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**Pretreatment Client Characteristics and Treatment  
Retention in an Intensive Outpatient Substance  
Abuse Treatment Program**

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Recommended

*Research Question 1*

The first research question was to determine predictor variables associated with treatment completion status. It was hypothesized that pre-treatment client characteristic variables (e.g., age, marital status, drug and alcohol use) would help predict treatment completion and drop-out status. Logistic regression was utilized to examine this question since the dependent variable of treatment completion status is a dichotomous variable. As mentioned, Table 6 includes the predictor variables that were used in the initial logistic regression analyses. Based upon the significance level of each covariate within the model, those that contributed the least amount of variance, and had the lowest level of significance, were removed from the model one by one until the most parsimonious model with the strongest predictors were remaining (Hosmer & Lemeshow, 2000).

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Like other regression analyses, logistic regression is susceptible to collinearity issues, whereby when two variables are highly correlated to one another it can make determining the unique contribution of each predictor variable, and thus any interpretation the meaning of the results, very difficult (Hair et al., 1998). To investigate any multicollinearity problems, collinearity diagnostics were run. Both the tolerance and variance inflation factor (VIF) were examined for each variable. The recommended cutoff is commonly a tolerance value of .10, which corresponds to a VIF value of above 10 (Hair et al., 1998). The tolerance and VIF values were examined for each of the variables and all fell in the range demonstrating no multicollinearity problems, with no tolerance levels falling below .97 and no VIF values above 1.03.

Table 7 depicts the final model utilized to address research question 1. The overall effect of the predictor variables upon the dependent variable of treatment completion status was statistically significant  $\chi^2(4, N = 258) = 42.805, p = .000$ . The model accurately classified treatment completion status for 70.2% of the participants, with 55% sensitivity and 81% specificity for treatment completion. It demonstrated a 33% false positive rate and a 28% false negative rate at predicting treatment completion. Among the clients tested for this study, the documented rate of completion was 59%. Therefore, this model demonstrated an increase in correctly identifying treatment completion status from what would have been determined simply by “chance” by increasing this probability to 70.2%.

Table 7

*Logistic Regression Model for Treatment Completion Status*

Variable 95% C.I for OR

B S.E. df Sig. OR Lower Upper

Age .046 .012 1 .000 1.047 1.022 1.073

Anxiety Disorder -.913 .296 1 .002 .401 .225 .718

Cocaine Use Disorder -.56 .172 1 .001 .571 .408 .801

Admission prompted by -.856 .465 1 .07 .425 .171 1.057

Legal system

As indicated by the inverting the adjusted odds ratios, for those clients who did not meet criteria for an anxiety disorder, there was a 2.5 increase in the odds of staying in treatment compared to those clients who were found to meet criteria for an anxiety disorder. Similarly, for those clients who did not meet criteria for a cocaine use disorder, there was a 1.75 increase in the odds of staying in treatment compared to those clients who were found to meet criteria for a cocaine disorder. Age was also found to be a statistically significant predictor. Because the adjusted odds ratio reported in the table indicates the change in odds with each one year increase in age, it was determined that a more meaningful indicator would be the change in odds with each decade increase in age (Norusis, 2003). The proper exponentiation was taken to calculate this more meaningful odds ratio. The resulting odds ratio demonstrated that the odds of staying in treatment increase by about 1 ½ times (OR = 1.58) for every decade increase in age. Although it was not statistically significant, by including the variable of “treatment prompted by the legal system”, the successful prediction of completion status increased by 3% (from 67% 97

to 70.2%). While there was not a substantial increase in the predictive power of the model, the slight increase, coupled with previous literature implicating legally prompted treatment as being related to retention, resulted in a decision to keep this variable in the model. Some of the participants in the study enrolled in treatment in large part because the legal system prompted them to do so (e.g., mandatory substance abuse treatment following a driving while intoxicated infraction). For those clients whose admission into treatment was prompted by the legal system, the odds of staying in treatment were slightly less than half when compared to those clients who were not prompted by the legal system.

*Research Question 2*

The second research question examined if time to dropout could be predicted by various predictors. Survival analysis was used in order to describe the proportion of cases for which the event dropout occurred at various time points by assessing the relationship between survival time and a set of predictor variables. Survival analysis is utilized to investigate the occurrence of an event (in this case, treatment dropout) taking place and allows one to determine the point of time at which most individuals are most likely to drop out of treatment. Survival analysis is used to examine how covariates may change the odds of individuals dropping out of treatment (Norusis, 2005).

Similar to the approach taken in the logistic regression model, exploratory analyses investigating the strength of the relationships between the potential covariates and the dependent variable (treatment duration) were conducted. All significant covariates that were then used in the initial survival analysis are listed below in Table 8.

The Cox Proportional Hazards (PH) Model was the model chosen for the survival  
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analysis. It is considered a *semiparametric* approach as it does not require assumptions about the multivariate normality, linearity, or homoscedasticity (Norusis, 2005). On the other hand, the model does assume “that covariates are additive and linearly related to the log of the hazards function” (p. 137-138), known as the *proportional hazards function*. It is assumed that for all cases and across points in time, the shape of the survival function will essentially remain the same. The assumption of the proportional hazards function was tested and only predictors that did not violate this assumption were maintained in the analysis.

Table 8

*Covariates Evaluated for Cox PH Model*

Variable Significance Category

Marital Status .019 Demographics

Age .000 Demographics

Opiate Use Disorder .031 Drug/Alcohol Disorder

Cocaine Use Disorder .077 Drug/Alcohol Disorder

Drug use Disorder .003 Drug/Alcohol Disorder

Alcohol Only Disorder .005 Drug/Alcohol Disorder

Alcohol and Drug Disorder .022 Drug/Alcohol Disorder

ASI Drug Composite Score .001 Drug/Alcohol Disorder

Anxiety Disorder .002 Dual Diagnosis

Dual Diagnosis .023 Dual Diagnosis

Regularly take prescription med .024 Health Problem  
for a physical problem

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Recent Drug Use .003 Alcohol/Drug Use  
(30 days prior to intake)

Socrates D Total Score .009 Motivation

Socrates A Total Score .10 Motivation

The variables that were used for the analysis are listed in Table 9. Based upon recommendations put forth by Eliason (1993), when five or fewer covariates are used in a Cox regression analysis a sample size of at least 60 is required. Given these guidelines, a sample of 273 provides adequate statistical power to detect statistical effects. It should also be noted that like other types of regression analyses, Cox PH method is sensitive to high correlations between covariates. To address any issues of multicollinearity, collinearity diagnostics were conducted. Both the tolerance and variance inflation factor (VIF) were examined for each variable. As previously indicated, the recommended cutoff is commonly a tolerance value of .10, which corresponds to a VIF value of above 10 (Hair et al., 1998). The tolerance and VIF values were examined for each of the predictors and all fell in the range demonstrating no multicollinearity problems, with no tolerance levels falling below .97 and no VIF values above 1.03.

