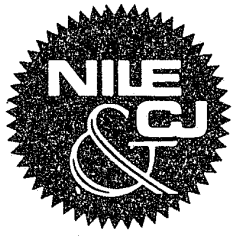
HEROIN USE AND CRIME IN A METHADONE MAINTENANCE PROGRAM

AN INTERIM REPORT



UNITED STATES DEPARTMENT OF JUSTICE
Law Enforcement Assistance Administration
al Institute of Law Enforcement and Criminal Justice

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AN INTERIM REPORT

By

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The papers presented in this report are part of the research program of the Addiction Research and Treatment Corporation Evaluation Team.

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FOREWORD

The following two reports analyze changes over time in the behavior of addicts in a methadone maintenance treatment program operated by the Addiction Research and Treatment Corporation (ARTC) in the Bedford-Stuyvesant area of New York City. This non-profit corporation, directed by Dr. Beny Primm, is devoted to the treatment of addicts and research related to drug addiction.

The study entitled "Changes in the Criminal Behavior of Heroin Addicts Under Treatment in the ARTC," by Dr. Gila J. Hayim from Harvard University, examines closely the criminal behavior of the first 416 addicts admitted to the program before and during their addiction and for one year after they entered the ARTC program. The study presents a detailed analysis of the effectiveness of the treatment period in terms of the reduction of criminal behavior and the patterns according to which the different subgroups of patients benefit from the program. A similar analysis of the behavioral changes of those patients who remained in the program for two years is in preparation and planned for release this summer.

The study entitled "Heroin Use and Crime in a Methadone Program," by Dr. Irving F. Lukoff and Debra Quatrone from Columbia University, examines in detail the medication patterns, methadone dosages and morphine detection among the first 765 patients accepted into the ARTC program and also provides early figures on the criminal activities of these patients. Preliminary assessment of the criminal activities of a small number of patients who remained in the program for two years is also included. These figures should be taken as preliminary only, since they represent an early analysis of a small number of patients.

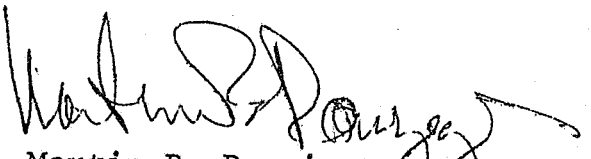
The overall trends of changes over time in the criminal behavior of the patients coincide in the two reports, but some of the statistics differ marginally due to the difference in the sizes of the samples examined.

The National Institute is pleased to present these reports as a significant contribution to understanding the role of methadone treatment in alleviating the problems of narcotics-related crime. While the decrease in criminal activities represented in this study is not large, it is significant to both the addicts and the community in which they reside.

Although the findings presented here are classified as preliminary, they provide a useful tool for researchers in drug addiction as well as those actively engaged in efforts to halt the spread of heroin addiction and to treat those already addicted.

Additional interim reports from this project covering other aspects of the research will be published as they are made available.

Any quotation or further publication of this report must be cleared with the researchers, since the project has not reached completion.



Martin B. Danziger
Assistant Administrator
National Institute of Law
Enforcement and Criminal Justice

This report was prepared on the basis of data developed by the staff of the Center for Criminal Justice at the Harvard Law School and the staff of the Addiction Research and Treatment Corporation Evaluation Team at the Columbia University School of Social Work. While Dr. Hayim had primary responsibility for analyzing the data and writing the report, the planning of the project and the preparation of the report itself has been a collaborative effort in which Robert Coates, Elinor Halprin, Alden Miller, Lloyd Ohlin, and James Vorenberg of the Center for Criminal Justice participated. Marion Coates and Willard Van Horne worked on the programming and the tabulation of the data. The related reports by the evaluation team from Columbia and the exchange of views with Dr. Irving Lukoff, Director of the Columbia team, provided important analytic assistance for the preparation of this report.

James Vorenberg
Director

Lloyd E. Ohlin
Research Director

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CHANGES IN THE CRIMINAL BEHAVIOR OF HEROIN ADDICTS UNDER TREATMENT IN THE ADDICTION RESEARCH AND TREATMENT CORPORATION: INTERIM REPORT ON THE FIRST YEAR OF TREATMENT

Gila J. Hayim

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Cambridge, Massachusetts

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Introduction and Summary of Findings

This report is a follow-up of a previous study* prepared by the Center for Criminal Justice of Harvard Law School which analyzed the criminal behavior of a sample of patients undergoing treatment at the Addiction Research and Treatment Corporation.** The previous study used successive charges and convictions as the base for analyzing changes in the criminal behavior of the sample, while this study uses charge rates. Rates*** take account of the fact that the patients in the sample differ in their age, in the length of their addiction and in their criminal history. Rates thus provide a useful yardstick for measuring behavior changes over time. The aim of this study is to determine with the help of these rates the magnitude and the quality of changes in the criminal behavior of the patients, with a special concern for the relationship between these changes and the period of treatment.

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* Miller, A., et al., Kinds of Addict-Crime: The Criminal Career Pattern of Addicts Seeking Treatment at ARTC.

** ARTC was established in 1969 for the purpose of maintaining heroin addicts on methadone against a broad rehabilitative background which combines social, legal, medical and personal services. Evaluation studies on the social, criminological and medical aspects of the program are being conducted by Columbia School of Social Work, Center for Criminal Justice at the Harvard Law School and Yale Medical School.

*** Computations of the types of rates used in the report will appear in a later section.

The major portion of the analysis uses charges rather than court convictions as the measure of change.* All the charge rates are based on official police records.

Evaluation studies of current methadone programs use several success criteria, depending on the goals of the various programs, such as reduction in crime, freedom from heroin use, increase in social productivity, and retention time in the program. The different measures are interrelated, so that an integrated evaluation utilizing all of them is obviously desirable. While such a multifaceted assessment of the program at ARTC is a future possibility, the present study is limited to the criterion of crime reduction.

The administration of methadone at ARTC is one modality of a broader approach to the treatment and rehabilitation of the heroin addict. Education, job development, counselling and legal services are also part of the program. These services are aimed at improving the general social adjustment of the patient, not just at reducing crime. Crime reduction, however, remains a central objective of all methadone programs, since a large portion of an addict's crime is attributable to his need for heroin and a large portion of the nation's crime is attributed to addicts.

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* Some of the findings of the analysis we conducted on the court dispositions of the patients raise questions about the appropriateness of these dispositions as a measure of change. See the detailed analysis in Appendix A.

A decline in the crime rate of the addicts in treatment at ARTC would therefore be a central criterion of the program's success.

The 416 patients at ARTC displayed a long history of addiction as well as of crime, mainly drug and property offenses, with much lower incidence of crimes of violence. Averaging two-thirds of a charge per person for every year of their addiction (.65) the patients' crime rate reached a peak in the year preceding their admission to the program, which amounted to one charge per person (1.03). The pre-admission crime rates* of the sample, both during the total period of addiction and during the peak year prior to entry into the program, were not found to be higher than the crime rates of addicts in the general population, or in other major methadone programs, such as the Methadone Maintenance Treatment Program (MMTP), affiliated with Beth Israel Medical Center in New York. After one year from the date of admission there was a modest decline of 21 percent in the overall crime rate of the sample, compared to the preceding year. The crime rate in the one year of treatment (.8) remained, however, higher than the crime rate which characterized the total period of addiction (.65), from the beginning of daily use of heroin up to entry into the program. The overall decline in the crime rate during the treatment year was predominantly influenced by the decrease in charges

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* The crime rate is calculated on the basis of the incidence of charges per every person/year in the various designated periods, as will be shown later.

related to the purchase, sale or possession of drugs, and to a lesser degree by the decrease of property offenses and prostitution. Crimes against the person and robbery increased slightly, but the addicts' pre-admission rates in these crimes were low compared to other types of crimes. It is also worth noting that robbery, a crime most feared by the public, is a type of crime least likely to be committed by the addict in the program. Preliminary analysis of data on patients who remained in the program for two years indicates a continuing trend of decline in crime, and shows an overall crime rate which stands below the crime rate which characterized the entire addiction period prior to treatment.

Specifying these results by comparing the various subgroups in the sample, we observe differences in responsiveness to treatment. Exposed to a treatment program which offers a variety of rehabilitation services in addition to the administration of methadone, the patients seem, accordingly, to have benefited from the program in different ways. In terms of the overall crime rate, the older patients in the sample, those who entered the program after the age of 30, show a slight advantage over the younger group (23 percent reduction vs. 15 percent). When we relate this finding to other studies by the ARTC team,* the older group appears to have pre-program advantages over the younger group, in terms of conventional social performance. Lower pre-admission crime rates, a more stable employment history and more years of education

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*D. Quatrone, Profile of Active and Terminated Patients in a Methadone Maintenance Program. ARTC. May 1972.

characterize the social history of the older patients, who also tended to remain in the program longer than the other group. However, this advantage is reflected only through the overall charge rate. When the overall charge rate is specified by type of offense, we find major differences between the two groups. The reduction in the average rate of drug offenses which the sample displays as a whole is found to be largely influenced by the younger group of patients - those between the ages of 21 and 30 upon admission to the program. The older group retains about the same level of illegal drug behavior, as detected by the police, in the year after entry as in the year before entry. On the other hand, the decline in the overall rate of property offenses was predominantly influenced by the older group, who reduced their burglary, larceny and shoplifting activities by one-half, while the younger group, in fact, slightly increased its rate of property crimes. No difference between the two groups appears in crimes of violence, which slightly increased over the preceding year.

The different patterns of responsiveness to treatment indicate no consistent relationship between changing rates of drug use and profitable crime. Property crimes as well as prostitution in the older group have decreased without a corresponding change in the rate of drug charges. A multi-modality treatment program such as the one at ARTC may bring about different effects on the patients. Some may remain little affected by the metha-

done experience itself, while responding to the other opportunities in the program, such as gainful employment or other types of aid. We are thus led to believe that the weight of the social history of the patients should be assessed in relation to the current forces operating on the patient. Legal barriers, community pressures, affiliations in criminal or addiction networks, job and education opportunities are immediate factors that can greatly influence the responsiveness of the patient and may even prove to be of more influence than events in the past. We intend to gear future evaluation research toward more consideration of these factors and their impact on the treatment results. Of particular importance will be a detailed study of the relationship between continued heroin use and crime. Some data on these different relationships are being collected now and the collection of other data is in the planning stage.

Data on patients who remained in the program for two years are now available. As mentioned earlier, the criminal behavior of these patients suggests a steady decline over time. The analysis of these data will allow us to see how the trends revealed in this study are affected by longer tenure in the program, to explore the differences in relation to crime between patients who withdraw and patients who remain active in the program, and ultimately to identify the type of addict offender who benefits most from the program.

The Sample

The study analyzes the criminal behavior of 416 addicts, admitted to the Addiction Research and Treatment Corporation beginning in October, 1969. The addicts constitute consecutive admissions of the first group of patients accepted into treatment. Subsequent reports will cover the analysis of all successive admissions, which have reached 1800 at the present time.

The analysis is based on official data collected from police and court records, for a period of one year from the date of admission. The assembling of data and their analysis in this study covers all patients in the sample, those who completed one year of treatment as well as those who withdrew from the program before the completion of one year of treatment. Of the 86 patients who withdrew from the program at any point within one year from their date of admission, only 20 patients (5 percent of the total sample) withdrew after a stay of less than six months.

All the addicts were volunteers, and were given methadone as a substitute for heroin. They had to meet relatively few screening rules for admission. The program requires that the patient live in the catchment area which the treatment clinic serves, that he be at least 21 years of age, that he have been

in at least one other treatment program, and that he have been a heroin addict for at least two years. All patients come from Bedford-Stuyvesant, a slum characterized by the Narcotics Register as an area with a high addiction rate as well as a high crime rate.

The following figures give the demographic breakdown of the sample by age, sex, race, marital status and prior criminal record.

Patient characteristics (416)

Age at Entry	%
21 - 30	37
31 - 40	42
41 +	21

Race	%
Black	86
White	14

Sex	%
Male	80
Female	20

Marital Status	%
Single	39
Married	28
Separated or Divorced	30
Widowed	3

Pre-admission Criminal Record	%
Arrested	84
Not arrested	16

Averages	
Age at entry	33 years
Age at daily use of heroin	21 years
Years of schooling	10.6 years

At the time they entered the clinic, over one-third of the addicts were in their twenties. The majority of the patients is black[1] and male. The basic features related to employment history, educational background, addiction history and criminal history vary, as will be shown below.

The average age of the patients upon admission was 33 years, higher than the average age of the addict population as currently known to the Narcotics Register (27.9 years in 1967). Blacks tended to be older than whites. Average age in the Methadone Maintenance Treatment Program[2] in New York City was 33.3 in 1970, with the average age of their black patients also older (35.6). The representation of whites in our sample is less than in MMTP, which treats a population of 40 percent whites, 40 percent blacks, 19 percent Spanish and 1 percent Oriental. The average age of patients in methadone programs in the country is usually between 30 and 35,[3] although

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1. The ethnic distribution of known addicts in New York City depicted by the Narcotics Register (Dec. 1969) is 47 percent black, 26 percent white and 27 percent Puerto Ricans.

2. Organization settings and patients' profiles of 43 methadone research enterprises are discussed by S.B. Sells and Deena Watson in Directory of Narcotics Addiction Treatment Agencies in the United States, NIMH publications, 1970.

3. James V. DeLong, "Treatment and Rehabilitation," Dealing With Drug Abuse: A Report to the Ford Foundation, New York, Praeger Publishers. 1972.

the minimum age for admission in most of these programs is in the range of 18 to 21. Parenthetically, it should be noted that we do not know how chronological age or length of addiction affects the attractiveness of the methadone concept for the addict population. Those who volunteer perhaps are those who are "burnt out" by the burden of the addiction life style, as noted by Wilson,[4] an observation which is supported by our data collected in the Personal and Social Inventory on the possible reasons for joining the program. Over two-thirds of the patients (N=238) listed such factors as "being tired of hustling," "the habit is getting too expensive," "would like to find an honest job" as important reasons for joining the ARTC program.

The mean age of the onset of addiction - the beginning of daily use of heroin - was 21. Thus, on the average, the addict in the sample had been addicted for 12 years before joining the program, although of course there are variations in the sample with respect to the age of the onset of addiction. About one-third of the patients were addicted between the ages of 12 and 18. (The proportion of whites addicted within this age bracket is twice as large as that of blacks.) One-third were addicted be-

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4. James Q. Wilson, Mark H. Moore, & I. David Wheat, Jr., "The Problem of Heroin," The Public Interest, 29, Fall, 1972, pp. 3-28.

tween 19 and 22, and another third between 23 and over. The studies conducted by the ARTC team showed that early age versus late age of addiction in general has a significant bearing on the patient's performance in the conventional roles of employment, education,[5] etc., which may, in the long run, also affect the treatment results. A person who had been addicted at the age of 16 or 17 will face more difficulties in accomodating himself, upon entry to the program, to the social roles of employment or family life, than a person who had some history of stable work and education before he became addicted.

During the two months before admission, 64 percent of the sample were unemployed at the time of joining the program. However, considering the total work history of our sample, there are variations with regard to the type of jobs, and to the length of time these jobs were held. About 45 percent of the patients in our sample fall in the category of skilled or semi-skilled workers, 24 percent were engaged in supervisory, business or clerical work, and 24 percent were unskilled workers.

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5. See the reports by A. Sardell, Age of Addiction as a Predictor of Conventional Behavior in Heroin Addicts, ARTC, August 26, 1972, and by D. Quatrone, op. cit.

Over one-third of the patients (36 percent) completed high school, including a small percentage who attended college. The mean number of years of schooling was 10.6.

A community survey[6] which studied the characteristics of the social environment of a quota sample of residents in the Bedford-Stuyvesant area showed a similar picture. It too found that heroin users in Bedford-Stuyvesant do not come predominantly from the lowest stratum of the community, stereotypically held to be the propogator of addicts.

