greater reductions in externalizing than adolescents whose alliances declined. As a group, these engagement and outcome studies support theoretical assumptions that strong therapeutic alliances with both adolescents and caregivers are key to successful family-based treatment with ASA clients (Liddle, 1995).

Treatment fidelity and techniques

To date three FBT studies have examined links between treatment implementation and clinical outcomes in ASA samples. Huey and colleagues (2000) showed that adherence to fundamental principles of MST predicted improved family relations and decreased affiliation with delinquent peers; in addition, changes in these two outcomes mediated the relation between treatment adherence and reduced delinquent behaviour in the target adolescent. Hogue and colleagues (2006a) found that greater use of core family- and adolescent-focused treatment techniques in MDFT were associated with greater reductions in adolescent internalizing and externalizing symptoms, as well as improvements in family cohesion and conflict, up to one year after treatment. And again for MDFT as well as for individual CBT, Hogue and colleagues (2008) showed that stronger treatment adherence predicted greater decline in externalizing symptoms (linear adherence effect), whereas intermediate levels of adherence predicted the largest declines in internalizing behaviour, with high and low adherence predicting smaller improvements (curvilinear adherence effect). Interestingly, no outcome effects were found for observer-rated therapist competence. Overall, these findings indicate that the implementation of core FBT interventions promotes positive outcomes in both adolescent and family functioning.

Parent and family change

FBT models have also demonstrated the ability to enact behavioural changes in parenting and family interactions that are directly in keeping with theory of change principles for systemic interventions (Liddle, 1999). Schmidt and colleagues (1996) found significant improvement in the quality of in-session parenting behaviours observed between the first three sessions versus the last three sessions of treatment in twenty out of twenty-nine MDFT cases, and these parenting improvements were linked to post-treatment reductions in drug use. Diamond and Liddle (1996, 1999) identified particular

MDFT interventions targeting problematic parent–adolescent interactions (e.g. actively blocking, diverting or working through negative emotions; amplifying feelings of sadness, regret and loss; prompting parent–adolescent conversation on important topics) that were associated with successful resolution of family impasses observed in treatment sessions. Other noteworthy advances in process research on parent and family change have been made for families of conduct-disordered youth participating in behavioural parent training (e.g. Patterson and Forgatch, 1985), MST (e.g. Henggeler *et al.*, 1986; Mann *et al.*, 1990) and FFT (e.g. Robbins *et al.*, 1996, 2000).

The next stage for research is practice: delivering family-based treatment for ASA in routine service settings

Rigorous treatment process and outcome research has demonstrated that high-fidelity family-based treatment is an efficacious approach for adolescent substance abuse and related behaviour problems. The next challenge facing FBT developers, researchers and practitioners is translating success in controlled research settings to success in everyday practice. Efforts are currently underway to determine the best methods for delivering empirically supported FBT models in a variety of routine care settings (Liddle *et al.*, 2002; National Institute on Drug Abuse Clinical Trials Network, 2008) and to create clinical and policy guidelines that promote family therapy as a first-line treatment option for drug-using adolescents (Drug Strategies, 2003). Below we present promising avenues for advancing clinical science in three important dimensions of FBT service delivery: treatment fidelity, client heterogeneity, and implementation in multiple service contexts.

Delivering high-fidelity treatment

Can empirically supported FBT models be delivered with fidelity in standard practice settings? Initial attempts to transport FBT models into usual care have yielded encouraging results. Henggeler and colleagues (1997, 1999) found in two MST transportability studies that community therapists delivering MST produced outcomes comparable to research therapists when supervision by model experts ensured strong fidelity; however, fidelity and outcomes both suffered when expert supervision was withdrawn. In addition, Liddle and colleagues (2002, 2006) demonstrated that intensive training and supervision in MDFT could change provider practices and programme

environment characteristics within a hospital-based day treatment programme, promote solid fidelity to MDFT based on observational adherence measures, and maintain improved adolescent outcomes after training.

A research methodology that offers great utility for growing the knowledge base on FBT implementation in usual care is benchmarking analysis. Benchmarking studies typically compare the performance of community-based providers to accepted gold standards (i.e. benchmarks) in critical areas such as retention, implementation and outcomes (Hunsley and Lee, 2007). Benchmarks can be derived from many sources, including local or nationwide performance standards (e.g. Weersing, 2005), national warehouse databases (Mellor-Clark *et al.*, 2006; Mullin *et al.*, 2006), or treatment efficacy trials in the form of single landmark studies (Gaston *et al.*, 2006) or a group of studies aggregated via quantitative review (Chorpita *et al.*, 2002) or meta-analyses (Minami *et al.*, 2007).

Benchmarking research to date has focused primarily on client outcomes for adult disorders (e.g. Barkham *et al.*, 1996; McEvoy and Nathan, 2007; Merrill *et al.*, 2003; Wade *et al.*, 1998) and depressed youth (Weersing and Weisz, 2002). By and large, these studies have found that empirically supported treatments exported to community sites using manual-guided training achieved outcomes similar to those produced in controlled trials, although effects in community sites may be less durable over time. By examining how FBT implementation and outcome in routine care compare to standards achieved in controlled research, benchmarking analyses can play a pivotal role in discovering whether FBT models are feasible, potent and durable when delivered in front-line settings (Weisz *et al.*, 2006).