Table 9

*Covariates Used in the Cox PH Regression Analysis*

Variable Category

Age Demographics

Marital Status Demographics

Opiate Use Disorder Drug Disorder  
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Cocaine Use Disorder Drug Disorder  
Recent Drug Use Alcohol/Drug Use  
SOCRATES A Total Score Motivation

*Cox Regression Survival Analysis Final Model*

Table 10 depicts the final Cox regression model utilized to address research question 2. The overall effect of the predictor variables upon the dependent variable of treatment duration was statistically significant  $X^2(3, N = 273) = 45.05, p = .000$ . The table below provides additional information about the covariates that are statistically significant and how they relate to the dependent variable of treatment duration. If the odds ratios are less than 1.0 the direction of the effect is toward reducing the hazard rate. The hazard rate function represents the risk that exists for dropping out of treatment on that specific day and provides information on the average number of people who drop out of treatment over the course of the study period. When hazard rates are plotted over time it allows one to view the risk of dropping out over a specific duration and determine if there are any peaks or troughs in the graph indicating an increased or decreased risk of dropout for that period of time in treatment (Kleinbaum, & Klein, 2005). The survival function is also used to assess the point at which most people are likely to drop out. It is common for researchers to look at the time point when the survival function equals .50 (i.e., the median lifetime) to make this determination.

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Table 10

*Cox Regression Model for Time to Treatment Drop-out*

Variable 95% C.I for EXP(B)

B S.E. Wald df Sig. EXP(B) Lower Upper

Anxiety Disorder .713 .194 13.46 1 .000 2.04 1.394 2.99

Cocaine Use Disorder .594 .203 8.55 1 .000 1.81 1.217 2.7

Age -.043 .009 23.11 1 .000 .958 .942 .98

As the results indicate, those individuals meeting criteria for an anxiety disorder have an increased risk of about 100% to drop-out compared to those without an anxiety disorder. Similarly, those clients meeting criteria for a cocaine disorder have an increased risk of drop-out of 81% compared to those clients who did not meet criteria for a cocaine disorder. Finally, for every year increase in age, the risk of drop-out was found to decrease by about 4%. As indicated earlier, 41% of the sample dropped out of treatment and 59% completed it, with 112 participants experiencing the event of drop-out and 161 cases censored, since they were classified as treatment completers. The figure below depicts how the “survival” rate of hypothetical individuals with mean values on the covariates decreases over time, with survival time represented on the X axis. Note that the risk of drop-out tends to be fairly linear across the time span, as opposed to having any sharp peaks or troughs.

*Completers Compared to Non-Completers*

Before the main research questions were investigated, analyses were run comparing treatment completers and non-completers on demographic, psychiatric, and

substance use characteristics. Statistically significant differences were found to exist between completers and non-completers in terms of: age, marital status, income, drug use just prior to treatment entry, meeting criteria for an anxiety disorder, having a dual diagnosis, meeting criteria for a cocaine or opiate disorder, and being diagnosed with only an alcohol disorder. Compared to treatment completers, treatment drop-outs were more likely to be younger; unmarried; report lower incomes; use drugs more prior to intake; have met criteria for an anxiety, cocaine, or opiate disorder; and have a dual diagnosis. Treatment completers were more likely to be diagnosed with an alcohol-only disorder than treatment drop-outs. Each of these statistically significant variables will be discussed in the subsequent section after the results of the research question are reviewed.

### *Research Question 1*

The first research question investigated whether client characteristics could help predict treatment completion status. The results indicated that younger age and meeting criteria for an anxiety disorder and/or a cocaine disorder were statistically significant predictors of treatment drop out. The final logistic regression model was found to accurately predict treatment completion status about 70% of the time. Although the predictive ability of the model was found to be better than chance (59%), it still did not demonstrate excellent predictive ability of treatment completion status among this sample. This may have been the result of the fact that only client characteristics were included as variables. Had treatment variables (i.e., therapeutic alliance, intensity of service allotment) also been included in this study, the predictive power of the model may have improved. This hypothesis is based on previous literature which has implicated program factors as impacting client retention (Broome et al., 1999; Chou et al, 1998; 109

Marrero et al., 2005). Still, the clinical implications of the model can help to inform current treatment practices, as well as future research investigations that could take place as a follow-up to this study.

At the very least, this program is now aware that, at the point of treatment intake, younger clients and those with an anxiety and/or cocaine disorder are at an increased risk for dropping out of treatment. One way to utilize this information is for counselors and intake workers to be aware of these risk factors and use them as an alert system to more closely work with such clients. For example, clinicians may meet with these “at risk” clients and employ a brief motivational intervention to help solidly engage them in treatment early on. In fact, if such a method is useful with those at risk for drop-out it may also be helpful with other client presentations as well. Additionally, employing treatment approaches specifically designed to address cocaine disorders may also help to decrease the risk of drop out. Motivational enhancement strategies have been found to be useful with this type of population and can be easily implemented into existing approaches (Bernstein et al., 2005; Secades-Villa et al., 2004). Finally, working to provide more holistic or integrated treatment to clients with co-morbid anxiety disorders could also help to decrease the risk of drop-out (Hesse, 2009). These recommendations will be expanded on in subsequent sessions discussing the individual variables.

It should also be noted that although the model did not demonstrate promising sensitivity (true positive) for treatment completion, it demonstrated much higher specificity (true negative). This suggests that the treatment program can be more confident in predicting who is going to drop-out of treatment as opposed to who is going

to complete it. This has positive clinical implications as treatment adjustments can be  
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targeted at these specific characteristics. In other words, there does not appear to be a down side to adjusting treatment based on some of the recommendations found here even for those clients who would end up completing treatment without such adjustments. For example, employing a brief motivational interviewing intervention early on in treatment at the very least would not hurt any of the clients and in fact, may be found to improve retention rates among those at-risk.

Future investigations could look to improve the predictive accuracy of the model by including both the statistically significant variables from this study, while incorporating additional variables such as program factors and other client characteristics not measured in this study. By doing so, the predictive power of the logistic regression model could improve, providing a more illustrative picture of those at-risk for drop-out. Ultimately by improving the predictive model the treatment program would be able to develop an at-risk screen that could identify those clients at greatest risk of dropping out. Altering treatment approaches to improve retention rates of these clients could be an ensuing step in research.

#### *Research Question 2*

The second research question investigated whether client characteristics could predict time to drop out. Mirroring the results of the first research question, younger age and meeting criteria for an anxiety and/or cocaine disorder were found to predict shorter stays in treatment. Treatment drop out was found to take place gradually over time, without what appears to be any specific periods of increased risk. Previous research identifies the beginning of treatment as a particularly vulnerable time for drop out (Justus et al., 2006; Sayre et al., 2002; Siqueland et al., 2002; Veach et al., 2000); however, the  
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sample utilized for this investigation does not support that finding. Still, it should be noted that the group of clients who were not tested for this study may have impacted this result. A variety of practical issues were found to impact the number of clients tested, including early drop-out. Some clients did not return for treatment after intake and therefore were not assessed for this project. The average duration of time from treatment entry to assessment appointment was five calendar days. There were a number of clients that dropped out of treatment between the point of intake and when they were to be tested. As such, data on these clients are not represented in these results. Consequently, there is a possibility that the results of this research question may be underestimating the risk of early drop-out since a number of clients who dropped out early were not included in the survival analysis.

#### *Research Question 3*

The third research question investigated if client characteristics could predict the number of treatment sessions attended. Results indicated that younger age, meeting criteria for an anxiety disorder, and greater number of years using alcohol regularly were statistically significant predictors of fewer treatment sessions attended. The next section will look more closely at the statistically significant variables and discuss possible interpretations of the results.

