



Chapter 1

The Need for Developing and Evaluating Adolescent Treatment Models

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The growing number of adolescents presenting for treatment to the nation's public treatment system pose many challenges. Rather than personally seeking treatment, many of these adolescents are being mandated to attend treatment by the criminal justice system or their parents. Most providers in the system use treatment approaches geared toward adults and their patterns of substance use, and evaluations of these approaches when used with adolescents have produced mixed results. Few formal adolescent treatment models exist that have demonstrated effectiveness and affordability in community-based programs. Furthermore, even fewer exist that have been manualized sufficiently for replication by other programs.

The Center for Substance Abuse Treatment (CSAT) has responded to this gap with a three-prong effort:

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1. Collaborating with the National Institute on Alcohol Abuse and Alcoholism (NIAAA) to fund fourteen research studies on adolescent treatment (personal communications from Cherry Lowman on March 28, 2001)
2. Funding a multisite randomized field experiment of five of the most promising approaches to adolescent outpatient treatment based on research and expert opinion (see Dennis, Babor, et al., 2000; Dennis et al., in press)
3. Setting up the Adolescent Treatment Model (ATM) program to fund the manualization and empirical evaluation of existing exemplary adolescent programs (described in this book)

This chapter provides background on the problem, the public treatment system for adolescents in the United States of America (USA), evaluations of existing practice, and CSAT's efforts to identify and develop evidence-based models of effective treatment based on exemplary programs under ATM.

ADOLESCENT SUBSTANCE USE AND PROBLEMS

After declining from the early 1980s until 1992, illicit drug use among adolescents has begun to increase (Monitoring the Future [MTF], 1999). Between 1991 and 1999, past-year illicit drug use rose from 29 to 42 percent among twelfth graders and from 11 to 21 percent among eighth graders. Although the rate of increase has leveled off in the past three years, the current rates are almost 1.5 to 2 times the 1992 low. More than twice as much past-month marijuana use exists as all other drugs combined among adolescents in eighth grade (10 percent versus 5 percent) and twelfth grade (23 percent versus 10 percent); marijuana is also more likely to be used daily than even alcohol by both eighth graders (1.4 percent versus 1.0 percent) and twelfth graders (6.0 versus 3.4 percent). Moreover, among twelfth graders the perceived risk of using marijuana, which is inversely related to use, is as low as it has been since 1982. Unfortunately, these perceptions do not match the facts.

A common progression of adolescent substance users includes some experimentation followed by opportunistic (e.g., parties with friends) use of tobacco and alcohol (often to intoxication), followed by regular (weekly or more) use of marijuana (with continued use of

tobacco and alcohol and increasing experimentation with other substances) (Golub and Johnson, 1994; Johnson and Gerstein, 1998; Kandel and Yamaguchi, 1985, 1993; Kandel, Yamaguchi, and Chen, 1992; Newcomb and Bentler, 1986, 1990). Compared to nonusers, adolescents in this latter group were three to forty-seven times more likely to have a host of other problems including symptoms of dependence, emergency room admissions, dropping out of school, behavioral problems, fighting, nondrug related legal problems, any legal problems, and being arrested. Unfortunately, fewer than 10 percent of adolescents with past-year symptoms of dependence have ever received treatment (Dennis and McGeary, 1999). While alcohol use continues to be a problem with this generation of adolescents, for the first time another illicit drug, marijuana, has become the leading substance mentioned in adolescent emergency room admissions and autopsy reports (Office of Applied Studies [OAS], 1995a). Part of the reason for this is that from 1980 to 1997 marijuana became significantly more potent, with the amount of delta-9-tetrahydrocannabinol (Δ^9 -THC) found in marijuana seizures rising over threefold, from less than 1.5 to 4.5 percent (El Sholy et al., 2000). Marijuana use alone and/or in combination with alcohol and other drugs is believed to be one of the major contributing factors to violent deaths and accidents among adolescents. It has been reported as being involved in as many as 30 percent of adolescent motor vehicle crashes, 20 percent of adolescent homicides, 13 percent of adolescent suicides, and 10 percent of other unintentional injuries among adolescents (Centers for Disease Control [CDC], 1997; McKeown, Jackson, and Valois, 1997; OAS, 1995a).

Some people think that adolescent substance use is almost a rite of passage and that adolescents will outgrow it: unfortunately the evidence is mixed. From age twelve to twenty the rates of past-month substance use more than double for alcohol (20 to 75 percent), tobacco (18 to 40 percent), and marijuana (8 to 27 percent); by age thirty, alcohol drops off by about 2 percent, tobacco by 5 percent, and marijuana drops off by 15 percent (Anthony and Arria, 1999). (Note that while they follow the same pattern, no other substance peaks over 5 percent.) While some adolescents do stop on their own, most who start using marijuana regularly at an early age have been found repeatedly to continue or increase their use and related problems (e.g., abuse or dependence, dropping out of school, getting in fights,

being arrested) (Hofler et al., 1999; Jessor and Jessor, 1975; Perkonig et al., 1999).

These trends are likely to worsen because the age of onset has been decreasing over the past thirty years (Dennis and McGeary, 1999; Dennis, Babor, Roebuck, and Donaldson, in press). Using data from the National Household Survey on Drug Abuse, the first set of columns of Table 1.1 shows the population estimate and prevalence of adult lifetime users of tobacco, alcohol, marijuana, and other drugs. The next set of columns shows the percent of lifetime users who report one or more symptoms of past-year dependence by age and overall. The last column shows the odds ratio of having problems for those who start using a given substance under the age of fifteen versus those who start over the age of eighteen. For tobacco and alcohol, 32 to 36 percent report one or more problems, with those starting before the age of fifteen being significantly more likely than those starting over the age of eighteen to have current (past-year) problems (odds ratios of 1.49 and 2.74 respectively). For marijuana and other drugs, 49 percent reported one or more problems, with those starting earlier reporting being more likely to have current problems (odds ra-

TABLE 1.1. Percentage of Lifetime Users with 1+ Symptoms of Dependence or Substance-Induced Disorders by Age of First Use

Substance	1998 Lifetime Users ^a		% With 1+ Problems ^b				Odds Ratio ^d
			Age of First Use ^c			Total	
	Population	%	<15	15-17	18+		
Tobacco	151,442,082	69	39	37	30	36	1.49 *
Alcohol	176,188,916	81	45	34	23	32	2.74 *
Marijuana	71,704,012	33	63	51	41	49	2.45 *
Other drugs	38,997,916	18	71	62	48	56	2.65 *

Source: 1998 NHSDA (OAS, 2000) Public Use Tapes.

