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# Predicting Initial Mental Health/Substance Abuse Treatment Attendance in HIV/AIDS Patients: An Exploration of Risk Factors

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Philadelphia College of Osteopathic Medicine

Department of Psychology

PREDICTING INITIAL MENTAL HEALTH/SUBSTANCE ABUSE TREATMENT  
ATTENDANCE IN HIV/AIDS PATIENTS: AN EXPLORATION OF RISK FACTORS

By Rachel D. Amodio

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

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**PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE  
DEPARTMENT OF PSYCHOLOGY**

**Dissertation Approval**

This is to certify that the thesis presented to us by \_\_Rachel Dawn Amodio\_\_\_\_\_  
on the \_\_\_29th\_\_\_ day of \_\_\_May\_\_\_, 2013\_, in partial fulfillment of the requirements for  
the degree of Doctor of Psychology, has been examined and is acceptable in both  
scholarship and literary quality.

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## Abstract

This study attempted to predict mental health/substance abuse treatment initial appointment attendance, utilizing specific social, provider, institutional, medical, and psychological risk factors through the use of a logistic regression model. The initial frequency analysis revealed that only 155 individuals were ever scheduled to attend an appointment of the original data set (N=298). The majority of individuals could not be scheduled due to unavailability, disinterest, latency and other reasons. A new data set was created from individuals who were scheduled and variables were collapsed across categories to include: length of wait time to appointment, CD4 count, prescribed medications, reason for referral, and past history/ current substance abuse in the model. This study did not find any of the identified risk factors or the proposed model ( $\chi^2(6, N=155) = 5.66, p = .46$ ) to be significantly predictive of treatment attendance. However, the clinical implications of pre-treatment dropout (or never attending) in this study support the importance of a behavioral health model of treatment. The findings of this study suggest pre-treatment dropout could be decreased with integrated treatment in the primary care setting, especially for HIV/AIDS patients.

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## Chapter 1

Problems with treatment adherence have been a concern in the medical and psychiatric treatment communities for decades. The effectiveness of advanced medical technology and evidence-based treatment practices continue to be undermined by treatment non-adherence. Adherence was originally defined and referred to as “compliance”. The term “compliance” has largely been abandoned in recent years, given its implication of submission by or coercion of patients (Vermeire, Hearnshaw, Van Royen, & Denekens, 2001). However, even with the introduction of the term “adherence”, the majority of research focused on criticizing the patient’s role in treatment. For example, reasons for non-adherence were first conceptualized as the *patient’s misunderstanding*, dependent personality style, or laziness (DeGood, 1983). More recently, treatment adherence research has focused on provider variables (such as individual therapist factors and treatment deliverance issues (Pekarik, 1992), strength of patient-provider relationships (Preau et al., 2004), and other social, institutional, psychological, and medical factors (Hampton-Robb, Qualls, and Compton, 2003; Sirey et al., 2001; Westmacott and Hunsley, 2010).

Adherence is broadly defined as a situation in which a patient’s behavior coincides with treatment recommendations (Nose, Barbui, & Tansella, 2003). Treatment adherence includes but is not limited to: taking medications as prescribed, implementing lifestyle changes and treatment regimens, and attending treatment appointments (DiMatteo, Giordani, Lepper, & Croghan, 2002). Non-adherence can be defined as failure to initiate treatment, prematurely terminating treatment, and not adequately implementing treatment recommendations (Nose et al., 2003).

Overall rates of adherence can also vary, depending on the operational definition of adherence per study, as well as using direct and/or indirect measures. Claxton, Cramer, and Pierce (2001) classify patients into 3 categories: full compliers (defined as those who take the necessary amounts of

medication to control their disorders), partial compliers (those who take regular dosages but not at a consistent level in order to control the disorders), or non-compliers (those who take few or no dosages, which does not improve or control their disorders). These authors cite that due to variations between medication thresholds and symptoms of disorders, a baseline or “cut-off” percentage for adherence cannot be universally applied. The exception is HIV/AIDS; the current recommendation from the International AIDS Society-USA Panel maintains that a rate of least 95% adherence to antiretroviral therapy is needed for best results (Thompson et al., 2012). However, rates can vary between studies. For example, Lewis, Colbert, Erlen and Meyers (2006) examined the medication-taking behaviors and attitudes of individuals with HIV who were determined to be 100% adherent to their prescribed antiretroviral treatments. Total adherence was defined in this study as an individual taking all of the correct, prescribed dosages within a 30-minute window per dose for 30 days. This study used electronic event monitoring (EEM); each prescription bottle had a chip that recorded the number of pills left and also time it was opened and this information could be downloaded. Measurement of medication by prescription bottle devices is one of the more common direct measures of adherence within the medical community.

Other measures of direct medical adherence include chemical markers, metabolites, and bodily fluids. Although these measures may be more accurate than self-report, they are considered invasive and costly (Vermeire et al., 2001). More commonly used are those indirect methods such as interviews, diaries, tablet counts, dates of prescriptions filled, and outcome measures. The only direct way of measuring treatment adherence in mental health, which can be completed retroactively or prospectively, is treatment attendance.

### **Mental Health Treatment Attendance**

Treatment non-attendance is not an issue exclusive to medical fields. However, when working within a specialty such as psychiatry and mental health, the referral process may pose an additional barrier to initiating treatment. Often there is a failure to follow through with the referral to psychiatric treatment, once the physician has completed the referral. Killaspy, Banerjee, King and Lloyd (1999) found that after the referral from the general practitioner is complete (through documentation), no further responsibility of care for a patient is evident on the general practitioner's end. This lack of communication can pose a greater risk for patients who have difficulty engaging in treatment and may need additional support. However, even if patients follow up with the mental health referral, it was discovered that 50% of patients referred for psychiatric consultation from their physicians missed their initial appointments ( Grunebaum et al., 1996). In a national survey of more than 1200 adults suffering from various mental health issues, Edlund et al. (2002) found an average mental health treatment drop-out rate of 20%. Estimations on patients who seek to terminate treatment prematurely have varied between 22% (Olfson et al., 2009) and 50% (Westmacott & Hunsley, 2010). Attendance has been operationally defined in a variety of ways, including pre-treatment dropout or initial non-attendance (e.g., missing first scheduled appointment), ( DeGood, 1983; Folkins, Hersch, and Dahlen, 1980; Grunebaum et al., 1996; Hampton-Robb, Qualls, and Compton, 2003; Kruse, Rohland, and Wu, 2002; Peeters and Bayer, 1999; Raynes and Warren, 1971) on-going or sporadic attenders (Claus and Kindleberger, 2002; Killaspy et al., 2000; McKellar, Kelly, Harris, and Moos, 2006; Reardon, Cukrowicz, Reeves, and Joiner 2002) and treatment drop-outs or premature termination ( Agosti, Nunes, and Ocepeck-Welikson, 1996; King and Canada, 2004, Ogrodniczuk, Piper, and Joyce, 2006; Olfson et al., 2009; Westmacott and Hunsley, 2010).

**Initial Appointment Attendance.** Failure to keep the initial scheduled appointment (otherwise known as no-show) or intake is a frequent occurrence, yet it is rarely studied. Implications of this result in the patient not receiving proper treatment, in a loss in time, in finances, and in client availability for clinicians (Hampton-Robb et al, 2003). Hampton-Robb et al. investigated Initial psychiatric appointment adherence rates in an outpatient clinic affiliated with a medical college and found that 37% of scheduled patients did not attend the initial session. Forty-six percent of those who did not attend did not cancel their appointments (no-showed), as compared with 54% who did cancel. Both referral source and annual income were found to predict attendance significantly in a model.

Kruse, Rohland, and Wu (2002) found a similar rate; 36% of individuals who were referred and scheduled missed their initial scheduled appointments. However, predictors in this study differed. Being younger, Hispanic, of poor socioeconomic status, not taking psychotropic medications, and having health insurance were found to predict non-attendance significantly. However, it is important to point out that the referrals in this study were from a state agency, not from the patient's personal physician. It is interesting to note that the same rate of non-attendance to the initial appointment (36%) was found by Killaspy et al. (2000), which was less than follow-up appointment non-attendance (40%). The only significant difference between groups was that those who did not-attend follow-up appointments had been previously committed under mental health laws. Reasons for non-attendance for both groups in this study were cited as forgetting, being too psychiatrically unwell to attend, unhappy with referral, clerical error, and medically ill.

Grunebaum et al. (1996) reviewed charts of patients who were referred for psychiatric consultations from a university-affiliated primary care clinic and found that 50% (N=90) of patients missed their scheduled appointments. Significant predictors of non-attendance were patients with self-

reported mild distress, resistance to seeing a psychiatrist, and longer wait period between referral and appointment.

Peeters and Bayer (1999) examined reasons for no-show as well as rates for no-show to an initial intake appointment in a community mental health center in the Netherlands. Only 9.6% were found to no-show to their initial appointments, which is very low, as compared with rates in the US. Non-attenders tended to have been referred for services by someone other than their general practitioners or themselves, as well as being referred to the clinic for the first time. A questionnaire sent to these individuals at a later time about their reasons for no-show yielded the majority of responses which cited, too long a wait time, lack of motivation for treatment, problem solved before appointment, other reasons, and transportation/scheduling issues.

Folkins, Hersch, and Dahlen (1980) randomly assigned self-referred adult outpatients who called a community mental health center in the San Francisco area to three separate groups; the wait time was 3 days or less (group one) , 6-8 days (group two) , or 16-19 days (group three). The no-show rate for group one was 24%, group two 38%, and 54% for group three. The trend in these rates clearly indicates that as wait time increased, non-attendance to the initial appointment increased as well.

Raynes and Warren (1971) examined adult outpatients referred for mental health treatment from their medical practitioners at a free clinic. It was found over the course of a year, 40% of new patients referred to the clinic did not attend their initial scheduled intakes. This study is of interest because the charted waiting periods extended from 0-5 days up to 31-35 days. A trend was clearly evident for the increase in non-attendance with the increase in time. The lowest rate (37%) was found at 0-5 days, with the highest rate (75%) at 31-35 days.

**Ongoing Appointment Attendance.** Ongoing attendance is significantly different from that of initial appointment attendance, because individual therapist and treatment variables are now introduced into accounting for some potential variance in attendance rates as well as in treatment outcomes. However, these variables are difficult to measure, and the majority of studies focus on treatment dropout or premature termination, rather than sporadic attenders (Ogrodniczuk et al, 2006). In addition, most clinics have policies regarding the number of missed sessions, and sporadic attenders often become treatment dropouts. Reardon et al. (2002) used an archival data set composed of self-pay patients with varying participation levels and durations of treatment as predictors of patient outcome. Patient improvement was assessed by means of closed charts, using a Clinical Global Improvement scale completed by clinical psychology doctoral student raters. Although neither the number of sessions nor duration of treatment was a significant predictor of outcome, a trend emerged, indicating that those who attended fewer sessions but spent more months in treatment (otherwise known as sporadic attenders) were associated with worse treatment outcomes.

Ogrodniczuk et al. (2006) examined outpatients who initiated and presented to at least one session of group therapy for supportive or interpretative grief therapies in order to investigate the effects of age and group cohesion on premature termination. It was found that the average number of sessions attended was 9 (SD=3.4); 23% of patients terminated prematurely. Decreased age was associated with decreased rates of attendance for supportive group therapy, but not interpretive group therapy. However, the level of perceived cohesion to the patient mediated age.

**Treatment dropout.** Treatment drop out (otherwise known as premature termination) typically reflects the decision of the patient to terminate treatment, for a variety of reasons (Olfson et al., 2009). For example, sometimes the reason can be positive. Westmacott and Hunsley (2010) used data from a Canadian health survey and examined early treatment dropout factors; 40% of participants cited the

reason for premature termination as feeling better or as perceived completion of treatment. . However, 44% of that samples left treatment because of some barrier or because they reported that therapy was not helping. In comparison, Olfson et al. used data from a US survey that asked questions about mental health treatment received in the previous 12 months. The overall rate of treatment drop out was 22%. Reasons for dropout were not assessed; however, the dropout was predicted by absence of health insurance, with most respondents dropping out of treatment within a medical setting. Specifically, Hispanic ethnicity, low socioeconomic status, substance use disorder, absence of health insurance, treatment within medical or human services, previous mental health treatment, and psychiatric comorbidity predicted dropping out after at least 3 visits. This finding suggests dynamic provider variables may be mediating the relationship between these predictors and treatment dropout, not accounted for in this study.