#### *Treatment Completers versus Non-completers*

##### *Demographic Characteristics*

In terms of demographic characteristics, younger clients, those not married, and

those with lower incomes were more likely to drop out of treatment than clients who were older, those married, and those with higher incomes. Similar findings are found in 112

the existing literature base. In fact, one of the most robust findings in the treatment retention literature is the positive relationship between age and treatment drop-out (Chou et al., 1998; Green et al., 2002; Kavanagh et al., 1996; Mammo & Weinbaum, 1993; Mitchell-Hampton, 2006; Roffman et al., 1993; Rowan-Szal et al., 2000; Satre et al., 2004; Stark, 1992). Considering that age was also a statistically significant predictor in each of the three regression analyses, the subject of age and retention will be expanded upon in the section specifically devoted to discussing the statistically significant predictors that held up in the regression models to avoid redundancy. The statistically significant client characteristics associated with the bivariate analyses that were not found to hold up in the regression models will be discussed in this section.

Although much research has been conducted on age, a more limited number of studies have implicated marital status as being related to treatment retention. Siqueland et al. (2002) reported that among their Caucasian participants, those who were married or lived with a significant other were found to remain in treatment for a longer period. Other studies have replicated this finding that not being married is associated with treatment drop-out (Broome et al., 1999; Curran, Stecker, Han, & Booth, 2009). Theories put forth explaining this relationship include the notion that clients may be more likely to remain in treatment if there is a supportive partner at home reinforcing the engagement in treatment. Related, spouses may put significant pressure on their partners to attend treatment and threaten to leave if treatment is not completed. This type of “external motivation” has been found to prompt initial attendance in substance abuse treatment (DiClemente et al., 1999; Weisner et al., 2001). Also related, those clients who are unmarried adults may have fewer people to whom they are held accountable to, including 113

children, which also could impact treatment retention. For example, a client could be more committed to a treatment regimen if s/he has young children at home who depend on him/her. A phenomenon coined *role incompatibility* illustrates the conflict between certain social roles (e.g., parenting) and certain types of behavior (e.g., heavy drinking resulting in the role of heavy drinker). These types of role incompatibilities could act as strong motivators to keep clients in treatment. Typically speaking, younger and unmarried clients tend to have fewer role incompatibilities as it relates to their substance use (Littlefield, Sher, & Wood, 2009), hence possibly making it less difficult to drop-out of treatment and continue using.

Finally, clients who reported receiving lower monthly incomes were more likely to drop out of treatment. This positive relationship has been replicated in the literature across samples (Roffman et al., 1993; Siqueland, 2002), as well as specifically with female clients (Green et al., 2002; Mertens & Weisner, 2000; Weisner et al., 2001). Explanations for this phenomenon may include that individuals with higher incomes generally have greater access to resources that individuals with lower incomes may not be able to afford. For example, those clients with higher incomes may also be able to pay for a psychotherapeutic add-on if co-morbid psychiatric distress was an issue, or cover child-care costs in order to attend treatment. Similarly, if insurance only allots for a limited number of sessions, individuals with higher incomes may have more latitude to select to pay out of pocket for additional sessions in order to complete the treatment they

started. On the flip side, those clients with lower incomes may not be in a position to miss numerous days of work to attend treatment, especially intensive outpatient treatment that meets every (or almost every) day of the week.

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The clinical implications of these findings suggest that when this treatment program enrolls clients who are young, not married, and/or have lower incomes they could be at an increased risk of dropping out of treatment. One useful strategy may be to work with those clients who are not married to identify motivating factors to remain in treatment. This could include identifying someone close to them who supports their sobriety to act as the accountability factor typically associated with a spouse.

Additionally, clients who present with lower incomes may benefit from meeting with a social worker on staff to learn about financial assistance or other types of community programs (e.g., affordable child care, employment placement) that might assist them in managing the additional stressors outside of their recovery process.

#### *Recent Drug Use and Type of Drug Disorder*

In addition to demographic characteristics, drug use just prior to treatment intake was associated more often among those clients who dropped out of treatment. More specifically, treatment drop-outs were found to have used marijuana, cocaine, heroin, and hallucinogens more in the 30 days prior to intake than those clients who completed treatment. Heavier drug use has been implicated as being related to retention in previous research as well. For example, Stark (1992) has claimed that “the fact that clients who use more drugs have higher attrition rates is true almost by definition and is overwhelmingly confirmed by the evidence” (p. 102). Drug use close to the point of intake can be indicative of both the severity and intensity of clients’ substance use, higher degrees of which have been found to negatively impact retention in treatment (Alterman et al., 1996; Lang & Belenko, 2000; Maglione et al., 2000b; Marrero et al., 2005; Mertens & Weisner, 2000; Westreich et al., 1997). Additionally, entering treatment when one is

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using both alcohol and drugs has been associated with increased rates of drop-out (Easton et al., 2007). Other studies have supported the finding that when clients are using drugs directly around, or 30 days before, treatment intake, they are less likely to remain in treatment (Alterman et al., 1996; Paraherakis et al., 2000; White et al., 1998).

Using drugs close to the point of treatment intake may negatively impact retention for a variety of reasons. As previously stated, the variability in treatment approaches is the rule rather than the exception and some treatment approaches may not be addressing the needs of those using drugs. For example, the treatment program associated with this study is based upon tenets of the Minnesota Model of treatment, including the incorporation of a 12-step approach rooted in the treatment of alcohol dependence (Owen, 2003). Clients who enter treatment with recent drug use may have idiosyncratic treatment needs not associated with those who only use alcohol. For example, before treating clients who are addicted to opiates, it has been suggested that first such clients may benefit from stabilizing on methadone and then subsequently being exposed to more traditional substance abuse treatment. Still, a call for alternative interventions for specific drug using populations has been recommended (Paraherakis et al., 2000). Further complicating matters may be that clients who are using illicit drugs just prior to and around treatment intake are not necessarily functioning at an optimal cognitive level. Decision making and judgment is often impaired, which has implications for engaging

and remaining in treatment (Stark, 1992). Additionally, if a client is having a difficult time abstaining from their use of drugs in a program that requires absolute abstinence in order to participate, such a client may simply make a decision to leave before being discharged due to violating treatment rules. The treatment program associated with this  
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study employs an abstinence-based treatment approach such that if abstinence is broken clients are mandatorily discharged from the program.

Research has also suggested that type of drug used can negatively impact treatment retention; cocaine and opiate use being cited in numerous studies for the adverse relationship it appears to have with treatment retention (Fletcher et al., 1997; Paraherakis, et al., 2000; Sapadin, 2006; Sinqueland et al., 2002; Veach et al., 2000). In this study, in addition to recent use of cocaine and heroin, meeting criteria for a cocaine or opiate disorder was also associated with higher treatment drop-out. In this study, meeting criteria for a cocaine disorder was found to be a statistically significant predictor of treatment drop-out and time spent in treatment; therefore, this topic will be expanded upon when the statistically significant predictors of the regression analyses are discussed. However, since opiate use was not implicated in the regression analyses it will be covered in this section.

