

# Efficacy Studies to Large-Scale Transport: The Development and Validation of Multisystemic Therapy Programs

Scott W. Henggeler

Family Services Research Center, Medical University of South Carolina, Charleston, South Carolina 29425; email: hengesw@musc.edu

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## Keywords

adolescents, delinquency, substance abuse, evidence-based treatment, implementation

## Abstract

The 35-year progression of multisystemic therapy (MST) from modest university-based efficacy studies to large-scale transport to community practice settings is described in this review. The success of early efficacy research led to effectiveness trials, and their success in decreasing rates of youth rearrest and incarceration led to multisite transportability trials and adaptations of the MST model for treating youth presenting other types of challenging clinical problems. To support the transport of MST programs to community settings, an intensive quality improvement system modeled after that used in clinical trials has been implemented in community-based MST programs for the past 15 years. With the association between therapist treatment fidelity and youth outcomes well established, transportability research has demonstrated the significant roles played by clinical supervisors, expert consultants, and provider organizations in supporting therapist adherence and youth outcomes. This body of work has been facilitated by federal and state initiatives to support evidence-based services.

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## INTRODUCTION

During the late 1970s, the author, a new assistant professor in the Department of Psychology, Memphis State University, patched together a quasi-experimental clinical trial ( $N = 80$ ; Henggeler et al. 1986) testing a “family-ecological” approach (Henggeler 1982) to intervening with juvenile offenders and their families. As with much psychotherapy research conducted within psychology departments, this intervention approach, later renamed multisystemic therapy (MST), was implemented by doctoral students in clinical psychology under

the close supervision of the faculty expert. Similarly, research data were collected by a cadre of undergraduate and graduate students in return for course credit or access to the data for use in master’s theses or doctoral dissertations. Analyses of these prepost data revealed promising results, with MST significantly reducing youth behavior problems, improving family relations, and decreasing association with deviant peers.

Skip from this modest beginning to 2010. More than 450 MST programs are operating throughout 30+ states and 11 nations—serving more than 15,000 adolescents with serious

antisocial behavior and their families annually. Several of these states and nations have funded statewide or nationwide access to MST services for the target population of serious juvenile offenders. Nineteen randomized clinical trials and two quasi-experimental studies of MST have been published, most with serious juvenile offenders (e.g., violent offenders, sexual offenders, drug-abusing offenders) as the target sample, but others using adaptations of MST to treat, for example, youth with serious emotional disturbance or chronic health conditions (e.g., poorly controlled diabetes, obesity). And, using MST as a platform, investigators are contributing knowledge in a new area of research—implementation science (Fixsen et al. 2005)—the study of activities designed to transport, for example, an evidence-based treatment from the lab to the real world.

The overriding purpose of this review is to describe the processes and science that underlie the journey from Memphis to the international transport of MST. This journey can be understood in the context of MST developer, researcher, and stakeholder approaches to three interrelated and ongoing issues during the past 30+ years. Each of these issues is discussed extensively in subsequent sections of the article.

The first issue pertains to the ecological validity of psychotherapy research. As with most research findings on evidence-based psychotherapies (Weisz & Kazdin 2010), early MST studies were generally efficacy in nature. Efficacy studies typically aim to optimize the probability of observing treatment effects by including, for example, highly motivated therapists with intensive training, supervision, and fidelity monitoring from the treatment developer and removing organizational barriers to treatment implementation (e.g., excessive productivity or administrative demands, concerns with interagency relations, policies on salary and comp time). On the other hand, obtaining treatment effects in effectiveness studies is considerably more difficult (see, e.g., Weisz et al. 1995). Here, therapists are typically employed by community-based provider organizations, caseloads can have greater heterogeneity

and co-occurrence of problems, and therapists have organizational demands that often have little to do with achieving favorable outcomes for youth. The challenge for bridging the science-to-service gap, then, is to (a) design treatment programs in ways that bridge the domains of clinical research and those of community-based services, and (b) rigorously evaluate the effectiveness of treatments in real-world community settings—using results to inform modifications of the treatment model. After the MST clinical model is reviewed, the next section of the article overviews findings and lessons learned from MST efficacy and effectiveness research as well as studies on MST adaptations.

The second issue pertains to the emerging field of implementation science. Fixsen and colleagues (Fixsen et al. 2010) have noted that efforts to transport evidence-based treatments to typical service settings have not gone well (e.g., Inst. Med. Comm. Quality Health Care in America 2001). Although an extensive science has been articulated regarding the development and testing of new treatments, little is known about factors that facilitate or attenuate the successful implementation of treatments in community practice settings. Since the establishment of favorable MST outcomes with serious juvenile offenders in effectiveness studies in the 1990s, several MST researchers have focused intensively on evaluating assumptions regarding the necessary conditions for the effective transport of MST to community settings. Moreover, results from these studies, in combination with heuristic experiences in developing and supporting MST programs in distal sites, inform current efforts in the large-scale transport of MST programs and have implications for the transport of other complex mental health treatments to community settings.

Third, MST has contributed to and benefited from the changing zeitgeist regarding the nature of child mental health services. When MST was initially developed, the vast majority of treatment services were individually oriented and office or institution based. Services typically blamed families for their children's problems, and mental health professionals often advocated

for the long-term placement of troubled youth in residential and inpatient settings to allow a supportive context for their treatment. With strong and well-conceived advocacy from system of care reformers (e.g., Knitzer et al. 1990, Stroul & Friedman 1986), national policy began to shift to a more consumer friendly and contextual perspective—one that emphasized the importance of family in the development of solutions to children's mental health and behavioral problems as well as the critical need to treat youth in the least restrictive environment possible (i.e., home and community). Indeed, the early influence of reform efforts can be seen in the Surgeon General's reports on mental health (U.S. Dep. Health Human Serv. 1999) and youth violence (U.S. Public Health Serv. 2001). Conceptualizations of youth emotional and behavioral problems are largely social-ecological in nature, families are viewed as critical partners in resolving these problems, and the use of institutional placements is eschewed. These changes meshed well with the central clinical (e.g., viewing families as the solution, addressing needs in the youth's and family's key social systems) and service (e.g., reducing out-of-home placements) emphases of MST. A recent review (Schoenwald 2010) is drawn from to describe the policy contexts of the development of MST and its subsequent transport and dissemination.

Before examining MST outcome research, transportability research, and role of policy in MST development and transport, a brief overview of MST clinical procedures is provided. At the time of development, these procedures conflicted greatly with extant services. Therapists provided treatment in the home; peer influences were a direct and critical emphasis of therapy; school and other community-based stakeholders were engaged in defining and supporting treatment aims; caregivers, even those with serious limitations, were viewed as critical to behavior change; treatment intensity was flexed to family needs; and treatment was provided at times convenient to the family. Although MST clinical procedures have become more widely accepted today (e.g., Natl.

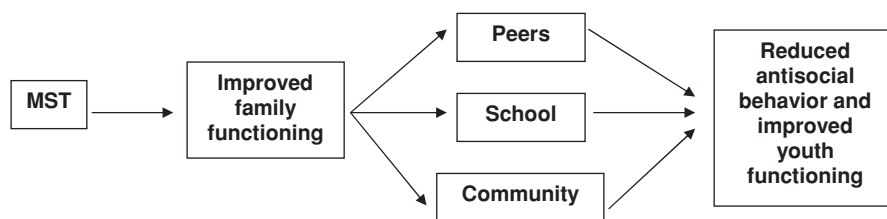
Alliance Ment. Illness 2008), MST programs still include essential components (e.g., ongoing training, monitoring of therapist and program fidelity, tracking of outcomes) that are not widely accepted by service providers.

## THE MULTISYSTEMIC THERAPY CLINICAL MODEL

Because extensive descriptions of MST treatment procedures are provided in clinical texts (e.g., Henggeler & Borduin 1990; Henggeler et al. 2002c, 2009b), this overview focuses on those central aspects of the model that are viewed as essential to achieving desired clinical outcomes for youth and their families. These aspects account for both the success of the model and challenges that arise in transporting MST to community-based provider organizations.

### MST Addresses the Multidetermined Nature of Serious Clinical Problems

Decades of longitudinal and cross-sectional research (e.g., Loeber et al. 1998, Thornberry & Krohn 2003) have shown consistently that adolescent delinquency and substance use are associated with the interplay of certain characteristics of the individual youth (e.g., positive attitudes toward antisocial behavior, negative affect) and the family (e.g., poor supervision, inconsistent or lax discipline), peer (e.g., association with antisocial peers), school (e.g., academic and behavioral difficulties), and neighborhood (e.g., availability of drugs and weapons) systems in which the youth is embedded. Such findings fit with a social-ecological conceptualization of human behavior (Bronfenbrenner 1979) and have clear implications for the design of treatment interventions. In order to optimize the probability of decreasing youth antisocial behavior, interventions must have the flexibility to address a comprehensive range of risk factors while concomitantly building protective factors. For reasons of efficiency, however, pertinent risk factors are addressed in an



**Figure 1**

The multisystemic therapy (MST) theory of change.

individualized fashion—not all risk and protective factors will pertain to all youth and families.

