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EVALUATING RESIDENTIAL PROBATION FOR DRUG INVOLVED FELONY OFFENDERS

By

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ABSTRACT

EVALUATING RESIDENTIAL PROBATION
FOR DRUG INVOLVED FELONY OFFENDERS

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Partially in response to the pressures caused by prison overcrowding the use of probation has expanded. Over the past ten years the probation population has increased almost 300%. Not only is the population growing in size the type of offender on probation has also changed consisting of offenders convicted of felonies and a greater proportion are also drug dependent. To manage the changing probation population various models of intermediate sanctions have been developed. Intensive Supervision Probation programs (ISP) are one example. Several studies have been conducted in efforts to determine the effectiveness of ISP programs. In general, research shows that intensive monitoring alone is not effective in producing positive outcomes. Instead, successful programs combine substance abuse treatment with surveillance.

This study examines the impact of a uniquely structured residential ISP program designed to provide specific levels of both intensive monitoring and substance abuse treatment for drug involved felony offenders. Several outcome measures are considered: treatment access;

length of time in treatment; subsequent drug use; and recidivism.

The study is designed as a prospective observational or cohort study and uses existing data from several sources for conducting secondary data analysis. Several statistical techniques are utilized. Cox and logistic regression are used for testing the complex interrelationships among the data elements. For examining less complex relationships, univariant and bivariant tools are applied.

This research demonstrates that the residential probation program examined is more effective in ensuring that drug involved felony offenders comply with court mandated treatment compared to other types of probation programs. Moreover, offenders sentenced to residential probation are somewhat more likely to remain drug and alcohol free during the first year of follow-up. Overall, time in treatment is proven to be a significant predictor of all outcome measures. Data also suggests that improved outcomes can be achieved among these probationers with minor modifications in the residential probation's program policies. This research also supports the claim that to improve outcomes ISP programs need to change the way in which they are intensive by shifting the emphasis away from incapacitation and punishment toward a more integrated approach of intervention and substance abuse treatment. The "intensity" of supervision needs to focus on intensifying the monitoring of treatment compliance.

DEDICATED IN LOVING MEMORY
to my father

Abraham Zold

>>> who always believed in me <<<<
and
>>> to whom I apologize -- for not finishing just a *little* sooner <<<

"SHALOM"

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I. INTRODUCTION

Overview of Issues:

The greatest rise in incarceration in the United State's history has taken place in the past three decades, contributing to significant prison overcrowding (Lurigio, 1997). In the past decade alone, incarceration rates have more than doubled, increasing 150% from 1980 to 1991 (Bureau of Justice Statistics, 1992a) and reaching an astounding rate of 645 per 100,000 in 1997, up from 458 per 100,000 in 1990 (Bureau of Justice Statistics, 1998). By mid-year 1997, 1 in every 155 U.S. residents was incarcerated in federal, state or local facilities (Bureau of Justice Statistics, 1998).

This increase has in part been due to sweeping revisions in sentencing legislation and a proliferation of stricter laws which led not only to a higher percentage of offenders being sentenced to prison, but to their being sentenced with longer terms and less probability for release on parole as well (Irwin and Austin, 1987). Despite prison capacity increases of more than 50% in the past decade (Bureau of Justice Statistics, 1992a), by early 1990, correctional systems in forty (40) states were operating under court order or consent decrees to reduce prison overcrowding (Maguire and Flanagan, 1991). With this nationwide problem, the need for

less expensive and flexible alternatives has never been greater.

Partially in response to the pressures caused by the growing prison population, the use of probation has expanded (Geerken and Hayes, 1993; Cunnif and Shilton, 1991; Lurigio, 1997). The probation population increased 5 to 7% each year from 1985 to 1990 (Petersilia and Turner, 1993a) and has continued by an average of 3% each year since 1990 (Bureau of Justice Statistics, 1997b). Over the past ten (10) years the population has increased almost 300% (Petersilia, 1997). By 1990, 2.5 million adults were on probation in the United States, representing two-thirds (2/3), of all persons under correctional supervision (Camp and Camp, 1993; Petersilia, 1993a). At year end 1996, over three (3) million adults were under state or federal probation (Bureau of Justice Statistics, 1997b). The probation population is now so large that the U.S. Department of Justice estimates that nearly 2 % of all U.S. adult citizens are under probation supervision on any one day (Bureau of Justice Statistics, 1996a).

Not only is the probation population growing in size, the type of offender on probation has also changed. Probation is no longer a sentencing alternative reserved for the first-time misdemeanants or petty offenders (Cunnif and Shilton, 1991). More of the current probation population consists of offenders convicted of felonies than misdemeanors (Petersilia and Turner, 1993a). For example, it is estimated that in 1995 the

probation population consisted of 1.5 million felons as compared to only one million misdemeanants (Bureau of Justice Statistics, 1997b). Moreover, of the current probation population a greater proportion are drug dependent (Petersilia and Turner, 1992; Guynes, 1988; Cunniff and Shilton, 1991). It is estimated that over half of the probation population are drug-involved either as users, sellers or both (Langan and Cunniff, 1992).

With recidivism rates among felony probationers as high as 65% in some jurisdictions, the use of probation as an alternative for these offenders has been called into question and has become controversial in recent years (Geerken and Hayes, 1993). According to Geerken and Hayes (1993), those who are critical of probation's effectiveness argue that a significant percentage of all felony offenders diverted from incarceration continues to commit crimes, is responsible for a significant amount of all reported crime, and rarely reform. However, standard probation is not structured or intended to manage this type of offender (Petersilia and Turner, 1993a), nor is it adequately funded to do so. Adding to the problem, despite the unprecedented growth and changes in the probation population, probation budgets have not grown (Langan, 1994). "Nationally, probation receives less than 10% of state and local government corrections funding, even though probation supervises two out of every three correctional clients" (Petersilia, 1995).

Critics of probation may not be justified. The fact is probation is now being used for the more serious offender. Standard probation cannot and should not be expected to be capable of responding to the current demands. It was never structured to do so. It could be argued that probation itself is not inadequate, but rather the structure and implementation of probation are. According to Judge Burton Roberts, Administrative Judge of the Bronx Supreme and Criminal Courts, "Nothing is wrong with probation. It is the execution of probation that is wrong" (Klein, 1997). While probation programs are often criticized as inadequate and an ineffective part of corrections (Clear and Hardyman, 1990), the concept of probation remains attractive. Probation does have many advantages over incarceration, e.g., lower cost, increased opportunities for rehabilitation, reduced risk of criminal socialization, and the possibility for offenders to continue working (Lurigio, 1997; Petersilia, 1997).

In many states, the increased proportion of more serious offenders among the probation population, prison crowding, and the need for more flexible and cost effective sentencing alternatives generated interest in experimenting with other sentencing options that offered more intense levels of supervision (Clear and Hardyman, 1990; Thompson, 1990; Petersilia and Turner, 1993a). During the past decade many models of "intermediate sanctions," such as house arrest, electronic monitoring and

intensive supervision were developed. Intensive Supervision Probation (ISP) programs, often referred to as intensive supervision, alternative sanctions, or intermediate supervision, (Petersilia and Turner, 1993b; Petersilia, 1997) were designed in direct response to prison crowding (Fulton and Gendreau, 1995; Clear and Hardyman, 1990; Byrne; 1990).

Like other models of sentencing alternatives, ISP programs were designed to be community-based sanctions that were tougher than probation but less severe and expensive than prison (Tonry and Lynch, 1996). These models assume that a significant number of felons sent to prison are too serious for probation but could be handled in a community setting and that both prison diversion and probation enhancement are cost effective. Moreover, ISP programs are believed to offer social and altruistic benefits; e.g., keeping families together, allowing offenders to continue working and avoiding harmful effects of prison (Lurigio, 1997). This new wave of intermediate sanction had great appeal that captured the attention of both conservative and liberal policy makers. For conservatives, it provided an opportunity to "get tough" by increasing the control over offenders without adding costs to corrections. For liberals, it provided a potential strategy for diverting offenders from prison without appearing to be "soft on crime" (Byrne, 1990).

Study Objectives and Scope:

Several studies have been conducted in efforts to determine the effectiveness of various ISP program models and identify program characteristics which best predict improved client outcomes. (Discussion of select studies follows in the literature review.) Although findings are many, research shows that the level of monitoring alone is not effective in producing positive outcomes (Langan, 1994; Petersilia,1993). Instead, successful programs combine substance abuse treatment with surveillance and target an appropriate offender subgroup (Petersilia and Turner, 1993a). This makes sense when considering that drug-involved offenders constitute a disproportionate share of repeat offenders and will continue to pose a substantial threat to society if not treated (U.S. Cong. House, 1991 p.76). Without treatment a significant proportion of drug-involved offenders will continue drug-seeking behavior and become reinvolved in criminal activity within just a few months (Wexler et al., 1988). Unfortunately, only a small proportion of these offenders actually receive treatment (Bureau of Justice Statistics, 1998). Moreover, there is overwhelming evidence that suggests the "length of time" in substance abuse treatment is the single best predictor of positive outcomes (Simpson and Sells, 1982; Barr and Antes, 1981; Holland, 1983; DeLeon, 1984; DeLeon 1988) and further, compulsory treatment is an effective means in getting offenders into

treatment to achieve positive outcomes (Maddux, 1988; Hubbard, et al., 1988; McGlothlin, et al., 1977b; 1978).

What remains unknown and continues to be questioned is: what levels of both substance abuse treatment and surveillance are required to maximize outcomes, reduce drug-abuse behavior and ultimately recidivism? Will different combinations of treatment and surveillance produce different results in different populations? By modifying and retesting various program models, the chances for improving the effectiveness of ISP programs will increase. With the growing use of probation as a sentencing alternative coupled with the increasing proportion of drug-involved felony offenders, there are reasons and a need to continue experimenting with community-based sanctions and evaluate the effectiveness of different models.

This program evaluation study is a response to this need. The study was designed to examine in some detail the impact of a uniquely structured residential ISP program on treatment access, substance abuse relapse and recidivism and compares this model to a variety of other models. The residential probation program selected for this outcome evaluation is of particular interest because the program was designed to provide specific levels of both intensive monitoring and substance abuse treatment for all drug-involved offenders. Thus, the program incorporates the tenents of

deterrence theory with strategies to address the key issues identified in the literature as barriers to successful ISP programs. By providing on-site substance abuse treatment, the residential probation program removes the barrier of limited treatment capacity and provides a structure to ensure the integration of treatment and punishment.

Several outcome measures are considered in this study: treatment access; length of time in treatment; subsequent drug use; and recidivism[1]. The analysis to examine recidivism was affected by the reduced sample size for which data was available. This presented limitations in drawing meaningful conclusions from the measures of recidivism. However, because of the known relationship between drug abuse and crime and the role of treatment in the reduction of crime, measurements of "treatment access," "length of time in treatment" and "subsequent drug use" should be considered as important and good indicators of subsequent criminal activity.

The importance of this evaluation is twofold. First, as called for in the probation literature, it provides the ability to test the effectiveness of a different combination of treatment and surveillance in reducing drug-abuse behavior. Second, if different combinations of treatment and surveillance

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1 A complete discussion of the outcome variables can be found in Chapter IV, " Methods" of this document.

can be shown to reduce drug use among offenders then this information can then be used by local policy makers to refine current ISP models and practices in efforts to improve the effectiveness of these programs. Better models for measuring the effects of these programs on recidivism can then be developed and tested further.

II. LITERATURE REVIEW

Background and Characteristics of Intensive Supervision Probation:

The development of ISP programs was based on the propositions of deterrence theory. Deterrence theory postulates that punishment or the threat of punishment will inhibit undesirable behavior of those disposed to commit crime in the future. According to Wright (1991) the success of deterrence is based on either the severity of punishment or the enforcement of punishment for the subsequent offences. The impact of enforcement depends on the probability of being detected and the certainty of getting caught and punished must be high before individuals will be deterred from criminal behavior. Consistent with deterrence theory, the basic premise of intensive supervision is that increased surveillance will act as a constraint on probationers and the likelihood of detection will act as a deterrent to crime (Langan, 1994).

Building on deterrence theory, ISP programs are developed based on four propositions (Petersilia and Turner, 1990). First, ISP programs propose that intensive monitoring not only makes it difficult for the offender to commit new crimes, but it also discovers technical violations. Second, technical violations are worth monitoring in that they signal an offender is "going bad" and are proxy measures for future criminal behavior. Third, if

an offender's probation is revoked for a technical violation, then the system may be preventing future crime. Finally, if offenders know that their behavior is closely monitored and probation is revoked for violations, then they will want to avoid violations.

Acclaimed by many as the most promising criminal justice innovation in decades, advocates believe that ISP programs have the potential to alleviate prison crowding at less cost than increasing prison capacity without compromising public safety (Byrne, Lurigio, and Baird, 1989; Fulton and Gendreau, 1995). According to Petersilia and Turner (1992), ISP programs are not only better able than prison or probation to fit the punishment with the crime, but they also may be the "best hope" for relieving prison crowding and ensuring public safety. Thus, support for ISP programs has grown and by 1990 every state had developed some form of ISP (U.S. General Accounting Office, 1990).

Despite their popularity, there is no standard or generic ISP program (Turner et al., 1992) and no two programs are exactly alike (Byrne, 1986; Fulton and Gendreau, 1995). Various jurisdictions may emphasize different goals, differ with respect to philosophy and methodologies, utilize different supervision strategies and staffing patterns, serve disparate target populations and differ in their ability to implement the program as planned (Byrne, Lurigio, and Baird, 1989; Byrne, 1990). The acronym alone says

little about any one program's characteristics except that the supervision provided by the program is more intense than standard probation. Moreover, there is no agreement on how many supervisory contacts are necessary for a probation program to be considered intensive (Petersilia and Turner 1992). "If there is one common element in the array of ISP programs, it is the emphasis on surveillance and control of offenders . . . " (Byrne, 1990). Petersilia and Turner (1993b) echo this observation noting, the ***only*** common characteristic of ISP programs is that they involve more supervision making them more "intensive" (Petersilia and Turner, 1993b). Thompson (1987) describes the "intensive" in intensive probation supervision as having five other dimensions beyond frequency of contacts. In addition to probation officers have multiple contacts with probationers, supervision is focused. The monitoring activities are aimed at regulating specific behaviors, for example, drug use, travel and employment. Second, supervision is ubiquitous. Probation officers usually conduct random drug tests and unannounced home visits. Third, supervision is graduated whereby offenders are monitored more closely at the beginning of the probationary period and monitoring activities become less frequent over time. Fourth, supervision is strictly enforced and any noncompliance with probation conditions is swiftly and severely penalized. And finally, supervision is coordinated by officers who are part of an autonomous unit

of probation and are specially trained.

Most programs therefore include some combination of multiple weekly contacts with a supervising officer with strict enforcement of probation conditions, place offenders on smaller case loads, require they participate in work, submit to random urine and alcohol testing, perform community service and attend treatment (Turner et al, 1992). Moreover, programs do tend to share common goals as well; to provide an alternative to incarceration, reduce prison crowding and incarceration costs, to punish and rehabilitate the offender, and to enhance probation services (Austin et al., 1990; Fulton and Gendreau, 1995).

Effectiveness of ISP Programs:

Although they are described as a recent innovation, ISP projects were initiated with Law Enforcement Assistance Administrative (LEAA) funds in the mid-1960's and early 1970's . These programs were largely probation-management tools designed to determine the most effective caseload size needed to achieve rehabilitation (Lurigio, 1997; Banks and Rardin, 1977). They were not designed to divert offenders from prison but rather were directed toward offenders who normally would have received regular probation. The focus of these earlier programs was on reintegrating the offender into the community (Lurigio, 1997). The

programs were based on two main assumptions: more intensive supervision will result in more successful outcomes; and the number of cases in a caseload determines the intensity of supervision received by a single case (Clear and Hardyman; 1990; Banks and Rardin, 1977). Follow-up studies of the earliest ISP programs documented disappointing results: offenders in smaller caseloads did not receive higher levels of supervision; offenders who were more intensely monitored were not more successful than offenders receiving less intense monitoring; and finally, the strict regulations of the programs had both positive and negative effects on adjustment to supervision (Clear and Hardyman, 1990). In contrast, ISP programs developed in the 80's and continued through the 90's, emphasized surveillance and control. These programs either targeted offenders who were classified as too serious for regular probation but not necessarily appropriate for incarceration; or offenders who, without the ISP option, would be sentenced to prison (Bureau of Justice Assistance, 1988).

The most widely implement and highly publicized programs developed in the 1980's were the Georgia and New Jersey projects, each with different and distinct models (Lurigio, 1990; Byrne, 1990). The Georgia project was credited with initiating subsequent interest in ISP and served as a model for many others (Lurigio, 1997). Implemented from 1982 through 1985, the project's primary goal was to divert nonviolent but

serious offenders from prison (Erwin and Bennett, 1987; Bureau of Justice Assistance, 1988). The program's supervision protocol was stringent relative to standard probation as well as other ISP programs. For example, during the first phase of a three-phase program, five (5) face-to-face contacts per week were required and weekly arrest checks were conducted. Offenders were expected to adhere to mandatory curfews, meet employment requirements and submit to routine drug and alcohol screens (Bureau of Justice Assistance, 1988). The project's results were promising. Erwin (1987) reported that Georgia's program played a significant role in reducing the flow of offenders to prison, noting a 10% reduction in the percentage of felons sentenced to incarceration. Georgia's program appeared to not only be successful in diverting a large number of offenders from prison, but proponents claimed it produced considerable cost savings as well. It was estimated that the ISP program saved $6,000 per offender (Erwin, 1990) or the cost of building at least two new prisons (Erwin, 1986). Further the evaluation reported that participants had lower recidivism rates and most were able to maintain employment and make restitution (Erwin and Bennett, 1987).

Second only to Georgia's program in prominence and replications, New Jersey's model is perhaps the best example of a backdoor early release mechanism to relieve prison crowding (Lurigio, 1990). The

program, implemented from 1983 through 1996, targeted offenders already incarcerated in prison as opposed to diverting offenders from prison (Bureau of Justice Assistance, 1988). Moreover, the target population consisted of more offenders convicted of drug sale than did Georgia's; 47% verses 24% respectively (Pearson and Harper, 1990) and placed significant emphasis on meeting the treatment needs of this population. Conducting offender needs assessments and making referrals to counseling were ongoing processes. Counseling was described as the cornerstone of the program (Fulton and Gendreau, 1995).

The admission criterion for the New Jersey program was very stringent and prolonged. Offenders had to apply within 30 to 60 following admission into prison, and had to pass through a seven-step selection process (Pearson and Harper, 1990). In applying, offenders were required to develop their own program plan to include identification of a community sponsor and a plan for employment and housing. Applications were reviewed by a screening board and if accepted, a recommendation for an amended sentence was sent to the judge. Much like the Georgia model, the program called for high levels of contact (Pearson and Bibel, 1986). The program's outcomes appeared promising as well. The program evaluation (Pearson and Harper, 1990) found that ISP offenders, when compared to parolees over a 24 month period, were significantly less likely

to be rearrested and convicted. Moreover, the evaluation claimed that ISP had achieved an employment rate of over 96%, reduced costs by $6,000 to $7,000 for each offender per year, saved over 62,000 offerder-days of prison time and achieved a significantly lower recidivism rate than the comparison group (Bureau of Justice Assistance, 1988).

The positive results of the initial evaluations of ISP in Georgia and New Jersey were highly publicized and used to justify expansion of both programs (Byrne, 1990). As such, other states moved to develop similar ISP programs, e.g., Wisconsin, Massachusetts, Ohio. However, subsequent evaluations of these programs were less encouraging. Neither Wisconsin nor Massachusetts reported any cost savings nor did Wisconsin or Ohio report any reduction in recidivism (Petersilia and Turner, 1993b). It is repeatedly argued by Petersilia and her colleagues (1990; 1992; 1993a; 1993b; 1997) that these inconsistent findings are due to weak and poorly designed evaluations that do not permit differentiation between program and participant effects, thus any claims about the effects of ISP from evaluations that did not employ randomized designs, are suspect. "Unfortunately, when these and other evaluations were examined more closely, it became clear that the effects of ISP remain unknown . . . " (Petersilia and Turner, 1993b).

Responding to the need to empirically demonstrate the effectiveness

of the ISP programs, the Bureau of Justice Assistance (BJA), U.S. Department of Justice provided funding to conduct a large scale randomized study of ISP programs. The Intensive Supervision Demonstration project which ran from 1986 through 1991, consisted of 14 programs in 9 states and involved approximately 2,000 offenders. Eligible offenders were randomized to either experimental programs (ISPs) or traditional sanctions (either prison, routine probation, parole or other forms of ISP). The target population had to meet only two criteria. The population had to be adult offenders and not currently convicted of a violent crime. Once these criteria were met, each site was free to tailor their programs to meet local needs. Only two sites chose to develop prison diversion programs while the others chose probation enhancement or parole enhancement of the more serious offender (Petersilia and Turner, 1993a). Thus, there were great variations among the 11 randomized field experiments.

In general, the findings suggest that by providing closer supervision, ISP programs are effective surveillance and intermediate sanction programs. Researchers reported:

> Most of the ISP's were significantly higher than the control programs in number of face-to-face contacts with supervisors, telephone and collateral contacts, law enforcement checks, employment monitoring, and drug and alcohol testing . . . Most of the ISP's had significantly higher levels of curtailed freedom . . . The rate of technical violation was high, making the resultant coercion and diminution of freedom

> experienced by the offenders an added punitive sanction as well as creating a public safety benefit (Petersilia and Turner, 1993b).

However, the level of surveillance does not appear to have a positive effect on offenders' subsequent behavior. Specifically, the data showed that there was no significant difference in the number of rearrests for new crimes or the severity of new crimes between the ISP and control cohorts. ISP participants were not subsequently arrested less often than the control group, nor did they have a longer time to failure. Another study of over 12,000 adult felons placed on probation replicated these findings and concluded that there is no association between intensive supervision and rearrest rates (Langan,1994). With minimal monitoring, regular probation has no worse recidivism than ISP. In fact, rearrest rates among ISP participants are somewhat higher due to more technical violations. When monitoring procedures are intensified, the likelihood that a probation violation will be identified is greater. On this particular measure, ISP programs are not very successful (Petersilia and Turner, 1993a).

Like other inquires about ISP's, the question of whether ISP programs are a cost-saving alternative has an ambiguous answer and is largely dependent on what alternative ISP is being compared to; e.g., incarceration, probation etc. (Latessa, 1986). For example, it cannot be disputed that incarceration is more expensive than probation or even

intensive probation. It is estimated that the average cost of imprisonment per year, per offender is $12,000 as compared to $4,000 for an ISP offender (Petersilia,1993a). However, if the term of prison commitment is significantly less than the time an offender would be expected to spend in ISP, the cost of incarceration could be less. Correspondingly, if ISP is utilized as an enhancement to standard probation then the cost of ISP compared to standard probation would also be greater. Within the diversion programs participating in the demonstration project, some ISP participants spend part of the follow-up year incarcerated anyway, due to technical violations. This offsets any initial cost-savings of these ISP programs. Moreover, in the ISP enhancement programs high violation and incarceration rates drove up the estimated costs for ISP participants to $7,200 per year compared to $4,700 for the control group (Petersilia and Turner, 1993a). Researchers concluded (Petersilia and Turner, 1993b):

In general, the evaluation findings show that ISP programs did not alleviate prison crowding and may have increased it in some states; they cost considerably more than advocates have realized, particularly if agencies incarcerate offenders for technical violations and rule infractions; they are no more effective than routine probation and parole in reducing in-program recidivism (as measured by arrests and convictions); they did provide a means by which offenders were held more accountable for there

crimes and community behavior; and they may have increased public safety.

Repeated studies continue to reported similar results (Turner et al., 1992; Langan, 1994; Petersilia and Turner, 1990). Overall, ISP programs appear to be effective in providing closer supervision, but have little impact on subsequent criminal behavior. Moreover, technical violations are greater among ISP probationers and if violators are incarcerated, ISP programs can be more costly.

After a decade of experimentation with ISP, the research suggests that ISP programs are not achieving their stated goals of alleviating prison crowding, reducing costs or reducing recidivism (Tonry, 1990). It would appear that all intensive supervision does is monitor offenders' success of failure in meeting the conditions of ISP. These results would indicate that the current emphasis of ISP on surveillance cannot be justified based on the goal of recidivism (Byrne, 1990). But before "throwing the baby out with the bath water" other aspects of these studies must be mentioned. There is sufficient evidence to suggest that offenders participating in more intensive probation programs are more likely to participate in substance abuse treatment and counseling. For example, data from the National Demonstration ISP Project show that 45% of ISP offenders participated in drug and alcohol abuse counseling compared to only 22% of offenders in

the control group. Moreover, this treatment participation was associated with 10 to 20 percent reductions in recidivism (Petersilia and Turner, 1993a). In programs where offenders received drug testing and participated in treatment, recidivism was reduced 20-30 % (Petersilia and Turner, 1997). Recent program evaluations in Texas, Wisconsin, Oregon, and Colorado have reported similar results (Clear and Braga, 1995). A study by Langan (1994) also found that ***if*** probationers were participating and making progress in treatment they were less likely to have a new arrest as compared to drug offenders who were not ordered to be tested or treated. Given the correlations between offenders participating in substance abuse treatment programs and recidivism, ISP programs can be an effective means to the reduction of subsequent crime.