Individuals addicted to opiates have been found to demonstrate higher levels of cognitive impairment than clients who enter treatment using other types of drugs (Paraherakis et al., 2000). Cognitive impairment, especially its potential effect on a client's ability to attend, has been found to impact retention, whereby greater impairment is related to increased risk of drop-out (Aharonovich, et al., 2006). Furthermore, Paraherakis et al., (2000) reported that when comparing clients according to alcohol, cocaine, and opiate use, those clients addicted to opiates were found to attend treatment sessions less often and demonstrated lower abstinence rates. It is difficult to ascertain exactly why one addicted to opiates might demonstrate lower retention rates. It may be, again, idiosyncratic treatment needs associated with such a population. It may be related  
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to the cognitive impairment associated with opiate use which was cited earlier. Finally, the lower rates of retention associated with opiate use may be related to the fact that younger clients have been found to use opiates a higher rates than their older counterparts (Paraherakis et al., 2000). Seen this way, since age is implicated consistently in retention, opiate use may simply be a confounding variable. Still, when clients present with an opiate disorder or at the very least, use opiates just prior to treatment, this can be an indicator of a risk for drop-out.

Interestingly, in the present study, treatment completers demonstrated higher rates of an alcohol-only disorder. Similar findings have been shown in previous research which has suggested that when clients present for treatment with only alcohol use, their retention rates have been found to be higher than for clients who present with a comorbid drug disorder or a single drug disorder (Joe et al., 1999; McKellar et al., 2006).

There are a few potential explanations of this finding. One explanation may be related to the treatment philosophy employed by the program. As mentioned, the treatment program associated with this study is based upon the Minnesota Model of treatment; one that has a history of, and roots in, the treatment of alcoholism. It would seem logical to conclude that this program likely meets the treatment needs of those clients addicted to alcohol, perhaps contributing to such clients demonstrating higher retention rates. Similarly, if a

client presents with a co-morbid drug use disorder this may be indicative of more severe substance abuse. This more severe pattern of use, coupled with a treatment program that may not be tailored for such individuals, could result in higher drop-out rates for such clients.

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### *Dual Diagnosis*

Treatment completers and non-completers were found to demonstrate statistically significant differences based on psychiatric distress and diagnoses. Treatment noncompleters demonstrated higher rates of meeting criteria for an anxiety disorder, being dually diagnosed, and having a history of psychiatric treatment. Because meeting criteria for an anxiety disorder was a statistically significant predictor in each of the regression analyses, the discussion around this finding will be expanded upon in the subsequent section.

Substance abuse treatment clients presenting with a dual diagnosis are a common occurrence with documented rates around 63-69% (Castel et al., 2006; Chareny et al., 2005). Slightly more than half (51.6%) of the total sample of this study met criteria for both a substance abuse and other psychiatric disorder, but a higher rate was demonstrated specifically among treatment drop-outs (61%). Although this rate is slightly below what has been reported in the literature, it still indicates high levels of dual diagnosis. This is a noteworthy finding considering clients with a co-morbid psychiatric diagnosis also have been found to demonstrate more severe substance use disorders (Kessler et al., 1996). Comorbid psychiatric problems among substance abuse treatment populations are an important area of study as this population continues to grow (Osher, 2000), and yet, it remains a significant challenge to dissect the etiology and relationship between substance use disorders and co-morbid psychiatric disorders (Gossop, Marsden, & Stewart, 2006). In the present study, it was not investigated whether the clients with a dual diagnosis demonstrated more severe substance abuse problems, but it is not uncommon for individuals with psychiatric distress to cope with such symptoms by using drugs or

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alcohol. In turn, the use of such substances often exacerbates the psychiatric distress they are attempting to manage. It would not seem unlikely then, that the substance use also decreases one's ability to manage both the withdrawal effects of the substance and the psychiatric distress, resulting in a more severe substance use disorder. Such clients might be more difficult to retain for a variety of reasons. First, clients with co-morbid psychiatric diagnoses are typically not provided specialized substance use treatment that also incorporates the treatment of the psychiatric disorder (Hesse, 2009; Petrakis et al., 2002). Such individuals likely have unique treatment needs that may not be met when substance abuse and psychiatric treatment remain distinct (Charney, Paraherakis, & Gill, 2001). The finding that clients with histories of psychiatric treatment were more likely to drop-out of treatment is not entirely surprising. Having a history of psychiatric treatment suggests that such clients have struggled with both substance use and other psychiatric disorders; again, relating to the hypotheses postulated above that having such a history could increase one's risk of drop-out.

The explanation for higher attrition rates among those who present for treatment with a dual diagnosis is likely due to a constellation of factors. The factors may be related, but not limited to some of the following. When clients are focused on alleviating intense psychological distress they may be less engaged and/or invested in substance use

treatment. Further exacerbating this problem is the fact that people often abuse substances in an effort to alleviate psychological distress (albeit temporarily). Engaging in substance abuse treatment, abstaining from substance use, and identifying the reasons underlying one's use can be a stressful undertaking. Additionally, if the psychiatric distress is intense a client may be less apt to remain in treatment as it may simply feel too

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overwhelming to manage severe psychiatric distress while attempting to abstain from substance use. In fact, previous research has demonstrated that more severe psychiatric distress can negatively impact retention (Haller et al., 2002; Mertens & Weisner, 2000). Furthermore, psychological symptoms may interfere with a client's ability to self-regulate their behavior thereby making it more difficult to both remain in treatment and abstain from using substances. Finally, if the treatment program itself does not formally address a client's co-morbid psychiatric distress they may be dissatisfied and drop out feeling as though their treatment needs were not adequately addressed. Indeed, clients who met criteria for a dual diagnosis in the treatment program for this study may not have fared well, in part, due to the Minnesota model employed. This model has been contraindicated for clients who present with a dual diagnosis when the psychiatric distress has not been stabilized (Owen, 2003). When a client presents with active co-morbid psychiatric distress it might therefore be useful to immediately refer them to another department for add-on psychotherapeutic treatment of the co-morbid psychiatric distress while also utilizing the addictionologist on staff to remediate symptoms more rapidly, if possible, through the use of pharmacology. This way, three treatments could be taking place simultaneously, more holistically treating the client, while also potentially contributing to increased treatment retention if symptom remediation is successful.

#### *Significant Predictors in Regression Analyses*

There were two predictors, age and anxiety disorder, that were found to be statistically significant predictors in all three regression analyses. One predictor, meeting criteria for a cocaine disorder, was a statistically significant predictor in the logistic regression and survival analyses. One final predictor, total years of consistent alcohol

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use, was a significant predictor in the multiple regression analysis. As was previously stated, due to the considerable overlap in findings, each predictor will be examined in subsequent sections based upon how they may relate to time spent in treatment. The findings, as they apply specifically to the treatment program associated with this study, will be discussed in each of the following sections as well.

#### *Age and Treatment Drop-out*

Age was found to be a statistically significant predictor as it relates to treatment completion status, number of treatment days attended, and treatment duration. More specifically, it was found that with each decade increase in age the odds of dropping out of treatment dropped by about 1 ½ times. This is a significant finding when one considers that there was a 6 decade range among the sample. Similar findings have been reported in other studies. For example, one study indicated that in regards to age, "for each one-year increase in age, there was a 2.8% increase in the likelihood of completing treatment" (Siqueland et al., 2002, p. 29). A similar, decrease in risk was associated with this sample, in that with every year increase in age the risk of drop-out fell by 4%. These results suggest that the sample for this study is similar to the population in that younger age represents an increased risk for drop-out.

With people continuing to live longer, there will likely be a wider range of ages represented in substance abuse treatment; therefore, being aware of retention patterns related to age is important (Satre et al., 2004). The positive relationship between age and time spent in treatment has been one of the most robust findings in substance abuse treatment literature. Consistent with the findings of this study, older clients are found to be retained in treatment for statistically significantly longer periods and prematurely

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dropout of treatment less frequently than younger clients, regardless of the treatment modality (Chou et al., 1998; Green et al., 2002; Kavanagh et al., 1996; Mammo & Weinbaum, 1993; Mitchell-Hampton, 2006; Roffman et al., 1993; Rowan-Szal et al., 2000; Satre et al., 2004; Stark, 1992).