Serving a multi-problem, heterogeneous population

Can FBT models serve the diverse clinical needs of adolescent drug users and their families? Among the most consistent findings to emerge from basic and applied research on ASA is the complexity, heterogeneity and multiplicity of problems associated with this disorder (Rowe and Liddle, 2006). Contemporary assessment and treatment efforts are therefore organized around a constellation of problems that typically co-occur with ASA: psychiatric symptoms, school problems, delinquency and high-risk sexual behaviour (Dennis *et al.*, 2003). Unfortunately, most adolescent substance users in community programmes do not receive comprehensive interventions

to address their multiple needs (Etheridge *et al.*, 2001; Jaycox *et al.*, 2003), and there is a well-documented mismatch between the services offered and the service needs of these clients (Grella *et al.*, 2001). In the absence of appropriate care, ASA youth with co-occurring disorders are at especially high risk to drop out of treatment (Kaminer *et al.*, 1992; Wise *et al.*, 2001) and have poor long-term outcomes (Crowley *et al.*, 1998; Whitmore and Riggs, 2006).

Two innovative approaches to serving clients with multiple behavioural problems warrant further research for treating ASA: combined treatments and core elements approaches. Combined treatments refer to integrated behavioural and pharmacological interventions for co-occurring substance use and mental health disorders (Mattson and Litten, 2005). In the case of adolescent substance users, combined treatment refers to integrating a pharmacological intervention to treat a co-occurring mental health disorder for which effective medications exist, such as attention-deficit hyperactivity disorder, anxiety and depression (Bukstein and Cornelius, 2006; Libby and Riggs, 2005). Although resources exist for treating 'dual-disorder' adult clients (e.g. Mueser *et al.*, 2003), there remains a dearth of empirical research on combined treatments for comorbid disorders in adolescents to guide clinical interventions and decision-making. The few existing studies of combined interventions for comorbid ASA populations suggest that treatment of one disorder may not be successful unless there is active treatment of the other (Whitmore and Riggs, 2006). For example, Riggs *et al.* (2004) found that pharmacotherapy for attention-deficit hyperactivity disorder (ADHD) in teens with comorbid ADHD and ASA was successful in reducing ADHD symptoms but had no impact on SUD problems. In contrast, the same research group (Riggs *et al.*, 2007) subsequently found in a combined treatment study for co-occurring ASA and major depressive disorder (MDD) that the behavioural intervention for ASA, individual CBT, also had clinical impacts on MDD symptoms in the absence of MDD medication. Of note is the fact that CBT is an evidenced-based treatment for both substance use (Waldron and Kaminer, 2004; Waldron and Turner, 2008) and depression (Chu and Harrison, 2007; David-Ferdon and Kaslow, 2008) in adolescents, which may account for the cross-over effects. It remains to be seen whether ASA clients with a co-occurring mental health disorder can benefit from integrated treatments combining FBT with evidence-based medications for that disorder.

Concerns about the feasibility of transporting research-based treatments into routine care have led clinical researchers in both mental

health (Chorpita *et al.*, 2007; Garland *et al.*, 2008) and substance use (Carroll and Rounsaville, 2006) to call for consideration of a core elements approach to dissemination that focuses on essential treatment elements that are common across therapy manuals for similar populations. The best-known example is described by Chorpita and colleagues (Chorpita *et al.*, 2005, 2007), who call their core elements approach the 'distillation and matching model'. In the distillation phase, the numerous treatment techniques prescribed by multiple independent manuals for a specific disorder are boiled down to a smaller number of overlapping practice elements considered to be core active ingredients of each manual. Then in the matching phase, clinicians decide which set of distilled practice elements to use for a presenting case based on client factors and other considerations highlighted in the research literature for the relevant disorder. It follows that for ASA clients, core elements FBT would be a primary treatment of choice. The overall goal of the core elements approach is to shift the emphasis of dissemination away from a focus on discrete therapy models and towards a focus on basic curative elements of research-supported approaches. The benefits of this shift may be profound (Daleiden *et al.*, 2006; Garland *et al.*, 2008): unify and simplify the task of transporting evidence-based approaches into routine care with fidelity; retain the importance of provider judgment about duration, intensity and other parameters of implementing evidence-based practices; provide evidence-based options for client groups with diagnostic complexity and/or for whom no treatment manuals currently exist; and create continuity across the process of adapting and replicating discrete manuals. However, while intriguing as an alternative or complementary dissemination strategy for FBT and other empirically based treatments, the core elements approach is a recent innovation with unknown endpoint value pending controlled implementation and testing in real world conditions.