The patients are evidently composed of different age groups who began their criminal practices, their addiction and their treatment phases at various points in their lives. Age distribution in the sample, at least in terms of the dichotomy of younger and older addicts, will thus be reflected in our analysis across the three periods of the study: the pre-addiction period, which we define as extending from the age of 16 to the beginning of daily use of heroin[7] (our definition of addiction); the addiction period, which continues up to

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6. Irving F. Lukoff, Social and Ethnic Patterns of Reported Heroin Use and Contiguity with Drug Users: ARTC, June 1972.

7. Patients who were addicted before the age of 16 (N=30) were removed from the analysis related to period I (before addiction) only. They were reattached to the sample in the analysis of the subsequent periods of addiction and treatment.

entry into the program,[8] and the subsequent treatment period in the program. Thus, in addition to overall crime rates, we shall present analysis of age-specific rates which may refine our assessment of the sample's aggregate behavior during every stage, since the incidence of crime, whether committed by addicts or other people, can be closely related to age.

8. We also calculated a crime rate for the one year before entry into the program, which is part of the addiction period.

Addiction Criminality and Age

The relationship between chronological age, addiction and crime has not been sufficiently explored in the literature.[9] Criminological literature regards age as a high correlate of crime; certain categories of anti-social behavior were found to be closely related to certain age-brackets. Other researchers (mainly the Gluecks) viewed the relationship between age and criminality from a different aspect. They regarded age of the first delinquent act as the major analytical point in time, and studied the effects on future criminal behavior of an early start versus a late start in crime. For our part we shall consider various aspects of age in relation to addiction and crime which follow from our longitudinal approach to the data. The data allow us to study the sample's behavior as it moves through different phases of addiction and criminal life. It allows us to assess the impact of age intersected by addiction on crime rates, given that the patients in all age categories eventually became addicts. Thus, while aggregate rates were computed for the sample as a whole in order to give us overall indices of crime for every period under discussion, we also computed age specific rates. The aggregate rate which characterizes the criminality of the patients for each period under discussion calculates the

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9. The major study on this topic is by John A. O'Donnell, "Narcotic Addiction and Crime," Social Problems, Vol. 13, No. 4, 1966, pp. 373-85.

incidence of charges for every patient in the sample per year spent by him in the designated period. The rates are then averaged for each period, as is illustrated in the following example.

Patient code	# of years spent in the designated period	# of charges for the designated period	Individual rate
1	2	0	0.0
2	4	2	.50
3	5	3	.60
4	5	2	.40
5	6	4	.67
Overall Rate for the designated period (Average of individual patient's rates)			.43

In like manner we computed crime rates by type of offense. Age specific rates for the total addiction period were computed by the age of the addict at the time of each charge. For the purposes of calculation the addiction period was defined as the period extending from the age of daily use of heroin or the age of 16, whichever is greater, until entry into the program. The period was broken into five consecutive age brackets. A patient could contribute time in years or days to all or some of these age brackets, depending on his age of addiction and his age at entry into the program. A charge was placed in the respective age-bracket according to the age at which the charge was filed. Rates were then determined for the different categories of offenses within each age bracket by taking the frequency of charges for a particular offense for the particular age bracket divided by

the number of years that the whole sample contributed to that age bracket.

We also computed age specific rates by age of entry into the program. The period in this case is always exactly one year so that the rate becomes simply the number of charges divided by one times the number of people. These rates were calculated separately for patients who entered the program at different ages. They were calculated for one year before entry into program and for one year after entry.

The age specific rates allow us to see whether the age of the addict at the time of the charge made a difference with respect to the volume and type of the crimes he committed. The rates also allow us to detect differences in responsiveness to treatment among the subgroups in the sample, in relation to the information we have on their pre-program differences in social characteristics. Upon the onset of addiction, the age factor appears to recede in its importance, in the sense that addicts in slum areas, regardless of their age, are likely to be involved in a variety of illegal acts in the course of sustaining their addiction. But age in our sample seems to regain some importance upon entry into the program. In terms of overall reduction in crime, older patients appear to respond better to treatment than younger patients. But this overall advantage of the older group will have to be specified by a number of factors in order to understand better the differences in the results. Different levels of moti-

vation for treatment as well as different patterns in benefiting from the program, and perhaps some aspects of a "maturing out" process generally associated with age, may be playing a part in addition to the effects of methadone as the major modality of treatment.

As stated earlier, all the rates are based on official police records. The records reflect the known limitations of apprehended crime. While chances of arrest may increase for known criminals and addicts in slum areas, we found that very few of the charges are of the kind that may be attributable to harassment, such as loitering, disturbing the public order, assaulting a police officer, etc. A preliminary examination of the patients self-reported data on their criminal activity shows that the official charges understate the amount of illegal behavior committed by the sample. The self-reported data are referred to only occasionally in this report since they are still largely incomplete for the sample under study, and more use will be made of them in future analyses.

The Criminal Behavior of the Sample before Addiction

Table 1 examines the crime rate of the sample across three periods of time: the pre-addiction period which includes charges from age 16 up to the daily use of heroin; the addiction period, which extends from the daily use of heroin up to the entry into the program, and the pre-entry year, which covers the one year just before the patient joined the program. In

the following pages we shall detail the criminological and addiction characteristics of the sample across the three periods, as well as highlight the implication of the table as a whole.

Table I

Crime Rates for the Periods Before Addiction, During Addiction and One Year Prior to Entry by Type of Offense

(Average Number of Charges Per Person/Year*)

	Before Addiction	During Addiction	Pre-admission Year
Drug offenses	.02	.24	.45
Property offenses	.07	.20	.26
Assault	.05	.04	.05
Property/assault (robbery)	.01	.01	.01
Forgery	.01	.05	.02
Prostitution	.00	.03	.09
OVERALL CRIME RATE	.21	.65	1.03

The rates designate the annual incidence of charges per every individual in the sample for the three periods. The overall pre-addiction crime index (.21), for example, tells us that on the average the patient in the sample had less

* The N's in the three columns are the 416 patients. The average number of years per patient for the period "before addiction (column 1) is 5, and for the period of addiction (column 2) is 12 years.

than one-fourth of a charge for every year prior to the onset of his addiction, or about one charge per patient over a period of five years. Stated differently, the rate shows the incidence of 21 charges per 100 men/years. This is a markedly low rate of charges in comparison to the subsequent periods. We know from the data gathered from interviews with the patients that many of them during the pre-addiction phase displayed conventional employment and education histories. Approximately one-third had completed twelve years of schooling and two-thirds had held a full-time job for over one year at some time before they became addicted. Data based on the official police records also show that only 37.5 percent of the sample were arrested during this phase, compared to 84 percent arrested during the period of addiction.

The distribution of the rates by type of offense for the pre-addiction period shows a slight focus on property offenses and on crimes of assault against the person. There were no incidences of prostitution and a very low rate of robbery, forgery, and drug offenses, relative to other types of crime. The rates fail to produce any patterns of criminality that would characterize the early criminal history of future addicts. The most we could glean from the data on the relationship between addiction, crime and age during this phase is a correlation consistent in direction but very low, between the overall crime rate and the age at which addiction began. Offenders who had high rates of charges related to forgery, property and assault offenses were

more prone to start using heroin at an age slightly earlier than those patients with lower rates or with no charges.

Our data also show (not presented in tabular form) that pre-addiction charges occurred more frequently among patients who were between 16 and 20 years of age before they began to use heroin daily than among patients in older age-brackets. The findings suggest that addiction occurred at an earlier age for those patients in the sample who had an early record of arrests.

Though the question of whether crime is a precursor to addiction or a result of addiction is still debated in literature, it is reasonable to assume that under those circumstances which combine the existence of delinquent groups with the availability of drugs, drug use would most probably evolve as one facet of a generally risk-taking style of life. O'Donnell documented the declining age of addicts in the population in the last two decades and their increasing proportion of pre-addiction criminal records over previous decades, which led him to conclude that slum addicts are increasingly becoming recruits from among criminals. The average age of the first thousand patients admitted to the clinics at Lexington, Kentucky, in the 1930's was 39.1 and the average age of the onset of addiction for these patients was 27.5 years.[10] For contrast, the early 1950's studies in New York City noted an appreciable decline in the average age of addiction, with an increase in the number of teen-aged

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10. J. Pescor, A Statistical Analysis of the Clinical Records of Hospitalized Drug Addicts, U.S. Public Health Reports, No. 143, 1943.

delinquents-addicts.[11] Against the environment of urban slums, in which access to drugs has increased over the previous decades, the street culture assumed a supportive role for a risk-taking style of life.[12] Heroin evolved as the new source of a high and experimenting with drugs often occurred as one facet of a pervasively delinquent way of life. This frame of reference does not exclude the possibility of novices experimenting with drugs outside the networks of delinquent association. It only emphasizes the fact that access to drugs and initiation into drug use can be better facilitated by semi-organized street groups. The implications of whether or not addiction occurred after criminal behavior had begun may have a bearing on understanding the patient's subsequent pursuit of crime and his responsiveness to treatment opportunities. For those addicts who are recruits from among criminal subcultures, the treatment program would have to exert a broad redirection of the value system of the patient in which drugs or crime are single facets of a generally dysfunctional style of life.

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11. Chein, I., and Rosenfield, E., "Juvenile Narcotics Use," Law and Contemporary Problems, No. 22, (1957), pp. 52-68.

12. Edward Preble and John J. Casey, "Taking Care of Business - The Heroin User's Life on the Street," International Journal of the Addictions, 4(1), March, 1969, pp. 1-24.

Our data are insufficient at this stage to allow a detailed assessment of the impact of early criminal affiliations and activities with respect to the onset of addiction and the subsequent criminal history of the group, both during addiction and after admission to the program. Some of these early criminal affiliations may continue to be maintained by the patient and their influence on improvement or relapse cannot be lightly dismissed. The effects of the present associates of addicts in treatment on their degree of success is well recognized in literature.[13,14] The treated addict faces many of the difficulties that confront the ex-convict. They both have to cope with the problem of recirculation in the same cultural environment which may have led them into deviance. Future collection of data in this direction is being planned.

The period of addiction. Moving to the second column in Table 1, which covers the total period of addiction, from the beginning of daily use of heroin up to admission into the program, we observe that the overall crime index for this period is three times greater than in the preceding period (.65 vs. .21). Except for crimes against the person,

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13. Marsh B. Ray, "The Cycle of Abstinence and Relapse Among Heroin Addicts" in The Other Side, H. S. Becker (ed.), The Free Press, New York, 1964, 163-177.

14. Seymour Fiddle, "The Addict Culture Movement into and out of Hospitals," U.S. Senate, Committee on Judiciary, Juvenile Delinquency Hearings, September 1962, pp. 3154-3162.

all categories of offenses increased in rate. The highest increase is in charge rates related to drug offenses, property offenses and forgery. The rate of drug charges is twelve times greater, the rate of property charges about three times greater, and of forgery, five times greater. The relatively high assault rate in the period before addiction and the fact that on the average the patients became addicted at an age (21) prone to the pursuit of violence makes the decrease in assault, even slight as it is, unexpected. However this decreased rate does not appear to be consistent. In the one year before entry into the program, the rate of assault increases and exceeds the rate which characterized the group in the period before addiction.

The preponderance of crimes of theft after the onset of addiction, which comes to the fore in our data, may be logically attributed to the addict's pressing needs to finance his habit. This is the kind of interpretation which dominates the literature on addiction. However, no large scale study yet exists which confirms empirically this apparent association. Almost all of the studies which suggest a strong relationship between addiction and property crime are based on fairly small samples with limited periods of observation. One large-scale study by the FBI, "Careers in Crime Program," [15] recorded the criminal history

15. Task Force Report: Narcotics and Drug Abuse. U.S. Government Printing Office, Washington, 1967.

of 4,385 offenders who were identified as heroin users. The addicts averaged ten arrests each over a period of twelve years. Six of these arrests were for non-drug crimes, and the proportion of arrests for property crimes was not different from the proportion in the larger offender population in general. Though we cannot firmly establish from our data a simple relationship between property crime and addiction, it is plausible to suggest that the onset of addiction precipitated an increase in the committing of crimes that would not have occurred if these patients had not become addicts. A daily cost of $75 reported by the group as the average minimum sum required to maintain their habit evidently increased the pressure for gainful crime and imposed on them a life style in which the breaking of the law became a daily pattern. Eighty-three percent of the sample was arrested at least once during this period, and when asked about their criminality at this stage of their career only 5 percent of the patients claimed that they committed no crime.

We examined the data on the total addiction period by age of entry into the program. Retracing the overall crime rate of patients who entered the clinic, the older group - 35 or over - shows a lower rate of charges during their addiction period than the younger group. The older black patient, for example, averaged an overall charge rate of .49 for every year of his addiction up to entry into the program, compared with a

rate of .66 for the younger black patient during the same period. The older white patient averaged a rate of .72 compared with a rate of .88 for the younger white patient.

Specifying the data further by age, sex, race, and type of offense, table 2 characterizes the criminal behavior in every age group. There is not much difference in the type of crime among the addicts in the various age brackets. All age groups indulge in a variety of crime centered around drug and property offenses. The major differences, however, are based on the ethnicity and the sex of the addict.

The age specific rates were computed for all designated periods in this study, and adjust for the increase or decrease in the overall crime rates that may have been due to the mere aging of the person, with or without addiction. The increase in crime noted during the period of addiction, and the subsequent changes over time in the overall rates are thus not an artifact of age. Because changes in age do not account for the changes in crime rates reported in this study, the age-specific rates are not always presented

In criminology sex is a variable which usually differentiates among rates as well as among types of offense. The Uniform Crime Reports show that on the whole, women commit fewer and different crimes than men. Males in the general population are arrested nearly seven times as frequently as females and the crimes for which women are most likely to be arrested are commercial vice and prostitution. The behavior of the female addict in the

sample diverges somewhat from this trend in the population. The males in our sample were charged at a rate less than twice that of the female addict during the addiction period. The older black female (35 or over) upon entry into the program showed an even higher overall rate of charges than that of the addicted black male in the same age category (.66 vs. .49). This is due mainly to the high rate of charges for forgery offenses during her addiction. Forgery, rather than prostitution, is the major illegal activity of the black female in the sample and the rate exceeds that of the males in the sample of both races and across all age brackets. The high forgery rate compared to the prostitution rate may also be an artifact of the probability of detection. Activities related to forging welfare checks or forging prescriptions may be more amenable to police detection than prostitution, but we have no empirical knowledge in this regard.

Because of the small number of white females in the sample (N=10), no marked differences can be established in her rates of charges across the age brackets. Property crimes, however, seem to be the type of offense she was most frequently charged with. Prostitution is not the major illegal occupation of the female addict in the sample, and the fact that the activity declines after entry into the program could indicate that prostitution is practiced in order to support her drug habit, rather than as a basic way of life. But the data, as we shall see later, do not lend consistent support for this hypothesis.

Table 2

Age, Race and Sex Specific Rates by Type of Offense for the Period of Addiction

	16-20				21-25			
	White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female
Drugs	.24	.23	.08	.07	.37	.17	.22	.14
Property	.17	.05	.14	.07	.25	.04	.20	.06
Assault	.10	.05	.07	.01	.04	.00	.03	.01
Property-Assault	.02	.00	.02	.01	.02	.00	.02	.01
Forgery	.00	.09	.02	.09	.02	.04	.02	.11
Prostitution	.00	.00	.00	.04	.02	.00	.01	.11

*The computations for this period appear in the section on Addiction, Criminality and Age.