There are a number of possible explanations for younger clients being at an increased risk of dropping out of this treatment program. First, younger individuals have been found to use more substances, use a wider variety of substances, are less likely to have children who rely on them, and often are thought to possess a behavioral impulsivity not typically associated with more mature populations (Satre et al., 2004; Stark, 1992). Additionally, younger individuals may not have experienced as many problems as a result of their drug and alcohol use, and therefore may not see their use as a chronic problem (McKellar et al., 2006). Being surrounded by many young people who also use alcohol and drugs would likely only exacerbate this perception. Conversely, older individuals who have demonstrated chronicity of substance use may be more aware of the toll that drug and alcohol use can have on one's life by likely having experienced such effects, reinforcing the messages heard in treatment about consequences of use.

Furthermore, older individuals may be more aware of the potential risks associated with relapse from having more recovery attempts than their younger counterparts (Bishop, Jason, Ferrari, & Chen-Fang, 1998). One noteworthy conclusion regarding age and retention is the positive concept that older adults are more likely to be retained. And although older adults are likely to represent a smaller percentage of substance abuse treatment clients (Satre et al., 2004), their presence in the therapeutic milieu could be used as a positive model for their younger counterparts. A real-world application of this

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conclusion is that the treatment program could implement a mentoring program as a way for older clients to work closely with younger clients and model more favorable treatment attendance patterns.

In summary, the positive relationship between age and retention appears to be a generalizable finding across populations and treatment centers, and has been coined the "indisputable factor" related to substance abuse retention (Saarnio & Knuuttila, 2003). Consequently, the relationship between age and treatment drop-out has noteworthy clinical implications. The results of this study (and others) suggest that this treatment program can be fairly confident in assuming that when younger clients present for treatment they are automatically at an increased risk for dropping out of treatment. Incorporating a mentoring approach with some of the older clients in treatment could assist younger individuals in engaging and remaining in treatment. Additionally, following up with younger clients who dropped out of treatment could provide some useful information as to the reasons behind it. No literature could be found on specific treatment approaches geared towards younger populations. Studying and developing a unique treatment approach for younger substance abusing populations could have a

significant directional impact on the future of substance abuse treatment.

Moreover, future research could look to compare and contrast effective substance abuse treatment approaches for adolescents and adults to inform the development of a specific approach with young adults. Working with younger clients to retain them in treatment could have far-reaching positive effects. Improved retention rates for younger clients should improve the outcomes associated with the treatment episodes. Improved treatment outcomes earlier in the clients' lives will mitigate the ill effects of long-term

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substance abuse. A good starting point in this approach would be to identify methods for establishing a solid therapeutic alliance as early as possible with younger clients.

Additionally, linking younger clients with community support could also be beneficial.

Historically, AA and NA support groups have been attended by older populations (Saarnio & Knuuttila, 2003). It may be beneficial to determine an approach for engaging younger clients in these groups so as to provide an additional protective factor for recovery (Saarnio & Knuuttila, 2003). A potential positive shift is that it appears as though younger individuals are beginning to tap into community 12-step programs at higher rates. For example, Narcotics Anonymous reported that most of their attendants are between the ages of 30-50 (NA World Services, 2007), however, it has also been reported that the median age of its members is decreasing (South Coast Recovery, 2008). Identifying community support options that attract younger members could help keep them engaged in the recovery process. Indeed, this recommendation aligns particularly well with the guiding principles of the treatment program associated with this study since it encourages the seeking out and attending of AA and other community support groups.

#### *Anxiety and Treatment Drop-out*

Being diagnosed with an anxiety disorder was found to be predictive of treatment drop-out, fewer treatment sessions attended, and a shorter duration of treatment. These results suggest that having an anxiety disorder is a significant risk factor for clients seeking treatment at the program utilized for this study. Although a fair amount of research has been conducted on co-occurring substance use and psychiatric disorders, a substantial portion of this research has focused primarily on depressive disorders coupled with substance use disorders (Gossop et al., 2006). This largely singular focus on

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depression has persisted despite the fact that substance abuse treatment populations commonly demonstrate anxiety disorders, paranoid ideation, and even psychoticism (Gossop et al., 2006). And although a high percentage of clients in this sample met criteria for a depressive disorder, this was not found to be related to treatment duration or drop-out. On the other hand, those who met criteria for an anxiety disorder demonstrated statistically significantly shorter stays and were more likely to drop out.

Anxiety is commonly reported among substance abuse treatment populations as it has been found to be related to both alcohol and cocaine use. For example, the National Epidemiologic Survey on Alcohol and Related Conditions (2006) indicated that about 20% of Americans with a current anxiety disorder also have a current alcohol or other substance use disorder. Co-morbid anxiety was common in this sample as well. Almost a third (29.6%) of the total sample for this study met criteria for an anxiety disorder and almost two-fifths (39.3%) of those who dropped out of treatment met criteria for an anxiety disorder. The common affiliation of anxiety and substance use is perhaps due in part to the "bidirectional" relationship that exists between the two. For example, alcohol

is commonly used to manage anxiety symptoms and then in turn results in additional anxiety symptoms during periods of withdrawal (Brady, Tolliver, & Verduin, 2007). Even though fewer studies have been conducted investigating anxiety and treatment retention, other studies have found anxiety to be related to time spent in treatment. For example, Doumas, Blasy, and Thacker (2005) reported that clients in an intensive outpatient program with co-morbid anxiety were more likely to drop out of treatment than those clients free of anxiety. Other studies have reported different findings whereby a diagnosis of an anxiety disorder was associated with longer treatment episodes and

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treatment completion (Curran, et. al., 2002). Despite limited research being conducted on anxiety and retention, this study suggests that anxiety and participation in substance use treatment are tied. At the very least it can be assumed that the anxiety often triggered or exacerbated by the ceasing of regular substance use could in turn result in avoidance strategies (i.e., leaving treatment), especially when a common requirement of treatment is abstinence.

An additional explanation of this finding may be related to the treatment modality employed at the treatment center. As was noted, all treatment takes place in group format, often in the upwards of 10-12 members per meeting (depending on census). If a client is struggling with symptoms of anxiety, being in a group setting may only exacerbate this. Further, symptoms of anxiety are generally much higher during the early phase of abstinence (Brady et al., 2007). This increase in symptoms, coupled with entering a group before rapport can be built, would likely only aggravate the anxiety disorder while also negatively impacting treatment effect. For example, if a client is struggling to manage acute anxiety symptoms s/he will not be able to focus appropriately on group content compromising positive treatment effects.

