

THREE-YEAR OUTCOMES OF THERAPEUTIC COMMUNITY TREATMENT FOR DRUG-INVOLVED OFFENDERS IN DELAWARE: FROM PRISON TO WORK RELEASE TO AFTERCARE

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Delaware researchers have argued for a continuum of primary (in prison), secondary (work release), and tertiary (aftercare) therapeutic community (TC) treatment for drug-involved offenders. Previous work has demonstrated significant reductions in relapse and recidivism for offenders who received primary and secondary TC treatment 1 year after leaving work release. However, much of the effect declines significantly when the time at risk moves to 3 years after release. Further analyses reveal that program effects remain significant when the model takes into account not simply exposure to the TC program, but, more importantly, program participation, program completion, and aftercare. Clients who complete secondary treatment do better than those with no treatment or program dropouts, and those who receive aftercare do even better in remaining drug- and arrest-free.

Meeting the treatment needs of drug-involved offenders in the correctional system would appear to be important in reducing the burgeoning costs of incarceration and related criminal justice and social costs. Researchers have documented the high costs of drug abuse, not only to individual drug

This research was supported by NIDA Grant DA06124 and by NJ Cooperative Agreement #97-RT-VX-K004. We wish to thank Michael Antonio, Tiho Enev, Druretta Nichols-Jennings, and Daniel O'Connell for their help with the data. We also wish to thank the reviewers for their helpful comments. Correspondence concerning this article should be addressed to Steven Martin, Center for Drug and Alcohol Studies, University of Delaware, Newark, DE 19716-2582; e-mail: martin@udel.edu.

THE PRISON JOURNAL, Vol. 79 No. 3, September 1999 294-320
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users, but to taxpayers and communities as a whole (Harwood, Napolitano, Kristiansen, & Collins, 1984; Rice, Kelman, Miller, & Dunmeyer, 1990). These costs are especially significant for drug-involved offenders whose poor health status results in the use of expensive public health services, and whose cycles of relapse and recidivism result in repeated contacts with the criminal justice system (Leukefeld, Logan, Martin, Purvis, & Farabee, 1998). Analyses of 26,000 drug users contacted during the National AIDS Demonstration Research Program during 1987 through 1992 (Auerbach, Wypijewska, & Brodie, 1994), for example, found that those who had been incarcerated had significantly higher rates of drug use in general, and multiple drug use, daily drug injections, and unsafe needle use in particular (Inciardi, McBride, Platt, & Baxter, 1993). These and other data suggest that chronic drug users are found in the greatest concentrations among inmate populations (Chaiken, 1989; Leukefeld & Tims, 1988).

The rationale for improving outcomes is fundamental—any success in reducing drug use leads to reductions in criminal behavior, which, in turn, generates cost savings to other sectors of society. The major impetus for treatment alternatives in prison settings emerged during the mid-1980s in an attempt to stem the growing criminal justice costs, particularly those related to the custody and health care associated with rapidly increasing numbers of incarcerated drug users (Currie, 1998; Inciardi & Martin, 1993). However, until the 1990s, only a few studies had addressed either the clinical- or cost-effectiveness of drug abuse treatment (Apsler & Harding, 1991; Harwood, Hubbard, Collins, & Rachal, 1988; Hubbard et al., 1989). A recent and widely cited study, however, reported yearly savings of more than a billion dollars resulting from treatment, with the largest savings coming from reductions in crime and health care costs (California Department of Drug and Alcohol Programs, 1994).

Cost-effectiveness or cost savings are what concern policy makers most; but all studies of cost-effectiveness are dependent on the availability of outcome data. Apsler (1991) has listed factors that singly or jointly would improve treatment outcome research: measures on the variability among treatment programs, long project periods, objective validation of self-report measures, the cooperation of the treatment programs, large samples, multiple measures of treatment experience, and multiple measures of outcomes. Recently, Knight, Hiller, and Simpson (1999) have reiterated this list and added to it the need for common or at least comparable indicators across studies.

Correctional systems have long since recognized the need for identifying concentrations of drug users, implementing treatment programs to “captive” populations, and assessing drug treatment outcomes (Petersen, 1974).

However, the systematic assessment of specific, promising, effective, and replicable drug treatment programs for offenders did not advance concomitantly with the increases in inmate populations and the number of new programs. The dilemmas of conducting field studies that can be rigorously evaluated proved difficult to solve. Consequently, most assessments of program effectiveness were process rather than outcome oriented and did not incorporate multiple outcome criteria. Outcome research, when attempted, involved short follow-up time frames and included only limited use of comparison groups, standardized measurement instruments, multivariate models, and appropriate control variables (De Leon, Inciardi, & Martin, 1995; Fourcier, 1991; Rouse, 1991; Wexler, 1995).

Many of these shortcomings were addressed through research initiated during the early 1990s, when a number of studies began reporting encouraging initial results from the use of therapeutic community (TC) treatment programs for drug-involved offenders. Furthermore, the great majority of these TC programs were prison based (Graham & Wexler, 1997; Lipton, 1995). However, a few programs have extended treatment into the community after release from prison—either through transitional or work release programs, aftercare, or a combination of both (Hiller, Knight, & Simpson, *in press*; Inciardi & Lockwood, 1994; Knight, Simpson, & Hiller, 1996; Mello, Pechansky, Inciardi, & Surratt, 1997; Nielsen & Scarpitti, 1997; Wexler, De Leon, Thomas, Kressel, & Peters, 1999). Many of the studies reporting the effectiveness of prison therapeutic communities in reducing relapse and recidivism have documented significant effects, but usually over relatively short terms—6 to 12 months after release from prison (Lipton, 1995).

With respect to longer term study, in an earlier article the authors examined treatment effectiveness in the Delaware correctional system with respect to relapse and recidivism using a quasi-experimental comparison of four client groups. Because only two of the groups had been randomly assigned, a multivariate analysis was designed to control for group differences. The findings from those studies suggested significant improvements in outcome for those with both in-prison and postrelease TC treatment, at both 6 months (Martin, Butzin, & Inciardi, 1995) and at 18 months (Inciardi, 1996a, 1996b; Inciardi, Martin, Butzin, Hooper, & Harrison, 1997; Mathias, 1995) after release from prison. These results were cited in federal legislation designed to increase the availability of Residential Substance Abuse Treatment for offenders. Attached to the legislation was \$275 million for the period 1997 through 2001 (Office of Justice Programs, 1996).