Table 2
(continued)

Age, Race and Sex Specific Rates by Type of Offense for the Period of Addiction

26-30				31-34				35+			
White		Black		White		Black		White		Black	
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
.40	.12	.27	.25	.42	.08	.24	.15	.27	.11	.19	.14
.49	25	.20	.10	.36	.08	.22	.07	.20	.18	.17	.07
.06	.00	.04	.04	.10	.00	.04	.00	.10	.04.	.02	.01
.03	.00	.01	.00	.00	.00	.01	.00	.00	.00	.00	.00
.03	.06	.03	.28	.07	.08	.02	.32	.00	.04	.01	.29
.00	.06	.01	.08	.03	.08	.02	.03	.13	.07	.02	.22

Taking the crime rate in the population at large as a basis of comparison, the crime rate of the white male addict in the sample (N=45) is unexpectedly higher than those of his black counterpart. Crime distribution by race in the general population indicates that blacks have significantly higher arrest rates than whites in every category of offense except in crimes against morals and against public order. The FBI criminal statistics show a property charge rate that is approximately three times greater for blacks. Sociologically, the difference is explained as a consequence of the disadvantaged position of the black population in the social and economic hierarchy, which would be likely to increase the pressure to break the law, as officially measured. The picture that emerges from our data does not correspond to the population stereotype. Table 3 shows the respective rates for the 331 males in the sample, of which whites comprise 14 percent. The crime rates are distributed by age as by race for the three major categories of offenses: crimes related to use and sale of drugs and drug works, crimes related to porperty, and crimes of violence against the person. Robbery, which we treat as a category separage from assault, is not included in the table because of the small number of charges.

The table covers two sets of charge rates, one set for the period during addiction and one set for the one year before entry into the program, which is part of the addiction period. The figures show a systematically higher rate of drug, property and assault charges for the white male than for the black male

Table 3

Offense Rates by Age and Race (from Onset of Addiction to Entry) (N=331 Males)

Drug Offenses

(age groups)

	21-25		26-30		31-34		35+	
	White	Black	White	Black	White	Black	White	Black
Total addiction period	.37	.22	.40	.27	.42	.24	.27	.19
One year before entry	1.07	.80	.38	.66	1.04	.56	.61	.26

Property Offenses

	21-25		26-30		31-34		35+	
	White	Black	White	Black	White	Black	White	Black
Total addiction period	.25	.20	.49	.20	.36	.22	.20	.17
One year before entry	.98	.47	.28	.26	.69	.26	.15	.22

Assault

	21-25		26-30		31-34		35+	
	White	Black	White	Black	White	Black	White	Black
Total addiction period	.04	.03	.06	.04	.10	.04	.10	.02
One year before entry	.09	.10	.19	.06	.35	.03	.00	.02

during the span of their addiction. The overall rate for the whites for the total period of addiction is twice that for the blacks. No systematic differences between the two groups are discernible in crimes related to prostitution, forgery or to robbery.

The same sociological factors that ordinarily explain differences in crime rates among races in the general population apply in this study to the white segment of the sample. The studies conducted by ARTC on the differences in the social background of the ethnic groups in the program showed that the white addict in the program occupies a disadvantaged position in terms of his employment and education history as well as in terms of his addiction history. Thus we find that about 40 percent of the whites were addicted between the ages of 11 and 17 (N=84), compared to 17 percent of the black population (N=649).* Thirty-seven percent of the black patients graduated from high school, compared to 32 percent of the whites. For the total sample, of those addicted between the ages of 11 and 17, 60 percent never worked or did not hold a job for more than one year, compared to 35 percent among those addicted between the ages of 22 and 25. The average age of the white patients upon admission is 27 compared to an average age of 32 for the black addicts. The early onset of addiction apparently damaged the access of a large proportion of the whites to the conventional roles in growing and to general social integration in work, education or family life. This premature exclusion from the

* The figure refers to the first 649 patients in the program which the ARTC team at Columbia University studied. Our 416 patients are included in this figure.

opportunity to experience the rewards of stable employment or education most likely precipitated the conditions for the white patient to break the law at an increased pace. This potential relationship between early age of addiction and subsequent criminal behavior, and its implications for treatment results, will be pursued in the future, using data obtained on a larger sample of patients and over two years of treatment in the program.

The Behavior of the Sample in the One Year Before Entry: The data related to the one year before entry into the program indicate that the patients who selected themselves for treatment at ARTC were addicts who had apparently reached a crisis in their crime/addiction career. In the one year before admission they had reached a peak of one charge per person (1.03). The charge rate for drug offenses was .24 for the total period of addiction, but in the year just prior to entry into the program it was .45. The rate for property offenses for the total period of addiction was .20, while for the year just before entry it was .26. The rate of assault crimes increased from a rate of .04 to .05.

Though the rates increased for the year preceding admission, they are not higher than the rates obtained on crimes committed by addict-offenders in the general U.S. Population. When we convert our charge rates for the year before entry into the program into arrest rates (usually used in criminal statistics) we observe in the sample an arrest rate of .75, slightly less

than the arrest rates of addicts in the population, which is .83, as reported by the FBI study, cited earlier. If we view the prior crime rate as a factor of potential treatment amenability, the self-selected sample in the ARTC program presents a treatment potential not different from the population at large. When compared with prior arrest figures of other major methadone programs, such as the MMTP in New York, our sample, with its rate of .75, shows even a lower arrest rate at the time of their admission than patients at MMTP, with a 1.2 arrest rate.

The Treatment Period

Analysis of data on the criminal behavior of the sample and the sample's court disposition is limited in this report to one year after the patients joined the program. The analysis of data on longer periods of treatment will appear in future reports. As mentioned earlier, patients who withdrew from the program before they completed one year of treatment were not excluded from the analysis. The average length of stay of those who withdrew was more than ten months and only 3 percent of those who terminated at any time within two years (N=151) did so after staying in the program less than three months. Methadone maintenance programs are generally reported to have a high rate of patient retention compared to free drug programs, for example.[16]

In assessing the impact of treatment we compared the overall crime rates for the first year in the program, first, to the rates for the total span of addiction, i.e., from the onset of addiction up to the date of entry into the program, and second, to the rates for the year prior to admission. Table 4 presents the three sets of rates both in terms of overall charge rates and specific charge rates.

The figures related to the overall crime index show that the patients in the sample reached a peak of 1.03 charges per person in the year preceding their entry into the program and started to show a modest decline during the year after admission (.81) relative to the rate of the peak year but not to the rate

16. James V. DeLong, "Treatment and Rehabilitation," op. cit.

of the total addiction period, which was .65.

Table 4

Offense Rates from Onset of Addiction to One Year After Entry (N=416)

	1 During Addiction	2 One Year Before Entry	3 One Year After Entry	Difference between 2 & 3
Drug offenses	.24	.45	.36	-.09
Property offenses	.20	.26	.21	-.05
Assault	.04	.05	.09	+.04
Property/Assault	.01	.01	.02	+.01
Forgery	.05	.02	.01	-.01
Prostitution	.03	.09	.04	-.05
Overall Crime Index	.65	1.03	.81	-.22

The addict in the sample averaged about two-thirds of a charge for every year from the time he began using heroin daily until his entry into the program, or about eight charges over a period of twelve years of addiction. Compared to the total period of addiction this rate increased by about 40 percent in the year prior to admission to the program, when the patients averaged one charge per person. After one year of treatment the rate declines by 21 percent relative to the preceding year but remains higher than the rate based on the criminal behavior of the sample during their twelve years, on the average, of addiction. We shall pursue rate comparisons of single years (one year before entry/one year after entry), since the overall period which extends from the onset of addiction until entry into the program contains years broken by long stretches of incarceration time during which the addict was not exposed

to the risks of arrest. Incarceration was the court's most common response to the addict - offenders at this period, as is shown in Appendix A.

Looking at the specific charges, the highest reduction measured by difference in rates, from one year before entering the program to one year after admission, is observed in charges related to the sale, purchase and use of drugs, though the decrease-difference amounts only to .09. The second highest decline is observed in charges related to property offenses and to prostitution, a decrease-difference of .05 in the rates for each of these offenses. When the reduction is measured by percentage-change, property charges declined by the same amount as drug charges (about 20 percent), while prostitution declined by 56 percent. Crimes against the person have increased in rate by .04, while robbery increased by .01. The observed slight increase after treatment in crimes of violence is relative to the total period of addiction, from onset up to entry, as well as relative to the rate in the peak year. The pre-admission rates of crimes of violence, however, were low compared to other types of offenses.

The patients, in overall terms, after one year of treatment at ARTC display a modest reduction in drug offenses which may be attributed to the fact that they are now being supplied with methadone and are less involved in heroin-seeking behavior and less likely to be arrested for drug offenses. However, the drug charge rate of .36, or about a third of a charge per person,

while in treatment remains higher than the drug charge rate which characterized the total period of addiction (.24). The overall decline in property offenses and in prostitution apparently indicates that a decline in heroin use involves simultaneous decline in crimes related to financial gain. However, when the aggregate rates are specified by age groups this relationship between the decrease in drug offenses and the decrease in property and prostitution crimes is not consistent in the sample, as will be detailed below.

The aggregate rate may serve as an overall index of behavior, but it can also blur differences that may be attributable to age, sex, etc. Literature refers to the concept of a life cycle in addiction in which age is assumed to play an important role.[17] Young addicts, for example, appear to avoid treatment, as shown by the fact that the average age of patients seeking treatment is between 30 and 35, higher than the average age of addicts in the population. One explanation advanced in the literature is that young addicts have not yet developed the tolerance for an image of themselves as full-fledged addicts, a pre-condition for seeking treatment. Even when young addicts do join a program, their readiness to respond may still be impaired by the ambivalence of balancing the hedonistic value of heroin against the costs involved. Older addicts, in full recognition of their addiction status, and handicapped by a long-term drug dependence and a history of entanglement with the law, may be more inclined

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17. H. Alksne et. al., "A Conceptual Model of the Life Cycle of Addiction," The Inter. Journal of the Addiction, Vol. 2, Fall, 1967, pp. 221-240.

to effect a change in their lives.

Research on addiction has also suggested, however tentatively, that a process of natural recovery from addiction, a "maturing out,"[18] occurs spontaneously as the addict grows older. Specifically, Winick suggested that two-thirds of the addicts become inactive in their thirties. Other studies show that spontaneous changes in criminal behavior as a result of aging also occur in other types of deviance. Assaultive behavior, for example, tends to diminish with age. However, we have no well-grounded knowledge on these processes and how they occur.

As we relate these observations to our treatment findings, we find that the older group - those 31 and over - show some advantage over the younger group in terms of an overall reduction in crime. However, the fluctuations of this advantage in the overall rate when specified by type of offense, coupled with the small degree of change in criminal behavior that the group as a whole displays after treatment, make premature any far-reaching conclusions in this respect. Table 5 examines the criminal behavior of the two age-groups in the treatment period relative to the year preceding admission.

Patients who joined the program between the ages of 21 and 30 had a crime rate in the pre-admission year which was about 40 percent higher than that of older patients in their pre-

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18. Charles Winick, "Maturing Out of Narcotic Addiction," U.N. Bulletin on Narcotics, Vol. 14, No. 5, January-March 1962. Also by the same author, "The Life Cycle of the Narcotic Addict and of Addiction," U.N. Bulletin on Narcotics, Vol. 16, No. 1, 1964, pp. 22-32.

Table 5

Crime Rates for One Year Before Entry/One Year After Entry by Age (N=416)

		21-30* (N=156)	31-over (N=260)
Overall Crime Index	Before	1.31	.82
	After	1.12	.65
Drugs	Before	.62	.34
	After	.40	.34
Property	Before	.33	.22
	After	.39	.11
Assault	Before	.09	.02
	After	.13	.07
Property/Assault (Robbery)	Before	.01	.01
	After	.04	.00
Forgery	Before	.02	.01
	After	.01	.00
Prostitution	Before	.09	.09
	After	.06	.03

*The N's are calculated by age of patient upon entry into the program.

admission year. The rate of charges for this young group remains fairly high after one year in treatment, higher, for example, than the average rate of the whole sample in the peak year which preceded admission (1.03). In all types of crime the older group had a lower rate of charges than the younger group. This does not mean that the young patients in the sample did not respond to treatment. In terms of overall reduction, the young group achieved a 15 percent reduction compared to 23 percent reduction by the older group. The overall charge rate, however, somewhat blurs the differences in response between the two groups. When observed by specific categories of offenses, the two groups appear to benefit differentially from the program. The older group, 31 and over, shows no difference in its drug behavior. The same drug charge rate is obtained for the year after entry as for the year before entry. At the same time the group cuts down property offenses by almost a half, and prostitution by two-thirds.

The patients under 30 years of age, in contrast, decreased their drug charges by over a third (from .62 to .40), while at the same time their property charges have slightly increased (from .33 to .39). Both groups increased their assault rate while in treatment, the older group by a rate lower than the young group.

The findings imply that a reduction in gainful crime (property, prostitution or forgery crimes) does not necessarily

result from less demand for heroin, as one might expect. The data show no consistent relationship between a reduction in drug charges and in property charges, or between drug abuse and crimes of violence. While the supply of methadone may decrease the likelihood of arrest for drug offenses, crimes of profit continue to be committed at the same rate as before treatment, apparently for purposes other than financing the consumption of drugs, which has meanwhile decreased. On the other hand, a sharp decline in property crime and prostitution, as displayed by the older group, does not appear to be a function of less heroin use. The older group appears to divorce its drug behavior from non-drug crime. It may well be that the older addicts are beginning to benefit from the broader rehabilitative services of the ARTC program while continuing to possess drugs and use them. It is very possible that the treatment program is bringing about, for some patients, a dissociation of a life in drugs from alife in crime. In a multi-modality program such as the one at ARTC, patients may benefit differentially from the services offered. The older group may be more resigned to the intake of drugs, remain little affected by the supply of methadone, while responding at the same time to the other opportunities in the program, such as gainful employment and other types of aid.

Breaking the sample into smaller age brackets by age of entry, as shown in table 6, does not appear to change the picture much. The only new finding is that the age group

Table 6

Differences in Crime Rates Between One Year before Entry and One Year after Entry into Program for All Patients (N=416)

		N=58		N=98		N=73		N=187	
		21-25		26-30		31-34		35+	
		Rates	Difference in Rates	Rates	Difference in Rates	Rates	Difference in Rates	Rates	Difference in Rates
Drugs	*Before	.65	-.15	.59	-.25	.54	-.14	.24	+.07
	After	.50		.34		.40		.31	
Property	Before	.46	+.06	.23	+.08	.26	-.12	.20	-.09
	After	.52		.31		.14		.11	
Assault	Before	.07	+.09	.10	+.01	.05	-.01	.01	+.07
	After	.16		.11		.04		.08	
Property-Assault	Before	.00	+.05	.02	+.01	.03	-.03	.00	.00
	After	.05		.03		.00		.00	
Forgery	Before	.03	-.01	.02	-.01	.00	+.02	.02	-.02
	After	.02		.01		.02		.00	
Prosti-tution	Before	.14	-.14	.05	+.04	.03	-.02	.12	-.11
	After	.00		.09		.01		.01	

*First row designates charge rate for one year before entering into program, the second row designates the charge rate for the first year of treatment. N's are computed by age of entry.

Overall Difference in Rates = -.22
Overall Percentage Change in Rate = -21%

of 31 to 34, which comprises 18 percent of the total sample, shows a consistent, though small, reduction in almost all categories of offenses. Table 7, which examines the treatment results by age of entry as well as by race and sex, further substantiates the absence of a consistent relationship between drug behavior and crimes against property.

