

REGULAR ARTICLES

Improving Continuity of Care in a Public Addiction Treatment System with Clinical Case Management

A. Thomas McLellan, Ph.D., Rosalyn L. Weinstein, MCAT,
Quansheng Shen, Ph.D., Connie Kendig, B.A., Marvin Levine, M.A.

Philadelphia attempted to expand the access to and continuity of addiction treatment by focusing on the 15% of patients who received multiple, detoxification-only (MDO) treatments each year. Clinical Case Managers at five detoxification centers encouraged MDO patients to continue care following detoxification in methadone, residential, or outpatient rehabilitation, and sustain improvements, and they recommended opening detoxification access for additional patients as well. System administrative information was available for one year prior and three years during the intervention. Counts of unduplicated patients within each year and measures of the length and type of treatment episodes determined the intervention effects. Records from a sub-sample of 100 MDO patients were examined to assess specific changes in system utilization. Over three years, 890 MDO patients were case managed and had received assessment, referral, and transport to health care and sober living. The sub-sample of case-managed MDO patients showed a 55% reduction in detoxification-only admissions, a 70% increase in use of rehabilitation, and a twenty-day increase in the average length of stay per episode. Though there are noted limitations in the evaluation design, the findings are consistent with the view that individual case management of MDO patients may improve the clinical appropriateness and administrative efficiency of public addiction treatment. (Am J Addict 2005;14:426–440)

There is now substantial evidence suggesting that substance abuse treatment can be effective in reducing addiction-related problems such as crime,

Received August 22, 2003; revised January 26, 2004; accepted May 23, 2004.

From the Treatment Research Institute, Philadelphia, Pa. (Drs. McLellan and Shen, Ms. Weinstein and Ms. Kendig); and the Coordinating Office for Drug and Alcohol Abuse Programs, Philadelphia, Pa. (Mr. Levine). Address correspondence to Dr. McLellan, Treatment Research Institute, 600 Public Ledger Bldg., 150 S. Independence Mall (West), Philadelphia, PA 19106. E-mail: tmclellan@tresearch.org.

unemployment, and welfare; inappropriate healthcare utilization; and spread of infectious diseases.¹⁻⁹ At the same time, there is an indication of insufficient capacity to provide adequate, high-quality substance abuse treatment, especially for substance abusers whose care would be supported by public funds such as Block Grant, Veterans Administration, and/or Medicaid dollars. Indeed, increasing access to addiction treatment has been a prominent goal of the Office of National Drug Control Policy's Performance Measures of Effectiveness (PMEs) for most of the past decade.¹⁰ In recognition of the importance of making quality substance abuse treatment more accessible within the public sector, the Center for Substance Abuse Treatment at the Substance Abuse and Mental Health Services Administration authorized a national program to expand and enhance treatment capacity within the public sector, called the Targeted Capacity Expansion Program.¹¹

It might seem that the expansion of treatment capacity would be a relatively simple matter of increasing the number of available inpatient beds and/or outpatient treatment slots. However, a closer examination of the factors affecting treatment capacity and treatment access within the public treatment system shows a more complex picture. For example, patient utilization practices themselves can act to restrict access. Many of those who wish to enter the public addiction treatment system are among the most severely affected by active substance use and combinations of physical and psychiatric illnesses.^{2-6,11,12} Most of these patients require some period of acute care and stabilization (eg, detoxification) if they are to be able to take advantage of the continuing care available in longer-term forms of rehabilitation.

While the symptoms of substance withdrawal are often the most severe and troubling to patients (serving to motivate them to get care), these symptoms are often the most rapidly resolved and can lead even

severely affected patients to assume that "the worst is over" and that they "can handle it now." Unfortunately, as has been documented since the early 1970s, detoxification that is not followed by continued rehabilitation regularly results in rapid relapse and, all too often, requests for re-detoxification.

In Philadelphia, a study by the Coordinating Office for Drug and Alcohol Abuse Programs (CODAAP) found that 40–50% of all substance abuse treatment episodes in the publicly supported treatment system were "detoxification-only" treatment episodes and not followed by any type of continued rehabilitative care. In fact, 10–15% of patients treated during any year were re-detoxified three or more times in that year, almost always without continuing care of any type. Here, we refer to those patients who had been detoxified three or more times in one year as "multiple detoxification-only" (MDO) patients.

From a purely clinical perspective, these MDO patients were not receiving appropriate continuing clinical care for their problems.³⁻⁶ From a health systems management perspective, the repeated use of these expensive acute-care services was a major source of system inefficiency. Moreover, because detoxification and stabilization is a necessary first step for most publicly supported patients in their treatment episodes and some of these scarce detoxification beds were being re-occupied multiple times by a small group of MDO patients, this inefficient, expensive utilization of the system had the additional perverse effect of reducing treatment access for other patients.

THE TARGETED CAPACITY EXPANSION INTERVENTION IN PHILADELPHIA— RATIONALE AND CLINICAL APPROACH

The occasion of grant support from the Center for Substance Abuse Treatment for Targeted Capacity Expansion¹³ provided

Clinical Case Management Improves Addiction Treatment

the impetus to improve the access to and the clinical efficiency of the Philadelphia public addiction treatment system—not through the creation of new treatment beds or slots, but by developing clinical management procedures that would address the access and efficiency problems created by the MDO patients at detoxification sites.