After reviewing the 1-year findings reported previously for treatment outcome for drug-involved offenders in the Delaware correctional system, we proceed to examine longer term outcomes. The first analyses review client

outcome at 3 years after completing work release. The second analyses also examine 3-year outcomes but take into account the extent to which clients completed a continuum of treatment during prison, work release, and correctional supervision in the community.

BACKGROUND

Delaware's corrections-based multistage therapeutic community treatment program began in 1991 as a research demonstration project funded by the National Institute on Drug Abuse (NIDA), and is now a continuing program in the Delaware correctional system. Like other therapeutic communities, it was designed to provide a total treatment environment in which a drug user's transformations in behavior, attitudes, emotions, and values are introduced and inculcated. Clinical staff include former drug users who themselves were resocialized in TCs. For both staff and clients, "the essential dynamic in the TC is mutual self-help" (De Leon, 1986). Through repetition and reinforcements as part of the daily regimen of community roles and community life, the TC process seeks to create a new drug-free lifestyle for the client.

Throughout the 1960s and into the 1970s, TCs were the most visible type of treatment in correctional settings. The first was established in 1962 in the Nevada State Prison, and in 1967 the Federal Bureau of Prisons established a similar program in an institution in Danbury, Connecticut (Petersen, 1974). During the next decade, many prison-based TCs seemed to come and go—in Arkansas, Connecticut, Georgia, Michigan, Nebraska, New York, Oklahoma, South Carolina, Virginia, the federal system, and elsewhere (Smith, 1977; Toch, 1980; Weppner, 1983). By the early 1980s, almost all of these TCs had closed, the result of prison crowding, state budget deficits, staff burnout or blowup, and changes in prison leadership. In a few instances, shut-downs were precipitated by inmate residents smuggling drugs and alcohol into the TC units. In others, custodial officers distrusted TC staff and operations and deliberately sabotaged programs (Camp & Camp, 1990).

Despite these early failures, the TC reemerged in the late 1980s and demonstrated great promise in the treatment of substance abuse (De Leon, 1985; Yablonsky, 1989). TCs modified their approaches from the earlier Synanon models. Staff had more professional training and credentials, inmates were given appropriate power and rewards without too much program control, and TC programs worked with institutional staff rather than in opposition (Wexler, 1995). At the same time, correctional approaches were again becoming more favorable to the concept of rehabilitation, no doubt spurred by the massive

d mandatory minimum sentences for drug-involved offenders (Inciardi & Martin, 1993; Wexler, 1995). Moreover, correctional administrators and clinicians found TCs useful in improving client attitudes and inmate comportment (Field, 1989; Holland, 1978; Inciardi & Scarpitti, 1992; Wexler, Falkin, Lipton, Rosenblum, & Goodloe, 1988).

A CONTINUUM OF THERAPEUTIC COMMUNITY TREATMENT

More recently, Inciardi and colleagues have argued that an integrated continuum of corrections-based TC treatment works best for seriously drug-involved offenders. This continuum involves three stages of therapeutic community treatment, tied to an inmate's changing correctional status: prison → work release → parole or other form of community supervision (Inciardi, Lockwood, & Martin, 1991, 1994).

The primary stage of treatment should consist of a prison-based TC designed to facilitate personal growth through the modification of deviant lifestyles and behavior patterns. Segregated from the rest of the penitentiary, recovery from drug abuse and the development of prosocial values in the prison TC would involve essentially the same mechanisms seen in community-based TCs. Ideally, it should last for 9 to 12 months (Wexler et al., 1988), and client recruits should be within 12 to 15 months of work release eligibility.

Since the 1970s, work release has become a widespread correctional practice for felony offenders. It is a form of partial incarceration where inmates work for pay in the free community but must spend their nonworking hours in an institution or a community-based work release facility or halfway house (Inciardi, 1999). Inmates qualified for work release are those approaching their parole eligibility or conditional release dates. Although graduated release of this sort carries the potential for easing an inmate's process of community reintegration, there is a negative side, especially for those whose drug involvement served as their entry key to the penitentiary gate in the first place. This initial freedom exposes inmates to old groups and behaviors that can easily lead them back to substance abuse, criminal activities, and reincarceration. Even those receiving intensive TC treatment while in the institution face the prospect of their recovery breaking down. Work release environments often do little to stem the process of relapse. Because work releasees mirror the institutional populations from which they came, they often continue the negative values of the prison culture. Added to the continuing inmate culture is the new (albeit limited) freedoms of being able to go out and work in the community without continual supervision. In a correctional

setting where street drugs and street norms tend to abound, it is not surprising that many relapse or recidivate.

Graduates of prison-based TCs are at a special disadvantage in a traditional work release center, because they must live and interact in what is typically an antisocial, nonproductive setting. Without clinical management and proper supervision, their recovery can be severely threatened. Thus, secondary TC treatment is warranted. This secondary stage is a transitional TC—the therapeutic community work release center—with a program composition similar to that of the traditional TC.

In the tertiary or aftercare stage, clients have completed work release and are living in the free community under parole or some other form of supervision. Treatment intervention in this stage should involve continued monitoring by TC counselors including regular outpatient counseling, group therapy, and family sessions.

THE DELAWARE TC CONTINUUM

The use and practicality of such a continuum of correctional TC treatment was untested until only recently. The three-stage model has been put in place sequentially in the Delaware correctional system. Initially, it was built around two therapeutic communities—the KEY (a prison-based program for men begun in 1988) and CREST Outreach Center (a work release program for both men and women begun in 1991). Subsequently, and largely based on the initial success of the KEY and CREST, Delaware's TC resources have been expanded by the addition of three new prison TCs and two community-based transitional facilities.

The unique contribution in Delaware is CREST Outreach Center, the work release therapeutic community program in Wilmington, Delaware (Lockwood, Inciardi, & Surratt, 1997). CREST emerged as the clinical component of a NIDA treatment research demonstration project, awarded to the University of Delaware in 1990. The primary goal of the research was to examine the feasibility and clinical efficacy of a therapeutic community work release center for drug-involved felony offenders who had spent a number of years in the penitentiary. The issues of feasibility and efficacy were especially important because CREST represented the first attempt, anywhere in the world, at developing a correctional work release program built on a therapeutic community model.