In general, no one variable in the social history of the sample is significantly related to the effects of treatment. This can be the result of the small variations in the overall treatment results, and of the fact that the patients pursued a fairly homogenous criminal life in the years preceding admission. When observed against the background characteristics of the sample, the differences in the treatment results appear mostly related to the age at which the patients entered the clinic, which in turn is correlated with the variable of age at the beginning of daily use of heroin. Older patients in the sample began daily use of heroin late in life ($r. = .44$), showed a higher rate of employment stability ($r. = .23$), were likely to be black ($r. = .21$) and had a lower charge rate during their addiction period ($r. = -.20$). Whatever bearing past characteristics may have on responsiveness to treatment, the weight of present factors cannot be dismissed. Immediate

Table 7

Age, Race and Sex Specific Rates by Type of Offense

One year before entry/One year after entry (N=416)

		21-25 (58)*				26-30 (98)			
		White		Black		White		Black	
		Male	Female	Male	Female	Male	Female	Male	Female
Drug Offenses	Before	1.07	.35	.80	.13	.38	.00*	.66	.66
	After	1.29	.23	.44	.10	.32	.00	.27	.69
Property	Before	.98	.35	.47	.06	.28	.00	.26	.07
	After	.54	.70	.60	.19	.48	.00	.37	.00
Assault	Before	.09	.00	.10	.00	.19	.00	.06	.13
	After	.44	.00	.10	.19	.16	.00	.12	.06
Property/Assault	Before	.00	.00	.00	.00	.05	.00	.02	.00
	After	.00	.00	.09	.00	.16	.00	.00	.00
Forgery	Before	.00	.00	.05	.00	.05	.00	.02	.00
	After	.00	.23	.00	.00	.00	.00	.02	.00
Prostitution	Before	.09	.00	.00	.58	.00	.00	.00	.33
	After	.00	.00	.00	.00	.00	.00	.02	.46

*N's are calculated by age of entry.

** There are no white females in this age category.

Table 7
(continued)

Age, Race and Sex Specific Rates by Type of Offense
One year before entry/One year after entry (N=416)

		31-34 (73)				35+ (187)			
		White		Black		White		Black	
		Male	Female	Male	Female	Male	Female	Male	Female
Drug Offenses	Before	1.04	.00*	.56	.22	.61	.00	.26	.10
	After	.50	.00	.36	.45	.00	.33	.35	.23
Property	Before	.69	.00	.26	.07	.15	.33	.22	.10
	After	.30	.00	.10	.15	.14	.00	.12	.06
Assault	Before	.35	.00	.03	.00	.00	.00	.02	.00
	After	.00	.00	.04	.07	.43	.33	.06	.06
Property/Assault	Before	.00	.00	.03	.00	.00	.00	.00	.00
	After	.00	.00	.00	.00	.00	.00	.01	.00
Forgery	Before	.00	.00	.00	.00	.00	.00	.02	.00
	After	.20	.00	.00	.00	.00	.00	.00	.00
Prostitution	Before	.17	.00	.00	.07	.00	.33	.02	.53
	After	.00	.00	.02	.00	.00	.00	.01	.18

*There are no white females in this age category.

forces acting on the individual in his current community or in his treatment environment can greatly influence the behavior of the patient and may even prove to be of more influence than the events in his distant past. We have in mind such current factors as community and legal barriers, job opportunities, education and other aid facilities. Availability in the future of data on these or other facets of social adjustment in the program may shed more light on the question of what type of patient benefits in what way from the methadone program.

Conclusion

To conclude, the patients who joined the program at ARTC displayed a long history of addiction marked by a criminal career which centered around drug and property offenses and, to a much lesser degree, around crimes of violence. The patients reached a relatively high crime rate during the year preceding admission to the program but they were not more criminally involved at this stage than addicts in the population in general, or addicts in other major methadone programs.

After one year of treatment at ARTC the addicts show a modest overall reduction in their criminal behavior relative to the peak rate but not to the rate which characterized their total addiction period. Early figures on the second year in the program indicate a steady decline in charges. Exposed to a program which offers different rehabilitative services in addition to the administration of methadone, the patients seem, accordingly, to have benefited from the program in different ways. Though the overall drug charge rate shows a reduction by 19 percent after a year in treatment, it is the younger patients - between 21 and 30 upon admission - who ac-

counted for the largest portion of this reduction in drug use. Apparently affected by the supply of methadone, this younger group reduced its use of heroin and was less likely to be arrested on drug charges. The reduction in drug charges for this group was not accompanied by a reduction in the rate of property crime or of crimes of violence, both of which in fact increased in rate. Older patients, on the other hand, especially those who entered the clinic at the age of 35 or over (45% of the sample), considerably decreased their non-drug charges but without showing change in their drug habits. Thus, the data, when subjected in this way to closer analysis, do not appear to establish a connection between the overall decrease in drug crimes and the decrease in gainful crime, which the sample as a whole displays. The factor of the patients' current age in the program, which differentiates the overall responses of the sample, is associated with past social characteristics, among which late age of the onset of addiction, employment stability, and lower criminal involvement in the pre-admission period seem to lend some advantage to the older group. When specifying the overall

advantage of the older group by type of offense, a differential pattern of adaptation to the program occurs. In addition to examining the effects of the social past on the behavior of the patient during the program, we feel that forces currently operating on the sample should also be explored. Job opportunities, legal barriers, criminal affiliations, and pressures of associates in the community may have more impact on observed and future results than events in the distant past of the patient.

Our research findings do not seem to support the existence of simple relationships between drug use and profitable crime or between the administration of methadone and subsequent modification in criminal behavior. Crimes which predominate in the addict's behavior are perceived to be related to his need to maintain a costly habit. However, a simple relationship between the gainful type of crime that the addict commits and his needs for drugs cannot be easily established. Even if a criminal style of life is secondarily developed as a result of the financial pressures of heroin-seeking, it is still possible that the long years of practice in

criminal behavior and the constant exposure to crime can develop attitudes and skills which may not be completely eliminated in a span of a year or so of treatment. This possibility is well illustrated in the words of a prostitute in the ARTC program: "Now that I'm on methadone, I feel like a human being for the first time. I want some nice clothes and the only thing I'm good enough at is boosting [shoplifting] and turning tricks. But I don't have to do as much as long as I can get my drugs here."[19] If crime for the addict has evolved as a general way of life, only partly contingent on his use of heroin, then methadone alone will not effect a total change. Even when methadone is supplemented with rehabilitative services, change cannot be anticipated in a short period.

The process of drift into crime, and the development of criminal skills before and during addiction can pose a serious challenge to methadone projects. The challenge becomes greater when these programs operate on an environmental background which has been shown to be tolerant of the phenomenon of drug use. The Community Survey, as conducted by ARTC, reports of the widespread use of heroin in the Bedford-Stuyvesant area

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19. Quoted in James Vorenberg, "The War on Crime: The First Five Years," The Atlantic, May 1972, pp. 68-69.

and the intimate peer groups and even kinship networks which accept and maintain it. The total relationship of the addict in treatment is with his local community, and efforts at rehabilitation cannot become fully effective unless they are related to the neighborhood community setting. The role of the local community in the success or relapse of addict - offenders was referred to earlier. In this frame of reference, methadone projects, in order to effect long-term alterations in the behavior of the patient, will have to follow concepts in rehabilitation not much different from those in other correction systems which have become increasingly geared toward the changing of the offender as a member of a community. Viewing methadone treatment in a context of a correction model would reduce unrealistic expectations with respect to behavior modification and suggests the need for prolonged periods of treatment in order to begin to observe long-term alteration in behavior. Preliminary analysis of data on the criminal behavior of the patients who remained in the program for two years suggests such a direction in the treatment results. The overall crime index of those patients shows a steady decline over time and stands below the index which characterized not only the pre-admission

year but the entire period of addiction. We intend to carry out in detail the analysis of the second year in the program, which will allow us to investigate differences between patients who withdraw and patients who remain active in the program, with the goal of exploring further the trends suggested in this study.

Appendix A

Comparisons with other studies. Different criteria of admission to methadone programs in the country, as well as differences in sampling techniques and methodologies, make comparisons among programs difficult. However, it appears that no matter what criteria for admission or for evaluating success are used, the vast majority of the evaluation studies indicate a remarkable rate of reduction in crime, as indicated in the proceedings of the second and third National Conferences on Methadone.

Most of the programs evaluate their effects along criteria which were originally developed by the MMTP in New York. Comparing our treatment results with MMTP, it should be noted that the New York program uses arrests as the unit for calculating the crime index, while we use charges. Calculations in terms of arrests would operate in favor of the success rate, since in the aggregate the number of charges for a person exceed the number of his arrests.

Arrest or charges as the unit of calculation also makes a difference when we compare our crime index with that of other evaluation studies or with arrest figures of addicts in the general population.

The decline in the rate of charges of our patients at ARTC is much lower than the one observed at MMTP. The MMTP has calculated rates based on arrests for a period of three years of addiction before admission and three years of treatment. The rate for the pre-admission period was 1.2 arrest per person/year, which declined after three years of treatment to .05, a reduction

of over 90 percent. Our results, computed in charges and based on a single year comparison (one year before entry/one year after entry), show a reduction of 21 percent only. The longer period of treatment at MMTP--three years as the baseline for the evaluation of the program effectiveness--should account for the results achieved. The differences in the results obtained by MMTP and our program are lessened when we convert our charge rates into arrest rates. We obtain a 30 percent reduction in the overall arrest rate which is still a much lower rate of reduction than that of MMTP.

Another way of presenting the comparison is to compare the percentage of patients who were arrested one year before entry to those arrested one year after entry.[1] The MMTP reports show that the percentage of persons arrested decreased from 20 percent in the one year prior to admission to 6 percent in one year after admission. (N=1530). Computing our figures on similar baselines we find that 45 percent of our patients were arrested during the year before entry compared to 32 percent after entry. However these figures are not rates, since they do not take into account the number of arrests each patient accumulated per year.

For purposes of effective comparisons and the implications of such comparisons both within the sample and between the sample and other studies, a longer observation period is desirable. The

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1. Frances R. Gearing, "Evaluation of Methadone Maintenance Treatment Program," in Methadone Maintenance, Stanley Einstein (ed.), Marcel Dekker, New York, 1971.

addition of the second year of treatment data will thus provide a better base for comparative analysis.

Another type of comparison is to contrast the rate of arrests of treated addicts with the rate of arrests of addicts in the general population. The arrest rates in the population are based on police reports to the uniform crime reports section of the FBI. 4,385 persons identified by the FBI in 1966 as heroin users averaged ten arrests over a span of twelve years, that is an annual arrest rate of .83 per person. Our patients averaged an arrest rate of .75 during the one year preceding entry into program, very close to the rate in the population. After one year in the program their arrest rate declined to .53. All this would indicate that the crime rate* of the patients at ARTC after one year of treatment is less than that of the untreated general population of addicts.

Another measure of the effects of treatment is the incarceration rate. For example the MMTP in New York[2] showed that the patients in the three years before admission had an incarceration rate of .48 which declined to .01 after three years of treatment, a remarkable reduction by 98 percent. The patients in our sample achieve a reduction of 80 percent, also quite high. However,

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* The crime rates used here should not be confused with the percentage of arrests in the treated population discussed above.

2. Herman Joseph and Vincent P. Dole, "Methadone Patients in Probation and Parole," Federal Probation, June, 1970.

analysis on the court disposition of our patients, which we present in the following section, appears to question the validity of the confinement rate as a measure of success in our sample.

Court disposition as a measure of successful treatment. The information we have on the court disposition of our subjects was obtained from the court files. Rates for the various sentencing alternatives were computed for the three periods defined earlier. Six dispositional categories were constructed: referral to drug programs, acquittal, charges dropped, sentence suspended or fine, probation, and institutionalization. Institutionalization was in turn broken into different confinement periods ranging from one month up to ten years or over.

Studies of sentencing have regularly shown that the severity of the penalty correlates closely with such factors as the seriousness of the crime and the extent of criminal record. Rates of sentencing to various dispositions are therefore sometimes used as indicators of court judgments as to the significance of criminal involvement of offenders. Thus, in the case of addicts in treatment, one might assume that a confinement rate which is lower after entry into treatment than before would indicate a descending trend of the criminal involvement of the subjects, or of the severity of their adjudicated crimes. In fact it is under such assumptions that confinement rates are used by large-scale methadone programs (for example the New York City MMTP) as an index of success of treatment.

Our findings show that the confinement rate of addicts while

in treatment does not necessarily correspond to the magnitude of the criminal involvement of the patients, as this involvement is measured by their charge rate. The following pages will detail this finding as well as review briefly the behavior of the courts toward our patients across their addiction career.

Sentencing behavior toward drug offenses: We begin the analysis of disposition by probing the actions of the court in the first drug offense of the members of the sample. Drug offenses produce the highest rate of charge, and may be the closest indicators of the defendant's probability of addiction.

Our data indicate that the judicial attitude toward the drug offenses of the patients, before treatment, is as severe as that which more commonly characterizes the attitude toward non-drug crimes of violence. (A drug arrest in New York City may take place for possessing drugs, possessing drug works, intent to sell and sale.) An extensive study of conviction rates for various types of crimes in New York City[3] revealed that of all the narcotic defendants brought to court in 1960, about 80 percent were convicted. This is a markedly higher rate than the 61 percent convictions for all other types of felony crimes and the 62 percent for all misdemeanor crimes.

The conviction rate for the first drug offense committed by our patients was 76 percent, close to the average of 80 percent mentioned above.

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3. An Analysis of New York City Police Statistics for Narcotic Arrests During the Period 1957-1967, Bureau of Applied Social Research, Columbia University, March, 1969.

The disposition breakdown for the first drug offense (not necessarily the first offense) is as follows: 33 percent were incarcerated, 6 percent received probation, and 2 percent were referred to drug programs. Fifteen percent of the cases resulted in suspensions or fines, 20 percent were still pending or awaiting appeal when the data were collected and the rest were acquitted.

For all age groups, as of the time of their first drug arrest, the proportion of those sentenced to serve time is higher than for any other type of disposition. The proportion incarcerated is highest in the 20-25 age group, where it reaches 40 percent. It drops moderately for the 26-30 age group and stands at 23 percent for those who were 31 or over at their first drug charge.

Disposition rates for all types of offenses: Table 8, which examines the sentencing response to all offenses, shows that prison sentencing remains the court's most frequent response.

Table 8

Disposition Rates for All Offenses

	I Before Addiction		II During Addiction		III Treatment Period		Difference in rate Between II and III
Institutionalization	rate .09	% 56	.22	% 76	.05	% 42	-.17
Probation	.03	19	.02	7	.03	25	+.01
Referral to Drug Programs	.00		.01	3	.03	25	+.02
Suspended	.04	25	.04	14	.01	8	-.03
Total of Above Categories	.16	100	.29	100	.12	100	-.17
Acquitted	.07		.18		.15		-.03
Charges Dropped	.00		.00		.00		.00

In all periods the court resorts to confinement more often than to any other dispositional category. Charges lodged against addicts are very rarely dropped in court. The likelihood that the full-fledged addict will be referred to a drug program is low, with increasing probability of such referral when his case is adjudicated while he is connected or has recently been connected to a program, as shown more fully below. The likelihood of probation is small during his addiction span and slightly increases while he is in treatment.

The limitations of the confinement rate: Rates of confinement were obtained for all offenses for the periods preceding addiction, during addiction and after admission to the program. Table 9 shows the confinement.

rates of the three periods together with the corresponding charge rate, and the association measure between the two.

Table 9

Charge Rate and Confinement Rate for All Periods

	Aggregate Charge rate	Aggregate Confinement rate	Correlation Coefficient
Before addiction	.21	.09	.56
From onset of addiction up to entry	.65	.22	.65
First year after entry into program	.81	.05	.21

The most frequent confinement term to which the patient was sentenced before addiction is between 6 months and one year. We note that in the period during addiction the rate of confinement as a dispositional category has increased to .22 from a rate of .09 in the pre-addiction period. However, short confinement periods in the range of 1-3 months and 3-6 months characterize the court behavior at this stage.

In the first year after admission to the program, the rate of confinement decreased to .05. The reduction must be explained in terms other than a corresponding reduction in the charge rate of the sample. Table 9 shows that for the periods before addiction and during addiction, the behavior of the courts seemed to be

HEROIN USE AND CRIME IN A METHADONE MAINTENANCE TREATMENT PROGRAM: A TWO YEAR FOLLOW-UP OF THE ADDICTION RESEARCH AND TREATMENT CORPORATION PROGRAM

A Preliminary Report

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INTRODUCTION

This is the first in a series of reports on the Addiction Research and Treatment Corporation program in the Bedford-Stuyvesant/Fort Greene area of Brooklyn. This report will present information on selected aggregate outcomes, including heroin usage by patients in treatment, criminal activity, program retention and regularity of patients' attendance for methadone. Subsequent reports will present information on other areas of social adjustment as well as an analysis of the factors associated with differential outcomes of the patients in the program.