One direct approach to solving these problems would be an administrative directive to simply deny repeated detoxifications. The CODAAP management team rejected this solution on three grounds. First, such an approach was prejudicial, as there are no restrictions on acute care utilization for public patients seeking treatments for any other chronic illnesses. Second, simply denying detoxification would not address the substantial public health and public safety problems caused by these patients, such as crime, transmission of infectious diseases, and a reduced quality of life for the public. Finally, the administrative denial of detoxification admissions could lead these patients to make greater use of even more expensive and scarce medical services such as Emergency Rooms and psychiatric Crisis Response Centers.

Instead, the CODAAP management adopted a clinical approach to solving the proximal problem of the MDO patient and thereby the more distal problem of offering better access and more appropriate care utilization within the system. Specifically, the CODAAP management team employed Clinical Case Managers (CCMs) to manage and monitor the MDO patients as a way of encouraging them to continue in more appropriate and less expensive rehabilitative care and improving detoxification bed access by reducing the large number of re-detoxifications.

These CCMs were trained to motivate the historically recalcitrant MDO patients to complete their detoxification treatments and to engage in any type of continuing rehabilitation care, including residential,

methadone maintenance, or outpatient programs. The CCMs also arranged for supportive services during and following rehabilitation, both to support the gains made during rehabilitation and to quickly manage early lapses on an outpatient basis before they became serious enough to warrant inpatient detoxification.

CODAAP management turned to Clinical Case Management for this because of a prior successful project in which CCMs were effective in promoting retention in outpatient rehabilitation and improving the post-treatment outcomes of substance-abusing clients within the Philadelphia public substance abuse treatment system.¹⁴⁻¹⁶

While case management is still not widely used within most substance abuse treatment systems, there is research showing that case management can be effective in improving the efficiency of general health system utilization, for example, by reducing the expensive, repeated use of emergency room services.¹⁷⁻¹⁹

Here we present the results of the three-year evaluation of Philadelphia's effort to use CCMs to manage and monitor "multiple detox-only" (MDO) patients. It is important to note at the outset that this intervention was not conceived as an experimental study but rather as an extension of a treatment philosophy and clinical practices that had been used for years within the Philadelphia treatment system.¹⁶

Thus, there was no control condition and no consent on the part of patients to participate in any data collection activities. Moreover, it was felt that management-appropriate "indicators" of intervention effectiveness that could be collected, analyzed, and reported quickly and inexpensively were preferable to experimentally rigorous but time-consuming and delayed outcome measures. With this in mind, the evaluation effort used only the existing information from the administrative claims records of the public treatment system. These administrative claims were available

for the year before the intervention (1997–1998), the transition year while the intervention was being implemented (1998–1999), and for two subsequent years during which the CCM intervention was fully operational (1999–2001).

Evaluation Questions

There were two questions regarding the use of CCMs in these public sector addiction treatment programs.

1. *Would the more severely affected and poorly motivated MDO patients respond to the efforts of the CCMs?* One of the paradoxical problems was that the treatment system had been providing access to the acute, inpatient detoxification services that were most desired by these MDO patients. Would these patients accept efforts to change their treatment system utilization toward longer-term, outpatient rehabilitation?
2. *Would the CCM efforts be associated with more appropriate treatment system utilization among the MDO patients?* Improved treatment system utilization would be characterized by longer lengths of stay per treatment episode, fewer “detoxification-only” treatment episodes, and more “detoxification + rehabilitation” or “rehabilitation-only” treatment episodes.

The administrative claims data permitted a simple time-series comparison across years as characterized above. In addition, a sub-sample of 100 MDO patients was followed over the course of three years to study the specific effects of case management on this sample of the targeted MDO population. While not an experimental test of the CCM intervention, the available data offered some indication of the acceptability and benefits of the intervention within the Philadelphia public substance abuse treatment system.

METHODS

Treatment Programs

The performance sites were the five largest detoxification programs within the city of Philadelphia. These five large sites accounted for approximately 50% of all admissions to the public treatment system in Philadelphia and approximately 80–90% of all detoxification admissions. All five programs were licensed, inpatient, medically-managed detoxification programs. Four of the sites were affiliated with hospital treatment systems, while the other was affiliated with a large, dedicated substance abuse treatment system. All were non-profit agencies that had been providers of detoxification and ongoing treatment services to public sector patients in Philadelphia for many years.

Clinical Case Managers

Two Clinical Case Managers (CCMs) were assigned to each of five programs. Five of the CCMs were male. Two CCMs were Hispanic, four were African American, and four were European-American. Most of these CCMs had been drug and alcohol counselors working in and familiar with the Philadelphia public treatment system for several years (average, six years, range, 3–10).