Non-attendance is widespread in the area of substance abuse. Agnosti, Nunes, and Ocepeck-Welikson (1996) examined data from an outpatient cocaine research clinic and found an average dropout rate of 55%. Individuals who dropped out tended to be African-American or Hispanic American, to be younger, and have an earlier onset of substance abuse. McKellar et al. (2006) assessed male patients at entry to residential substance abuse treatment and found that younger age, greater cognitive dysfunction, more drug use and a lower severity of alcohol dependence to be predictive of treatment dropout. It was found that patients with all 4 significant risk factors had a dropout rate of 31%; this is in comparison with patients with none of the risk factors, who had a dropout rate of 8%. King and Canada (2004) also examined predictors of treatment entry and dropout in a substance abuse outpatient setting and found that 36% of the patients met criteria for treatment dropout. Individuals who dropped out of treatment were more likely to be of African-American ethnicity, female, used cocaine, and were referred from an outside medical center. Claus and Kindleberger (2002) examined

pre-treatment entry and dropout of adults who were assessed and waiting for outpatient or residential substance abuse treatment. It was found that 75% of all referrals, regardless of outpatient or residential status entered treatment within 30 days of referral. A total of 25% did not show for treatment; 15% left treatment early, and 60% stayed in treatment for three or more sessions. Only one predictor, number of days until treatment was significant. Those with a shorter wait time between their assessments and treatment appointments were more likely to attend treatment.

### **Treatment Adherence of Individuals with Co-Morbid Medical Conditions**

In addition to diagnosed psychiatric conditions as reasons for referral to mental health treatment, the prevalence of mental health conditions increases drastically within medical populations. For example, mental health conditions (specifically depressive disorders) are associated with increased prevalence of chronic diseases (Chapman, Perry and Strine, 2005). Therefore, risk factors for non-attendance of mental health treatment are amplified within populations with co-morbid medical conditions.

Although identification of depressive symptomatology within primary care is common, the follow-through with referral to mental health treatment is less so. Within a primary care setting, it is estimated that depressed patients who were referred for psychotherapy by their primary care doctors tended to follow-up, with the referral on average only 20% of the time, and of those who followed up with referral, 50% dropped out of treatment (Mohr et al., 2006). This illustrates a serious disconnect in the referral process and maintaining the continuity of care from primary care to mental health treatment. Mohr et al. investigated this trend along with various social and environmental barriers (concerns of others, cost, time constraints) and found that patients who self-reported higher levels of depression tended to suggest more practical and emotional barriers to treatment than patients who

were not depressed. Also of interest was that individuals who had been in treatment previously suggested more practical barriers rather than emotional ones. This finding suggests that the perception of psychotherapy in addition to practical barriers such as transportation and scheduling are reasons not to attend treatment. However, it can be argued the cognitions of individuals with depression that suggests such barriers verify the reason for treatment. However, Dwight-Johnson et al. (2000) evaluated an English and Spanish speaking sample of primary care patients (78% suffered from a chronic medical illness) and found that 83% of patients expressed a desire for treatment for depression. Specifically, a desire for active treatment (e.g., counseling) was significantly higher than the desire for antidepressants, although these preferences varied by age, gender, ethnicity, income, and knowledge about treatments. It is cautioned however, that an expression of interest in mental health treatment does not necessarily translate into seeking or following through with a referral.

DiMatteo et al. (2000) reviewed studies correlating medical patient's treatment non-compliance with their anxiety and depression and found that depressed patients are three times as likely not to adhere to their medical treatment as compared with non-depressed patients. As for anxiety, the relationship appears to be minimal, with an overall difference in compliance of 4% between anxious and non-anxious patients. Whether or not the patient's treatment recommendations were lifestyle changes (diet, exercise), medications, or chronic illness treatment, the impact of depression on medical treatment non-adherence was found consistently across studies. This finding is also consistent with other studies examining the influence of depression on chronic medical illness, such as diabetes (Kilbourne et al., 2005) Hepatitis C (Schaefer et al., 2003) and Human Immunodeficiency Virus (HIV) (Gordillo, Amos, Soriano, and Gonzalez-Lahoz, 1999).

In addition to precipitating depression, chronic illness is also known for exacerbating symptoms of depression (Chapman, Perry, and Strine, 2005). Schafer et al. (2003) examined patients with Hepatitis

C, comorbid psychiatric and addiction histories, and other current illnesses, as compared with patients without these histories during interferon treatment. They found that 16% of patients without a psychiatric history (of any mental health or substance use diagnosis) actually experienced symptoms of depression (sleeping disturbance, lack of concentration) during the study. In addition, psychiatric patients as a group had more depressive symptoms before and during treatment, compared with other groups, as well as increased usage of antidepressants. In all patients who experienced depressive symptoms during interferon treatment, improvement was possible with psychiatric and psychotropic support. The highest dropout rate in interferon treatment occurred in the former addiction history group (43%), as compared with the psychiatric group (18%), methadone group (14%), and control group (13%). This finding could be associated with that fact that the psychiatric group receive support for depression with antidepressants prior to initiating interferon treatment, and these may have been preventatives. The researchers concluded that the timely usage of antidepressants is most likely related to the low dropout rate of the psychiatric group, which is inversely related to the addiction group, who did not utilize the antidepressants/psychiatric support, but reportedly suffered similar depressive and psychological symptoms. The main finding of this study was that although the risk of developing psychiatric symptoms with interferon medical treatment is increased with psychiatric support and medication management for depression, the potential for medical treatment drop-out rates decreases. However, this finding was not applicable to patients with an addiction history who were not actively engaged in mental health treatment.

DiMatteo, Lepper, and Croghan (2008) found that depressed patients with various conditions such as cancer, renal disease, and dietary issues were 3 times more likely not to adhere to treatment recommendations, as compared with non-depressed patients. It was suggested by these authors that depression typically involves feeling hopeless, and adherence to medical treatment would be difficult for

an individual who has little or no hope in his or her treatment regimen to follow through with maintaining it. Second, it was suggested that depression is often accompanied with isolation and withdrawal from social supports; therefore, this lack of support could be linked to decreased support needed in following a medical regimen. Last, the authors suggested cognitive problems resulting from depression, such as difficulty concentrating or paying attention could make remembering treatment regimens more difficult, which could lead to decreased compliance.

Kilbourne et al. (2005) examined the influence of depression, demographics and health status on diabetes medication adherence in older veterans presenting to a VA primary care facility. Diabetes type 2 is a chronic illness that makes a person's body dependent on insulin pills or injections; a patient with this illness must follow a strict no-sugar diet to avoid severe medical complications (blindness, orthopedic problems). An EEM device measured medication adherence, and the patient's depression levels and substance abuse were measured by self-report. Overall, 65% of patients were found to be adherent to their medications and 10% of the patients screened were found to have depression. Specifically, it was found that depressed patients were less likely to adhere to their diabetes medication (42%), even after accounting for: cognitive impairments, substance use, age, and number of medications prescribed. The authors concluded that the association between depression and non-adherence could be due to lack of motivation or of feeling a loss of control over illness, beliefs that would be more common in a depressed population. This finding supports the connection between depression, chronic medical illness, and treatment non-adherence.

***HIV/AIDS and mental health.*** Non-attendance to medical appointments and mental health treatment is not the only issue of non-adherence within chronic medical illness populations. In addition, and unique to HIV/AIDS patients, a stringent threshold of medication adherence has been established; at least 95% is considered adhering to treatment guidelines. Issues with adherence to medication,

(namely HAART, or Highly Active Antiretroviral Therapy) are a major treatment barrier for individuals with HIV/AIDS. HAART adherence is further compounded by disorders such as anxiety and depression, which are common to other populations suffering from chronic medical conditions. Ciesla and Roberts (2001) completed a meta-analysis examining the prevalence of major depressive disorder (MDD) and found that MDD was found to co-occur among individuals with HIV/AIDS at a rate greater than twice that of the general population. Campos et al. (2006) assessed anxiety and depression in women prior to initiating HAART and found 36% of the participants reported experiencing anxiety symptoms, with 22% experiencing depression symptoms. Komiti et al. (2003) examined medical professional's abilities to detect depressive symptoms in a primary care center with individuals diagnosed with HIV/AIDS. The authors found that most doctors were able to detect and diagnosis depressive symptoms successfully, with 22% of the assessed population meeting criteria for Major Depressive Disorder.

Barclay et al. (2007) examined age-associated predictors, health beliefs, and self-efficacy of medication adherence (defined as taking 95% of prescribed dosages of HAART) in HIV positive adults and found that 76% reported consistent use of HAART. Older age was found to be significantly predicative of treatment adherence, with an increased rate of adherence (85%), as compared with younger age (73%). Younger participants with decreased adherence tended to have an active substance use/abuse disorder, higher levels of apathy, as well as being financially dependent on others. Older participants with decreased rates of adherence were found to have decreased income levels; decreased rates were also found with individuals who identified themselves as gay or bisexual. Psychiatric variables were not found to be predictive of decreased adherence in older participants. Information related to health beliefs, such as low perceived treatment utility, decreased familial support, lower intention of adherence, and greater perceived barriers to treatment were associated with poor medication adherence across groups.

Mellins et al. (2002) examined the adherence rates to HAART and missed medical appointments within HIV-infected ethnic minority mothers. It was found that 50% of the women met criteria for at least one psychiatric disorder, and 25% for a substance abuse disorder. The most common diagnosis included: Post-traumatic stress disorder (35%), followed by depression (29%), and other anxiety disorders (24 %). Among the 50% with a diagnosis, 67% reported previous mental health treatment and 35% were receiving current mental health treatment. Significant predictors of higher levels of medication adherence were increased education level and increased attendance rates were found with older age. The most common factors associated with missing pills were substance abuse and mental health conditions.

Despite extensive research, the nature of treatment non-attendance and non-adherence for both mental health and medical treatment is very complex and multi-determined, and often varies, depending on populations and illnesses. Barriers to treatment engagement significantly increase with the addition of co-morbid mental health, medical, and substance use disorders (Uldall et al., 2004). This is especially the case with patients often referred to as “triply-diagnosed patients”, suffering from co-morbid HIV/AIDS, mental illness, and substance abuse disorders. Although individuals suffering from HIV/AIDS may be diagnosed with mental health disorders commonly diagnosed in the general population, individuals with HIV/AIDS and their comorbid mental health conditions are often complicated by a history of trauma and loss, as well as by other factors contributing to the severity of psychopathology (Whetten, Reif, Whetten, and Murphy-McMillan, 2008).

In an attempt to explain non-adherence further, theoretical models have been developed to explain individual patient cognition and behaviors, as well as social, provider, institutional, psychological, and medical factors that affect adherence.

### **Theoretical Models of Treatment Non-Adherence**

Many explanations have been suggested to account for treatment non-adherence. Theoretical models such as the Health Belief Model (Becker, 1974), the Protection Motivation Theory (Rogers, 1975), the Theory of Planned Behavior (Ajzen, 1988), and the Health Services Utilization Model (Anderson, 1968) attempt to explain non-adherence by organizing contributing environmental factors and patient variables into a model that explains health behavior change (DiMatteo, 2004; Gochman, 1997). Although empirical evidence suggests a basis for these health behavior and belief models, consistent support for these frameworks across the medical field is not evident (DiMatteo). These models have outlined contributing factors, but have not been able to account for differences across various disorders and populations (Gochman).

Gochman's model of health behavior (1997) explains health behavior as occurring on a broad spectrum. Health behavior is broadly defined as something people do, or refrain from doing (Gochman). Specifically, he describes health behavior as overt and covert actions, such as taking medication, as well as a perception, thought, or feeling about an illness. His definition includes recognizing that health behavior is influenced by various cultural and social determinants that are individual to each person. Gochman indicates that health behavior is not defined as treatment, recovery, or health status, but rather these are the outcomes of behavior. Gochman proposes that health behaviors can be examined in broad levels of analysis, into personal, social, institutional, cultural, and provider categories. Personal determinants include; cognitive representations of health and illness, beliefs about control and health behaviors, behavioral intention, family health cognitions and actions, and maternal influences on children's health behavior (Gochman). Social determinants include; lifestyles, social class, demographic characteristics, gender, social attachments, and sick role concepts. Institutional and cultural determinants are work-related influences on health behavior, as well as etiological and political issues.

Provider determinants include; the communication between patient-provider, care setting, and adherence to and acceptance of regimens. Gochman's model is comprehensive, and accounts for many different contributing factors to adherence, namely health behavior as an outcome. However, Gochman cautions that these factors occur on a spectrum and they vary, depending on the individual and the type of illness.

### **The Impacts of Treatment Non-Adherence and Non-Attendance**

As a whole, non-adherence can result in extreme costs to the patient (i.e., suffering, shortened life-span) as well as frustration, anger, and hopelessness on behalf of treatment provider and the patient (DiMatteo, Lepper, and Croghnan, 2008). The cognitions and behaviors of patients and/or providers in applying treatment directly also affect the quality of life of the individuals, their caregivers and family (Preau, 2004). In addition, non-adherence can waste both time and finances of health care providers and insurance companies, but also contributes to the increased morbidity and mortality of preventable health conditions (DiMatteo, 2004). Financial costs of non-adherence within the United States health system were estimated to between \$100 billion and \$289 billion a year (Viswanathan et al., 2012).