Still, some of the difficulty in deciphering the meaning behind the lower retention rates among the sample for this study may be due to the variety of anxiety disorders represented by this variable (e.g., OCD, PTSD, Panic Disorder, and Social Anxiety). It is unknown if clients with a particular anxiety disorder were more likely to drop-out than those with a different anxiety disorder. It would not seem unreasonable to assume that clients who present with a co-morbid PTSD disorder may likely have distinct treatment needs from another client who presented with co-morbid social anxiety. Related, because

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the treatments of different anxiety disorders are often distinct, such clients are not likely to receive this type of treatment in an intensive outpatient substance abuse program. If these clients do not also seek out a psychotherapeutic add-on treatment, removing the substance use, which is likely a primary coping mechanism, might only exacerbate the anxiety disorders symptoms; in turn they may cope by avoiding treatment, putting them at risk for drop-out. The finding that meeting criteria for an anxiety disorder is predictive of shorter stays in treatment has applied value for the treatment program as this can be viewed as a risk factor indicating possible premature treatment drop-out. At the very least, this information can be used by clinicians to assist their clients in developing a plan to address both their substance use and anxiety.

It should be noted that the best treatment approach for co-occurring substance use and mood and anxiety disorders has yet to be determined. The industry has seen a forward movement to integrate substance abuse and psychiatric treatment, as opposed to keeping them distinct as historically has been the case (Hesse, 2009). This is in part due

to the fact that substance abuse treatment seeking individuals fare better when substance abuse treatment addresses underlying psychiatric disturbance that does not remit when abstinence is achieved (Rounsaville & Kleber, 1985; Woody et al., 1984). Furthermore, as was indicated in Chapter 3, the treatment program utilized for this study employs an abstinence based program adopting components of the Minnesota Model of treatment. The Minnesota Model treats chemical dependency as the primary problem (Winters, Stinchfield, Opland, Weller, & Latimer, 2000). Not surprisingly, this treatment program also treats the substance use disorder as the primary problem. Although it is certainly understandable that a substance abuse treatment program would consider the SUD as the

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primary issue to address, this does not mean that co-morbid psychiatric distress will not interrupt this process. Indeed this hypothesis may be why the Minnesota Model of treatment has been contraindicated for individuals with un-stabilized co-morbid psychiatric distress (Owen, 2003). This notion, coupled with this study's finding of the relationship between anxiety and dropout suggests that the program may want to consider altering components of their treatment approach. If the program has sufficient resources available to provide integrated treatment, it is hypothesized that it could be extremely beneficial for clients. If resources are not available to facilitate integrated treatment, the program could still make efforts to ensure that clients with a co-morbid anxiety disorder have a psychotherapeutic add-on treatment. Considering the treatment program associated with this study has on-site departments that treat other types of psychiatric disorders, it may be beneficial to refer clients with a co-occurring anxiety disorder to another department in the hospital. This way, even if the treatment itself is not integrated, staff could consult and work together in the planning and delivering of treatment to such clients.

Finally, an additional useful pursuit may be working with clients to tolerate the distress often associated with anxiety. Clients in general could benefit from learning behavioral techniques that have been found to assist with distress tolerance, which might also be a useful skill in relapse prevention. For example, individuals with lower levels of distress tolerance have been found to demonstrate shorter periods of abstinence from cigarettes (Brown, Lejuez, Kahler, & Strong, 2002). If the primary coping strategy of substance use is taken away, a new coping strategy is not provided, and distress tolerance training is not implemented, then individuals experiencing symptoms of anxiety may

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begin to avoid treatment. This is noteworthy as when substance abusing individuals demonstrate avoidant coping strategies it has been found to predict negative outcomes (Ireland, McMahon, Malow, & Kouzekanani, 1994). Assisting clients by both (1) replacing the unhealthy coping strategy of substance use with an alternative, while (2) also teaching them to tolerate stressful and uncomfortable emotions could be helpful. Clients suffering from anxiety disorders may particularly benefit from distress tolerance training due to the bidirectional mechanism associated with anxiety and substance use described earlier. Teaching distress tolerance to clients may improve retention. Individuals who demonstrate higher degrees of distress tolerance have been found to persist in treatment for longer periods than those demonstrating lower distress tolerance (Daughters et al., 2005).

#### *Cocaine Disorder and Risk of Drop-out*

In the sample for this study, meeting criteria for a cocaine disorder was found to

be predictive of treatment drop-out status and a shorter time spent in treatment. This finding has emerged in previous research, which has suggested that having a cocaine addiction is related to decreased retention (Alterman et al., 1996; Fletcher et al., 1997; Sapadin, 2006; Veach et al., 2000; White, Winn, & Young, 1998). It may not just be the type of drug disorder, but the type of treatment program attended by people with distinct drugs of choice that impacts retention. For example, research has indicated that clients engaged in intensive inpatient substance abuse treatment, whose primary substance of abuse was not alcohol, were statistically significantly more likely to drop out of treatment than those clients with alcohol as their primary drug of choice (Wickizer, et al., 1994).

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The reasons behind why clients in this sample who met criteria for a cocaine disorder were at an increased risk of drop-out remain elusive. Explanations of this phenomenon in other treatment populations have focused primarily on treatment approaches that are deeply rooted in the AA model, which is associated with a large number of substance abuse treatment centers in the United States (Sapadin, 2006; Veach et al., 2000). Although a large number of centers, like the one utilized for this study, employ treatment models that are grounded in AA theory and approach, they still treat clients with drug disorders, expanding the model to include illicit drugs. Individuals with cocaine disorders may very well have specific treatment needs that are distinct from those individuals only addicted to alcohol. For example, it may be that the impulsivity often linked to cocaine use impacts one's ability to remain focused in treatment. Addressing a unique characteristic such as impulsivity might improve their retention rates. The theory that retention can be impacted by exposing clients with drug disorders to a treatment approach not specifically designed to treat such clients could apply to the sample of this study since the treatment method is rooted in the principles of AA. Not surprising, AA principles were designed to specifically treat alcohol use disorders, therefore, they may not be automatically applicable to individuals with a drug use disorder. . Indeed, alcohol dependent individuals have been found to be retained for longer periods than drug dependent individuals when a Minnesota Model of treatment (an approach based on principles of AA) was employed (Veach et al., 2000). A similar finding was uncovered in this study whereby those clients who were diagnosed with only an alcohol disorder were more likely to complete treatment. Again, this supports the hypothesis that treatment

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programs rooted in AA may meet the treatment needs of those clients who present with an alcohol use disorder better than those with a drug use disorder.

Furthermore, a majority of the clients in this sample met criteria for an alcohol disorder (74%) and a minority for a cocaine addiction (22%). Being in the minority, those clients with a cocaine disorder may find it challenging to identify with other clients in the treatment program who struggle with an alcohol addiction. This lack of universality among cocaine dependent individuals, coupled with a treatment approach rooted in treated alcohol disorders, could potentially relate to their increased risk of drop-out. Finally, considering that cocaine use is illegal, it may be that those individuals who met criteria for a cocaine disorder lead a more antisocial lifestyle than clients addicted to alcohol. Antisocial personality traits and/or lifestyle characteristics are not likely to mesh well with the regimented treatment approach associated with most centers (White et al., 1998). Antisocial personality disorder has been found to be linked to lower treatment completion rates (Mueller & Wyman, 1997). This is not to say that someone with a

cocaine disorder will automatically have an antisocial personality or traits, but using an illicit substance does demonstrate a tendency to operate outside of accepted social norms, in this case legal boundaries. Seen this way, such individuals may have a more difficult time “buying into” a treatment process that they perceive is based upon a misplaced cultural value that the use of illicit substances is inappropriate.