CREST Outreach Center was designed to provide the secondary or transitional phase in the continuum of treatment and to eventually serve as a home base for developing a tertiary aftercare program. As such, clients from the in-prison TC would transition to CREST. However, it was also planned to use

CREST to examine the effects of work release TC treatment for clients who did not come from a prison TC. Consequently, not all of CREST's residents receive their primary treatment in prison; in fact, for many, their first exposure to a TC is at CREST. So, the Delaware work release TC environment at CREST represents secondary treatment for some (those coming from the prison TC), but for even more clients, CREST is both their primary and secondary treatment.

METHODS

RESEARCH DESIGN

The research protocol includes ongoing process evaluation and a baseline and multiple follow-up interviews with all treatment and comparison clients, as well as HIV and urine testing at each contact. The baseline interview is administered in prison, prior to an inmate's transfer to CREST Outreach Center or regular work release. The first follow-up occurs 6 months hence, corresponding with graduation from CREST (for the treatment groups) or completion of regular work release (for the control group). Subsequent interviews have been conducted 18 months and 42 months after baseline (i.e., 1 year and 3 years after treatment and work release). Treatment dropouts are also followed. Interviews at baseline and each subsequent follow-up are lengthy, representing 700 variables per administration, including data on basic demographics, living situations, criminal history, drug use history, treatment history, sexual behavior history, sexual attitudes, HIV risks, self-esteem, sensation seeking, and physical and mental health. The instruments include much of the Addiction Severity Index (ASI) and NIDA's Risk Behavior Assessment (RBA). It is important to note that these instruments were administered by the researchers after client selection and not as part of the client selection process. Follow-up surveys elicit detailed event history information on the intervening periods. Participation in the project is voluntary, and participants are paid up to \$50 at each of the testing intervals—\$25 for completing the questionnaire and \$25 for giving both a blood and urine sample. About 95% of all eligible subjects agreed to participate in the study at baseline, and more than 80% of those interviewed also provided a blood and/or urine specimen. Follow-up rates for all study participants have been about 80%.

The original research project design to evaluate the TC continuum in Delaware was quasi-experimental, and it has involved a number of both planned and serendipitous comparisons of prison releasees. Most of the

previously published outcome work focused on four treatment and control groups (Inciardi, 1996; Inciardi et al., 1997; Martin et al., 1995). The first group is a sample of conventional work release residents with a past history of drug use, as determined by the Delaware Department of Corrections counseling and institutional review procedures. The department's classification is based on criminal history and correctional counselor interviews; counselor recommendations are approved by the Institutional Classification Board as part of the classification from prison to work release. Among those classified to work release with a recommendation (not a mandate) for drug treatment, some were randomly assigned to regular work release (the comparison group). These releasees have relative freedom during working hours, but are held in secure dormitories after 10 p.m. Most attend Alcoholics Anonymous (AA) or Narcotics Anonymous (NA) meetings at the work release center and have access to an on-site counselor, but have little other treatment. The quasi-experimental contrast in the study is between this comparison group and the second group, the CREST clients, a sample of work releasees with a history of drug use and a recommendation for treatment who were randomly assigned to CREST. This was possible because the number of eligible clients exceeded the capacity at CREST to allow for the random assignment procedure. So, subjects coming to work release with a history of chronic, heavy drug use (determined by institutional classification screening) but no prison TC experience were randomly assigned to one of these two groups. The assignments were made by the research staff and not by clinical staff from the population of those classified to work release with a history of significant drug problems.

Two other groups also are being followed as part of this study: (a) the KEY group, a group of releasees from the in-prison TC who did not go to CREST because they were released before CREST was operational; and (b) the KEY-CREST group, clients who graduated from the KEY and were then assigned to CREST for work release treatment. Although not randomly assigned, each of these groups included all clients coming from the KEY who were being classified to work release. More importantly, each of these nonrandom groups provides an important contrast with the randomly assigned groups. Table 1 presents some of the salient distinctions among the four initial comparison groups, which we refer to as initial groups.

These initial group distinctions are conservative in that they consider assignment to CREST rather than whether the client completed treatment. A number of clients who enter CREST do not stay more than 1 month, and others stay an appreciable time but do not complete the program. In practice, CREST completion rates are about 65%. Consequently, our initial group

TABLE 1: Planned Characteristics of Initial Groups in the Delaware Therapeutic Community (TC) Continuum for Subjects About to be Released From Prison

| | <i>Work Release Classified</i> | <i>Past Heavy Drug Use</i> | <i>Gender</i> | <i>Randomly Assigned</i> | <i>In-Prison TC (KEY) Graduate</i> | <i>Assigned to CREST Work Release TC</i> |
|------------|--|------------------------------------|---|------------------------------|--|--|
| Comparison | Yes | Yes | 80% male, 20% female | Yes | No | No |
| KEY | Yes | Yes | 100% male | No | Yes | No |
| CREST | Yes | Yes | 80% male, 20% female | Yes | No | Yes |
| KEY-CREST | Yes | Yes | 100% male initially, but decreasing to 75% male, 25% female | No | Yes | Yes |

categories do not account for the potential cumulative effect of length of time in transitional TC treatment, nor do they consider the potential categorical effect of completing and graduating from CREST. There are other limitations of the initial groups in operationalizing the TC continuum. The initial groups could not be used to evaluate the effectiveness of the full theoretical continuum of treatment, because the tertiary or aftercare program did not exist in Delaware until 1996. Aftercare has now been in operation long enough to have a first cohort of aftercare clients who are 3 years from their graduation from work release. At the other end of the continuum, the in-prison TC-only group (KEY) has become a historical artifact because almost all KEY graduates are assigned to CREST for their work release assignment. Finally, as noted earlier, for the majority of TC clients for whom we have long-term follow-up data, CREST represents both primary and secondary treatment.

Consequently, we have begun to examine a different four-group comparison, which we refer to in this article as revised groups. These include comparison (the same group as previously described), CREST dropouts, CREST graduates without aftercare, and CREST graduates with aftercare. This grouping more appropriately distinguishes major elements of the TC continuum, particularly in the secondary and tertiary stages that have not been adequately studied. Also, and significantly, we have excluded the KEY-only group from the revised groups, and we have included KEY graduates who went to CREST together with those who went directly to CREST. Table 2 describes the distinctions for these four revised groups.