Treatment non-adherence is multi-determined by a number of personal, social, emotional, and health-related factors. Individual static factors, which include demographic variables; dynamic medical factors, which include the number of medications prescribed, complexity and length of treatment course, poor communication among providers, and also psychiatric conditions have been correlated with medical treatment non-adherence (Vermeire et al, 2001). Other research in this area has correlated other types of dynamic factors with non-adherence, such as the patient's beliefs regarding treatment (Horne and Weinman, 1999), as well as expected side effects, and perceived lack of familial and social

support (DiMatteo et al, 2002). For example, a patient's non-adherence could be related to maintaining perceived control over health, maintaining a sense of identity, and in extreme cases, denial (DiMatteo, 2004).

Depression, anxiety, and other psychological symptoms within medical populations have been associated with non-adherence to medical treatment (DiMatteo et al, 2000; Kilbourne et al., 2005; Schaefer et al., 2003). Individuals with severe mental illness factors who experience cognitive disorganization may present with additional complicating factors that affect medical non-adherence (Cramer and Rosenheck, 1999). Specific non-attendance risk factors unique to the mental health population have also been identified (Westmacott & Hunsley, 2010); these include length of wait time to initial appointments (Hampton-Robb, Qualls, & Compton, 2003), stigma (Sirey et al., 2001), and severity of illness (Killaspy, Banerjee, King, & Lloyd, 2000; Nose, Barbui, & Tansella, 2003). As for medical factors, lower adherence rates have also been observed in patients with chronic illnesses that do not create immediate distress, such as HIV/AIDS (Meichenbaum and Turk, 1987).

Inconsistent adherence to HIV/AIDS treatment can result in significant consequences, such as treatment failure, medication resistance, even death (Udall et al, 2004). Individuals in this population are often referred for outpatient mental health treatment because of HIV/AIDS medication non-adherence. At least 50% of individuals with HIV/AIDS have some form of reported mental health problem (Bing et al., 2001) that may be related to medical treatment non-adherence, typically HAART medication non-adherence. However, previous research has failed to identify connections among HAART medication non-adherence, medical treatment non-adherence, and mental health treatment non-attendance for the HIV/AIDS population. Often individuals in the HIV/AIDS population are referred for outpatient mental health treatment because of non-adherence to HAART, as well as for comorbid mental health and substance abuse issues. However, this population has a high rate of mental health

treatment non-attendance. The purpose of this study was to investigate specific social, provider, institutional, medical, and psychological risk factors that may be predictive of initial treatment non-attendance, within the dual-diagnosed, adult HIV/AIDS population. These variables have not been examined to date in the HIV/AIDS population referred for outpatient mental health treatment. These predictors were based on Gochman's model of health behaviors (1997), with the addition of medical and psychological predictors.

## Chapter 2

### Factors affecting Treatment Attendance

**Social factors.** Utilization of health services are individual behaviors, but occur within a social context (Andersen and Newman, 1973). These authors discuss, within a theoretical framework, the impact the way in which health services are characterized, the changing social definitions of illness and treatment, and individual demographic factors; together, these explain key patterns and trends in the utilization of healthcare. In addition, Gochman (1997) suggested that demographic variables (age, gender, and ethnicity) should be examined in relation to a social context. Demographic variables are important with respect to treatment attendance because previous research has demonstrated influences of these variables on treatment attendance. For example, young age has been one variable that is often found to be associated with, or predictive of, treatment non-attendance (Agosti, Nunes, Ocepeck-Welikson, 1996; King and Canada, 2004; Kruse, Rohland, and Wu, 2002; McKellar, Kelly, Harris, and Moos, 2006; Nose, Barbui, and Tansella, 2003).

Mixed results have been found for the relationship between gender and treatment adherence. Nose et al. (2003) as well as Gallucci, Swartz, and Hackerman (2005) found that being male (specifically young males) was associated with poor compliance to treatment programs. Agosti et al. (1996) found the majority of patients referred were male (78%), but they did not find a significant effect for males dropping out of treatment. Other studies (Grunebaum et al., 1996, Hershorn, 1993; Killaspy, Banerjee, King, and Lloyd, 2000) also did not find gender to be predictive of treatment non-attendance.

In addition to demographic variables, social support is also considered by Gochman (1997) to be influential upon health behavior. Unfortunately, research reviewing medical chart information is unable to identify the quality of direct and familial social supports of patients; therefore, case management has often been identified as a form of social support in many studies for both medical and mental health

patients (Sorensen et al., 2003). However, Sorensen et al. examined the effects of case management for substance abusers with HIV/AIDS and found it was not statistically significant in terms of effectiveness at reducing HIV risk behaviors and substance abuse. Clinically, however, participants were found to improve over 18 months. Although case management alone may not be enough for a sufficient support system, some form of brief contact was shown to help this population.

**Provider factors.** Mixed results have been found in terms of health care utilization, with respect to insurance status. Kruse, Rohland, and Wu (2002) found that individuals who did have insurance were more likely to miss their appointment. It was concluded that individuals with public-sector insurance may experience a lesser impact in missing their appointments due to low or no out-of-pocket costs. As for the uninsured, Olfson et al. used data and found that the overall rate of treatment drop (22%) was predicted by absence of health insurance, with most respondents dropping out of treatment within a medical setting. It is suspected the additional cost of continuing treatment for uninsured was a barrier for attendance.

Previous studies have indicated that referral source, especially from a general practitioner or primary care provider is positively associated with treatment attendance (Hampton-Robb et al, 2003). Non-attendance at mental health centers has also been related to problematic communication of referral information among providers (Killaspy, Banerjee, King, and Lloyd, 1999). Often, primary care or general practitioner cease to follow-up with referrals to mental health treatment after they have been made (Killaspy et al.). In addition, this cycle is perpetuated when psychiatrists or other mental health professionals do not follow up with the referral source after the patient has been seen (Killaspy et al.). These authors examined the impact of letters and communication between general practitioners and psychiatrists, and found that this process is adequate when referring new patients who followed through with the appointment. It was noted that non-attendees often fell by the wayside, with general

practitioners no longer identifying a role for themselves once the referral had been made. Thus, the referral process was an important contributing factor in treatment attendance for that study. Hampton-Robb et al. (2003) examined referral information at a mental health clinic of patients referred by various sources. It was found that patients who were referred by their physicians and religious groups were significantly more likely to keep their appointments, as compared with patients referred by other agencies or a crisis hotline. Patients referred by their insurance companies, friends, and relatives did not differ in their appointment attendance. This study concluded that referral source is an important indicator of first-session attendance, but was not able to identify a specific reason why certain referral sources were more effective than others.

**Institutional factors.** One of the most commonly identified reasons for missing initial appointments is length of wait time to first appointment. Hampton-Robb et al. used referral sheets in an outpatient community mental health center to examine attendance, referral source and income, and assigned appointment status, either as cancelled, no-show, or appointment kept. Overall, the findings were consistent with previous findings that 37% of patients failed to keep their initial psychotherapy appointments in general, with 46% of that percent failing to cancel (no -show). These percentages peaked with increasing lengths of time to the patient's first appointment (e.g., 12 days versus 2). Folkins, Hersch, and Dahlen (1980) examined length of wait time to initial appointment to determine if it was correlated with the no-show rate for non-attendance. It was found that no-show rates increased substantially (from 24% to 54%) when length of waiting time increased. Researchers concluded that the scheduling of the initial appointment is significantly related to attendance of the first session.

**Medical factors.** HIV/AIDS is a complex, incurable medical condition often resulting in life-threatening conditions, which often co-occur with mental health and substance abuse disorders. The comorbid impact of these conditions may lead to different risk factors for non-adherence to treatment

recommendations, as compared with individuals with mental health and/or substance abuse disorders without HIV/AIDS. Gochman (1997) discusses possible risk factors that impact not only general treatment adherence, but also specific medical factors related to the HIV/AIDS population (e.g., medical status, severity of illness).

The impact of the relationship between mental illness and chronic medical conditions, such as HIV/AIDS has been well established in the research literature (Daughters, Magidson, Schuster, and Safren, 2010; Margolin, Avants, Warburton, and Shi, 2003; Molassiotis, Lopez-Nahas, Chung, and Lam, 2003; Mugavero et al., 2007). The need for the HIV/AIDS population to engage in mental health treatment is clear. Without identifying risk factors and variables contributing to this populations' non-adherence with mental health treatment recommendations, it is likely that non-adherence to mental health treatment will continue, and continue to further impact the mental and physical health of the individuals with HIV/AIDS. Without identifying risk factors, it is also difficult to develop appropriate intervention strategies to engage these individuals in treatment.

Understanding the factors that contribute to the HIV/AIDS patient's quality of life and the risk factors that prevent these individuals from engaging both in medical and in mental health treatment is crucial in the prevention and treatment of the disease. Additionally, engaging HIV/AIDS patients in psychiatric treatment has been shown to be effective in managing both psychiatric symptoms and adhering to medical treatment regimens (Reece, 2003).

**Psychological factors.** The impact of psychological conditions on treatment adherence has been well established in literature. Killaspy et al. (2000) examined treatment adherence in a psychiatric outpatient setting over one year and found that on average, 40% of appointments were not attended, and of the new patients, 36% did not attend their initial appointments. The patients with diagnoses

such as schizophrenia who reported more severe symptoms, with greater social impairment, tended to have the lowest attendance rate. This trend was also present at 6 and 12-month follow-ups. This study concluded that treatment non-attendance is a serious problem, especially for the young individuals who suffer from serious mental illness. This study demonstrates the importance of identifying these risk factors and implementing strategies targeted at these factors in order to improve attendance.

The effectiveness of psychological interventions on treatment attendance and medication adherence has also been studied. Nose et al. (2003) completed a meta-analysis of 103 studies reporting non-adherence rates to follow-up care appointments after discharge in patients diagnosed with serious mental illness (e.g., schizophrenia). It was found that the overall adherence (defined as medication adherence and keeping appointments) varied between 25% and 78%. Specifically, rates of non-attendance varied between 47- 57%. However, the rates of attendance and adherence improved significantly (more than doubled) when an individual sought community mental health treatment at a 6-month follow-up. This study highlights the problematic issues with treatment adherence and attendance, but also conveys the effectiveness of mental health interventions on the issue.

**Substance abuse.** Adherence to mental health treatment is further complicated by comorbid substance abuse. King and Canada (2004) examined predictors of early dropout in a substance abuse treatment center and found 5 main predictors regarding patients who stayed in treatment (education, gender, ethnicity, specific drug of choice, and referral source). Overall, female African-Americans with lower education levels, who had used cocaine in the past tended to terminate treatment prematurely. Agosti et al. (1996) confirmed that some of these results in examining treatment dropout rates among cocaine abusers referred for outpatient treatment, found that dropouts tended to be African-American, younger in age, with an early onset of substance abuse. Overall, 69% of the patients who attended initially for intake, dropped out before 4 weeks of treatment completion. Together, the findings of these

studies demonstrate that attendance rates of individuals entering substance abuse treatment were consistently predicted by factors such as gender, ethnicity, and education level.

Overall, a review of demographic, social, provider, institutional, medical, and psychological risk factors have been found to be associated with or predictive of treatment attendance. Demographic variables such as age (Agosti, Nunes, Ocepeck-Welikson, 1996; King and Canada, 2004; Kruse, Rohland, and Wu, 2002; McKellar, Kelly, Harris, and Moos, 2006; Nose, Barbui, and Tansella, 2003), and gender (Gallucci, Swartz, and Hackerman, 2005; Nose et al, 2003) have had mixed support. Social variables defined as case management (Sorensen et al., 2003) and provider variables such as health insurance (Kruse, Rohland, and Wu, 2002; Olfson et al., 2009) and referral source (Killaspy, Banerjee, King, and Lloyd, 1999) have had similar findings. Institutional factors such as increased time to initial appointment (Folkins et al., 1980; Hampton-Robb et a., 2003) have found consistent trends in predicting treatment non-attendance. Psychological variables such as the severity of mental health symptoms (Killaspy et al, 2000), and substance abuse history (Agosti, et al., 1996; King and Canada, 2004; McKellar et al., 2006) have been found to be predictive of mental health treatment non-attendance. The impact of psychological variables on medical treatment adherence and attendance has also been validated. The relationship between psychological symptoms (i.e., depression) and chronic medical conditions (DiMatteo, 2000) such as Hepatitis C (Schaefer et al., 2005), diabetes( Kilbourne et al., 2005) has been associated with medical treatment non-adherence and non-attendance. This issue of depression is magnified within the HIV/AIDS population, who already have major difficulties in keeping medical and mental health appointments, and in strictly adhering to HAART ( Barclay et al., 2007; Ciesla and Roberts, 2001; Campos et al., 2006; Komiti, 2003; Mellins et al., 2000).