*p < .05

^aBased on an estimated total household population size of 218,444,761

^bPercent with 1+ past-year problems at the time of the interview (mean current age of 41 overall, 43 for alcohol and tobacco users, 36 for marijuana users and 35 for other drug users)

^cAge at the time of first use of a given substance, which is grouped separately for each row and an average of 20 years earlier

^dCalculated as $[(\% \text{ under } 15)/(1-\% \text{ under } 15)]/[(\% \text{ } 18+)/(1-\% \text{ } 18+)]$

tios of 2.45 and 2.65 respectively). While many adolescents who try or use substances do not have problems, a 50 percent or more risk of having continued problems for an average of eleven to twelve years is an unacceptable loss for our nation's public health system. It is also important to note that of all adults reporting one or more symptoms of tobacco, alcohol, or marijuana dependence, 90 percent started using under the age of eighteen (50 percent under the age of fifteen).

The onset and impact of adolescent substance use is also intertwined with a wide range of comorbid (i.e., both cause and consequence) psychological and behavioral conditions including conduct disorder, attention deficient/hyperactivity disorder (ADHD), depression, anxiety, a variety of stress disorders, oppositional defiant disorder (ODD), and reactive attachment disorder (Crowley and Riggs, 1995; Dennis, Scott, et al., 2000; Dennis, Godley, and Titus, 1999; Kaminer, 1994, 1995; Risberg, Stevens, and Graybill, 1995; Robins and McEvoy, 1990). Generally, these studies have found that over 75 percent of the adolescents entering treatment have one or more of these other conditions, with over 50 percent having three or more. In one of the most extensive comparisons across ages and levels of care, the Drug Outcome Monitoring Study (DOMS) (Dennis, Godley, and Titus; 1999; Dennis, Scott, et al., 2000; Godley, Godley, and Dennis, 2001) showed that relative to adults, adolescents were more likely to have externalizing problems such as conduct disorder or ADHD, engage in violent/aggressive behaviors, and are less likely to report internalizing or mood disorders such as depression, anxiety, or stress disorders. Moreover, the rate of these problems was substantially higher among adolescents in inpatient versus outpatient levels of care. While the rate of these problems generally increases with age in the community, in these clinical samples the severity of substance use and comorbid problems were actually higher among females and younger clients: the authors attributed this to a threshold effect in which the problems had to be worse for the system or the families to refer these subgroups to treatment.

THE PUBLIC TREATMENT SYSTEM FOR ADOLESCENTS IN THE UNITED STATES

Public treatment programs in the United States are required to collect a core set of information for their state, which is then submitted

to the federal government as part of the national Treatment Episode Data Set (TEDS). Using reports from the Office of Applied Studies (OAS, 1999; 2000) and public data tapes made available through the University of Michigan (see www.icpsr.umich.edu/SAMHDA), we can assess how the public treatment system for adolescents in the United States has changed from 1992 to 1998 and what it looks like as of 1998 (the most recent data publically available).

TEDS includes nineteen core questions related to demographic characteristics such as gender, race, age, education, and marital status; the primary, secondary, and tertiary substances for which adolescents are being treated, their typical route of administration, frequency of use, and age at first use; the source of referral to treatment; and type of treatment being provided. An additional supplemental data set provided by about 60 percent of the states includes more detailed information on referrals, other client problems, and diagnosis. TEDS is based on treatment admissions, not unique individuals. It is voluntary for clients and has some missing data. It is also voluntary for programs in some states, and some programs either do not report or report too late to be included. TEDS does not include data from exclusively private facilities, those operated by other federal agencies (e.g., the Veterans Administration, Bureau of Prisons, Indian Health Service), treatment provided by individual therapists, or the treatment of codependents. OAS (1999, 2000) estimates that TEDS covers 83 percent of the targeted public treatment system admissions and 67 percent of all admissions (including other federal and private providers). For this chapter we have subset the public use data tapes to the TEDS admissions related to people under the age of eighteen. The public use data are a random sample of the entire data set, so the population estimates here have been weighted to make them equal to the published adolescent treatment population estimates for the whole data set.

Table 1.2 shows the characteristics of adolescent admissions in 1992 and 1998 in terms of population estimate and proportion, as well as the percentage change in each from 1992 to 1998. During this six-year period, the number of admissions grew by 53 percent (from 96,787 to 147,899) and the primary substance for the admission shifted from alcohol to marijuana (though both increased in terms of being primary, secondary, and tertiary problems). Although the system was still dominated by outpatient treatment, substantial growth

TABLE 1.2. Change in Characteristics of Adolescents Entering Substance Abuse Treatment^a

	Admissions			Relative Proportion ^b		
	1992	1998	Change	1992	1998	Change
Total (Weighted)	96,787	147,899	53%	100%	100%	0%
Gender						
Female	32,277	44,361	37%	33%	30%	-10%
Male	64,297	103,480	61%	66%	70%	5%
Race						
African American (non-Hispanic)	14,570	22,333	53%	15%	15%	0%
Caucasian (non-Hispanic)	61,716	92,782	50%	64%	63%	-2%
Hispanic	10,095	16,587	64%	10%	11%	8%
Other (non-Hispanic)	3,894	7,062	81%	4%	5%	19%
Age						
14 years old or less	24,714	37,316	51%	26%	25%	-1%
15 to 17 years old	72,073	110,583	53%	74%	75%	0%
Education						
0 to 8 years	38,315	58,156	52%	40%	39%	-1%
9 to 11 years	52,386	80,534	54%	54%	54%	1%
12+ years or GED	2,107	3,537	68%	2%	2%	10%
Other						
Employed full-time ^c	1,313	6,301	380%	2%	5%	197%
Employed part-time ^c	5,273	8,320	58%	6%	6%	-2%
Student ^c	41,681	60,011	44%	91%	76%	-16%
Pregnant at admission ^d	389	308	-21%	1%	1%	-42%
Psychological problems ^{c,e}	7,625	28,025	268%	15%	30%	104%
Homeless or runaway ^c	8,573	2,982	-65%	13%	2%	-82%
Source of Referral						
Criminal justice system	35,321	61,278	73%	36%	41%	14%
School/community agency	26,862	32,060	19%	28%	22%	-22%
Self/family	17,425	25,837	48%	18%	17%	-3%
Other substance abuse provider	7,334	9,221	26%	8%	6%	-18%
Other health care provider	5,322	9,069	70%	5%	6%	12%
Other	4,524	26,232	480%	5%	18%	279%
Prior Treatment						
None	60,485	86,588	43%	71%	71%	0%
1 episode	15,638	22,514	44%	18%	19%	0%
2 episodes	5,088	7,218	42%	6%	6%	-1%
3+ episodes	3,546	5,347	51%	4%	4%	5%