Subjects

Subjects included the total population of individuals admitted to any of these five sites from July 1997 through June 2000. Because the only data available were the administrative claims, only the very basic demographic information on the population of patients admitted to the participating treatment programs can be provided. This information is displayed in

Clinical Case Management Improves Addiction Treatment

TABLE 1. Demographic Characteristics of Detoxification Population (by Year)

	Base Year 6/30/97–6/30/98	Project Year 2 6/30/98–6/30/99	Project Year 3 6/30/99–6/30/00	Project Year 4 6/30/00–6/30/01	Stat. Signif.
Age (Mean)	37 (12)	37 (10)	38 (12)	38 (12)	NS
Gender: % male	71%	71%	70%	70%	NS
Race					
Afro-American	59%	54%	53%	52%	0.01
Euro-American	26%	33%	34%	33%	0.001
Hispanic-American	9%	7%	6%	8%	NS
Other	5%	4%	5%	5%	NS
Unknown	1%	2%	2%	2%	NS

Table 1. As can be seen, there were no changes in the average age (37 years) or in the distribution of males and females entering treatment (70% male) over the four years of study. With regard to the ethnic distribution of these patients, there were only two changes over the course of the four years: a statistically significant but practically modest reduction of about 7% in the number of black admissions, and an increase of about the same magnitude in the number of white admissions.

Admission drug codes recorded in the claims data indicated that the modal drug problems presented by admissions to these detoxification programs were cocaine (56%), alcohol (46%), and heroin (33%); however, the great majority of admissions reported multiple drug problems, usually cocaine, alcohol, and marijuana. There were no significant differences in the distribution of drug problems over the course of the four years. While these data offer an approximate indication of the types of drug problems treated within these five detoxification sites during the course of the present evaluation, there was no available quantitative information on the drug use patterns, health problems, and employment and family issues that are so often affected among inner-city, publicly funded, substance abuse patients.^{2,4-6}

“Multiple Detoxification-Only” Patients

MDO patients were defined as those who had been admitted to any inpatient detoxification within the CODAAP system three or more times in the prior twelve months. In fact, the number of detoxification-only admissions per MDO patient per year ranged from three to seventeen. Thus defined, this group comprised 12–15% of all admissions to these programs in any of the study years.

Records indicate that 260 patients met the criteria for MDO and received Clinical Case Management during the first year of the implementation (1998–1999), 325 in the second year (1999–2000), and 305 in the last year of the intervention (2000–2001), or 890 unduplicated patients across the full three-year period of the intervention. When these MDO patients were initially contacted for the intervention, CCMs collected some additional information using the brief GPRA (Government Performance and Results Act) form designed by the Center for Substance Abuse Treatment. The GPRA covered the demographic characteristics, treatment history, substance use, and health and social problems presented by these patients. It was not possible to collect this information on the other

TABLE 2. Background Characteristics and Problem Severity of 890 MDO Patients

Age	38 (12)
Gender: % male	65%
Race	
Afro-American	31%
Euro-American	55%
Hispanic ethnicity	9%
Years education	11
Living conditions, past month	
Street	7%
Shelter	5%
Institution	6%
Employment/training, past month	
Employed full or part time	11%
In school or training, past month	3%
Days of substance use, past month	
Alcohol, 5+ Drinks	9
Heroin	7
Cocaine	6
Benzodiazepines	4
Percent injecting drugs, past month	46%
Institutional utilization, past month	
Percent incarcerated	10%
Percent admitted to ER	23%
Percent admitted to hospital	51%

detoxification patients who did not meet MDO criteria.

Table 2 presents some background and problem severity information on the group of 890 case-managed MDO cases. As can be seen, this MDO group was approximately 40 years old and one-third female (35%), and they had about the same racial composition as the total admission population. There was substantial instability of living arrangements reported by this group of patients, with 18% living almost full time on the streets, in a shelter, or in one or more institutional settings (jail or hospital) in the month prior to their interview. Only 11% of these patients reported any type of employment in the month prior to

their admission, and only 3% were enrolled in any type of school or vocational training program.

The remainder of Table 2 shows that almost half of these patients (46%) admitted to injecting drugs at least once in the month prior to their interview, in addition to heavy use of alcohol (five or more drinks per day). The major drugs used were heroin, cocaine, and benzodiazepines approximately once or twice weekly. This level of substance use is quite high considering that most had spent a significant portion of their prior month in one or more types of controlled, institutional environments. In this regard, 51% had been admitted to a hospital (general medical or psychiatric), 23% had been admitted to an Emergency Room, and 10% had been in a jail or prison during the prior thirty days, illustrating the broad, regular, and expensive pattern of public service utilization by these patients.

Clinical Procedures

The CCMs received initial and ongoing training by the Coordinating Office for Drug and Alcohol Abuse Programs in performing individual, comprehensive assessments; motivational interviewing; and procedures in the administrative, legal, and functional workings of the city treatment system. Regular team meetings of all CCMs were held on a monthly basis to allow the sharing of common problems, the development of methods to solve the problems, and the acquisition of needed services for their patients. Caseloads were purposely kept low (fifteen or fewer patients) in recognition of the intensity of the effort likely to be needed by these patients.

Because of their extensive treatment histories, most of the MDO patients were easily identified at the time of detoxification admission. When this was not the case, the administrative records of prior treatment

Clinical Case Management Improves Addiction Treatment

were available shortly following admission, and it was possible for the administrative staff at each of the sites to notify the project CCMs of any patient whose recent treatment history made them eligible for the intervention. Clinical Case Management had been in use for many years within the Philadelphia treatment system¹⁵ and was considered the standard form of clinical intervention for all eligible MDO patients who entered these five sites. Although CCMs did ask eligible patients whether they wished to participate in the intervention, the presentation was that this service was part of the normal treatment package. Exact information on number of refusals was not available, but CCMs reported that very few patients refused case management, as it often involved desired services such as transportation and even some housing.