### **MST Views Family As Key to Effective Behavior Change**

An underlying assumption of MST is that family-directed change across the youth's social ecology is most likely to lead to sustainable outcomes such as those observed by Schaeffer & Borduin (2005) for 14 years post treatment. Therefore, consistent with the theory of social ecology and research on the correlates of antisocial behavior in youth, MST aims to decrease youth antisocial behavior by addressing those variables that are most strongly linked with problem behaviors (see the MST theory of change depicted in **Figure 1**). Critically, however, the family is seen as the most important link in the treatment process. The MST therapist works to enhance the caregivers' parenting skills (i.e., monitoring, supervision, affective relations) and then leverages these improvements in family functioning to facilitate key changes in the youth's social network with the ultimate goal of surrounding the youth with a context that now supports prosocial behavior. Caregivers are often coached in how to disengage youth from antisocial peers and develop their relationships with more prosocial peers. Similarly, caregivers are often helped to collaborate more effectively with teachers and other community professionals (e.g., probation officers) involved in the life of the youth and family.

Importantly, the MST theory of change has been supported in mediational studies (Henggeler et al. 2009a, Huey et al. 2000) that

examined clinical trials with serious juvenile offenders (Henggeler et al. 1997), substance-abusing juvenile offenders (Henggeler et al. 1999a), and juvenile sexual offenders (Letourneau et al. 2009). Across these studies, findings showed that MST treatment processes or adherence to MST altered key family and peer risk factors for criminal behavior, and these changes in risk factors resulted in decreased adolescent antisocial behavior.

### **MST Uses a Home-Based Model of Treatment Delivery**

The home-based model of treatment delivery that MST uses removes barriers to service access and enhances the ecological validity of treatment. Key components of this approach include (a) provision of treatment at home, school, and other community locations; (b) appointments scheduled at the family's convenience, including evening and weekend hours; (c) 24-hour-per-day, 7-day-per-week availability of therapists to address crises that might threaten treatment success; (d) caseloads of four to six families per therapist to enable the provision of intensive services titrated to family need; and (e) the inclusion of two to four full-time therapists in each MST team to provide increased continuity of treatment (e.g., therapists can rotate an on-call schedule during evening, weekend, and holiday hours).

The home-based model of service delivery has been extremely effective at reducing the high rates of treatment dropout historically observed in the child psychotherapy literature (Kazdin 1996). For example, MST treatment

completion rates have been greater than 95% in clinical trials with substance-abusing juvenile offenders (Henggeler et al. 1996a) and youth presenting psychiatric emergencies (Henggeler et al. 1999b). Moreover, the treatment completion rate is 79% among MST programs worldwide treating youth with serious antisocial behavior ([http://www.mstinstitute.org/2008-mst\\_data\\_report-summary.pdf](http://www.mstinstitute.org/2008-mst_data_report-summary.pdf)). Such evidence from clinical trials and the field attests to the power of the home-based model, especially when combined with MST clinical engagement strategies (Henggeler et al. 2009b).

### **MST Integrates Evidence-Based Intervention Techniques**

Many of the specific interventions delivered by MST therapists take advantage of the advances achieved by treatment developers and investigators in the broader fields of child, family, and adult psychotherapy (Weisz & Kazdin 2010). In addition to the serious antisocial behavior presented by youth in MST programs, family members often present co-occurring problems that function as barriers to treatment success (e.g., caregiver mental health and substance abuse disorders), and therapists are trained to address any and all such barriers. Thus, therapists not only draw on structural (Minuchin 1974), strategic (Haley 1987), and social learning (Munger 1999, Robin & Foster 1989) formulations to improve instrumental (i.e., supervision, discipline) and affective (i.e., warmth, conflict) aspects of family relations, but also integrate evidence-based interventions that are more individually focused. For example, several types of cognitive-behavioral techniques have proven effective in treating adult depression and anxiety (Leahy 2003), and contingency management (Higgins et al. 2008) has a strong track record in treating both adult and adolescent substance use disorders. Similarly, cognitive-behavioral approaches have been effective in treating childhood anxieties and the symptoms of posttraumatic stress disorder (Cohen et al. 2006, March & Mullen 1998), and several evidence-based pharmacotherapies have

been developed (Daley et al. 2007). When such interventions are used, however, they are fully integrated into the broader MST treatment model and quality improvement system (discussed next). Thus, for example, caregivers are actively engaged in the delivery of cognitive-behavioral interventions for their adolescent's depression; outcomes are monitored continuously; interventions are put in place to align family, peer, and school interactions to maximize the youth's success; barriers to intervention delivery are removed; and the quality of the therapist's work is assessed weekly.

### **MST Uses a Comprehensive Quality Assurance and Improvement System**

With the large-scale transport of MST programs nationally and internationally, the MST quality assurance and improvement system aims to assure that youth and families in MST programs in North America, Europe, and Australia receive the same high level of MST services. Clearly, extensive efforts were needed to make the transition from a quality assurance system that relied exclusively on the direct supervision of graduate student therapists by an MST treatment developer (e.g., Borduin et al. 1995, Brunk 1987, Henggeler et al. 1986) to a quality improvement system used to support the treatment of more than 15,000 youth and families annually. The MST quality assurance and improvement system includes three broad interrelated components (i.e., training, organizational support, and implementation measurement and reporting) that are integrated into a feedback loop to support youth outcomes, therapist and supervisor fidelity to MST protocols, and the fidelity and sustainability of the MST program (Henggeler et al. 2009b). Training components include specification of treatment, supervisor, expert consultant, and program manuals; an initial five-day orientation; quarterly booster training; weekly case supervision; weekly case consultation; and supervisor and consultant training. Organizational support for MST programs includes a program operations manual, extensive support for



program development (e.g., needs assessment, site readiness review, staff recruitment and orientation training), ongoing implementation reviews (e.g., problem-solving organizational and stakeholder barriers to implementation), and support for program and agency leadership. Implementation measurement and reporting are ongoing and include validated measures of therapist, supervisor, and consultant adherence to respective protocols and a Web-based system to track critical aspects of site performance, including youth outcomes. The validation of key components of this system has been led by Schoenwald (e.g., Schoenwald 2008), and associated findings are described below in this review.

### Broader Applicability of the Central Aspects of the MST Model

Although MST is validated most extensively in the treatment of serious antisocial behavior of juvenile offenders (i.e., chronic and violent offending, sexual offending, substance abuse), the aforementioned central aspects of the MST model are relevant for serious clinical problems other than juvenile offending. As such, several groups of investigators are advancing MST adaptations for youth presenting other types of challenging and costly problems (e.g., result in frequent hospitalizations or out-of-home placements). The work of Ellis and Naar-King in modifying MST for youth with serious health care problems provides one of the best examples of such an adaptation. Their research, described more extensively in the next section of this review, focuses on youth with chronic health care conditions such as poorly controlled type 1 diabetes, HIV infection, obesity, and asthma. Each of these conditions is exacerbated by poor compliance of the youth to medical regimens, and research in pediatric psychology has demonstrated the multidetermined nature of poor medical-care compliance among adolescents. Using MST assessment and intervention design resources and viewing the caregivers as critical to achieving favorable outcomes (improved health in this case), these

investigators have adapted MST protocols to address these health care problems, and several clinical trials have supported the effectiveness of these adaptations.

### MULTISYSTEMIC THERAPY OUTCOME RESEARCH

MST outcome research has transitioned from small efficacy studies in which an MST treatment developer provided all of the clinical training, supervision, and quality assurance for graduate student therapists to multisite transportability trials conducted internationally using community-based practitioners and with no involvement of an MST developer. This transition has produced a range of successes and failures, with both informing subsequent efforts to transport MST to community settings—primarily by contributing to the continuous refinement of the MST quality assurance and improvement system.

This review of MST outcome research has three general purposes. The first is to provide a brief summary of results from the 21 outcome studies (19 randomized clinical trials) focusing on ultimate outcomes, which are goals common to all treatments of a particular problem. For studies with juvenile offenders, these outcomes usually pertain to decreased criminal behavior and incarceration/residential placement. For youth presenting psychiatric emergencies, key ultimate outcomes pertain to decreased psychiatric symptoms and hospitalizations, and so forth. **Table 1** provides a more comprehensive summary of study design and outcomes, including studies describing secondary analyses of outcome data. The second purpose is to provide a conceptual framework for understanding the nature of the clinical trials and the meaning of findings vis-à-vis the broader goal of large-scale and effective transport of treatments to community settings. Efficacy, effectiveness, and transportability trials answer different questions regarding the viability of a treatment approach. The third purpose is to summarize key lessons learned from MST outcome research and describe how these lessons