TABLE 1.2 (continued)

	Admissions			Relative Proportion ^b		
	1992	1998	Change	1992	1998	Change
Primary Substance Problem						
Marijuana/hashish	21,806	79,572	265%	23%	54%	139%
Alcohol	54,361	35,338	-35%	56%	24%	-57%
Stimulants	1,203	4,125	243%	1%	3%	124%
Hallucinogens	1,661	827	-50%	2%	1%	-67%
Cocaine/crack	3,436	3,237	-6%	4%	2%	-38%
Inhalants	1,460	555	-62%	2%	0%	-75%
Heroin/opiates	736	1,801	145%	1%	1%	60%
Other ^f	474	1,871	294%	0%	1%	158%
None identified by adolescent	11,649	20,573	77%	12%	14%	16%
Pattern of Primary Substance Use						
Weekly use at intake ^c	36,323	63,869	76%	46%	52%	14%
First used under age 15 ^c	63,806	100,099	57%	78%	78%	0%
Dependence ^c	7,813	19,343	148%	30%	37%	24%
Primary, Secondary, or Tertiary Substance Problem						
Marijuana/hashish	51,081	109,875	115%	53%	74%	41%
Alcohol	74,809	89,846	20%	77%	61%	-21%
Stimulants	4,876	12,005	146%	5%	8%	61%
Hallucinogens	9,621	9,040	-6%	10%	6%	-39%
Cocaine/crack	9,023	12,191	35%	9%	8%	-12%
Inhalants	4,078	2,406	-41%	4%	2%	-61%
Heroin/opiates	1,501	3,521	135%	2%	2%	53%
Other ^f	3,947	10,019	154%	4%	7%	66%
By Setting						
Outpatient (OP)	70,371	101,604	44%	73%	69%	-6%
Intensive outpatient (IOP)	6,524	16,550	154%	7%	11%	66%
Detoxification or hospital (D/H) ^g	4,164	8,481	104%	4%	6%	33%
Short-term residential (STR)	5,984	8,415	41%	6%	6%	-8%
Long-term residential (LTR)	9,743	12,849	32%	10%	9%	-14%

Source: Office of Applied Studies 1992 and 1998 TEDS public use data set (OAS 1999, 2000).

^aBased on unweighted sample n of 23,662 in 1992 (weight = 4.090) and 35,960 in 1998 (weight=4.113); Change is the change calculated as $[(1998-1992)/1992]$

^bMay not equal 100% due to rounding and/or missing data

^cCalculated based on the subset of states and clients reporting

^dPercent of females

^eSelf-identified psychological problems; note that this appears to grossly underestimate comorbid problems

^fIncluding tranquilizers, sedatives, over-the-counter medications, and other identified substances

^gIncluded detox hospital inpatient, detox free-standing, detox ambulatory, and hospital-based inpatient

occurred in the number of admissions to intensive outpatient (154 percent) and hospital-based programs (104 percent). As shown in the columns to the right, the treatment system is dominated by white males, aged fifteen to seventeen, who are in (or have dropped out of) high school. They are most likely to use marijuana and alcohol weekly (or more often), have started using before the age of fifteen, and never have been in treatment before. Although only about 8 percent are being treated for stimulant use, this represents a 61 percent increase over the rate in 1992.

While policymakers and researchers have often attempted to compare outpatient and inpatient treatment, these programs have historically served different subgroups of adolescents (CSAT, 1999; Gerstein and Johnson, 1999; Hubbard et al., 1985; Powers et al., 1999; Sells and Simpson, 1979; Simpson, Savage, and Sells, 1978). These differences grew in the 1990s with the increasing use of more explicit patient placement criteria, such as those recommended by the American Society of Addiction Medicine (ASAM, 1996) which have been mandated in several states. Table 1.3 focuses on the characteristics of the treatment system in 1998. Males, African Americans, and adolescents involved in the criminal justice system are more likely to go to intensive outpatient and long-term residential programs. Females, Caucasians, and those referred by other substance abuse treatment or health care providers are more likely to go into detox, hospital, or short-term residential programs. Those in outpatient and intensive outpatient are likely to be younger and entering treatment for the first time. Those entering one of the residential levels of care are more likely to have been in treatment before, use weekly (or more often), and meet criteria for dependence. While the dominant pattern of substance use across levels of care is marijuana and alcohol, adolescents in the residential levels of care are more likely to have problems with marijuana, and (at much lower prevalence rates) cocaine, stimulants, hallucinogens, or other drugs.