Clinical case management was designed to do three things for the MDO clients. First, the CCMs were expected to engage these patients early in their detoxifications and to assess their substance use, health, and social problems. Second, the CCMs were trained in motivational interviewing that was designed to help patients recognize and accept the need for continued care. Finally, because these MDO patients were known to be severely impaired in many ways that would require both basic services (eg, shelter, clothing, and transportation) and specialized services (eg, primary medical care, psychiatric care, employment counseling, and legal aid), CCMs were expected to play an active, participative role in helping the patients access and continue with needed medical and social services.

Access to all ancillary services was handled by the CCMs through standard appointments and referrals, and often by accompanying the patient to the service appointments. Of course, there was an ongoing effort to encourage the patients to continue in some form (their choice) of addiction care in residential, intensive outpatient, traditional outpatient, or

methadone maintenance. In addition to referring and engaging patients into ongoing addiction treatment, CCMs were expected to collaborate with the treatment team at the rehabilitation program and maintain contact throughout the course of that treatment. Most of the rehabilitation treatments focused almost entirely on drug and alcohol use; thus, the CCMs were trained to play a complementary and supportive role within the rehabilitation effort by linking patients to supplemental medical and social support services toward the goal of maintaining and enhancing the rehabilitation efforts.

Evaluation Procedures

Time Frame for the Evaluation. The CCMs were recruited, hired, and trained from approximately November 1998 through February 1999. Caseloads were assigned as each CCM completed training, but full operation was not achieved until approximately July 1999. Two of the original five sites discontinued detoxification services in the spring of 2000, although Clinical Case Management continues today in the remaining three treatment programs.

For purposes of the evaluation, we constructed a file containing all administrative claims records for all admissions to these five substance abuse treatment programs for four, successive, twelve-month periods (July 1–June 30) from 1997 through 2001. We considered the 12-month period of July 1997 through June 1998 as the pre-intervention year, 1998–1999 as the transition year, and 1999–2000 and 2000–2001 as the intervention years. This construction offered a time-series design for the evaluation of the CCM intervention.

Administrative Data Sources. As indicated, one of the charges for our evaluation was to use only existing information to monitor the administrative and clinical appropriateness of treatment system utilization. To these ends, we used the administrative claims

data from Philadelphia's not-for-profit managed care entity Community Behavioral Health (CBH), and from a CODAAP component created to manage additional state funds allocated for substance abuse treatment. Administrative records in both systems used the same data structure and client identifier; thus, it was possible to combine them into a unified record of all treatment services received during the years covered by the evaluation.

This combined data set included admission date, service type (ie, treatment modality), and service endpoint information on all patients initially admitted through one of the targeted detoxification sites in the Philadelphia public treatment system. Importantly, these records of care utilization also included times of admission and date of last service receipt from each treatment component or modality within the network, enabling us to construct a treatment episode for each new admission. These records also included services for psychiatric and emergent care (but not primary medical care) for all clients, enabling us to detect any shifts in utilization patterns between mental health and substance abuse oriented services.

Clinical Services Information. CODAAP required each of the CCMs to complete a Case Management Services Monitor for each patient served. This administrative form was a checklist of services provided to each patient served in any way. This brief (40-item) listing of contact dates and services provided (eg, referral to shelter, counseling sessions, physician appointments, vocational assessments, etc.) required fewer than five minutes to complete for each client and served as a simple record of the nature and types of services provided by CCMs (directly and through referral) to each of their clients. While the data were collected on all patients, a change in the form following the first year made comparisons across years impossible. In order to

get a direct estimate of the effects of clinical case management, we selected the service monitor records from a sample of the first 100 case-managed patients admitted during 1999 to analyze. We chose this sample because it was drawn during the period of full operation of CCM services and prior to the change in the service form. While not explicitly randomly selected, the selection was not biased, and we believe that the data offer at least one reasonable indication of the number and types of services provided by the CCMs.

Definition of a Treatment Episode. The combined record for any individual client often contained a series of admissions and discharges to one or more modalities and settings of care (eg, detoxification or intensive outpatient). Completely integrated care would be evidenced by a discharge from a detoxification followed by admission to some form of continuing rehabilitation care the following day—one continuous treatment episode with no breaks in service. In fact, there were many system impediments to this idealized form of care. For example, there were often waiting lists for appointments to various modalities of care that would necessitate breaks in service. In addition, it was not always possible for a patient to take long and continuous amounts of time away from other responsibilities. Finally, there were system problems in accurately recording starts and stops for the various treatment components.

These considerations figured into our decisions regarding what would constitute a true break in service or separate episodes of care. Our operational definition of an episode of treatment was the receipt of any addiction session or service, preceded and followed by thirty days of no recorded visit to any service in the system. Thus, a detoxification followed 29 days later by admission to a residential, methadone, intensive, or traditional outpatient treatment program would be counted as a single

episode of treatment. However, if that detoxification were followed by no system contact for 31 days and then an admission to a residential program, we counted two episodes of care, one “detoxification-only” and one “rehabilitation-only.”