**Table 1** Published multisystemic therapy (MST) outcome studies

Study, sample size, and design	Population	Comparison	Follow-up	MST outcomes	Therapists	Provider organization
Henggeler et al. (1986) N = 80 Quasi-experimental	Delinquents	Diversion services	Post treatment	Improved family relations Decreased behavioral and emotional problems Decreased association with deviant peers	Graduate students	University
Brunk et al. (1987) N = 33 RCT	Maltreating families	Behavioral parent training	Post treatment	Improved parent-child interactions	Graduate students	University
Borduin et al. (1990) N = 16 RCT	Adolescent sexual offenders	Individual counseling	3 years	Reduced sexual offending (93%) Reduced other criminal offending (72%)	Graduate students	University
Henggeler et al. (1992) N = 84 RCT	Violent and chronic juvenile offenders	Usual community services—high rates of incarceration	59 weeks	Improved family relations Improved peer relations Decreased recidivism (43%) Decreased out-of-home placement (64%)	Community therapists	Community provider
Henggeler et al. (1993)	Same sample		2.4 years	Decreased recidivism (24%) (doubled survival rate)		
Borduin et al. (1995) N = 176 RCT	Violent and chronic juvenile offenders	Individual counseling	4 years	Improved family relations Decreased psychiatric symptomatology for parents Decreased recidivism (63%)	Graduate students	University
Schaeffer & Borduin (2005)	Same sample		13.7 years	Decreased youth behavior problems Decreased rearrests (54%) Decreased days incarcerated (57%)		
Klietz et al. (2010)	Same sample		13.7 years	Showed cost benefits up to \$199,374 per MST participant		
Henggeler et al. (1997) N = 155 RCT	Violent and chronic juvenile offenders	Juvenile probation services—high rates of incarceration	1.7 years	Decreased youth psychiatric symptomatology Decreased incarceration (53%) Decreased recidivism (26%, nonsignificant) Treatment adherence linked with recidivism outcomes	Community therapists	Community providers—two sites



Henggeler et al. (1999b) N = 116 (Final sample = 156) RCT	Youth presenting psychiatric emergencies	Psychiatric hospitalization	4 months post recruitment	Decreased externalizing problems (CBCL) Improved family relations Increased school attendance Higher consumer satisfaction	Community therapists	University
Schoenwald et al. (2000b)	Same sample		4 months post recruitment	73% reduction in days hospitalized 49% reduction in days in other out-of-home placements		
Huey et al. (2004)	Same sample		16 months post recruitment	Decreased rates of attempted suicide		
Henggeler et al. (2003)	Same sample		16 months post recruitment	Favorable 4-month outcomes, noted above, dissipated 15% decrease in days in out-of-home placement (nonsignificant)		
Sheidow et al. (2004)	Same sample		16 months post recruitment	MST cost benefits at 4 months, but equivalent costs at 16 months		
Henggeler et al. (1999a) N = 118 RCT	Substance-abusing and -dependent delinquents	Usual community services	11 months post recruitment	Decreased drug use at post treatment Decreased days in out-of-home placement (50%) Decreased criminal arrests (19%, nonsignificant) Treatment adherence linked with decreased drug use and other outcomes	Community therapists	University
Henggeler et al. (1996a)	Same sample		Same	98% rate of treatment completion		
Schoenwald et al. (1996)	Same sample		Same	Incremental cost of MST nearly offset by between-groups differences in out-of-home placement		
Brown et al. (1999)	Same sample		4 years	Increased attendance in regular school settings		
Henggeler et al. (2002a)	Same sample			Decreased violent crime (74%) Increased marijuana abstinence		

(Continued)

Table 1 (Continued)

Study, sample size, and design	Population	Comparison	Follow-up	MST outcomes	Therapists	Provider organization
Ogden & Halliday-Boykins (2004) N = 100 RCT-independent	Norwegian youth with serious antisocial behavior	Usual child welfare services	6 months post recruitment	Decreased externalizing and internalizing symptoms Decreased out-of-home placements (78%) Increased social competence Increased consumer satisfaction Differential site effects	Community therapists	Community providers—four sites
Ogden & Hagen (2006)	Sample from three sites with fidelity		24 months post recruitment	Decreased internalizing symptoms Decreased out-of-home placements (56%)		
Ellis et al. (2004) N = 31 RCT-independent	Adolescents with poorly controlled type 1 diabetes	Standard diabetes care	6 months post recruitment	Improved diabetes adherence Improved metabolic control Decreased hospital admissions (100%)	Community therapists	University
Ellis et al. (2005a) N = 127 RCT-independent	Inner-city adolescents with chronically poorly controlled type 1 diabetes	Standard diabetes care	7 months post recruitment	Increased blood glucose testing Decreased inpatient admissions Improved metabolic control	Community therapists	University
Ellis et al. (2005c) (N = 31)	Subset of sample		9 months post recruitment	Decreased medical charges and direct care costs		
Ellis et al. (2005b)	Same sample		7 months post recruitment	Decreased diabetes stress		
Ellis et al. (2007b)	Same sample		12 months post recruitment	Decreased inpatient admissions sustained (43%) Favorable metabolic control outcomes dissipated		
Naar-King et al. (2007)	Same sample		12 months post recruitment	Parents improved awareness of adolescent adherence		
Ellis et al. (2007a)	Subsample of youth in MST condition (N = 40)		7 months post recruitment	Treatment fidelity to MST predicted adherence to diabetes care regimen		
Ellis et al. (2008)	Same sample		24 months post recruitment	Decreased hospitalizations (47%)		

Rowland et al. (2005) N = 31 RCT	Youth with serious emotional and behavioral disturbances	Hawaii's intensive Continuum of Care	6 months post recruitment	Decreased symptoms Decreased arrests (34%, nonsignificant) Increased days in regular school (42%, marginally significant) Increased social support (marginally significant) Decreased days in out-of-home placement (68%)	Community therapists	Community provider
Timmons-Mitchell et al. (2006) N = 93 RCT-independent	Juvenile offenders (felons) at imminent risk of placement	Usual community services	18-month post-treatment follow-up	Improved youth functioning Decreased substance use problems Improved school functioning Decreased rearrests (37%)	Community therapists	Community provider
Henggeler et al. (2006) N = 161 RCT	Substance-abusing and -dependent juvenile offenders in drug court	Four treatment conditions, including Family Court with usual services and Drug Court with usual services	12 months post recruitment	MST enhanced substance use outcomes for alcohol and marijuana Drug Court was more effective than Family Court at decreasing self-reported substance use and criminal activity	Community therapists	University
Rowland et al. (2008) (N = 70)	Nearest-age siblings		18 months post recruitment	Evidence-based treatment decreased sibling substance use		
Stambaugh et al. (2007) N = 267 Quasi-experimental-independent	Youth with serious emotional disturbance and antisocial behavior at risk for out-of-home placement	Wraparound	18-month follow-up	Decreased symptoms Improved functioning Decreased out-of-home placements (54%)	Community therapists	Community provider
Sundell et al. (2008) N = 156 RCT-independent	Youth met diagnostic criteria for conduct disorder	Usual child welfare services in Sweden	7 months post recruitment	No outcomes favoring either treatment condition Low treatment fidelity Treatment fidelity associated with arrest	Community therapists	Community providers—four sites

(Continued)

**Table 1** (Continued)

Study, sample size, and design	Population	Comparison	Follow-up	MST outcomes	Therapists	Provider organization
Borduin et al. (2009) N = 48 RCT	Juvenile sexual offenders	Usual community services	9 years	Decreased behavior problems and symptoms Improved family relations, peer relations, and academic performance Decreased caregiver distress Decreased sex offender recidivism (83%) Decreased recidivism for other crimes (50%) Decreased days incarcerated (80%)	Graduate students	University
Letourneau et al. (2009) N = 127 RCT	Juvenile sexual offenders	Usual sex offender-specific treatment	12 months post recruitment	Decreased sexual behavior problems Decreased delinquency, substance use, and externalizing symptoms Reduced out-of-home placements (59%)	Community therapists	Community provider
Naar-King et al. (2009) N = 48 RCT-independent	African American adolescents with primary obesity	Family group weight-management program	7 months post recruitment	Decreased percent overweight, body fat, and body mass index	Community therapists	University
Swenson et al. (2010b) N = 86 RCT	Physically abused adolescents	Group-based parent training and enhanced outpatient treatment	16 months post recruitment	Decreased symptoms for youth and caregiver Improved parenting behaviors Increased social support Decreased out-of-home placements (63% fewer days)	Community therapists	Community provider
Glisson et al. (2010) N = 615 Counties were randomized to conditions	Juvenile offenders	Usual services	18 months post recruitment	Reduced out-of-home placements (53%) Reduced symptoms (internalizing and externalizing combined) in sites with organizational intervention, but dissipated at 18-month follow-up	Community therapists	Community providers

Abbreviations: CBCL, Child Behavior Checklist; RCT, randomized controlled trial.

are informing the transport of MST programs for juvenile offenders and the validation of MST adaptations.

### Efficacy Trials

From the outset, MST studies have aimed for high external validity in terms of the clinical population addressed. Thus, the exclusion criteria have typically been minimal (e.g., autism, severe developmental delay, active suicidality), which has allowed the inclusion of youth with a wide range of co-occurring problems and disorders. Consequently, virtually all MST trials are efficacy-effectiveness hybrids of varying degrees based primarily on characteristics of the therapists (e.g., graduate students versus community-based practitioners), supervisors (e.g., treatment developer versus community-based supervisors), and organizational context (e.g., university department with clinical funding provided by grant versus community-based provider organization with clinical funding provided by some combination of local, state, and national stakeholders).