TABLE 2: Planned Characteristics of Revised Groups in the Delaware Therapeutic Community (TC) Continuum for Subjects About to be Released From Prison

| | <i>Work Release Classified</i> | <i>Past Heavy Drug Use</i> | <i>Gender</i> | <i>Randomly Assigned</i> | <i>In-Prison TC (KEY) Graduate</i> | <i>Assigned to CREST Work Release TC</i> |
|----------------|--|------------------------------------|-------------------------|------------------------------|--|--|
| Comparison | Yes | Yes | 80% male, 20% female | No | No | No |
| CREST | Yes | Yes | 80% male, 20% female | No | Some | Yes |
| Dropouts | | | | | | |
| CREST | Yes | Yes | 80% male, 20% female | No | Some | Yes |
| Completers | | | | | | |
| CREST | Yes | Yes | 80% male, 20% female | No | Some | Yes |
| Completers | | | | | | |
| with aftercare | | | | | | |

SAMPLE AND MEASURES

All baseline measures are self-report items. The baseline variables were chosen to represent basic demographic characteristics, and to control for potential differences in clients in drug and criminal justice histories. Categorical baseline measures include gender, previous drug treatment, and ethnic group. Previous drug use is an ordinal scale derived from questions asking frequency of use of each of injecting or noninjecting cocaine, heroin, speed, crack, PCP, hallucinogens, and nonprescribed sedatives, stimulants, tranquilizers, analgesics, or other opiates in the 6 months prior to incarceration. The maximum reported use of any drug was recorded on a scale ranging from 0 (*no use*) to 6 (*use more than once a day*). Continuous baseline measures are age, age of first incarceration, number of previous incarcerations, and number of previous arrests. Table 3 presents these baseline variables by the initial and revised groupings.

As seen in the top half of Table 3 and as would be expected from the assignment process in the initial groups, the CREST and comparison groups are very similar but differ from the KEY groups on several dimensions. The two KEY groups contain more African Americans and were first incarcerated at a younger age. They were more drug-involved before entering prison. The KEY-only group is historically all male. Everyone from the KEY groups had previous drug abuse treatment, whereas more than one fifth of those in the other two groups reported no prior treatment.

The 6-month follow-up interviews provided a measure of time spent in any drug treatment since release from prison. This is important because the

TABLE 3: Baseline Sample Characteristics by Initial Grouping and Revised Grouping: Delaware Therapeutic Community Continuum

| | Initial Groups | | | | Revised Groups | | | |
|---|----------------|-----|-------|---------------|----------------|-------------------|---------------------|------------------------------------|
| | Comparison | KEY | CREST | KEY- CREST | Comparison | CREST Dropouts | CREST Completers | CREST Completers With Aftercare |
| <i>n</i> | 165 | 38 | 157 | 68 | 210 | 109 | 101 | 69 |
| Age (<i>M</i>) | 29 | 31 | 29 | 31 | 29 | 29 | 31 | 31 |
| Age of first incarceration | 22 | 18 | 21 | 19 | 22 | 20 | 21 | 23 |
| Mean number of times in prison | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Mean number of arrests | 10 | 15 | 12 | 11 | 10 | 13 | 13 | 11 |
| Males (%) | 82 | 100 | 77 | 74 | 82 | 83 | 76 | 67 |
| Whites (%) | 27 | 16 | 24 | 13 | 28 | 21 | 15 | 20 |
| Hispanic (%) | 4 | 0 | 2 | 0 | 3 | 4 | 2 | 2 |
| African Americans (%) | 68 | 84 | 74 | 85 | 68 | 74 | 83 | 74 |
| Drug use 6 months prior to prison, ranging from 0 (<i>none</i>) to 6 (<i>several times a day</i>) | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 |
| Previous drug treatment (%) | 75 | 100 | 77 | 100 | 74 | 79 | 79 | 88 |

comparison sample was not truly a no treatment group. As might be expected in the real world, many of these releasees were motivated for treatment and sought treatment on their own during work release. Beyond the ethical issue of denying treatment to those seeking it, the subsequent follow-up data reveal the practical observation that fully 56% of the no treatment group reported some treatment during the initial 180 days after prison release (the time while the CREST group was at the TC work release program). The mean number of days in treatment was, not unexpectedly, higher for the CREST assignees (116 days), as contrasted with 24 days for the comparison group. Because of the skew in number of days, the log days of treatment was used in the following analyses.

The dependent variables for the analyses are dichotomous measures of behaviors—relapse and recidivism. Each dependent variable combines information from repeated self-report and objective criteria. The dependent measures are stated positively. The criterion for “drug-free” is whether the respondent reported no use of any of the drugs counted in the baseline measure and tested negative for any illegal drug at any time in the follow-up period. In this article, we examine findings from each of the 1 year and 3 years since leaving work release. If the respondent reported no illegal drug use and tested negative, drug status was coded as 1 for drug-free; any positive response or test result was coded as 0. As such, this is an extremely conservative criterion. It combines repeated self-reports and repeated urine screens during follow-up, and relapse on even just one occasion during follow-up is coded as 0. The criterion for “no arrest” included no self-reports of arrest or records of arrest for new offenses since release from prison. It does not include parole violations. Arrest status is coded 1 for no arrest for any new crime, and 0 if there is any arrest for a new crime.

RESULTS

In our earlier work, the basic hypothesis was that drug-involved offenders receiving primary treatment in a prison-based TC, followed by secondary treatment in a work release TC, would be more likely to remain arrest-free and drug-free than those having had fewer stages of therapeutic community treatment. This work examined outcomes 1 year after work release (Inciardi et al., 1997). The data were first analyzed as a bivariate logistic regression with group assignment as the only independent variable, modeled by a dummy classification with the comparison group as the excluded category. These results were strongly supportive of the continuum of TC treatment hypothesis, with each of the treatment groups showing significant and

incremental improvements in arrest-free and drug-free status during the 1-year follow-up. Moreover, the pattern of results remained similar when a number of other putative predictors of treatment effect—the covariates described above—were included in the analyses in multivariate logistic regressions. These control variables are not only potential predictors of treatment outcome on their own, but, more importantly, they are factors that may differ in the groups who were not part of the random assignment process (see Table 1). Also included in the model was length of time in treatment (log of number of days from 0-180) during the 6 months of work release to demonstrate the TC program effect beyond retaining clients in treatment longer.

These previous results reported in 1997 and predicting arrest-free and drug-free status are reviewed in Figure 1. The results of the multivariate logistic regressions predicting to each of the two dichotomous arrest-free and drug-free criterion, including the effects of these other independent variables, are presented as logistic regression histograms, showing the predicted percentages (or probabilities) for each comparison group. This was done by estimating $1/(1 + e^{-Z})$, where Z is the sum of the logistic regression equation for each group with other variable effects entered as their coefficient multiplied by the mean value for that variable.