As might be expected, there was a very wide variety of treatment episode sequences and lengths. To focus our analyses, we concentrated on detoxification-only (detoxification preceded and followed by at least thirty days of no system contact); detox + rehab (detoxification followed within thirty days by admission to residential, methadone maintenance, intensive outpatient, or traditional outpatient care); and rehabilitation-only (admission to any of the previously specified rehabilitation modalities preceded and followed by thirty or more days of no system contact). These three types accounted for more than 70% of treatment episode typologies throughout all years of the study.

RESULTS

Analyses of the Case Managed Patients

Services Provided by the CCMs. A specific goal of the study was to determine if the MDO patients who had been specific targets of the clinical case management had actually received the services intended as part of the intervention. In this regard, the CCMs averaged 9 active cases during the first year of operation, 12 cases in the second year and 14 in year three. On average, each of these cases received approximately 26 contacts per episode, of which 11 were face-to-face contacts and 15 were over the telephone. Contacts between a CCM and a service agency to arrange for support services on behalf of a patient(s) were counted even if the patient was not present.

As described previously, the case management was initiated early in the course of the detoxification episode but

continued for as long as one year in an effort to support, facilitate, and sustain rehabilitation-oriented recovery. Not surprisingly, the major patient problem areas serviced by the CCMs were substance abuse, physical and mental health, and legal problems. Assessment, negotiating a service plan, and problem solving were the major activities (virtually all face-to-face) performed by the CCMs. In addition, contacting the substance abuse rehabilitation program and other types of social and medical service agencies also comprised a significant amount of case management time. Providing transportation for the client and physically accompanying patients to service appointments were also regular activities.

Treatment Utilization Patterns for 100 Case-Managed Patients—Prior to and Following Initiation of Case Management Services. To address this issue, we focused on the first 100 MDO patients who received CCM services in the first full year of intervention implementation (year 3, July 1999–June 2000). We compared the nature and amount of treatment system utilization among that sample for two years prior and one year following their receipt of case management (see Figure 1).

Type of Treatment Episode. As indicated, the sample of 100 MDO case-managed patients was drawn from the admissions during year 3. Fifty-six of those 100 patients had been detoxified in year 1 (July 1997–June 1998), and 86 had been detoxified in year 2 (July 1998–June 1999), indicating that the pattern of repeated detoxifications was not confined to one year. In this regard, it was interesting that only 45 of these 100 MDO patients received detoxification in year 4, the year following the initiation of the case management. As can be seen in Fig. 1, 60–68% of the treatment episodes of these MDO patients were detoxification-only episodes in the two years prior to their introduction to the CCMs, and only

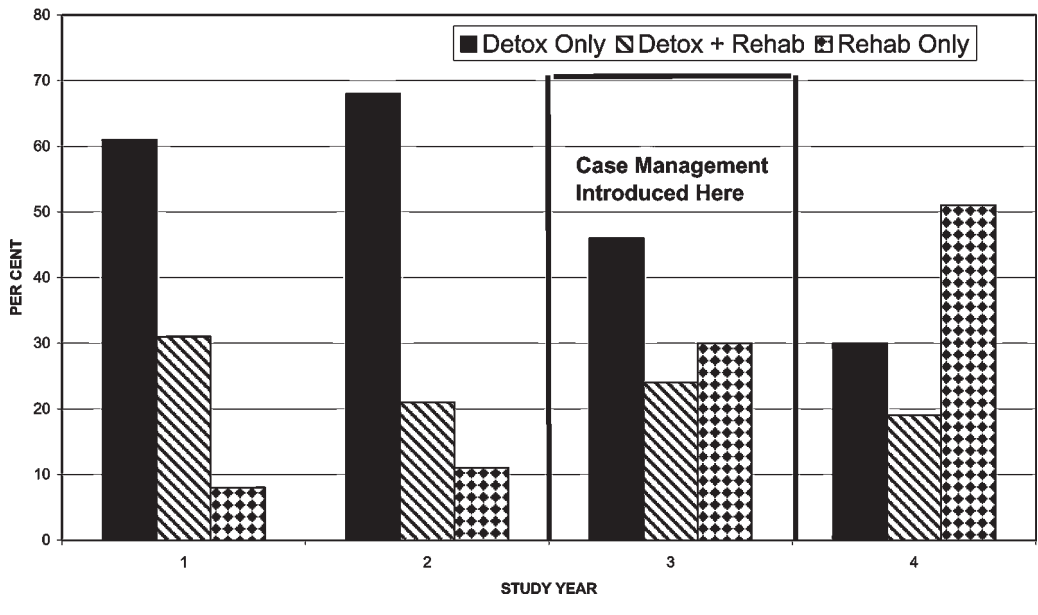


FIGURE 1. Types and proportions of treatment episodes by year among 100 case-managed clients.

20–30% of those episodes included rehabilitation. There was a significant reduction in the proportion of detoxification-only episodes following introduction of the CCMs (year 2 to year 3; chi square 6.9, $p < .001$) and an additional significant reduction (chi square 7.4, $p < .001$) from year 3 to year 4. Similarly, there were corresponding increases in the proportions of detox + rehab and rehabilitation-only treatment episodes from years 2 through 4 (all chi square values, $p < .01$).