The Addiction Research and Treatment Corporation Center is located in the heart of a ghetto community which has an extremely high rate of heroin addiction. According to the Narcotics Register (1969) the area served by the program contains all but one of the health areas with the highest addiction rates in Brooklyn. Admission to the program is limited to persons 21 years old or older who have been heroin addicts for at least two years. No effort is made to screen patients, and except for gross contrary medical indications the program accepts all those who apply from the catchment area who conform to the above provisions.

Because there is so little selectivity of patients in the admission process, a proper assessment of program success must await the completion of this series of reports.

Most reports on program outcomes for methadone patients have been for experimental programs with self-selected patients drawn from very different communities than the one where ARTC is located. Unlike many other programs, the ARTC patient population is heavily weighted with so-called 'hard-core' addicts who lack education and job skills and who have long criminal records.

The following report deals only with aggregate program outcomes. The characteristics of successful and unsuccessful patients will be described in the series of reports that will follow this one and where we will observe that a concatenation of factors in the patients' history and background can have a marked influence on the results. We can also learn from this and the subsequent reports what results may be anticipated as drug programs expand in order to provide treatment facilities for an increasing portion of the addicted population.

The Addiction Research and Treatment Corporation accepted the first group of patients in October 1969. Since that time, the Center has added successive clinics to accommodate additional patients until it reached its present size of about 1200 active individuals.

The program, from its inception, was guided by a commitment to multi-modality approach to the

treatment and rehabilitation of heroin addicts. Almost all patients are given methadone, although the quantity of methadone may vary. Counselors are assigned small caseloads. Various forms of group therapy are also available to assist patients. There is a program of medical services, job development, education, and legal services. In addition, there is a community education program that provides speakers and conducts educational programs in the community.

The sample examined in this report covers the first 765 patients accepted into treatment. It includes all individuals who completed the intake process and who were administered methadone at least once. There was no attempt to exclude individuals who may have withdrawn from the program after a few days or weeks. These patients were admitted between October 1969 and February 1971 and were in the program for at least one year, or would have been if they were not terminated, when the data for this report were assembled.*

*The number of cases in tables varies as a function of the completeness of the particular information examined. Urines and methadone attendance were obtained from Creative Computers Inc., who stored all the information the ARTC Team used in this report. There are several lacunae for periods of time where all urine records were not stored. As a consequence the number of cases declines as it excludes those instances where the information is unavailable, or for individual patients who may have escaped the requirement that they submit urines on schedule. Data obtained from interview schedules or from police records include all 765 cases.

The typical patient was 31.7 years old when accepted in the program. He started using heroin on a daily basis when he was 21.5 years, and thus had been addicted to heroin for 10.2 years when he entered the program. The average number of years of schooling completed is 10.5 years. About four-fifths of the patients are male, and reflecting the ethnic character of the community where the ARTC Center is located, 77.4% of the patients are black, 10.4% white and 11.7% Puerto Rican. Less than 1% are from oriental and other racial backgrounds. The largest group, 36%, were single, 24% married, 29% separated or divorced at admission; and the balance, 2%, widowed. When entering the program only 18% reported their major source of income was from gainful employment; 19% were on welfare; and 7%, mainly females, reported they were supported by their spouse or kin. Almost half, or 48%, reported that their major source of income was from illegal activities (see Table 1).

The patient group investigated in this report, then, is primarily black, of whom fewer than one-fifth are gainfully employed, and who typically have less than high school education. Almost half derived their major income from illegal activities. We therefore have a patient

TABLE 1

PATIENT CHARACTERISTICS

Marital Status:	
Single	37%
Married	33
Separated/Divorced	29
Widowed	1
Primary Source of Income at Admission:	
Legitimate Job	18%
Welfare	19
Spouse/Kin	7
Illegal	48
Other	7
Ethnic Classification:	
Black	77.4%
White	10.4
Puerto Rican	11.7
Other	0.4
Average Age	31.7 years
Age Regular Drug Use	21.5
Percent Male	81.5%
Average Years Schooling	10.5 years

group that is heavily weighted with long-term drug users who present a profile of characteristics that is most likely to be recalcitrant to rehabilitative efforts.

Heroin Use

In Charts I, II and III the profile of heroin use of patients in the program is presented. In the first chart, data are presented for all patients in the program, including those who subsequently terminated. The second chart shows the profile of heroin use among patients who remained in treatment through March 1972 when these data were collected. Chart III presents data on heroin abuse by patients who subsequently terminated from the program.

Only morphine indications in the urine tests were used in assessing whether a urine was 'dirty'.* An investigation by Dr. Charles Riordan and his staff (Riordan 1972) indicated that tests for quinine detection proved insufficiently reliable as an indication that the patient was using heroin. Even morphine indications were not perfectly reliable; therefore, patients were classified on the basis of three-months experience in order to include a substantial number of tests. This reduces the chance that they would be misclassified.

*Although patients use heroin, the heroin metabolizes to form morphine in the urine. Amphetamines and barbiturates are also tested in the urinanalysis; however, indications of these were found to be both infrequent and unreliable. (Riordan 1972)

Chart I

PERCENTAGE WITH MORPHINE IN URINE FOR SUCCESSIVE QUARTERS IN PROGRAM, FOR ALL PATIENTS

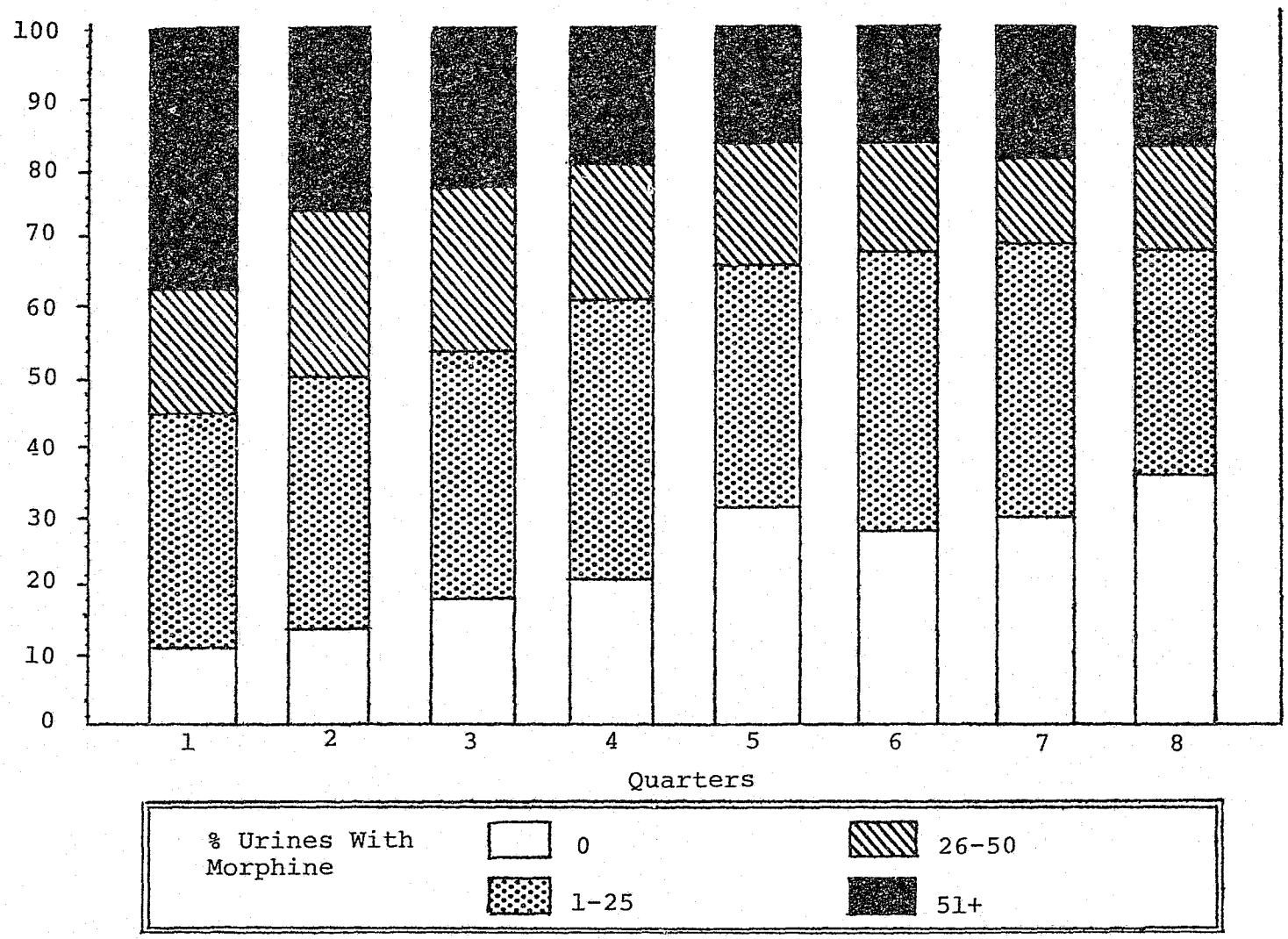


Chart II

PERCENTAGE WITH MORPHINE IN URINE FOR SUCCESSIVE QUARTERS IN PROGRAM, ACTIVE PATIENTS

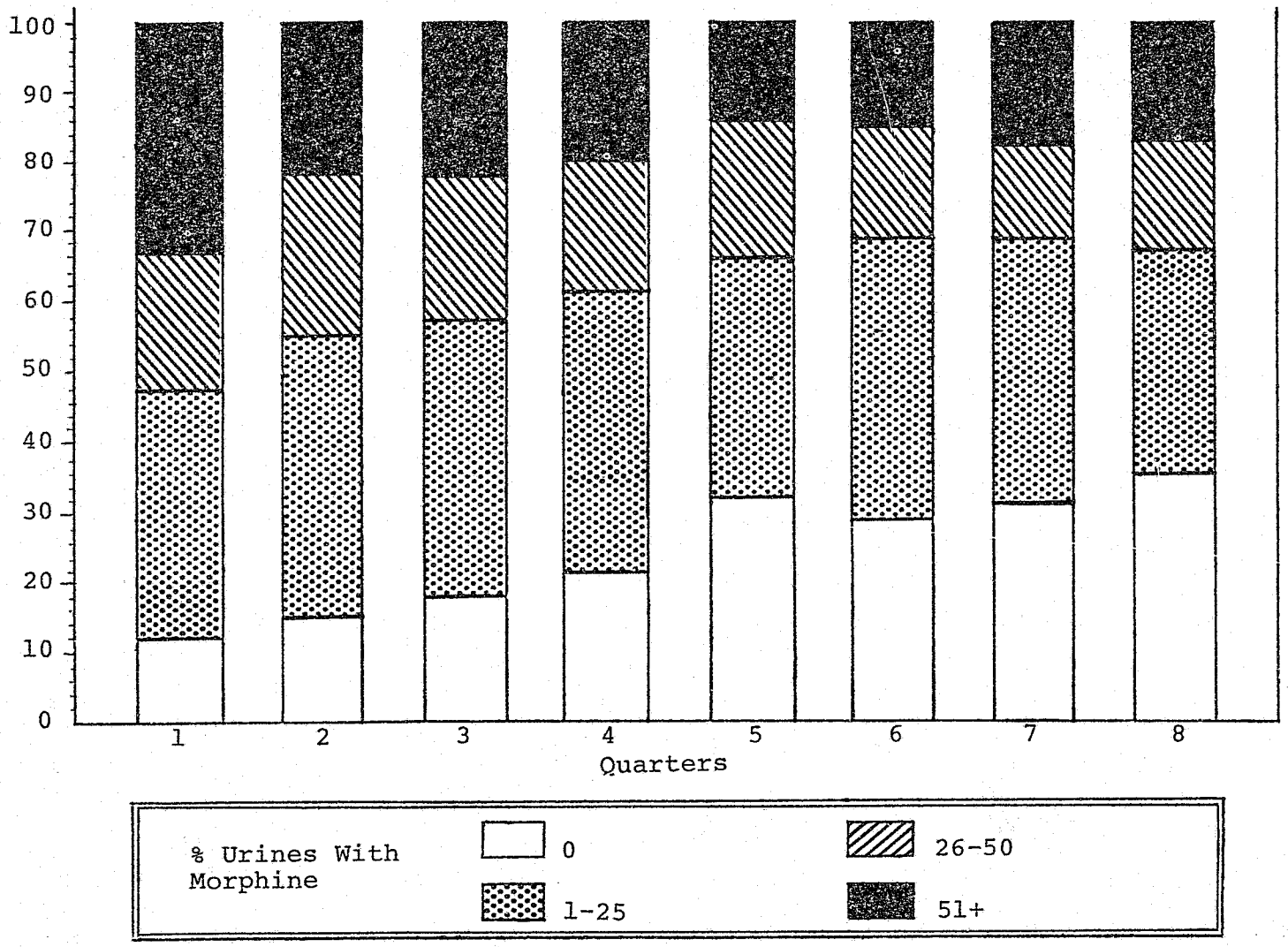
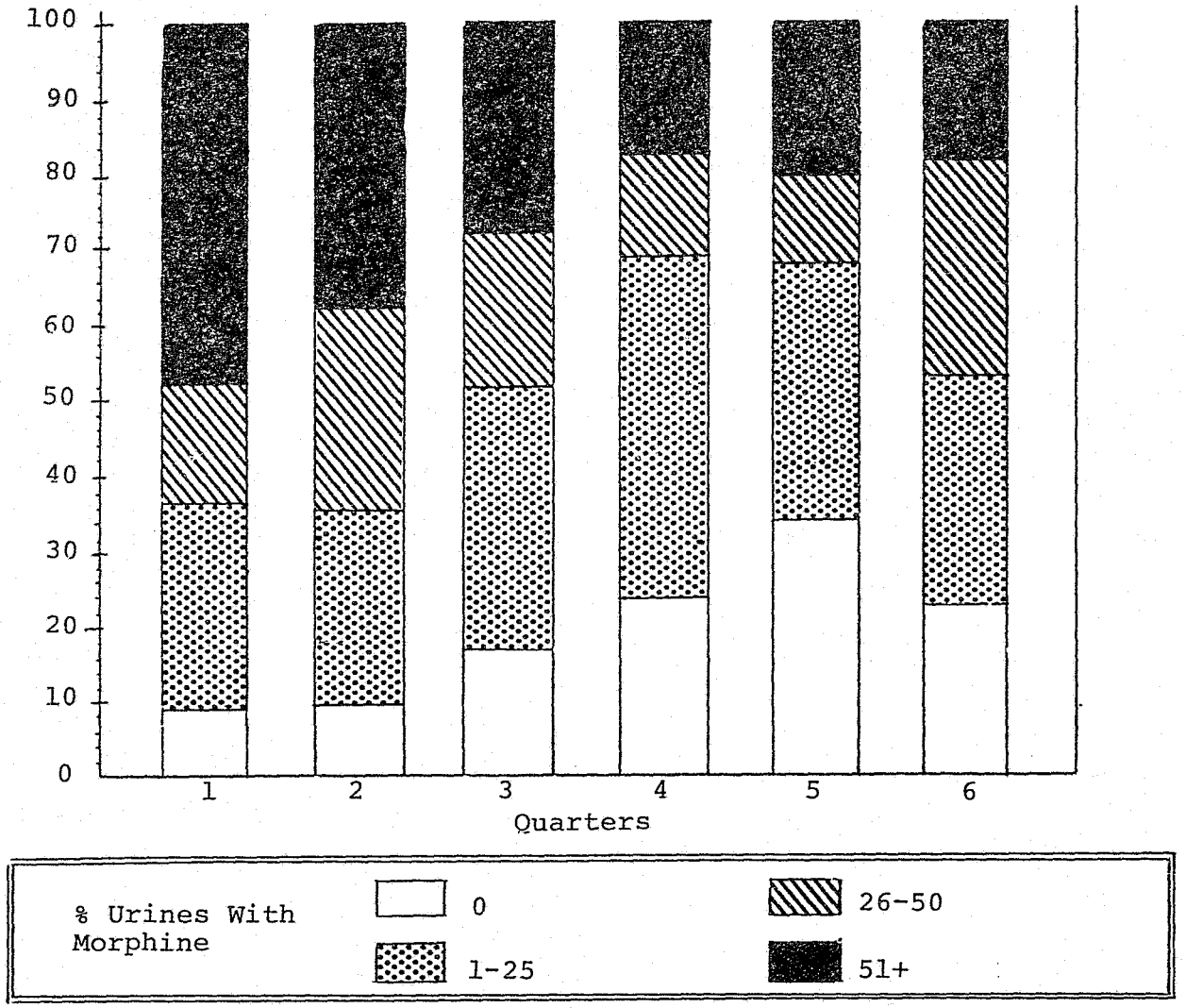


Chart III

PERCENTAGE WITH MORPHINE IN URINE FOR SUCCESSIVE QUARTERS IN PROGRAM, TERMINATED PATIENTS



In Charts I-III the amount of heroin use in the patient group is divided into four classifications depending on the percentage of morphine indications found in the urine tests.* The four categories are "none", if all urines were 'clean', and where morphine was detected, the patients were classified into the following groups: '1-25%', '26-50%, and '51% and over'.