Compulsory Treatment:

The operant term here is "if probationers were participating." Treatment cannot work unless the offender accesses treatment or in other words, unless treatment is administered. For many drug abusers, the criminal justice system may provide the only contact with treatment. Most offenders have not been treated in the community and community-based sanctions can offer an opportunity to engage the substance abuser in treatment (Tims and Leukefeld, 1992). Because ISP programs have been

proven effective in providing increased levels of monitoring, ISP programs can provide an effective context for court-ordered or compulsory substance abuse treatment.

The underlining premise of compulsory treatment assumes that, of the numerous types of substance abusers, few are motivated for treatment. Consequently, some sort of lever for structuring treatment for those who would not seek treatment or stay in treatment under their own volition, must exist. This lever has come to be known as "rational authority" and suggests non-punitive, but mandatory or compulsory, "treatment" (Inciardi, 1988).

The use of "rational authority" or legal sanctions to force offenders into treatment is not a new concept. Prison based treatment was proposed for the first time in the United States following the passage of the Harrison Act of 1914. Prior to the 1920's, the Narcotics Unit of the Treasury Department encouraged Congress to establish a conglomerate of Federal "Narcotic Farms" where heroin users could be treated while incarcerated (Brecher, 1972). Subsequently, specialized treatment for addicts in the United States began in 1935 with the opening of a Public Health Service in Lexington, Kentucky and another in 1938 in Fort Worth, Texas. These hospitals treated addict-patients who voluntary requested commitment, and involuntary patients, who had been prosecuted for

criminal offenses, incarcerated, and civilly committed for treatment (Leukefeld and Tims, 1988b).

Patients spent 6 to 12 months at these hospitals. The hospitals followed a standard course of withdrawal, physical restoration, psychological therapy in the form of group and individual counseling, and vocational counseling. Following the course of treatment, patients would be returned to their communities to resume their lives. However, the physical structure of these "hospitals" resembled a prison with walls, bars, and strict security and most voluntary patients did not remain in treatment for the entire program. Relapse rates were extremely high and outcome reviews were not favorable (Morgan, 1981; Inciardi, 1988).

Critics argued that the Lexington and Fort Worth programs were almost total failures. Follow up studies showed that between 1935 and 1964 there were 87,000 admission at the two facilities. Of these admissions 63,600 were considered "voluntary" patients and 23,400 were Federal prisoners. Of the voluntary patients, seventy percent (70%) had left against medical advise. Of the total admissions, ninety percent (90%) had relapsed within a few years (Inciardi, 1988). However, a number of implementation flaws, not the concept, were acknowledged as barriers in achieving success.

Building on the Lexington model, and lead by the new treatment

based philosophy, a series of new programs were designed. In 1961, the California State legislature established the California Civil Addict Program within the Department of Corrections for the compulsory treatment or non-punitive incarceration of narcotic addicts. During this same period several cases were being brought before the U.S. Supreme Court challenging the Constitutional rights and guarantees of prisoners. The "hands of doctrine" was beginning to erode and the mood of the Court was changing. In 1962 the United States Supreme Court in *Robinson v. California*, 370 U.S. 660, 82 S.Ct. 1417, 8 L.Ed.2d 758 (1962), held that punishing a person for being a drug addict is a violation of the Eighth Amendment of the U.S. Constitution and constitutes cruel and unusual punishment. The rationale set forth by the Court stated that drug addition was an illness, and therefore a state could not make addiction a status of crime (Gostin, 1991). The Court's decision gave additional support to the commitment for treatment vs. punishment approach and in 1963, the California state legislature amended sections of the California Rehabilitation Act to further emphasize the treatment philosophy.

The revision of the California statutes provided for civil commitment to the California Rehabilitation Center for an indeterminate period for up to seven years, without first being convicted of a crime (Inciardi, 1988). An individual in need of treatment could be civilly committed by one of three

methods. First, after conviction for a misdemeanor or felony - but prior to sentencing, a separate superior court proceeding could be held to determine whether the person was an addict or in danger of becoming an addict. Second, any "concerned" party could report under oath to the district attorney (DA) the belief that another person was addicted to narcotics or was in danger of such. If probable cause was present, the DA could petition the superior court for commitment not to exceed seven years. Lastly, any person who believed themselves to be an addict in need of treatment could request of the DA a petition to the superior court for commitment not to exceed two and one-half years. Most of these patients were involuntary commitments who had been convicted of a crime (McGlothlin, et al., 1977a). Although the stated intent of the legislation was "non-punitive", the program was placed under the Department of Corrections as opposed to a treatment agency, e.g., the Department of Public Health. Some were skeptical of the legislative "intent" of this action:

> ...there is little doubt that the political climate in 1961 favored strong measures to suppress narcotic addiction and that the intent of civil commitment legislation was at least equally as much for *CONTROL* as for treatment (emphasis added) (McGlothlin et al., 1977a).

There seems to be little question that the tensions resulting from the opposing ideologies between corrections and treatment are long standing.

At the Federal level, Congress enacted the Narcotic Rehabilitation

Act (NARA) in 1966 which consisted of four Titles. Titles I, II, III of the act provided for; civil commitment of those choosing treatment or as requested by a relative without a criminal charge; those assigned after a criminal conviction, but in addition those persons charged but not convicted of any offence could also be committed. Drug offenders could seek treatment as an alternative to criminal prosecution. Title IV provided for financial assistance to States and localities for treatment programs (Maddux, 1987).

The NARA authorized the Surgeon General to contract any public or private agency for the provision of drug treatment services. To expedite program development and implementation, the Lexington and Fort Worth hospitals were utilized. These facilities were renamed "clinical research centers" and NARA admissions to the centers began in 1967. All other admissions (federal prisoners and voluntary) ceased by 1968. However, patients that entered the two centers were not much different than those previously admitted with prisoner or voluntary status, nor was the treatment much different. Even though the NARA program required new and different procedures, the fundamental programs of the centers remained. Little change in response to NARA occurred (Maddux, 1988).

Grants under other legislative authority and grants to states and other communities under Title IV created increasing local services for drug abuse treatment. With the increase in local services there was a decrease

in Title III admissions: civilly committed addicts not charged with criminal offenses. Drug Abusers could only be admitted to Lexington and Forth Worth if State or local facilities were not available. Therefore, the clinical and research missions of the facilities were lost and in the early 1970's both facilities were closed (Maddux, 1987, 1988).

Effectiveness of Compulsory Treatment:

The California program proved to be effective at modifying behaviors. The initial evaluation study of the California Civil Addict Program (CAP) was performed during 1974 to 1976 and examined the efficacy of mandatory treatment and civil commitment. Data from 1,000 individuals admitted from 1962 to 1964 for a seven (7) year period of commitment were selected for follow-up. Eight (8) years of pre-admission data and 11 to 13 years of post-admission data were obtained during interviews (Anglin, 1988; Leukefeld and Tims, 1988b). To evaluate subsequent drug use, researchers examined the percentage of time during each year that narcotics were used on a daily basis. Data showed that among the treatment group there was an immediate and dramatic decrease in daily narcotic use which was sustained over a 5 year period. Moreover, a sharp and sustained reduction in associated property crimes was also observed among the treatment cohort. Researchers concluded that civil commitment is effective in suppressing daily drug use and criminal

involvement (McGlothlin, et al., 1977a). Two follow-up studies of the NARA program (Langerauer and Bowden, 1971; Stephens and Cottrell 1972) found similar results with respect to drug abstinence. Each reported that patients treated in the NARA program had better results than patients who volunteered for hospitalized treatment (Maddux, 1988).

Studies also show a relationship between the length of time in treatment and treatment outcomes among legally coerced clients. Utilizing multivariant analysis, studies by Simpson and Sells (1982), Barr and Antes (1981) and Holland (1983) identified time in treatment as the most consistent predictor of positive client outcomes. Even among clients who drop out, the link between length of stay in treatment and treatment success exists (DeLeon, 1984; DeLeon 1988). One of the largest studies conducted that demonstrated this relationship is the Treatment Outcome Prospective Study (TOPS). This large-scale study included 12,000 clients from 10 cities. From these 10 cities, 41 various publicly funded treatment programs participated including: outpatient methadone, residential, and outpatient drug-free from 1979 to 1981. The purpose of the study was to determine the major factors that affected treatment outcomes (Hubbard, et al., 1988). The study results not only support the basic belief that criminal justice clients do as well or better than other clients in drug abuse treatment, but also legally referred clients stay in treatment longer and

length of time in treatment is associated with treatment outcomes.

Other studies have been conducted that compare outcomes with specific treatment time intervals (Wexler, et al., 1990; Field, 1989). Field's 1989 study evaluated one of the most widely known substance abuse treatment programs for incarcerated offenders, the Cornerstone program located in the state of Oregon. Among one of the many study objectives, the evaluation examined the effectiveness of compulsory residential treatment and the relationship between length of time in treatment and recidivism. Researchers compared a group of program graduates with an average program length of stay of 11 months with 3 groups of offenders who did not graduate: 1) offenders who spent over 6 months in the program; 2) offenders who spent 2 to 6 months in the program; and, 3) offender who were in the program less than 2 months. The groups were followed for 3 years and each group was evaluated based on the percent of each group without arrest, without conviction, and without incarceration of jail terms greater than 6 months. Results showed that more than 50% of the graduates were not convicted, 75% were not incarcerated, and over one-third (1/3) or 37% were not rearrested. Of the non-graduates who were in treatment over 6 months, only 28% were not convicted, 37% were not reincarcerated, and 21% were not rearrested. Of the drop-outs who spent less than 2 months in treatment, only 8% were not rearrested in the 3

year follow-up period, 11% were not convicted, and only 15% were not reincarcerated (Field, 1989). Researchers conclude that time in treatment correlates positively with measured decreases in criminal activity.

However, more does not necessarily always mean better. In a large scale evaluation study of New York's well known Stay'n Out residential treatment program, researchers sought to examine the effectiveness of compulsory prison based treatment on recidivism (Wexler, et al., 1990). All offenders who participated in the program between 1977 and 1984 were included. One of many elements of the study examined the effect of specific lengths of time offenders remained in treatment to subsequent arrest. Program participants were divided into 5 subgroups according to the length of time they were in treatment: less than 3 months; 3 to 5.9 months; 6 to 8.9 months; 9 to 11.9 months; and greater than 12 months. The results of the study affirmed findings in other studies that showed increases in the length of time in treatment to be significantly related to positive treatment outcomes. Of the offenders who remained in treatment 9 to 12 months, 77% had no parole revocation, no arrests or no convictions of any kind for 3 years (Wexler, et al., 1992; U.S. Cong. House, May 1991). However, the most provocative finding of the study showed a decline in positive outcomes of offenders who remained in treatment for more than 12 months. Researchers concluded that there is a optimal

duration for treatment and that greater exposure to treatment produces positive effects only up to a point of satiation. This finding suggests the need for further research to determine the optimal levels of treatment for different offender populations under various conditions.

There is more than 25 years of supporting evidence that coerced substance abuse treatment for offenders is as effective, and in some cases more effective at producing positive treatment outcomes than voluntary treatment (Wexler, et al., 1990; Fields, 1989; Langenauer and Bowden, 1971; Stephens and Cottrel, 1972; Anglin, 1988; De Leon: 1988, Anglin and Hser, 1990a; Lipton, 1995). Moreover, the relationship between compulsory treatment and positive outcomes is consistent across the four major treatment modalities: therapeutic communities; outpatient drug-free; social models; and methadone maintenance (Gerstein, et. al., 1994). Studies support the conclusion that how a substance abuser is exposed to treatment seems irrelevant. What is important is that substance abusers are brought into an environment where treatment can occur and that treatment is long enough to bring about change and recovery. Unfortunately the recovery process is often misunderstood by criminal justice officials which can lead to an unrealistic expectation for immediate change in the drug-involved offender's drug seeking behavior.

The Addiction Process and Recovery:

In order to understand the recovery process it is necessary to understand the nature of addiction. People who fail to recover from alcohol and drug addiction do so often because they do not understand their addiction. It is argued that erroneous information about the nature of addiction is responsible for much improper or incomplete treatment that often leads to alcohol and drug relapse (Gorski and Miller, 1986; Martin, 1982). Although theories abound relative to the nature of addiction, most professionals in the field of addiction science agree that alcohol/drug addiction is a chronic relapsing incurable but treatable ***physical disease*** characterized by compulsive drug seeking behavior, and should be treated as such (Ohlms, 1993; Leshner, 1997).

Scientific advances over the past 20 years in the biological and neurosciences have furthered the understanding of the physiological nature of addiction. Early research in liver metabolism has shown that people who develop a high tolerance for alcohol and develop alcoholism metabolize alcohol quite differently compare to people who drink and never develop the disease. The hepatic metabolic anomaly in combination with biochemical processes cause irreversible alterations in the brain's chemistry leading to addiction to alcohol and other sedative drugs, referred to as "sedativism". Specifically, science has shown that in people who

develop alcoholism/sedativism, a small portion of the bi-product produced from metabolized ethanol (acetaldehyde) combines with the brain's neurotransmatter dopamine and biologically an opiate-like addictive chemical substance is produced in the brain know as tetrahydroisoquinline (TIQ). Research suggests that this process only occurs in the brains of individuals who develop alcoholism/sedativism and not in the brains of people who, even though may drink for years, never develop the disease. Once produced, TIQ remains a part of the brains chemical composition and is not eliminated even though the alcoholic may stop drinking for years. It is theorized that this process may explain the progressiveness and chronicity of the disease: once addicted, always addicted and long periods of abstinence will not reverse the process (Cohen, 1978; Hamilton et al., 1978; Myers, 1978; Ohlms, 1993). Moreover, these metabolic differences are more often seen in people with a family history of alcoholism and are present even before there are any indications of problem drinking (Schuckit and Rayses, 1979). These studies strongly support studies which suggest a genetic and hereditary basis for addiction (Cloninger et al., 1981; Cotton, 1979; Goodwin, 1980; Schuckit et al., 1985).

The biological and neurological basis for addiction is further supported by studies which led to the suggestion that people at risk for addiction to certain drugs may suffer from deficiencies in the brain's natural

chemicals and neurotransmitters that determine mood and serve to relieve pain and stress: e.g., endorphins, norepinephrine, seratonin and dopamine (Gold et al.,1985; Khantzian, 1985; Levinthal, 1988). For example, there is empirical evidence documenting that endorphine levels are abnormal in opiate addicts (Goldstein, 1978; Ho et al., 1980). According to Levinthal (1988), a deficiency in an endorphine system that ordinarily would support feelings of pleasure and reinforcement could lead to feelings of inadequacy and sadness. It is argued that people at risk for narcotic addiction may suffer from an impairment of the body's ability to produce endorhpines and further, that this deficiency may be genetically determined. Goldstein (1978) hypothesized that a person could inherit an endorphine deficiency and if they began to use narcotics they would discover a "normalizing" or euphorogenic effect in excess of that experience by people without the abnormality. This effect would predispose a person to opiate addiction and make it harder for them to remain abstinent. Not only does the endorphine deficiency, which is observed in the heroin addict, provide a plausible medical reason for relapse, Schuckit (1980) argues that additional genetic factors play a role in the physiological drive to return to drugs, as mediated by a protracted abstinence syndrome or through inherited psychological vulnerabilities.

Once addicted, Leshner (1997) argues that more recent scientific

evidence shows that the addictive brain becomes even more distinctly different than the nonaddictive brain in that all drugs of abuse have common effects on a single pathway within the brain referred to as the mesolimbic reward system. Activation of this system appears to be a common element in addiction or what keeps drug users taking drugs and is not unique to any one drug. All addictive substances appear to affect this circuit in the same way. Prolong drug use then causes changes in the brain's metabolic activity, receptor availability and responsiveness to environmental cues that can persist long after the person stops taking drugs.

The implication in understanding the fundamental differences and changes in brain function as a consequence of addiction for treatment and recovery is self evident. Even though initial alcohol and/or drug use comes about as a voluntary behavior, addiction is not voluntary. The addict's metabolism and brain chemistry is different from the non-addict's and the addict must be dealt with as if she or he has a chronic relapsing illness with long lasting physical and social consequences requiring long periods of time for recovery. Recovery from the long-term effects of addictive drugs on the central nervous system (CNS) alone requires a significant amount of time. For example, CNS damage or brain dysfunction has been documented in as much 75 to 95 percent of recovering alcoholics (Abbott

and Gregson, 1981). Recovery from CNS damage usually requires 6 to 24 months (Gorski and Miller, 1986). During this period of time, post-acute physical withdrawal symptoms (PAW) may continue lasting months and include, cognitive and memory disturbances, excessive anxiety, irritability, insomnia, depressive symptoms and more. These symptoms of long-term toxicity and withdrawal associated with CNS damage can take up to 18 months to stabilize and are often related to relapse (McGrady and Smith, 1986; Porjesz and Begleiter, 1983). The recovery process can create a great deal of stress and many chemically dependent people have difficulty learning to manage stress without the use of alcohol or drugs. It is suggested that the stress associated with recovery aggravates the brain dysfunction and exacerbates the long-term withdrawal symptoms often leading the addict back to drugs to relieve the symptoms (Gorski and Miller, 1986). However, with abstinence, treatment and time these symptoms will disappear and recovery is made possible.

Time is a critical element in reversing the physiological, sociological and emotional deterioration and dysfunction of the addict. In addition to the time necessary to complete long-term withdrawal and repair neurological damage, some researchers suggest that the most serious problems caused by addiction require 2 to 3 years to resolve (DeSoto et al., 1985). However, recovery should not be conceptualized as a developmental

process of simply repairing or reversing damage created by the addictive disease. In addition, successful recovery demands the development of entirely new coping skills, the development of a new personal identity and approaches to living. Recovery goes beyond "re-covering" what was once lost to the acquisition of a new lifestyle. The more longstanding lifestyle changes require 8 to 10 years for full resolution (DeSoto et al.,1985).

The Need for Program Evaluations and Change:

Despite research documenting the need for substance abuse treatment and the effectiveness of compulsory treatment most ISP programs are unable to ensure compliance with court-ordered substance abuse treatment. As a result, these programs are not as effective as they could be. It is argued that many ISP program models are plausible and could work except they lack the necessary treatment resources (Petersilia, 1997). Because ISP practices generally center around surveillance and enforcement activities and are not treatment focused, programs are often implemented without creating the organizational capacity or resources to provide the necessary substance abuse treatment. This apparently reflects the values of policy makers. It appears that most program policies tend to support punishment of the offender as opposed to treating the drug-involved offender as having a chronic relapsing disease characterized by

"drug-seeking behavior." Therefore a significant proportion of offenders who are in need of treatment or court ordered to treatment never receive treatment services. Langan (1994) found in a study of 12,370 felony probationers, 24% of those ordered to alcohol treatment and 32% of offenders ordered to drug treatment never received any treatment by the end of their probation term.

In order to provide for court-order treatment, the focus of ISP programs needs to change. Fulton and Gendreau (1995) argue that ISP programs need to change the way in which they are intensive by shifting the emphasis away from incapacitation and punishment toward a more integrated approach of intervention and substance abuse treatment. Given what is known regarding the nature of addiction, punishment without treatment is futile. Research has consistently shown that successful programs combine both treatment and surveillance and target an appropriate offender subgroup (Petersilia and Turner, 1993a). However, it is unknown what levels of both treatment and surveillance are required to maximize outcomes and reduce drug-abuse behavior and recidivism. Is there an optimal length of treatment time as suggested in the Stay'n Out study? Will different combinations of treatment and surveillance produce different results in different population? By modifying and retesting various program models, the chances for improving the effectiveness of ISP

programs will increase. Moreover, with continual budget constraints, it is imperative that the many unanswered questions concerning supervision and treatment are explored in efforts to realize and maximize the potential of probation. More support must be gathered that convinces both criminal justice professionals and the public that community sanctions are punitive, will hold offenders accountable for their behavior, produce positive outcomes; and whether ISP, a concept sound in theory, can be structured differently to produce more effective results.

This study responds to the question of whether a different and unique structure of ISP can lead to different outcomes. As such, the primary aim of this evaluation research is to determine whether meaningful differences in outcome measures (treatment access, length of time in treatment, subsequent drug use and recidivism/re-arrest) exist between drug-involved felony offenders who were sentenced to residential probation and ordered to outpatient substance abuse treatment, and similarly situated offenders sentenced to less intensive probation and also ordered to outpatient substance abuse treatment. The residential probation program selected for this outcome evaluation is of particular interest in that it mitigates key issues identified in the literature as barriers to successful ISP programs. By including on-site substance abuse treatment, the residential probation program provides the organizational capacity to treat all offenders in need

of substance abuse treatment, and offers a greater emphasis in the integration of treatment and punishment. The following section describes the residential program in detail and the environmental context of the research setting.

III. THE RESEARCH SETTING

Overview:

Intensive supervision probation programs for drug-involved felony offenders focus on two activities designed to reduce recidivism and drug use. These activities are: 1) substance abuse treatment and 2) surveillance or monitoring. In general, there is evidence supporting the contention that more intensive, treatment-oriented programs could produce different results in some populations (Petersilia and Turner, 1993a). The residential probation program selected for this study is only one of many sentencing alternatives for drug-involved felony offender. The County represented in the research setting utilizes a variety of community based sentencing alternatives each characterized by differing levels of monitoring and substance abuse treatment (e.g., standard probation with outpatient substance abuse treatment, residential probation with outpatient substance abuse treatment, electronic monitoring with outpatient substance abuse treatment). It is therefore possible to track similarly situated offenders sentenced to different ISP models within the same jurisdiction to determine if there are meaningful differences in outcome measures between offenders sentenced to the various models.

Before discussing the study design, it is important to first describe

aspects of the research setting. These aspects include the process in which probationers may be sentenced to residential probation, the residential probation program intervention and the substance abuse treatment program.

Environmental Context:

The residential probation program selected for evaluation is located in a Mid-western county with a population of 430,459. Of the county's total population, 47.9% are males and 52.1% are females. The median age is 32.0 years with 43.2% of the population between the ages of 18 to 44 years. The ethnic distribution is 78.2% white, 19.6% black and 2.2% other (Table 1).

In 1996, approximately 1,403 felony offenders were sentenced in the County's Circuit Court. Of these offenders, approximately 730 offenders[2] were sentenced to one of various models of probation; standard probation, electronic monitoring, boot camp, residential probation; or a combination of any of the models. The probation model an offender is sentenced to is affected by many factors during the pre-sentencing process. Prior to sentencing, a probation agent conducts a pre-sentence investigation (PSI)

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2 This information was provided by the Office of Community Corrections and obtained from the Basic Information Reporting database maintained by the county in the research setting. The database does do not include mandatory and escape sentences. To protect the anonymity of the research setting, this source is not referenced.

Table 1 Population and Demographics of the Research County[3]

Gender	N	%	Age	N	%
Males	206,003	47.9	< 5yrs	33,436	7.8
Females	224,456	52.1	5 - 17	87,227	20.2
Total	**430,459**	**100**	18 - 20	19,906	40.6
			21 - 24	24,484	5.7
Ethnicity	**N**	**%**	25 - 44	137,491	31.9
White	336,651	78.2	45 - 54	46,425	10.8
Black	84,257	19.6	55 - 59	19,676	4.6
Other(Asian, Hispanic,	9,551	2.2	60 - 64	17,985	4.1
American Indian, Eskimo,			65 - 74	26,231	6.2
Pacific Islander, all other)			75 - 84	13,442	3.1
			> 84	4,156	1.0
Total	**430,459**	**100**	**Total**	**430,459**	**100**

and makes recommendations to the court regarding sentencing. One of the county's 32 probation agents responsible for conducting PSI's is assigned to the case. This assignment is based solely on the current case load of all 32 agents. In conducting the PSI, the probation agent uses objective criteria as well as his/her individual assessment skills to determine if an offender is likely to be eligible for residential probation. Once this determination is made, the decision to recommend an offender for residential probation is discretionary. Program administrators recognize that among the cadre of probation agents some may be more likely than others to recommend residential probation, but others do not utilize this option at all. One official acknowledged, "sometimes it's a fine line and a

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3 This information was provided by the county's Metropolitan Planning Commission. To protect the anonymity of the county and research setting, the source is not referenced.

toss-up where we recommend they go." The discretion of the probation agent is, therefore, an important element in determining whether a recommendation is made to the court for residential probation for offenders who may be eligible. Thus, not all probationers who meet the criteria for residential probation are recommended for the program.

The process in which cases are assigned to circuit court judges in this jurisdiction is similar and equally as important in determining placement in residential probation. In the circuit court represented in the research setting, cases are assigned to any one of seven[4] sentencing judges based exclusively on "blind draw"[5]. This suggests, in theory, that all cases have an equal probability of being assigned to the docket of any one of the presiding judges and moreover, that the distribution of cases for each judge is similar. However, this was not empirically documented. Judicial discretion and sentencing practices can also affect whether an offender who may be eligible for residential probation actually receives this probation option as a sentence. Based on preference and support of the residential probation program, some judges may override PSI

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In 1996, the county's circuit consisted of 7 judges. In the study cohort, it was determined that cases were disposed of by 10 different judges. During 1996, 3 judges were replaced accounting for the variance.