Length of Treatment Episodes. We also analyzed the length of the treatment episodes among this sample of 100 case-managed MDO patients across the same time periods. The average length of a treatment episode in the years prior to case management was approximately 7–8 days, but this increased in year three to approximately 23 days and in year four to approximately 28 days ($F = 26.7$, $p < .0001$). Of course, the

short-term stays in the first two years were due to the preponderance of detoxification-only episodes.

An examination of the years 3 and 4 data indicated that many opiate-dependent MDO patients had been referred and admitted to methadone maintenance treatment. This was a change in itself, as there had been only two methadone maintenance episodes among these patients during the two years prior to the clinical case management. As a way of examining whether the increases in length of stay were due only to those methadone-referred patients, they were eliminated from the analyses and the results were reanalyzed for the remainder who had not entered methadone maintenance. These analyses also showed significant ($F = 5.7$, $p < .01$) increases in average length of stay from the years prior to the clinical case management (approximately seven days) to the years after initiating the case management (twelve days in year 3, eighteen days in year 4).

Clinical Case Management Improves Addiction Treatment

Comparison of Clinically Case-Managed MDO Patients with "Average" Patients. One of the main management methods used by many managed care organizations is to identify "outliers" and "variability" among samples of patients in treatment or among practitioners—and then to focus efforts on reducing that variability. In this regard, it is reasonable to question the extent to which the case management intervention was successful in bringing the treatment utilization patterns of the MDO patients closer in line with the utilization patterns of the "average" patient in the system, patients whose treatment utilization had not been considered problematic.

To this end, we compared those MDO patients who had been case-managed during the third and fourth years of the study to the remainder of the patient population who had entered these treatment programs in those years, using the three measures of system utilization previously reported. These comparisons are shown in Table 3.

Surprisingly, the treatment utilization characteristics of the case-managed MDO patients in years 3 and 4 were in several respects more clinically appropriate than those of the non-case-managed patients admitted during the same year. For example, there was a significantly lower proportion of detoxification-only episodes

among case-managed MDO patients than was seen among all other patients in both comparison years (chi squares = 23.4 and 11.6; $p < .01$). In addition, the case-managed MDO patients exhibited a greater proportion of detox + rehab episodes than was seen in the remaining patients for both of the years examined (chi square = 13.6 and 119.1, $p < .01$). There were no differences between the groups ($p > .10$) in any of the other aspects of treatment utilization measured, despite the fact that the MDO patients had been specifically selected because of their generally inappropriate treatment utilization patterns.

System Level Analyses

The funding for the CCM intervention had been provided through a CSAT grant designed to increase system capacity—in this case, the number of individuals entering the five-program system. In fact, our analyses showed a substantial increase in the total, unique admissions over the first three years of study ($F = 23.45$, $p < .0001$). Specifically, there was a 56% increase in admissions between the pre-intervention year and the transition year, and there was an additional 9.5% increase in total number of unique admissions

TABLE 3. Treatment Utilization Patterns in 100 Case-Managed MDO Patients Compared with All Other Patients Admitted in That Year

	Year 3 (1999–2000)		Year 4 (2000–2001)	
	CM Patients	All Other	CM Patients	All Other
Number of patients	325	6765	305	6491
Detoxification only	43%*	48%	39% [†]	46%
Detoxification + rehab	15%*	10%	17% [†]	10%
Rehabilitation only	9%	7%	11%	8%
Average LOS/episode	14 days	16 days	17 days	15 days

* = $p < .05$.

[†] = $p < .01$.

Comparisons are with the corresponding "all other" group.

between the transition year and the first year of full implementation.

We had expected an increase in total admissions based on a reduction in re-detoxifications and detoxification-only admissions. In fact, there was a significant reduction in the proportion of re-detoxifications from the pre-intervention year (16%) to the transition year (11%), a slight increase in the first full year of the intervention (12%), and then another decrease in the last year of study (8%) ($\chi^2 = 14$, $p < .001$). It was interesting that the maximum number of detoxifications received by any patient in the pre-intervention year (1997) was 17; 24% of patients had a re-detoxification and 2% of patients had five or more detoxifications in that year. By 2001, the maximum number of detoxifications was 6, and only 13% of patients had more than one detoxification within that year.

As was seen in our analyses of the case-managed MDO patients, we saw a significant decrease in the proportion of detoxification-only admissions from the pre-intervention year through the transition year and throughout the two subsequent years of implementation (chi square 6.78, $p < .0001$). There were also corresponding increases in the proportion of detoxification-plus-rehabilitation and rehabilitation-only admissions over the same time period—again, both statistically significant ($p < .001$). Additional analyses showed a significant increase in the average length of treatment episodes across the years of study from approximately 7.6 days during the pre-intervention year to approximately 16.9 days by the second year following implementation of the intervention ($F = 8.91$, $p < .001$).

DISCUSSION

Like many other cities, Philadelphia needed to expand access to substance abuse

treatment in its Medicaid- and state-funded system that was already filled with patients. Under stimulation from a Center for Substance Abuse Treatment (CSAT) grant to expand treatment capacity,¹¹ Philadelphia decided not to simply add beds, but to improve utilization of the existing beds, thereby creating better access and broader utilization. Specifically, Philadelphia decided to focus on the group of patients characterized by multiple admissions to detoxification not followed by any type of continuing rehabilitative care. While detoxification is typically necessary to stabilize patients, decades of research indicate that detoxification by itself is not sufficient to initiate the longer-term behavioral and social changes that are necessary for lasting rehabilitation.^{1-3,6,9,11} Thus, the typical result of most detoxification-only admissions is rapid relapse and return to treatment.