HIV/AIDS is a chronic, incurable condition, and treatment strategies have largely focused on developing interventions to treat the psychological symptoms and improve HIV/AIDS medication

adherence. It is expected that the similar demographic, social, provider, institutional, medical, and psychological factors found in the previously mentioned studies may also be operating within the HIV/AIDS population, further compounded by medical complications, which will be identified in the current study and used to predict initial mental health treatment non-attendance.

### **Purpose of Study**

This study attempted to investigate social/demographic, provider, institutional, medical, and psychological factors that were expected to be predictive of treatment non-adherence. Treatment non-adherence in this study was defined as always versus never attending an initial scheduled outpatient mental health appointment. Risk factors were identified and grouped, based on Gochman's model of health behavior, with the addition of specific medical factors of HIV/AIDS. These factors were measured, using information documented on past referral forms.

It was hypothesized that specific risk factors would be operating for participants diagnosed with HIV/AIDS, comorbid mental health and/or substance abuse disorders. Additionally, it was hypothesized that a model of these risk factors would be predictive of non-attendance to the first scheduled mental health/substance abuse intake appointment. This prediction was based on combining identified social/demographic, provider, institutional, medical, and psychological risk factors identified in previous literature that, together, would be predictive of initial appointment non-attendance. The specific risk factors consist of social (age, gender, case management), provider (referral source, access to insurance, signature of referral source), institutional (length of wait to initial contact and initial appointment, number of sessions attended, length of treatment), medical condition (measured by medical status, CD4 count, viral load, medications, clinic, other medical conditions diagnosed), and psychological factors (current and past substance abuse, other treatment, diagnosis, reason for referral ). These variables

were abstracted from past outpatient referral forms from the primary care clinic and closed charts of the outpatient mental health/substance abuse clinic.

The alternative hypothesis was that there are no significant, specific risk factors operating for individuals suffering from HIV/AIDS with comorbid mental health and/or substance abuse disorders. Specifically, factors identified may not, alone, be a strong enough risk factor or, together, as risk factors, in a model to predict mental health treatment non-attendance. This would lead to the conclusion that mental health/substance abuse treatment non-attendance may be the result of a combination of static risk factors (social, provider, institutional, psychological risk factors), coupled with other dynamic factors not assessed in this study (e.g., cultural determinants, social support, health beliefs, and motivation).

## Chapter 3

### Overview

This study sought to identify significant risk factors for patients diagnosed with HIV/AIDS with comorbid mental health and/or substance abuse treatment that would be predictive of attending an initial, scheduled outpatient mental health/substance abuse treatment appointment. However, the identification of a third group (individuals who had never been scheduled), resulted in a reduced sample for analyses for which variables had to be collapsed in order to be utilized within a model. However, prior to collapse of the variables, a bivariate correlational matrix was used to identify significant predictor variables of treatment non-attendance, of which none of the predictors were found to be significant ( $p = .05$ ). This prompted a conceptual approach to combining identified predictors into a model which was analyzed using logistic regression in an attempt to predict initial, scheduled mental health treatment non-attendance.

### Design and design justification

The retrospective correlational design of this study used archival de-identified data to identify social, provider, institutional, medical, and psychological variables that would be predictive of treatment attendance. Information was collected via past (no longer active) referral forms and compared with referral forms and attendance logs of closed charts. Past referral forms and closed charts were utilized only from December of 2008 to December of 2010, in order to exclude any current active records. Active records were not permitted for use in this study by the site's institutional review board. In addition, the clinic was scheduled as of August 2011, in order to change over to electronic record keeping; therefore, the referral forms in this study were no longer to be used by the clinic. Cases in which the individual attended at least 1 initial outpatient appointment between December 2008-2010 and who were no

longer active were considered closed charts. All data collected were de-identified prior to being entered into a Microsoft Excel data spreadsheet. Variables were analyzed for their predictive validity regarding the outcome variable of interest, non-attendance of the initial outpatient mental health treatment appointment.

### **Participants**

The inclusionary criteria for cases in this study consisted of past referral forms and closed charts from adult patients, ages 18 and over, who have been diagnosed with HIV/AIDS, and have been seen in the outpatient medical clinic in Center City Philadelphia, which specializes in HIV/AIDS treatment. Cases used in this study were originally referred by their primary care doctor or case manager at the medical clinic to the outpatient mental health/substance abuse clinic within the same building.

The exclusionary criteria for cases in this study were referrals and closed cases referred prior to December of 2008 and after December of 2010, as well as active patients. In addition, referral sheets or closed charts that were missing information for 50% or more of the variables identified were not utilized in this study. This resulted in 2 referral forms as well as 15 closed charts excluded from the data set. This study did not have permission to access files of active patients; therefore, their files were not accessed and subsequently were excluded from data collection.

The mean age of the sample (N=298) was 41.0 years of age (SD=9.32); the participant ranged in age from the youngest at 20.0 years to the oldest at 68.0 years. There were slightly more males than females referred (55% were male (N=165), 42% female (N =124); 3% were transgendered (N=8) and 1 case had missing information. All case information in this study was used from adult participants.

### **Recruitment**

The clinic records utilized in this study were available through the courtesy of an existing outpatient psychotherapy and primary care partnership practice. Permission to collect data and to use a de-identified version of the data set for analyses had been granted both by the institution where data collection occurred and also with authorization by the clinic founder, director, and head psychiatrist. Permission was also granted by the researcher's academic institution.

### **Measures**

The past referral forms of individuals who had ever attended (defined as attending the initial scheduled appointment) or had never attended (never attending the initial scheduled appointment) were utilized to extract patient information regarding the identified social, provider, institutional, medical, and psychological variables. The attendance logs of closed patient charts (ever attenders) were used to substantiate their attendance to the initial appointments. De-identified information was collected and recorded in ranges for data collection (e.g., 0-7 days from contact to scheduled appointment) age, which was the exception, was recorded in years (rounded to nearest year), not the exact date of birth. Each variable contained 0 standing for missing variables. Data collected did not contain any Personal Health Information (PHI) or identifiable patient information.

**Social Risk Factors.** Age was extracted from date of birth, and rounded to the nearest number of whole years from birthdate. The variable of gender was coded as male = 1, female = 2, transgender =3, and other =4. Case management services were classified into having services (yes = 1) or not having services (no = 2). These predictors together defined the social risk factors category.

**Provider Risk Factors.** The source of referral, case managers (coded as =1) or primary care physicians (coded as =2), substantiated by the signature of the referring source (case manager =1,

physician =2) on the form along with the status of health insurance at the time of referral made up the provider risk factors category. Health insurance was coded as: private = 1, community behavioral health =2, none= 3, Medicare = 4, and having more than 1 =5.

**Institutional Risk Factors.** Included in the institutional variables category were: length of wait or time from date of referral received to date of initial contact and length of time between initial contact and initial scheduled appointment, which were coded in ranges of days (0-7 days = 1, 8-14 days= 2, 15-21 days = 3, 22-28 days = 4, and 29 days and over =5).

**Medical Risk Factors.** Medical predictors of this study consisted of HIV/AIDS status, CD4 cell counts, viral load, and information on other medical conditions. Medical status was classified as 1=HIV or 2=AIDS at the time of referral. CD4 cell counts were classified into ranges of: 1= <200, 2=201-499, 3= 500-799, 4= 800 and up, 5=unavailable. These ranges were set as per classifications utilized in previous research (Gordillo et al, 1999). Viral load, which has a range of <48 to 10,000,000, was classified as 1= undetectable, 2= 400 or less; 3= 401-10,000; 4= 10,0001-50,000; 5= over 50,000, and 6= unavailable; as used in previous research (Murphy, Marelich, Hoffman, and Steers, 2004). Other medical conditions separate from HIV, such as diabetes, asthma, etc., were classified as (yes, other conditions are present =1, or no other conditions are present =2) along with types of prescribed medications (classified as HIV medications =1, HIV medications and psychotropic medication =2, HIV medications and other medical medications = 3, HIV medications, psychotropic, and other medical medications = 4, Other=5, and None=6).

**Psychological Risk Factors.** Psychological predictors for this study were defined by initial contact (if the participant has been seen for services with the clinic before, yes= 1, no =2) as well as if the patient is in mental health and/or drug and alcohol treatment at another site (yes=1, no=2). Also measured was

whether or not the patient was specifically referred to the mental health or substance abuse treatment clinic, or both (MH= 1 or SA = 2, MH/SA = 3). The main psychological predictor variables consisted of current mental health diagnosis (0=Missing/None, Depression = 1, Bipolar disorder =2, Psychosis = 3, Anxiety = 4, PTSD= 5, Other=6) (as per Kruse et al, 2002), and reason for referral ( 0=Missing/None, Depression =1, Anxiety =2, Psychosis = 3, Grief =4, Trauma = 5, Medication Adherence, = 6, Alcohol/Drug use = 7 other = 8, and Mental Health and Substance Abuse =9).

Substance abuse classifications were also measured under psychological predictors. For example, if a patient admitted current alcohol and/or drug use, a past history of alcohol and/or drug use, (each was classified, as yes (= 1) and no (= 2). Primary, secondary, and other drug or alcohol substances that were reported were classified as into major drug categories ( N/A, or denies current abuse =1, alcohol =2, cocaine = 3, cannabis =4, opioids = 5, hallucinogens = 6, inhalants = 7, phencyclidine = 8, sedative, hypnotic, and anxiolytics = 9, or polysubstance = 10). Along with the substance of choice, the number of days since last use were also recorded in ranges (1= <1 week, 2=past 2 weeks, 3= past 3 weeks, 4= past month, 5=N/A, or not applicable). The data for number of days since last use were categorized and documented separately, by order of primary, secondary, and other substances of use/abuse.

### **Procedure**

All data collected were de-identified by the primary investigator and only information in the previously mentioned categories of information was collected via Excel spreadsheet and compiled into a computer statistical program, known as the Statistical Package for Social Sciences, commonly referred to as SPSS. The primary investigator examined the original referral form and attendance records from December of 2008 until December 2010 and compiled the institutional, provider, social, medical and

psychological risk factors into individual categories described previously. In an effort to select forms to utilize, every referral form dating from December 2008 to December 2010, in both closed files (ever attenders) and referrals that did not become active (never-attenders) was used, unless it met exclusionary criteria. After onsite data abstraction was complete, this investigator performed data checks and reviews of the data in order to identify incorrect or missing values.

## Chapter 4

### Results

To test the hypothesis that specific risk factors were predictive of initial appointment non-attendance, a binary logistic regression analysis was conducted. All of the identified social, provider, institutional, medical, and psychological factors were originally proposed to be used as predictor variables in the model to predict initial scheduled appointment attendance (ever attended vs. never attended to the first intake appointment) as the outcome, or dependent variable. Frequency distributions and descriptive statistics were utilized to identify features of the overall sample (N=298), and then categorized by attendance outcome. Of the 298 cases used in this study, 29% of the sample attended at least one scheduled appointment (N=88) and 71% of the sample never attended any appointments (N=210). However, a closer look at the outcome variable revealed that of the total number of participants who never attended (N=210), 32% were scheduled, but never attended (N=67); 7% were missing scheduling information and never attended (N=20), and surprisingly, 41% were never scheduled for an initial intake appointment (N=123).

The identification of the three outcome groups that emerged (ever attended (N=88) and never attended (N=67), and never scheduled (N=123) made it unfeasible to base the proposed analyses on the original sample (N=298) (Table A6). The original hypotheses and analyses for this study were chosen on the basis of examining the outcome of only those cases that were scheduled. Therefore, unscheduled referral cases (N=123) and missing (N=20) referral cases were excluded from the main data analyses, and only the sample of individuals who had been scheduled (N=155) was used. In addition, cases missing from each predictor were removed, resulting in a decreased sample (N=109).

Given the reduced sample size, some predictor variables could not be utilized and other predictor variables were collapsed across levels to decrease the original number of predictors and to retain enough power for the planned analyses. Predictor variables in the final analysis were retained based on previous empirical findings and theoretical considerations. In addition, predictor variables were collapsed across levels and then categories based on reduced frequency (less than 5%) of each level. Frequency distributions and cross-tabulation tables were used to identify and collapse variables across for the new model, consisting of institutional (number of days from contact to scheduled appointment), medical (medications prescribed, CD4 count) and psychological (reason for referral, current and past substance abuse information) predictors.