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This information was provided by a presiding judge in the county's circuit court during a personal interview. To protect the anonymity of the jurisdiction and programs, the interview and the name of the judge are not referenced.

recommendations and refer to residential probation even when another form of probation is recommended. For example, in the study cohort, 69 convicted felons were sentenced to residential probation. However, in only 27 cases were recommendations for residential placement made by probation agents in the pre-sentence investigations. And of the ten sentencing judges, three judges accounted for 58% of the sentences to residential probation. It is also possible that some judges are more or less likely to sentenced felons to a particular type of probation program based on offender characteristics such as age, race, prior felony convictions etc. In order to control for these potential variations in sentencing patterns several offender characteristics were included in both the Cox regression and standard logistic regress models as independent variables when testing the hypotheses.

The likelihood that offenders who are both eligible for residential probation at the beginning of the criminal justice process and who actually receive this sentencing option is affected by the random selection of both the PSI investigator and the sentencing judge. Thus, it could be argued that the probability of any offender who meets the admission criteria for residential probation actually being sentenced to residential probation is affected by the random assignment of both the PSI investigator and sentencing judge, as well as judicial discretion.

The Intervention Program:

The residential probation program serves as a sentencing alternative for nonviolent prison and jail bound adult male offenders and provides an intense level of supervision for a period of up to six months. Within the residential probation program, several different programs exist. Each is designed to target specific offender populations. For example, the residential program provides a "Long-Term Alcohol" program to target offenders convicted of a third "Operating Under the Influence of Liquor" (OUIL) offence. In addition, a 30 day "Probation Rule Violation" program is designed for technical rule violators, a 30 day after care program for offenders released from boot camp and, the "Standard Program for Circuit Court" (SPCC) provides longer term services for felony offenders. It is the SPCC residential probation program that is the focus of this evaluation research.

To be eligible for admission to SPCC, the offender must first be male and at least 17 years old. He must be charged or convicted of a felony crime that carries a minimum sentencing guidelines of "0 to 9 months " or convicted of a probation violation while on probation for on a felony crime with a sentencing guideline of "0 to 6 months". In addition the offender must not:

- present a continuing pattern of aggravated assaultive behavior,
- be recently or currently addicted to intravenous drugs,
- require medical alcohol detoxification,
- present a pattern of debilitating mental illness,
- be currently suicidal or demonstrate suicidal behavior, and;
- have any serious medical problems that would preclude active participation in the program, or suffer from a life-threatening communicable disease.

The offender also must have a functional I.Q (educable) and able to speak and understand the English language.

The SPCC includes three graduated levels of supervision, the first of which provides the most intense level of monitoring and is the most restrictive for the offender. As the offender demonstrates progress and the ability to follow the program's rules, he is rewarded by graduating to the next level until he reaches the third level and is ready for discharge. He may also receive "credit days" towards early discharge for compliance, work or for attending classes. While in residence, SPCC participants must adhere to strict supervision and behavior standards and participate in educational programs and life skills groups. All activities and the offender's

whereabouts are closely monitored. Any rule violation is subject to disciplinary consequences ranging from loss of "credit days" to probation revocation depending on the severity or frequency of the violations. Routine and random urinalysis and breathalyser tests are conducted, as well as personal and facilities searches. Canine drug teams are periodically invited to check the building for drugs. Offenders may be permitted work release at approved work sites. The average length of stay in SPCC is four months.

The SPCC population includes many substance-abusing offenders. For this population, the residential probation program also provides on-site substance abuse treatment. Although the treatment is provided in-residence, the treatment is not based on a residential treatment or therapeutic community model, but rather on an out-patient treatment model. Thus, the residential probation program integrates the philosophies and characteristics inherent in intensive probation[6], the concepts of specific deterrence theory[7] and the knowledge generated by research in

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Thompson (1987) describes intensive probation as having 5 elements in addition to intensive monitoring or frequent contacts. First, supervision is focused and aimed at regulating specific behaviors e.g., drug use, travel, employment, etc. Second, the offender is usually subjected to random drug testing. Third, supervision is graduated whereby offenders are monitored more closely at the beginning and less frequently over time. Fourth, supervision is strictly enforced and noncompliance is swiftly punished. Lastly, supervision is monitored by agents who are specially trained and part of an autonomous unit of probation. All of these elements are visible components of the residential probation SPCC program.

7

Specific deterrence is concerned with changes in the behavior of the convicted offender (after-the-fact) and punishment or the "threat" of punishment is intended to discourage the

compulsory treatment[8].

The substance abuse treatment is contracted through a local substance abuse treatment provider. The outpatient substance abuse program consists of a two-phase process lasting an average of fourteen weeks. During the first phase of treatment, offenders are required to participate in two sessions per week for six weeks. In the second phase, the offender participates in two sessions per week for eight to nine weeks. While in treatment, each probationer is assigned to a probation case manager who assists in identifying the individual needs of the offender and facilitates appropriate referrals to outside human service agencies when appropriate.

Once the probationer has completed the in-residence probation and substance abuse treatment programs, offenders typically return to standard probation, where probation officers monitor the offender's behavior, check re-arrest status and conduct urinalyses. At this point, the level of monitoring is determined at the discretion of the probation agent. If

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convicted from committing crimes in the future. The threat of additional legal sanctions, revocation of probation/incarceration, is used to discourage specific behaviors and increase compliance. In contrast, general deterrence holds that the population at large is dissuaded from criminal when it sees that punishment follows criminal behavior. The punished criminals are intended to serve as an example (Clear and Cole, 1994).

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As previously mentioned, there is more than 25 years of supporting evidence that coerced substance abuse treatment for offenders is effective (Langenauer and Bowden, 1971; Stephens and Cottrel, 1972; Anglin, 1988; Anglin and Hser, 1990a; Lipton, 1995) and moreover, that treatment is effective regardless of the modality (Gerstein, et. Al., 1994). SPCC requires that all offenders with substance abuse history's participate in out-patient treatment.

indicated by the treatment staff, the probationer is also referred for continued outpatient substance abuse treatment. It is recommended that all probationers continue attendance at Alcoholics Anonymous and/or Narcotics Anonymous.

The residential probation program selected for this evaluation study is only one of many sentencing options available to circuit court judges in the research county. The program provides a unique treatment oriented model that emphasizes the integration of treatment and punishment. With a greater emphasis on treatment the program is designed to address the treatment needs of all offenders who are sentenced to the program and in need of treatment. All offenders who meet the program's admission criteria are eligible for residential probation placement. However, several factors influence whether offenders are actually sentenced to residential probation or to another probation model: the random process of assigning PSI agents; the recommendations of the PSI agents; the random process of assigning cases to judges' dockets; and the discretion of each circuit court judge. Therefore it is possible to track similarly situated offenders sentenced to different ISP models within the same jurisdiction to evaluate the effects of residential probation and compare differences in outcome measures to other ISP models. The following section details the research design and methods for evaluating the residential probation program.

IV. METHODS

Introduction:

Based on previous research discussed in the literature, the primary research question this program evaluation intended to answer is: *"Are there meaningful differences in treatment access, length of time in treatment, subsequent illegal drug use and recidivism between offenders sentenced to residential probation and out-patient substance abuse treatment (SSPC)*[9]*, and similarly situated offenders sentenced to less intense levels of probation and outpatient substance abuse treatment?"* Given the documented link between substance abuse treatment and the reduction in subsequent criminal activity, the study was designed to answer questions directed towards evaluating the residential probation program's effectiveness in ensuring compliance with court ordered substance treatment and to measure subsequent drug use among drug involved felony offenders. The analysis to examine recidivism is affected by the reduced sample size for which data was available. This presents limitations in drawing meaningful conclusions from the measures of

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9 As previously discussed, the residential probation program has within it several individual programs designed to target specific populations. This study focuses only on offenders participating in the SSPC and SSPC/PES programs. Henceforth, the term "residential probationers" will refer only to participants in the SSPC and SSPC/PES programs.

recidivism. However, measures of compliance with court ordered substance abuse treatment and drug relapse are good proxy measures for recidivism. Therefore, treatment access, length of time in substance abuse treatment and length of time to subsequent drug use are used as the dependent variables in the study's main evaluation models. The length of time to rearrest (failure) for technical violations and new crimes are also examined. The following section details the selected evaluation questions, rationale and hypotheses.

Research Questions and Hypotheses:

Evaluation
Question 1: Are drug-involved offenders sentenced to residential probation more likely to receive substance abuse treatment than drug-involved offenders sentenced to non-residential probation models?

Research consistently shows compulsory treatment to be an effective means in achieving positive treatment outcomes (Maddux, 1988; Hubbard, et al., 1988; McGlothlin, et al., 1977a; 1977b). Ensuring compliance with court ordered treatment is therefore, the first step toward achieving this goal. All probationers in the study sample were required to participate in substance abuse treatment as a condition of probation. For the residential probation population, the required treatment is conducted

on-site while the probationer is in residence. The program also provides 24 hour intense monitoring and conducts frequent random drug screens. Offenders are subject to severe legal sanctions if they are found to be using drugs or do not comply with all rules, inclusive of treatment participation. It is assumed that offenders who are faced with legal sanctions (legal threat) if they fail or abscond are more likely to comply with court ordered treatment mandates, and that the legal threat for not participating in treatment is greater for probationers within the residential program compared to probationers in non-residential probation programs. Given these assumptions, the following is hypothesized.

Hypothesis 1: Probationers sentenced to residential probation are more likely to participate in substance abuse treatment.

Evaluation

Question 2: Are there differences in the length of time drug-involved offenders stay in treatment and remain drug free following sentencing, between probationers sentenced to residential probation and probations sentenced to non-residential probation models?

As previously discussed, studies find that clients who complete treatment have better outcomes compared to those who drop out of

treatment. For many studies, completion rates are measured as a dichotomous variable: either the client completed treatment or not. This measure yields little information regarding the length of time a client remains in treatment. Several studies well document that the "length of time" a client remains in treatment is the most constant and best predictor of treatment outcomes. This is true even among clients who drop out of treatment (Simpson and Friend, 1988; DeLeon, 1988, 1994; Hubbard et al.,1988; Barr and Antes, 1981). Given the importance of this link, this study also examines the time in treatment for all offenders who entered treatment.

Studies also show a relationship between treatment retention and enhanced case management services (Collins and Allison, 1983; Cook, 1992). Clients receiving case management services have been found to remain in treatment, both residential and outpatient, up to 7 weeks longer than clients not receiving case management services (Hubbard, et al. 1988). These augmented services are also provided by the residential probation program. Each probationer is assigned an in-house case manager to bridge the criminal justice and treatment systems and facilitate linkages to ancillary services, (e.g., medical care, social support, shelter, food, job assistance, etc.). The evidence in the literature and the residential program's activities supports the following hypotheses.

Hypothesis 2a: Drug-involved offenders sentenced to residential probation will remain in substance abuse treatment longer.

Hypothesis 2b: Drug-involved offenders sentenced to residential probation will remain drug-free longer.

Evaluation
Question 3: Are there differences in the likelihood of rearrest over time between drug-involved offenders sentenced to residential probation and offenders sentenced to non-residential probation models?

This question is answered separating rearrests for technical violations and rearrests for new felony offences and examining failure over time. Recent evidence shows the rearrest rates among probationers in more intensive probation programs are somewhat higher due to more technical violations. When monitoring procedures are intensified, the likelihood that a probation violation will be identified is greater (Petersilia and Turner, 1993b). Moreover, the level of surveillance does not appear to have a positive effect on rearrests for new crimes cases, the severity of the new crime or the length of time to rearrest (Langan, 1994; Turner et al., 1990; Petersilia and Turner, 1990). With minimal monitoring, regular probation has no worse recidivism than more intense forms of probation,

except when substance abuse treatment is involved. When substance abuse treatment is involved, a reduction in recidivism of 10 to 20 percent has been found. In programs where offenders received drug testing and participated in treatment, recidivism was reduced 20 to 30 percent (Petersilia, 1997). Given these research findings, and the services and level of monitoring observed at the residential probation program, it is hypothesized that the risk of rearrest for probation violations will be greater among residential probationers. It is also hypothesized that the risk of rearrests for new felony crimes will be lower.

Hypothesis 3a: The risk of failure over time for technical violations is greater among offenders sentenced to residential probation.

Hypothesis 3b: The risk of failure over time for new felony crimes over time is less among offenders sentenced to residential probation.

Evaluation
Question 4: Of the probationers rearrested for new crimes, are there differences in the severity of the new offence between residential probationers and non-residential probationers?

It is known that rearrest rates among probationer in more intensive probation programs are more likely to be higher due to more technical violations. Recidivism rates and patterns for new felony crimes, however, are of greater concern. Here only arrests for new felony crimes are considered and differences in the severity of the new crime are examined. As previously mentioned, the level of surveillance does not appear to have a positive effect on rearrests for new crimes or the severity of the new crime, except when offenders are involved in substance abuse treatment. Because it is expected that offenders sentenced to residential probation are more likely to receive substance abuse treatment, and treatment is related to better outcomes, the following is hypothesized.

Hypothesis 4: Of the probationers rearrested for new crimes, the severity of the new offence will be less for offenders sentenced to residential probation.

Research Design and Study Population:

In an ideal evaluation circumstance, offenders would be randomly assigned to the different forms of intensive probation and causal inferences about the impact of each program would be drawn from a comparison of post-sentence behavior. Because this procedure would ensure that individuals with reasonably equivalent characteristics were sentenced to

both SPCC or non-residential probation, it would increase the confidence that any observed differences in post-sentence behavior could be attributed to the type of program experienced by the offender. By utilizing a quasi-experimental design the strongest causal inferences cannot be drawn. However, it must be kept in mind that evaluation research is an effort to obtain "reasonable evidence" that specific activities or services have some meaningful impact in a specific environment or setting. Randomized field experiments represent only one of a variety of possible effective impact evaluation strategies (Rossi and Freeman, 1982; Weiss, 1972; Mohr, 1988). If evaluation research is to be used as a valuable tool for policy makers, then in environments where randomized designs are not possible, quasi-experimental designs are the only option.

Although random assignment may be the best experimental method for testing the differences, due to various environmental constraints it was not possible for this program evaluation. Instead, this study is designed as a "prospective observational or cohort study" and uses existing data for conducting secondary data analysis. In observational or cohort studies there is no control over the assignment of the exposed experience or the interventions. Only the individual exposures experienced by each participant in the study can be observed. Generally, a sample of the population is selected and information is obtained to determine which

individuals have the particular characteristics that are suspected of being related to the event being investigated. In this study, all offenders meeting the admission criteria for residential probation were selected. Individuals are then followed over time and outcomes are assessed through the use of existing data. In observational studies, the necessary data are often obtained indirectly by reviewing existing records and consist of information about the exposure status of the individual and whether the event of interest occurred after the exposure (Lilienfeld and Stolley, 1994). This study relies primarily on data in probation files.

The Sample:

The primary aim of this evaluation research was to determine whether meaningful differences in outcome measures exist between drug involved felony offenders who were sentenced to residential probation and, similarly situated offenders sentenced to other forms of probation. Therefore, it was deemed appropriate to include in the sample only offenders meeting the eligibility criteria for admission to the residential probation program. As such, the starting point in identifying the study sample was to identify all felony offenders who met the eligibility criteria for admission, but who were not necessarily sentenced to, the residential probation program during a defined time period. A database of all felony

offenders sentenced in the research county is maintained by the Department of Community Corrections. From this master database, a subset of data was obtained consisting of only offenders sentenced during 1996 for two reasons. First, because the residential probation program being evaluated only accepted male offenders, the ability to identify male offenders in the data set was necessary. Data prior to 1996 did not include gender codes. Therefore, it was not possible to discriminate male offenders from female offenders in records prior to 1996. Second, urinalysis data were needed to measure offenders' subsequent drug use. This information is collected and maintained by the county's adult probation department. The department's policy regarding drug testing changed in early 1997 and some probationer's were tested less frequently than others during calender year 1997. Because validity of the outcome measure "subsequent drug use" is affected by the frequency of drug testing for all probationers, a time period following 1995 that would yield the greatest and most consistent information regarding drug testing was identified. Thus, 1996 represented the most favorable period of time for identifying the study cohorts.

From the 1996 master database, all offenders meeting the eligibility criteria for the standard residential probation program and who were

sentenced to probation[10] were extracted. These criteria included: all males with histories of alcohol and/or drug abuse; convicted of felonies with sentencing guidelines of "0 to 9" or greater; and who were diverted from prison and sentenced to probation. In this initial data cut, 205 cases were identified. All cases had 1995 or 1996 docket numbers. Next, because the residential probation program also includes offenders sentenced for technical violations with sentencing guidelines of "0 to 6" or greater on the original offence, a second set of data was extracted from the same 1996 master data set. This extraction included all 1995 and 1996 dockets of male felony offenders with histories of alcohol and/or drug abuse and who were convicted of technical violations and continued on probation. From this second data extraction an additional 83 cases were identified[11]. A total of 288 felony offenders sentenced to probation in 1996, and meeting the eligibility criteria for residential probation, were identified.

Once the sample was identified, each offender's probation file was reviewed to determine the actual probation sentence. Upon review, it was discovered that offenders meeting the criteria for placement into residential

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10 In the county's master data set the sentence type is coded as either, Prison, Probation or Split. It was not possible to determine which form of probation an offender was sentenced to until each record was reviewed.

11 Sentencing guideline are not applicable to technical violations. It was not possible to determine whether these cases met the sentencing guideline admission criteria for the residential program until each file was reviewed.

probation were actually sentenced to one of five different probation models: Standard Probation; Residential Probation; Electronic Monitoring (PES); Residential Probation with Electronic Monitoring; or Boot Camp and Electronic Monitoring. These separate distinctions represent the study's five separate cohorts for comparison. During the review process 79 cases were excluded for the following reasons: 48 files could not be located during the review period; in 11 cases it was determined that the offender did not meet the admission criteria to residential probation (e.g., history of suicidal tendencies, inappropriate sentencing guidelines, etc.), 8 probationers were sentenced to residential substance abuse treatment instead of out-patient treatment; 4 cases were transferred out to other county's for supervision; 3 cases had requirements of only mail-in-monitoring; and in 5 cases offenders were sent to prison for violations committed in jail while serving a "split sentence". In these last 5 cases offenders never spent any time on probation or were never "exposed to the risk of failure." The final sample (N= 209) is distributed among the five study cohorts accordingly: Standard Probation N = 70; Residential Probation N = 38; Electronic Monitoring (PES) N = 54; Residential Probation with Electronic Monitoring N = 31; and Boot Camp with Electronic Monitoring N = 16.

Variables and Measures:

All of the data used in the evaluation were previously collected by either the county's department of community corrections, adult probation, the residential probation program or the substance abuse treatment provider. As previously discussed, the Office of Community Corrections maintains an electronic database that includes the data elements required for state reporting. This information is obtained from the offenders pre-sentence investigation and court records and collected by the department of probation. Data from the Office of Community Corrections were extracted electronically and merged into the evaluation data set. No attempt was made to alter the operational definitions or coding scheme of these variable, except in cases where data categories needed to be collapsed due to the size of the evaluation data set. Data elements that were necessary but not included in the electronic file were abstracted from paper files at either the residential probation program, the adult probation department, or the substance abuse treatment provider. This process had advantages in that, in some instances, coding schemes were not predefined and could be developed to conform to the evaluation design.

The primary source of data came from the offenders' probation files which are maintained at the county's probation department. Although most of the active case files provided many of the data elements needed for the

evaluation, several of the inactive case files were void of information. Wherever possible, attempts to rectify these omissions were made through contacts with the treatment provider, the residential probation program or by review of public records. The following describes the data and variables used in the evaluation research.

Independent Variables:

Several risk factors are identified in the literature as predictors of recidivism. Among these include, age, race, employment status, drug use, prior felony convictions, offence type, employment and treatment retention (Langan, 1994; Morgan, 1993; Gennaro, 1987; Prichard, 1979; Hubbard et al., 1998; Maddux, 1988). These and other variables found to be significant in the bivariant and univariant analyses of this study were identified as the study's key independent variables.

Demographic Variables: Ethnicity and age had previously been recorded in the master electronic database and distinguished as white, black, Asian, Arabic, Indian, Hispanic and other. Because only one Hispanic and one Asian were identified in the evaluation data set with all others reported as either white or black, the two racial categories, white and non-white were used. Age was previously recorded in two ways. First, the offender's actual age at the time of the offence was recorded. Second,

age was also assigned an age category or range. For analysis, it was decided to use the offender's actual age instead of the age category because the actual age would yield a more robust and precise analysis.

Education Level: Education level was also recorded in the master database in seven separate categories. Due to the size of the evaluation data set and the selected methodology, education level was collapsed into two categories for analyses; "0-11 grade" and "GED, 12th grade and beyond 12th grade".

Employment and Income: Employment and income were previously recorded as binomials. Offenders were reported to either be employed or not employed at the time of arrest, with incomes as either, greater or less than $75 per month.

Prior Felonies: Prior Felonies were obtained from the master electronic data file and recorded as a continuous variable.

Offence Code: This variable was pre-recorded into six categories: property, drugs, weapons, csc, assault, and arson. Due to the size of the study population and the selected methodology, offence codes were collapsed into three categories; property, drugs and violent offences.

Probation Violation: This variable denotes whether the critical incident which led to offenders receiving new sentences in 1996, was either the result of a technical violation while on probation for a previous 1995 or

1996 felony conviction, or the result of a new felony conviction.

Drug of Choice: Drug of choice is the drug preferred or primarily used by the offender. This information is recorded at the time of the pre-sentence investigation. Probationers are asked by the pre-sentence investigator which drug they prefer or used most frequently prior to their arrest of the incidence offence. The information recorded in the pre-sentence investigation is usually report as: Alcohol; THC; Crack/Cocaine; Heroin; Tranquilers; or Poly-Drug Use. Poly-Dug use is recorded if the offender reports more than one drug of choice. From this report, the drug of choice was abstracted, coded and recorded in the evaluation data set for each offender as either; Alcohol, THC, Crack/Cocaine, or Poly-Drug Use. Due to the low frequency of reported heroin as the drug of choice (N=1) this case was included in the poly-drug use category. Research indicates that as high as 90% of heroin users also abuse cocaine and alcohol. Therefore it is reasonable to consider heroin users as poly-drug users (Abadinsky, 1989). In only three cases tranquilers were reported as the drug of choice. The use of "tranquilers" by definition assumes the use of multiple drugs within the same drug classification (sedatives) all with similar pharmacological response. Thus these cases were also included in the poly-drug use category.

Additional Independent Variables:

Jail Days: Many probationers receive a "split sentence" which is a jail term in addition to probation. It seemed reasonable to assume that a split sentence itself is a unique intervention which could impact client outcomes. Due to the small size of the sample, instead of treating the split sentence as a separate type of intervention, the length of time offenders spent in jail was controlled for as a separate independent variable in the regression analyses. Therefore, "jail days" represent the length of time each offender spent in jail after the critical incident arrest and any time served after sentencing for a split sentenced. This was calculated from the information found in the probation files.

Study Group: The model of probation each offender was sentenced to was determined through a review of the probation files. Five separate probation models were identified: Residential Probation and Electronic Monitoring; Residential Probation only; Boot Camp and PES; Electronic Monitoring only (PES); and Standard Probation only. The models were then ranked ordered from high to low in terms of the frequency of monitoring expected for each model. For example, unless they are working, offenders sentenced to PES are expected to report for face-to-face contacts with their probation officer once a week while on tether. If working, the expectation is that they will have face-to-face contacts no less

than twice a month. Offenders sentence to residential probation or boot camp are usually monitored after discharge at the same level as PES for approximately 90 days. After 90 days, the level of monitoring is determined at the discretion of the probation agent. For standard probation, the level of monitoring ranges from 1 to 4 times per month depending on the offenders individual risk level classification (maximum, medium, or minimum risk). Considering these practices, Residential Probation with PES is considered to be to be the most intensive model of probation, followed by Residential Probation only, Boot Camp with PES, PES only, and Standard Probation.

Dependent Variables:

Length of Time to Failure-Interval Open Date: This study measures 3 of the dependent variables, treatment retention, subsequent drug use, and recidivism, not as dichotomous concepts but rather as a spread of time or duration effect. In other words, treatment retention is measured as the length of time or number of week an offender stayed in treatment as opposed to either completed treatment or dropped out of treatment. Similarly, this study is interested in the length of time an offender remains "arrest free" or "drug free" versus rearrested or not rearrested, used drug or didn't use drugs. One way of controlling for differences in the length of

follow-up time without discarding data is by using survival analysis. This statistical technique yields a survival function representing the conditional probability of remaining in a given state over time; or in this instance, "length of time to subsequent drug use"or "length of time to rearrest." Moreover, it provides information about patterns and the timing of an event or condition (Pearson and Harper, 1990).

Three assumptions are made when using a survival model. First, for any two individuals at any point in time, the ratio of their "risk of failure" (hazard) is assumed to be constant over time (Motulsky, 1995). To be at "risk of failure" assumes that the individual must be "exposed to the risk" or in a condition where failure is a possible event. For example, an offender cannot be considered to be at risk for dropping out of treatment, if in fact, he is not in treatment. Second, a case ceases to remain "exposed to the risk" of failure after termination of a condition (e.g., withdrawal from or completion of treatment, rearrest, failed drug-screen); and third, "censored observations" are treated as non-terminal "withdrawals"; the probationer is not considered to have "failed or survived" (Petersilia and Turner, 1992). Censored cases are simply dropped from the analysis *at that point in time*. For this evaluation, the events which serve to "censor" a case from any of the analyses include: death; lost to follow-up (no reported information on the probationer for more than one month); or in the even supervision of a

probationer is transferred to another jurisdiction. In addition, some offenders will not have "failed" at any event of interest (recidivism, subsequent drug use) by the end of the follow-up period. Simply, the observation period has not extended a sufficient period of time to capture these possible events. These cases are also treated as censored data at the point the offender was last observed.