The first two controlled evaluations of MST were conducted at Memphis State University with doctoral students in clinical psychology as the therapists and Henggeler providing all the training and clinical supervision. The first MST outcome study used a quasi-experimental study with juvenile offenders (Henggeler et al. 1986) and demonstrated favorable decreases in behavioral problems and association with deviant peers for juvenile offenders and improved relations (e.g., increased warmth, decreased aggressive communications) for their families. The second study evaluated the effects of MST with maltreating families (Brunk et al. 1987) in a randomized design. MST was more effective than behavioral parent training at improving aspects of parent-child interactions that are associated with child maltreatment. These results were promising and set the stage for efficacy trials with serious juvenile offenders that included follow-ups for recidivism.

The three MST studies with the greatest effect sizes have been conducted by Borduin

at the University of Missouri-Columbia. Doctoral students in clinical psychology served as therapists, and Borduin provided all training and clinical supervision. In the largest of these studies ( $N = 176$  violent and chronic juvenile offenders; Borduin et al. 1995), MST demonstrated extensive improvements in family relations and, most significantly, a 63% decrease in recidivism at a four-year follow-up. Moreover, in one of the longest follow-ups in the child psychotherapy literature, Schaeffer & Borduin (2005) showed that MST produced a 54% reduction in rearrest and a 57% reduction in days sentenced at 14 years post treatment. Similarly outstanding results were observed with juvenile sex offenders in two randomized trials conducted by Borduin and colleagues. As shown in **Table 1**, the initial study (Borduin et al. 1990) demonstrated large MST reductions in sexual offending and other criminal offending at a three-year follow-up. A larger subsequent study (Borduin et al. 2009) also demonstrated very substantive reductions in sexual offending and other criminal offending for MST through a nine-year follow-up. Additional MST outcomes included an 80% reduction in days sentenced to incarceration as well as improved family relations, peer relations, and academic performance.

In sum, these rigorous efficacy trials (e.g., randomized design, use of intent-to-treat analyses, long-term follow-up) clearly demonstrated the capacity of MST to achieve favorable outcomes with youth presenting very serious clinical problems and their families. The attainment of favorable clinical outcomes in university studies under near-ideal conditions, however, is a long way from achieving the effective transport of an innovative treatment to community settings. Indeed, efforts to bridge the science-service gap (e.g., Inst. Med. 1998) have become a national priority.

### Effectiveness Studies

With the success of MST efficacy research, MST investigators began to focus on bridging the science-to-service gap. The first such

study was a randomized trial conducted through a community mental health center with violent and chronic juvenile offenders at imminent risk of incarceration (Henggeler et al. 1992). Therapists and the supervisor were employed by the mental health center, and Henggeler provided the initial training and ongoing consultation to support practitioner fidelity to the MST model. At a 59-week follow-up, youth in the MST condition evidenced a 43% reduction in recidivism and a 64% reduction in out-of-home placement. Moreover, MST recidivism effects remained significant at a 2.4-year follow-up (Henggeler et al. 1993). Similarly, Borduin recently provided ongoing consultation to a community-based randomized trial of MST for juvenile sex offenders (Letourneau et al. 2009). At 12-month follow-up, MST produced a 59% reduction in out-of-home placement and a 30% decrease in self-reported delinquency. Although treatment effects in these studies were not quite as powerful as those observed in the efficacy studies, this work has made a major step in bridging the science-to-service gap by demonstrating the successful transport of MST programs to community-based providers.

In the two preceding effectiveness studies, an MST treatment developer did not give direct supervision but did provide ongoing expert consultation (i.e., weekly phone consultation focusing on treatment fidelity and achieving targeted outcomes—the role that the MST consultant plays in the present-day MST quality assurance and improvement system). Henggeler et al. (1997) examined the necessity of such consultation in the transport of MST. Therapists and supervisors in two community mental health centers received MST training but not ongoing expert consultation. Participants again were serious juvenile offenders at imminent risk of incarceration and their families. Results at a 1.7-year follow-up from this randomized trial revealed that MST was effective in reducing incarceration (53% reduction; see **Table 1**) but not recidivism (26% reduction, not statistically significant). In anticipation of possible implementation problems, however,

the investigators assessed therapist fidelity to MST using a newly developed adherence measure (Henggeler & Borduin 1992). Analyses showed a significant association between therapist fidelity and youth recidivism—higher treatment fidelity was linked with lower recidivism. These findings clearly demonstrated the importance of including fidelity measures in clinical trials as well as the significance and value of the expert consultant role in MST programs.

### Hybrid Efficacy-Effectiveness Studies with New Clinical Populations

Following the successful focus of MST developers on chronic and violent juvenile offenders in the early-mid 1990s, two medical university-based research groups began to direct their attention to the adaptation and validation of MST for treating other serious clinical problems presented by adolescents and their families (i.e., serious emotional disturbance, substance abuse, physical abuse, and chronic health care problems). On the efficacy side of the efficacy-effectiveness continuum, these studies were conducted under the auspices of the investigators' respective academic departments—the Department of Psychiatry at the Medical University of South Carolina (MUSC) and the Department of Pediatrics at Wayne State University. Therapists' salaries were typically paid by research grants, and the supervisors were usually faculty members trained in MST. Consistent with the central purpose of efficacy research, the primary aim of these studies was to determine whether the MST adaptation could be effective with the new population. On the effectiveness side of the continuum, participants reflected real-world clinical populations, and, importantly, neither Henggeler nor Borduin provided ongoing clinical oversight. Thus, clinical outcomes were dependent on the guidance of a second generation of MST expert consultants.

#### Youth with serious emotional disturbance.

Two studies evaluated an adaptation of MST for treating serious emotional disturbance in



adolescents (Henggeler et al. 2002c). Using a randomized design, Henggeler et al. (1999b) evaluated this MST adaptation (i.e., lower caseloads, psychiatric support, integration of evidence-based pharmacotherapy, addition of crisis caseworker) as an alternative to the inpatient hospitalization of youth in psychiatric crisis (i.e., suicidal, homicidal, psychotic). In comparison with the hospitalization condition, MST was more effective at decreasing youth psychiatric symptoms and preventing hospitalization (73% reduction) and other out-of-home placements (49% reduction) at post treatment and at reducing rates of attempted suicide at 16-month follow-up (Huey et al. 2004). In contrast with significant long-term outcomes for MST with juvenile offenders, but consistent with other evidence-based treatments of childhood internalizing disorders (Weersing & Weisz 2002), the favorable MST symptom and out-of-home placement outcomes dissipated by 16-month follow-up (Henggeler et al. 2003). A second randomized trial compared MST with Hawaii's intensive continuum of care in treating youth with serious emotional disturbance (Rowland et al. 2005) and replicated the short-term findings of Henggeler et al. (1999b). At six months post referral, youth in the MST condition had a greater decrease in psychiatric distress and a 68% reduction in days in out-of-home placement.

**Juvenile offenders with substance use disorders.** Additional support for the capacity of second-generation MST experts to sustain effective MST implementation was obtained in two randomized trials with substance-abusing juvenile offenders. In the first, MST was compared with usual community services in the treatment of juvenile offenders who met diagnostic criteria for a substance abuse disorder (Henggeler et al. 1999a). Findings at an 11-month follow-up showed that MST was more effective than usual services at decreasing youth substance use and out-of-home placement (50% reduction), but not recidivism (19% reduction, nonsignificant). At a

four-year follow-up (Henggeler et al. 2002a), however, MST participants evidenced decreased violent crime and increased marijuana abstinence. More recently, in a relatively complex four-condition study (Henggeler et al. 2006) with substance-abusing juvenile offenders, MST enhanced the drug-related outcomes of juvenile drug court but did not seem to improve criminal or placement outcomes in comparison with juvenile drug court. The fact that all youth in the MST conditions also were enrolled in juvenile drug court clouds interpretations of the findings (e.g., drug court enrollment includes intensive surveillance, which in turn is linked with an increased probability of being arrested). Nevertheless, the overall results of the MST psychiatric and substance abuse trials support the capacity of second-generation MST experts to achieve favorable outcomes with very challenging clinical populations, which in turn has favorable implications for the effective transport of the model.

**Physically abused adolescents.** Building on findings from the early efficacy trial with maltreating families (Brunk et al. 1987), Swenson and colleagues developed an adaptation of MST for child abuse and neglect (MST-CAN; Swenson et al. 2010a) and evaluated its effectiveness in comparison with a group-based parent training approach in a randomized design (Swenson et al. 2010b). Consistent with effectiveness research, both interventions were delivered by therapists employed at a community mental health center. MST-CAN was more effective than parent training in reducing youth mental health symptoms, caregiver emotional distress, and parenting behaviors associated with maltreatment; and at increasing caregiver social support. At 16 months post baseline, youth in the MST-CAN condition were also less likely to be placed out of the home and spent 63% fewer days in placement. Although youth in the MST-CAN condition experienced a lower rate of reabuse (4.5% versus 11.9% for

the comparison condition), this difference was not statistically significant.