THE HISTORY AND EVALUATION OF ADOLESCENT TREATMENT PRACTICE

From 1915 to 1985, only a handful of evaluations of adolescent substance abuse treatment studies existed and many of these took

TABLE 1.3. Characteristics of Adolescent Admissions in 1998 by Level of Care

	Level of Care ^a					Total
	OP	IOP	D/H	STR	LTR	
Total 1998 Admissions^b	101,604	16,550	8,481	8,415	12,849	147,899
[Row %]	(69%)	(11%)	(6%)	(6%)	(9%)	(100%)
Gender						
Female	30%	28%	33%	32%	26%	30%
Male	70%	72%	66%	68%	74%	70%
Race						
African American (non-Hispanic)	15%	16%	11%	13%	20%	15%
Caucasian (non-Hispanic)	64%	57%	68%	68%	56%	63%
Hispanic	11%	12%	12%	7%	16%	11%
Other (non-Hispanic)	5%	4%	5%	7%	5%	5%
Age						
14 years old or less	28%	19%	17%	17%	18%	25%
15 to 17 years old	72%	81%	83%	83%	82%	75%
Education						
0 to 8 years	41%	36%	31%	37%	42%	39%
9 to 11 years	53%	58%	59%	57%	53%	54%
12+ years or GED	2%	2%	8%	2%	2%	3%
Other						
Employed full time ^c	4%	6%	4%	1%	12%	5%
Employed part time ^c	7%	5%	7%	2%	1%	6%
Student ^c	72%	89%	83%	81%	89%	76%
Pregnant at admission ^d	1%	1%	0%	0%	1%	1%
Psychological problems ^{c,e}	32%	17%	30%	30%	23%	30%
Homeless or runaway ^c	3%	1%	2%	4%	3%	2%
Source of Referral						
Criminal justice system	41%	47%	36%	31%	47%	41%
School/community agency	25%	19%	14%	15%	8%	22%
Self/family	18%	15%	20%	15%	15%	17%
Other substance abuse provider	4%	8%	7%	24%	12%	6%
Other health care provider	6%	6%	8%	9%	6%	6%
Other/unknown	6%	6%	15%	5%	12%	7%
Prior Treatment ^c						
None	77%	62%	59%	51%	49%	71%
1 episode	15%	25%	20%	32%	28%	18%

	Level of Care ^a					
	OP	IOP	D/H	STR	LTR	Total
Total 1998 Admissions^b	101,604	16,550	8,481	8,415	12,849	147,899
[Row %]	(69%)	(11%)	(6%)	(6%)	(9%)	(100%)
2 episodes	4%	8%	9%	10%	12%	6%
3+ episodes	3%	5%	12%	7%	10%	5%
Primary Substance Problem						
Marijuana/hashish	50%	69%	55%	59%	63%	54%
Alcohol	25%	20%	25%	27%	15%	24%
Stimulants	2%	4%	5%	5%	5%	3%
Hallucinogens	0%	1%	1%	1%	1%	1%
Cocaine/crack	1%	2%	4%	4%	6%	2%
Inhalants	0%	0%	0%	0%	1%	0%
Heroin/opiates	1%	1%	5%	3%	2%	1%
Other ^f	2%	0%	1%	0%	1%	1%
None identified by adolescent	6%	1%	1%	1%	5%	5%
Pattern of Primary Substance Use						
Weekly use at intake ^c	39%	57%	66%	76%	63%	48%
First used under age 15 ^c	73%	78%	71%	82%	76%	75%
Dependence ^c	26%	61%	80%	67%	82%	37%
Primary, Secondary, or Tertiary Substance Problem						
Marijuana/hashish	69%	88%	77%	91%	85%	74%
Alcohol	59%	68%	63%	73%	58%	61%
Stimulants	6%	11%	11%	15%	11%	8%
Hallucinogens	5%	8%	9%	11%	11%	6%
Cocaine/crack	5%	10%	15%	15%	20%	8%
Inhalants	1%	2%	2%	3%	3%	2%
Heroin/opiates	1%	2%	7%	6%	5%	2%
Other ^f	7%	5%	6%	4%	9%	7%

Source: Office of Applied Studies 1998 TEDS public use data set (OAS, 2000).

^aLevels of care are outpatient (OP), intensive outpatient (IOP), detoxification or hospital (D/H), short-term residential (STR), and long-term residential (LTR); D/H includes detox hospital inpatient, detox free-standing, detox ambulatory, and hospital-based inpatient.

^bWeighted based on total reported number of TEDS admissions under age 18 divided by the sample ($n = 35,960$) put in the public domain (constant = 4.113).

^cCalculated based on the subset of states or clients reporting

^dPercent of females

^eSelf-identified psychological problems; note that this appears to grossly underestimate comorbid problems

^fIncluding tranquilizers, sedatives, over-the-counter medications, and other identified substances

place when adolescents were treated in adult programs or in segregated units with adult models. After the de facto criminalization of narcotics between 1915 and 1920, New York City treated 743 adolescents (under the age of nineteen) addicted to narcotics in segregated units at the Worth Street Clinic. By the 1920s, however, this effort was declared a failure based on internal evaluations (Copeland, 1920; Graham-Mulhall, 1921; Hubbard, 1920).

It took the federal government until the 1930s to establish two federal narcotics “farms” (later called U.S. Public Health Hospitals) that were initially to be dedicated to the treatment of juvenile addiction. But by the time they opened, the average age of a person entering treatment was almost thirty-eight years (Lowry, 1956). From 1947 to 1950, however, adolescent narcotic use increased, and the number of adolescents (under age twenty-one) entering this facility rose from 22 to 440 (1900 percent) (*Conferences*, 1953). New York City also admitted another 250 adolescents per year in a residential treatment program at Riverside Hospital on the Old Welfare Island (Ganso and Mason, 1958). The lack of community resources to help young narcotic addicts in the 1950s triggered new initiatives within cities being hard hit by heroin addiction and these initiatives are the origins of the modern community-based treatment system. These included the creation in the 1950s and early 1960s of addiction wards in local hospitals such as the Detroit Receiving Hospital; Chicago’s Bridewell Hospital; and Bellevue, Kings County, Manhattan General, and Metropolitan hospitals in New York City, as well as church-based efforts including such programs as St. Mark’s Clinic in Chicago, the Addicts Rehabilitation Center in Manhattan, the Astoria Consultation Service in Queens, Exodus House in East Harlem, and other religiously affiliated programs such as Teen Challenge and the Samaritan Halfway House Society (White, 1998).

Despite the antimarijuana campaigns of the 1920s and 1930s and the de facto criminalization of that drug with the Marihuana Tax Act of 1937, there is little evidence of large numbers of adolescents (or adults) seeking treatment for marijuana until the late 1960s when its use became more common (Anslinger and Cooper, 1937; Anslinger and Tompkins, 1953; Dennis and White, 1999; Rowell, 1929, 1937; Rowell and Rowell, 1939). The transition from adolescent admissions for narcotics to admissions for marijuana and alcohol did not start until the late 1960s and early 1970s. This also coincided with a series of

national program evaluations of existing practice and attempts to apply adult treatment models to adolescents.