Logically, this model assumes a starting point and end point, a specified interval. Variables were created to specify the span of time each offender was exposed to the risk of failing. Operationally defined, the "Interval Open Date" variable represents the point in time when the offender becomes "exposed to the risk" of failing. However, in this study some offenders spent a period of time incarcerated after sentencing before being released on probation. It cannot be assumed that the risk of failure is constant during both the period of time an offender is incarcerated and the period of time the offender is in the community. For those probationers in jail or boot camp, the risk of failure (rearrest and failed drug screen) is assumed to be extremely low, if it exists at all. In these cases the date the interval opens was adjusted to the date where the ratio of the "risk of failure" (hazard) was assumed to be constant. For example, if an offender was sentenced to a term in jail and a term of probation, the "Interval Open Date" is represented as the date in which the offender was released from

jail and began his probationary period. Similarly, if an offender was sentenced to Boot Camp and a term of probation, the "Interval Open Date" is the date the offender was released from Boot Camp and thus, becomes exposed to risk of recidivism and subsequent drug use. For all other forms of probation, the "Interval Open Date" represents the sentencing date.

Interval End Date: The interval end date is the date an offender was removed from the "risk of failure". This condition occurred when: the offender was successfully discharged from probation; removed from community placement via court sanction (e.g. jail or prison) for more than 60 days as a consequence of either a technical violation arrest or an arrest for a new crime; or was still successfully on probation at the time the file was reviewed. If an offender absconded and was not arrested at the time the file was reviewed, then the warrant date was used as the "Interval End Date". A separate variable was created and coded to identify the end point as: continued on probation; discharged from probation successfully; or failure due to additional court sanctions. This variable was used to censor the event in the Cox Regression models where recidivism is the dependent variable.

Recidivism/Rearrest: Relying on official arrest records has limitations. It is known that most crimes are hidden from enforcement agents and are unlikely to be recorded (Tittle, 1980). Moreover, an arrest

does not necessarily mean a defendant is guilty. Lacking any other measure of subsequent criminal behavior, this study did rely on officially recorded arrest data in the probationer's file. The rearrest variable represents the date an offender was arrested for either a technical violation or a new felony crime. An additional variable (Subsequent Violation Type) was created to identify the rearrest as either an arrest due to a probation violation or an arrest due to the commission of a new crime. Rearrests for new crimes were also coded by type: property, drug, or violent. The rearrest date did not necessitate a "failure" because an arrest for a technical violation may not lead to a jail term of more than 60 days as described above.

Subsequent Drug Use: All random drug screens required of probationers are obtained at the adult probation department. Offenders participating in residential probation are tested at the residential site while in residence. Results are recorded in separate drug screen files at both the adult probation department and the residential probation program. These files were reviewed and both positive and negative results were recorded for each probationer in the evaluation data set. The date a positive drug screen was noted is considered the "failure" date. The time interval between the "open interval date" variable and the drug failure date was calculated to determine the length of time offenders remained drug free. In

the event an offender never tested positive for drugs during the follow-up period, the length of time the offender remained drug free was calculated from the "interval open date" to the "interval close date". Because it was determined that drug relapse for cocaine and other drugs are of greater concern among officials in the study jurisdiction, and therefore court sanctions are more likely to occur for subsequent cocaine/ other drug use compared to relapse for alcohol and THC, it was important to analyzes relapse for alcohol and THC use separately from relapse for cocaine and other drugs. Thus, drug screen results for alcohol and THC were recorded separately from cocaine and other drug screens. The major drug categories screened for were: alcohol, THC, cocaine, and other. During the evaluation period, drug screens were required on the average of once a month. Probationers not required to submit to drug screens for more than 60 days were censored from the analysis at the date of their last drug screen.

Treatment Access: All offenders included in the study sample were court ordered to substance abuse treatment. This variable identifies whether offenders complied with court mandated treatment or not and is a dichotomous measure of the event.

Time in Substance Abuse Treatment:[12] As previously mentioned, offenders participating in residential probation were also required to participated in out-patient substance abuse treatment. To hold constant the modality of substance abuse treatment, only offenders sentenced to probation and ordered to out-patient substance abuse treatment were considered in the analysis. The "time in treatment" variable is therefore a measurement of out-patient substance abuse treatment only. Unlike residential treatment, which is measured in terms of treatment days, out-patient treatment typically occurs on a weekly basis. Thus, for purposes of this evaluation, "time in treatment" is measured in terms of "weeks in treatment". Information on the number of weeks between the treatment admission date and the treatment discharge date was obtained from either the probation files or was furnished by the treatment provider.

Treatment Status: Treatment status indicates the treatment disposition of the offender at the time the offender was discharged from treatment. The probationer was considered as either: never entering treatment; unsuccessful at completing treatment; successful at completed treatment; or successful and transferred for additional treatment.

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12 "Time in Treatment" is also considered as an independent variable in the Cox regression models where "time to rearrest" and "time to subsequent drug" are the dependent variables.

Method of Analysis:

The statistical methods used in the research included univariant, bivariant, and multivariant methods. To begin, summary statistics, frequency, means, median and standard error measures were used to ascertain and describe the basic profile of the sample and each cohort for all independent variables. For comparing categorical data between cohorts, Chi-Squares, Proportional z Tests, Fishers Exact test, Odds Ratios and crude Relative Risk ratio (RR)[13] methods are used. ANOVA and t-Tests are used to test and describe differences among continuous variables. These levels of analyses were necessary to understand the degree of homogeneity within the sample and between the cohort populations and, the complex relationships of the multivariant analysis.

Next, univariant survival analyses using SAS Life time test function (SAS Institute Inc., 1997 pp. 413-431) were conducted for each time sensitive outcome measure to illustrate differences in recidivism, treatment retention and drug relapse patterns between the cohorts. As previously discussed, survival analysis was used because the data represents time

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The relative risk (RR) is used to measure the strength of associations found in observational studies and is calculated from observed incidences rates of an event between two cohorts. (From a 2x2 table; RR = [A/(A+B)]/ [C/(C+D)]). The greater the RR, the stronger the association. A RR of more than 3.0 or more indicates a strong association, 2.0 indicates a moderate association and a RR between 1.0 and 1.5 indicates a weak association. The RR for observed incidence rates of events associated with study participants at the beginning of the observational period (odds ratio) can be calculated from a 2x2 table where RR = (AxD)/(BxC) (Lilienfeld and Stolley, 1994).

sensitive and censored data[14] and because this type of analysis is consistent with the substance abuse treatment and relapse literature . For example, some probationers remained "crime or drug free" for one week while others were not rearrest or experienced substance abuse relapsed by the end of the observation period. Similarly, some probationers remained in treatment only one week, while others in theory could have still been in treatment at the end of the follow-up period. Both univariant and multivariant survival analysis statistical techniques provide methods to control for differences in the varying amounts of time individuals were observed and whether or not the outcomes, or the events of interest, occurred. The limitation to univariant survival analysis is that explanatory variables are not controlled for. Thus, the analysis proceeds with multivariant analyses including Cox regression, and logistic regression.

Cox regression, a mulitvariant survival analysis tool commonly referred to as a proportional hazards regression (Motulsky, 1995; Kay, 1977; Cox, 1972) was then applied to evaluate the likelihood or the relative risk of the outcomes examined: recidivism and drug relapse. This

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Again, censored observations are treated as non-terminal "withdrawals"; the probationer is not considered to have "failed or survived". For this evaluation, the events which serve to "censor" an individual from any of the analyses include: death, lost to follow-up (no reported information on the probationer for more than one month), or in the event supervision of a probationer is transferred to another jurisdiction. In addition, the event of interest may not have occurred during the follow up period but may have occurred in the future. Simply, the observation period was not a sufficient period of time to capture these possible events. These cases are also treated as censored data at the point the offender was last observed.

statistical technique was believed to be the most appropriate in that the method allows for the probability of the outcomes to be measures in consideration of the varying amounts of time individuals were observed and it controls for the various demographic and system factors which may confound the relationship (Cox, 1972). This technique assumes that the risk of failure between any two individuals at any point in time is constant and uses regression methods to predict the relative risk of failing (hazard ratio) based on one or more explanatory variables (Motulsky, 1995). For this reason, Cox regression was not used to measure differences in the length of time in treatment.

After examining the data it was established that the probability of being determined a success or failure in completing treatment was considerably different among offenders. For example, offenders sentenced to residential probation were expected to complete 12 weeks of treatment before they could be determined "successful". In contrast, the length of time offenders sentenced to other probation models were expected to remain in treatment before being determined "successful" varied or was unknown. Some offenders were considered successful after only one month of treatment while others were noted as failures after six months of treatment. Considering probationers sentenced to residential probation, these offenders could not be successful in completing treatment during any

time period prior to 12 weeks. Thus at any point in time prior to 12 weeks they had zero probability of success, and therefore a greater probability of failure when compared to offenders with lower treatment expectations. In other words, the probability of failing in treatment for offenders with longer expected lengths of time in treatment is considerably different at earlier points in time compared to offenders with shorter treatment expectations. This also makes the interpretation of "failure" difficult. Failure for an offender with a one month treatment expectation is significantly different from failure for an offender with a 12 month treatment expectation. The data indicate that the hazard functions of offenders sentenced to the various probation models cannot be expected to be proportional over time. In this situation, proportional hazard regression is not appropriate (Cox, 1972; Motulsky, 1995). Instead, because differences in the lengths of time in treatment between cohorts is a continuous variable without any censored observations, ANOVA statistics are used. Logistic regression statistics were used to test differences in the proportion of offenders who actually entered treatment. Like Cox regression methods, logistic regression quantifies the association between risk factors and an event after adjusting for other variables as relative risk ratio and require that the outcome variables to be binary or dichotomous measures. However, in contrast, logistic regression is appropriate when outcome variables are not time

sensitive.

In summary, several statistical techniques are used in this study. For descriptive purposes summary statistics, frequency, means, median and standard error were used. For comparing categorical and continuous variables between cohorts, Chi-Square, Proportional z Tests, Fishers Exact test, Odds Ratio, crude Relative Risk ratio, AVOVA and t-Test methods are applied. Mulitvariant tools are employed for testing more complex interrelationships among the data elements.

V. RESULTS AND FINDINGS

This chapter provides the results of the univarient, bivarient, and multivariant analyses. The analyses consider three dimensions, the probability of relationships, the strength of relationships and the direction of relationships. One limitation in analyzing small samples is the potential inability to detect significance for weak or moderate relationships. In analyzing small samples it is therefore helpful to examine not just the probability of significance, but also the strength and the direction of any observed relationship.

This chapter begins with a comprehensive description of the independent variables relating to the study sample and each cohort is provided. These include demographic characteristics and the criminal justice and substance abuse characteristics at the time offenders were sentenced in 1996. Next, post-sentence criminal justice and substance abuse offender characteristics and patterns of recidivism and treatment retention are described. Lastly, results of the mulitvariant analyses and ANOVA statistics employed to test the hypotheses are discussed.

Descriptive Analysis:

Offender Characteristics at the Time of Sentencing:

The study sample consists of 209 drug involved felony offenders sentenced in 1996 to a term of probation in a large midwestern county. Because the intent of this evaluation study is to examine the effects of residential probation on recidivism and drug relapse, each offender in the sample also met the eligibility criteria for residential probation (The rationale for the sample selection criteria were discussed previously in Chapter IV). These criteria include: males with a minimum age of 17 years, who were convicted of a felony crime with sentencing guidelines of "0 to 9 months" or greater or, who were convicted of a probation violation on a felony with sentencing guidelines of "0 to 6 months".

Of the 209 probationers, 70 (33.5%) were sentenced to standard probation, 54 (25.8%) to tether (PES,) 16 (7.7%) to boot camp with tether, and 69 (33%) were sentenced to residential probation (SPCC). Of the 69 probationers sentenced to residential probation, 31 also received an additional sanction which required probationers to be placed on tether following discharge from residential probation. There is no question that the experience for probationers sentenced to this additional level of monitoring was different than the experience of probationers sentenced to residential probation only. Therefore, the group of offenders sentenced to

residential probation in combination with tether was considered a as separate cohort.

Sociodemographic Characteristics: The mean age for the total sample of probationers is 27.9 years. Between cohorts the mean age ranges from 21.4 to 30.7 years of age. Analysis of variance statistics were applied to determine if observed differences were significant. As noted in Table 2, the ANOVA P-Value is significant (.002); therefore t-Tests were then used to determine significance between cohorts. Results show that offenders sentenced to standard probation are considerably older than offenders sentenced to Boot Camp/PES, SPCC and SPCC/PES.

Not surprisingly, a greater proportion 59.3% of the total population is non-white than white. A marginal difference is noted between probationers sentenced to residential probation and tether; 31.6% white vs 46.2% white, but overall comparisons of white to non-white between cohorts are not significant. With respect to education level, offenders sentenced to standard probation were somewhat more likely to have achieved higher education levels compared to offenders sentenced to Boot Camp/PES and offenders sentenced to residential probation only (SPCC)[15]. However, it is

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15 Due to the size of the cohorts, education level was collapsed into two categories (0-11 and 12 and above) for analysis.

Table 2 Sociodemographic Characteristics

Sociodemographic Variables

	Std. Prob		SPCC		PES		SPCC/PES		BC/PES		ANOVA P-Value
Age											0.002
Mean	30.7		26.6**		28.1		26.3**		21.4*		
Median	28.5		24.5		28.0		26.0		19.5		
Minimum	17		17		18		17		18		
Maximum	75		49		62		49		35		
SE	1.3		1.3		1.2		1.4		1.2		
Race	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**Total % N**
White	47.1	33	31.6	12	46.2	25	38.7	12	25.0	3	40.7 85
Non-White	52.9	37	68.4	26	61.3	19	61.3	19	75.0	12	59.3 124
Education Level											
0 - 11 grade	32.9	23	57.9	22	48.2	26	48.4	15	75.0	12	46.9 98
GED/12	51.4	36	42.1	16	33.3	18	35.5	11	18.8	3	40.2 84
12+	15.7	11	0.0	0	18.5	10	16.1	5	6.2	1	12.9 27
Employment											
No	41.4	29	68.4	26	53.7	29	67.7	21	62.5	10	55.0 115
Yes	58.6	4*	31.6	12	46.3	25	32.3	10	37.5	6	45.0 94

SPCC = Residential Probation; **SPCC/PES** = Residential Probation/Tether; **PES** = Tether; **BC/PES** = BootCamp/Tether; **Std.Prob** = Standard Probation

Age: * P < .01 compared to all cohorts: **P < .01 compared to Standard Probation
Education Level: * Categories GED/12 and 12+ were combined for analysis. P < .05 compared to SPCC; P< .01 compared to Boot Camp/PES.
Employment: * P < .01 compared to SPCC and P < .05 compared to SPCC/PES.

reasonable to assume that the difference detected between offenders sentenced to Boot Camp/PES compared to standard probation can be explained by the age variance between the two populations. Finally, of the total sample, 55% of probationers reported being unemployed at the time of sentencing, with the greatest proportion of unemployed probationers among the residential probation populations (SPCC = 68.4% and SPCC/PES = 67.7%). Offenders sentenced to standard probation were 3 times more likely[16] to be employed at the time of sentencing compared to both residential probationers and residential probationers with PES combined.

Criminal Justice and Substance Abuse Characteristics: Table 3 depicts the criminal justice and substance abuse characteristics of the study sample at the time of sentencing. In the total study sample, the mean for all prior felonies is .51. Interestingly, the largest prior felony mean (.60) is noted in the standard probation cohort, although no significant difference in the number of prior felonies was detected between the study cohorts (ANOVA; p= .28). However, differences in the nature of the offence were noted (technical vs non-technical). Offenders sentenced

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Calculated crude Odds Ratio which measures the strength of the association, as previously discussed, from a 2x2 table where RR = {AD}/{BC} (Lilienfeld and Stolley, 1994).

Table 3 Criminal Justice and Substance Abuse Characteristics at Sentencing

Criminal Justice and Substance Abuse Variables

	Std. Prob		SPCC		PES		SPCC/PES		BC/PES		ANOVA P-Value	
Prior Felonies											0.28	
Mean	0.60		0.55		0.57		0.32		0.19			
Median	0		0		0		0		0			
Minimum	0		0		0		0		0			
Maximum	4		3		3		3		1			
SE	0.11		0.13		0.13		0.12		0.10			
Incidence Offence Type	%	N	%	N	%	N	%	N	%	N	Total %	N
Technical	5.7	4	36.8	14	22.2	12	32.3	10	18.8	3	20.6	43
Non-Technical	94.3*	66	63.2	24	77.8	42	67.7	21	81.2	13	79.4	166
Offence Classification												
Drug	55.7	39	36.8	14	35.2	19	22.6	7	31.3	5	41.2	84
Property	31.4	22	28.9	11	29.6	16	38.7	12	37.5	6	32.0	67
Violent	12.9*	9	34.2	13	35.2	19	38.7	12	31.3	5	27.8	58
Drug of Choice												
Alcohol	14.3	10	5.3	2	3.7	2	12.9	4	12.5	2	9.6	20
THC	38.6	27	36.8	14	44.4	24	38.7	12	50.0	8	40.7	85
Cocaine/Crack	17.1	12	13.2	5	18.5	10	6.5	2	18.75	3	15.3	32
Polydrug	30.0	21	44.7	17	33.3	18	41.9	12	18.75	3	34.4	72

SPCC = Residential Probation; **SPCC/PES** = Residential Probation/Tether; **PES** = Tether; **BC/PES** = BootCamp/Tether; **Std.Prob** = Standard Probation

Incidence Offence: * P<.01 compared to all other cohorts
Offence Code: * P< .01 compared to PES and SPCC/PES and P< .05 compared to SPCC

to standard probation were less likely to be technical violators.[17] Only 5.7% of offenders in the standard probation cohort were sentenced due to technical violations compared to 63.2% of the offenders in SPCC, 67.7% in SPCC/PES, 77.8% in PES and 81.2% in BC/PES. In other words, offenders sentenced to SPCC, SPCC/PES, PES and BC/PES combined were 6.4 times more likely to have been sentenced as a result of a technical violation compared to offenders sentenced to standard probation.

Regarding offence classification, the largest proportion (41.2%) of offenders in the sample were convicted for drug offences, followed by property and violent offences (32.0% and 27.8% respectively).[18] In comparing offence classifications between cohorts, offenders sentenced to standard probation represented the largest proportion of drug offences (55.7%) and the smallest proportion of violent offences (12.9%). Offenders within the standard probation cohort were over 3 times more likely[19] to be sentenced as a result of non-violent crimes (drugs and property) compared to all other cohorts combined. Sentences for violent crimes represent

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Chi-Square statistics were used to test overall significance ($p<.01$). However, due to the size of some of the cells, Fisher Exact test statistics were employed to determine significance between cohorts.

18

Both technical violations and non-technical violations are included. For offenders sentenced on a technical violation, the classification of the original offence was considered.

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Drug and Property categories were collapsed to represent the Non-Violent category. Chi-Square $p < .05$. Odds Ratio calculation = 3.6.

34.2% of all offences among offenders sentenced to SPCC, 38.7% of the offences within the SPCC/PES cohort, and 35.2% and 31.3% of the offences among PES and BC/PES offenders respectively, compared to only 12.9% of all offences within the standard probation cohort.

The most frequently reported drug of choice in the total sample is marijuana (40.7%) followed by poly-drug use[20] (34.4%). Due to the size of the cohorts, the drug categories were collapsed before differences between cohorts could be tested[21]. The comparative analyses show that drug of choice is distribution between cohorts consistently with no significant differences noted.

Criminal Justice Characteristics: Post Sentencing:

Actual Jail Days: Many probationers in the study sample received a split sentenced of jail terms in addition to probation. Although not empirically documented in the literature, it seemed reasonable to assume that the split sentence in and of itself would impact offender outcomes.

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This category represents offenders who reported more than one drug of choice or the use of multiple drugs in the same classification e.g., barbiturates; central nervous system depressants etc.

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The comparative analysis was performed in two phases. First, three categories were created by collapsing Alcohol and THC into one category. Chi-Square statistics were performed, with no significance noted. However, the validity between two of the cohorts remained questionable. The drug of choice was further collapsed into two categories (Alcohol/THC and Cocaine/Crack/Poly-drug). The rational for this bifurcation was previously discussed. Following, both a standard Chi-Square and Fisher Exact tests were performed with no significant differences noted.

Therefore, the use of a split sentence was documented and included in the mulitvariant analyses as an independent variable. The variable "Jail Days" represent the length of time each offender spent in jail after the critical incident arrest and any time served after receiving a split sentenced. Table 4 illustrates the differences in the average length of time offenders in different cohorts actually spent incarcerated. The mean jail time ranged from 38.4 to 101.1 days. The overall comparison is significant (ANOVA P-Value = .005). The t-Test was used to test for differences between each cohort. These tests demonstrate that there are significance differences between offenders sentenced to standard probation and the other cohorts in the length of time offenders are incarcerated ranging from $p < .01$ - $p < .05$. Comparisons between SPCC, SPCC/PES, PES and BC/PES cohorts are not significant.

Sentence Type: The finding that probationers sentenced to standard probation spend less time in jail is interesting in view of the proportion of offenders who received split probation sentences and the distribution of this sentences between cohorts. Of the total sample, 40.7% of all offenders received split sentences. When the proportions of split sentences for each cohort are examined and comparisons made between

Table 4 Criminal Justice Characteristics: Post Sentencing

Criminal Justice Variables

	Std. Prob		SPCC		PES		SPCC/PES		BC/SPCC		ANOVA P-Value	
Actual Jail Days											0.005	
Mean	38.4*		70.5		101.1		84.6		85.6			
Median	2.0		43.5		40.0		53.0		57.5			
Minimum	0		1		0		0		0			
Maximum	318		340		365		308		301			
SE	9.1		13.9		15.3		15.9		22.2			
Sentence Type	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**Total %**	**Total N**
Jail/Probation (Split)	30.0	21	34.2	13	37.0	20	35.5	11	37.5	6	40.7	85
Probation	70.0	49	65.3	25	63.0	34	64.5	20	62.5	10	59.3	124
Subsequent Violation Type												
None	51.4	36	29.0	11	38.9	21	35.5	11	18.8	3	39.2	82
Technical	24.3	17	44.7*	17	46.3*	25	54.8**	17	50.0*	8	40.2	84
New Felony	24.3	17	26.3	10	14.8	8	9.7	3	31.3	5	20.6	43
Subsequent Felony Offence Classification*												
Non-Violent	76.6	12	100	10	62.5	5	66.6	2	100	5	79.0	34
Violent	29.4	5	0	0	37.5	3	33.3	1	0	0	21.0	9

SPCC = Residential Probation; **SPCC/PES** = Residential Probation/Tether; **PES** = Tether; **BC/PES** = BootCamp/Tether; **Std.Prob** = Standard Probation

Actual Jail Days: *P< .05 compared to SPCC and P< .01 compared to SPCC/PES, PES and BC/PES.
Subsequent Violation Type: * P < .05 compared to Std.Prob: **P < .01 compared to Std.Prob
Subsequent Felony Offence Classification: * Sample size not sufficient to calculate stable estimates.

cohorts, very small and insignificant differences are noted. Among all five cohorts, the maximum difference in the proportion of split sentences is only 7.5%, ranging from 30.0% to 37.5%. One might conclude that although the relative risk of receiving a split probation sentence is approximately the same across probation models, the actual jail time offenders receive is significantly less for offenders sentenced to standard probation.

Subsequent Violation Type: One strength of this research design is that it was possible to track offenders for a minimum of 24 months. For offenders sentenced in early 1996, the follow-up period extend up to 34 months. This time period is believed to be adequate to test the effects of residential probation with treatment on recidivism. As previously mentioned, policy makers supporting this evaluation are particularly interested in the commission of new felony crimes as a measurement of recidivism. However, in many cases offenders are often faced with severe consequences for technical violations and are removed from community supervision for a considerable length of time. This presents limitations on measuring subsequent felony arrests when survival analysis methods are used. Survival analysis assumes a well-defined end point and recurring events should not be analyzed with this methodology (Motulsky, 1995). When offenders are rearrested and receive additional court sanctions that

remove them from community supervision, they have by definition failed, even though they may return to community supervision after 60 days or so. In a survival analysis, this failure is treated as a terminal end point and the case is not included in the accumulative proportion still surviving at the next time interval. Cases can not be reentered in the analysis at a later time to measure a reoccurring event, or in this case a rearrest for a new felony following reentry into the community. It is therefore not possible to follow offenders who have failed due to a technical violation past the technical violation failure date to determine if a future felony crime was committed. Thus, it is recognized that the measure of recidivism due to new felony crimes within the follow-up period may be an underestimate.