Treatment implications of these findings suggest that it may be useful to link clients up with others who use and are addicted to similar substances for support. The finding that clients who met criteria for an opiate disorder were more likely to drop-out of treatment may also support this recommendation. It may be useful to provide periodic

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brief motivational interviewing interventions with clients who meet criteria for a cocaine and/or opiate disorder. Such a brief approach has been found to improve drug use rates among cocaine and heroin addicted individuals (Bernstein et al., 2005), and could assist with treatment retention efforts. Additionally, reinforcing the importance of attending NA or CA (Cocaine Anonymous) meetings outside of the regular treatment meetings may help individuals with cocaine addictions to connect with a larger community of those in recovery that may be more similar to themselves. Talking with individuals who meet criteria for a cocaine disorder about their treatment needs may also be helpful, especially during times when such clients might feel as though their treatment needs are not being met. “Resistant behaviors” might be indicative of clients feeling as though treatment is not working for them (Teyber, 2005). This type of behavior could include sporadic attendance or decreased contribution and engagement during group session. When clinicians note such behaviors, an individual session could be scheduled with the client to discuss potential concerns. A useful client-centered approach to explore such concerns would be motivational interviewing, as a way to both gain information while also minimizing defensive reactions from clients. Any identified themes derived from such interviews could be implemented into practice if feasible.

For example, client motivation has consistently been implicated as being positively related to retention and time spent in treatment (Brocato, 2004; Broome et al., 1999; Simpson & Joe, 2004; Simpson et al., 1997). And although there are a variety of ways in which motivation is defined (i.e., external vs. internal), this study included a motivation measure of “readiness for change”, which was not found to be predictive of treatment drop-out. This then begs the question: what else is predictive of individuals dropping out of treatment that the current variable set is not revealing? There are a number of possibilities and few of the potential factors will be described below.

First, an unknown in this study is the impact of treatment variables on client retention. Program specific and treatment specific factors have recently gained attention in research efforts as potentially relating to client retention. The link appears clear: if

clients are not satisfied with the treatment program in which they are engaged, they are not likely to continue with treatment. Certainly client satisfaction with service offerings can impact premature drop-out. In fact, Hser et al. (2004) reported strong relationships between treatment intensity, client satisfaction and, in turn, treatment retention.

Interestingly, clients who entered treatment with greater problem severity reported greater satisfaction with treatment services rendered. The authors hypothesized that this increased satisfaction was directly related to the fact that clients with greater problem severity received more services; when clients were offered and utilized more services, they reported greater satisfaction with treatment.

### *Therapeutic Alliance*

As other psychotherapeutic research has demonstrated (Martin, Garske & Davis, 2000), the therapeutic alliance is important in improving treatment retention and outcomes. Meier, Donmall, McElduff, Barrowclough, and Heller (2006) reported that substance abuse treatment clients often leave treatment prematurely and outcomes suffer when they are unable to establish a solid therapeutic relationship early on with their therapists. Meier et al. (2006) determined that clients who had weaker alliance ratings with their counselor were more likely to prematurely drop out of treatment than those clients who rated their alliance as strong. Furthermore, the counselors' rating of the therapeutic alliance was found to be the strongest predictor of treatment drop-out. Meier, Barrowclough, and Donmall's (2005) review of the literature on the role of the therapeutic alliance in drug treatment found moderate effect sizes of the alliance (accounting for 5%-15% of the variance) in predicting retention. It appears that the therapeutic alliance is a particularly important component of drug treatment when the client enters treatment while experiencing psychiatric distress. When clients entered treatment with no or minimal psychiatric distress the therapeutic alliance did not appear to be related to treatment completion. On the other hand, when clients entered treatment with moderate or severe psychiatric symptoms, those who had a good alliance with their counselor were retained until completion 75% of the time versus 25% of the time for

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those with weak alliances. Even when the therapeutic alliance has not been found to be a direct predictor of retention, studies have suggested that it plays a mediating role impacting clients' motivation to change, which in turn is positively related to retention (Brocato & Wagner, 2008). The aforementioned findings may be particularly noteworthy as they relate to this sample considering such a large percentage of the clients were dually diagnosed and/or met criteria for an anxiety disorder, which was consistently linked to treatment dropout.

These studies point to the importance of offering treatment program services that are perceived as helpful by clients. When clients are satisfied with the services they receive, it can directly impact a program's ability to retain them. After all, substance abuse treatment is a service provided to consumers, and if the consumers are not satisfied with that service they are not likely to continue participating in it. Programs that offer services that adequately address the needs of clients by reducing distress and improving functioning stand to improve retention rates. One way in which programs can focus on improving client retention and possibly program satisfaction is by utilizing counselors

who are able to establish solid, positive therapeutic alliances with their clients. This is an area of future research that warrants additional study.

#### *Interactions of Client and Program Factors*

It is evident from the cited literature in this section that client and program factors are both related to retention. It is important to note, however, that neither exists in a vacuum; different program characteristics will likely impact clients differently. Unfortunately, little research has examined this interaction. Chou et al. (1998) investigated how client and program characteristics interact to impact overall retention.

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They included three client attributes (e.g., gender, age, drug use level) and three program characteristics (e.g., service provision, funding, staff-client gender matching). Results demonstrated that younger male clients with increased drug severity were more likely to prematurely drop out of drug-free outpatient treatment. Additionally, female clients were more likely to remain in programs that accepted both public and private funding (versus simply public funding). These results imply that the interactions between client and program characteristics that are linked to retention are complex and, as the authors suggest, future research should look to include more variables since this is a significantly understudied area.

#### *Client Impulsivity*

Impulsivity has been defined as “a predisposition towards rapid, unplanned reactions to internal or external stimuli with diminished regard to the negative consequences of these reactions to the impulsive individual or others” (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001, p. 1783). Impulsivity has been linked to substance abuse in the literature, and is believed to be both a facilitator and result of drug use (DeWit, 2009). The link between impulsivity and substance abuse treatment retention is less clear however. Nonetheless, impulsivity has increasingly become a focus in the general arena of substance abuse and may very well be related to length of stay in treatment. At the very least, impulsivity has been found to be associated with chronic substance use and a contributor to relapse (Ersche, Roiser, Robbins, & Sahakian, 2008; Perry & Carroll, 2008).

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Further, impulsivity has been found to be related to age; the younger individuals are, the more impulsive they tend to be, which has been found to predict alcohol use disorders (Littlefield et al., 2009). Impulsivity has also been implicated as a risk factor associated with developing a cocaine addiction (Lejuez, Bornovalova, Reyonlds, Daughters, & Curtin, 2007). Exacerbating the problem, the earlier one develops a cocaine disorder and the more chronic their use, the more impulsive such individuals tends to be, and the more intense withdrawal effects they tend to experience (Ahmadi, Kampman, Dackis, Sparkman, & Pettinati, 2008). The link seems reasonable; if younger clients and those who met criteria for a cocaine disorder are found to be more impulsive, relapse becomes more probable and therefore, so does treatment drop-out. Individuals with higher levels of impulsivity may simply decide that treatment is no longer necessary and are more likely to relapse. Younger impulsive clients may struggle with sobriety, especially when surrounded by peers, who are also using, increasing the likelihood of dropping out of treatment. The bottom line is that for a younger individual addicted to cocaine, the rewards associated with substance abuse treatment may appear insignificant

when compared to the immediate gratification associated with cocaine use (Potenza, 2007). Perhaps exacerbating the problem, cocaine use has also been found to result in enduring impulsive decision making even after the drug is no longer being used (Simon, Mendez, & Setlow, 2007). This suggests that even clients with only historical use of cocaine could still be presently at-risk for making impulsive decisions about remaining in treatment.