The Drug Abuse Reporting Program (DARP) (Sells and Simpson, 1979; Simpson, Savage, and Sells, 1978) was conducted in the early 1970s using a national stratified and purposive sample of existing community-based programs for narcotics use. The study included data on adolescents (under age twenty) at intake ($n = 5,405$) and a follow-up interview approximately three years later with 587 adolescents who had been treated in methadone maintenance ($n = 119$), therapeutic communities ($n = 238$), outpatient drug free ($n = 158$), and detoxification/other ($n = 72$). Prior to admission, 73 percent of the adolescents used opioids (66 percent weekly or more often), however, the rate of any opioid use ranged from 93 percent of those being treated with methadone to 49 percent of those being treated in outpatient drug free. Even in this early study, marijuana had already emerged as the second most commonly used substance, with 62 percent reporting any use (46 percent weekly use) and ranging from 48 percent among those in methadone programs to 66 percent of the adolescents in outpatient drug free and therapeutic communities. With a median length of stay of about two months, all levels of care substantially reduced opioid use, the rates of alcohol use went up slightly, and the amount of marijuana use remained the same or increased (particularly among those in methadone treatment).

The Treatment Outcome Prospective Study (TOPS) (Craddock, Bray, and Hubbard, 1985; Hubbard et al., 1985) was conducted in the late 1970s and early 1980s using a second national stratified and purposive sample of existing community-based treatment for any kind of drug use. The study included data on adolescents (under age twenty) at intake ($n = 1,042$) and twelve-month post discharge interviews with 256 adolescents who had been admitted to therapeutic communities ($n = 106$) or outpatient treatment ($n = 150$). By this time, 31 percent of the adolescents were being treated primarily for marijuana related problems, followed by admissions primarily related to amphetamines (7 percent), alcohol (5 percent), and only then opioids (4 percent). TOPS found 25 to 50 percent reductions in the rates of daily marijuana use, alcohol use and other drug use, and drug related problems after residential treatment (with a median length of stay of about three months). For adolescent outpatient treatment (with a median length of stay of two months), however, the results were mixed—

with 25 percent or less reductions and several subgroups (e.g., eighteen- to nineteen-year-olds in treatment for less than three months; twelve- to seventeen-year-olds in treatment for more than three months) actually increasing their rates of substance use or other problems.

The Services Research Outcome Study (SROS) (OAS, 1995b) was conducted in the late 1980s to early 1990s using a national probability sample of existing community-based treatment for any kind of substance use. The data include record abstraction and five-year postdischarge follow-ups (that recaptured intake histories) with a total of 156 adolescents (under age eighteen) receiving treatment. Although the data from this study are limited to the percent using five or more times in the five years before and after treatment (with no detailed breakdown for adolescents), it does help to further document the continuing shift toward a pattern of using marijuana (68 percent), alcohol (80 percent), and the smaller roles of cocaine (20 percent) and opioids (2 percent) among adolescent admissions. The median length of stay was two to three months, with 48 percent of the adolescents going back into treatment one or more times in the five years after the index episode (ranging from 65 percent of those who received less than a week of treatment to 40 percent of those who received six or more months). Although the adolescent sample in SROS was very small, it caused considerable concern among policy makers because it found that from the five years before to the five years after treatment, the prevalence of using (5+ times in the past year) substances increased for marijuana (68 to 70 percent), alcohol (80 to 92 percent), cocaine (20 to 29 percent), and heroin (2 to 7 percent).

The National Treatment Improvement Evaluation Study (NTIES) (CSAT, 1999, 2000; Gerstein and Johnson, 1999) was conducted in the early 1990s using a national stratified and purposive sample of community-based treatment programs that had received demonstration grants to enhance treatment. The data include interviews with 236 adolescents (age thirteen to seventeen) at intake and twelve-month postdischarge who received any kind of treatment (no modality breakdowns are available). Again, most adolescents were being treated for marijuana (46 percent) or alcohol (10 percent), with heroin, crack, and cocaine together making up only 14 percent more. With a median length of stay of about two months, NTIES found that residential treatment was associated with reductions in using (5+

times in the past year) marijuana (97 to 72 percent), cocaine (52 to 30 percent), and in alcohol intoxication (52 to 45 percent). Adolescent outpatient treatment, however, was associated with a slight reduction in marijuana use (77 to 69 percent), no change in cocaine use (13 to 13 percent), and a slight increase in alcohol intoxication (32 to 37 percent).

The Drug Abuse Treatment Outcome Studies of Adolescents (DATOS-A) (Grella et al., 1999, 2000; Hser et al., 1999, 2001; Powers et al., 1999; Rounds-Bryant et al., 1998) was conducted in the mid- and late-1990s using a third national stratified and purposive sample of existing community-based treatment for any kind of substance use. The study included data on adolescents (age eleven to nineteen) at intake ($n = 3,382$) and twelve-month postdischarge interviews with 1,785 adolescents that had been admitted to long-term residential ($n = 727$), short-term residential ($n = 613$), and/or outpatient treatment ($n = 445$). By the early 1990s, over 90 percent of the adolescents were using marijuana at intake (58 percent meeting dependence criteria) and 84 percent were using alcohol (27 percent dependent). In contrast, only 15 percent had cocaine dependence and 3 percent opioid dependence. For the year before to the year after treatment, the rates of marijuana (91 to 68 percent) and heavy alcohol use (34 to 20 percent) across modalities went down, while the rates of cocaine use went up slightly (17 to 19 percent).

Substantively, it is important to realize that most of the treatment programs in these evaluations were using adult treatment models with only minimum modifications. Early therapeutic communities such as Odyssey House and Phoenix House started admitted adolescents in the late 1960s and were quickly followed in the 1970s by Crossroads, Gateway Foundation, Inc., Synanon, and Safri House; almost immediately these programs began modifications in order to involve more professionals and families (Kajdan and Senay, 1976). Some of the other early changes made by these and other adolescent programs included:

1. incorporating more psychological and psychiatric assessment, concepts, and services,
2. dealing more flexibly with rule violations,
3. using younger and better educated staff, and
4. using less emphasis on confrontation.