In examining the prediction of each of arrest-free and drug-free status, the comparison group did not differ significantly from the KEY group. As reported earlier (Inciardi et al., 1997), the data suggest that in-prison TC primary treatment alone may not be effective. More effective is the provision of treatment in the transitional setting (CREST), where treatment occurs at the time that clients are truly at risk for relapse and new criminal activity. The KEY-CREST group, with both primary and secondary TC treatment, emerges as the group doing by far the best in terms of avoiding relapse and recidivism.

This earlier work demonstrated a consistent and persuasive pattern of results supporting the continuum of TC treatment in a 1-year follow-up study. It is, of course, not strictly appropriate to apply standard tests of significance to both random and purposive comparison groups in the same analyses, and it would be particularly inappropriate without controls for known group differences. However, making such comparisons is often necessary in field evaluation studies. When conducted with sufficient samples, sufficient control variables, and repeated follow-ups, such studies can demonstrate convincing effects and have important policy implications.

Even more important from a policy perspective is whether the effects of TC treatment on drug-involved offenders have long-term effects. Significant reductions in relapse and recidivism 1 year after work release have substantial societal benefit, but, if the effects are longer lived, the cost savings to

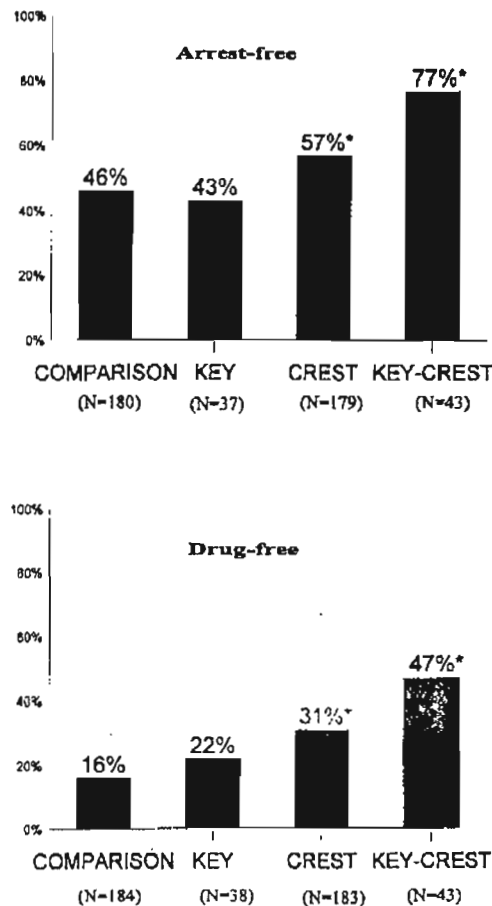


Figure 1: Percentage Arrest-Free and Drug-Free for Initial Groups in Year After Release (adjusted for control variables)

*Significantly different from the comparison group, $p < .05$.

society increase almost exponentially. Consequently, we proceed to look at these same criteria of arrest-free and drug-free—for these same groups and with the same control variables used in the 1997 analyses—for a period of 3 years after work release. The research sample attrition, fortunately, has been low (less than 10% between the 1-year and 3-year follow-up), and, significantly, it has not varied appreciably between TC clients and the comparison group. Again we estimate a multiple logistic regression model for each

TABLE 4: Logistic Regression Coefficients for Variables Included in the Initial Group Model Predicting Arrest-Free at 3 Years

| <i>Independent Variable</i> | <i>Regression Coefficient</i> | <i>Standard Error</i> | <i>Wald Statistic</i> | <i>Significance</i> |
|---|-------------------------------|-----------------------|-----------------------|---------------------|
| Age | -0.062 | 0.022 | 7.629 | .006 |
| Age of first incarceration | -0.042 | 0.025 | 2.834 | .092 |
| Number of times in prison | 0.054 | 0.075 | 0.527 | .468 |
| Number of arrests | 0.044 | 0.018 | 6.201 | .013 |
| Female = 1, male = 0 | -0.279 | 0.300 | 0.862 | .353 |
| African American = 1, other = 0 | -0.017 | 0.292 | 0.003 | .954 |
| Drug use 6 months prior to prison, ranging from 0 (<i>none</i>) to 6 (<i>several times a day</i>) | 0.074 | 0.070 | 1.131 | .288 |
| Previous drug treatment at baseline (1 = yes, 0 = no) | -0.261 | 0.313 | 0.696 | .404 |
| Log days in treatment during work release | -0.035 | 0.090 | 0.155 | .694 |
| KEY (group = 1, other = 0) | -0.491 | 0.508 | 0.932 | .334 |
| CREST (group = 1, other = 0) | -0.315 | 0.388 | 0.659 | .417 |
| KEY-CREST (group = 1, other = 0) | -0.571 | 0.447 | 1.631 | .202 |
| Constant | 2.920 | 0.824 | 12.558 | .000 |

NOTE: -2 log likelihood = 420.54.

dichotomous dependent variable. The results of this regression predicting arrest-free at 3 years are reported in Table 4, and the results for drug-free at 3 years are reported in Table 5. Each table includes the regression coefficients, significance levels, and Wald statistics for each of the independent variables. We first review the effects of the control variables and then focus on the differences among the initial groups.

In general, the effects of the control variables in the multivariate logistic equations were modest but did indicate the importance of controlling for covariates where possible. In Table 4, the model predicting arrest-free status, the only significant covariates were age and number of previous arrests. Not surprisingly, older subjects were less likely to be arrested for a new crime, whereas those with more past arrests were more likely to have a new arrest. What is perhaps surprising is that none of the other measures—gender, race (represented here as a dichotomy of African American vs. other), early incarceration, previous drug use, or previous treatment—predicted new arrests. In Table 5, the model predicting drug-free status, the only significant control variable was previous drug use. These results are very similar to what had been found previously for the control variables at 1 year: very modest effects with past arrests predictive of future arrests and past drug use predictive of future drug use.