In the total study sample, 39.2% of offenders had not been rearrest and court sanctioned (failed)[22] by the end of the follow-up period. Figure 1 and Table 5 provide a visual representation and the descriptive statistics of the survival rates for all court sanctioned failure including both technical violations and new felony crimes for each cohort.[23] For all survival analysis in this evaluation, observations are censored in the event of death, if the

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This distinction is important to the analyses. A rearrest was not considered to be synonymous with failure. Again, failure was operationally defined as a rearrested that resulted in a court sanction which removed the offender from community supervision for more than 60 days. In cases where offenders were rearrested but were not considered to have failed, the offender was either rearrested and the case dropped or rearrested and immediately placed back into the community and continued on probation.

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All univariant survival analysis graphs and associated descriptive statistics were constructed using the SAS Lifetime Test function (SAS Institute Inc., 1997).

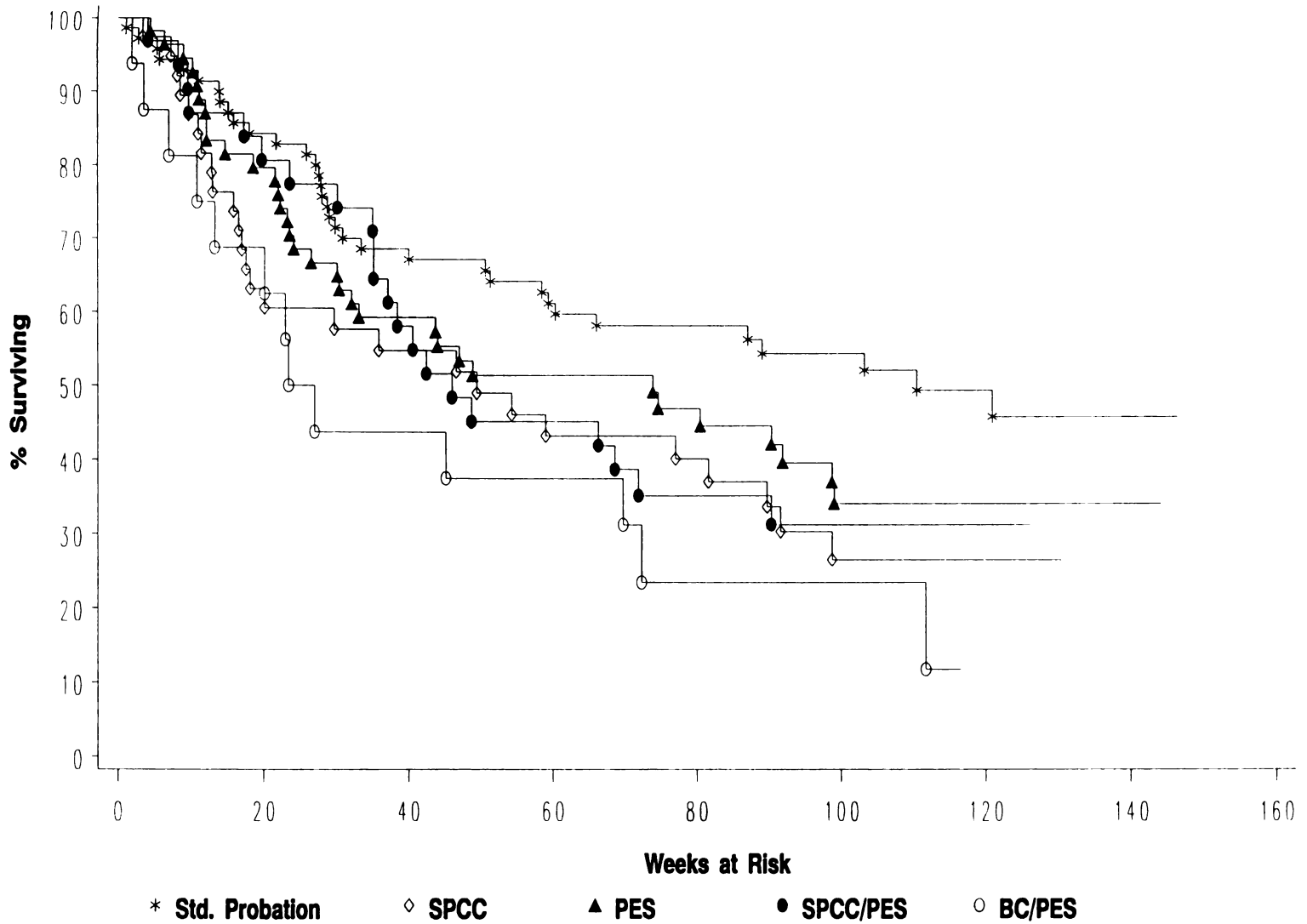

Figure 1 **Weeks Surviving Additional Court Sanctions: Technical Violations and New Felony Crimes**

Table 5 Weeks Surviving Additional Court Sanction: Technical Violations and New Felony Crimes

	A = Std. Prob	B = SPCC	C = PES	D = SPCC/PES	E = BC/PES
Mean	91.8	62.3	75.5	65.4	47.7
Median	110.4	49.4	73.9	46.0	25.2
SE	7.1	8.3	7.8	8.4	11.1

offender is lost to follow-up or if supervision is transferred to another jurisdiction.

When technical violations and new felony crimes are examined separately, 40.2% of all offenders failed due to technical violations and 20.6% of the offenders committed a new felony crime. Between cohorts, significant differences were noted when comparing offenders sentenced to standard probation and each cohort. Offenders sentenced to standard probation were less likely to be rearrested and court sanctioned for technical violations compared to offenders sentenced to each of the other probation models. This is consistent with previous research which show that rearrest rates for more intensive probation programs are higher. Specifically, when monitoring procedures are intensified, the likelihood that a probation violation will be identified is greater (Petersilia and Turner, 1993b). Figures 2 and 3 illustrates the survival analyses for technical violations and new felony crimes respectively. As in Figure 1, the survival analysis and descriptive statistics in Figure 2 and Table 6 includes all

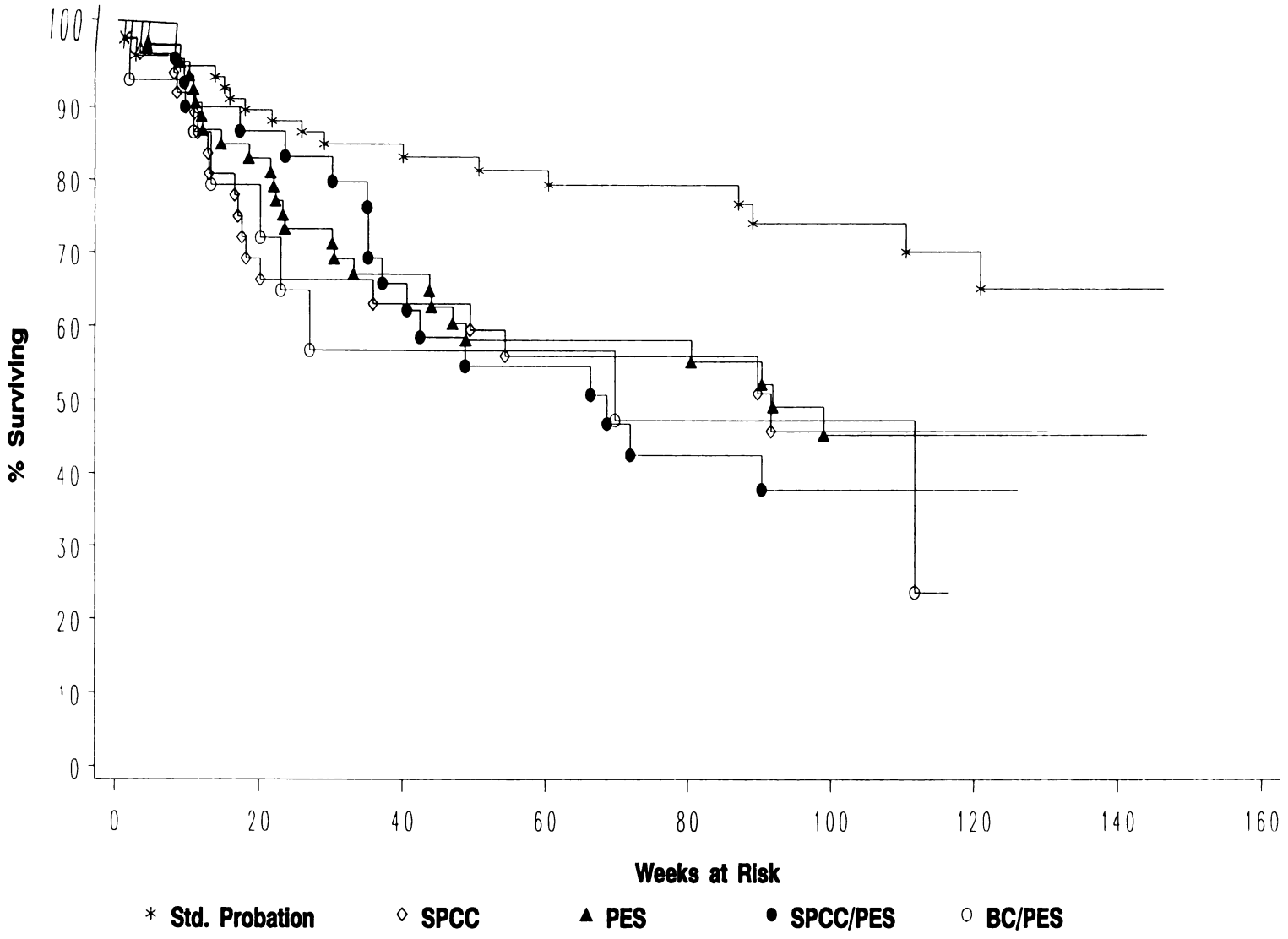

Figure 2 **Weeks Surviving Technical Violations**

Table 6 Weeks Surviving Technical Violations

	A = Std. Prob	B = SPCC	C = PES	D = SPCC/PES	E = BC/PES
Mean	115.6	78.4	87.2	73.6	67.8
Median	*	91.6	91.9	68.6	69.7
SE	6.7	9.5	8.4	8.8	13.6

* More than 50% still surviving at the end of the follow-up period

offenders. However, the single event that establishes failure in this model is obviously a court sanctioned technical violation that removed an offender from community supervision for more than 60 days. Offenders who are arrested for new felony crimes prior to an observed technical violation are censored from the analysis at the time of the arrest. The rationale to this is straight forward. All offenders, including those who are arrested for new felony crimes, are at equal risk for a technical violation failure at the beginning of each offender's observation period. Offenders who are arrested for a new felony crime, but who did not experience a technical violation failure up to the time of the arrest, by definition have not failed in this analysis. However, because an arrest for a new felony crime removes the offender from community supervision (jailed or sent to prison), these offenders are no longer at risk for failing the event of interest and therefore the case becomes a censored event. Including all offenders in the model and censoring on new felony crimes provides a more accurate analysis of technical violation rates.

Figure 3 and Table 7 represents the survival analysis for new felony crimes. The same procedures as described for Figure 2 were employed with the exception of the censored events. Since the event of interest is new felony crimes, the censored events in this analysis include technical violation failure as well as those previously mentioned (death, lost to follow-up, supervision transferred to another jurisdiction).

Subsequent Felony Offence Classification: As noted above, by the end of the observation period 20.6% of all offenders in the study sample had failed due to the arrest and conviction of new felony crimes. It was the intent of this study to measure whether there were differences in the severity of the subsequent felony crime (e.g., violent vs. non-violent) between cohorts. However, based on results of the descriptive statistics, this question can not be answered. Overall, only 9 (21.0%) violent new felony crimes and 34 (79.0%) non-violent felony crimes were recorded among the study sample. When distributed among the five cohorts, the incident rate within each cohort is not large enough to make any stable estimates.

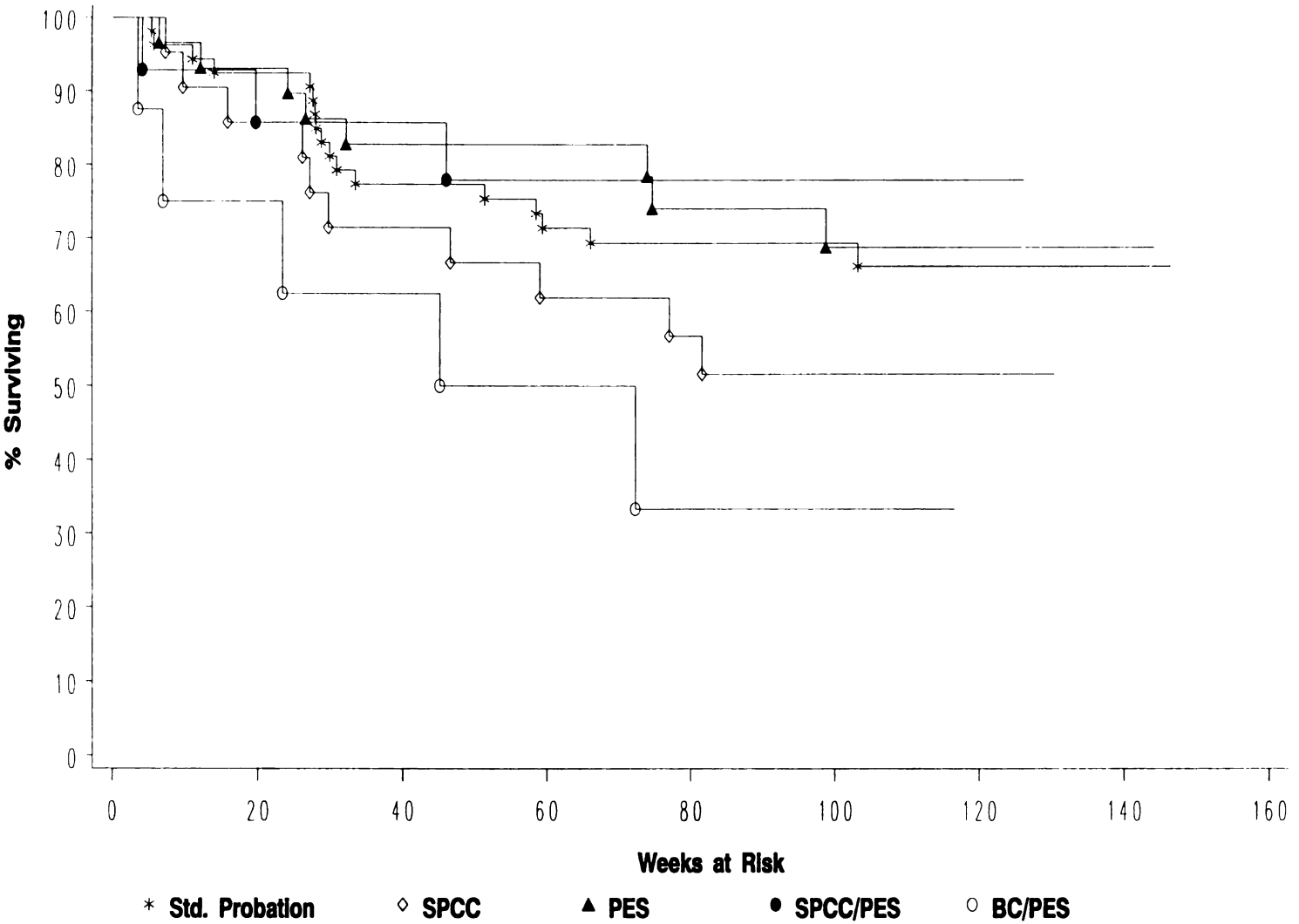

Figure 3 Weeks Surviving New Felony Crimes

Table 7 Weeks Surviving New Felony Crimes

	A = Std. Prob	B = SPCC	C = PES	D = SPCC/PES	E = BC/PES
Mean	110.0	86.0	114.3	103.6	60.8
Median	*	*	*	*	58.7
SE	7.6	11.4	9.8	14.3	18.1

* More than 50% still surviving at the end of the follow-up period

Substance Abuse Characteristics: Post Sentencing:

Received Substance Abuse Treatment: Previous research has consistently demonstrated that the "length of time" a client remains in treatment is the most constant and best predictor of treatment outcomes. This is true even among clients who drop out of treatment (Simpson and Friend, 1988; DeLeon, 1988, 1994; Hubbard,1988; Barr and Antes, 1981). Moreover, studies support the conclusion that how a substance abuser is exposed to treatment seems irrelevant. What is important is that substance abusers are brought into an environment where treatment can occur (Wexler, et al., 1990; Fields, 1989; Langenauer and Bowden, 1971; Stephens and Cottrel, 1972; Anglin, 1988; De Leon: 1988, Anglin and Hser, 1990a; Lipton, 1995). Unfortunately only a small proportion of offenders in need of treatment actually receive treatment. The effects of treatment can only be measured if the offender actually enters treatment. It is therefore important to determine if there are differences in the proportion of offenders

who enter treatment between probation modalities. Referring to Table 8, only 58.3% of all offenders sentence to substance abuse treatment actually received any treatment. When comparisons between cohorts are examined, it is noted that offenders sentenced to residential probation (SPCC) or residential probation with tether (SPCC/PES) are approximately 1.5 times more likely to enter substance abuse treatment compared to all other cohorts[24]. Only 52.9% of offenders sentenced to standard probation actually entered substance abuse treatment compared to 81.6% of SPCC and 77.4% of SPCC/PES probationers. The least likely to enter substance abuse treatment are offenders sentenced to Boot Camp/PES (31.2%).

Treatment Discharge Status: Within the total sample, among offenders who actually entered treatment, 77.9% successfully completed treatment. Comparisons between cohorts were not significant. The proportion of offenders successfully completing treatment is relatively consistent, ranging from 71.0% to 86.5%. It must be noted that this measurement is not an indicator of the length of time in treatment. For example, as previously discussed the expected length of time in treatment for offenders sentenced to either residential probation model

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[24] Overall Chi-Square; $p < .01$. Crude Relative Risk calculations; RR = 1.45-1.54

Table 8 Substance Abuse Characteristics: Post Sentencing

Substance Abuse Variables

	Std. Prob		SPCC		PES		SPCC/PES		BC/PES		Total	
Received Substance Abuse Treatment	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**
Yes	52.9	37	81.6	31*	46.2	25	77.4	24*	31.2	5	58.3	122
No	47.1	33	18.4	7	51.8	28	19.4	6	68.8	11	40.7	85
Unknown	0.0	0	0.0	0	2.0	1	3.2	1	0.0	0	2.0	2
Treatment Discharge Status												
Successful	86.5	32	71.0	22	76.0	19	75.0	18	80.5	4	77.9	95
Unsuccessful	13.5	5	29.0	9	24.0	6	25.0	6	20.0	1	22.1	27
Weeks in Treatment											**ANOVA P-Value**	
											0.32	
Mean	28.6		18.4		28.9		22.0		14.7			
Median	21.0		12.1		23.4		16.6		8.2			
Minimum	1.0		3.0		2.0		2.0		1.0			
Maximum	105.0		108.0		90.0		109.7		41.0			
SE	4.5		4.0		4.7		4.9		7.0			

SPCC = Residential Probation; **SPCC/PES** = Residential Probation/Tether; **PES** = Tether; **BC/PES** = BootCamp/Tether; **Std.Prob** = Standard Probation

Received Substance Abuse Treatment: * P< .01 compared to Std. Prob.

(SPCC or SPCC/PES) is approximately 14 weeks. Once offenders complete Phase One and Two of the residential probation out-patient substance abuse treatment model, they are considered to have met the treatment expectation and are discharge as "successful completers." Offenders sentenced to other probation models may enter out-patient treatment delivered by an alternative treatment provider. The expected length of time in treatment appears to vary from provider to provider[25].

Weeks in Treatment: Time in treatment is considered as both an independent and dependent variable in this evaluation study and is discussed here because of the predicted relationship of this variable to the other dependent variables. As noted, not all offenders sentenced to substance abuse treatment actually enter treatment. However, of those who entered treatment, the mean length of time in treatment is 23.2 weeks. Overall comparisons between cohorts are not significant (AVOVA P-Value = .33) ranging from 14.6 to 28.8 weeks. Figure 4 and Table 9 provide a graphic illustration and the descriptive statistics respectively of the length of time in treatment for each cohort. In this analysis there are no censored observations. All offenders who entered treatment either completed

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Treatment expectation between providers vary. The majority of offenders in SPCC and SPCC/PES received substance abuse treatment from the same treatment provider. Overall, 3 treatment providers delivered serviced to the study cohort, and all services were based on an out-patient treatment model.

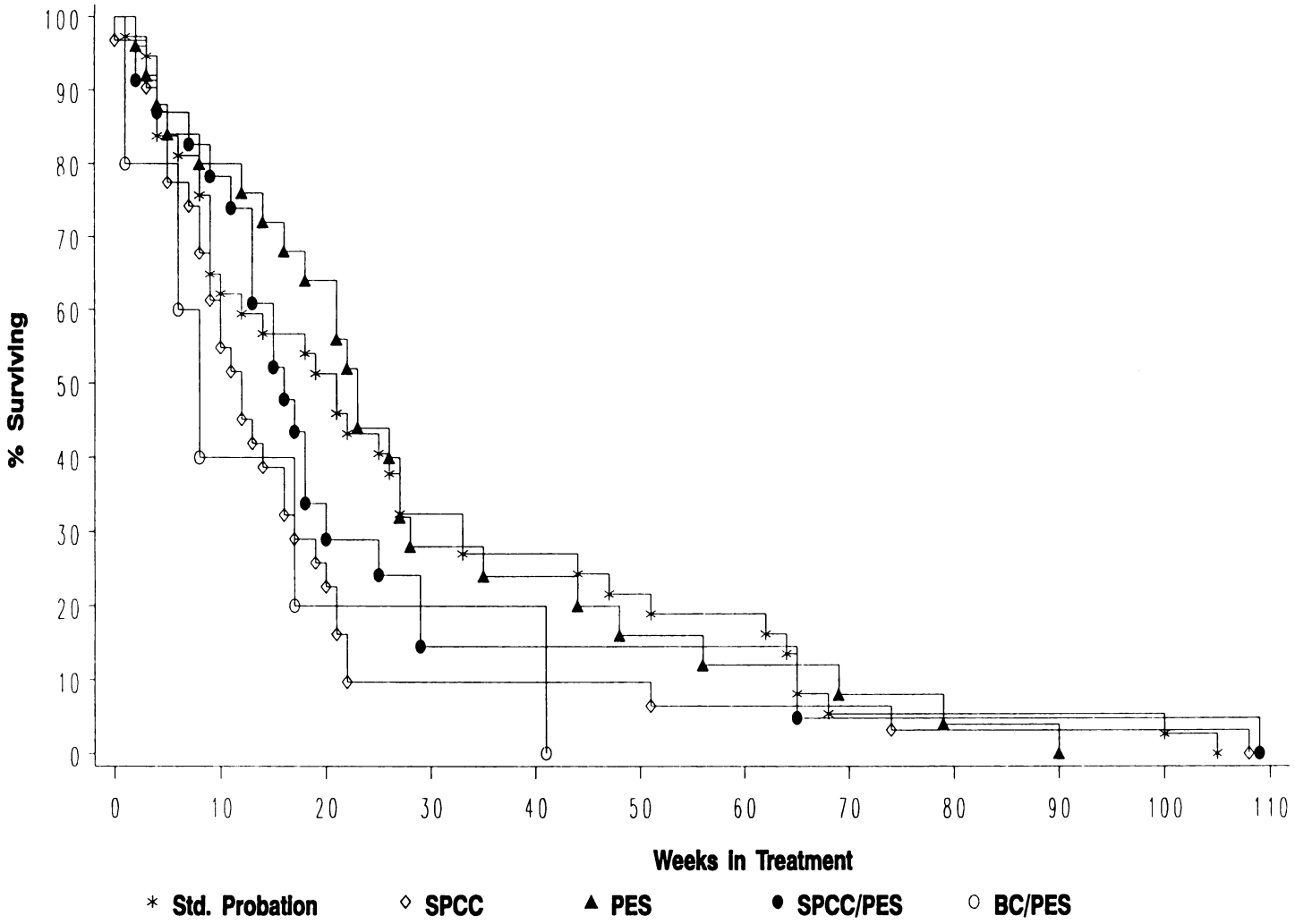

Figure 4 **Weeks In Substance Abuse Treatment**

Table 9 Weeks in Substance Abuse Treatment

	A = Std. Prob	B = SPCC	C = PES	D = SPCC/PES	E = BC/PES
Mean	28.5	18.5	28.8	22.9	14.6
Median	21.0	12.0	23.0	16.5	8.0
S.E.	4.5	4.0	4.7	4.9	7.1

treatment or were discharged as unsuccessful by the end of the observation period.

Descriptive Summary:

Results of the univarient and bivariant analyses suggest there are only marginal differences relative to offender characteristics between offenders sentenced to SPCC, SPCC/PES, PES, and Boot Camp/PES at the time of sentencing. However, offender characteristics among probationers sentenced to standard probation appear to vary on several dimensions. Offenders sentenced to standard probation tend to be older, have a higher level of education and are more likely to be employed. They are also less likely to be technical violators at the time of sentencing and a greater proportion of their crimes are drug and property crimes. Although offenders in this cohort are just as likely to receive a split sentence compared to the other cohorts, the actual time these offenders spend in jail

for the offence is less compared to all other cohorts[26]. Thus, the degree of homogeneity between offenders sentenced to standard probation and offenders sentenced to the other probation models is less. Where appropriate, mulitvariant tools were used to control for these differences in testing the main hypotheses.