Throughout the 1980s there were increasing calls for more “developmentally appropriate” approaches for working with adolescents (Loree Adams and Nancy Hamilton, personal communication, April 17, 2001). For example, adolescents who had no concept of respecting parents or authority figures were easily confused by the “fuzzy” boundaries between clients and staff. More formal boundaries were needed and the staff’s behavior had to be above reproach. Role modeling (for which therapeutic communities (TCs) and twelve-step programs are famous) becomes even more important when it comes to adolescents (Hamilton at Operation PAR, for instance, instituted a “no swearing” policy and other “parenting” types of rules; Adams requires adolescents to “take care” of a teddy bear). Checks on the ability of clients to discipline each other were required, as some could be overly harsh or impulsive. Another key issue was the need for access to formal educational services and the level of intellectual development. Adolescents still think in very concrete (versus abstract) terms; they might say they do not have a drug “problem” but then readily acknowledge having three or more symptoms of dependence. This is not (necessarily) denial, but a gap in their ability to recognize the link between these “concrete” symptoms and the abstract label of a “problem.” Obviously this impacts both how assessments are conducted and the kinds of things that can be done in therapy or expected in a living environment. By the end of the 1990s, treatment programs and researchers were only just beginning to address these issues (with most acknowledging a lot of room for more improvement).

These early evaluations of adolescent treatment practice in the community were also methodologically limited by small samples spread over many different programs/undefined approaches, low treatment duration (generally about two months), and marginal follow-up rates (50 to 70 percent). Complicating matters further, none of these studies was based on the kind of manualized approach that is required for easy dissemination to the field and that is increasingly the sine qua non for good substance abuse treatment (Carrol, 1997; Crits-Cristoph and Siqueland, 1996; Institute of Medicine, 1990; Lamb, Greenlick, and McCarty, 1998; Miller et al., 1995; Onken, Blaine, and Battjes, 1997; Ozechowski and Liddle, 2000; Stanton and Shadish, 1997; Weinberg et al., 1998). Several other attempts have been made to develop and evaluate additional models of substance abuse treatment more appropriate for adolescents (e.g., Alford, Koehler, and Leonard, 1991;

Azrin et al., 1994; Borduin, 1999; Brown, Myers, and Vik, 1994; Dakof, Tejada, and Liddle 2001; Dennis, Babor, et al., 2000; Dennis, Scott, et al., 2000; Godley, Godley, and Dennis, 2001; Godley et al., in press; Henggeler, 1993; Henggeler et al., 1991; Henggeler, Pickrel, and Brondino, 1999; Henggeler et al., 1996; Jainchill, 1997; Joanning et al., 1992; Kaminer and Burlison, 1999; Kaminer et al., 1998; Lewis et al., 1990; Liddle and Dakof, 1995; Szapoznik et al., 1983; Szapocznik et al., 1988; Titus and Godley, 1999; Winters et al., 2000). However, most of these have even smaller sample sizes, were conducted in research or exemplary settings, and suffer from many of the same problems as early evaluations of adolescent treatment practice. Moreover, treatment protocol manuals with sufficient detail to allow another program to replicate their successes are only now becoming available to the field and have yet to be independently replicated in a large number of diverse community-based settings. In short, evaluations of adolescent treatment practice have produced positive but sometimes mixed results, and adolescent treatment research still is many years from demonstrating that its emerging models will be effective and cost-effective in practice.

CSAT'S ADOLESCENT TREATMENT MODEL PROGRAM

One of the ways that CSAT responded to this gap in our knowledge about adolescent treatment was to establish the Adolescent Treatment Model (ATM) program. The goals of the ATM program are to

1. identify currently existing potentially exemplary models of adolescent treatment;
2. collaborate with the treatment providers to formalize their models into disseminable manuals that can be replicated by other programs;
3. determine with whom the model has been tested and the amount of services the adolescents actually received;
4. evaluate the effectiveness, cost, and cost-effectiveness of each model;
5. collaborate on cross-site comparisons of these models with one another and with other studies of adolescent substance abuse treatment; and

6. participate in professional activities to disseminate the resulting models and findings.

CSAT also hopes to make these evidence-based models of treatment available through publication of manuals, through its Addiction Technology Transfer Centers (ATTC), through its Targeted Capacity Expansion (TCE) grants, by working with the states (which received block grant funding), and by making these evidence-based models of treatment available directly to treatment agencies via mailings, clinical conferences, and specialized workshops.

Programs and program evaluators formed partnerships and submitted grant applications that were peer reviewed and the basis for CSAT issuing five awards in 1998 (CSAT GFA No. TI 98-007) and five more awards in 1999 (CSAT GFA No. TI 99-001). Each of these grantees was required to work and be judged on the extent to which they could demonstrate that they: were working with a program that had been in existence for at least two years, had some preliminary data demonstrating program effectiveness, were willing to develop the manual and make it publically available, had a local evaluation plan for assessing the effectiveness of the program, and would be willing to collaborate with the cross-site evaluation of client mix, service mix, client effectiveness, costs, and cost-effectiveness.

The ATM treatment models represent a wide range of levels of care, clinical approaches, provider organizations, geographic locations, and evaluators. The levels of care, programs, and evaluators (described at length in the subsequent chapters of this book) include the following:

- *Outpatient treatment*: EMPACT-SPC in Phoenix, Arizona, evaluated by the University of Arizona Services Research Office
- *Outpatient treatment*: Chestnut Health Systems (CHS) in Bloomington, Illinois, evaluated by CHS' Lighthouse Institute
- *Outpatient treatment*: Epoch Counseling Center in Catonsville, Maryland, evaluated by Friends Research Institute, Inc., Baltimore, Maryland
- *Outpatient family therapy*: The Village, Inc., in Miami, Florida, evaluated by the University of Miami School of Medicine