TABLE 5: Logistic Regression Coefficients for Variables Included in the Initial Group Model Predicting Drug-Free at 3 Years

| <i>Independent Variable</i> | <i>Regression Coefficient</i> | <i>Standard Error</i> | <i>Wald Statistic</i> | <i>Significance</i> |
|---|-------------------------------|-----------------------|-----------------------|---------------------|
| Age | -0.025 | 0.028 | 0.760 | .383 |
| Age of first incarceration | -0.001 | 0.031 | 0.000 | .988 |
| Number of times in prison | 0.085 | 0.096 | 0.775 | .379 |
| Number of arrests | -0.019 | 0.018 | 1.019 | .313 |
| Female = 1, male = 0 | 0.102 | 0.407 | 0.063 | .802 |
| African American = 1, other = 0 | -0.256 | 0.374 | 0.470 | .493 |
| Drug use 6 months prior to prison, ranging from 0 (<i>none</i>) to 6 (<i>several times a day</i>) | 0.221 | 0.087 | 6.406 | .011 |
| Previous drug treatment at baseline (1 = yes, 0 = no) | 0.129 | 0.411 | 0.098 | .754 |
| Log days in treatment during work release | -0.033 | 0.122 | 0.074 | .785 |
| KEY (group = 1, other = 0) | -1.843 | 0.677 | 7.419 | .006 |
| CREST (group = 1, other = 0) | -1.628 | 0.569 | 8.173 | .004 |
| KEY-CREST (group = 1, other = 0) | -1.656 | 0.641 | 6.678 | .010 |
| Constant | 2.664 | 1.028 | 6.716 | .010 |

NOTE: -2 log likelihood = 291.23.

What is different in the 3-year data results is the initial group effects. The coefficients for the initial group differences as deviations from the omitted comparison group and adjusted for the control variables are reported near the bottom of Tables 4 and 5. They are also shown in Figure 2 as adjusted logistic histograms. The model is exactly the same as that in Figure 1, with the same initial group comparisons, except that in Figure 2 the period at risk is now 3 years rather than 1 year.

It is readily apparent that the significant group differences in effects of TC treatment seen in Figure 1 for the initial groups have been significantly attenuated. For arrest-free status, there is a small, now nonsignificant, benefit of TC treatment versus the comparison group, and no differences among the three TC groups. For drug-free status, TC treatment in each of the three categories does produce a significant increase in the probability of being drug-free, as opposed to the comparison group. However, among the TC groups, there are no differences in likelihood of being drug-free.

The implications of these findings are, at first glance, sobering. There is a modest benefit for some TC treatment as compared to no TC treatment, but no indication of the relative improvement with more stages of TC treatment, as appears so convincingly in the 1-year follow-up data. However, as we noted earlier, the initial group distinctions for each of CREST and the

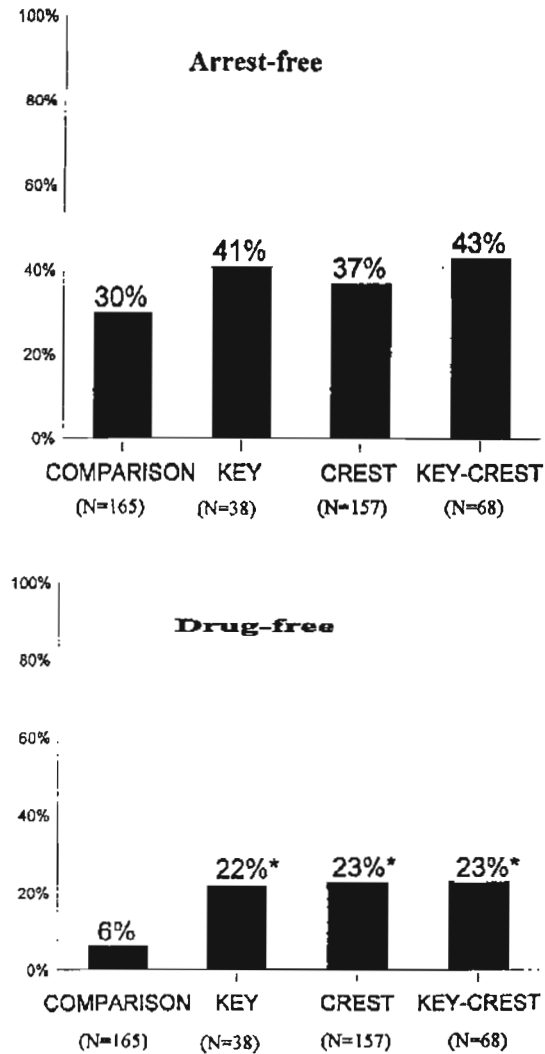


Figure 2: Percentage Arrest-Free and Drug-Free for Initial Groups in 3 Years After Release (adjusted for control variables)

*Significantly different from the comparison group, $p < .05$.

KEY-CREST were conservative in that they included all clients who entered CREST, not just CREST completers. So the models were not truly testing the continuum hypothesis.

Therefore, given the limitations of the initial groups and the recent existence of sufficient cases with an aftercare program following CREST, we revised our comparative grouping to look at three more realistic distinctions of engagement in the TC continuum—CREST dropouts, CREST completers (without aftercare), and CREST completers with aftercare—as opposed to a comparison group with no TC treatment. In essence, the revised groups allow us to examine the effects of secondary and tertiary TC treatment. We ignore the primary stage distinction for the moment out of necessity. Of the 279 CREST clients included in the analyses, only 21% have come from an in-prison TC. However, coming from an in-prison TC does seem predictive of retention in the TC continuum: 14% of the CREST dropouts, 21% of the CREST completers, and 32% of the CREST completers with aftercare came from an in-prison TC.

In the final models presented, we again look at the criteria of arrest-free status and drug-free status with the same control variables for a period of 3 years after work release, but for the revised grouping of comparison, CREST dropouts, CREST completers, and CREST completers with aftercare. The regression coefficients, significance levels, and Wald statistics are reported in Table 6 for arrest-free status and Table 7 for drug-free status. The revised group differences, adjusted for the control variables, are then shown in Figure 3 as adjusted logistic histograms.

Looking at the control variable effects first, the results are very similar to what was observed in the initial groups models. As seen in Table 6, age and previous arrest history again predict new arrests, but here there is also a small effect of previous drug history. This may indicate that drug history is related to having gone to a prison TC, a possibility indicated by the higher scores on prior drug history for the KEY groups (see Table 3). In Table 7, the model predicting drug-free status for the revised groups, the only significant control variable is prior drug history.