**Adolescents with chronic health care conditions.** Finally, as hoped 20 years ago (Henggeler & Borduin 1990), a pediatric research group has adapted and tested MST for youth with serious health care problems. Along with several uncontrolled trials (e.g., Ellis et al. 2006), Ellis and Naar-King have published three randomized trials of MST adapted for youth with serious health care problems. A second-generation MST expert served in the consultation role in each of these trials. In a randomized pilot study, Ellis et al. (2004) showed that MST was more effective than standard care in improving metabolic control and preventing hospital admissions among adolescents with poorly controlled type 1 diabetes. These findings were replicated in a larger randomized trial (Ellis et al. 2005a)—at seven months post recruitment, the adolescents with poorly controlled type 1 diabetes showed improved metabolic control and decreased inpatient admissions relative to youth in usual care. In addition, a 12-month follow-up showed that decreases in hospitalization were sustained (43% decrease), though favorable outcomes for metabolic control dissipated. Most recently, Naar-King et al. (2009) demonstrated favorable outcomes for an MST adaptation for primary obesity. In comparison with a family group weight management program, MST was more effective at decreasing youth percent overweight, body fat, and body mass index.

Together, these sets of findings support the generalizability of MST to a range of serious clinical problems presented by adolescents and their families as well as the potential viability of using second-generation MST experts to support the larger-scale transport of the model. Next, independent replication studies that included third-generation MST experts (i.e., experts trained by second-generation experts and not directly associated with MST developers) are reviewed.

## Independent Replications and Transportability Trials Using Purveyor Organizations

The effectiveness trials with serious juvenile offenders have demonstrated the capacity of MST to achieve key ultimate outcomes in real-world clinical settings, and the hybrid efficacy-effectiveness studies have supported the promise of several MST adaptations and shown that second- and third-generation MST experts can provide a level of quality assurance needed to achieve key outcomes. Although, as a whole, this set of studies addresses many of the central issues in the large-scale transport of an evidence-based treatment to community settings (e.g., will therapists follow implementation protocols, and can favorable outcomes be achieved in the absence of developer involvement?), at least one critical link is missing. Large-scale transport requires an experienced group of individuals, known as purveyors (Fixsen et al. 2005), who represent the evidence-based treatment and actively work to facilitate program adoption and subsequent implementation with fidelity and favorable results. These purveyors might be the treatment developers themselves, individuals trained by the developers (e.g., second-generation MST experts), or individuals trained by second-generation experts (e.g., third-generation MST experts), and so forth.

**Creation of lead purveyor organization.** In the case of MST, a purveyor group was formally formed in 1996 (i.e., MST Services, Inc.) with the aim of facilitating the large-scale transport of MST. At the time, MST teams were serving several communities across the nation that had adopted MST programs, and the quality assurance for MST implementation was being provided by research faculty at the Family Services Research Center (FSRC), MUSC. However, the provision of training and consultation by research faculty to the community MST programs was neither very efficient for the FSRC (e.g., the primary priorities of research faculty on soft money pertain to the attainment and

conduct of research grants as well as the publication of research) nor optimally available to the MST teams given the constraints imposed by faculty members' primary obligations to research. After extensive discussions with university officials, the privatization of MST training endeavors seemed the best choice for both preserving the research priorities of the FSRC and facilitating the large-scale transport of MST. Thus, MST Services was created, and MUSC licensed the transport of MST technology and intellectual property to MST Services.

MST Services or one of its network partners (i.e., purveyor organizations trained by MST Services to carry out all aspects of program development and implementation and monitoring for program fidelity and outcomes) has conducted the training and ongoing quality assurance for several independent clinical trials. Findings from these studies attest to the viability of large-scale MST transport and to the challenges in developing and implementing MST programs in distal sites.

**Independent replications.** The first independent replication of MST was a four-site randomized trial conducted by Ogden and colleagues in Norway with youth presenting serious antisocial behavior and their families. In comparison with the usual child welfare services provided to such youth in Norway, youth in the MST condition had decreased externalizing and internalizing symptoms, a 78% reduction in out-of-home placements, and increased social competence at six months post recruitment (Ogden & Halliday-Boykins 2004). A 24-month follow-up (Ogden & Hagen 2006) showed that MST effects on youth internalizing symptoms and out-of-home placements (56% decrease) were sustained. Importantly, this study also demonstrated site effects, with MST implementation fidelity and corresponding youth outcomes substantially lower in one of the four sites.

Three successful independent replications have been conducted subsequently in the United States under the auspices of purveyor organizations. In the first (Timmons-

Mitchell et al. 2006), juvenile felons at imminent risk of incarceration were randomized to MST versus usual services conditions. At about 12 months post recruitment, youth in the MST condition showed improved mood and school/work functioning, and decreased substance use. Moreover, at about two years post recruitment, youth in the MST condition evidenced a 37% decrease in rearrests. The second replication (Stambaugh et al. 2007) used a quasi-experimental design to compare the effectiveness of MST versus Wraparound (Burns & Goldman 1999) for youth with serious emotional disturbance at risk for out-of-home placement. Results at an 18-month follow-up showed that MST was more effective at decreasing youth symptoms, improving youth functioning, and decreasing out-of-home placements (54% decrease). In the third (Glisson et al. 2010) replication, 14 rural Appalachian counties were randomized to receive MST programs or not, and 615 juvenile offenders at risk of out-of-home placement and their families participated. Counties were also randomized to an organizational intervention in a 2 (MST versus usual services)  $\times$  2 (organizational intervention versus usual services) design, and the organizational findings are discussed later in this review. Outcome analyses showed that MST was associated with a 53% reduction in the odds of out-of-home placement. In addition and consistent with aforementioned findings for youth with serious emotional disturbance (Henggeler et al. 2003), when MST was delivered in the sites that also received organizational interventions, treatment effects on symptom reduction (externalizing and internalizing symptoms combined) were observed at 6 months post recruitment but dissipated by 18 months post recruitment.

On the other hand, a four-site randomized trial conducted in Sweden with youth meeting diagnostic criteria for conduct disorder failed to replicate favorable MST outcomes (Sundell et al. 2008). At seven months post recruitment, analyses comparing MST with usual child welfare services revealed no MST effects across a broad array of outcome measures.

Several potential explanations were offered for this failure to replicate, the most viable of which pertain to the low treatment fidelity observed for the MST therapists, the strength of interventions received by the comparison group relative to juvenile justice services in the United States (i.e., youth in the MST condition showed decreases in symptoms similar to those observed in other MST clinical trials, but youth receiving Swedish services also showed such decreases), and a poor match between the immigrant families (47% of sample) and Swedish therapists. At any rate, and as discussed later in this review, such findings have clear implications for the design of transport efforts.

Finally, benchmarking studies in Norway (Ogden et al. 2007) and New Zealand (Curtis et al. 2009) showed that outcomes from mature MST programs were equal to or superior to those achieved in successful randomized trials. Together, the results from these experimental and nonexperimental studies demonstrate the potential of MST purveyor groups to support the types of favorable outcomes achieved in MST effectiveness studies.

### Most Important Lessons Learned

Empirical and experiential lessons from MST efficacy and effectiveness research have shaped the MST research agenda and transportability efforts in at least two broad manners. First, a program of research on the conditions needed to optimize the performance of MST programs in community settings has been developed to better understand the multidetermined nature of treatment fidelity and its linkage with youth outcomes. Second, strategies and sequential steps for taking MST adaptations from the pilot stage to large-scale transport have been specified and implemented as several groups of investigators have collaborated in using MST as a platform for the development of adaptations to treat a broad range of serious clinical problems.

#### Treatment fidelity and youth outcomes.

The association between treatment fidelity and youth outcomes is relatively well established for

MST. As noted above, Henggeler et al. (1997) found that high therapist fidelity to MST treatment principles was associated with lower rates of rearrest among serious juvenile offenders. Similarly, treatment fidelity has been linked with various youth outcomes in other MST studies with youth presenting serious antisocial behavior (Henggeler et al. 1999, Huey et al. 2000, Sundell et al. 2008) and chronic health care conditions (Ellis et al. 2007a).

Although the attainment of high treatment fidelity in efficacy studies might seem straightforward (i.e., recruit skilled therapists and have them well trained and supervised by the treatment developer), such is very far from the case for evidence-based treatments that have been transported to community settings. As Schoenwald & Hoagwood (2001) delineated, program and clinical outcomes can be affected by a wide range of variables at multiple levels of influence. To attenuate threats to program success, an extensive MST quality assurance and improvement system has been developed and is required in MST programs worldwide. The components of this system are well specified, and extensive efforts have been made to examine and evaluate the parameters of this system. This work is reviewed subsequently.

**Taking MST adaptations to scale.** A useful framework for the major sequential steps needed to take an evidence-based treatment to scale is depicted in **Figure 2**. This framework was informed by the National Institute on Drug Abuse's stages of behavioral therapy research as articulated by Onken et al. (1997). The key aims of the initial adaptation/pilot study phase of the process are to specify the adaptation protocol and collect pilot data regarding the feasibility of the MST adaptation. If feasible, an efficacy study is conducted with direct developer oversight to determine whether the adaptation is viable under ideal conditions. If efficacy is supported, the next phase of research examines, using rigorous methods, the effectiveness of the intervention in one or more real-world clinical settings. Subsequent phases aim at evaluating the

implementation and effects of the adaptation across several community-based settings with decreasing developer support and oversight. The eventual aim is for the intervention to be effective with oversight from second- or third-generation experts.