Terminated patients are those who were terminated in any successive quarter. They are separated here and in subsequent sections in order to distinguish their performance from that of patients who remain in the program. The terminated group includes all patients who were discharged for cause or who simply withdrew. Some may have been admitted to other treatment programs after leaving ARTC. Subsequent reports will examine this group of patients in more detail.

In Chart I, 11% of the patients in their first three months in the program have no indications of morphine in their urines; about one-third have occasional indications; almost 18% reveal detectable morphine fairly

*The table values corresponding to the three charts, including the base figures, can be found in Appendix A (Table A-1), and similarly for subsequent charts.

often. More than one-third (37.4%) of the patients are seen to have morphine in over 50% of their urines. In successive quarters, until we reach the fifth quarter, there is an increase in the percentage of patients who have no urines with morphine indications: 11.0% in the first quarter, 32.6% in the fifth quarter. Those in the highest category of heroin use (51% or more) decline from 37.4% to 19.2% over the same period. The next two quarters show some backsliding, at least with respect to patients without detectable morphine, but this bounces back by the eighth quarter.

Thus, we observe that after 21 to 24 months in the program, one-third (36.2%) of the patients have consistently clean urines, and almost 32% are in the low abuse classification. About fifteen percent are in the group where morphine is detected 26-50% of the time. Another 17% are in the highest abuse classification, where 51% or more urines reveal the presence of morphine.

There is then, a reasonably consistent trend in the decreasing use of heroin for patients who remain in the pro-

gram longer. However, there is no elimination of drug use in somewhat more than three-fifths of the patients, although most are clearly using less heroin than they would have used had they remained on the streets.

Charts II and III separate Active and Terminated patients. Only six quarters are presented for terminated patients because of the paucity of terminated patients among those who remained in the program beyond one and one-half years. Most terminations take place earlier in the program. In the earlier quarters those who subsequently terminated were more likely to be found among those who had indications of more extensive drug use. Yet, the distributions of Active and Terminated patients become very similar by the fourth quarter, and the distinction between the two groups becomes negligible. The steady progression toward decline in heroin use, although somewhat greater for those who remain in the program, is observed for even those who subsequently withdrew or were discharged from the program.

In later sections we will examine the relationship between the amount of methadone administered and the presence of morphine in the urine.

Aggregate Arrest Rates

The link between heroin and crime has become one of the major reasons for community concern with drugs.

In order to maintain oneself on heroin the sums of money required can only rarely be earned legitimately. Thus, most addicts become engaged in illigitimate activities that range over the whole gamut of criminal offenses. One objective of treatment programs is to contribute to the abatement of criminal activity and thereby to the reduction of crime in general, since a significant portion of crime is attributed to heroin addicts.

The existence of a simple relation between crime and the addicts need for heroin in all, or even a substantial portion, of the cases is not as self-evident as is often assumed. Many assume that the involvement of increasing numbers of addicts in treatment programs will contribute to the reduction of crime, and some reports attest to this (Gearing 1970, 1972). Yet, addicts have very often a history of legal entanglements prior to the onset of drug use (Lukoff and Vorenberg 1972) and the fairly advanced age of those in treatment also suggests very different explanations for the decline in criminal activity. These subjects will be explored in more detail in subsequent reports; however, the interest in the reduction of crime by patients in treatment is one that is central to the rationale for treatment. Yet, insofar as criminal deviance may not be exclusively contingent on

the need for money to purchase drugs, the challenge for treatment programs becomes even more onerous. They must contribute to the redirection of a life-style that not only involves drugs but a more pervasive pattern of deviant behavior, including crime. Thus, remarkable short-term alterations in criminal behavior may be more difficult to achieve as programs reach into the communities where addicts are concentrated.

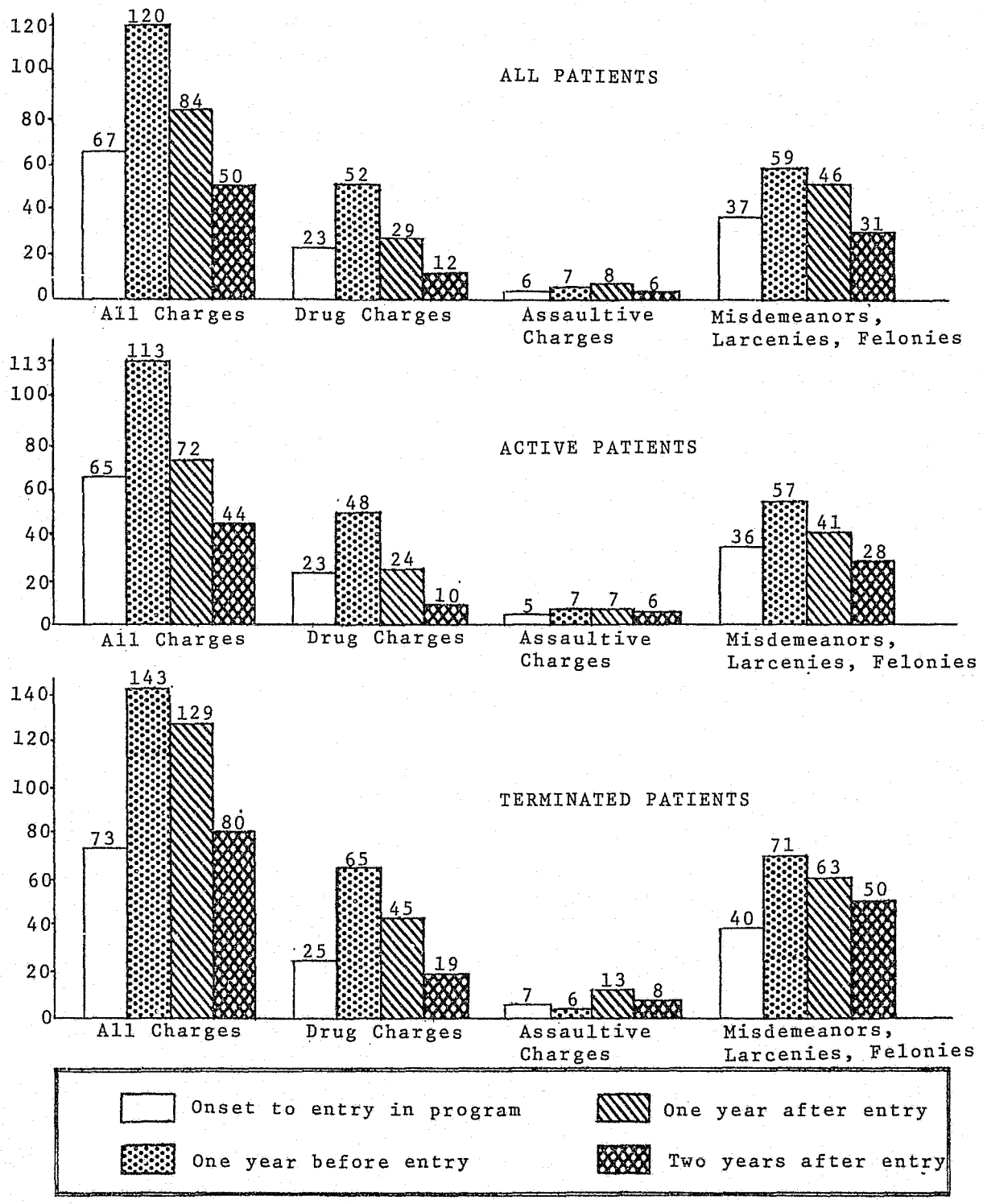
When each patient enters the program his arrest history is obtained from the police department. The arrest record is again updated on the anniversary of admission. The information presented here is based on official arrest records provided by the Bureau of Criminal Intelligence (BCI) of the New York City Police Department.

Crimes committed outside the jurisdiction of New York City are also kept on the BCI's, although the completeness of this information is difficult to estimate. As BCI's are obtained on each patient the information on the dispositions, which may be incomplete, is obtained directly from the court files.

In Chart IV several rates are computed. The rate designated Onset-Entry is the annual arrest rate for all patients in the program from the date they began to use heroin regularly until they entered the program.

CHART IV

CHARGE RATES FOR ADDICTION RESEARCH AND TREATMENT CORPORATION PATIENTS FROM ONSET TO ENTRY IN PROGRAM, ONE YEAR BEFORE ENTRY, ONE YEAR AFTER ENTRY AND TWO YEARS AFTER ENTRY



The second rate is the arrest rate in the year prior to entrance in the program. This is followed by arrests in the first year in the program, and then the rate for those in the program for two years.*

The first panel is for all 765 patients who were in the program for at least one year, and the 216 who were in the program for two years. This panel assesses the impact on all who entered treatment, even though some were discharged or withdrew in the intervening time span.

The second panel is limited to those who remained in treatment during the designated period. Here we can observe whether they differ from those in panel three, where rates for terminated patients are presented. We can identify whether those who remain in treatment differ initially in their criminal behavior form those who left the program, and whether the criminal behavior of those who stay in treatment is altered more dramatically. We also can observe, if only crudely, whether the program impact results in substantially different arrest experiences for patients who remained than for those who withdrew in the intervening periods.

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*Arrest Index = $\frac{\text{total no. arrests}}{\text{no. patient months}}$ k/(.833). For the Onset-Entry indices the denominator is the total number of months from first regular drug use to the date of admission. For the remaining indices it is simply 12 times the number of patients.The constant (.833) adjusts the rate so that one arrest per year would result in an index value of 100, in order to facilitate interpretation. For the specific indices the numerator includes only the designated charges.

There are four rates in each time-span: the overall charge rate, and the charges classified as assaultive, drug related, and misdemeanors, larcenies and felonies. The overall rate is the annual number of charges for the designated time-span. 'Assaultive' includes all charges where there were weapons or where the patient is accused of inflicting physical injury on the victims. Drug arrests are those charges that are related to possession of drugs or works, loitering for the purposes of obtaining drugs or for selling drugs. The balance, and the largest category, includes misdemeanors, larcenies and felonies where there were no weapons or any indication that there was violence. Most of the charges are for shop-lifting, forgery, purse-snatching, burglary and similar crimes.*

The Onset-Entry index measures the volume of crime in the patient group since they became addicted to heroin until the time of their admission to the program. In Chart IV we observe that the typical patient had about two-thirds of an arrest per year since he began using heroin, or seven charges in a ten-year span.

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*The precise nature of criminal activity will be presented in a series of separate reports being prepared by the Center for Criminal Justice, Harvard University. Here we are primarily concerned with the impact of treatment on drug charges and crimes of violence, or where violence is a potential element as in armed robbery. Other reports will examine the nature of the charges in more detail.

The year just before the patients were admitted to the program, however, was a peak year for arrests: the charge rate for this time span was 120 for all patients (first panel), compared to 67 for the entire period since they became addicted. When we examine the specific rates we observe little change in Assaultive crimes (six compared to seven for the year prior to admission). Both drug arrests and those for misdemeanors, larcenies and felonies show a steep rise.

The overall index for the first year in the program declines relative to the year prior to their admission in the program from 120 to 84, although it is still higher than the rate based on their arrest histories over the full time-span of their drug addiction. When we examine the specific rates there is a slight, although negligible, increase in assaultive crimes. Misdemeanors, larcenies and other charges decrease from 59 to 46, to less than one-half an arrest per patient on these charges. The largest decline, however, is for drug-related charges. These show a steep drop from 52 to 29 per annum. Thus, it is apparent that the decline in criminal activity in the first year of the program is primarily attributable to the sharp drop in drug charges (from 52 to 29),

accompanied by a much smaller decline in misdemeanors, larcenies and felonies. This is to be expected since patients are using much less heroin, many of them none at all, and therefore are less likely to be arrested for possession.

Preliminary analysis of the overall crime index for 216 patients who were in the program for two years shows considerable improvement in reduction of criminal activity in the second year. The overall index declines from 84 at the end of the first year to 50 in the second year. As was observed in the discussion of the decline of specific charge rates from the year prior to the year after admission, the most significant decline occurs in the drug-related charge category (from 29 to 12). There is a minimal decline in the assaultive crime index in the second year (from 8 to 6). However, the decline in the index of misdemeanors, larcenies and felonies is somewhat more significant in the second year than in the first. This index is 31 in the second year as compared to 46 in the first year. Although the picture is markedly improved, the overall index remains fairly high relative to the overall Onset-Entry index (50 and 67 respectively).

Panels two and three in Chart IV separate patients who remain in treatment from those who terminated in the

particular time span. Several important trends emerge. First, terminated patients had higher rates of arrests prior to their entering treatment than did patients who remained in treatment, pointing to the fact that those who are retained tend to be less "criminal" to begin with. In the year preceding entrance, active patients had a rate of 113 compared to 143 for terminated patients. However, despite this generally higher level of pre-program criminal activity, addicts who terminated also show an apparent decline in criminal activity, although it is markedly smaller than that of active patients.

On examination of the particular charges for which patients' have been arrested, it is seen that only the treated group show reduced arrest rates in the larceny, misdemeanor and felony category below the rates that prevailed over their entire period as addicts (onset to entry). However, this does not occur until after two years of treatment. If we look at the charge rates for misdemeanors, and larcenies, those patients who remained in treatment declined from 36 to 28 after two years, a 22% decline in such charges. Their drug arrests,on the other hand,declined 57% over the same

two years, from 23 to 10. If, however, the rates during treatment are contrasted to rates reported during the year prior to entrance, a more rapid decline appears, but, as noted earlier, this year was a peak period for arrests among this group of patients.

Although a comparison of the year prior to treatment and successive time periods for terminated patients also shows a decline in arrest rates, for those charges that are most directly related to 'crime-on-the-streets', we see only modest change. Assaultive charges after two years approximates the rate that characterized this group over most of their period as addicts. A similar observation can also be made for misdemeanor, larceny and felony. Only drug charges show a drop, but this may be explained by the fact that these patients were in the program receiving methadone during at least part of the period.

In order to contrast the results presented here with data from other programs, where no differentiation between types of crimes is made, it would be necessary to confine attention to "ALL CHARGES," and to look at the figures for ALL patients in the period for one year preceding entrance into the program, and follow those who remain active for successive periods. In this case we observe a seeming decline. The rate for all patients admitted declines

from 120 in the year prior to entrance to 84 in the first year, a 30% drop. By the second year there is a further drop to 50, a substantial diminution of arrests of 43%. However, as we have suggested, this aggregation of rates exaggerates the decline in significant areas of criminal behavior.