The inappropriate utilization of the public substance abuse treatment for short-term, expensive, and clinically inadequate care was creating a bottleneck in the treatment system, effectively denying access to others. In fact, in 1997, the first year that CODAAP had electronic records, over 45% of all episodes within the public addiction treatment system were detoxification-only, and 15% of individuals treated within the Philadelphia public treatment system had three or more detoxifications in that year. It was hypothesized that if this group of MDO patients could be motivated and supported to continue in rehabilitation-oriented treatment in the existing network of residential and intensive outpatient programs, it could be clinically beneficial for them and would also serve to open access to the treatment system by relieving the bottleneck created by the repeated use of these expensive detoxification services.

It is important to stress that this intervention was not considered an experiment, thus, there was no control or comparison group of MDO patients that did not receive

Clinical Case Management Improves Addiction Treatment

the clinical case management. As evaluators of this effort, the authors were asked to use just existing databases, permitting only a very simple, descriptive, time-series examination of changes in system utilization across the years of the study.

Consistent with the logic of the case management intervention at the individual patient level, analyses from a sample of 100 case-managed MDO patients did show marked reductions in their detoxification-only admissions (67% to 30%), increases in rehabilitation utilization (30% to 70%) and increases in average length of stay per treatment episode (6.4 days to 27.6 days) between the year before they received clinical case management to the year following the receipt of those services. In fact, when patterns of treatment utilization were compared between the case-managed MDO patients and the remaining population of admissions—those that had no prior indication of heavy system use—the MDO patients showed significantly fewer detoxification-only admissions and more detoxification + rehabilitation admissions.

Consistent with the logic of the intervention at the system level, there were significant increases in the total number of admissions, reductions in re-detoxifications (from 16% to 8% of all admissions) and in detoxification-only admissions (54% to 44%), and an increase in rehabilitation admissions (23% to 40%) and in average length of stay per episode (7.6 days to 16.9 days) between the year prior to the intervention and the last full year of the intervention.

Were These System-Level Changes Caused by the CCM Intervention?

The amount and patterns of treatment utilization among the MDO patients were substantially and positively changed following the introduction of the Clinical Case Managers. Further, and as predicted at the

start of the intervention, there were broader changes in the treatment utilization patterns of the substance abuse patient population admitted to these five detoxification programs. The facts that these changes were consistent with the a priori predictions of the intervention and that they followed the time course of the intervention implementation make it tempting to conclude that the Clinical Case Management *caused* the positive outcomes at the individual patient level and, through those patients, at the broader system level.

While this is an appealing and even plausible possibility, there are other possible explanations for these findings. For example, the changes seen could have been simply the effect of differential admission policies that might have diverted the more problematic MDO patients outside the system. Interviews with the members of the CODAAP and CBH administrations indicated that there were no such changes in administrative or fiscal policies during the course of the project. However, during later years of the intervention (1999–2001) CBH and CODAAP encouraged and supported sober community housing. We did not formally evaluate the impact of this parallel intervention, but this type of supported care was only available to very few patients.

It is also possible that the observed pattern of clinically and economically more efficient treatment utilization seen among the MDO patients was part of larger, system-wide management or policy changes. Indeed, the development of the Community Behavioral Health management organization was in part a recognition of the economic and public health importance of better system management, and it did attempt to encourage more clinically appropriate system utilization, particularly the use of intensive outpatient rehabilitation. Thus, it remains possible that this system-wide intervention was also an important influence.

Finally, it is also clear from our formal interviews and informal conversations with the CCMs that their availability at the detoxification sites produced effects that were not confined to the MDO patients. Again, with the background influence of greater system management by CBH, the development of community resources such as the supportive sober housing and the availability of CCMs who had been trained to identify and access health and social services for their patients, we believe the CCMs acted in concert with some of the existing counselors and other staff at the five treatment sites on behalf of some of the non-MDO patients. Again, it is not possible from our evaluation to know the extent of this involvement, but it is believed that it is a factor in accounting for the broader pattern of results observed.

Limitations

There were some positive aspects to the design and procedures, such as the use of the existing claims data to increase the objectivity of the analyses and to provide CODAAP and CBH administration a useful and inexpensive method of monitoring changes in treatment system utilization. Another positive feature of the evaluation was the availability of four years of data on which to perform the time-series analyses. However, it is obvious that there are significant inferential limitations to our evaluation design, as discussed below.

First, it bears repeating that the evaluation of the intervention was not constructed as an experimental test. As the intervention was instituted in those centers that comprised approximately 80–90% of all detoxifications within the Philadelphia treatment system, and the remaining detoxification cases were spread throughout a very wide set of substance abuse programs, it was not possible to examine patterns of treatment utilization among MDO patients

who did not receive the intervention. In addition, to assure maximum implementation of the planned intervention, the Clinical Case Management was designed as part of standard clinical care for all patients who met MDO inclusion criteria. The positive feature of this decision was that it allowed the CCMs to intervene with all patients, with very few rejecting the additional assistance. However, without a control group of detoxification sites or of MDO patients that did not receive the intervention, it is not possible to know if the observed changes in treatment utilization were due to the intervention or merely reflective of a broader set of management initiatives.