As shown in **Figure 2**, the original MST model for serious juvenile offenders has completed all stages through successful transport by third-generation experts. Currently, however, MST Services has responded to demand for MST programs from stakeholder groups but has not engaged in proactive dissemination (e.g., lobbying, marketing). As a second example, the MST adaptation for youth with serious emotional disturbance (i.e., MST-Psychiatric) has been well specified (Henggeler et al. 2002c) and validated in efficacy-effectiveness trials (Henggeler et al. 1999b, Rowland et al. 2005). MST-Psychiatric is now in the transportability pilot stage, with sites in several major cities. As a final example, the Building Stronger Families adaptation (Swenson et al. 2009) has strong viability and pilot data, and a rigorous efficacy-effectiveness trial has recently been funded.

### **IMPLEMENTATION SCIENCE: FACTORS THAT INFLUENCE THE FUNCTIONING OF MULTISYSTEMIC THERAPY PROGRAMS**

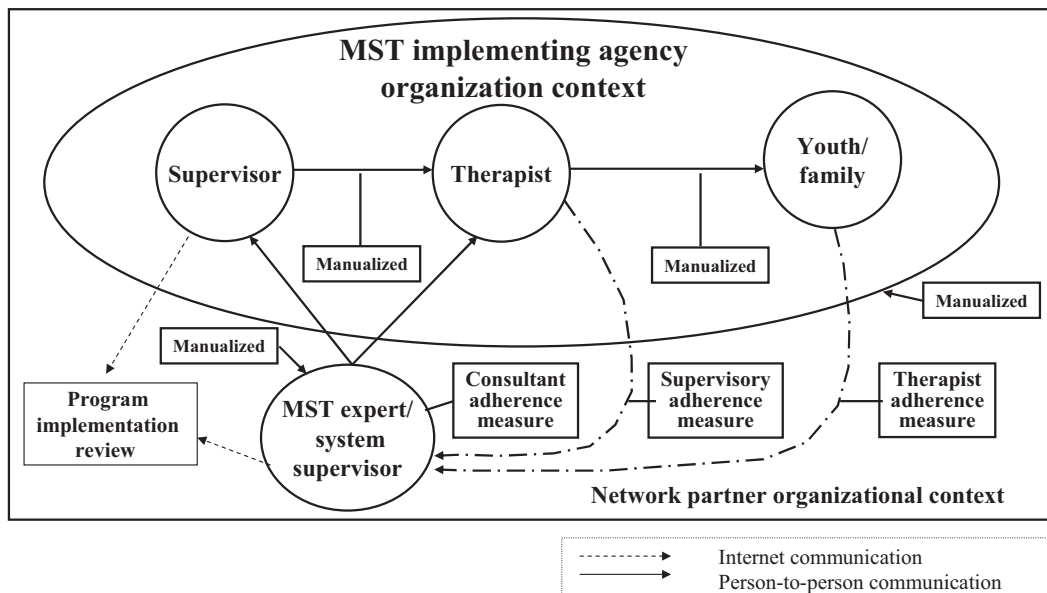
The effective transport (i.e., maintaining the treatment fidelity required to attain favorable youth outcomes) of MST to community settings has presented many challenges. MST program standards (e.g., team of 2–4 full-time therapists, caseloads of 4–6 families per therapist, extensive supervision and continuous training, tracking of treatment fidelity) and service delivery model (e.g., 24-hour/7-day availability of team, provision of treatment in homes and other community locations) differ dramatically from traditional mental health and juvenile justice services. Consequently, organizational practices and funding structures of potential MST adopters have usually not been aligned

with the requirements of MST programs, especially during the early years of MST transport in the mid to late 1990s.

In consideration of the many challenges to successful transport, Schoenwald (2008, 2010) has led our efforts to develop and validate an effective transport strategy, noting, “how well an intervention works, and how well it is implemented, are two different things. Ineffective interventions can be implemented well, and effective interventions can be implemented poorly (Fixen et al. 2005)” (Schoenwald 2008, p. 70). Thus, we were acutely aware that efforts to transport MST effectively to community settings could fail; in light of this possibility, two strategies were pursued to optimize the probability of success. First, the intensive training and clinical oversight (i.e., quality improvement system) that characterized MST clinical trials were brought to community settings with relatively little compromise. In addition, as was soon learned, procedures for aligning organizational practices to support the MST program (e.g., flexible hours for therapists, cell phones, transportation) needed to be developed (see Strother et al. 1998). Second, the quality improvement system required empirical evaluation to test key assumptions (e.g., that MST supervision promoted therapist fidelity to MST protocols).

The primary aim of this section is to examine key linkages between the components of the MST quality improvement system depicted in **Figure 3**. Evaluating associations between such components (e.g., supervisor, consultant, and organizational characteristics) and MST program performance (i.e., adherence and outcomes) requires a large number of participating sites to conduct appropriate statistical analyses. As such, two multisite studies have been conducted to examine the functioning of the quality improvement system. The initial transportability study (Henggeler et al. 2002b) included 285 families, 74 therapists, 12 supervisors, 16 teams, and 9 organizations across three states. Subsequently, Schoenwald directed a large-scale transportability study that included almost 2,000 families, 429 therapists, 122





**Figure 3**

Multisystemic therapy (MST) quality improvement system. Note that linkage between therapist adherence, as reported by caregivers, and child outcomes has been empirically supported in clinical trials. Additionally, the linkages between supervisor adherence and therapist adherence as well as consultant adherence and therapist adherence have been empirically demonstrated in research studies of MST. Current research efforts are directed at evaluating this model and identifying possible barriers to successful implementation of MST.

supervisors, more than 20 consultants, and 45 organizations in North America. Most knowledge about the parameters of the MST quality improvement system has been provided by this latter project.

### Therapist Adherence and Youth/Family Outcomes

The most important association to examine in **Figure 3** is the link between therapist adherence and youth/family outcomes. If such an association is not present, there seems little reason to implement an intensive quality improvement system aimed at optimizing treatment fidelity. Several studies of the adherence-outcome association are reviewed in the sections below, as well as research on characteristics of youths, caregivers, therapists, and the ethnic match between therapists and caregivers that might influence therapist adherence.

### Findings from clinical trials and the large-scale transportability study.

In general, consistent associations have been observed between therapist fidelity to MST treatment principles and youth outcomes. As noted previously, therapist adherence for MST was first measured in a two-site effectiveness study with serious juvenile offenders in which a key aspect of the quality improvement system had been removed (Henggeler et al. 1997). In that study, high therapist adherence predicted lower rates of arrests, incarceration, and youth symptoms. Secondary analyses of mediating processes (Huey et al. 2000) showed that therapist adherence, based on caregiver reports, improved family functioning, which decreased delinquent peer affiliation, which in turn led to decreased delinquent behavior. These findings greatly increased our awareness of the importance of treatment fidelity in achieving outcomes and consequently led to the inclusion of caregiver-reported



adherence measures in subsequent clinical trials and transport efforts.

Examination of the associations between therapist adherence and family/peer-related outcomes in a subsequent trial with substance-abusing juvenile offenders (Henggeler et al. 1999a) produced less-consistent results (Schoenwald et al. 2000a), but latent variable path analyses (Huey et al. 2000) replicated the associations reported for Henggeler et al. (1997). Therapist adherence improved family functioning, which decreased delinquent peer affiliation, which in turn led to decreased delinquent behavior. Therapist adherence was associated with decreased rates of rearrest as well as increased social competence and resilience in the Swedish trial (Sundell et al. 2008). In a more recent mediation study, Ellis et al. (2007a) showed that therapist fidelity to MST increased youth adherence to their diabetic treatment regimen, which in turn led to decreased HbA1c. Ellis et al. (2007a) also found that observational ratings of therapist adherence correlated significantly with caregiver ratings of adherence, which further supports the construct validity of the self-reported adherence measure.

Findings from the large-scale transportability study also demonstrated significant associations between treatment fidelity and youth outcomes. Therapist adherence was associated with decreased externalizing and internalizing symptoms at post treatment (Schoenwald et al. 2003b) and decreased externalizing symptoms at one-year follow-up (Schoenwald et al. 2009b). In addition, therapist adherence predicted decreased criminal charges at a four-year follow-up (Schoenwald et al. 2009a). Together, this body of work supports the predictive validity of caregiver ratings of therapist fidelity.

**Client-level and ethnic match predictors of adherence and outcomes.** Youth and caregiver demographic predictors of therapist adherence were evaluated in both transportability studies (Schoenwald et al. 2003a, 2005). Across studies, therapist adherence did not vary as a function of characteristics such as youth and

caregiver age and gender. Also across studies, higher adherence was associated with socioeconomic disadvantage and ethnic match between caregiver and therapist. Halliday-Boykins et al. (2005) examined the role of ethnic match more closely and found that such match (e.g., African American caregiver and African American therapist; white caregiver and white therapist) was also associated with greater decreases in youth symptoms, longer treatment duration, and more favorable case terminations. Direct associations between ethnic match and youth outcomes did not hold, however, for longer-term youth behavioral and criminal outcomes (Chapman & Schoenwald 2010). In addition, same-race caregiver-therapist match was not associated with more favorable in-session client behavior (Foster et al. 2009) in a study with substance-abusing juvenile offenders (Henggeler et al. 2006). Indeed, therapists used more strength-focused and reinforcing behaviors when matched with racially dissimilar than with same-race clients. Thus, it is not yet clear how similarity and dissimilarity between clients and therapists affects MST treatment processes.