Implementation in various service delivery contexts

Can FBT models meet the clinical needs presented by ASA clients in various service sectors? Adolescent substance users are prevalent in multiple systems of care—substance abuse treatment, juvenile justice, mental health programmes, child welfare and the schools – and each sector presents unique treatment service contexts (Center for Substance Abuse Treatment, 1999; Institute of Medicine, 2006). FBT models that can be flexibly delivered while maintaining adherence to

the fundamental treatment principles and techniques that make them effective will have great appeal to various stakeholders and greater viability within and across systems. One strategy for addressing the fit of research-developed treatments within various sectors of care is developing treatment *systems* that can be flexibly adapted for implementation in diverse clinical contexts. MDFT is an example of a family-based model that has evolved into a treatment system via iterative treatment development research (Liddle, 1999; Liddle and Hogue, 2001). MDFT has been adapted and tested as an indicated preventive intervention for high-risk youth (Hogue *et al.*, 2002, 2005), an early treatment intervention for substance-using teens (Liddle *et al.*, 2004, in press b), an outpatient treatment model for adolescent drug abusers with co-occurring psychological problems (Liddle *et al.*, 2001, in press b), an adjunctive family intervention integrated within a hospital-based day-treatment programme (Liddle *et al.*, 2002, 2006), and an intensive home-based intervention with case management for adolescents in the juvenile justice system who exhibit comorbid substance use and conduct disorders (Liddle and Dakof, 2002). Observational fidelity assessment and controlled outcome research support the integrity and effectiveness of each 'version' of the MDFT system.

A promising method for conducting policy-relevant research on implementing FBT in diverse applied settings is the practical clinical trial. Practical clinical trials (PCTs; March *et al.*, 2005; Tunis *et al.*, 2003) are designed to directly inform clinical practice by asking research questions that are clinically relevant, highly generalizable to routine practice, and of substantial public health importance. PCTs have a number of essential features. They should be controlled trials, optimally with random assignment; be conducted under conditions that mirror clinical practice; include samples large enough to detect small to moderate effects and support analysis of client subgroups; and use simple, clinically meaningful outcome measures (March *et al.*, 2005). PCTs differ from large-scale effectiveness trials primarily in their limited use of elaborate quality assurance and research management strategies, such as rigorous provider training and monitoring procedures that are very difficult to sustain outside a research context. Another important design feature readily leveraged by PCTs is strong academic-government agency partnership (Morgenstern *et al.*, in press). Government is often the sole funder of services and a primary stakeholder in accountability and quality of those services; gaining stakeholder buy-in to a study design increases the likelihood that

study findings will be adopted at a systems level after research is completed (Morgenstern *et al.*, under review; Zerhouni, 2003).

Conclusion

Three additional issues warrant attention from clinical researchers working on family-based approaches for ASA. First, assessment designs should extend beyond substance use patterns, psychiatric problems and behavioural coping skills to routinely include indicators of positive youth development that provide a fuller picture of developmental functioning and adult role-taking (Weisz and Hawley, 2002). These broader indicators should be chosen for their salience to development success in the context of adolescence and early adulthood (Steinberg, 2002), and they should also map well on to targeted therapeutic changes (Gladis *et al.*, 1999). Involvement in pro-social activities, school and academic outcomes, employment readiness, quality of close relationships, and self-management patterns are a few good candidates for ASA youth (see Williams *et al.*, 2002).

Second, FBT research should renew its early intentions to examine processes of family change during the course of treatment (Pinsof, 1989). On the one hand, FBT process research has increased appreciably in size and rigour since Friedlander and colleagues (1994) reported that family therapy process studies were few in number, small in sample size and mostly descriptive in nature. On the other hand, the bulk of recent FBT process studies have focused on *therapy* change processes; that is, therapeutic interventions hypothesized to be the active ingredients of a given treatment (Doss, 2004). Too few FBT studies (with notable exceptions, e.g. Diamond and Liddle, 1999; Patterson and Forgatch, 1985; Robbins *et al.*, 2000) have measured *client* change processes; that is, client behaviours or experiences that occur as a direct result of therapy change processes and are expected to precipitate treatment gains (Doss, 2004). Without accounting for this second dimension of the therapeutic process, investigators cannot adequately capture the conceptual centrepiece of FBT theories of change: dynamic, bidirectional processes of therapist–family interactions that give rise to enduring systemic change (Pinsof, 1989). Reliable technology exists for measuring family processes in treatment (e.g. Gardner, 2000; Margolin *et al.*, 1998), leaving the onus on clinical researchers to design studies of family change that promote the development of more effective FBT principles and techniques for ASA and other clinical populations.

Finally, the research area now known as *implementation science* offers a world of exciting new challenges and opportunities. Indeed, given the lack of widespread use of family-based therapies in regular clinical practice settings, this research area has more urgency than it might have if such dissemination were widespread. Certainly the dissemination of family-based therapies is vastly superior to what it was only a few years ago, given the institutionalization of these therapies in national and international registries of best (or evidence-based) practices (e.g. NREPP). While these developments represent clear advances, national and international family therapy associations can play a significant role in the widespread dissemination of family-based therapies and bridging the divide between research and clinical practice.

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