#### **Frequency Information of Original Sample (N=298)**

The mean age of the original sample (N=298) regardless of attendance status was 41.5 years of age (SD=9.32), ranging from 20.0 years of age to 68.0 years. The majority of the sample was male (55% N=165), 42% female (N =124); 3% were transgendered (N=8) and 1 case was missing information. A review of frequency information for the majority of the sample revealed that 53% of the sample did have case managers at the time of referral (N=158). Most individuals had some form of insurance, with 77% having Community Behavioral Health (CBH) otherwise known as Medicaid (N =229). A slight majority of cases were referred from their case managers (56%, N= 166), as compared with 43% from their primary care physicians. The majority of cases (44%) were contacted over 29 days from date of referral (N=131). After removing the 41% of individuals (N=123) for which an appointment was never made, the wait time to an appointment for the rest of the original sample (N= 155) consisted of 33% scheduled within a week (0-7 days) (N=98),

The majority of the original sample was diagnosed with HIV (N=201), as compared with AIDS at that time of referral, with CD4 counts between 201-499 (35%, N=104) and viral loads of less than 400 (37%, N=111). Most individuals were prescribed both HAART (Highly Active Antiretroviral Therapy) medications as well as medications for other medical conditions (38% of cases, N=112). As for other medical conditions 79% were classified as yes (having other medical conditions other than HIV/AIDS, N=237).

The most common psychiatric diagnosis documented on the referral forms of cases was depression (28%, N=83), which was also the main reason for referral (59%, N =177). Upon referral, a large number (83%) of cases were referred for the mental health clinic (N=248) . The majority (61%) of cases were not prescribed any psychotropic medication at the time of referral (N=182). Of those who were prescribed psychotropic medication, most were prescribed antidepressants (16%, N=49). In relation to substance abuse, most cases (68%, N=202) reportedly were not currently using substances at the time of referral. Alcohol was used by 11% of cases (N=33) as a primary and secondary substance of choice (less than 4%, N=11), although most cases denied using secondary (N=248, 83%) or third substances (N=265, N= 89%). Days since last used were measured for primary, secondary and other substances. The majority of cases were not currently using a primary substance at the time of referral or were N/A (68%, N= 203); 84% reported not currently using a secondary substance at the time of referral (N= 250), and 89% did not report utilizing a third substance of abuse at the time of referral (N=266), followed by less than 1% for using a third substance in any category. Of the total number of cases, over 61% admitted to a past history of substance abuse (N=183) and 80% were not receiving (drug and alcohol (N=239) or mental health treatment services elsewhere (86%, N=257).

**Comparison of Never Scheduled to Attend (N=123) to the Scheduled to Attend (N=109)**

A comparison of medical and psychological predictor variables within never scheduled (N=123) and scheduled samples (N=109) was completed using an independent samples t-test. Length of wait time to appointment (provider variable) could not be compared on the basis of the never scheduled group being unable to attend an appointment that was never scheduled. Only significant results would be reported. None of the medical (CD4 count, medications) or psychological predictors (reason for referral, past substance abuse history, current substance abuse) were found to be significantly different between these groups. It can be concluded that significant differences between scheduled versus never scheduled cases with institutional, medical, and psychological predictors in this study were not found.

**Cases that were Scheduled to Attend (N=109)**

Missing cases were extracted from this sample with regard to each predictor variable, resulting in a total N for the analyses of 109 cases prior to analysis. Individual predictors for this sample were then collapsed across levels into a regression model used to predict treatment non-attendance.

**Institutional**

***Wait time to appointment.*** Length of wait time to appointment was categorized as the number of days from the initial contact by phone call from the clinic to the client to the date of scheduled appointment for intake. Categories for the scheduled only sample (N=109) were collapsed into less than 2 weeks (0-14 days) and greater than 2 weeks (15 Days+) with 84% of this sample (N=91) with a wait time of 14 days or less and 17% having to wait greater than 15 days (N=18). This variable was not found to be predictive of treatment attendance when included in the model (B (1, N= 109) = .491,  $p = .38$ ).

### Medical

**CD4.** CD4 counts for the scheduled only sample (N=109) were collapsed across to CD4 level to <200 (17%, N=18), and 201+ (84%, N=91). Missing cases or cases with unavailable information at the time of referral were removed from analysis (N=28). This variable was not found to be predictive of treatment attendance alone or when included in the model B (1, N= 109) = -.762,  $p = .18$ ).

**Types of Medications.** Types of Medications were collapsed across to HIV/AIDS medications (13%, N=14) HIV/AIDS and Medical medications (50%, N=54), HIV/AIDS with Psychotropic Medications and/or Medical medications (28%, N=31) or Other/None (9%, N=10). Medication was not found to be predictive of treatment attendance alone or when included in the model. B (1, N= 109) = -.365,  $p = .16$ ).

### Psychological

**Reason for referral.** For the scheduled only sample (N=109), depression constituted the most frequent reason for referral (61%, N=66). Additional categories were collapsed to anxiety/psychosis (11%, N=12) reasons such as grief or PTSD into other conditions (14%, N=15), medication adherence (8%, N=9) and 6% (N=7) for substance abuse. Reason for referral was not found to be significantly predictive of treatment attendance alone or when included in the model B (1, N= 109) = .006,  $p = .97$ ).

**Current Substance Abuse.** Categories were collapsed for the scheduled only sample (N=109) into current substance abuse (no current abuse or yes/current substance) as well as past history (no, history or yes, past history). Of the scheduled only sample, 75% (n=81) denied current substance abuse as compared with 26% admitted current substance abuse (N=28). This variable was not found to be predictive of treatment attendance alone or when included in the model B (1, N= 109) = .010,  $p = .984$ ).

**Past Substance Abuse History.** As for past substance abuse history for the scheduled only sample (N=109), 68% (N=74) indicated that they suffered from substance abuse in the past, as compared with 32% (N=35) who denied having a history of substance abuse. This predictor variable was not found to be predictive of treatment attendance ( $B(1, N=109) = -.063, p = .887$ ) alone, and was not found to significantly predict treatment attendance as part of the model.

### **Logistic Regression**

An examination of correlations among all variables and tests for multicollinearity was performed and did not identify any problems with highly interrelated variables (Field, 2009). Upon inspection no two variables were found to have a correlation of 0.70 or above (Field, 2009). Tests for multicollinearity were conducted using the collinearity diagnostic in the linear regression option of SPSS (as recommended by Field, 2009). Although SPSS does not have an option for collinearity diagnostic under the logistic regression option, it is recommended to run a linear regression using the same outcome and predictor variables to obtain tolerance and Variance Inflation Factors (VIF) (Field, 2009). Tolerance levels for this study ranged from .905 to .922, indicating that levels were within a normal range and did not point to a collinearity problem. In addition, Schroeder(1990) recommends that VIF levels greater than 10 are concerning. The values for this study ranged from 1.105 to 1.085, and thus were not a cause for concern. The dependent variable (treatment attendance) for this study was coded as 0 (never attended) and 1 (ever attended). Logistic regression assumes that  $P(Y=1)$  is the probability of the event occurring (in this study, treatment attendance), which represents the desired outcome (ever attended).

In order to test for violation of linearity of the logit between the dependent and each independent predictor variable in SPSS, the logistic regression is run again but includes predictors that are the interactions between the predictor and the log of itself. (Field, 2009). A new variable was

created for each predictor that was the log of the each of the original variables. The assumption was tested by forcing all variables into a single block and inputting new interaction terms for each predictor and its respective log by running the binary logistic regression and specifying main effects for each predictor variable and inputting interactions. The transformation did not detect a violation in the linearity of the logit for the model, because no interactions were found to be significant at the  $p = .05$  levels, indicating a main effect of any of the predictor variables (Field, 2009).

The overall fit of the model (goodness-of-fit) was assessed using the Hosmer-Lemeshow test statistic. This statistic is not significant if the model fits the data, which was found for this logistic regression model of treatment non-attendance ( $p = .26$ ) (see TableA2). This statistic is used to assess how well the identified model fits the data (Field, 2009). To ensure the model itself is stable, an examination of residuals is warranted. The purpose of examining residuals is to identify specific areas of the model that may fit the data poorly, as well as to identify areas that influence the model (Field, 2009). Examination of standardized residuals found that the final logistic model fit, as evidenced by the standardized residual (.927 for 100% of cases). On average, only 5% of cases should fall outside of  $\pm 1.96$  and only 1% should lie outside  $\pm 2.58$ . Additionally, cases approaching or above 3.0 are of concern (Field, 2009). The leverage statistic, which typically varies between no influence (close to 0) and completely influence (close to 1) (calculated by  $k+1/N$ ) (Field, 2009). The number of predictors for this model was 6, so  $7/109 = .17$  for the current model, which shows almost no influence. In using Cook's distance, a measure of how a case might influence the model, any values above 1 are a cause for concern. No cases were found in this study to be  $>1$ , because Cook's  $d$  was .052. In addition, a standardized value of Cook's distance known as DFBeta in SPSS, also with a cut-off of an absolute value greater than 1, was calculated. None of the predictor variables was found to have a value close to or greater than 1. There were no outliers in the study that needed to be removed from the data set.

The main hypothesis of this study assessed the predictive validity of a model including institutional, medical, and psychological risk factors predictive of initial treatment attendance. A binary logistic regression was performed through SPSS Logistic Regression to assess the prediction of initial scheduled treatment non-attendance. The predictor variables, conceptually collapsed and theoretically derived, were entered in one step. The institutional group of variables, contained only one predictor, length of time from initial contact to scheduled appointment (measured in 0-14 days/15+ days). The medical group of variables contained 2 predictors, CD4 count (<200, and 201+) and prescribed medical medications (measured as HAART, HAART and medical, HAART and psychotropic and/or medical, or other). Last, the psychological group of variables contained 3 predictors: reason for referral (measured as depression, anxiety/psychosis, other, drug and alcohol, or medication adherence) past substance abuse history (measured as no history, or past history) and current substance abuse (measured denies current abuse or admits current abuse).

The first and only block of the model containing all of these previously mentioned factors was not found to be significant ( $p = .57$ ) producing a Cox and Snell  $R^2$  of .040 and Nagelkerke's  $R^2$  of .054 (Table A1). These statistics can be seen as effect sizes for the model. The overall fit of the model, calculated by the large, log-likelihood statistic ( $-2LL = 145.909$ ) for the constant, as compared with the model ( $-2LL = 150.362$ ) found that the model was a poor fit statistically and did not significantly predict the outcome variable than the model with only a constant.

The model was able to correctly classify only 60.6% of the cases (see Table A3), as compared with 54.1% of cases in the model containing only the constant, without predictors. Of 59 cases, the predictor model classified 66.1% of the ever-attended cases correctly, ( $N = 39$ ), but misclassified 20 cases as ever attended who, in fact, never attended an initial appointment. Of 50 cases, the model also correctly classified 54% ( $N = 27$ ) of individuals predicted as not having attended the scheduled

appointment, but misclassified 23 cases as individuals who never attended, but these individuals actually did attend. To answer the question of how much better the model predicted the outcome of attendance, as compared with chance, the chi square statistic was not found to be significant  $\chi^2 (6, N=109)= 4.47, p= .61$ ). In other words, the addition of these variables to the model did not significantly affect its predictive power (Field, 2009). The Wald statistic .741 (Table A2) showed that none of the b-coefficients of predictors in the model were statistically significant from 0 (Field, 2009).

Last, when interpreting the logistic regression, an examination of the odds ratio Exp (B) is warranted. The odds ratio examines the odds of an event occurring (attendance, in this study) defined as probability of an event occurring (the individual attended the appointment), divided by the probability of the event not occurring (the individual never attended). The idea is to calculate the change in odds that results from a unit change in the predictor (e.g., the odds of the patient attending if he or she did not have a substance abuse history), then calculate the odds of the patient attending if he or she did have a substance abuse history. Last, the proportionate change for these two odds is calculated (Field, 2009). If the Exp (B) value is greater than 1, this indicates that as the predictor variable increases, the odds of the outcome will increase with it; in this case, attend the appointment (Field, 2009). The opposite goes for Exp (B) values less than 1, as the predictor increases, the odds of the outcome occurring decrease. Table A2 displays these values, only which decreased length of time from contact to appointment was found to be associated with increase in attendance, although this was not found to be a reliable estimate (Exp (B)= 1.634, 95% CI= .549-4.861). Reason for referral and admitting current substance abuse were also noted that as they increased, the odds of non-attendance increased, but not significantly. Conversely, the odds of the individual attending increased with increased CD4 levels. This is consistent with most studies that have found increased length of time from contact to appointment (Folkins et al., 1980; Hampton-Robb et al., 2003) have been shown to be linked to

treatment non-attendance, as the findings in this study also suggest; however, they were not found to be statistically significant (Table A2). These estimates of odds ratios are reliable because the majority of predictor variables that did not have confidence intervals that crossed the threshold of 1 (Field, 2009), with the exception of past substance abuse history (Exp (B)= .939, 95% CI= .392-2.249), and current substance abuse (Exp (B)= .1.01 95% CI= .402-2.538).

In sum, the null hypothesis that there were no HIV/AIDS patients' specific risk factors that were found to be predictive of mental health treatment non-attendance has to be accepted for this study. The predictor variables tested in this study's model did not significantly predict treatment attendance together or separately as independent predictors.