Whereas the control variable effects are quite stable in each of the initial group and revised group models, the group effects themselves are quite different. The top panel of Figure 3 (predicting arrest-free) reveals that CREST dropouts are as likely to be arrested on a new charge as the comparison group. However, those who complete CREST do much better, and those who complete CREST and receive aftercare as well are the least likely to have a new arrest. Less than one out of three clients with aftercare have a new arrest, whereas more than two out of three of the comparison group with no TC treatment have a new arrest. It is new arrests and the concomitant sentence likely associated with a new crime by a repeat offender (because all clients in the study are repeat offenders) that have the most obvious implications for the cost savings of treatment.

TABLE 6: Logistic Regression Coefficients for Variables Included in the Revised Group Model Predicting Arrest-Free at 3 Years

| <i>Independent Variable</i> | <i>Regression Coefficient</i> | <i>Standard Error</i> | <i>Wald Statistic</i> | <i>Significance</i> |
|---|-------------------------------|-----------------------|-----------------------|---------------------|
| Age | -0.055 | 0.021 | 6.984 | .008 |
| Age of first incarceration | -0.034 | 0.022 | 2.256 | .133 |
| Number of times in prison | -0.055 | 0.061 | 0.803 | .370 |
| Number of arrests | 0.027 | 0.012 | 5.487 | .019 |
| Female = 1, male = 0 | -0.350 | 0.281 | 1.552 | .213 |
| African American = 1, other = 0 | -0.030 | 0.269 | 0.012 | .912 |
| Drug use 6 months prior to prison, ranging from 0 (<i>none</i>) to 6 (<i>several times a day</i>) | 0.121 | 0.059 | 4.215 | .040 |
| Previous drug treatment at baseline (1 = yes, 0 = no) | -0.179 | 0.279 | 0.412 | .521 |
| Log days in treatment during work release | 0.071 | 0.082 | 0.766 | .381 |
| CREST dropouts (group = 1, other = 0) | 0.034 | 0.385 | 0.008 | .930 |
| CREST completers (group = 1, other = 0) | -1.127 | 0.390 | 8.363 | .004 |
| CREST completers with aftercare (group = 1, other = 0) | -1.711 | 0.426 | 16.152 | .000 |
| Constant | 2.703 | 0.737 | 13.453 | .000 |

NOTE: -2 log likelihood = 462.90.

A stepping stone pattern for the secondary and tertiary treatment groups is even more apparent when drug-free status is examined in the lower panel of Figure 3. When contrasted with the comparison group, CREST dropouts are more than three times as likely to be drug-free, CREST completers more than five times as likely, and CREST completers with aftercare are seven times more likely to be drug-free. It appears that length of time in transitional and aftercare TC treatment is a significant and incremental protective factor against likelihood of relapse.

DISCUSSION

In our previous work, we have suggested the use of the TC approach to treatment for drug-involved offenders. Given the usually long-standing drug and criminal histories of these clients, treatment needs to be both intensive and extensive, and we have proposed a continuum of primary (in-prison), secondary (work release), and tertiary (aftercare) TC treatment corresponding to sentence mandates. We have been fortunate in Delaware, with federal and state support, to institute such a continuum in stages over the past decade.

TABLE 7: Logistic Regression Coefficients for Variables Included in the Revised Group Model Predicting Drug-Free at 3 Years

| <i>Independent Variable</i> | <i>Regression Coefficient</i> | <i>Standard Error</i> | <i>Wald Statistic</i> | <i>Significance</i> |
|---|-------------------------------|-----------------------|-----------------------|---------------------|
| Age | -0.000 | 0.027 | 0.000 | .986 |
| Age of first incarceration | -0.019 | 0.029 | 0.416 | .519 |
| Number of times in prison | 0.019 | 0.080 | 0.056 | .813 |
| Number of arrests | -0.014 | 0.012 | 1.282 | .258 |
| Female = 1, male = 0 | 0.155 | 0.360 | 0.186 | .666 |
| African American = 1, other = 0 | -0.196 | 0.342 | 0.328 | .567 |
| Drug use 6 months prior to prison, ranging from 0 (<i>none</i>) to 6 (<i>several times a day</i>) | 0.219 | 0.069 | 9.982 | .002 |
| Previous drug treatment at baseline (1 = yes, 0 = no) | -0.073 | 0.369 | 0.039 | .844 |
| Log days in treatment during work release | 0.007 | 0.115 | 0.004 | .950 |
| CREST dropouts (group = 1, other = 0) | -1.280 | 0.534 | 5.743 | .017 |
| CREST completers (group = 1, other = 0) | -1.841 | 0.552 | 11.112 | .001 |
| CREST completers with aftercare (group = 1, other = 0) | -2.245 | 0.554 | 16.401 | .000 |
| Constant | 2.574 | 0.922 | 7.784 | .005 |

NOTE: -2 log likelihood = 317.19.

Earlier evaluations that we conducted of the Delaware programs demonstrated significant reductions in relapse and recidivism for offenders who received primary and secondary or just secondary TC treatment, as opposed to a no-treatment comparison group or a group that received only in-prison treatment. These initial-group differences remain clearly evident 12 months after leaving treatment and work release (18 months after release from prison), an outcome period longer than most reported in the literature (see Figure 1). The importance of providing primary and/or secondary treatment in a transitional setting was highlighted.

However, much of the effect of exposure to primary and secondary TC treatment appeared to decline significantly when the time at risk involved a period 3 years after completing treatment (see Figure 2). Declines in relapse were seriously attenuated and, in fact, declines in recidivism for those entering treatment almost entirely disappeared. Earlier reported effects of the continuum of treatment were also no longer present. These initial groups, however, were overly conservative, and do not effectively operationalize the continuum model because the CREST and KEY-CREST initial groups included all those assigned to CREST without consideration of whether they