There were a number of limitations associated with this project. First, the percentage of clients that dropped out of treatment (41%) is lower than what has generally been reported in the literature for outpatient treatment, which has been found to range from around 60% to 75% (Justus et al., 2006; Sayre et al., 2002; Siqueland et al., 2002; Wickizer et al., 1994). Even though some investigations have reported retention rates of around 50%, this is a minority of the literature focused on intensive outpatient populations (Dobkin, De Civita, Paraherakis, & Gill, 2002; Green et al., 2002; Mammo & Weinbaum, 1991). It should also be reiterated however, that the 444 clients who matriculated through the program during the data collection process (i.e., those tested and *not* tested for the study) demonstrated an overall drop-out rate of 51%. This percentage is closer to the cited averages found above, but again, still lower than what is generally associated with outpatient treatment.

Table 13

*Statistically Significant Results, Clinical Implications and Fit with Literature*

**Statistically**

**Significant Variables Findings**

**Clinical Implications and**

**Recommendations**

**“Fit” with Previous**

**Research**

**Demographic Characteristics**

Age Younger clients

dropped out of

treatment more

than older

clients. Age was

a positive

predictor of

treatment

completion

status, number of

treatment days

attended, and

total duration in

treatment.

The treatment program can

be quite confident that young

clients are at increased risk

of drop-out.

Meet with young adults early

on one-on-one to establish

strong working alliance.

Establish a mentoring

approach in treatment

whereby younger clients are

paired up with older adults

who have demonstrated

abstinence and treatment

commitment.

The positive

relationship between age and treatment duration is one of the most robust findings in substance abuse treatment retention literature (Chou et al., 1998; Green et al., 2002; Kavanagh et al., 1996; Mammo & Weinbaum, 1993; Mitchell-Hampton, 2006; Roffman et al., 1993; Rowan-Szal et al., 2000; Satre et al., 2004; Stark, 1992).

Marital Status Unmarried clients dropped out of treatment more often than married clients.

Help unmarried clients identify a supportive person in their life that can act as an accountability source. For example, a spouse could act as a motivational source to stay in treatment.

Being married has been associated with better retention in previous research (Broome et al., 1999; Curran et al., 2007; Siqueland et al.).

Income Clients with lower incomes (30 days prior to intake) dropped out of treatment more often than clients with higher incomes.

Clients with lower incomes may not be able to miss work to attend an intensive outpatient program regularly. Similarly, such clients may not have enough income to supplement treatment or pay for things like child care. Setting up lower income clients with a staff social worker could assist with peripheral planning.

Income has been found to be positively related

to time spent in treatment in other research efforts (Green et al., 2002; Mertens & Weisner, 2000; Roffman et al., 1993; Siqueland, 2002; Weisner et al., 2001).

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**Statistically Significant Variables Findings Clinical Implications and Recommendations “Fit” with Previous Research**

**Recent Drug Use**

Recent Use of:

- Marijuana
- Cocaine
- Hallucinogens
- Heroin

Clients who used marijuana, cocaine, hallucinogens, or heroin during the 30 days prior to treatment were more likely to drop out of treatment than those who did not use those drugs.

Recent drug use could indicate a more severe disorder. Increased drop-out might be related to Minnesota treatment model employed. Connecting new clients who use drugs with other drug using clients who have demonstrated good attendance could help increase universality with this minority group.

Drug use close to the point of treatment intake has been found to negatively impact client retention (Alterman et al., 1996; Paraherakis et al., 2000; White, Winn, & Young, 1998).

**Alcohol Use**

Years of Regular

Alcohol Use  
Years of regular  
alcohol use was  
negatively  
predictive of  
number of  
treatment  
sessions  
attended.

Chronic alcohol use can  
impair cognitive functioning  
perhaps resulting in  
decreased ability to attend.

The group may also represent  
a “treatment resistant” group  
that does not respond as  
favorably to treatment.

Literature confirms that  
chronic substance use  
has been found to be  
negatively related to  
time spent in treatment  
(Alterman, McKay,  
Mulvaney & McLellan,  
1996; Lang & Belenko,  
2000; Maglione et al.,  
2000b; Marrero et al.,  
2005; Mertens &  
Weisner, 2000;  
Westreich, Heitner,  
Cooper, Galanter &  
Gued, 1997).

#### **Drug Use Disorder**

Cocaine or Opiate  
Disorder

Meeting criteria  
for a cocaine or  
opiate disorder  
was associated  
with increased  
risk of drop-out  
and shorter stays  
in treatment.

Increased drop out might be  
related to the treatment  
program’s philosophy.

Clients with a cocaine or  
opiate disorder may  
demonstrate cognitive  
impairment or increased  
impulsivity, which may  
impact drop-out. Clients who  
meet criteria for a drug use  
disorder might benefit from  
motivational interviewing  
strategies.

Cocaine and Opiate use disorders have been indicated as negatively influencing time spent in treatment (Fletcher et al., 1997; Paraherakis, et al., 2000; Sapadin, 2006; Sinqueland et al., 2002; Veach et al., 2000).

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### **Statistically**

### **Significant Variables Findings**

### **Clinical Implications and**

### **Recommendations**

### **“Fit” with Previous**

### **Research**

### **Psychiatric Co-Morbidity**

Dual-Diagnosis Clients who met criteria for a dual diagnosis were more likely to drop out of treatment.

Dual diagnosis could impact retention if the psychiatric symptoms are not stabilized or treated concurrently with the substance use disorder. If integrated treatment cannot be offered, retention may be improved by: (1) referring clients to other departments at the hospital (2) have such clients meet with the addictionologist on staff for pharmacology add-on.

Previous research demonstrates conflicting results, with some researchers finding decreased retention rates among dually diagnosed clients (Curran et al., 2002) and other studies reporting higher retention/completion rates among those dually diagnosed (Broome et al., 1999; Justus et al., 2006).

Anxiety Disorder Meeting criteria for an anxiety disorder was predictive of treatment dropout, shorter

treatment stays,  
and fewer  
treatment days  
attended.

Anxiety and substance use  
have a bidirectional  
relationship whereby one  
negatively influences the  
other. Treatments that ID  
the SUD as the primary  
problem have been  
contraindicated for dually  
diagnosed clients if  
psychiatric distress is not  
stabilized. This suggests  
that integrated treatment  
may be a positive future  
direction this treatment  
program could consider.

Previous research has  
demonstrated conflicting  
results suggesting that  
having an anxiety  
disorder is associated  
with shorter (Doumas et  
al., 2005), and longer  
stays (Curran et al.,  
2007) in treatment. More  
research has been  
conducted on substance  
abuse treatment  
retention and co-morbid  
depressive disorder.

History of Psychiatric  
Treatment

Clients with a  
positive history of  
psychiatric  
treatment were  
more likely to  
drop out of  
treatment.

Having a history of  
psychiatric treatment  
suggests that these clients  
may also be at-risk of comorbid  
psychiatric distress  
which could negatively  
impact treatment retention.

Additionally, individuals  
with psychological distress  
also tend to demonstrate  
more severe substance use  
disorders, which could be  
related to the increased risk  
of such clients dropping out.

No literature could be found linking previous psychiatric treatment to retention problems, but the literature listed previously in the dual diagnosis and anxiety sections likely also apply here since having a history of psychiatric treatment could likely be linked to dual diagnosis issues.

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