## Chapter 5

The objective of this study was to investigate specific risk factors that may be predictive of initial mental health/substance abuse treatment for HIV/AIDS patients, using Gochman's health behavior model as a basis for social, provider, institutional, medical, and psychological risk factors. Due to the identification during frequency distributions of a large majority of cases (N=123) that were never scheduled, these cases had to be extracted from the original data set and could not be utilized in the main analyses. The scheduled only sample (N=109) was then examined, utilizing a collapsed model of institutional, medical, and psychological risk factors to predict the outcome variable of ever versus never attending the initial, scheduled outpatient appointment. Risk factors (predictors) had to be conceptually collapsed across categories and levels in order to create a model that would fit the size of the reduced data set. This collapsed model was then tested using binary logistic regression, with all variables being entered in one step and was not found to be significant to correctly classify 60.6% of cases, as compared with 54.1% with the constant.

### **Treatment Attendance Outcome**

Previous literature regarding HIV/AIDS medication adherence, specifically HAART, has indicated that patients with more severe levels and complicated health statuses are non-adherent both to medical treatment and to medication (Gordillo et al., 1999). This study was novel because it expected to find that HIV/AIDS medical status, in conjunction with social, provider, institutional, psychological variables would be predictive of mental health treatment non-attendance. Although previous literature has examined medication and medical treatment adherence in HIV/AIDS research, no study to date has examined the effects of these risk factors on outpatient mental health treatment adherence within this population.

In this case, it appears for this study that the null hypothesis is true, because previously identified social, provider, institutional, psychological, and specific medical factors for the HIV/AIDS population did not prove to be significant predictors of attendance. The alternative hypothesis stated that specific risk factors operating for the HIV/AIDS population (CD4 count, viral load, and other medical conditions) would be predictive of non-attendance. However, the unexpected finding of the never scheduled (N=123) is clinically significant and conveys the issue of problematic follow-up and referral processes. It is important to note that attempts to contact these individuals were made, as documented by the assigned therapist on the referral form. Reasons for not scheduling varied from being unable to contact the referral via phone and mail (e.g., number disconnected, change in address) or the person was no longer interested in treatment at the time of initial contact. This clinical finding conveys urgency of referring and treating a population at increased risk for medical and psychological problems rapidly, such as when they initially present for medical treatment.

### **Social and Provider Risk Factors**

Overall, the category of social predictors containing age, gender, and case management variables and provider variables containing source of referral and health insurance were not found to be significant predictors of treatment attendance in this study. These variables could not be collapsed across and were not chosen on the conceptual basis of inconsistent findings in literature, and consequently were not entered into the final logistic regression model.

### **Institutional Risk Factors**

***Wait time to appointment.*** It was expected that increased length of wait time to initial appointment would be predictive of initial appointment non-attendance. Length of elapsed time to initial appointment has been found in previous research to be strongly associated with initial mental

health appointment non-attendance (Claus and Kindleberger, 2002; Gallucci, et al, 2005; Grunebaum et al., 1996; Orme and Boswell, 1991; Peeters and Bayer, 1999; Raynes and Warren, 1971). Specifically, the longer the elapsed time between referral and initial intake appointment, the worse the attendance rate becomes; one study finding the no-show rate as high as 75% for a waiting period of 31-35 days (Raynes and Warren). Length of wait time to appointment was categorized as the number of days from the initial contact by phone call to the date of scheduled appointment for intake. However, it is important to note that within the original data set, for more than 41% of individuals (N=123) an appointment was never made (i.e., contact had never been established). Rates of contact were followed by 33% receiving an appointment in a week (0-7 days) (N=98), 10% within 8-14 days (N=32), 4% within 15-21 days (N=12), and less than 3% for 29+ days (N=9) and 22-28 days (N=4). Information was missing for 20 individuals. This predictor had the greatest support based on previous literature and was included in the final analyses (Claus and Kindleberger, 2002; Gallucci, et al, 2005; Grunebaum et al., 1996; Orme and Boswell, 1991; Peeters and Bayer, 1999; Raynes and Warren, 1971). However, these findings were not replicated in this study, because wait time was not significantly predictive of treatment non-attendance ( $p=.38$ ).

Overall, findings in this study did not support previous research that increased lengths of time to initial appointment would be significantly predictive of initial appointment non-attendance. Instead, this study had the unexpected finding that of individuals who never attended, 41% never had a scheduled intake appointment (N=123). When these individuals were removed from the sample, the majority of individuals (33%) could be seen within 1 week, which is largely considered adequate, especially for community mental health, and thus may not have influenced attendance within this study.

**Medical Risk Factors**

**CD4.** It was originally expected that individuals with a progressive HIV/AIDS status (i.e., increased viral load, decreased CD4 count) would be predictive of initial appointment non-attendance. This finding was expected, based on previous medical research with HIV/AIDS patients complicated with co-occurring mental health/substance abuse issues (Gordillo et al, 1999; Mellins et al., 2003). In addition, the CD4 count of an HIV/AIDS patient has been associated with medical treatment non-adherence (Gordillo et al., 1999, Reece, 2003). The medical predictor category was collapsed across to utilize only broad ranges of CD4 count levels (<200 and 201+) on the basis of CDC classification of HIV (CD4 level of 201+) and AIDS (CD4 level of <200) (CDC, 2007). However, CD4 levels were not found to be significantly predictive of non-attendance within this study ( $p=.18$ ).

**Medications.** As for medications prescribed at time of referral, this study was specifically interested in HIV/AIDS medications (also known as Highly Active Antiretroviral Therapy or HAART) prescribed along with additional medications. The variable of prescribed medications was utilized in the final analyses and model on the basis of previous literature (Daughters, Magidson, Schuster, and Safren, 2010; Molassiotis, Lopez-Nahas, Chung, and Lam, 2003; Margolin, Avants, Warburton, Hawkins, and Shi, 2003). Individuals in this population are often referred for outpatient mental health treatment because of HIV/AIDS medication non-adherence. Medical factors such as the number of medications prescribed, complexity and length of treatment course, along with poor communication among providers have been correlated with non-adherence (Vermeire et al). However, this study was unable to identify prescribed medications as a significant risk factor that would be predictive of treatment non-attendance ( $p=.16$ ). In addition, this study was able to measure only those types of classifications of medications that were prescribed, not levels of adherence.

This study is novel because it expected to find that factors that make up an individuals' HIV/AIDS status would be predictive of mental health treatment non-attendance, as measured by non-attendance of the initial intake appointment. Although previous literature has examined medication and medical treatment adherence in HIV/AIDS research, no study to date has looked at the effects of medical risk factors on outpatient mental health treatment adherence within this population. However, this hypothesis was not validated in this study, because neither medical nor other risk factors were found to be significantly predictive of treatment non-attendance.

### **Psychological Risk Factors**

***Reason for Referral.*** In this study, the main reason for referral documented by the case manager or physician completing the referral form, was its use as a psychological predictor of non-attendance. This variable was included in the final analyses and model, on the basis that specific psychiatric conditions such as depression have consistently have been found to be correlated with medical treatment non-adherence (DiMatteo, Lepper, and Croghan, 2008; Schafer et al., 2002; Vermeire et al.). Ciesla and Roberts (2001) completed a meta-analysis examining the prevalence of major depressive disorder (MDD) and found that MDD was found to co-occur among individuals with HIV/AIDS at a rate greater than twice that of the general population. Mellins et al. (2002) examined the association between mental health conditions, substance abuse, and family factors and their influence on medical treatment adherence. It was found that 50% of the sample met criteria for at least one psychiatric disorder, and 25% for a substance abuse disorder. Only substance abuse and mental health conditions were found to impact medication and medical appointment adherence significantly. However, it is difficult to infer reasons based on symptom presentation alone. Reece (2003) found that increased severity of depression, anxiety, and psychotic symptoms were associated with treatment non-attendance, because self-reported follow-ups indicated that these individuals had too many problems to

be able to engage in treatment. However, this study did not find a reason for referral to predict treatment non-attendance significantly ( $p = .97$ ). Findings were not expected regarding symptom severity, because the current study does not have a way of measuring the severity of the symptoms reported by the patients (i.e., using a clinical inventory).

### **Substance Abuse**

It was expected, based on findings in previous literature (Agosti et al., 1996; McKellar et al., 2006, Mellins et al., 2003; Murphy et al., 2004;) that patients who are actively using substances and have a history of past substance abuse (Nose et al, 2003; Reece, 2003) would be predictive of initial appointment non-attendance in this study. Substance abuse variables were collapsed across to include measures of current substance use and past substance abuse history (defined as yes/no) in the model used for logistic regression. This study did not find support for current substance use ( $p = .98$ ) or past history of substance use ( $p = .89$ ) to be significantly predictive of treatment non-attendance.

***Current Substance Abuse.*** As for substance abuse, most participants (68%,  $N = 109$ ) denied currently using substances at the time of referral. Previous research has found that individuals diagnosed with mental health issues, who are currently abusing substances, have a predictability of appointment non-attendance (McKellar et al., 2006; Mellins et al, 2002; Nose, 2003) Agosti, Nunes, and Ocepeck-Welikson (1996), which was expected in this study. This study also measured a timeline of current substance abuse, i.e., days since last used. Ranges of days were measured for primary, secondary and other substances of use/abuse. The majority of the overall sample ( $N = 298$ ) denied using at least one substances or indicated that they were not applicable (68%,  $N = 203$ ), followed by participants last use of their primary substance of abuse within the past week ( $< 7$  days) (10%,  $N = 31$ ), followed by 7% ( $N = 20$ ) having used within the past month, and less than 2% having abused drugs within

the past 2 weeks (N=6) and less than 1% having used drugs within the past 3 weeks (N=2). Information was missing for 37 participants. As for time periods of secondary substance abuse, 84% (N=250) denied current abuse of a secondary substance. Less than 3% indicated that they had abused a secondary substance within the past week (N=8), followed by less than 1% within the past 2 weeks (N=2), 0% for within the past 3 weeks, and less than 3% over the past month (N=7). Information was missing for 32 cases. Last, a large percentage (89%, N=266) denied current abuse of a third or other substance. In addition, less than a 1% rate of occurrence for each time period (ranging past week to past month) was noted, with information missing for 27 cases.

***Past Substance Abuse History.*** Of the total number of participants, over 61% admitted to a past history of substance abuse (N=183), as compared with no past history or N/A reported by 28% (N=85). Information was missing for 31 participants. Consistent findings have been found with individuals who have substance abuse histories, in particular cocaine and alcohol abuse (Nose et al., 2003; Reece, 2003). Additional studies have cited the co-occurrence among mental health conditions and past/current substance abuse could account for high treatment dropout rates (Agnosti, Nunes, and Ocepeck-Welikson, 1996; Claus and Kindleberger, 2002, King and Canada, 2004). Overall, past substance abuse history and current substance use have consistently been found in previous research to be significantly related to treatment outcome. However these findings were not replicated in the current study.

It is important to note that that all the substance abuse information in this study is largely self-reported, as well as subjective. The referral form was interested about information concerning which substance the patient was abusing, which is dependent on the patient's level of insight and admittance of a substance abuse problem and the documentation and possible input of the case manager/physician. It is possible that rates were underreported, as well as possibly over reported, if the patient though he or she was disclosing levels of use, not abuse.

### **Limitations of this Study**

Several types of limitations are noted to be for this study. The most notable was the creation of an archival data set from referral forms designed for tracking and management of referrals. These forms were not developed to measure treatment engagement, so information available within them determined the predictors selected for this study. Although the method of referral information is standardized, documentation of attendance outcome varied individually, depending on the provider and recipient of the referral. Specifically, it was up to the therapists or referred provider's discretion to document the date, time, and notes regarding attempted contacts/scheduling of the patient. A checklist or column added to the form specifying this information could serve as a prompt for standardizing information; this notation column could also be added to document a reason for cancellation or missed appointment.

Another possible limitation of the study is misinformation or incorrect documentation on the referral forms. Because the primary care and medical case management team document referral information, it is possible that some information on the referral form is incorrect or inaccurate. Additional changes to the referral form itself might include additional static factors such as ethnicity, legal history, age and mode of HIV transmission as well as dynamic variables such as socioeconomic status, current modes of transportation, employment information could be of benefit.

The identification of the never scheduled group was both a benefit and a limitation of this study. The limitation of the reduced small sample size, in turn, limited the range of the identified social, provider, institutional, medical, and psychological predictors. The original research question was aimed at examining 2 groups, those who attended an initial, scheduled appointment and of those who never attended an initial, scheduled appointment. This dichotomous outcome was conceptualized on the basis

of the importance of treatment attendance, incorrectly assuming that all cases would at least have been scheduled. This study did not foresee the possibility that a large portion (41%, N= 123) of the original referral sample (N=210) that never attended because they were never scheduled. The reduced data set (N=155) prompted a conceptual collapsing of categories, and then removal of missing cases for individual predictors reduced the sample further (N=109). The predictor variables were collapsed to 6 individual predictors including dummy variables, for a total of 15 variables for a reduced sample (N=109). Most variables were collapsed conceptually and also for low rate of occurrence (e.g., frequency values of less than 5%, such as other types of substances abused). This study was seriously affected by power limitations, and effect size was found to be only 0.54 for the sample. This severely limited the opportunity to find significant results for the model. Furthermore, the conceptual combination of predictors led to losing specific information relative to individual predictors and categories based on Gochman's theoretical model.