- *A short-term and intensive inpatient program:* Mountain Manor Treatment Center in Baltimore, Maryland, evaluated by the Johns Hopkins School of Medicine, Baltimore, Maryland
- *A moderate-term residential program on a Native American reservation:* Four Corners Regional Adolescent Center in Shiprock, New Mexico, evaluated by Shiprock Navaho Behavioral Health Board, Inc., and the University of Oklahoma, Oklahoma City, Oklahoma
- *A moderate-term step-down (residential, intensive outpatient, outpatient) treatment program:* CODAC Behavioral Health Services in Tucson, Arizona, evaluated by the University of Arizona
- *A modified therapeutic community treatment program:* Phoenix Academy in Los Angeles, California, evaluated by Drug Policy Research Center (RAND), Santa Monica, California
- *A modified therapeutic community and step-down (residential, intensive outpatient, outpatient) treatment program:* Dynamic Youth Community, Inc., in Brooklyn, New York, evaluated by the New York Office of Alcoholism and Substance Abuse Services, Albany, New York
- *A modified therapeutic community treatment program:* Thunder Road, in Oakland, California, evaluated by the Public Health Institute

Participants in all programs are predominately marijuana and alcohol using males with criminal justice system involvement. However, significant numbers of adolescents are being treated for cocaine in New York and Tucson, and heroin in New York and Baltimore. Significant numbers of females are being treated in New York, Baltimore, Tucson, Oakland, and Bloomington. Most of the program clients are Caucasians, though there are significant numbers of African Americans in Baltimore, Miami, and Catonsville; Hispanics in Los Angeles, Tucson, Miami, and Phoenix; and Native Americans in Shiprock. These differences are important because prior work has shown that gender identity, ethnic identity, and the degree of acculturation can moderate substance use behaviors (Navarro et al., 1997; Scheier et al., 1997; Vega and Gil, 1998). In addition, the gap between child and parent acculturation may contribute to substance use (Felix-Ortiz, Fernandez, and Newcomb, 1998).

Each of the ATM programs is unique. The goal of manualizing existing programs is to identify the replicable components and allow programs to potentially combine components across manuals into new manual “guided” approaches, which though they vary considerably, generally include: descriptions of the treatment program, facilities, staff, interventions, and services, as well as details about the treatment interventions (e.g., group counseling goals, process, hand-out materials) and community (e.g., therapeutic milieu, role of clients). Tentative summaries of their current approaches appear in the following chapters, however, it is important to appreciate that these programs continue to evolve their treatment approach.

Each of the program evaluations involves the collection of a core set of measures including treatment transition and follow-up logs, standardized adolescent interviews with the Global Appraisal of Individual Needs (GAIN) (Dennis, 1999) at intake, and follow-up and cost data on the services provided by the ATM program. Intake interviews were conducted no more than two weeks before treatment intake or one week after treatment intake. Follow-up interviews were conducted at six and twelve months postintake for all sites. Individually, sites are also collecting additional measures, additional waves (three- and nine-months postdischarge), abstracting records and/or conducting qualitative studies. The following is a summary of the common data sources and their status.

Developed for the ATM program, the Treatment Transition Log (TTL) is designed to track adolescents as they move through the ATM program (including movement between levels of care). Using multiple rows per unique adolescent, it tracks the site, study ID, treatment program ID, intake date, intake status, referral source (if applicable), prior level of care and site, current program site and level of care, discharge status, discharge date, posttreatment destination, and level of care. As of March 2001, the ten grantees had recruited 1,568 unique adolescents who had a total of 2,205 admissions to one or more levels of care (e.g., step-down, step-up, or readmissions). Approximately 17 percent were in treatment for less than thirty days, 28 percent for thirty-one to ninety days, 28 percent for more than ninety days, and 21 percent were still in treatment. The adolescents were most likely to be transferring in from a juvenile institution (44 percent), the community (32 percent), or from another substance abuse treatment unit. The admissions were spread across outpatient (20 percent), intensive outpatient (12 percent),

group homes (19 percent), short-term (thirty days or less) inpatient (8 percent), moderate-term (thirty-one to ninety days) inpatient (19 percent), or long-term (greater than ninety days) residential treatment (13 percent). Of the more than 1,700 adolescents discharged as of March 2001 (counting multiple admissions more than once), 20 percent completed treatment and were discharged to the community, 20 percent transferred to another level of care within the same agency, 3 percent transferred to another substance abuse treatment agency, 13 percent transferred to a criminal justice agency, 3 percent were asked to leave at staff request, and 18 percent left against medical advice.

Developed for the ATM program, the Follow-Up Log (FUL) tracks all people recruited into the study, whether they agreed to participate and, if so what happened to them. For each wave of follow-up being done by a site, it indicates the target date for their follow-up interviews, their current status (not due, completed on time, completed late, unable to gain access, refused, pending), and, if completed, the date of the interview. It generates a summary report by site, and this report is combined and shared across the programs. As of April 30, 2000, the ten grantees had completed 90 percent (1,301 done/1,450 due [excluding those who have died]) of the required six-month interviews and 90 percent of the required twelve-month interviews (1,019/1,137). The New York, Baltimore, Tucson, Arizona, Los Angeles (three-month only), Oakland, Bloomington, and Phoenix sites also completed 92 percent (1,263/1,366) of their optional three-month interviews and 87 percent (699/802) of their optional nine-month interviews. These rates build on follow-up methods developed under earlier CSAT studies (Scott and Dennis, 2000) and represent a major breakthrough for the field by this group of collaborating grantees.

The Global Appraisal of Individual Needs (GAIN) is actually a series of screeners, intake, and follow-up participant interviews that have been normed on both adults and adolescents (Dennis, 1999; Dennis, Godley, and Titus, 1999; Dennis, Scott, et al., 2000), is used as the biopsychosocial clinical assessment at Chestnut Health Systems and is currently one of the most widely used measures in adolescent treatment studies in the United States (Buchan, Tims, and Dennis, 2000; Dennis, Babor, et al., 2000; Dennis et al., in press). There are eight core sections (background, substance use, physical health, risk behaviors,

mental health, environment, legal, and vocational) that each contain questions on the recency of problems, breadth of symptoms, and recent prevalence in days or times, as well as lifetime service utilization, recency of utilization and frequency of recent utilization. The items are combined into over 100 scales and subscales that can be used for diagnosis, placement, treatment planning, and outcome monitoring. The GAIN also includes items designed for comparison to the National Household Survey on Drug Abuse (OAS, 1996) and is currently being “valued” for adolescents at the unit (e.g., day, time) level by Dr. Michael French at the University of Miami School of Medicine.