To sum up, when we break the arrests by types of charges for active and terminated patients we observe that (1) patients who remain in treatment differed from their co-patients who were terminated by having fewer arrests prior to entrance in treatment; (2) that a substantial proportion of the decline is attributable to fewer arrests directly associated with the purchase, possession and sale of drugs; (3) that the year prior to treatment provides a base that exaggerates the decline in criminal activity; and (4) the decline in the crimes that most concern the community require a prolonged investment in treatment before they begin to show a substantial decline relative to crime rates based on their full period of drug-use.

Further investigation into the implications of the modest decline in non-drug offenses will be provided by the analysis being carried out by the Center for Criminal

TABLE 2

TERMINATIONS BY DATE OF TERMINATIONS*

	1-6 Mos.	7-12 Mos.	13-18 Mos.	19-24 Mos.
% of Terminated	15%	50%	27%	8%
% of total population who terminated	5%	16%	9%	3%
Cumulative % terminated	5%	21%	30%	33%

*First row is based on all patients terminated within a two-year period (N=255). The second row is based on the patient population during the particular time span. The third row is the cumulative percentages of the second row.

Justice, Harvard University. However, it is already apparent that there is no simple short-term solution to the problem of crime which accompanies heroin addiction.

Terminations

Any rehabilitative effort, before it can succeed in transforming addicts into productive citizens, must be able to retain them in the program. One advantage of methadone maintenance over drug free programs based in the community is that they have been more successful in retaining a significant segment of the patient group in treatment over a fairly prolonged period of time. Thirty-three percent (33%) of the first 765 patients who entered ARTC from October 1969 through February 1971 had terminated as of March 1972. Estimates based on a previous report indicate that approximately 38% will terminated within two years of entrance (Quatrone 1972).

In Table 2 terminations are examined in several ways. In the first row the distribution of terminated patients is related to the period of time they have spent in the program. Among the patients in this sample who terminated 15% did so within six months after admission and 50% terminated in the second half of the first year. Twenty-seven

percent terminated between 12 and 18 months after admission and 8% terminated after remaining in the program for 18 months. Thus, among those patients who terminated within two years of admission, 65% did so within the first year.

A similar profile is presented in the second column where the terminations are related to the number of patients in the program. In the first six months this is 5% of all persons in the program; by the second half of the first year this increases to 16% of all patients. For the beginning of the second year this declines to 9% of patients in the program for 13-18 months, and 3% for those in the program more than 18 months.

The cumulative terminations for this patient group are presented in the third row. After one year 21% of the patients have been terminated and by the end of the second year 33% of the 765 patients are no longer active. A comparison of their experience with that of other programs will be included in a subsequent paper. However, several other methadone programs located in large urban cities report similar rates, among them programs in Washington, D.C. and New Orleans (Stewart, 1970 and Dupont, 1972).

There is no difference between males and females in rate of terminations. However, there are substantial differences in ethnic patterns where 54% of white patients have left the program within 24 months, compared to 29% for both blacks and Puerto Ricans.*

Missed Medication

One feature of methadone programs is that patients must come to the program in order to receive their medication. When patients first are admitted they come daily for medication. Once they have been in the program for a period of time they may be given weekend doses of methadone to take home; however, almost all patients are required to come each week-day for medication. Insofar as methadone serves to substitute for heroin use and assists the patients in avoiding drug use, regularity of attendance is an essential feature of successful programs. Methadone is delivered to patients who are ill, or incarcerated briefly at a facility where none is available.

Charts V, VI and VII present the distribution of missed medications for all patients, those who remained active, and , finally, for those who terminated in succeeding quarters. If we look first at Chart V, we see a

*White patients at ARTC are younger and have less education than black patients, factors that may contribute to the higher rates of attrition.

Chart V

PERCENTAGE MISSED MEDICATION FOR SUCCESSIVE QUARTERS, ALL PATIENTS

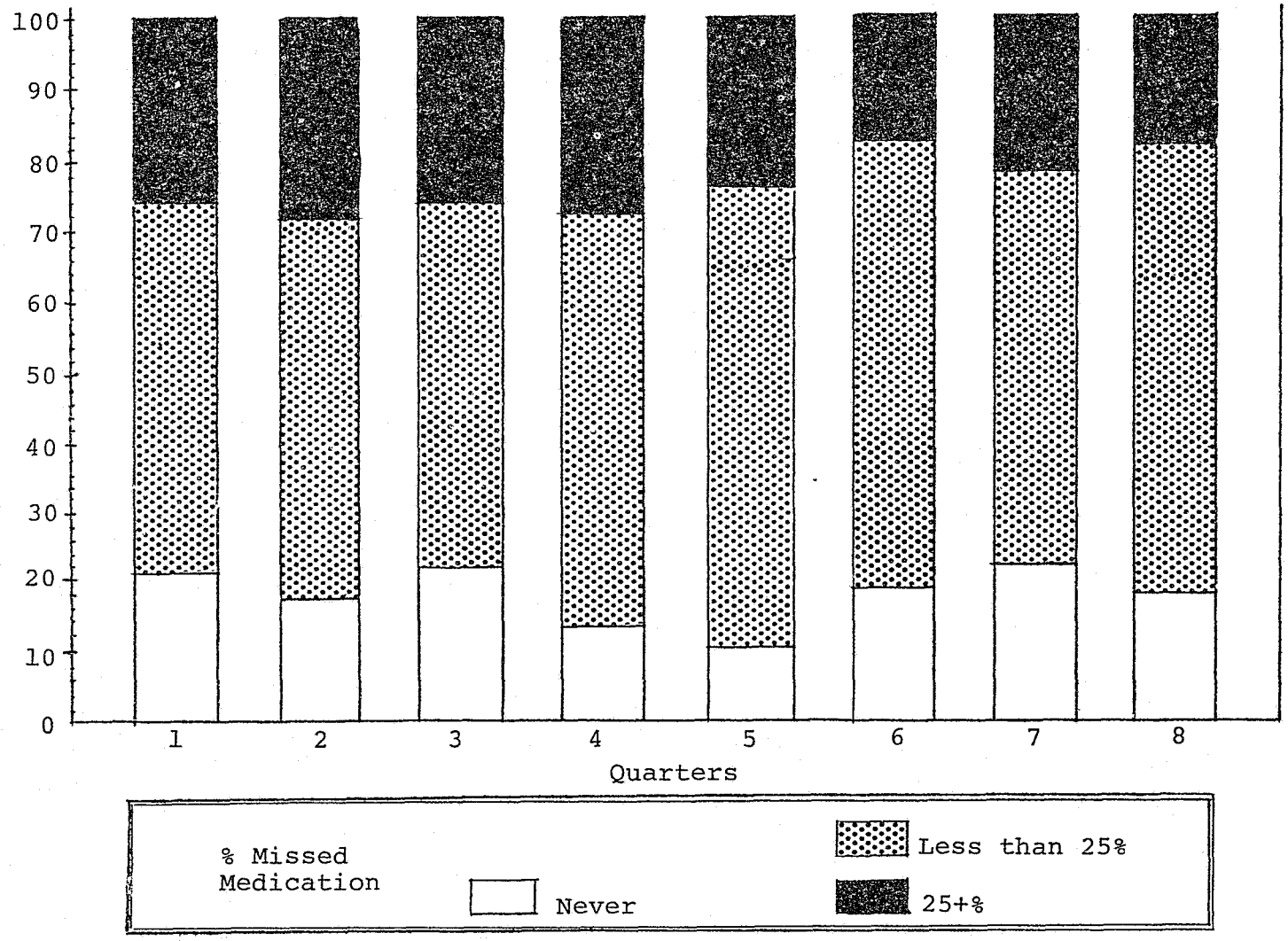


Chart VI

PERCENTAGE MISSED MEDICATION FOR SUCCESSIVE QUARTERS, FOR ACTIVE PATIENTS

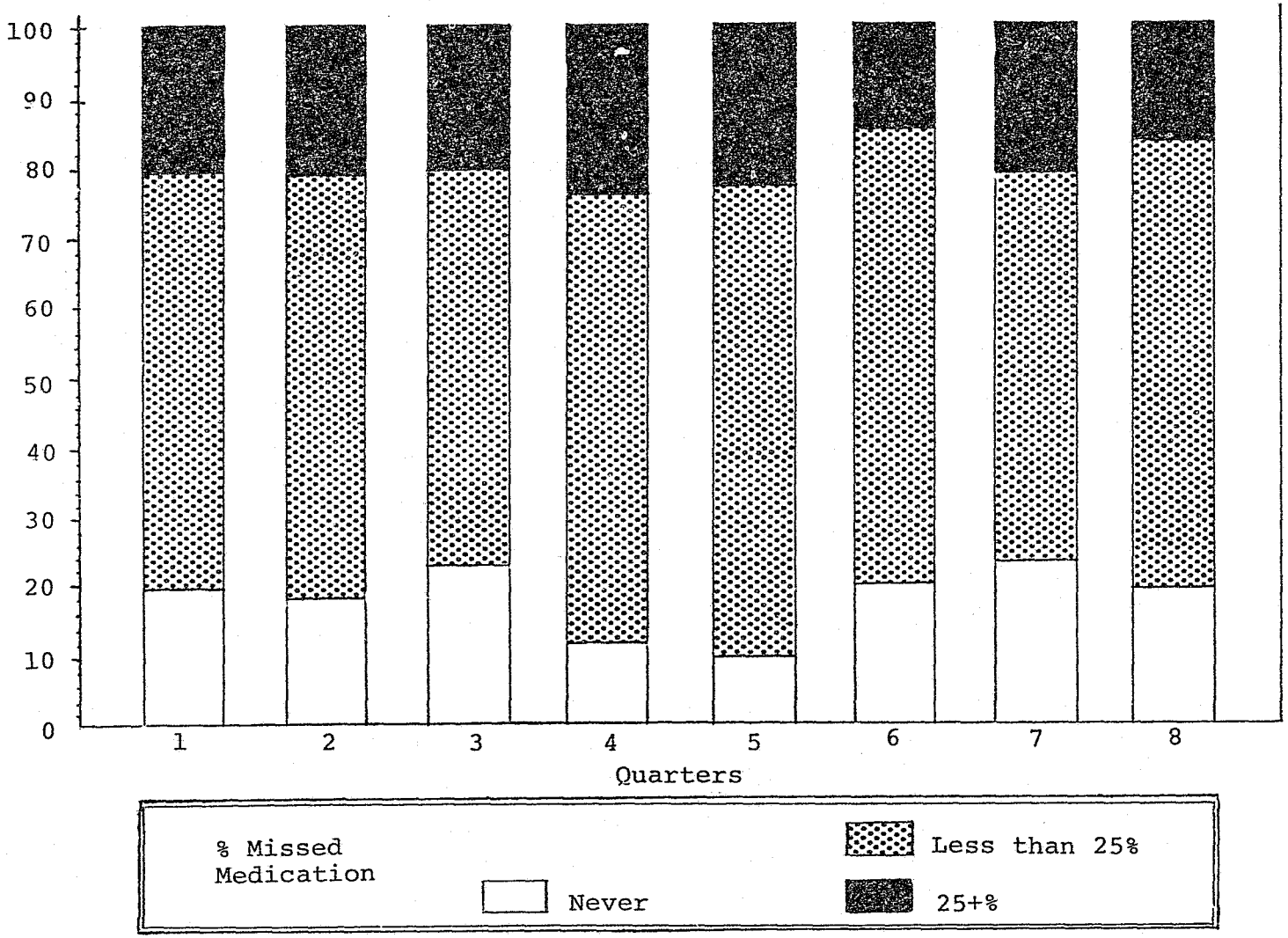
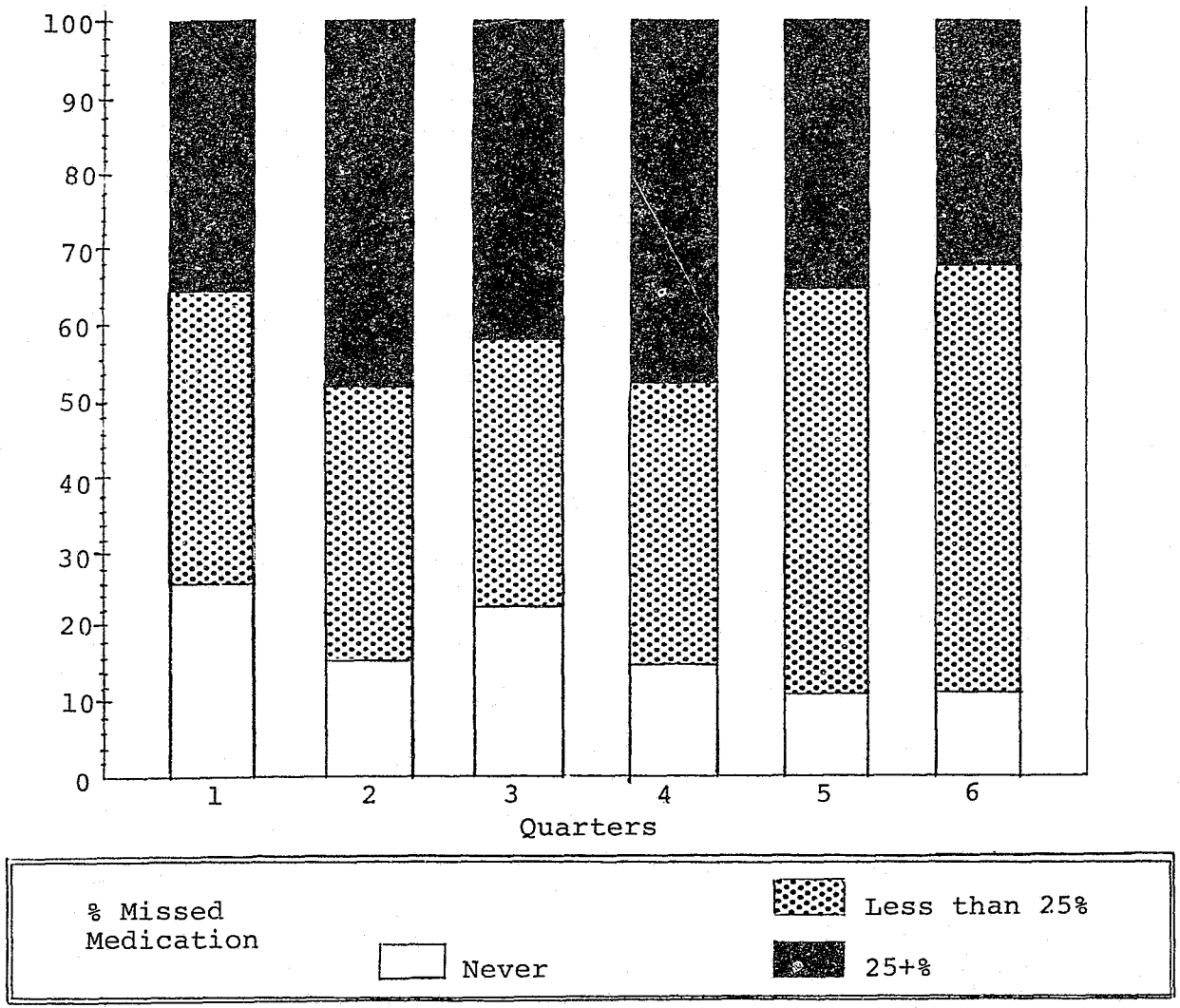


Chart VII

PERCENTAGE MISSED MEDICATION FOR SUCCESSIVE QUARTERS, FOR TERMINATED PATIENTS



slight, if erratic, trend toward slightly improved attendance over the two-year span. There is a decline in regularity of attendance at the end of the first year and the beginning of the second year, particularly among those who never miss their medication. In succeeding quarters there is a decline, albeit a small one, in the proportions who miss as much as 25% of their medication. The pattern holds also when we distinguish between active (Chart VI) and terminated patients (Chart VII).

In sum, there is only a slight improvement over time in the attendance of patients for methadone. Small, if consistent, differenes in absence rates favor those who were subsequently terminated, who are more often in the highest absence rate category. Insofar as the regular use of methadone is a feature of the program there is clear evidence that patients must be encouraged to attend more consistently, barring illness or other circumstances that may prevent them from attending the clinic.