Efforts to increase sample size for the future could include other closed cases as well as active patients. This study permitted only the use of archival charts of individuals whose cases were closed from 2010 to 2012; 2 years of referral forms could be utilized. This is also due to change in referral forms in that time period, because older forms did not contain as much information as these newer forms for use for this study. In addition, although well over 500 charts were reviewed for possible inclusion, most patients' cases had either been closed or transferred prior to the time period for this study.

One major theoretical limitation of this study in identifying risk factors was that archival data was used; therefore, dynamic variables such as health beliefs and motivation for outpatient treatment were not assessed. In addition, factors such as socioeconomic status and other environmental barriers to treatment were unable to be assessed. Thus the limitation of this study of measuring largely static factors omitted the dynamic variables and unique barriers often encountered by the HIV/AIDS

population. For example, information regarding motivation, health beliefs, stigma and perceptions of treatment, and patient-provider relationships were also unable to be assessed as a function of the study.

Last, a limitation exists in generalizing the current study to other populations. This study investigated adult HIV/AIDS patients that receive tertiary care treatment at the largest HIV/AIDS practice in the Philadelphia region. Therefore, it would not be recommended to generalize the findings of this study to rural and suburban populations, to situations overseas, or to children diagnosed with HIV/AIDS.

### **Future Directions**

Future directions with this study would measure static factors in conjunction with system issues (length of wait time, services provided, referral process) as well as dynamic factors (levels of social support, relationship between patient and provider, motivation, stigma, socioeconomic status). It is believed that by initially identifying individual, static patient characteristics, then assessing system and dynamic variables, further improvements in treatment attendance and adherence can be made. In addition, the unique needs of the HIV/AIDS population need to be explored via qualitative studies and to be investigated on a service systems level in order to identify the effectiveness of service needs through the service users.

**Assessment.** Assessment is also an important component of providing effective HIV/AIDS care. Current research needs to be directed towards identifying risk factors of individuals diagnosed with HIV/AIDS with co-occurring mental health/substance abuse disorders. One study found that more than 50% of an HIV/AIDS sample also met criteria for, at least, mental health diagnosis (Mellins et al., 2002). An additional 25% of those patients also met criteria for a substance abuse disorder (Mellins et al.). The most common psychiatric diagnosis documented on the referral forms of participants in the current

study was depression (28%, N=83), followed by Bipolar Disorder (12%, N=35), psychosis (4%, N=12), anxiety (3%, N= 8), PTSD (2%, N=5) and other (4%, N=11). Screening tools for use in primary care would be of benefit to identify those with pre-existing diagnoses or new psychiatric symptoms. Inventories such as the Client Diagnostic Questionnaire (CDQ), a non-mental health screening tool is designed to assess, specifically, the range of psychiatric disorders known to be prevalent person with HIV (such as depression, anxiety, substance abuse, and PTSD) (Aidala et al., 2004). It takes about 15-20 minutes to administer, and staff, without mental health training, were able to identify correctly, 90% of clients that were found to meet criteria for an Axis I mental health disorder by a clinician. The need for thorough assessment is justified by the presence of co-morbid mental health problems with medication and medical treatment adherence in this population. Continuing to focus solely on medication-compliance rather than assessment of mental health needs in the HIV/AIDS population fails to address major risk factors that contribute to the compromised medical status of these individuals.

**Service Linkage.** Future directions of this research should ideally focus on identifying the disconnect between mental health and medical care of individuals with HIV/AIDS. Previous research has primarily focused on medication adherence and interventions and strategies to address compliance issues. However, the need to investigate underlying system mechanisms and problems with service linkage that contribute to mental health and medical treatment adherence is evident. This study demonstrates this issue, with the identification of the never scheduled group, or with individuals who were unable to be contacted to schedule an appointment. Outreach projects and examination of case management within the practice could possibly address some of the problems with contacting patients for follow up (i.e., many are not scheduled for an appointment because they could not be located or contacted). Lehrman et al. (2001) examined HIV case management outcomes in New York State and found that almost 80% of cases needed linkage to services (i.e., medical, mental health, housing), as

opposed to advocacy or maintenance services. An overall outcome rate of 73% was found among case managers successfully able to arrange services; the client utilized 63% of those services and referrals. This study demonstrates the important and critical component of addressing links between service and referral follow-up needs within the HIV/AIDS population.

**Service Needs.** In addition, although many services are offered to the HIV/AIDS population, the question of the utility and appropriateness of services remains. For example, services ranging from medical care, case management, assistance with basic necessities, illness-related services, and other support services are widely available to this population under public health, the AIDS Drug Assistance Program, and the Ryan White CARE Act (Conover and Whetten-Goldstien, 2002). An examination of the impact of ancillary services on primary care use and outcomes for HIV/AIDS within public insurance coverage found that 65% of patients used case management services, and 30% used pharmacological assistance. However, even with the services offered, 17% of patients continued to indicate a problematic transportation service issue, as well as 44% with outstanding childcare needs. Both of these service needs were found to influence patients' abilities to attend medical treatment appointments. In addition to the utility of services provided for outreach, the mental health needs of HIV patients referred for home care services have largely gone ignored. Hurley and Ungvarski (1994) completed chart reviews in order to identify the mental health needs of HIV/AIDS patients admitted to home care; they found, in this study, the majority of patient's cognitive status accounted for an inability to manage treatments, medication noncompliance, and depression. This study suggests that a homecare plan that focuses solely on physiological needs and ignores the mental health and environmental needs of these patients is inadequate.

Although HIV/AIDS patients are often referred to outpatient mental health care, very little is known about the overall effectiveness of behavioral interventions and direct benefits of receiving

mental health care services. This is largely due to the fact that many patients do not stay in treatment long enough, or drop out at the time of referral. For example, in this study, length of wait time to contact was measured as the number of days from the referral by phone call to the day of actual, initial contact. The majority of participants (44%) were contacted over 29 days from date of referral (N=131), followed by 27% within 0-7 days (N=81), 13% within 8-14 days (N=38), 6% within 15-21 days (N=18), less than 3% 22-28 days (N=8) and information was missing for 8%, or 23 participants. This variable was not included in the in the analysis of the model because this category could not be collapsed across, and was not found to be a significant predictor of treatment non-attendance.

It is important to note that the majority of the sample (44%) took over 29 days to contact; this finding may be related to the cycle of the clinic. Each year, new practicum students begin in July, and the current practicum students do not take on new cases beginning in April of that same year. Essentially, a 4-month window exists in which referrals are received and are given to full-time staff (e.g., supervisors) during the transition process, pending openings on their caseloads. It is possible that a large portion of individuals are referred during that time period are unable to be seen due to the student transfers at the clinic. A behavioral health consultant in the primary care office that could serve as the liaison and interim therapist until the new cycle of students is available to see patients could address this issue. In addition, a rolling admission process could also be of benefit.

Another way to address the issues of wait time is through system improvements through an accelerated intake process. Festinger et al. (1996) examined whether or not offering same day versus a 1-7 day waiting period for intake appointments would increase initial attendance. It was found that 59% of the sample that were offered the same day or accelerated intake attended their scheduled appointments. This study demonstrates support for brief waiting periods as a factor that a clinic system could address by way of open door or accelerated intake processes.

**System variables.** Major system changes on a federal level are also warranted to address the service needs of HIV/AIDS patients adequately. The Substance Abuse and Mental Health Services Administration (SAMHSA) recognizes the impact of this issue and has awarded new grants to provide behavioral health services in communities most heavily impacted by HIV/AIDS. Funding will be used to develop and expand networks of primary care, HIV/AIDS and behavioral health service providers serving individuals with HIV/AIDS, or who are at a high risk for contracting HIV/AIDS. (SAMSHA, 2011). Through this grant, The Philadelphia Department of Health partnered with the AIDS Activities Coordinating Office (AACO) and received \$1,328,657 to create Behavioral Health Consultant Positions throughout the cities of Philadelphia. The clinic at which this study took place did receive a portion of the grant, and currently has a Behavioral Health Consultant working within the HIV/AIDS primary care clinic to address the mental health needs.

**Behavioral Health Model.** Law and Buermeier (2005) suggest having a psychologist work directly in a primary care practice (known as a behavioral health consultant); this would allow these patients to be referred for a consult, or a crisis evaluation, or for immediate assistance in the exacerbation of a mental health condition. In addition, having a psychologist in the primary care setting can address referral issues, as well as facilitate improved medical outcomes through patient, staff, and clinic interventions. For example, a psychologist can serve as an educator to the staff regarding the importance of mental health services through collaborative work and trainings, and also to provide psychoeducation regarding mental and medical health status to patients.

The psychologist can also serve as a consultant/liaison in an effort to assess for medication and treatment non-adherence risk, crisis/danger evaluations, and complete preliminary neuropsychological screening to assess for HIV-related cognitive decline. Last, the psychologist can act as a treatment provider by providing emotional support to patients at various stages of illness, tailor adherence

interventions, provide psychoeducation, brief psychotherapy, and behavioral health services (e.g., improving lifestyle behaviors such as quitting smoking, losing weight).

Relevant to this study, psychologists can quickly assess the need for further mental health treatment and make timely and appropriate referrals for more intensive or specialized treatments (Law and Buermeyer, 2005). Psychologists can serve as the direct linkage to mental health services from primary care while maintaining patient contact and being familiar with appropriate assessment and levels of treatment services. This is especially important relative to this study, because the primary care center was located on the 3<sup>rd</sup> floor of the building, and mental health services were contained within the same building on the 8<sup>th</sup> floor. However, it appears that the proximity of patient services did not provide a deterrent for pre-treatment dropout.

It is theorized that inclusion of a personal facilitator for referrals (such as a behavioral health consultant working directly with the patient) or meeting the provider prior to treatment, along with streamlined referral processes could improve this transition. Olfson et al. (1998) evaluated the effects of communication between patients and their outpatient clinician before discharge, concerning a patient's referral compliance, psychiatric symptoms, and community function at 3 months follow-up, post discharge. Compared with patients who did not have communication with their referred outpatient clinician prior to discharge, those individuals who did have communication were significantly more likely to complete the outpatient referral. Although this study was completed with an inpatient psychiatric sample, a similar mechanism can be applied to the outpatient HIV/AIDS population by way of a behavioral health consultant.

Law and Buermeyer (2005) also support this idea, because they indicate that the best opportunity for mental health services to be successful is within a primary care clinic or HIV/AIDS

specialized treatment setting, where large numbers of patients are seen for outpatient care and case management services. Future directions could include utilizing this study as a baseline and examining the effectiveness of the new Behavioral Health Consultant intervention in order to see if patients are following through with referrals and attending at least one scheduled outpatient appointment.

**Motivation.** It is expected that motivation of patients may be an important unmeasured variable in this current study. It is assumed that some motivation is evident because the patient did complete a referral with his or her case manager/medical doctor to schedule an initial appointment; however, self-reported levels of motivation were unable to be measured within this study. Motivation for treatment has been assessed through examining how patients manage negative feelings about attendance (Sheeran, Aubrey, and Kellett, 2007), as well as adherence-related beliefs (Norton et al., 2010). Sheeran, Aubrey, and Kellett evaluated interventions focused on increasing intentions to attend appointments and manage negative feelings of shame or embarrassment. It was found that participants who addressed their negative feelings by normalizing, reported increased intent to attend and were significantly more likely to attend their appointments. Norton et al. (2010) assessed adherence-related motivation and skills of HIV patients in clinical care and found that beliefs associated with non-adherence (e.g., "As long as I am feeling healthy missing medications is OK") to be present at an increased rate among non-adherers as well as behaviors such as difficulty in discussing HIV with provider. The results of these studies validate the connection between illness-related cognitions and treatment adherence. This study was unable to address health beliefs or models of study participants. Based on models of health decision-making, such as the Health Belief Model (Becker, 1974) and the Transtheoretical Model of Change (Prochaska and DiClemente, 1983), motivation as well as health cognitions and behaviors are assumed to play a significant role in initiating health care treatment. It is recommended that the referral process for the future involve utilizing questionnaires to assess patients'

health beliefs and motivation. Some type of inventory that would identify health beliefs and cognitions of these patients would also help identify specific motivational and individual health issues that could contribute to initial appointment non-attendance in this population. Assessment of patient motivation and cognition could include the Readiness to Change Questionnaire for current drug abuse (Heather, Rollnick, and Bell, 1993) and alcohol abuse (Hile and Adkins, 1998), the Life-Windows Information-Motivation-Behavioral Skills Adherence Assessment Questionnaire (Norton et al., 2010) and the Client Diagnostic Questionnaire (CDQ) (Aidala et al., 2004).