CONCLUSIONS

The Clinical Case Management intervention that was applied to the Multiple Detoxification-Only segment of the Philadelphia public substance abuse patient population was implemented in the manner intended across the five target sites, was *associated with* changes in treatment system utilization among that targeted population in the manner intended, and was *associated with* the predicted changes in treatment utilization. These changes were clinically significant, temporally consistent with the implementation of the intervention, and specifically predicted as part of that intervention.

From a research perspective, these results are only suggestive of a causal role for the CCM intervention and will require replication with a stronger design and more detailed data. However, research findings are not the only considerations in health policy determinations. Those responsible for the public addiction treatment system in Philadelphia have been influenced by the fact that these system improvements were both clinically and administratively appealing and that the intervention was well accepted by the treatment system.^{15,16} For

Clinical Case Management Improves Addiction Treatment

these reasons Clinical Case Management for “hard to treat” patients will continue to be included as a standard part of treatment care in the Philadelphia public addiction treatment system.

Support for this project was provided by grant #5 H79TI11521 from the Center for Substance Abuse Treatment at the Substance Abuse and Mental Health Services Administration, Rockville, Md. (Dr. McLellan).

REFERENCES

1. Institute of Medicine (IOM). *Broadening the Base of Treatment for Alcohol Problems*. Washington, DC: National Academy Press; 1990.
2. Institute of Medicine (IOM). *Managing Managed Care: Quality Improvement in Behavioral Health*. Washington, DC: National Academy Press; 1997.
3. Gerstein D, Harwood H, eds. *Treating Drug Problems*. Vol. 1. Washington, DC: National Academy Press; 1990.
4. McLellan AT, Woody GE, Metzger D, McKay J, Alterman AI, O'Brien CP. Evaluating the effectiveness of treatments for substance use disorders: reasonable expectations, appropriate comparisons. In: Fox D, ed. *The Milbank Foundation Volume on Health Policy Issues*. New York: Milbank Foundation Press; 1995.
5. McLellan AT, Weisner C. Achieving the public health potential of substance abuse treatment: implications for patient referral, treatment “matching” and outcome evaluation. In: Bickel W, DeGrandpre R, eds. *Drug Policy and Human Nature*. Philadelphia, PA: Wilkins and Wilkins; 1996:14–18.
6. Simpson DD. Effectiveness of drug abuse treatment: review of research from field settings. In: Egertson JA, Fox DM, Leshner AI, eds. *Treating Drug Abusers Effectively*. Cambridge, MA: Blackwell; 1997:122–130.
7. Project MATCH Research Group. Matching alcoholism treatments to client heterogeneity: project MATCH posttreatment drinking outcomes. *J Stud Alcohol*. 1997;58:7–29.
8. Holder HD, Longabaugh R, Miller WR, Rubonis A. The cost effectiveness of treatment for alcohol problems: a first approximation. *J Stud Alcohol*. 1991;52:517–540.
9. Simpson DD, Joe GW, Brown BS. Treatment retention and follow-up outcomes in the Drug Abuse Treatment Outcome Study (DATOS). *Psychol Addict Behav*. 1997;11:294–301.
10. Office of National Drug Control Policy. *The National Drug Control Strategy, 1997*. Washington, DC: Office of National Drug Control Policy; 1997.
11. Lamb S, Greenlick M, McCarty D, eds. *Bridging the Gap: Forging New Partnerships in Community-Based Drug Abuse Treatment*. Washington, DC: National Academy Press; 1998.
12. Carise D, McLellan AT, Gifford L, Kleber H. Developing a national addiction treatment information system: an introduction to the Drug Evaluation Network System. *J Subst Abuse Treat*. 1999;17:67–77.
13. Center for Substance Abuse Treatment (CSAT). *Request for Proposals—Targeted Capacity Expansion*. Washington, DC: Center for Substance Abuse Treatment; 1998.
14. McLellan AT, Hagan TA, Meyers K, et al. Supplemental social services improve outcomes in public addiction treatment. *Addiction*. 1998;93:1489–1499.
15. McLellan AT, Levine M, Hagan TA, et al. Does clinical case management improve outpatient addiction treatment? *Drug Alcohol Depend*. 1999;55:91–103.
16. Gould F, Levine M, McLellan AT. Treating the substance abusing patient in the public sector: “medical necessity vs. social responsibility” in the Philadelphia Target Cities Demonstration Project. *J Subst Abuse Treat*. 2000;1:75–77.
17. Helliweil PE, Hilder PN, Ardagh MW. Frequent attenders at Christchurch Hospital’s emergency department. *New Zealand Medical Journal*. 2001;114:160–151.
18. Okin RL, Bocellari A, Azocar R, et al. The effects of clinical case management on hospital service use among ED frequent users. *Am J Emerg Med*. 2000;18:603–608.
19. Witbeck G, Hornfield S, Dallack GW. Emergency room outreach to chronically addicted individuals: a pilot study. *J Subst Abuse Treat*. 2000;19:39–43.