Testing the Hypotheses:

This phase of the analysis specifically tests each hypothesis using Cox regression, logistic regression and ANOVA statistics. The rationale for the statistical methods and the procedures applied in constructing each model used to tests the hypotheses are briefly restated to set the framework in which each hypothesis is tested. Following, the results of each analysis are presented.

Cox regression analysis was used to test differences in the outcome measures of recidivism and subsequent drug use because the data represents time sensitive and censored data. This technique allows for both the probability of the outcomes to be measures in consideration of the varying amounts of time individuals were observed and controls for the

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As previously discussed the "Time in Jail" variable was calculated to include the days each offender spend in jail for the offence from the date of arrest to sentencing, and any additional time served on a split sentence. The actual length of the jail sentence is not known. Therefore it can not be determined if the length of time in jail is a function of the jail sentence or other factors such as the ability to make bond or early release.

various demographic and system factors which may confound the relationship. Cox regression assumes that the risk of failure between any two individuals at any point in time is constant and uses regression methods to predict the relative risk of failing based on one or more explanatory variables. For this reason, Cox regression was not used to measure differences in the dependent variable "length of time in treatment" even though this outcome variable is time dependent.

After examining the length of time in treatment data it was established that the probability of being determined a success or failure in completing treatment was considerably different between offenders. Offenders sentenced to residential probation were expected to complete 12 weeks of treatment before they could be considered "successful". In contrast, the length of time that offenders who were sentenced to other probation models were expected to remain in treatment varied both within and between probation models and was as little as one month. Probationers sentenced to residential probation had zero probability of successfully completing treatment before 12 weeks, while others with shorter treatment expectations had some probability of successfully completing treatment prior to 12 weeks. Therefore the probability of failing in treatment for offenders with longer expected lengths of time in treatment is considerably different at earlier points in time compared to offenders with

shorter treatment expectations. This also makes the interpretation of "failure" difficult. Failure for offenders with a one month treatment expectation is significantly different from failure for offenders with a 12 month treatment expectation. These data indicate that the hazard functions of offenders sentenced to the various probation models can not be expected to be proportional over time. In this situation, proportional hazards regression is not appropriate. Instead, because differences in the lengths of time in treatment between cohorts is a continuous variable without any censored observations, ANOVA statistics are used to test for the significance of differences in the length of time offenders remained in treatment between cohorts.

Like Cox regression methods, logistic regressions quantifies the association between risk factors and an event as a relative risk ratio after adjusting for other variables. However, this statistical method requires the outcome variables to be binary or a dichotomous measures and is appropriate when the outcome variables are not time sensitive. For these reasons logistic regression statistics are used to test for the significance of differences in the proportion of offenders who actually entered treatment.

Before preceding with the results, it is first necessary to describe the procedures used in constructing the multivariant models. This will provided ease in interpretation for the reader. In the Cox and logistic regressions

relative risk ratios for categorical variables are calculated in relation to a reference variable or study group (referred to as the omitted category or the hold out). Typically the reference study group is the cohort of interest to which all other cohorts are compared. This study is focused on the effects of residential probation on outcomes; thus residential probation is the variable of interest. However, in this study all regression models use standard probation as the reference group for two reasons. First, the degree of homogeneity is much less compared to the other cohorts. Second, residential probation is subdivided to create two separate residential probation models. Using a reference group other than one of the residential probation models makes it easier to visually examine the risk ratios between the two residential probation models.

Hold outs (also referred to as reference or omitted category) for all other independent categorical variables are also consistent in all the models and are as follows. In the data set ethnicity is recorded as "Race" and consists of two categories, white and non-white[27]. The non-white category is always considered the hold out. Employment is represented as a dichotomous variable, " not employed or employed," and "not employed" is the omitted category. Drug of choice is collapsed into two categories,

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The procedures and rationale for combining categories was previously discussed and can be found in Chapter IV. Methods; Variable and Measures.

"alcohol/THC" and "cocaine/polydrug". The category alcohol/THC represents the reference category. The offence variable consists of three offence types, "violent, property and drug ". The violent offence category is selected as the hold out group. Probation violation indicates whether the critical offence which led to the 1996 sentence was the result of a technical violation or not. Here, the non-technical violation category is the omitted category. The independent continuous variables were constructed in each model to be interpreted in ascending order. For example, in the variable age, the risk ratio is associated with older offenders relative to younger offenders. For jail days, the risk ratio is associated with more days in jail relative to less days in jail, and for time in treatment, more time in treatment relative less time in treatment.

Each model tested using Cox or logistic regression was performed in two phases. First, all of the independent variables previously defined in Chapter IV. were included in an initial analysis (full model). From this analysis the independent variables which were identified as either significant or approaching significance ($p<.10$) and the cohort variables were entered into a second regression analysis (reduced model)[28]. This second analysis was done for several reasons. By including only the

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Because this analysis is intended to distinguish between the various cohorts, the cohort variables are always included in the reduced analysis whether they are significantly related to the dependent variable or not.

variables from the full model which are shown to be approaching significance or are significant in a reduced model improves the power of the model. In other words, this increases the probability that true differences will be detected. For example, variables approaching significance may reach significance when the power of the model is improved. This process is particularly useful when analyzing a sample with a limited number of observations. In addition, this procedure provides a more clear assessment of the strength in the relationships between the independent and dependent variables. Presenting a reduced model is the most parsimonious way to provide a clear analysis of these multivariant models.

Recidivism:

To begin, an overall recidivism failure model was constructed to examine differences in the length of time from sentencing to additional court sanctioned failure. Court sanction failure was defined as a subsequent arrest which led to a court sanctioned that removed an offender from community supervision for more than 60 consecutive days. This analysis was only concerned with examining the relationships of the independent variables on "overall failure" and did not make any distinction between failure due to rearrests for new felony crimes or rearrests for

technical violations. Table 10a presents the first phase in this analysis (refer back to the survival analysis plot, Figure 1, for visual illustration). Offenders sentenced to either residential probation program (SPCC and SPCC/PES) are over 2 times more likely to experience a court sanctioned failure over time compared to standard probation while offenders sentenced to tether (PES) and boot camp with tether (BC/PES) are 1.5 times more likely to fail over time. This supports the bivariant analysis discussed and is consistent with previous research which show that rearrest rates for more intensive probation programs are higher. Specifically, when monitoring procedures are intensified, the likelihood that a probation violation will be identified is greater (Petersilia and Turner, 1993b). Additionally, Table 10a shows that length of time in treatment, offence category and drug of choice are related to failure. As might be expected based of several studies, the single best predictor of failure in the model is the length of time in substance abuse treatment ($p<.0001$). Offenders who remain in treatment longer are less likely to fail. The offence category is also shown to have a significant effect on length of time to failure ($p<.01$). Offenders sentenced for drug crimes are 2 times more likely to fail over time compared to offenders sentenced for violent crimes (the reference category). Drug of choice is also noted to affect failure in this model. Offenders who report their drug of choice to be cocaine/crack or

Table 10a Length of Time Until Court Sanctioned Failure: Full Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
201	122	79	39.30

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	1161.826	1060.809	101.017 with 15 DF (p=0.0001)
Score	.	.	74.199 with 15 DF (p=0.0001)
Wald	.	.	60.717 with 15 DF (p=0.0001)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Age	1	-0.018004	0.01503	0.2310	0.982
Race	1	-0.194632	0.21396	0.3630	0.823
Education Level	1	-0.062422	0.22939	0.7855	0.939
Employment	1	-0.099179	0.20052	0.6209	0.906
Prior Felonies	1	0.132237	0.14101	0.3484	1.141
Offence/Property	1	0.183087	0.28581	0.5218*	1.201
Offence/Drug	1	0.724856	0.26434	0.0061*	2.064
Jail Days	1	0.000599	0.00109	0.5845	1.001
Drug of Choice	1	0.498234	0.22505	0.0268*	1.646
Treatment Weeks	1	-0.064471	0.01208	0.0001*	0.938
Probation Violation	1	-0.157513	0.24360	0.5179	0.854
SPCC	1	0.884449	0.31882	0.0055*	2.422
PES	1	0.434964	0.27602	0.1151*	1.545
SPCC/PES	1	0.801024	0.33067	0.0154*	2.228
BC/PES	1	0.432593	0.34713	0.2127*	1.541

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	8.9383	4	0.0627*
OFFENCE CATEGORY	8.9048	2	0.0117*

* Used in reduced model

polydrugs have significantly lower lengths of time to court sanctioned failure.

In the second phase, the reduced model was created. The independent variables, offence category, time in treatment and the cohort category were then included in the analysis to better assess the strength of the relationships between the independent variables observed as significant or approaching significance in the full model and the dependent variable. Table 10b specifies the results of this analysis (refer back to the survival analysis plot, Fiqure 2, for visual illustration). As can be seen, the relationships of the independent variables identified as significant predictors of court sanctioned failure in Table 6a are strengthened in this model. Again, weeks in treatment, offence category and drug of choice are significantly related to the length of time offenders remain in the community before failing and the relative risk of failing over time is greater for offenders sentenced to residential probation.

Next, failure due to technical violations and new felony arrests were examined separately. This was accomplished by running two separate analyses and censoring the event that was not of interest. Specifically, in the model that examines technical violations, new felony crimes are censored events whereas in the model that examines new felony crimes, technical violations are censored. First, technical violations are examined.

Table 10b Length of Time Until Court Sanctioned Failure: Reduced Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
201	122	79	39.30

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	1161.826	1066.054	95.771 with 8 DF (p=0.0001)
Score	.	.	64.794 with 8 DF (p=0.0001)
Wald	.	.	56.106 with 8 DF (p=0.0001)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Offence/Property	1	0.145672	0.26179	0.5779	1.157
Offence/Drug	1	0.729965	0.23856	0.0022*	2.075
Drug of Choice	1	0.506820	0.19779	0.0104*	1.660
Treatment Weeks	1	-0.067389	0.01169	0.0001*	0.935
SPCC	1	0.997845	0.29490	0.0007*	2.712
PES	1	0.555082	0.25981	0.0326**	1.742
SPCC/PES	1	0.875839	0.31007	0.0047*	2.401
BC/PES	1	0.571101	0.33578	0.0890	1.770

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	13.3614	4	0.0096
OFFENCE CATEGORY	11.5118	2	0.0032

* $p < .01$

** $p < .05$

As in the previous model, all independent variables were initially introduced into the analysis (Table 11a). Only those variables identified as significant or approaching significance ($p<.10$) were included in a second reduced model of analysis. Table 11b illustrates these results. Here again, the single best predictor of positive outcomes is the length of time in substance abuse treatment ($p<.0001$). The longer offenders stay in treatment the less likely there are to be arrested and court sanctioned for technical violations. In addition, the level of monitoring is directly related to technical violations. Offenders sentenced to the most intensive probation model are the most likely to fail. Specifically, offenders sentenced to residential probation with tether are 3.6 times more likely to be arrested and court sanctioned for technical violations compared to the least monitored cohort, standard probation. The next most intensely monitored probation model is residential probation. As expected, these offenders are the next most likely to be arrested and court sanctioned for technical violations followed by tether and boot camp: 3.1, 2.5, and 2.1 respectively. These data strongly supports hypothesis 3a which states, "the risk of failure over time for technical violations is greater among offenders sentenced to residential probation" (refer to section IV Methods).

Of particular interested in this study was the commission of new felony crimes as a measurement of recidivism. However, as shown above

Table 11a Length of Time Until Court Sanctioned Technical Violations: Full Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
201	81	120	59.70

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	774.251	704.092	70.159 with 15 DF (p=0.0001)
Score	.	.	50.694 with 15 DF (p=0.0001)
Wald	.	.	42.396 with 15 DF (p=0.0002)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Age	1	-0.029964	0.01995	0.1330	0.970
Race	1	-0.219918	0.26039	0.3983	0.803
Education Level	1	0.316298	0.28660	0.2698	1.372
Employment	1	-0.231399	0.24874	0.3522	0.793
Prior Felonies	1	0.043835	0.17773	0.8052	1.045
Offence/Property	1	0.198429	0.34241	0.5623	1.219
Offence/Drug	1	0.549576	0.31483	0.0809	1.733
Jail Days	1	0.001068	0.00135	0.4287	1.001
Drug of Choice	1	0.350501	0.27662	0.2051	1.420
Treatment Weeks	1	-0.060761	0.01444	0.0001*	0.941
Probation Violation	1	-0.287498	0.29810	0.3348	0.750
SPCC	1	1.261011	0.41104	0.0022*	3.529
PES	1	0.908618	0.35426	0.0103*	2.481
SPCC/PES	1	1.301721	0.40831	0.0014*	3.676
BC/PES	1	0.674566	0.45615	0.1392*	1.963

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	12.3476	4	0.0149*
OFFENCE CATEGORY	3.2858	2	0.1934

* Used in reduced model

Table 11b Length of Time Until Court Sanctioned Technical Violations: Reduced Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
201	81	120	59.70

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	774.251	718.219	56.032 with 5 DF (p=0.0001)
Score	.	.	35.559 with 5 DF (p=0.0001)
Wald	.	.	32.196 with 5 DF (p=0.0001)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Treatment Weeks	1	-0.060868	0.01302	0.0001*	0.941
SPCC	1	1.138381	0.36125	0.0016*	3.122
PES	1	0.926838	0.32841	0.0048*	2.527
SPCC/PES	1	1.289301	0.36640	0.0004*	3.630
BC/PES	1	0.780416	0.44115	0.0769	2.182

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	14.8349	4	0.0051*

* p < .01
** p < .05

offenders are often faced with severe consequences for technical violations and are removed from community supervision for considerable lengths of time. This presents limitations in measuring subsequent felony arrests when survival analysis methods are used to measure recidivism for new felony crimes within the follow up period. As previously discussed, survival analysis assumes a well-defined end point and recurring events should not be analyzed with this methodology. When offenders are rearrested and receive additional court sanctions that remove them from community supervision, they have by definition failed, even though they may return to community supervision after 60 days or so. In a survival analysis, this failure is treated as a terminal end point and the case is not included in the accumulative proportion still surviving at the next time interval. Cases can not be reentered in the analysis at a later time to measure a reoccurring event (in this case a rearrest for a new felony) following reentry into the community. It is therefore not possible to follow offenders who have failed due to a technical violation past the technical violation failure date to determine if a future felony crime was committed. In the following analysis technical failures are censored events at the time of the technical failure and not considered in the accumulative proportion still at risk for felony failure past the technical failure date. Moreover, the proportion of censored events to non-censored events is considerable. Consequently, the rate of

subsequent felony crime may be under or over estimated. And the degree to which felony crime estimations are affected will be much greater in the cohorts which have the largest proportion of offenders who fail in the survival models as a consequence of technical violations. With this caveat, any conclusion drawn from the interpretation of the following analysis must be considered with caution.

Another Cox regression was run to examine the risk of failure for new felony crime. Again, all independent variables were first tested prior to running the reduced model (Table 12a). Table 12b provides the results of the reduced Cox regression for new felony crimes (refer back to the survival analysis plot, Fiqure 3, for visual illustration). It continues to be documented that the single best predictor of outcomes is the length of time in substance abuse treatment ($p<.0025$). Offenders who remain in treatment are less likely to commit a subsequent felony crime. Also related to felony crime failure is education level. Specifically, the higher the education the less likely the offender is to recidivate. Offence category is shown to have a significant effect on recidivism as well. Offenders sentenced for drug crimes are 3.4 times more likely to commit new felony crimes over time compared to offenders sentenced for violent crimes ($p<.007$). In addition, the offenders' drug of choice affect failure in this model. Offenders who report their drug of choice to be cocaine/crack or

Table 12a Length of Time Until New Felony Crimes: Full Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
201	41	160	79.60

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	395.368	353.615	41.753 with 15 DF (p=0.0002)
Score	.	.	35.225 with 15 DF (p=0.0023)
Wald	.	.	29.013 with 15 DF (p=0.0160)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Age	1	-0.009977	0.02407	0.6785	0.990
Race	1	-0.244977	0.37301	0.5113	0.783
Education Level	1	-0.792231	0.38498	0.0396*	0.453
Employment	1	0.306097	0.34730	0.3781	1.358
Prior Felonies	1	0.236929	0.23619	0.3158	1.267
Offence/Property	1	0.358149	0.53378	0.5022*	1.431
Offence/Drug	1	1.306179	0.50173	0.0092*	3.692
Jail Days	1	0.000012410	0.00194	0.9949	1.000
Drug of Choice	1	0.645601	0.39252	0.1000*	1.907
Treatment Weeks	1	-0.055025	0.01918	0.0041*	0.946
Probation Violation	1	0.112387	0.43144	0.7945	1.119
SPCC	1	0.405433	0.50398	0.4211*	1.500
PES	1	-0.350006	0.48081	0.4666*	0.705
SPCC/PES	1	-0.565544	0.69627	0.4166*	0.568
BC/PES	1	0.139267	0.54381	0.7979*	1.149

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	3.3628	4	0.4990*
OFFENCE CATEGORY	8.3948	2	0.0150*

* Used in reduced model

Table 12b Length of Time Until New Felony Crimes: Reduced Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
201	41	160	79.60

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	395.368	355.730	39.638 with 9 DF (p=0.0001)
Score	.	.	32.117 with 9 DF (p=0.0002)
Wald	.	.	27.588 with 9 DF (p=0.0011)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Education Level	1	-0.761115	0.34903	0.0292**	0.467
Offence/Property	1	0.276610	0.47857	0.5633	1.319
Offence/Drug	1	1.230864	0.45943	0.0074*	3.424
Drug of Choice	1	0.780170	0.36246	0.0314**	2.182
Treatment Weeks	1	-0.053420	0.01765	0.0025*	0.948
SPCC	1	0.430847	0.46786	0.3571	1.539
PES	1	-0.295762	0.44967	0.5107	0.744
SPCC/PES	1	-0.634060	0.66455	0.3400	0.530
BC/PES	1	0.219816	0.52437	0.6751	1.246

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	3.7206	4	0.4451
OFFENCE CATEGORY	8.9649	2	0.0113*

* p < .01
** p < .05

polydrug are 2.1 times more likely to recidivate compared to those whose drug of choice is alcohol or THC. Finally, offenders sentenced to residential probation/tether (SPCC/PES) and tether (PES) appeared to do just slightly better, while offenders sentenced to residential probation (SPCC) and boot camp/tether (BC/PES) appear to be somewhat more likely to recidivate when compared to offenders sentenced to standard probation. These differences are not statistically significant. Again, the proportion of technical violations (censored data) in this model and the small number of observation within each cohort presents limitations in drawing conclusions relative to the relationship between probation models and subsequent felony crime. Thus, hypothesis 3b which states; "the risk of failing over time for new felony crimes over time is less among offenders sentenced to residential probation" can not be supported with these data.

Substance Abuse Treatment Access and Retention:

Even with a small sample, what continues to be very significant in all models is the impact that substance abuse treatment has on outcomes. Research consistently shows compulsory treatment to be an effective means in achieving positive outcomes. How a substance abuser is exposed to treatment seem irrelevant. What is important is that drug involved offenders are brought into an environment where treatment can

occur (Maddux, 1988; Hubbard, et al., 1988; McGlothlin, et al.,1977a; 1977b). Given the importance of this link, ensuring compliance with court ordered treatment is therefore the first step in achieving positive outcomes. Unfortunately, a significant proportion of offenders court ordered to treatment are discharged from probation before having complied with court ordered mandates. Research has also found that offenders sentenced to more intensive probation programs are more likely to participated in treatment compared to offenders sentenced to standard probation (Petersilia and Turner, 1993a). Given the structure of the residential probation program it was believed that the residential probation program evaluated in this study was best able to ensure compliance with court mandated treatment compared to other probation models.

To test this assumption, data were analyzed using a logistic regression model. Again, this method was selected because it quantifies the association between risk factors and an event after adjusting for other variables as relative risk ratio, but requires the outcome variable to be a binary or dichotomous measure as opposed to a time sensitive measure. Here, the evaluation designed to determine whether offenders sentenced to residential probation are more likely to access substance abuse treatment. Thus, the outcome measure is quantified as dichotomous. Offenders either enter treatment or they did not. The same process used in constructing the

Cox regression models was employed for the logistic regression. All independent variables were entered into an initial analysis (Table 13a) followed by a reduced model which includes only those variables noted as significant or approaching significance in the initial analysis. Table 13b provides the results of the reduced logistic regression model. Clearly offenders sentenced to both residential probation program (SPCC and SPCC/PES) do better with respect to this outcomes measure. Offenders sentences to SPCC are 4.9 times more likely to enter treatment and offenders sentenced to SPCC/PES are 3.8 times more likely to enter substance abuse treatment compared to offenders sentenced to standard probation. The strength of the relationship is statistically significant ($p = .002$ and $p = .014$). Offenders sentenced to tether (PES) and boot camp/tether (BC/PES) are some what less likely to enter treatment, although the association is not statistically significant. Additionally, Table 13b indicates that the length of time offenders spend in jail as a consequence of the critical offence, significantly affects whether offenders enter treatment or not ($p = .029$). The relationship is inverse; the longer offenders are incarceration the less likely they are to enter treatment following release. The overall offence category is shown to have a significant effect on treatment access as well ($p = .02$). When drug and property crimes are compared to the hold out category (violent crimes) it is

Table 13a Offenders Receiving Substance Abuse Treatment: Full Model

Response Profile

Ordered

Value	Substance Abuse Treatment	Count
	Yes 1	118
	No 0	83

Testing Global Null Hypothesis BETA=0

Criterion	Intercept Only	Intercept and Covariates	Chi-Square for Covariates
-2 LOG L	271.451	231.103	40.348 with 14 DF (p=0.0002)
Score	.	.	36.899 with 14 DF (p=0.0008)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Odds Ratio
INTERCPT	1	-0.2120	0.7184	0.7679	.
Age	1	0.00477	0.0206	0.8170	1.005
Race	1	0.4883	0.3659	0.1820	1.630
Education Level	1	0.2624	0.3585	0.4642	1.300
Employment	1	0.1954	0.3477	0.5742	1.216
Prior Felonies	1	-0.0166	0.2101	0.9371	0.984
Offence/Property	1	0.3405	0.4390	0.4379*	1.406
Offence/Drug	1	-0.8335	0.4555	0.0673*	0.435
Jail Days	1	-0.00448	0.00197	0.0230*	0.996
Drug of Choice	1	0.0544	0.3497	0.8764	1.056
Probation Violation	1	0.2867	0.4322	0.5071	1.332
SPCC	1	1.7094	0.5339	0.0014*	5.526
PES	1	-0.0862	0.4395	0.8444*	0.917
SPCC/PES	1	1.3673	0.5494	0.0128*	3.925
BC/PES	1	-0.4550	0.6464	0.4814*	0.634

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	18.6121	4	0.0009*
OFFENCE CATEGORY	7.7197	2	0.0211*

* Used in reduced model

Table 13b Offenders Receiving Substance Abuse Treatment: Reduced Model

Response Profile
Ordered

Value: Substance Abuse Treatment		Count
Yes	1	118
No	0	83

Testing Global Null Hypothesis BETA=0

Criterion	Intercept Only	Intercept and Covariates	Chi-Square for Covariates
-2 LOG L	271.451	235.547	35.904 with 7 DF (p=0.0001)
Score	.	.	33.264 with 7 DF (p=0.0001)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Odds Ratio
Intercept	1	0.3754	0.4334	0.3864	
Offence/Property	1	0.3386	0.4181	0.4180	1.403
Offence/Drug	1	-0.7081	0.4109	0.0848	0.493
Jail Days	1	-0.00407	0.00187	0.0297**	0.996
SPCC	1	1.5805	0.5198	0.0024*	4.857
PES	1	-0.0210	0.4080	0.9590	0.979
SPCC/PES	1	1.3257	0.5398	0.0141*	3.765
BC/PES	1	-0.7151	0.6290	0.2555	0.489

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	19.0858	4	0.0008
OFFENCE CATEGORY	7.8043	2	0.0202*

* $p < .01$
** $p < .05$

noted that offenders sentenced for property crimes are somewhat less likely to enter treatment and offenders sentenced for drug crimes are 1.5 more likely to enter treatment. This multivariant analysis supports the bivariant analysis discussed previously and hypothesis 1 which states, "probationers participating in residential probation are more likely to participate in substance abuse treatment."

Getting offenders into treatment is only the first step. Keeping them there for periods of time long enough to bring about change is another issue. Several studies well document that the length of time offenders remain in treatment is the most consistent and best predictor of treatment outcomes. This is true even among those who drop out of treatment (Simpson and Friend, 1988; DeLeon, 1988, 1994; Hubbard et al., 1988; Barr and Antes, 1981). It was the intent in this evaluation to measure the effect of residential probation on treatment retention (hypothesized 2a; "Drug-involved offenders sentenced to residential probation will remain in substance abuse treatment longer"). In order to test the effect of residential probation on treatment retention the actual length of time all offenders were expected to remain in treatment had to be known. This information was only really known for those offenders sentenced to the residential probation. Some assumptions could have been made with respect to offenders in the other cohorts, but the probability of error in making any

assumption was too great. In addition, treatment expectations would have to be consistent among all offenders in order to establish true differences in treatment retention rates between cohorts. This was not the case. The length of time offenders actually spent in treatment appeared, to some degree, to be a function of the treatment provider and where the services were delivered. For example, the treatment provider delivering services at the residential probation program provided two phases of a three phase out-patient treatment program. This is a function of the average length of time offenders spend in the residential probation program. Upon successful completion of the residential probation program and successful completion of the two phase substance abuse treatment program, offenders are successfully discharged from both residential probation and treatment. In contrast, offenders in other probation models receiving treatment services from the same provider at the provider's out-patient location may be expected to complete all three phases of the out-patient program. In addition, a meaningful proportion of offenders received outpatient services from other providers in the county where treatment expectations range from one month to unknown. Therefore, treatment retention is not evaluated, but instead differences in the actual length of time offenders remained in treatment are examined. This does not suggest that the information derived from this analysis is without value. The actual

length of time offenders remain in treatment is consistently shown to effect other outcome measures.