**Patient-Provider Relationship.** Additional future directions of this study would be to examine the relationship between the patient and the primary care provider. It is possible that the decreased strength of the relationship and lack of confidence in the provider's treatment may be associated with initial appointment non-attendance. The patient may not put stock in the physician's referral, and therefore not follow through with treatment. Bodenlos et al. (2007) assessed attitudes toward healthcare providers as well as social support and depression and, further, depression in relation to outpatient attendance. A model containing social support attitudes toward healthcare providers and medication status was predictive of appointment attendance. The study concluded that positive attitudes and larger social support networks were significantly related to appointment attendance. Gauchet, Tarquinio, and Fischer (2007) investigated psychosocial predictors of medication adherence among persons living with HIV and found that only confidence in the physician and satisfaction with treatment significantly predicted adherence. The study concluded that the patient-provider relationship to medication adherence is mediated by the patient's beliefs and satisfaction with treatment. Wagner, Kanouse, Koegel, and Sullivan (2004) examined correlates of antiretroviral medication adherence in individuals with serious mental illness and found that greater adherence was found with the strength of and perceived quality of the patient-provider relationship.

Previous research supports positive relationships between the patient and his or her healthcare provider is associated with increased treatment attendance (Hampton-Robb et al., 2003). Murphy et al. (2002) conducted a small pilot trial aimed at improving antiretroviral adherence among HIV patients. Patients in the treatment group received 4 sessions of cognitive-behavioral intervention strategies to improve medication adherence. It was found that patients in the intervention group reported significantly higher self-efficacy to communicate with clinic staff, to continue medical treatment; they also experienced higher life satisfaction, increasing feelings of social support with provider, and an increase in taking their medications on schedule. King and Canada (2004) examined predictors of early dropout from drug treatment and found that outside referrals from the medical center were predictive of treatment non-attendance in individual therapy. It was suggested by these authors that patients who had already established a relationship with a physician inside the treatment center are self-selected, and are more likely to engage in treatment within a familiar setting; however, this also could have been due to misinformation.

**Stigma.** Health care providers are not only responsible for providing psychoeducation and assessment of illness as well as medications, but they also can serve as a central source of support for patients with HIV/AIDS. Healthcare visits can be opportunities for patients who feel stigmatized by their illness to discuss issues openly. However, if the patient feels stigmatized within his or her medical treatment setting, this may have a negative impact on the quality of the relationship with his or her healthcare provider (Bodenlos et al., 2007). Whetten et al. (2008) discussed a unique form of stigma within the HIV/AIDS population as originating from an experience an individual may have encountered or a perceived fear of negative attitudes or discrimination relating to positive HIV status. These authors point out that individuals diagnosed at the beginning of the epidemic in the US have been shrouded in secrecy and isolated from social support. Some of the cognitive distortions and myths surrounding

HIV/AIDS continue to operate today in the US, primarily regarding misconceptions about modes of transmission. One way to combat the stigma surrounding HIV/AIDS and to provide treatment is through the use of specialized curriculums, such as the Life Force (Lyon and Woodward, 2003). This group curriculum lasts for 8-30 weeks and focuses on psychoeducation of illness (without the use of stigmatizing labels), builds employment skills, teaches how to manage anger/rejection on the job, teaches health coping and managing conflicts, and provides guest speakers to discuss a range of career opportunities. These authors concluded that the non-stigmatizing, skills-based focus on a positive life outcome (i.e., getting a job) would increase motivation and improvement of adherence. Reece (2003) examined factors influencing dropout among low-income HIV positive individuals and found that the level of HIV-related stigma was significantly higher among dropouts than among those who returned to care. These authors also suggested that a form of stigma was already operating, because they had enrolled in mental health care. In addition to stigma, this study concluded that unfamiliarity with mental health care, which is common among low-income populations, may facilitate the development of perceived barriers to treatment.

**Poverty.** Research on mental health in relation to social problems often ignores the environmental and socioeconomic factors such as crime, unemployment, and homelessness in favor of biological or causal explanations (Draine et al., 2002). It is often posited that mental illness is the explanation for the presence of these factors, not the idea that these factors can mediate a relationship between illness and social problems. A similar view is found within the HIV/AIDS population. Individuals who receive less than optimal care for HIV/AIDS treatment, such as missing medical appointments and medications, and increased emergency room visits tend to be low-income or homeless people. Individuals with HIV/AIDS tend to be concentrated in impoverished urban areas afflicted with social disadvantages and marginalization (Pellowski et al., 2013), as was found in this study. It is unique to the disease of HIV/AIDS that this illness is found almost exclusively within populations who face severe

socioeconomic straits, with wider gaps in income and involves many individuals dependent on public healthcare for treatment. Other variables associated with poverty, such as lack of employment opportunity, transient living situations or homelessness, as well as other basic unmet needs such as necessary food have been found to be predictive of overall mental health and disease prognosis for individuals with HIV/AIDS. Kidder et al. (2007) compared health status, health care use, antiretroviral use and adherence among individuals with HIV/AIDS who are homeless and individuals who are housed. These authors found that homeless individuals were more likely to be uninsured, made frequent emergency room visits, and were admitted to the hospital. Their disease statuses was found to be compromised, because homeless individuals had lower levels of CD4 counts and were less likely to take and adhere to antiretroviral medications. Although poverty and information relating to socioeconomic status was not measured in this study, it is likely an operating barrier to treatment attendance that cannot be ignored. Addressing health disparities in HIV/AIDS by providing adequate basic needs, along with mental health interventions which target individual behaviors, in addition to dismantling social stigma are sorely needed to eradicate the pandemic of HIV/AIDS among the poor (Pellowski et al, 2013).

It is suggested that the information obtained in this study and possibilities for future directions be used to design interventions or to revise referral procedures within primary care and mental health clinics. Combining proposed future directions with the projected findings of this current study assists in explaining a large number of treatment non-attendance to initial mental health appointments for individuals with HIV/AIDS. System changes to referral processes can then be made, such as having the patient meet with the behavioral health consultant, or the assigned clinician before the initial appointment. A behavioral health consultant within the primary care practice can provide brief interventions and identify those patients in need of outpatient psychotherapy, possibly reducing the risk

for non-attendance. However, targeted interventions and strategies can be designed effectively only after the risk factors behind treatment non-attendance are identified (James and Folen, 2005).

### **Summary and Conclusions**

Overall, a review of social, provider, institutional, psychological, and medical factors, such as age (King and Canada, 2004), doctor referral (Mohr et al., 2006), time to initial appointment (Folkins et al., 1980; Hampton-Robb et al., 2003), severity of mental health symptoms (Killaspy et al., 2000), substance abuse history (Agosti, et al., 1996; Claus and Kindleberger, 2002; King and Canada, 2004; McKellar et al., 2006); and chronic medical illness (DiMatteo et al, 2000; Kilbourne et al., 2005; Schaefer et al., 2003) have been found to be associated with treatment adherence, according to the literature. The impact of mental health symptoms on HIV/AIDS treatment adherence is evident, because HIV/AIDS is a chronic, incurable condition, and treatment strategies largely focus on developing interventions to treat the psychological symptoms and improve HIV/AIDS medication adherence. It was expected that the same factors found in the previously mentioned studies may also have been operating within the HIV/AIDS population; this would be further compounded with their medical complications, which were identified in the current study but not found to predict initial mental health treatment attendance.

It was hypothesized that specific risk factors operating for participants diagnosed with HIV/AIDSs, comorbid mental health and/or substance abuse disorders would predict mental health treatment non-attendance to the first intake appointment. This prediction was made chiefly because of their medical conditions (measured by CD4 count, viral load, other medical conditions diagnosed), but also because of specific provider factors (referral source, access to insurance), institutional factors (length of wait to initial contact and initial appointment), social factors (age, ethnicity, case management), and psychological factors (depression, anxiety, substance abuse history/current usage) that may be unique to this population. All of these factors were all measured through information collected on past

outpatient referral forms from the primary care clinic to the outpatient mental health/substance abuse clinic. The reduced data set of cases that were scheduled prompted a collapse across the variables, resulting, consequently, with institutional, medical, and psychological predictors entered only into the logistic regression model. These predictors neither alone nor together in a model were found to be predictive of mental health treatment non-attendance.

The alternative or null hypothesis was that there are no significant specific risk factors operating for individuals suffering from HIV/AIDS with comorbid mental health and/or substance abuse disorders. Specifically, medical factors identified were not strong enough risk factors to be significant in predicting mental health treatment non-attendance. This indicates that mental health treatment non-attendance may be the result of already identified health behavior determinants (social, provider, institutional, psychological risk factors) coupled with other factors not assessed in this study (e.g., cultural determinants, social support, health beliefs, and motivation).

Overall, the frequency information collected about individuals who were referred for mental health treatment was helpful in identifying a “snapshot” of individuals who were referred to the clinic, regardless of attendance status (N=298). Based on frequency information obtained in this study, these individuals tend to be males, with an average of age of 41.0 years, who were referred by their case managers and already had some form of case management. In addition most of these individuals had already been prescribed for HAART medications along with other prescriptions for medical conditions; most respondents were documented as having other medical conditions along with HIV/AIDS. The CD4 count ranges of this sample overall were above the AIDS threshold (201-499) and viral loads overall were found to be <400, which is generally good for this population. Most of these individuals referred for treatment had never been seen before in the mental health and/or substance abuse clinics. Last, the

majority of them had a history of substance abuse but are not currently using. The main reason for referral, as well as for psychiatric diagnosis, was depression.

Therefore, it is believed that in the future, initially identifying individual patient characteristics, then assessing motivation levels and relationships between patients and their health care providers, those specific risk factors will be readily identifiable within this population for use with predictive models. Combining proposed future directions with the findings of this current study will assist in explaining the process of treatment non-attendance to initial mental health appointments for individuals with HIV/AIDS. Future directions should focus on identifying treatment interventions to engage HIV/AIDS patients in mental health treatment in order to treat them for medication and medical treatment adherence. Specifically, it is recommended that it would be beneficial to have a behavioral health consultant within the primary care practice be available to provide brief interventions and identify those patients in need of outpatient psychotherapy and possibly reduce the risk for non-attendance. Brief interventions to address HIV medical treatment have also demonstrated favorable outcomes.

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Appendix A

TABLE A1

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*Logistic Regression Model Statistics for Scheduled Only Patients (N=109)*

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| Model   | $\chi^2$ | df | -2LL    | Cox<br>and Snell R | N <sup>1</sup><br>R | H and<br>L <sup>2</sup> Test |
|---------|----------|----|---------|--------------------|---------------------|------------------------------|
| Model 1 | 4.468    | 6  | 145.894 | .040               | .054                | .26                          |

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*Note.* <sup>1</sup> Nagelkerke's R, <sup>2</sup> Homer and Lemeshow Test.

*p* = .614

TABLE A2

*Logistic Regression Analysis Model/Step 1*

|                   | B (SE)      | Wald<br>X | P    | Adjusted<br>Odds Ratio (Exp(B)) |
|-------------------|-------------|-----------|------|---------------------------------|
| Types of Meds     | -.365(.256) | 2.026     | .155 | .694                            |
| CD4 Count         | -.762(.561) | 1.843     | .175 | .467                            |
| Reason4Referral   | .006(.156)  | .002      | .968 | 1.006                           |
| Time Contact2Appt | .491 (.556) | .780      | .377 | 1.634                           |
| CurrentSA         | .010 (.470) | .000      | .984 | 1.010                           |
| Past SA History   | -.063(.446) | .020      | .887 | .939                            |
| Constant          | .423(.786)  | .290      | .590 | 1.526                           |

*Note. All variables were entered on step 1: Types of Meds, CD4count, reason4referral, timecontact2Appt, Current Substance Abuse, Past SA history.*

*R<sup>2</sup> = .040 (Cox and Snell), R<sup>2</sup> = .054 (Nagelkerke).*

*p = .614*

TABLE A3

*Classification Table*

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|                    | Observed      | Predicted      |           |
|--------------------|---------------|----------------|-----------|
|                    | —————         | —————          |           |
|                    | Ever Attended | Never Attended | % Correct |
| Ever Attended      | 39            | 20             | 66.1%     |
| Never Attended     | 23            | 27             | 54.0%     |
| Overall Percentage |               |                | 60.6%     |

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Table A4

*Variables not In the Equation*

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|                    | Score | <i>df</i> | Sig. |
|--------------------|-------|-----------|------|
| Types of Meds      | 1.983 | 1         | .515 |
| CD4count           | 1.365 | 1         | .243 |
| Reason4referral    | .006  | 1         | .940 |
| Timecontact2appt   | .423  | 1         | .515 |
| Current SA         | .138  | 1         | .710 |
| Past SA history    | .151  | 1         | .697 |
| Overall Statistics | 4.358 | 6         | .628 |

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Table A6: Breakdown of Total Sample (N=298)