Although the transportability studies had similar findings regarding the effects of youth and caregiver demographics on therapist adherence, findings differed regarding the association between clinical severity and adherence. Increased clinical severity (e.g., more arrests, school suspensions, and co-occurring problems) was associated with lower therapist adherence in the initial transportability study (Schoenwald et al. 2003a) but not in the large-scale transportability study (Schoenwald et al. 2005). Though based on anecdotal experience, this difference might have reflected differing levels of expertise in the MST purveyor organization working with the participating sites. The initial transportability study was conducted during the early stages of MST transport to community settings—when the purveyor organization was on a steep learning curve. In contrast, the large-scale transportability study was conducted while the purveyor organization was considerably more mature and experienced, and

perhaps more effective at helping therapists adhere with challenging clinical cases.

**Therapist-level predictors of adherence.** In the large-scale transportability study, Schoenwald et al. (2005) evaluated whether treatment adherence was associated with a range of therapist-level variables including demographic characteristics (e.g., age, gender, ethnicity, marital status), educational degree, salary level, and attitudes toward MST (e.g., “How difficult compared to other jobs?”; “How problematic are the flexible hours?”). Aside from ethnic match with caregiver noted above, only one variable was associated with adherence. Therapists who had difficulty with the flexible hours required by MST had lower adherence. Overall, these results are encouraging and suggest that MST can be implemented with adequate adherence by professionals from varying backgrounds. It should be noted, however, that the sample was biased toward therapists who had chosen to work in MST programs.

### **Supervision, Expert Consultation, and Organizational Factors**

As depicted in **Figure 3**, MST supervision and expert consultation are intended to promote and support therapist treatment adherence and youth outcomes. This section reviews findings regarding the effectiveness of such support as well as the role of organization climate and structure in the functioning of MST programs, as MST programs are almost always embedded in community-based provider organizations.

**Supervision.** The explicit aims of MST supervision are to support therapist adherence and youth outcomes through an intensive (e.g., at least a half-time supervisor per team), goal-oriented, and ecologically valid (e.g., including observations of therapist-family interaction) supervisory process (Henggeler & Schoenwald 1998). Indeed, using a time series methodology, Schoenwald et al. (2000a) showed that observational ratings of adherence based on audio

review of therapy sessions could help supervisors improve therapist adherence.

The initial transportability study examined associations between supervisory practices and therapist adherence (Henggeler et al. 2002b) and found several significant results, but not always in the expected directions. Supervisory expertise in MST and empirically supported treatments (based on therapist reports) were positively associated with therapist adherence (based on caregiver reports), whereas supervisory focus on developing the clinicians’ competencies and the MST analytic process and principles were negatively associated with therapist adherence. These latter unexpected findings might have been due to the bidirectional nature of interactions—therapists with low levels of adherence might have led supervisors to devote greater attention to building therapist competencies and to helping structure therapists through the MST analytic process. The correlational nature of the data, however, did not permit an evaluation of these possibilities.

Findings from the large-scale transportability study (Schoenwald et al. 2009b), which allowed longitudinal analyses, have helped to clarify the impact of supervisory practices on therapist adherence and youth outcomes. Consistent with the aforementioned findings, supervisors were more likely to focus on developing the competencies of therapists whose clients were making relatively fewer gains in functioning. On the other hand, and in contrast with the earlier findings, the longitudinal analyses showed that supervisory emphasis on MST treatment principles predicted increased therapist adherence, and supervisory emphasis on the structure and process of MST supervision predicted decreased youth symptoms. Though not entirely consistent, the observed prospective linkages between supervisor behavior and therapist adherence and youth outcomes are encouraging in the validation of the MST quality improvement system.

**Expert consultation.** MST consultation (Schoenwald 1998) is intended to provide teams with a level of expert clinical support

similar to that provided by the treatment developers in early clinical trials. In the large-scale transportability study, Schoenwald et al. (2004) found that consultant behavior, assessed through therapist reports, was associated with therapist adherence and youth outcomes as assessed by caregiver reports. Specifically, consultant competence in MST (i.e., knowledgeable, skilled, and able to teach MST) predicted increased therapist adherence and improved youth functioning. Similarly, consultant use of MST-specific assessment, intervention, and analytic techniques was associated with improved youth functioning and decreased behavior problems. In contrast with expectations, however, high consultant-therapist alliance (i.e., therapists felt that consultant was attentive and supportive of them) was associated with decreased therapist adherence and increased youth behavior problems. Thus, instrumental, problem-focused aspects of consultant behavior enhanced program functioning (i.e., improved adherence and outcomes), whereas emotionally supportive aspects of consultant behavior had deleterious effects on adherence and outcomes. As Schoenwald and colleagues concluded, the findings show that weekly consultation with an expert consultant outside the provider organization can enhance the performance of MST programs—especially when the consultant has high clinical expertise.

**Organizational effects.** MST programs are typically embedded in large provider organizations, and, based on many anecdotal experiences, it seems reasonable to hypothesize that the functioning of the clinicians within these programs is associated with the nature of the parent organizations. The large-scale transportability study, therefore, examined associations between organizational climate (e.g., role clarity, opportunity for growth and advancement, depersonalization) and structure (e.g., participation in decision making, hierarchy of authority) variables and therapist adherence and youth outcomes at post treatment (Schoenwald et al. 2003b), one-year follow-up

(Schoenwald et al. 2008), and four-year follow-up (Schoenwald et al. 2009a). Although findings at post treatment were relatively inconclusive, some consistent patterns emerged at the one- and four-year follow-ups. Therapist adherence was positively associated with opportunities for growth and advancement within the organization and negatively associated with therapist emotional exhaustion. In addition, youth outcomes were more favorable in contexts where therapists reported greater involvement in decision-making and opportunities for growth and advancement. At the four-year follow-up, increased job satisfaction was associated with higher adherence and improved youth outcomes. Moreover, low salary and emotional exhaustion predicted therapist turnover (Sheidow et al. 2007). In general, these findings suggest appropriate targets for efforts to enhance organizational hospitability for the implementation of evidence-based treatments.

Indeed, as noted above, Glisson et al. (2010) recently completed a study in which 14 rural Appalachian counties were randomized, in a  $2 \times 2$  design, to clinical (MST program versus usual services) and organizational (ARC to help organizations implement effective community-based mental health services versus usual services) intervention conditions. Although ARC did not influence therapist adherence, ARC independently resulted in reduced youth out-of-home placement. In addition, youth in the MST/ARC condition (i.e., youth in the communities that received both an MST program and ARC) evidenced the most rapid decline in symptoms (externalizing and internalizing combined). Consistent with the implications of the correlational findings reported in the large-scale transportability study, these experimental findings suggest that the effectiveness of evidence-based treatments is likely enhanced when embedded in supportive organizational and community contexts.

### Lessons Learned

Several clinical trials and the transportability research program have clearly demonstrated

the importance of therapist adherence in achieving desired youth outcomes. Moreover, findings from the transportability studies have demonstrated significant associations between key components of the MST quality improvement system (i.e., supervisor behavior, expert consultant behavior, organizational characteristics) and therapist adherence and youth outcomes. Together, this research supports the validity of the MST quality improvement system and suggests that intensive outcome-oriented efforts by skilled supervisors and expert consultants can enhance therapist effectiveness and youth outcomes. Further, in light of the fact that evidence-based treatments are usually imported by community stakeholders to improve client outcomes, the transportability findings suggest that training and quality improvement components are well worth the effort.

### **POLICY INFLUENCES ON THE TRANSPORT OF MULTISYSTEMIC THERAPY**

The clinical population (i.e., juvenile offenders) and central outcomes (i.e., decreased crime, reduced out-of-home placement) targeted by MST provide a tremendous advantage in facilitating its transport. Government agencies are legally mandated to serve juvenile offenders, and traditional services (e.g., residential treatment, incarceration) have generally been ineffective and costly (Howell 2003). Thus, MST and other evidence-based treatments of juvenile offenders can be used as vehicles of change by governmental or private sector stakeholders interested in any one of the following results—improving the lives of troubling youth, increasing community safety by decreasing crime, or decreasing costs. This section is based largely on Schoenwald's (2010) recent chapter on the policy contexts of MST transport and dissemination and highlights state and federal changes in mental health and juvenile justice policy that have supported the transport of MST.

### **Key Federal Initiatives**

As noted previously, several private and public sector provider organizations sought to develop MST programs in the early 1990s, as findings from MST randomized trials with serious juvenile offenders were being disseminated. Initial strategies for transporting MST to provider organizations were relatively inefficient, which led to the creation of MST Services in 1996. At about this same time, two federal initiatives, one in juvenile justice and the other in mental health, were beginning to influence the nature of services provided to youth and their families.

**Office of Juvenile Justice and Delinquency Prevention.** Under the leadership of Shay Bilchick, the Office of Juvenile Justice and Delinquency Prevention (OJJDP) undertook several strategies that stimulated demand for effective juvenile justice services in general and facilitated the transport of MST in particular (Schoenwald 2010). OJJDP funded Elliott (1998) and his colleagues to review the vast literature on the prevention and treatment of youth violence and, then, to work with developers of those few programs identified as effective to develop Blueprints (i.e., summaries of clinical procedures and outcomes from evaluations, implementation measures) for their transport. Subsequently, OJJDP awarded grants to the University of Colorado, Center for the Study and Prevention of Violence (Elliott, director) to help disseminate the Blueprints programs, including MST. Concurrently, OJJDP funded the development of supervisory (Henggeler & Schoenwald 1998), consultation (Schoenwald 1998), and organizational manuals (Strother et al. 1998) that are central to the MST quality improvement system as well as the aforementioned nine-site transportability study (Henggeler et al. 2002b). As evidenced by the most recent Blueprints conference (e.g., Yeager 2010), this initiative continues to have a major impact on the spread of effective juvenile justice prevention and intervention services across the nation.