The relationship of missed medication to other program parameters, including heroin use, will be described in later reports.

Comparative Outcomes of Active and Terminated Patients

It has already been reported that 33% of the patients in this study group have terminated from the program.

TABLE 3

DETECTABLE MORPHINE INDICES AND
PERCENTAGE TERMINATED FOR EACH QUARTER

% Urine with Morphine	Percentage Terminated Quarters					
	1	2	3	4	5	6
0	23.2	16.5	16.3	11.4	8.5	5.6
1-24%	23.1	17.7	15.3	11.5	8.1	5.2
25-49%	24.1	26.1	17.3	7.6	4.9	11.9
50+%	35.3	35.5	20.3	8.7	11.3	8.1

*See Appendix Table A-1 for column totals.

One might speculate that those who terminate from the program are the patients who abuse drugs after admission, miss their medication, get arrested and generally perform poorly. In fact, drug abuse is somewhat more prevalent among patients who are discharged or leave the program, and patients who terminate are likely to have higher rates of absenteeism. Post admission arrest rates are also somewhat higher for terminated patients.

Examination of patient performance while in the program reveals that a significant percentage of drug abusers, as evidenced by positive urines, are early dropouts. However, after the second quarter of the program the amount of drug abuse does not affect the percentage of terminations (see Table 3). Approximately 35% percent of those who had a high incidence of drug abuse (more than 50% of the time) in their first two quarters of the program, subsequently left the program while a considerably smaller percent of those who did not abuse heroin subsequently terminated. As seen in Table A-1 the patients who terminated in the 3-6 quarters do not differ significantly from active patients in the amount of heroin abuse.

It is apparent that the relationship between positive urines and terminations has had a somewhat cleansing effect

on the total picture of drug abuse in the program. Since a large proportion of those patients who used heroin often after admission left the program by the end of the second quarter, the overall picture of drug abuse in the program improves as these patients terminate. Over a period of time, the percentages of patients who do not revert to heroin use and those who continue to use heroin remain fairly constant. The significant drop after the second quarter in the percentage of frequent abusers, however can be partially attributed to the termination of patients in this category, although there is also an accompanying improvement among patients who remain active.

As might be expected, terminated patients had a history of significantly high absenteeism from the program. During the first year, an average of more than 40% of those who subsequently terminated missed taking their daily medication more than 25% of the time (Table A-2). It should be noted, however, that these figures may be somewhat inflated since many patients were officially terminated after failing to appear for medication over a period of time. Thus, absenses may have been recorded after the patients, themselves, had dropped out but before they were officially

TABLE 4

DISTRIBUTION OF ARRESTS ONE YEAR AFTER ENTRY
FOR ACTIVE AND TERMINATED PATIENTS*

No. of Arrests	Active	Terminated
None	71.0	60.8
1	9.1	14.0
2	9.3	9.2
3	5.8	6.0
4+	4.7	10.0
N	(514)	(250)

*Terminated refers to any patient who left or was discharged at any time within two years.

TABLE 5

TERMINATION RATES & METHADONE LEVELS
FOR SUCCESSIVE QUARTERS IN THE PROGRAM

Quarter	>40gm	40-79gm	80+gm
		% Terminated	
1	31.8	25.4	29. 7
2	28.7	21.1	27. 8
3	21.9	14.9	20.00
4	10.9	9.7	12. 1
5	9.6	7.5	8.9
6	8.0	6.6	6.5

terminated by the program administration. The average percentage for active patients who missed their daily medication more than 25% for the first year was 21% or about half that of terminated patients.

Post admission arrest rates were somewhat lower among patients who remained in treatment compared to those who terminated. Twenty-nine percent of the active patients were arrested at least once in their first year on the program; 39% of the terminated patients were arrested during that time (see Table 4). However, arrest was not a major cause of termination. Only a small percentage (2.4%) of patients terminated because they were incarcerated.

Influence of Methadone Levels

Preliminary investigation of the effect of dosage levels on outcome measures reveals some interesting findings. The dosage level at which patients are stabilized has little effect on attrition rates over a period of time. In general, patients receiving 40-70 mg of methadone daily, the middle dose range, terminate at slightly lower rates than patients receiving high (over 80 mg) or low (under 40 mg) levels of methadone (see Table 5).

Attendance records, however, are significantly affected by the level of methadone administered to a patient.

The higher a patients' dose, the less likely he or she is to skip medication. This is true for both active and, in most quarters, terminated patients.* Among patients remaining in treatment, who receive a low dose, the percentage of patients absent more than 25% of the time is more than twice that of patients on a high dose. In some quarters this percentage of high absenteeism is even six times greater among those receiving low rather than high doses. Thus, seemingly patients become "hooked" on methadone at higher dose levels to the extent that they are much less likely to skip their medication (see Table 6).

Despite better attendance records, however, patients on high doses are just as likely, and in some cases more likely to abuse heroin while in the program. As shown in Table 7, the amount of drug abuse is not directly related to methadone levels. Although more heroin abuse occurs among patients receiving middle dose levels, heroin abuse among those receiving high methadone levels is consistently higher than for those remaining in the program who are receiving low levels of methadone. The picture is more diffuse for terminated patients. Thus, the data

*This is the case for terminated patients up through the first nine months. After that time, the number of cases in the 80 mg category become too small to determine a pattern.

TABLE 6

METHADONE LEVELS AND MISSED MEDICATION FOR SUCCESSIVE QUARTERS
BY ACTIVE AND TERMINATED PATIENTS

ACTIVE PATIENTS

Missed Medication	FIRST QUARTER Methadone Level			SECOND QUARTER Methadone Level			THIRD QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
none	20.3	18.0	37.5	20.0	12.6	60.0	26.4	16.6	53.8
1-25%	55.7	61.8	56.3	54.0	66.4	34.3	53.8	60.4	38.5
26% +	24.1	20.1	6.3	26.0	20.9	5.7	19.8	23.0	7.7
	(79)	(283)	(16)	(100)	(301)	(35)	(106)	(326)	(52)

Missed Medication	FOURTH QUARTER Methadone Level			FIFTH QUARTER Methadone Level			SIXTH QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
none	20.6	9.0	19.6	20.9	5.6	21.6	18.3	19.1	27.7
1-25%	47.7	67.3	74.5	53.8	70.5	68.6	63.3	65.1	63.8
26% +	31.8	23.7	5.9	25.3	23.8	9.8	18.3	15.8	8.5
	(107)	(321)	(51)	(91)	(302)	(51)	(60)	(209)	(47)

Missed Medication	SEVENTH QUARTER Methadone Level			EIGHTH QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
none	21.6	12.5	44.2	19.2	8.7	31.6
1-25%	51.4	65.0	44.2	69.2	63.0	63.2
26%+	27.0	22.5	11.6	11.5	28.3	5.3
	(37)	(80)	(43)	(26)	(46)	(38)

TABLE 6 (continued)

METHADONE LEVELS AND MISSED MEDICATION FOR SUCCESSIVE QUARTERS
BY ACTIVE AND TERMINATED PATIENTS

TERMINATED PATIENTS

Missed Medication	FIRST QUARTER Methadone Level			SECOND QUARTER Methadone Level			THIRD QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
none	28.9	21.5	100.0	19.1	9.1	64.3	31.1	15.1	43.8
1-25%	40.0	39.7	--	36.2	36.4	35.7	24.4	40.6	43.8
26% +	31.1	38.8	--	44.0	54.5	--	44.4	44.3	12.5
	(45)	(121)	(17)	(47)	(121)	(14)	(45)	(106)	(16)

Missed Medication	FOURTH QUARTER Methadone Level			FIFTH QUARTER Methadone Level			SIXTH QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
none	24.1	14.5	--	21.4	5.9	14.3	--	14.3	33.3
1-25%	27.6	37.7	60.0	50.0	58.8	42.9	50.0	57.1	66.7
26% +	48.3	47.8	40.0	28.6	35.3	42.9	50.0	28.6	--
	(29)	(69)	(10)	(14)	(34)	(7)	(8)	(21)	(3)

TABLE 7
METHADONE LEVELS AND DETECTABLE MORPHINE FOR SUCCESSIVE QUARTERS
BY ACTIVE AND TERMINATED PATIENTS

ACTIVE PATIENTS

% Urine with Morphine	FIRST QUARTER Methadone Level			SECOND QUARTER Methadone Level			THIRD QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
0	13.9	11.3	9.6	21.6	14.2	11.5	22.6	17.5	15.4
1-25%	39.6	33.3	44.2	36.3	40.3	42.3	49.5	33.3	57.7
26-50%	17.8	20.0	13.5	28.4	20.1	28.8	18.3	22.1	13.5
51+%	28.7	35.3	37.7	13.7	25.4	17.3	9.7	27.1	13.5
	(101)	(300)	(52)	(102)	(303)	(52)	(93)	(303)	(52)

% Urine with Morphine	FOURTH QUARTER Methadone Level			FIFTH QUARTER Methadone Level			SIXTH QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
0	36.7	16.9	21.6	41.3	32.0	21.6	43.5	24.1	30.2
1-25%	36.7	38.3	49.0	38.7	31.3	43.1	41.3	39.7	39.5
26-50%	16.7	21.7	13.7	10.7	21.3	23.5	6.5	19.9	14.0
51+%	10.0	23.1	15.7	9.3	15.4	11.8	8.7	16.3	16.3
	(90)	(290)	(51)	(75)	(272)	(51)	(46)	(141)	(43)

% Urine with Morphine	SEVENTH QUARTER Methadone Level			EIGHTH QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
0	33.3	26.6	35.7	45.0	24.3	41.7
1-25%	36.4	34.4	45.2	20.0	27.0	44.4
26-50%	12.1	20.3	4.8	30.0	16.2	5.6
51+%	18.2	18.8	14.3	5.0	32.4	8.3
	(33)	(64)	(42)	(20)	(37)	(36)

TABLE 7 (continued)

METHADONE LEVELS AND DETECTABLE MORPHINE FOR SUCCESSIVE QUARTERS
BY ACTIVE AND TERMINATED PATIENTS

TERMINATED PATIENTS

% Urine with Morphine	FIRST QUARTER Methadone Level			SECOND QUARTER Methadone Level			THIRD QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
0	10.6	7.8	13.6	4.9	12.3	5.0	23.1	13.2	23.1
1-25%	23.4	25.5	54.5	31.7	24.7	25.0	26.9	41.5	23.1
26-50%	14.9	14.7	13.6	24.4	23.5	35.0	23.1	13.2	46.2
51+%	51.1	52.0	18.2	39.0	39.5	35.0	26.9	32.1	7.7
	(47)	(102)	(22)	(41)	(81)	(20)	(26)	(53)	(13)

% Urine with Morphine	FOURTH QUARTER Methadone Level			FIFTH QUARTER Methadone Level			SIXTH QUARTER Methadone Level		
	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg	Under 40 mg	40-79 mg	80+ mg
0	9.1	32.3	14.3	25.0	36.4	40.0	--	30.0	33.3
1-25%	63.6	38.7	42.9	37.5	31.8	40.0	--	40.0	33.3
26-50%	9.1	16.1	14.3	12.5	13.6	--	50.0	20.0	33.3
51+%	18.2	12.9	28.6	25.0	18.2	20.0	50.0	10.0	--
	(11)	(31)	(7)	(8)	(22)	(5)	(4)	(10)	(3)

suggests that the higher dose level does not necessarily block the craving for heroin nor its effects as has been claimed by some proponents of methadone maintenance. It is likely, however, that larger quantities of heroin are needed by these patients in order to achieve the desired 'high'. Less heroin abuse is consistently reported among patients on medium doses. Even the lowest dose group does better than the highest dose group.

Doses were not randomly assigned to patients in this group. It depended on when they entered the program and on the patients' past drug history and other assessments made by the medical department. It may be that patients assigned lower doses have shorter histories of drug use or showed greater potential for success in treatment. In a subsequent report based on a group of patients whose dosage levels were randomly assigned, we will be able to clarify many of the questions raised here and make a more accurate assessment of the effects of dosage levels on program outcomes.

SUMMARY

Preliminary investigation of the performance of 765 patients at ARTC revealed that over a two-year period, there was a steady decline in heroin use and a modest decline in criminal activity. However, there is no elimination of drug use nor of criminal activity. Patients who also terminated from the program were likely to have abused heroin more often, have a higher rate of absenteeism, and to have been arrested somewhat more frequently than patients who remained in treatment.

Available data on the effect of methadone levels on program outcomes indicates that while attendance is better among patients who receive doses of 80 mg or more, the incidence of heroin use while on the program is not affected by the dose level. It is apparent that high doses may 'hook' patients but not block their craving for heroin.

All of the above findings, however, must be considered preliminary at this point. We have reported only aggregate outcomes with no attempt to analyze them in terms of the patients' social history and background.

Subsequent reports will provide more detailed analysis of factors and patient characteristics related to the various program outcomes reported on here. In addition,

results of the Experimental Study, will provide more concrete data on the effects of methadone levels on patient performance. We will also analyze the ARTC experience as it relates to that of other methadone programs.

A P P E N D I X

TABLE A-1

PERCENT URINES WITH DETECTABLE MORPHINE FOR SUCCESSIVE QUARTERS OF PATIENTS IN THE PROGRAM

ALL PATIENTS

% urines with detectable morphine	QUARTER 1	2	3	4	5	6	7	8
None	11.0	14.1	18.1	21.9	32.6	23.7	30.1	36.2
1-25	33.8	36.5	38.7	39.8	34.2	39.3	39.0	31.9
26-50	17.8	23.6	20.4	19.2	18.9	17.0	13.7	14.9
51+	37.4	25.7	22.8	19.2	14.3	15.0	17.1	17.0
	(628)	(602)	(540)	(480)	(433)	(247)	(146)	(94)

ACTIVE PATIENTS

ACTIVE % urines with morphine	QUARTER 1	2	3	4	5	6	7	8
None	11.7	15.5	18.3	21.6	32.4	29.1	30.9	35.5
1-25	36.0	39.6	39.5	39.2	34.2	40.0	38.1	32.2
26-50	18.8	23.0	20.3	19.7	19.6	16.1	13.7	15.1
51+	33.6	21.9	21.9	19.5	13.8	14.8	17.3	17.2
	(453)	(457)	(448)	(431)	(398)	(230)	(139)	(93)

TERMINATED PATIENTS

TERMINATED % urines with morphine	QUARTER 1	2	3	4	5	6
None	9.1	9.7	17.4	24.5	34.3	23.5
1-25	28.0	26.9	34.8	44.9	34.3	23.5
26-50	15.4	25.5	20.7	14.3	11.4	29.4
51+	47.4	37.9	27.2	16.3	20.0	17.6
	(175)	(145)	(92)	(49)	(35)	(17)

TABLE A-2

PERCENTAGE MISSED MEDICATION FOR SUCCESSIVE QUARTERS

ALL

Missed Medication	1	2	3	4	5	6	7	8
Never	21.6	17.5	22.6	13.3	10.6	19.5	22.3	18.6
>25%	53.3	53.7	51.5	58.8	65.5	63.8	56.0	63.7
25+%	25.2	28.8	26.0	27.9	23.8	16.7	21.7	17.7
	(552)	(618)	(651)	(587)	(499)	(348)	(175)	(113)

ACTIVE

	1	2	3	4	5	6	7	8
Never	19.3	18.1	22.7	12.7	10.6	20.3	23.1	19.1
>25%	60.3	61.0	56.6	63.7	66.9	64.6	56.3	64.5
25+%	20.4	20.9	20.7	23.6	22.5	15.2	20.6	16.4
	(378)	(436)	(484)	(479)	(444)	(316)	(106)	(110)

TERMINATED

	1	2	3	4	5	6
Never	26.4	15.9	22.2	15.7	10.9	12.5
>25%	37.9	36.3	36.5	37.0	54.5	56.3
25+%	35.6	47.8	41.3	47.2	34.5	31.3
	(174)	(182)	(167)	(108)	(55)	(32)

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