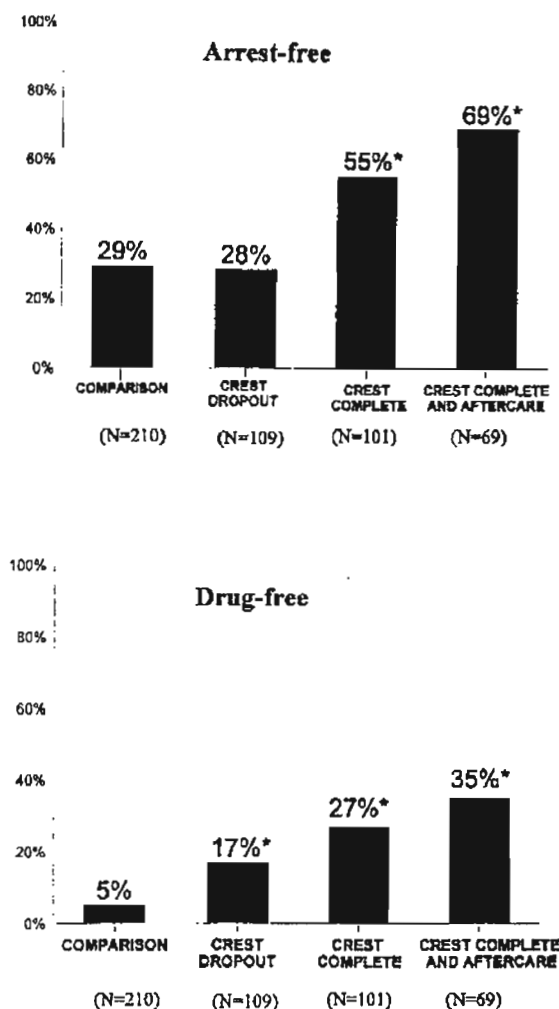


Figure 3: Percentage Arrest-Free and Drug-Free for Revised Groups in 3 Years After Release (adjusted for control variables)

*Significantly different from the comparison group, $p < .05$.

completed or dropped out of the transitional TC. Moreover, the essential component of aftercare did not exist in the program. Under these circumstances, it is more surprising that the 1-year effects are so strong, rather than that the 3-year effects weaken. The 3-year outcome becomes far more

positive when we examine the revised groups where program participation, program completion, and aftercare are taken into account. The multivariate logistic regression results for the revised groups (see Figure 3) suggest that clients who complete secondary treatment (some of whom also completed primary treatment) do better than those with no treatment or program dropouts after 3 years. Furthermore, data now available on Delaware clients who received tertiary treatment (a TC aftercare program) suggest that this group does even better still in predicting to the long-term likelihood of remaining drug- and arrest-free. The results provide new and long-term support for the continuum model of TC treatment for seriously drug-involved offenders.

These results are still preliminary. As we gain 3-year follow-up data on more cases, we will be able to look comprehensively at all stages and most combinations of the three-stage continuum of TC treatment. In particular, length of time in each stage of treatment as well as completion of each stage can be examined more fully. So far we have looked at primary/secondary stage effects and now secondary/tertiary stage effects. We have not been able to put the whole model together. The new analyses do not distinguish the in-prison TC experience effects, although we noted that there is some indication that in-prison TC graduates are more likely to remain in treatment through work release and aftercare. With more clients having 3-year follow-up, it will be possible to include all stages of the continuum in one model.

There are other limitations that need to be addressed in future research. It is obvious that the models estimated, though significant, are not accounting for all of the variance in predicting relapse and recidivism. It is probable that important control variables and possible that significant confounding variables for group effects have not been modeled. One large potential area that needs to be considered is the selection of clients into treatment and the suitability of the treatment that clients receive. This article has ignored the extensive literature on assessing client risk and needs and getting them into appropriate programs (e.g., Andrews et al., 1990; De Leon et al., 1995; De Leon, Melnick, Kressel, & Jainchill, 1994). There is a less extensive but equally important literature on compulsory versus voluntary treatment (De Leon et al., 1995; Leukefeld & Tims, 1988). Both of these issues are involved in the Delaware data and need to be operationalized and incorporated in any comprehensive model involving treatment effects predicting relapse and recidivism.

Despite these limitations, the present data support the value of treatment in work release and parole settings and the importance of retention in treatment in predicting long-term success in reducing the likelihood of recidivism or relapse. More generally, the data also support some long-standing arguments about the value of aftercare (De Leon, 1990-1991; Inciardi & Scarpitti,

1992). In 1935, for example, just 1 year after the term *addiction* first appeared in the American Psychiatric Association's Standard Classified Nomenclature of Disease, the U.S. Public Health Service opened its first narcotics "farm" in Lexington, Kentucky. A second facility was opened in Fort Worth, Texas, 3 years later. They were called farms because clients participated in farm work during their sojourns at Lexington and Fort Worth. In reality, however, both facilities were prison hospitals established for the treatment of addiction to narcotics while at the same time designed to alleviate prison crowding in other parts of the federal system (White, 1998, p. 122).

It was anticipated from the outset that the treatment approach at the new federal establishments would be highly effective, for at the very least, the hospitals were designed to treat not only the physical dependence but also the mental and emotional problems thought to be related to addiction (Maddux, 1978). This was an advanced conception, because until then treatment for a narcotics problem had focused exclusively on physical dependence. And there were other innovations, including a drug-free environment and access to educational and vocational services, as well as recreational and religious activities. When the patients were followed up, however, treatment outcomes were disappointing. In a study of 1,881 patients discharged from the Lexington facility to the New York City area, for example, some 90% had become readdicted within 1 to 4½ years (Hunt & Odoroff, 1962). Other studies documented that 90% to 96% treated at Lexington returned to active addiction, most within 6 months of discharge (White, 1998, p. 125). Although Dr. Victor H. Vogel, the medical officer in charge of the Lexington program, tried to put a positive spin on the outcome data by suggesting that the treatment results were better than those of such other chronic diseases as diabetes and cancer (Maddux, 1978), the studies underscored the limited role of institutionally based treatment alone in reducing the likelihood of subsequent relapse. What the Lexington and Fort Worth experiences did suggest was the need for community-based treatment and a continuum of treatment with community aftercare as a crucial component (Brown, 1979).

The data presented in this article present some interesting parallels and comparisons with the Lexington and Fort Worth experiences. When the KEY was established in the Delaware correctional system in 1988, the authors argued that unless a continuum of treatment from prison to work release to aftercare was established, the positive effects of the institutional phase of treatment could not be maximized. This prediction is amply documented in Figure 1, wherein there were no significant differences in relapse and recidivism rates between the KEY and comparison groups at the 1-year follow-up. Prison treatment alone does not appear to have a lasting impact. Significant differences after 1 year are readily apparent, however, as care extends into the

community during the work release transition. Next, a comparison of Figures 2 and 3 shows how important it is to take into account completing transitional TC treatment at CREST. Finally, and as illustrated in Figure 3, the most potent effects of treatment become visible when followed by community aftercare. These data should not suggest, however, that prison-based treatment is without merit. On the contrary, when combined with transitional treatment in a work release setting followed by aftercare, the positive effects become stronger. As follow-ups continue and the number of cases becomes larger, the effects of prior treatment—both in the institution and elsewhere—can be more fully examined.

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