**Substance Abuse and Mental Health Services Administration (SAMHSA).** In light of mental health services for children and adolescents that were uncoordinated, relied on restrictive out-of-home placements, and were not friendly to families, SAMHSA devoted considerable resources toward system reform in an effort to develop community-based systems of care (Stroul & Friedman 1986). The philosophy of the system-of-care initiative was consistent with that of MST (Henggeler et al. 1996b)—services should be family focused, strength based, and ecologically valid. As such, this movement led to the development of many new MST programs and helped to create a service system culture that was much more hospitable to MST than were traditional office-based, pathology-focused, and individually oriented mental health services for children and adolescents.

### Major State Initiatives

In 1994, the South Carolina Department of Health and Human Services funded the Family Services Research Center, MUSC, to collaborate in the development of Medicaid standards for various types of mental health services for youth and families across the state and to provide training for newly established MST programs. As described by Schoenwald (2010), several major state initiatives followed, all with the aim of importing and implementing evidence-based treatments on a large scale across the respective states. These policy initiatives continue to operate and influence services throughout Washington State, led by the Washington State Institute on Public Policy; Connecticut, led by the Department of Children and Families as well as the Court Support Services Division of the judicial branch; Ohio, led by the Center for Innovative Practices, Department of Mental Health; and Hawaii, led by the Child and Adolescent Mental Health Division, Department of Health. These initiatives have almost always been driven by the desire of state leadership to obtain more “bang for the buck” for services dollars spent. Continued

commitment of policy makers to accountability and value are critical to the sustainability of the evidence-based practice movement.

### Lessons Learned

Schoenwald (2010) emphasized several important lessons learned from the transport of MST programs during the past 15+ years. Most important for present purposes is that continuous collaboration is essential to sustain the support of those stakeholders who influence the funding and viability of MST programs. At the state level, such individuals might include state directors of juvenile justice and mental health services. At the local level, such individuals might include juvenile court judges and professionals in the juvenile justice system. No matter how effective a provider agency or well trained a therapist, the MST program cannot be successful in the absence of adequate funding and community support.

### CONCLUSION

The relative success of MST in progressing from efficacy trials conducted through a university psychology department to transport across numerous states and nations is due to a range of interrelated factors at multiple levels. First, though conflicting with traditional mental health practices, the development of the clinical model was based on extant science (e.g., research on the determinants of antisocial behavior in adolescents, child and family psychotherapy research) and the recognition that traditional services (e.g., office or institution based, individually oriented) were not a good fit for the needs of juvenile offenders and their families.

Second, the development of MST coincided with emerging family therapy theories that emphasized the reciprocal nature of interpersonal interaction and social ecological theories (e.g., Bronfenbrenner 1979) that provided highly compatible conceptual frameworks for the development and specification of MST interventions. Moreover, Bronfenbrenner’s



emphasis on ecological validity foreshadowed the efficacy-effectiveness and science-practice distinctions that have become clinical research priorities in recent years and have been an emphasis of MST outcome research almost from the beginning. Thus, studies examining the parameters of MST effectiveness have progressed to multisite randomized trials in community settings with no involvement of the MST developers.

Third, as suggested above, it's one thing to develop an effective treatment, but it's quite another to transport that treatment effectively to the real world. In this regard, the MST transport strategies and quality improvement system can serve as prototypes for other complex psychosocial interventions. MST is transported by purveyor organizations whose sole function is to support the development and sustainability of effective MST programs. In addition to the political acumen needed to collaborate effectively with a variety of key community stakeholders, these purveyor organizations oversee

a quality improvement system that has been shown to enhance therapist adherence to treatment protocols and youth outcomes. MST programs will be sustainable only for so long as they achieve desired outcomes.

Finally, the sustainability of MST and other evidence-based treatments requires a wide range of commitments. Clients must be satisfied with services. Therapist and supervisors must be willing and have the skills to implement these treatments with fidelity. Provider organizations must appreciate the advantages of evidence-based treatments and be willing to retool. Referral sources must view evidence-based treatments favorably and be willing to buck local tradition in their referral practices. And funding mechanisms must support the nontraditional protocols of many evidence-based treatments. Fortunately, many highly committed lay persons, health care professionals, advocates, private and public sector administrators, and policy makers are dedicated to having these commitments align.

#### SUMMARY POINTS

1. Consistent with the known causes of adolescent criminal behavior and substance abuse, MST addresses the multidetermined nature of antisocial behavior in adolescents at individual, family, peer, school, and community levels.
2. The MST theory of change proposes that parents/caregivers are critical to achieving favorable outcomes with youth presenting serious clinical problems, and meditational research supports this perspective.
3. Numerous clinical trials have established the capacity of MST to reduce youth criminal behavior, substance use, psychiatric symptoms, and out-of-home placements while improving family relations and school performance.
4. Considerable research has demonstrated significant associations between therapist fidelity to MST treatment protocols and youth short- and long-term outcomes.
5. MST includes an intensive quality improvement system that aims to optimize youth outcomes by supporting therapist intervention fidelity at multiple levels.
6. Extensive implementation research supports the various components of the MST quality improvement system, with therapist treatment adherence and youth outcomes associated with key characteristics of the supervisors, consultants, and organizations supporting MST programs.
7. Continuous collaboration with key community stakeholders is instrumental to the success of MST programs.



8. Several groups of researchers have developed adaptations to the basic MST model for other challenging clinical populations, and the validation of these adaptations is proceeding through logical steps consistent with those adopted by the National Institute on Drug Abuse for treatment development.

## DISCLOSURE STATEMENT

Dr. Henggeler is a board member and stockholder of MST Services, LLC, the MUSC-licensed organization that provides training in MST.

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An early MST randomized efficacy trial that demonstrated favorable outcomes for chronic juvenile offenders at a four-year follow-up.

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The first extensive explication of the bases of the MST theoretical model.

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An early randomized effectiveness trial that demonstrated favorable MST effects with violent and chronic juvenile offenders.

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Provides the most comprehensive and up-to-date specification of the MST clinical protocols.

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Provides the first examination of MST meditational processes.

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An independent multisite randomized trial conducted in Norway and demonstrating favorable MST outcomes.

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Establishes MST effects on reducing criminal behavior and incarceration at a 14-year follow-up.

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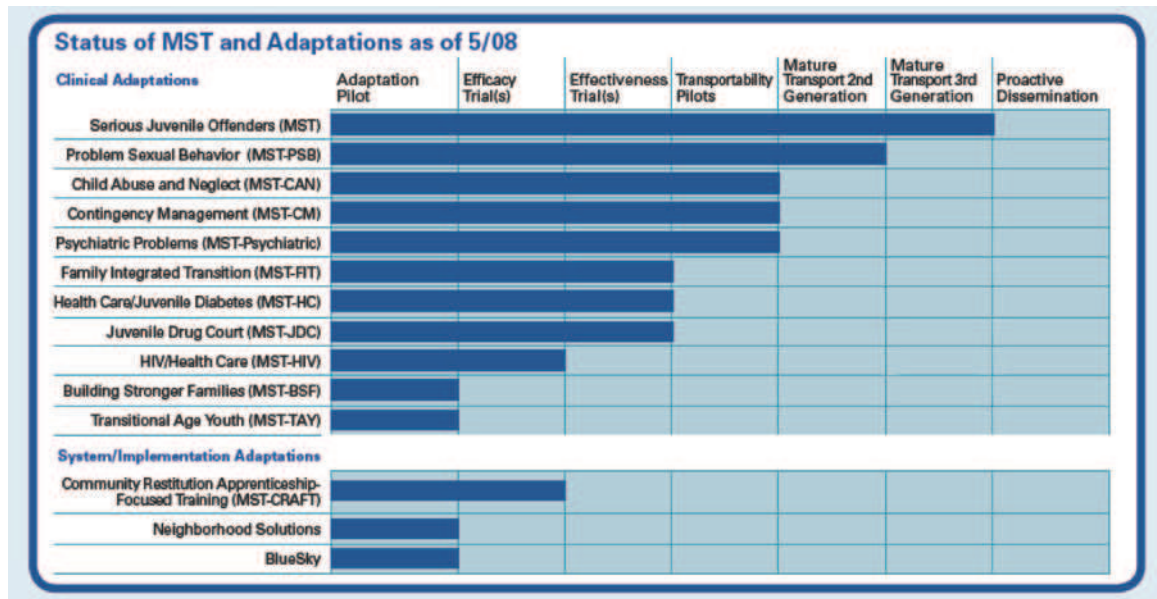
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The first independent randomized clinical trial conducted in the United States and demonstrating favorable outcomes with serious juvenile offenders.

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**Figure 2**  
Status of multisystemic therapy (MST) and adaptations.





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