Using data from the first 1,028 adolescents admitted to ATM, we found that the GAIN scales replicated earlier results (Dennis, Scott, et al., 2000; Dennis et al., in press) in terms of high internal consistency on both the summary dimension scales and their more specific subscales, including:

- Internal Mental Distress Index (IMDI-39, .94) and its subscales: Somatic Symptom Index (SSI-4, 0.69), Depressive Symptom Index (DSI-6, .77), Homicidal Suicidal Thought Index (HSTI-4, .83), Anxiety Symptom Index (ASI-10, .77), Traumatic Stress Index (TSI-13, .92), and General Mental Distress Index (GMDI-21, .88)
- Behavior Complexity Index (BCI-33, .91) and its subscales: Inattention Index (IAI-9, .88), Hyperactivity-Impulsivity Index (HII-9, .81), Conduct Disorder Index (CDI-15, .82), and ADHD-Index (ADHD-18, .90)
- Substance Problem Index (SPI-16 items, alpha = .90) and its subscales: Substance Issues Index (SII-5, .67), Substance Abuse Index (SAI-4; .70), Substance Dependence Index (SDI7, .83), and Substance Use Disorder Index (SUDI-11, .87)
- Violence-Delinquency Index (VDI-22, .90) and its subscales: General Conflict Tactic Index (GCTI-12, .89), Property Crime Index (PCI-6; .75), Interpersonal Crime Index (ICI-7, .67), Drug Crime Index (DCI-4, 0.53), and General Crime Index (GCI-17, .84).

A confirmatory factor analysis using data from the 608 adolescents in the Tucson, Los Angeles, and Oakland sites revealed an outstanding fit between the hypothesized and actual data (Comparative Fit Index or

CFI = .96) (Dennis, Funk, and McDermeit, 2001). Using data from the GAINs for 187 adolescents admitted to residential treatment in the Oakland site, Jasiukaitis and Shane (2001) were able to use discriminant analysis to accurately predict independent and blind psychiatric diagnoses of co-occurring psychiatric diagnoses including ADHD ($\kappa = 1.00$), mood disorders (.85), conduct disorder/obsessive compulsive disorder (.82), adjustment disorder (.69), or the lack of a non-substance use diagnoses (.91), and to discriminate the primary other disorders across these conditions ($\kappa = .65$). In a comparison of fifty-four adolescents entering residential treatment in New York State, Perry and Stark (2001) found that the more detailed GAIN questions were significantly more likely than admission records from New York State's version of the Treatment Episode Data Set (TEDS) to document self-reported needle use, and prior mental health treatment. Also, a tendency (effect size $d = .86$) for the GAIN existed to identify more prior substance abuse treatment episodes.

A test-retest study of the days of use in the past ninety days and lifetime DSM-IV abuse/dependence symptoms over forty-eight hours or less with a nonATM sample of 210 adolescent entering outpatients reveals consistent but increasing numbers of days of marijuana use ($r = .74$, 31 versus 34 days), days of alcohol use ($r = .74$, 6 versus 7 days), abuse/dependence symptoms ($r = .73$, 4.6 versus 5.3 lifetime), and lifetime diagnosis ($\kappa = .55$, 40 versus 44 percent lifetime dependence) (Dennis, Babor, et al., 2000; Dennis et al., in press).

The GAIN has also been cross validated with the much more detailed time line followback method using the Form 90 (Miller, 1996; Miller and Del Boca, 1994). A study of 114 adolescents entering residential treatment showed that they produced very similar estimates of the days of alcohol ($r = .84$) and marijuana use ($r = .85$), peak blood alcohol content levels ($r = .73$); after treatment discharge they also produced similar estimates to the days to the first use of alcohol ($r = .89$) and marijuana ($r = .96$) (Dennis et al., in press). Self-reports of past-month use by adolescents in residential treatment were also consistent with on-site urine tests for THC (50 ng/ml) at both intake ($\kappa = .53$) and follow-up ($\kappa = .69$) (Godley et al., in press). Relative to collaterals, adolescents reported about the same days of alcohol use and about a third more days of marijuana use at intake and follow-up.

The ATM cost study is being conducted by the Capital Consulting Corporation (CCC, 1999), using an accounting methodology based on generally accepted accounting principles (GAAP) and cost accounting standards (CAS) of the American Institute of Certified Public Accountants (AICPA, 2002, <<http://www.aicpa.org>>). The cost allocation methodology contains a specified allocation basis for each cost center within a substance abuse treatment program, ensuring that costs are uniformly allocated across programs being studied. To date, CCC has completed substance abuse treatment cost profiles for more than 1,000 programs being evaluated under CSAT grants. They provide each grantee with summary and individual level data on the number of service units provided, the average unit cost, and the total (accounting) costs. This includes admission and discharge dates, length of stay, hours of counseling (broken out by individual, family, substance abuse groups, and mental health groups), and units of counseling and other services (e.g., assessment, HIV testing and counseling, medical services, room and board, records management, case management, aftercare, transportation, and education). At the time this chapter was prepared, CCC was about half way through collecting and reporting the cost data.

IMPLICATIONS

The ATM program promises to advance research and actual practice in the area of adolescent substance abuse treatment in several ways. First, ATM will be among the first efforts to manualize and evaluate step-down and/or continuum of care models. Second, it provides large samples of Native American, African American, Hispanic, and female adolescents entering treatment. Third, it provides a wide scope of arrangements between the substance abuse treatment and criminal justice systems that increasingly play a critical role in public policy. Fourth, the ATM grantees have replicated earlier efforts with adolescents (Dennis, Babor, et al., 2000; Dennis, Scott, et al., 2000; Scott and Dennis, 2000) to achieve high follow-up, are doing significant work on measurement, and have been able to address many of the other key barriers that have limited earlier efforts. This book and the ongoing work of CSAT and its ATM grantees promise to lay the foundation for improving actual practice in community-based treatment.

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