To examine this issue, the actual experience of all offenders who entered treatment, both those who dropped out of treatment and those who completed treatment is examined and comparisons between cohorts are made. First, a univariant survival analysis was conducted and descriptive statistics produced using SAS Life time test function (SAS Institute Inc., 1997 pp. 413-431) to illustrate differences the length of time offenders remained in treatment between cohorts. Survival analysis was used because the data are time sensitive however, there were no censored observations in this analysis. All offenders in the study sample who entered treatment terminated from treatment by the end of the observation period. Moreover, the concept of treatment failure has an ambiguous relationship to length of time in treatment because treatment expectations among offenders varied considerably. Using treatment failure as a censored observation has little meaning and is therefore not appropriate. Thus, the univariant survival analysis was construct using all offenders who entered treatment and plots the length of time offenders in each cohort were in treatment from date of admission until the date of termination, regardless of the reason for discharge. This analysis illustrates only the actual length of time offenders stayed in treatment. No conclusions

regarding treatment success or failure can be drawn (refer back to Figure 4). As shown, the average length of time offenders remained in treatment ranged from a mean of 14.6 weeks to 28.5 weeks. ANOVA statistics were then used to test the observed differences in the mean length of time in treatment between cohorts. The results of the ANOVA test indicate that observed differences are not statistically significant ($p = 0.33$, see Table 14). Hence, Bonferroni or Scheffe's test were not indicated and therefore not performed. Although this analysis can not support hypothesis 2a, the data does illustrate that once offenders get into treatment, the length of time they remain in treatment is fairly consistent across the study sample.

Table 14 Weeks in Substance Abuse Treatment: ANOVA Results

	Std.Prob	SPCC	PES	SPCC/PES	BC/PES
Mean	28.5	18.5	28.8	22.9	14.6
Median	21.0	12.0	23.0	16.5	8.0
Minimum	1.0	3.0	2.0	2.0	1.0
Maximum	105.0	109.0	90.0	109.0	41.0
SE	4.5	4.0	4.7	4.9	7.1

ANOVA P-VALUE: 0.33

Std.Prob = standard probation; **SPCC** = residential probation; **PES** = tether; **SPCC/PES** = residential probation with tether; **BC/PES** = boot camp with tether

Alcohol and Drug Relapse:

The analysis continues by examining drug and alcohol relapse patterns and testing the relationship of the independent variables to the

length of time offenders remained substance free. Offenders are typically screened once a month for alcohol, marijuana (THC) and cocaine. If indicated, offenders are screened for other types of drugs. Because it was determined that drug relapse for cocaine and other drugs are of greater concern among officials in the study jurisdiction and therefore, court sanctions are more likely to occur for subsequent cocaine/ other drug use compared to relapse for alcohol and THC, it was important to analyzes relapse for alcohol and THC use separately from relapse for cocaine and other drugs. Consequently, THC use was not considered in the drug category. Instead, alcohol and THC use were collapsed into one category. The "drugs other than alcohol/THC" category includes cocaine/crack cocaine and poly-drug use. These two categories, "alcohol/THC and "other drugs", are examined separately.

Like recidivism data, these data are time sensitive and include censored observations. Survival analysis methods are the most appropriate method for analyzing these data and, to examine the length of time to failure for each category requires censoring the event that is not of interest. However, before constructing the survival analysis the data were checked to determine the likelihood that failure due to other drugs would precede failure due to alcohol and THC. This was considered important because it would be misleading with respect to substance abuse relapse to examine

alcohol and THC relapse separately (censoring other drug use) if a significant proportion of offenders were failing due to using other drugs first. This event occurred in only 3 cases. Therefore, it was determined that examining alcohol/THC use separately and censoring out failure due to other drug use, would be appropriate and the analysis would yield an accurate assessment of substance abuse relapse with respect to alcohol and TCH use. In each analysis, both univariant and multivariant survival methods are used. First, alcohol and THC relapse is examined.

Figure 5 and Table 15 illustrates the univariant survival analysis and descriptive statistics for alcohol and THC relapse. As shown, although there does not appear to be marked differences in mean survival times between cohorts, there are notable differences in the proportion of offenders who remained alcohol and THC free in the first year. Approximately 78% of offenders in both residential probation programs (SPCC and SPCC/PES) remained alcohol and THC free for approximately 35 week compared to only about 64% of offenders supervised on tether (PES) and 56% supervised in standard probation. More than half of the BC/PES cohort had relapsed during this time period. The appreciable difference dissipates at about 52 weeks. At around one year relapse stabilizes among all cohorts. This pattern is very consistent with the substance abuse relapse literature. Substance abusers are most

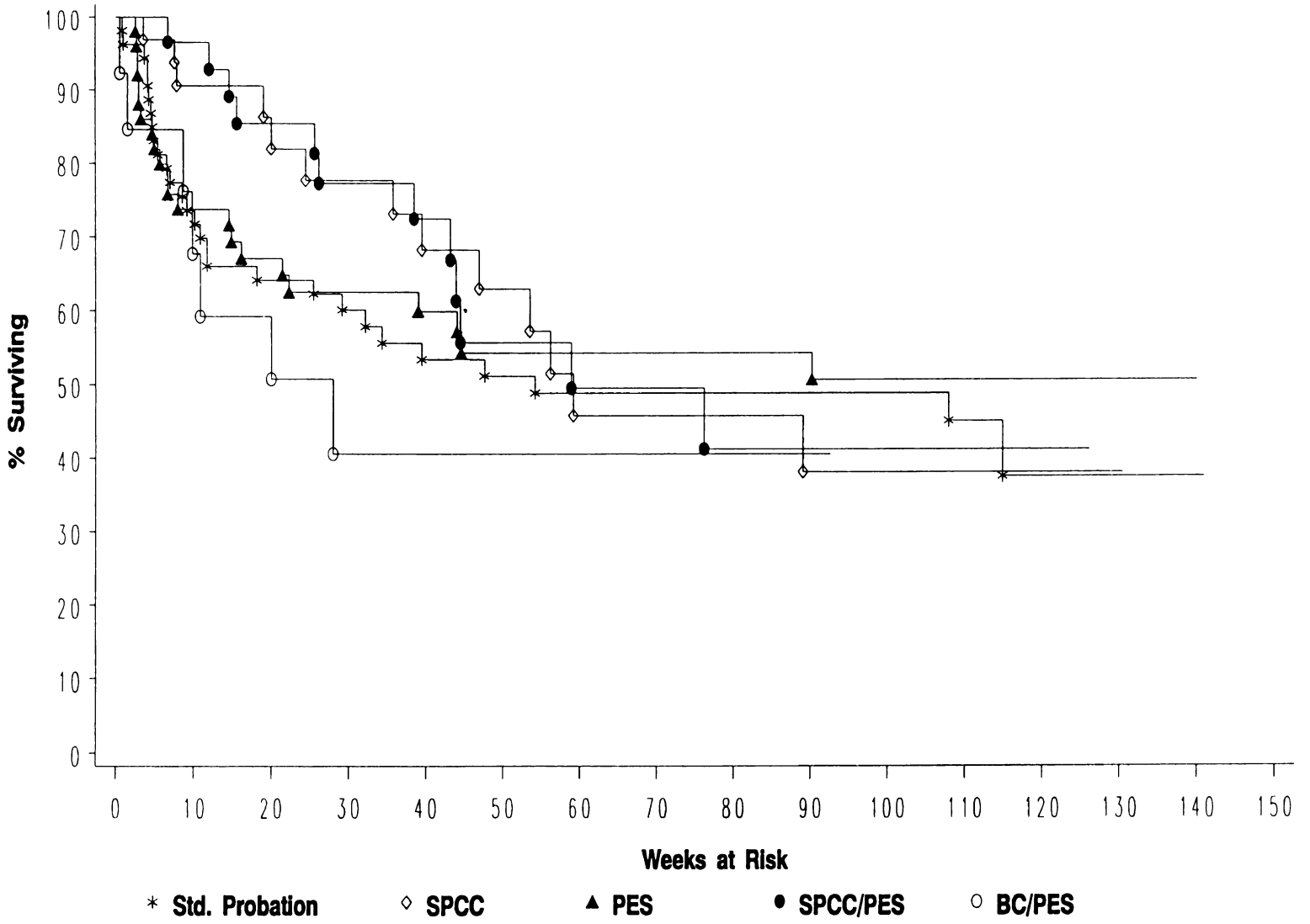

Figure 5 **Weeks Surviving Alcohol and THC Relapse**

Table 15 Weeks Surviving Alcohol and THC Relapse

	A = Std. Prob	B = SPCC	C = PES	D = SPCC/PES	E = BC/PES
Mean	74.0	75.6	80.9	75.1	44.8
Median	54.1	59.1	*	58.9	28.0
SE	8.9	10.7	9.5	10.6	12.8

* More than 50% still surviving at the end of the follow-up period

vulnerable to relapse during post acute or late physical withdrawal which reaches its peak at 3 to 6 months and becomes less intense at about one year (Fitzgerald, 1993).

To examine the differences, Cox regression methods are used. The same process used in constructing all other Cox regression models was employed. All independent variables were entered into an initial analysis (Table 16a) followed by a reduced model which includes only those variables noted as significant or approaching significance in the initial model. Table 16b provides the results of the reduced model for alcohol and THC relapse. Again, length of time in treatment continues to be significant in predicting outcomes (p=.0083). The longer offenders remain in treatment the less likely they are to relapse. Age however, is noted as the most significant predictor of failure in this model (p=.0003). Specifically, older offenders are less likely to fail due to alcohol or THC use than younger offenders. In addition, there appears to be a relationship between the length of time offenders are incarcerated as a result of the

Table 16a Length of Time Until Alcohol or THC Relapse: Full Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
170	76	94	55.29

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	699.074	658.357	40.717 with 15 DF (p=0.0004)
Score	.	.	34.184 with 15 DF (p=0.0032)
Wald	.	.	33.945 with 15 DF (p=0.0035)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Age	1	-0.050278	0.01999	0.0119*	0.951
Race	1	-0.292413	0.26048	0.2616	0.746
Education Level	1	0.124212	0.27764	0.6546	1.132
Employment	1	-0.390530	0.26325	0.1379	0.677
Prior Felonies	1	-0.011776	0.18648	0.9496	0.988
Offence/Property	1	0.240151	0.34827	0.4905	1.271
Offence/Drug	1	0.454272	0.32700	0.1648	1.575
Jail Days	1	-0.002859	0.00165	0.0832*	0.997
Drug of Choice	1	-0.287550	0.27543	0.2965	0.750
Treatment Weeks	1	-0.017206	0.00706	0.0148*	0.983
Probation Violation	1	-0.036147	0.32098	0.9103	0.964
SPCC	1	-0.556241	0.39006	0.1539*	0.573
PES	1	-0.064555	0.33110	0.8454*	0.937
SPCC/PES	1	-0.752353	0.42856	0.0792*	0.471
BC/PES	1	-0.313161	0.48673	0.5200*	0.731

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	4.5917	4	0.3318*
OFFENCE CATEGORY	1.9352	2	0.3800

* Used in reduced model

Table 16b Length of Time Until Alcohol or THC Relapse: Reduced Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
170	76	94	55.29

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square	
-2 LOG L	699.074	664.870	34.204	with 7 DF (p=0.0001)
Score	.	.	27.773	with 7 DF (p=0.0002)
Wald	.	.	27.291	with 7 DF (p=0.0003)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Age	1	-0.061170	0.01697	0.0003*	0.941
Jail Days	1	-0.002794	0.00157	0.0747**	0.997
Treatment Weeks	1	-0.017622	0.00667	0.0083*	0.983
SPCC	1	-0.554666	0.35422	0.1174	0.574
PES	1	-0.175018	0.31367	0.5769	0.839
SPCC/PES	1	-0.693848	0.39414	0.0783***	0.500
BC/PES	1	-0.375819	0.45513	0.4089	0.687

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CAREGORY	4.4353	4	0.3503

*p < .01
**p < .05
*** p < .10

critical of offence, and failure. Although not significant at the .05 level the relationship is approaching significance (p = .07) and seem strong enough to indicate that a larger sample would yield greater significance. This relationship is present in only one other analysis (treatment access) and is therefore particulary interesting. Biological and physiological aspects of addiction are often over looked when attempts are made to explain behavior but may offer a plausible explanation in this case. This possible explanation is discussed in detail in Chapter VI.

Finally, offenders sentenced to residential probation (SPCC) and residential probation with tether (SPCC/PES) appear to do slightly better over time in maintaining abstinence from alcohol and TCH, compared to offenders sentenced to standard probation. While these differences are not statistically significant (p=.11 and p=.07 respectively) the observed change is in the direction hypothesized.

The analysis for drug relapse replicates the above process. A univariant survival analysis was conducted to illustrate differences in the length of time offenders remained drug free between cohorts. However, the survival model was constructed slightly differently. This analysis did not censor the event that is not of interest; alcohol and THC failure. The rationale for this is straight forward. Many offenders use both marijuana and cocaine or other drugs. A review of the data showed that a meaningful

proportion of offenders who relapsed due to cocaine had previously tested positive for THC. If the analysis was constructed to censor alcohol/THC failure, then analysis would clearly underestimate drug relapse. Specifically, offenders who tested positive for THC prior to failing for cocaine use would be censored from the analysis and the failure due to cocaine would not be included. Therefore, all offenders are included in the analysis until they fail due to a positive drug screen other than alcohol or THC[29] or until censored. As in prior analyses, censored events include, death, lost to follow-up, transferred to another jurisdiction or removed from community supervision (court sanctioned failure).

Although not as pronounced, the unitivariant survival analysis for drug relapse reflects a similar pattern to that of the survival analysis for alcohol/THC relapse (Figure 6 and Table 17). The proportion of offenders remaining drug free is slightly greater among offenders sentenced to both residential probation programs (SPCC and SPCC/PES) during the first few months. Over 90% of offenders in both residential probation programs remained drug free for a little more than 5 months compared to approximately 83% of offenders sentenced to standard probation. Less than 80% of offenders supervised on tether (PES) and approximately 65%

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29 Not all probationers' files contained drug screen information. These cases were excluded from the analysis.

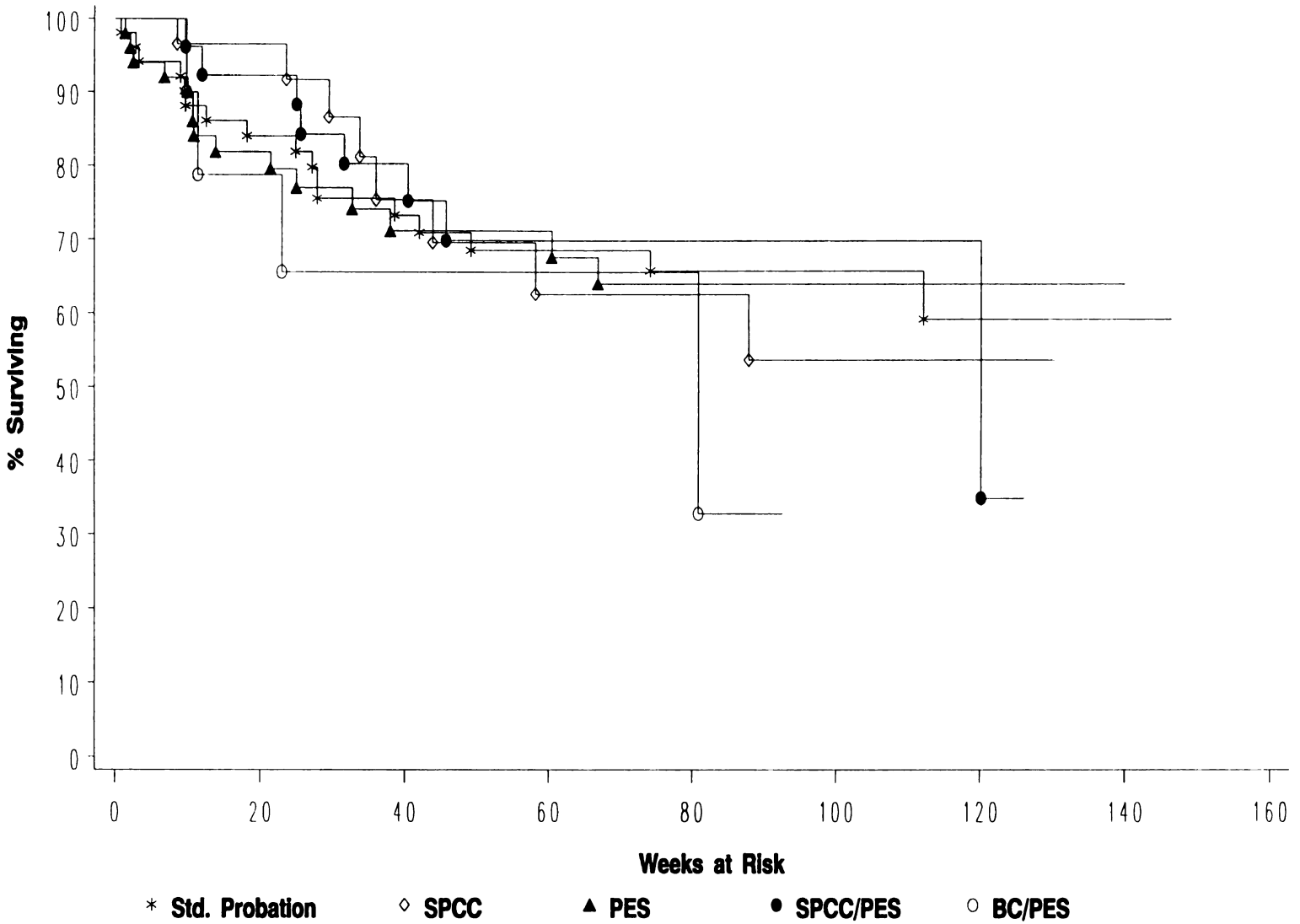

Figure 6 **Weeks Surviving Drug Relapse Other Than Alcohol or THC**

Table 17 Weeks Surviving Drug Relapse Other Than Alcohol or THC

	A = Std. Prob	B = SPCC	C = PES	D = SPCC/PES	E = BC/PES
Mean	102.8	91.3	98.8	94.7	62.2
Median	*	*	*	120.1	80.9
SE	8.8	11.5	9.1	9.9	13.8

* More than 50% still surviving at the end of the follow-up period

of probationers in the boot camp/tether cohort remained drug free up to this time period. These differences diminish rapidly but again, relapse stabilizes at about one year.

Another Cox regression was run to examine the risk of failure for drug use. Again, all independent variables were first tested prior to running the reduced model (Table 18a). Table 18b provides the results of the reduced Cox regression for drug relapse. The proportion of censored data and the actual number of failure in this model undoubtedly affects this analysis. Despite this limitation, length of time in treatment still is shown to be significant in predicting outcomes (p=.03). Unlike failure due to alcohol and THC use, the offenders' drug of choice is also significant in predicting failure due to drugs other than alcohol and THC. With respect to the different probation models, no appreciable difference are noted. The risk ratios do however indicate that observed changes are in the direction hypothesized. Given this consistent pattern, it is expected that a larger sample would yield true differences between cohorts.

Table 18a Length of Time Until Drug Relapse: Full Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
165	51	114	69.09

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	465.542	419.416	46.126 with 15 DF (p=0.0001)
Score	.	.	47.822 with 15 DF (p=0.0001)
Wald	.	.	40.035 with 15 DF (p=0.0004)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Age	1	0.023278	0.01955	0.2338	1.024
Race	1	-0.519975	0.35011	0.1375	0.595
Education Level	1	0.150241	0.35526	0.6724	1.162
Employment	1	0.286177	0.31056	0.3568	1.331
Prior Felonies	1	-0.038449	0.18936	0.8391	0.962
Offence/Property	1	-0.340204	0.38709	0.3795	0.712
Offence/Drug	1	0.510382	0.41319	0.2167	1.666
Jail Days	1	0.000033039	0.00171	0.9846	1.000
Drug of Choice	1	1.868225	0.41633	0.0001*	6.477
Treatment Weeks	1	-0.013608	0.00789	0.0845*	0.986
Probation Violation	1	-0.176929	0.42906	0.6801	0.838
SPCC	1	-0.164587	0.52460	0.7537*	0.848
PES	1	-0.046484	0.39532	0.9064*	0.955
SPCC/PES	1	-0.192254	0.48786	0.6935*	0.825
BC/PES	1	0.471328	0.61205	0.4413*	1.602

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	1.0991	4	0.8944*
OFFENCE CATEGORY	4.1416	2	0.1261

* Used in reduced model

Table 18b Length of Time Until Drug Relapse: Reduced Model

Summary of the Number of Event and Censored Values

Total	Event	Censored	Percent Censored
165	51	114	69.09

Testing Global Null Hypothesis: BETA=0

Criterion	Without Covariates	With Covariates	Model Chi-Square
-2 LOG L	465.542	428.750	36.792 with 6 DF (p=0.0001)
Score	.	.	35.367 with 6 DF (p=0.0001)
Wald	.	.	29.042 with 6 DF (p=0.0001)

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Pr > Chi-Square	Risk Ratio
Treatment Weeks	1	-0.015893	0.00740	0.0317**	0.984
Drug of Choice	1	1.894012	0.37545	0.0001*	6.646
SPCC	1	-0.365963	0.43562	0.4009	0.694
PES	1	-0.125840	0.36190	0.7281	0.882
SPCC/PES	1	-0.265091	0.43566	0.6047	0.748
BC/PES	1	0.299792	0.56795	0.5976	1.350

Linear Hypotheses Testing

Label	Wald Chi-Square	DF	Pr > Chi-Square
COHORT CATEGORY	1.3744	4	0.8486

* $p < .01$
** $p < .05$

Summary:

To recapitulate, some of the findings discussed in this section were consistent with the hypotheses outlined while other were not or could not be adequately tested. As hypothesized, offenders sentenced to residential probation are more likely to comply with court ordered substance abuse treatment compared to offenders sentenced to less intensive probation programs. This finding supports previous research which suggest that offenders sentenced to more intensive probation programs are more likely to participate in compulsory treatment. Interestingly, this analysis also shows an inverse relationship between the length of time offenders spend in jail prior to being released to community supervision and participation with court ordered substance abuse treatment. The longer offenders are incarcerated the less likely they are to enter treatment.

It was also hypothesized that offenders sentenced to residential probation would remain in treatment longer. This was not the case. Offenders sentenced to residential probation remained in treatment approximately 6 - 10 weeks less compared to offenders sentenced to less intensive probation programs (excluding BC/PES). However, this appears to be a function of the length of time offenders are expected to remain in treatment as opposed to a failure in retaining offenders in treatment.

Although not statistically significant, comparisons of the relative risk

ratios indicate that the likelihood of remaining alcohol and drug free is slightly greater for offenders sentenced to residential probation compared to offenders sentenced to less intensive probation programs. This is also consistent with the hypotheses. The observed patterns show that a greater proportion of offenders who were sentenced to residential probation remain alcohol and drug free up to approximately one year, at which time appreciable differences dissipate. Moreover, the analyses show that the length of time offenders remain in treatment is a significant predictor of alcohol and drug relapse which underscores the importance of ensuring compliance with court mandated treatment.

Based on previous research it was anticipated that court sanctioned technical violations would be greater among offenders sentenced to residential probation. The data in this study support this assumption and associated hypothesis. The likelihood of failure due to technical violations is greatest among offenders sentenced to the most intensive probation programs and least among offenders sentenced to the least intensive probation programs. Again, the length of time offenders remain in treatment is shown as the single best predictor of failure. This analysis continues to underscore the importance of ensuring that offenders comply with court mandated treatment and further, that offenders remain in treatment long enough for treatment to bring about change.

This program evaluation was also designed to examine the effects of residential probation on subsequent criminal behavior or recidivism. However the proportion of court sanctioned technical violations and the small number of subsequent felony crime convictions limited the ability to draw meaningful conclusion from this analysis and also affected the ability to test the following hypothesis which states: "Of the probationers rearrested for new crimes, the severity of the new crime will be less for offenders sentenced to residential probation." Even though the sample size was limited, the analysis conducted to measure the effects of residential probation on recidivism still show time in treatment to be a significant predictor of successful out comes.

VI. CONCLUSION AND DISCUSSION

Overview:

The greatest rise in incarceration in the country's history has taken place in the past three decades, contributing to significant prison overcrowding. In response to this pressure, the use of probation has expanded considerably causing an increase in the probation population of almost 300% over the past 10 years. Not only is the probation population growing in size, the type of offender on probation has changed as well. More of the current population consists of offenders convicted of felonies and a greater proportion of offenders are drug dependent. Because standard probation was never intended to manage these types of offenders, over the past decade many models of intermediate sanctions or intensive supervision probation programs were developed to cope with probation's dilemma. Critics of prison diversion are many, arguing that diverted offenders continue to commit crimes and rarely reform. Meanwhile supporters reinforce the many advantages of probation and argue the difficulty lies in its execution, not its theory.

As the debate continues, many studies have been conducted in efforts to determine the effectiveness of various ISP programs models and identify program characteristics which best predict improved client

outcomes. Research has shown that monitoring alone is not effective in producing positive outcome, but rather successful programs are those that combine substance abuse treatment with surveillance. What remains unknown are the specific levels of both treatment and monitoring required to maximize outcomes and for particular types of offenders. The program evaluation described in this dissertation was an attempt to respond to this need and examined the effectiveness of a different and unique structure of ISP (residential probation) in combination with a very specific level of substance abuse treatment (out patient) for drug involved felony offenders.

The literature was first reviewed to determine key risks factors or predictors of recidivism. These risk factors determined the independent variable and included, age, race, education level, employment, prior felonies, offence category, drug of choice and substance abuse treatment. In addition, the actual time offenders spent in jail as a consequence of the incidence offence and probation violation status were also included as independent variables. Essentially, four outcomes measures were considered: treatment access, length of time in treatment, subsequent drug use or relapse, and recidivism. Both univariant and mulitvariant methods were used to test the hypotheses. However, certain limitations were encountered that restricted the analyses and the ability to fully test one of the hypotheses.

Limitations:

The most significant limitation to this dissertation is the size of the study population. To avoid sampling error, the study was design to utilize a population-based cohort which included the total population of offenders meeting the admission criteria for residential probation. Sample size calculations were performed to ensured the study population was adequate. Results indicated that the identified study cohort was 10% larger than was needed. However, over 25% of the study cohort was lost in the data collection process due to missing files or missing data. Moreover, the high rate of subsequent technical violations was not anticipated and further reduced the sample in some of the analyses. This was not problematic in the bivariant analyses but presented limitations when conducting some of the multivariant analyses. As a result, some of the analyses were not able to provide certain information sought by the officials and policy makers supporting the evaluation. The other unexpected nuance was the significant proportion of technical violators sentenced to residential probation compared to the other probation programs. If the residential probation program is truly servicing more of this population then a more accurate assessment of the program may be to compare outcomes of technical violators across probation models. Finally, the study was designed to evaluate the effectiveness of a specific program,

servicing a specific population and provide information to program managers for the purpose of developing policy. Therefore the study is limited in its generalizibility.

However, despite these limitations the results of the study provide meaningful information which have implications for both the local criminal justice and treatment agencies and for future research. A discussion of the findings, recommendations and direction for future research are presented in this section.

Discussion of Findings and Policy Recommendations:

Treatment Access

The established link between substance abuse treatment and treatment outcomes among criminal justice clients is well document. Consistently, length of time in treatment is found to be the single best predictor of positive outcomes. Unfortunately, a sizable number of offenders are discharged from probation before having complied with court mandated treatment, indicating a gap between the criminal justice and treatment systems. Thus, despite court mandates, getting offenders into treatment remains an issue whether this is a function of treatment capacity or offender noncompliance. This study was designed to determine the effectiveness of residential probation in facilitating treatment access and

ensuring compliance with court mandated treatment. On this measure residential probation is by far the most effective compared to other probation programs. Offenders sentenced to residential probation were almost 4 to 5 times more likely to enter substance treatment compared to offenders sentenced to standard probation. This is consistent with previous research which show that offenders who participate in more intensive probation programs are more likely to participate in substance abuse treatment and counseling. Moreover, this finding appears congruent with deterrence theory. It is assumed that the "perceived threat" of punishment and the "certainty of punishment" for failing to comply with court mandated treatment are far greater for offenders sentenced to residential probation. Therefore, greater treatment compliance rates would be expected.[30] Whether these treatment compliance rates are a function of perceived threat, the certainty of punishment or a function of on site treatment, the residential probation program's strategies seem to be effective in ensuring that offenders comply with court mandated treatment. The importance of this can not be overstated given the relationship between substance abuse treatment and outcomes.

When analyzing "treatment access," the length of time offenders

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To provide an adequate test of deterrence theory or test this assumption, data regarding the types of threats, the offenders' perceptions of the threats and the actual consequences (certainty of punishment) are needed. Only outcome data (treatment admission) was available.

spend in jail for the critical offences was shown to be a significant predictor of this outcome measure. The longer offenders spent in jail the less likely they were to enter treatment after release. Only speculation can be offered to explain this relationship. Previous research in treatment retention (Wexler, et al., 1990) suggests that greater exposure to treatment produces a positive effect up to a point of satiation. After this point, positive outcomes declined with more treatment, suggesting a dosage model. It is possible that incarceration may have a similar effect on treatment motivation. Incarceration may serve as a treatment motivator up to a point of satiation and after this point the longer the confinement the less motivated the offender may become. As pointed out in the drug treatment literature, motivating clients to enter treatment is often problematic. Denial of how severe the problem really is for the substance abuser can significantly affect the clients' motivation or "readiness for treatment." Emotional pain or the pain of a significant loss, which can occur as a consequence of addictive behavior, can help reduce the denial and resistance to treatment (Simpson and Marsh, 1986). According to Martin (1982) the opportune time to motivate the substance abuser for treatment is at the point when he is experiencing emotional pain as a consequence of addictive behavior. However, if the negative consequences of the addictive behavior are not reinforced the pain and motivation for treatment will

subside over time. When the pain subsides, the motivation is gone and the denial of the problem returns. It would then follow that the longer the confinement, the farther removed the offender becomes from the painful event or the treatment motivator. Given the importance of treatment, this relationship is worth further investigation to determine if optimal levels of incarceration exist for different offenders under various conditions. Certainly the data suggests that there are.

Regardless of the reason, the relationship between length of incarceration and the likelihood of treatment admissions is evident throughout the study sample. To improve treatment admissions some form of intervention either by the criminal justice system (i.e., probation officer) or by the treatment provider is indicated for offenders incarcerated for long periods of time. A well establish transition plan to link these offenders to treatment directly from jail should be considered. For example, in a jurisdiction known to this writer, when drug involved felony offenders are released from the county jail they are transported by the county from jail directly to out-patient treatment services. Offenders are not allowed to be released to or transported by family members. On the same day offenders are released from jail, they are admitted and required to participate in treatment. This policy ensures the gap between the criminal justice and treatment systems is closed. Another alternative may be to develop an

intervention or treatment program while the offender is incarcerated, that uses the personal crisis which has significant personal implications for the addict to guide and affirm change and keep the offender in a readiness state for treatment. Other factors and processes from body of knowledge in the medical sociology literature that facilitate help-seeking behavior and or maintain the readiness for treatment state should be explored as well.

Length of Time in Treatment

This evaluation also was designed to examine the effects of residential probation on treatment retention. However, this was not possible. To explain, the distinction between length of time in treatment and treatment retention is restated. Obviously, length of time in treatment is simply the actual time offenders spent in treatment from the date of admission to the date of discharge, irrespective of success or failure. In comparison, treatment retention is not just how long the offender remains in treatment, but also whether clients are retained in treatment until a specified end point. Clients who drop out before the specified end point are considered to have failed. To measure retention therefore requires that the specified end point is known. Moreover, to compare the effectiveness of one intervention with others in retaining offenders in treatment requires the expected length of treatment to be consistent across interventions. If

the expected length of treatment in one intervention is one month and in another intervention it is four months, appropriate comparisons can not be made. Within the study sample, the expected time in treatment was either not known for many or varied considerably between offenders. To adjust the study design to the realities of the field, the actual length of time offenders remained in treatment were compared to determine if there were meaningful differences between offenders sentenced to residential probation and other probation programs.

The average length of time offenders sentenced to residential probation stayed in treatment ranged from means of 18.5 to 22.9 weeks for the different subgroups. The analysis show that these differences are not statistically significant. However, it could be argued that the observed difference may have practical significance. The treatment experience for offenders sentenced to residential probation is approximately 6 to 10 weeks less compared to offenders sentenced to less intensive probation models (excluding BC/PES). Given the relationship between length of time in treatment and treatment outcomes, this variance could be important. It has been documented that treatment durations of 3 months or more are necessary to predict improved outcomes (Tims, et al., 1991).

The differences in time in treatment do not appear to be a retention or treatment failure issue. Among offenders who actually entered

treatment, treatment success rates were compared. Bivariant analysis shows that observed differences in the proportion of offenders successfully completing treatment are not statistically significant between cohorts. This suggests that the 6 to 10 weeks difference in the average length of time in treatment observed among offenders sentenced to residential probation is a function treatment expectations. Offenders sentenced to either residential probation programs are expected to complete approximately 14 weeks of out-patient treatment while in residence. The 14 week program consists of two phases of a three phase program which is offered by a local treatment provider. Due to the average length of time offenders remain in residential probation only two phases are provided at the program site. After successfully completing residential probation and the two treatment phases, offenders are discharged from residential probation and the sole responsibility for supervision is transferred back to the adult probation department. Many leave with a "recommendation" from the provider to continue treatment and complete the third phase. Because of state regulatory substance abuse treatment licencing rules, offenders are discharged from treatment and considered successful completers at that level. If offenders are to continue treatment, even with the same provider, they must be readmitted at the out-patient location. In theory, offenders have completed treatment and the offenders' perception may be the same.

It appears that many offenders discharged from residential probation do not continue on with treatment and there does not appear to be reason for the offender to do so. In contrast, offenders sentenced to standard probation or tether and receiving services from the same provider attend treatment at the provider's primary out-patient treatment facility. Offenders are admitted with the expectation that they continue through the three phases and can do so without any interruption in services between phases. This would account for the 6 to 10 week variance in the average length of time in treatment.

Clearly the residential probation program is far more effective in engaging offenders in treatment process. Moreover, the proportion of offenders who successfully complete treatment is equivalent compared to other cohorts. However, the average length of time offenders remain in treatment is notably less which appears to be a system function. A gap between the criminal justice treatment system is created when offenders are successfully discharged from residential probation and treatment then continued on standard probation with a recommendation to continue treatment. To close this gap, a strategy to motivate offenders to continue treatment (at least until the third phase is complete) needs to be considered. One possible strategy would be to transition the probationer into the third phase of treatment prior to leaving residential probation. This

could be accomplished by formally discharging the client from treatment and formally readmitting him into the third phase of out-patient treatment at the provider site just prior to discharging him from residential probation. As part of the discharge planning process, the probationer would be required to go to the out-patient treatment site and re-enroll in treatment. The probationer would then be transferred to standard probation with a treatment "expectation" as opposed to a treatment "recommendation." Probation officers can then continue to monitor compliance with treatment expectations.

Substance Abuse Relapse

Substance abuse relapse is an important indicator of successful outcomes. As previously discussed, alcohol and THC relapse was examine separately from relapse due to other drugs. Consistent with the literature, the length of time an offender remains in treatment is a significant predictor for both alcohol/THC and drug relapse. The length of time offenders spend in jail prior to being released on probation is also significant in predicting alcohol/THC relapse. Offenders who are incarcerated longer are less likely to relapse. The effect of incarceration on alcohol and TCH relapse is interesting and again, only speculation can be offered to explain this relationship. Research has shown that physical

withdrawal from chronic alcohol abuse can last for months during what is often referred to as protracted abstinence syndrome or post acute withdrawal (Goldman, 1983; Fitzgerald, 1988; Gorski and Miller,1986; Kinney and Leaton, 1995). This prolong withdrawal is induced by the damage to the central nervous system caused by alcohol. Recovery from central nervous damage usually requires 6 to 24 months. During this period, withdrawal symptoms may continue and include cognitive and memory disturbances, excessive anxiety, irritability, insomnia, depressive symptoms and more. Post acute withdrawal symptoms may appear 2 weeks into abstinence, generally peak at 3 to 6 months and may last for several months thereafter (Gorski and Miller, 1986; Kinney and Leaton, 1995). Research indicates that the symptoms of long-term withdrawal associated with central nervous system damage is related to relapse (McCrady and Smith, 1981; Porjesz and Begleiter, 1983). Similarly, Ohlms (1983) argues that because THC is absorbed by the body's fat cells and is rid of very slowly, heavy THC users experience a build up of THC in the brain's fat cells, or neurons. Even after long periods of abstinence TCH users are susceptible to "flashbacks" which may be caused from the release of the built up THC from the neurons. These flashbacks are described as, the experience of a "THC high" and are theorized as being trigger mechanisms for relapse. In contrast, both the early withdrawal and

second phase withdrawal from cocaine and crack cocaine are known to be much shorter. The acute withdrawal phase typically lasts only 4 days and is characterized by some of the same neurological systems noted in alcohol withdrawal (e.g., agitation, depression). During this brief period hypersomnia, fatigue and exhaustion usually occurs. As these symptoms diminish post withdrawal begins characterized by anhedonia (lacking in interest or pleasure; apathy). However, this post withdrawal period is described only to last up to 10 weeks (Herridge and Gold, 1988; Gawin and Kleber, 1986).

The most vulnerable periods of time for alcohol and drug abuser to relapse is during both the acute and post acute withdrawal periods. Clearly, alcohol and THC abusers experience the longest periods of post acute withdrawal compared to other drugs. Confinement during this period of time restricts access to the offender's drug of choice and may aid him (begrudgingly) in managing through periods of time when he is most susceptible to relapse. Thus, where post acute withdrawal periods are known to be long, longer periods of confinement may be associated with reductions in relapse.

Age is also shown to be related to alcohol and THC relapse. The older the offender the less likely they are to relapse. This finding is consistent with previous research on aging offenders and criminal behavior

that show as offenders age criminal activity decreases and often ceases completely (Irwin, 1970; Meisenhelder, 1977; Petersilia,et al., 1978; Shover, 1985). These studies conclude that as offenders age or "mature" they experience a number of changes which cause them to reduce their criminal behavior. Among these changes are the development of new commitments, a growing fear of arrest and incarceration, changes in self-concept, motivations and approaches to problem solving. This maturation process has also been used to explain recovery from heroin addiction. However, results from these studies are conflicting. For example, using data from the Federal Bureau of Narcotics registry, Winick (1962; 1964) noted that most opiate addicts began use in their late teens and early twenties and disappeared from the narcotics registry after age 35. Winick therefore hypothesized that by age 35 most opiate addicts "mature out" of the problems that led them to heroin use. Moreover, in studies of "natural recovery" from heroin addiction[31] researchers concluded that the ability to quit heroin use was not necessarily related to treatment. Rather the concept of "maturing out" preconditions recovery (Waldorf and Biernacki, 1981; Waldorf, 1983). However, subsequent longitudinal studies do not support the maturation hypothesis to explain recovery from heroin

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31 In contrast to recovery assisted by a formalized treatment process, the concept of natural recovery is described as the ability to quit opiate use and maintain abstinence without treatment.

addiction. In two twenty year follow-up studies only 2 to 35 percent of recovering heroin addicts could be classified as "matured out" by age 40 (Harrington and Cox, 1979; Vaillant, 1973).

These conflicting findings are difficult to explain. Moreover, in view of the growing body of more recent scientific evidence suggesting a possible inherited biological and neurological basis for some addictions, it is difficult to conceptualize the ability of a person to "mature out" of a genetic or biological anomaly. However, the concept of "drug dependence syndrome" (DDS) may offer one possible explanation for the conflicting findings. As a theory of relapse, the DDS postulates that relapse is a direct function of the severity of the dependence BEFORE abstinence was begun (Babor, et al., 1986). It is possible that there were major differences between the severity of drug use which could range from drug misuse, dependence to intense physical addiction. And the ability to "mature out" of drug use may be directly related to the degree and severity of drug dependence. Therefore the maturation process or "maturing out" theory may be useful to explain drug abstinence based on both a person's degree of dependence or addiction and possibly their drug of choice. This hypothesized relationship between the ability to "mature out" of drug abuse and the degree of dependence and/or addiction may also explain why age was found in this study to be a predictor of relapse among alcohol and THC

abusers relapse but not found to be associated with relapse for cocaine and poly-drug abusers. However, data on the level of drug dependence or addiction severity were not available for offenders in study sample. Therefore it was not possible to test this assumption but further investigation of this issue is indicated.

At the bivariant level, the proportion of offenders remaining alcohol and THC free is slightly greater among offenders sentenced to residential probation during the first few months, but observed differences diminish at about one year. Although not as pronounced, a similar pattern is noted for drug relapse. At the multivariant level these differences are not statistically significant. However, a qualifying point needs to be made. The sample size for this particular analysis was small with a large proportion of censored observations. Comparisons of the risk ratios indicate that observed changes are in the direction hypothesized. Given the consistent pattern in the two analyses, there is reason to believe a larger sample would demonstrate greater differences in the relative risk ratios between cohorts.

On a practical level, the observed differences should not be ignored by the programs. The data show that the proportion of offenders who remain alcohol and drug during the first year of follow-up is slightly greater for those offenders sentenced to residential probation and the relative risk

of relapse over time is slightly less. Even if outcomes are consider equivalent between probation models, the positive treatment effects observed in the residential probation cohort are accomplished with 6 to 10 weeks less treatment time. Given the significant relationship between time in treatment and relapse, if offenders in residential probation where continued in treatment after discharge there is reason to believe that positive treatment outcomes would be greater among offenders sentenced to residential probation compared to other probation models. Further investigation of this issue is indicated.

Recidivism

Recidivism rates are always the greatest concern among officials and policy makers and was the most problematic to evaluate in this study. First, an overall failure model was constructed to evaluate the length of time offenders remained on community supervision before receiving any type of court sanction that resulted in jail or prison terms. The length of time offenders remained in treatment is seen as the single best predictor of failure, followed by offence category and drug of choice. Offenders sentenced for drug crimes and offenders reporting their drug of choice as either cocaine/crack or poly-drugs are more likely to fail. Next, failure due to technical violation and new felony crimes are examined separately. In

both analyses, time in treatment remains the best predictor of failure. However, the offence and drug of choice categories are not shown as predictors of technical violations, as observed in the overall failure model. What is significant in predicting technical violations is the probation model. Specifically, the likelihood of failure due to technical violations is greatest among offenders sentenced to the most intensive probation model (residential probation with tether) and least among offenders among offenders sentenced to the least intensive probation model. This is consistent with previous research that suggests when monitoring procedures are intensified the likelihood that probation violations will be intensified is greater. The technical violation analysis strongly supports this claim. However, an observation that was made while examining this analysis also needs to be considered when interpreting the results.

The study sample included all offenders who met the eligibility criteria for residential probation within a specified time period. In theory, all offenders could have been sentenced to residential probation. The largest proportion (56%) of technical violators in the study sample is seen in the residential probation programs. Offenders sentence to the residential probation programs (SPCC and SPCC/PES) are over 2 times more likely to be technical violators compared to all other offenders. Compared to offenders in standard probation, they are over 6 times more likely to be

sentence to residential probation for a technical violations. This is interesting considering that the residential probation provider has a program separate from SPCC or SPCC/PES specifically for technical violators. This program is referred to as the Probation Rule Violator Program for Circuit Court (PRV). PRV offenders were not part of this evaluation. It appears that the judicial process also favors residential probation for technical violations. Thus, a significant proportion of the residential probation population are already technical violators. Because it is assumed that the probability of being court sanction for a subsequent technical violation is greater among probationers who have already been sanctioned for a technical violation, it could be argued that this may also explain why the failure rate for technical violations is the greatest among offenders in the residential probation cohorts. A more appropriate analysis of residential probation may be to examine the outcomes of offenders sentenced on probation violations only. This would increase the sample, eliminate offenders sentenced to standard probation and improve the ability to detect true differences.

The large proportion of technical failure was problematic when measuring the effect of residential probation on felony crime (A complete discussion of the issues are found on pp. 118 -119). The conclusion is that inferences regarding the effect of the various probation models can not be

drawn. This also eliminated the ability to test hypothesis 4: "Of the probationers rearrested for new crimes, the severity of the new offence will be less for offenders sentenced to residential probation". However, the analysis of felony crime failure did produce meaningful information. Even with a limited sample in this analysis, length of time in treatment is shown to be the single best prediction of recidivism. Also related to felony crime is education level; the higher the education the less likely the offender is to recidivate. This is consistence with the literature and lends support to the residential probation programs in providing educational opportunities on-site. Offence category and drug of choice are shown to have a significant effect on recidivism as well. Offenders sentenced for drug crimes are over 3 times more likely to commit new felony crimes compared to offenders sentenced for violent crimes. Offenders who report their drug of choice to be cocaine/crack or poly-drugs are over 2 times more likely to be rearrested for a new felony crimes. The above substantiates what is already known to providers in this jurisdiction: the population most at risk are offenders with limited education, whose drug of choice is other than alcohol or THC, and are involved in felony drug crimes.

Although this evaluation documents much of which is already known in the literature, the information and recommendations for change are specific to a particular population and jurisdiction. The information is

intended to be use by officials to enhance the delivery system in efforts to improve outcomes where possible. Most importantly, length of time in substance abuse treatment is proven to be significant in effecting *all* outcomes in this jurisdiction. Treatment is working here, and residential probation programing is the most effective in ensuring compliance with court mandated treatment.

Direction for Future Research:

In response to the many issues identified in the probation literature, the primary purpose of this research was to examine the impact of a uniquely structured residential ISP program to determine if a different combination of treatment and surveillance could produce different outcomes for a specific population of drug involved felony offenders. While several findings in this study mirror what has been previously documented in the probation literature, other findings suggest the need to modify and retest program models in efforts to refine existing programs and improve the effectiveness of probation. For example, although results in this study document that drug involved felony offenders sentenced to residential probation are more likely to become engaged in the treatment process, the structure of both the residential probation and substance abuse treatment programs impact the length of time offenders are expected to remain in

treatment. Specifically, in some cases, the length of time offenders who are sentenced to residential probation are expected to remain in treatment is notably less compared to some offenders sentenced to other probation programs. However, even with less treatment time, alcohol and drug relapse rates among offenders sentenced to residential probation are not greater. There is evidence to suggest that a small adjustment in the program's policies could ensure that offenders would remain in treatment longer and ultimately produce better outcomes compared to other probation programs. Following this refinement, a retest of the program's effectiveness is indicated which could provide information for improving the effectiveness of probation.

Although the residential probation program evaluated in this study was not intentionally designed to primarily service offenders sentenced on technical violations, the data indicate that a greater proportion of the program's participants are in fact sentenced to the program for a technical violation while on probation for a felony offence. Given this reality, it is suggested that a more appropriate evaluation of this residential probation would be to examine the outcomes of offenders sentenced on technical violations between the various probation models. This subsequent study would help to further determine whether a different combination of treatment and surveillance will produce different results in different

populations.

Based on the findings in this study, it is also suggested that studies should be designed to examine the effects of incarceration on offenders' motivation for treatment. These studies could help determine if optimal levels of incarceration exist for different offenders under various conditions, which could ultimately serve as a valuable treatment tool. In addition, longitudinal studies which clarify the relationship between age and drug relapse, not excluding the possible interaction of addiction severity, are indicated. Such studies would allow researchers to examine more closely the processes of relapse and recovery.

In summary, this research clearly demonstrates that the substance abuse treatment oriented residential probation program examined is significantly more effective in ensuring that drug involved felony offenders comply with court mandated substance abuse treatment compared to other types of probation programs. Further, even though the expected length of time probationers sentenced to residential probation are to spend in treatment is approximately 6 to 10 weeks less compared to probationers sentenced to other probation programs, they are somewhat less likely to relapse due to alcohol and drug use over time. This provides evidence suggesting that significantly improved outcomes could be achieved among probationers sentenced to residential probation with a minor modification in

the residential probation program's policy that ensures these offenders would be retained in treatment longer once the probationer is discharged from residential probation.

Moreover, this research documents that the longer offenders are incarcerated prior to being released on probation the less likely they are to enter substance abuse treatment. Most program policies tend to support punishment of the offender as opposed to treating the drug-involved offender as having a chronic relapsing diseased characterized by "drug seeking behavior." Given the significant relationship between substance abuse treatment and positive outcomes, the problems with significant jail overcrowding and the documented effectiveness of the residential probation program in ensuring compliance with court mandated treatment, this study suggests that residential probation many be a more cost effective and efficient sanctioning strategy compared to long periods of incarceration in combination with other probation program models.

Although it is known that intensive monitoring or closer supervision have little impact on subsequent criminal behavior, this study documents that more intensive monitoring does affect whether offenders comply with treatment mandates, which in turn affects subsequent behavior. These findings appear congruent with deterrence theory in that it is assumed that the "perceived threat" of punishment and the "certainty of punishment" for

failing to comply with court mandated treatment are greater for offenders sentenced to residential probation. However, further testing of this assumption is indicated.

Overall, this research supports the claim that to improve positive outcomes intensive supervision programs need to change the way in which they are intensive by shifting the emphasis away from incapacitation and punishment toward a more integrated approach of intervention and substance abuse treatment. The "intensive" focus needs to be on intensify the monitoring of treatment compliance. To move forward, future probation program models that fully incorporate this change in focus need to be developed and tested.

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VII. BIBLIOGRAPHY

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